ABSTRACT

Title of dissertation: THE EFFECTS OF PUBLIC POLICIES ON INFORMAL LABOR: AN ANALYSIS FOR LOW-SKILLED WORKERS

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Doctor of Philosophy, 2021

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In this dissertation I empirically assess how public policies such as regulations and taxes influence workers' employment on the informal sector of the economy - particularly in low-skilled occupations with a high female presence. Informal employment is characterized by not paying in full into the national pension scheme and generally not being affected by many other aspects of the regulatory or tax system. As such I contribute to the literature on the institutional aspects of labor informality and on integrated labor markets. The study sheds light on different aspects of the labor market from a gender perspective, which can have short-term implications in terms of tax collection or access to certain benefits for workers, and also long-term effects in the inter generational transmission of poverty and inequality, as children who are raised in informal households have less access to opportunities.

In the first analytical chapter I show that the introduction of Argentinean national Law 26.063 of 2005, which provided employers of domestic workers with a tax deduction for having their workers on-the-books, increased domestic workers'

formalization rates. I do so through a triple difference (difference-in-difference-in-difference) strategy which exploits geographic variation in the intensity of the law based on differences in the share of potential household employers that could benefit from the deduction according to their income level, and uses a group of similar low-skilled females as control. In the second chapter, I show that the fear of losing welfare payments under a formal work arrangement is the mechanism behind the difference in registration for domestic workers with children under and over 18 years old in Argentina after the introduction in 2013 of a new regulation for formal domestic workers giving them access to extended mandated benefits. I do so through a difference-in-difference approach that exploits variation in the age of a domestic worker's youngest child. In the last chapter, I explore the effect of a stricter nail technician's occupational licensing requirement in the United States on two proxies for informality by exploiting state level variations in the number of mandated training hours. Through an instrumental variable (IV) approach using characteristics of the state-level Board of Cosmetology as instruments I found that stricter requirements increase the probability a nail technician will be self-employed, but not of working without a license.

THE EFFECTS OF PUBLIC POLICIES ON INFORMAL LABOR: AN ANALYSIS FOR LOW-SKILLED WORKERS

by

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2021

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Dedication

To my mom and dad

Acknowledgments

I want to thank all the people whose help and support allowed me reach this important milestone in my life. First and foremost I would like to thank my advisor and committee chair, Professor Phillip Swagel. His guidance and support through all the PhD program made this possible. I learned a lot working with him, and his encouragement to keep pushing forward even at the hardest times got me to the finish line. I want to thank Professor Susan Parker for her help, patience and dedication both in my research as well as my career path overall. My time working with her has been one of the most rewarding at the School of Public Policy. This dissertation is also possible thanks to Professor Sergio Urzúa. I developed the early stages of this project in his class, and I am very grateful for the time he has spent going over ideas with me and for the innumerable recommendations he has given me over the years. I also want to thank Professor Peter Reuter for having his office door always open for me. His wise words and conversations have been a constant motivation. Thanks also to Professor Evan Starr for giving me valuable comments, advice and taking the time to be part of my dissertation committee. I am truly honored to be able to call all of you my mentors.

I also want to thank everyone at the School of Public Policy for making me feel at home these years and to everyone at the Phd lab - the time spent there is one of the best parts of this experience. Thanks to my friends both here and back home in Argentina for being an important part of my support system, and a special thanks to Eli and Agustin for always finding the time to discuss ideas with me.

And of course none of this would have been possible without my family. My husband Adam who joined me at the end of this journey and has given me nothing but support, love and encouragement when I needed it the most. Thanks to my brother Martin for always being proud of my achievements and believing in me. Thanks to my mom, my biggest fan, for listening, for taking care of me even at a distance, for the uncountable trips she made to be with me all these years and for being unconditional. And thanks to my dad, for always finding the right words, for being my constant source of inspiration, and for teaching me that I could do anything as long as I put a lot of hard work towards it. I could not have done this without you.

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Chapter 1: Introduction

1.1 Stylized Facts on Labor Informality

Informality in the labor market can be defined as "...the collection of firms, workers, and activities that operate outside the legal and regulatory frameworks" (Loayza et al., 2009, pg. 2). Under this scenario, an informal worker is defined either as a self-employed individual with an informal enterprise or a salaried worker not contributing to a retirement pension scheme (Heintz, 2012). An informal firm, then, is defined as one that employs informal workers and therefore do not make the necessary payroll contributions.

Even though it could be optimal for some firms and workers to be informal, labor informality represents a second-best scenario for a country overall. Labor informality implies a missallocation of resources and represents distorted and deficient economic growth (Loayza et al., 2009). For example, unregistered firms congest infrastructure and public services without contributing the taxes needed to finance them (Slonimczyk, 2014). Informality also implies less access to formal credit institutions at the country level, less participation in international markets, having firms that remain sub-optimally small and are less prone to invest in technology, use irregular distribution channels and divert resources to mask their activities (Loayza

et al., 2009). Even with the previous consequences, it is not straightforward what is the optimal strategy for the government. On the one hand, the process of labor formalization can bring a more efficient use of resources and higher growth because "...informality undermines development prospects through loss of fiscal revenues and unfair competition to formal firms" (Mbaye, 2014, pg. 3). However, on the other hand, formalization might lead to unemployment and low growth if it is based purely on enforcement measures, and can impose a serious penalty on those workers who turned to the informal sector for employment and incomes of last resource (Loayza et al., 2009; Choi and Thum, 2005; Maiti and Bhattacharyya, 2020). The previous point might be translated in social unrest. There is therefore a tension for governments between boosting and reducing the size of the informal sector, particularly in developing countries. Designing policy that can reduce informality without increasing unemployment or reducing income is the challenge for policymakers.

The literature seems to agree that - particularly in scenarios where strong implementation and enforcement of rules and regulations is not possible - policy design needs to be centered in finding the correct set of incentives as to increase both firm's and worker's participation rates in the formal sector (Almeida and Carneiro, 2012; Gudibande and Jacob, 2020; Dinkelman and Ranchhod, 2012; Amaral and Quintin, 2006). The previous is based on the theory of integrated or competitive labor markets. In that setting, both workers and firms are heterogeneous, and make an active decision regarding in which sector of the economy to operate. This implies that the choice for firms and workers to demand informal labor and supply it, respectively, is voluntary and based on an optimization strategy. Workers and firms analyze the

costs and benefits of operating *in the shadows* and decide accordingly (Galiani and Weinschelbaum, 2012). Benefits of operating informally for the firms include avoiding tax payments (but still being able to have access to public goods) and the costs associated with labor and environment regulation, as well as avoiding the costs associated with burdensome regulation and corruption (Assenova and Sorenson, 2017; Friedman et al., 2000; Straub, 2005); while the costs are related to the penalties that it can face if discovered operating illegally (the last being low in countries with fragile law enforcement (Maiti and Bhattacharyya, 2020)) and the limitations to access credit that can put them at a higher risk of going bankrupt (Wellalage and Locke, 2016; Aga and Reilly, 2011; La Porta and Shleifer, 2014). Workers also choose in which sector to work given their non-pecuniary preferences related to each sector. Among the benefits of informality for a worker are the avoidance of taxation and regulation (particularly for the self-employed), having more flexibility and access to subsidies and the cash transfers that a worker would need to disregard when accepting a formal job (Galiani and Weinschelbaum, 2012; Chen et al., 2006). The costs, on the other hand, are related to not fully enjoying the protection of work regulations and having a limited access to the mandated benefits established by the law. Moreover, informal workers are usually unable to have proof of income, which limits their capacity of accessing formal credit and therefore limits their possibilities of consumption and investment (Galiani and Weinschelbaum, 2012; Loayza, 2018).

The previous theory contrasts the one by Lewis (1954), who claims that a group of disadvantaged workers are forced to accept low-paying informal jobs because they do not have access to the regulated, formal sector. The result is a segmented labor

market, with some workers in the formal sectors and other in the informal one (Harris and Todaro, 1970). Under such setting, workers' decisions play no role in determining the equilibrium. Firms choose optimally to operate formally or informally and workers, who are homogeneous, are constrained to obtain the best job available given the labor demand.

In developing countries, there is a view which combines the two previous competitive and segmented labor market theories: an "upper tier" segment where individuals voluntarily enter the informal sector based on private cost-benefit calculations, and a "lower tier" one where individuals rationed out of the state benefits or the formal market end up as a strategy of last resource to escape involuntary unemployment (Gunther and Launov, 2016; Perry et al., 2007). Understanding the incentives faced by the "upper tier" worker and the entry-barriers that are encountered by the "lower tier" ones is important when designing policy.

Empirical research such as the one of Amaral and Quintin (2006); Magnac (1991); Maloney (2004) do not find evidence of market segregation in Colombia, Mexico, and Argentina - respectively. On his note on informal employment in emerging and transition economies, such as those countries coming out of the Russian block, Slonimczyk (2014) also states that there is evidence that labor markets are well integrated, and that therefore a large fraction of informal employment is voluntary. The literature also points out three stylized facts regarding labor informality that go in line with the theory of integrated labor markets. The first one is that while large firms tend to operate formally, small ones tend to operate informally (Rauch, 1991). The second one is that labor formality is negatively cor-

related with the skill level of the worker: low-skilled workers tend to be informal while high-skilled workers, formal. The last one is that ceteris paribus, within a household, secondary earners are more likely to be informal workers compared to primary earners (Galiani and Weinschelbaum, 2012).

1.2 On the causes of labor informality and how to reduce it

Adhering to the notion that preferences towards informality from the supply side arise mainly from poorly designed institutions (Maloney, 1999), this subsection explores different theories related to the causes and persistence of the informal sector.

At the country level, the main causes related to the presence of a large informal sector are the strong rules and regulations that might impose a cost on entering the formal sector (Antunes and Cavalcanti, 2007), structural and socioeconomic barriers that decrease the incentive to invest in the formal sector (Maiti and Bhattacharyya, 2020; Amaral and Quintin, 2006; Acemoglu and Johnson, 2005), and weak enforcement which instigates financial friction (Maiti and Bhattacharyya, 2020; Amaral and Quintin, 2006; Antunes and Cavalcanti, 2007). In developing countries, it has also been argued that as a way to "...tackle poverty and unemployment without putting much burden on taxpayers" (Maiti and Bhattacharyya, 2020, pg. 260) governments might allow the informal sector to flourish (Choi and Thum, 2005; Maiti and Bhattacharyya, 2020; Marjit et al., 2006).

Amaral and Quintin (2006) point out to the lack of contract enforcement efficiency to the reason why the informal sector is high in the developing world. They

develop a model where managers' decision to enter the formal sector depends on the return to outside financing exceeding the additional cost that they have to bear – which means that the most productive managers will self-select into the formal sector and operate with more capital. Moreover, they show that if the enforcement gap is wide, then those firms will also operate at a higher capital to labor ratio. Since low-skilled workers are a better substitute to capital than high-skilled ones, then the formal sector will operate with the more educated workers, and large firms will operate formally. For the authors, policies to reduce the size of the informal sector should include investments in education and/or quality of formal institutions. According to their view, policies that increase the absorption of workers by the formal sector – through a subsidy of formal employment, for example – are distortionary because formal sector workers earn more on average due to productivity.

Ihrig and Moe (2004) point out at tax rates as the institutional aspect that determines the size of the informal sector in a country. The authors develop a dynamic model where a representative agent has to choose whether to allocate labor in the formal or the informal sector while accounting for taxation policies. In this case, the tradeoff lies between higher productivity per unit of labor in the formal sector, or lower productivity but avoidance of taxes in the informal one. A key characteristic of the model is that the formal sector uses both capital and labor, while the informal one uses just labor. That means that as capital accumulates (and the economy grows towards full employment), the marginal product of labor in the formal sector rises and the agent shifts labor out of the informal one. For this model, informality is then the result of the tax burden, which is a combination

of the tax rate and the enforcement rate. The authors, after a series of simulations, conclude that the tax rate, as opposed to enforcement policy, plays a more critical role in determining the size of the informal sector. A country can then attract people out of the informal sector by reducing the tax rate. Nevertheless, the authors also point out that such policy might reduce tax revenues. Therefore, for governments that need to keep tax revenues constant, it could be optimal to lower the tax rate and increase enforcement simultaneously.

Loayza et al. (2009) show that policy and institutional variables related to the quality of the state are the most important factors explaining differences in informality. Therefore the mechanism relying on improvements in the regulatory framework and the quality and availability of public services can help countries experience a more efficient use of resources and a higher growth. The authors argue that formality entails both a cost of entry and permanence; and that informality arises when those costs exceed its benefits. Beginning with a simple correlation analysis, the authors point out that informality is more prevalent when the regulatory framework is burdensome, the quality of government service to formal firms is low and the state's monitoring and enforcement power is weak. They also state that, other things equal, higher levels of education reduce informality by increasing labor productivity. Moreover, production structure skewed towards agriculture favors informality since contract enforcement is less relevant and valuable in primary sectors. Finally, the authors state that a larger share of young workers increases informality by: (1) increasing the cost of monitoring; (2) demanding more resources for skill development; (3) creating bottlenecks in the school-to-work transition; and (4) mak-

ing the expansion of formal public services more problematic. Even though most of the previous stylized facts regarding labor informality have to do with structural characteristics of an economy that are hard to change in the short and medium term, the authors also make a contribution in terms of policies that can reduce informality given the characteristics of a country. They highlight that policy and institutional variables related to quality of the state, particularly restricted regulatory freedom and deficient law and order, are the most important factors explaining the differences in informality across countries.

Galiani and Weinschelbaum (2012) show with data from the Argentinean labor market that regulations that increase the cost of operating formally, both from the demand and the supply side, increase the size of the informal sector. They find that small firms operate informally and large firms operate formally, and workers with low human capital work in the informal sector and those with high levels of human capital work formally. Moreover, they prove that secondary workers, ceteris paribus, are less likely to operate formally than primary workers. The authors conclude remarking the role of the worker in determining the size of the informal sector, and stating that "...ignoring the role of [households] could be misleading and may well induce to disregard important (unintended) consequences of policies and interventions...Policies that reduce labor supply of workers in the informal labor market at given wages will increase the level of formality in the economy" (Galiani and Weinschelbaum, 2012, pg. 837). Among the benefits related to having an informal work arrangement for workers is the access to subsidies and the cash transfers that a worker would need to disregard when accepting a formal job. This

means that welfare - even if well intentioned - might inadvertently lead to a situation in which workers are hired in the informal sector. In other words, the way welfare is designed can change the incentives at the formal margin.

On the previous line, Gasparini et al. (2009) show, using matching techniques, that the likelihood that an unemployed household head will work in the informal sector increases by 5 percentage points with a cash transfer program in Argentina. Moreover, Camacho et al. (2014) used panel data and a variation across municipalities to estimate that the expansion of health insurance to the poor in Colombia. They show that it increased the probability of a worker operating in the informal sector by 4 percentage points. Gasparini et al. (2009) show that the introduction of a conditional cash transfer to unregistered workers with children in Argentina meant a reduction in the incentive to transition to labor formality among low-skilled workers of 8 percentage points. Azuara and Marinescu (2013) show how the introduction of Seguro Popular in Mexico (universal health insurance) is associated with a small but significant increase in informality for those workers with less than 9 years of schooling - however, the same study shows that the overall expansion of the social protection system through both Seguro Popular and Oportunidades did not seem to have had an effect on informality. Bosch and Campos-Vazquez (2014), on the other hand, show using Social Security data that Seguro Popular had a negative effect on the number of registered workers in firms with less than 50 employees. In Uruguay, Bérgolo et al. (2011) find that the extension of health benefits to dependent children of private sector salaried workers decreased informality rates by 1.3 percentage points - but workers responded to the increase formal sector incentive so that only

one member of the household was employed in such sector. Levy (2010) also develops models to show how increasing social benefits to informal workers increases the size of the informal sector. Designing welfare with the correct set of incentives is therefore relevant to increase the effectiveness of social protection schemes and labor policies (Garganta and Gasparini, 2015).

Ulyssea (2010) finds that the trade off between informality and unemployment is not present when the policy under consideration is the reduction of the entry cost of being formal – but it is when considering reductions in payroll taxes and increases in unemployment insurance (which is a subsidy for formal employment). Based on the two-sector continuous time matching model of Acemoglu (2001) incorporating institutional aspects from Latin American labor markets, the author finds limited effects of variations in the unemployment insurance on the size and the wage difference of the informal sector. However, with variations in formal sector entry cost, like eliminating all bureaucratic and monetary costs associated to opening a formal vacancy, the author finds increases in formal employment share, decreases in unemployment (in both sectors, with the increases of exit from unemployment being higher in the formal one) and reductions in the wage gap between formal and informal employment. Thirdly, the author finds that higher enforcement rates (higher risk of operating in the informal sector) reduce its size, reduce the wage gap, but create unemployment. Finally, he shows that variations in payroll tax rates seem to have limited effects on informal sector size, unemployment and wage gap. The author concludes that what is crucial for the determination of the size of the informal sector are the formal entry costs. The best approach then to reduce informality

is to adopt policies that decrease the cost of being formal and generate the correct incentives for both workers and firms to enter the formal sector.

1.3 This Dissertation

Based on the previous facts, in this dissertation I will assess how public policies such as regulations and taxes influence workers' employment on the informal sector of the economy. As such I contribute overall to the literature on the institutional aspects of labor informality as well as to the literature on integrated labor markets given that I show how incentives for both workers and employers can play a role in the size of the informal sector. My analysis is done for low-skilled occupations with a high female presence: domestic workers in Argentina and nail technicians in the United States. Even though the political and regulation enforcement contexts are different in each group, in both cases they are workers with a low bargaining power, meaning that my analysis can represent a lower bound then for how public policies influence informality. The conclusions therefore will not only be important for labor policy overall or in terms of tax collection or access to certain benefits for workers, but also have implications for a gender perspective as well as for the intergenerational transmission of poverty and inequality - thinking that children who are raised in an informal household might have less access to opportunities (Levy, 2010; Hinrichsen, 2017; Docquier et al., 2017).

In the first chapter, I analyze the effects on labor force participation, formalization rates and hours worked of a government policy aimed at reducing labor

informality for domestic workers in Argentina. Specifically, I examine Argentinean national Law 26.063 of 2005 [43], which provided employers of domestic workers with a tax deduction for having their workers on the books - thinking then that the policy in place was in line with subsidizing the demand of formal employment. I find that the tax deductions increased domestic worker's formalization and employment. As such, it contributed to the literature that points out to tax rates as a more effective tool for reducing the size of the informal sector than enforcement (Dinkelman and Ranchhod, 2012; Galiani and Weinschelbaum, 2012; Tomei, 2011) considering that the workplace of this occupation is a private dwelling and therefore monitoring is low, and highlights how household employers are highly sensitive to changes in the cost of employing a worker in this sector as described by Mattila (1973).

In Chapter 3 I examine whether it is possible that poorly designed policies lead low-skilled workers to stay in off-the-books jobs that leave them outside the formal economy. While in 2005 access to social protection for domestic workers with children under 18 years old was non-universal, in 2013 it was. Therefore, Chapter 3, I use the introduction of a new regulation for domestic workers in Argentina which offers new benefits - like paid vacation time and maternity leave - under a formal arrangement (national Law 26.844 of 2013: "Private Homes Employee's Regime" [46]), to show how some interventions targeted at encouraging formalization from the supply side might have unintended consequences when not designed properly. At the time of the introduction of the new regulation, contradicting information lead to the belief that welfare payments could be lost under a formal arrangement. Even though on paper that was not the case, I show that the the probability of exhibiting a formal

domestic work arrangement was lower for those domestic workers eligible for welfare payments compared to those not eligible after the reform. The effect highlights how the fear of losing welfare payments might prevent eligible workers from formalizing, contributing as such to the literature that points out to the expansion of welfare on worker's incentive to operate informally (Camacho et al., 2014; Bosch and Campos-Vazquez, 2014; Bérgolo et al., 2011; Levy, 2010; Garganta and Gasparini, 2015), the one on the misperception on tax systems and tax complexity (Romich and Weisner, 2000; Smeeding et al., 2000; Maag et al., 2005; Chetty et al., 2013; Feldman et al., 2016), and finally the one on policy design and implementation (May, 2003; Howlett and Mukherjee, 2014; Chindarkar et al., 2017) - by showing how people's perceptions are a key. As such, I highlight the relevance of communication and of the timely dissemination of the effects of a new policy for the targeted population at the time of implementation.

Finally, in the last chapter I analyze a possible channel through which regulations might affect the informal employment of low-skilled workers in the United States. In the developed world, the institutional context and enforcement framework is different, and therefore I extend my analysis to see if the conclusions of the previous chapters hold in a new setting. Currently around 30 percent of the workforce in the United States is required to obtain some sort of licensing. That number was 4 percent in the 1950s (Zapletal, 2019). Two thirds of the increase is explained by the growth in the number of occupations that have become licensed over time - particularly for low-skilled occupations. While domestic workers are currently not required to hold a professional license in the United States, a licensed

occupation that has a high female presence and has a similar earning distribution is nail technicians. Therefore in Chapter 4 I exploit state-level variation in the strictness of the regulation to get a nail technician license (measured as number of mandatory hours of Beauty School training) to analyze the effect on two proxies for informality: self-employment and reporting not to hold a professional license in states that require one. While measuring informality is not straightforward in developed economies in comparison to developing ones, it is a first attempt to explore this relationship. I find a small effect of stricter occupational licensing on the probability the nail technician will be self-employed, but not on working without a license. This chapter contributes directly to the literature on the effects of occupational licensing on different labor market outcomes (Zapletal, 2019; Timmons and Thornton, 2008, 2010, 2016; Kleiner and Krueger, 2013; Kleiner, 2015) by adding one new margin of analysis that had been neglected as well as to the literature of the overall effects of the entry costs on determining the size of the informal sector (Ulyssea, 2010).

The three empirical chapters therefore point out to the analysis of how public policies can affect the informal sector through different mechanisms: an incentive to the demand of formal work through a fiscal incentive in Chapter 2, an incentive to the supply of formal work through an extension of mandated benefits in Chapter 3 and the effects of entry barriers on determining the size of the informal sector in Chapter 4. The findings of this dissertation therefore can be a stepping stone for further research. The reforms aimed at the domestic work sector which I have shown were effective in increasing the number of formal work arrangements could be used as instruments to determine the causal effect of informality on outcomes

where reverse causality is usually a cause for endogeneity such as poverty, children's education, access to credit or health status. Moreover, the effect of occupational licensing on the informal employment of low-skilled women could continue to be explored with event studies which analyze the introduction of a particular license in a specific state as a way to look for the possible biggest shock, for example the introduction of the nail technician license in New York back in 1994.

Chapter 2: Stimulating the Demand for Formal Domestic Worker

2.1 Overview

The 2018 Academy Award winner for Best Foreign-Language Film *Roma* portrays the journey of Cleo, a young woman employed as a domestic worker for a middle-class family in Mexico City during the 70s. Cleo's story uncovers the reality of at least 50 million women today who, like her, work as domestic workers in an informal arrangement worldwide. Most of them have no access to benefits like healthcare or maternity leave and are not subject to safety and labor regulations. They are also subject to credit constraints and usually paid less than the minimum wage, without required vacation and rest periods. They probably never can retire, as they do not make the necessary contributions to the pension scheme throughout their working years.

Domestic work is in fact the urban sector with the highest rate of informality in the world. It is estimated that at least 75 percent of the global 67 million domestic workers (maids, nannies) do not contribute to the national pension scheme and do not have access to employment related social security benefits (ILO, 2013a, ILO, 2016a). To understand the importance of the sector globally, "If all domestic workers worked in one country, this country would be the tenth largest employer

worldwide" (ILO, 2013b, pg. 19). A key characteristic of domestic work is that it is predominantly a female occupation, with women making up over 80 percent of the domestic workforce worldwide (ILO, 2016a). Just in Latin America, this sector employs a little less than 15 percent of all female salaried workers (Lexartza and Chaves, 2016). Therefore, policies targeting this sector are also relevant from a labor markets' gender perspective.

This chapter studies the effects on labor force participation, formalization rates and hours worked of a government policy aimed at reducing labor market informality in Argentina and bringing workers on the books. Specifically, it examines Argentinean national Law 26.063 of 2005 [43], which provided household employers of domestic workers with a tax deduction for having their workers on the books.

Using employment data for over 100,000 low-skilled women (of which more than 20,000 are domestic workers) from the Argentinean Household Survey for the period 2003-2008, the chapter examines market responses to the introduction of the tax deduction through a triple difference (difference-in-difference-in-difference) strategy. It exploits geographic variation in the intensity of the application of the law based on differences in the share of potential household employers that could benefit from the deduction according to their income level, and uses a group of similar low-skilled females as control.

Results show that the introduction of the tax deduction increased registration (particularly for those working in areas with a high share of potential household employers that could benefit from the tax deductions), overall reduced unemployment in the sector and increased the number of full-time work arrangements - an indica-

tion that the amount of the deductions was enough to cover the incremental cost of formality. The findings of this paper are in line with authors such as Tomei (2011); Hertz (2005); Raz-Yurovich and Marx (2018) as well as the predictions of Mattila (1973) which point out that the demand of domestic workers is highly sensitive to its costs. It also highlights how tax rates are a more effective tool for reducing the size of the informal sector than enforcement (Dinkelman and Ranchhod, 2012; Galiani and Weinschelbaum, 2012; Tomei, 2011) considering that the workplace of this occupation is a private dwelling and therefore monitoring is low.

Finally, the chapter uses this policy to test whether access to welfare might increase the cost of holding a formal work arrangement for low-skilled workers, and as such discourage them to be employed in the formal sector. In 2005, access to welfare for domestic workers depended on: i) reported family income being below a certain threshold; ii) having children under the age of 18; and, iii) having a spouse employed in the formal sector. I find that domestic workers eligible for welfare might have transition to formality at a lower rate.

The chapter is organized as follows. Section 2.2 describes the characteristics of the domestic work sector worldwide, in Latin America and the Caribbean and particularly in Argentina. Section 2.3 exposes the specifics of Law 26.063 of 2005 [43]. Section 2.4 explains the empirical strategy, and Section 2.5 shows results. Finally, Section 2.6 concludes.

2.2 Characteristics of Domestic Work

The International Labour Organization (ILO) defines domestic work as "work performed in or for a household or households within an employment relationship" (ILO, 2011, Article 1). Domestic workers carry out a variety of activities for the household that employs them: from general cleaning and cooking activities to taking care of the children, the old or the disabled (ILO, 2010).

There are three main characteristic of domestic work that make it unique from other occupations. First, the employer in this case is a private household which outsources chores and childcare activities to free up time of its members for other labor and non-labor activities (Raz-Yurovich and Marx, 2018; Van der Lippe et al., 2004; Craig et al., 2016). Therefore the hiring of a worker in this case is not directly linked to an economic profit – though the fact that such worker takes care of basic chores releases valuable time for members of the household to participate in the labor force.

Secondly, the location where the employment takes place is a private dwelling (ILO, 2010). The previous implies isolation, as most households employ one domestic worker at a time (Gaitskell et al., 1983; ILO, 2020a), low monitoring and enforcement mechanisms and translates into special dynamics between household employers and workers. For example, the interpersonal nature of the interactions between household employers and workers builds a social hierarchy where domestic employees can be seen as inferior in the labor relationship context (Gorbán and Tizziani, 2014); their relationship is many times disguised by a sense of familiarity

and operating social norms though they are not part of the family which might cause "affective ambiguities" (Valenzuela and Mora, 2009; Pereyra et al., 2017; Brites, 2014; Courtis and Pacecca, 2014); and the work many times is not seen as a proper occupation – a supply of services – but rather as "help" to the functioning of the household (ILO, 2010; Peterson, 2007).

Finally, the employee is in general a low-income, low-educated woman (ILO, 2010; Brites, 2014; Courtis and Pacecca, 2014; Neetha, 2008). Women from poor households without training might find in domestic work a way to earn life that does not require any particular training (D'Souza, 2010). This is particularly true for women from marginalized populations who end up migrating in look for better opportunities within this occupation (Gorbán and Tizziani, 2014; Courtis and Pacecca, 2014; D'Souza, 2010; Rubio, 2003).

2.2.1 Domestic Work in the International Context

It is estimated that at least 67 million people 15 years and older work as domestic workers around the globe (ILO, 2013b; Gallotti and Branch, 2015). In 2010, that meant that 3.6 percent of global salaried employment was related to domestic work activities. The region with the highest figure is Latin America with 11.9 percent. The next one is the Middle East, with 8.0 percent (ILO, 2013b).

Around 17 percent of domestic workers are migrants - that figure is over 70 percent in North America and the Arab States (Gallotti and Branch, 2015) - and women make up over 80 percent of the domestic workforce worldwide (ILO, 2020b).

The number of domestic workers has been steadily increasing and is expected to keep growing - particularly in developed countries (ILO, 2020b; Manyika et al., 2017; Pape, 2020). The reduction in the size of families (which implies less extended family support), the decline in the public provision of care services, the increase in women's education (now more than ever before women have high-skilled jobs requiring them to spend more time working outside their houses) and the increase in life expectancy mean families have to turn to domestic workers to care for their children, their old relatives and their households overall (ILO, 2020b; Pape, 2020). Moreover, the growing inequality means that not only the demand for the services of domestic workers will continue to grow, but also their supply as long as opportunities do not reach those households in the bottom of the income distribution – and particularly girls coming from those families. In fact, Latin America is the region with the highest percentage of their female workforce performing domestic work and also the most unequal region in the world (Torrens, 2019).

Another key characteristic of domestic work is its high rates of informality: 75 percent of those 67 million workers do so in an informal scenario, meaning they do not contribute to the national pension scheme and do not have access to employment related social security benefits (ILO, 2013a). This is particularly striking given that globally, it is estimated that 60 percent of the work force is informal (Bonnet et al., 2019). Therefore domestic work is a sector that significantly contributes to the informal economy.

Related to the previous is the lack of regulation of the sector. The fact that domestic work does not have a standard structure (workers can be full or part time;

they can have one or more than one employers and they can live in the home of the employer or on their own); their isolation at the workplace; their high rates of international migration and low-educational attainment; and their low levels of collective organization and relative lower bargaining power affect their ability to push for a regulation of their work (D'Souza, 2010; ILO, 2020b; Pape, 2020; ILO, 2016b). By 2013 only 10 percent of domestic workers were covered by general labor laws to the same extent as other workers in the economy - the rest were either covered by subordinate regulations, specific labor laws or state level provisions (60 percent) or completely excluded from the scope of the country's labor laws (ILO, 2016b). The previous represents a de facto discrimination against an occupation made up mostly by poor women (ILO, 2018a). In an effort to reduce such reality, the ILO instrumented in 2011 the Domestic Workers Convention [67] aiming signing countries to develop national laws to transition domestic workers to formality.

Even with the regulation in place, the special characteristics of this occupation - mainly its location and dynamic of the employer-employee relationship - means that their enforcement might be challenging (Gudibande and Jacob, 2020). In fact "... in most of the countries, the law requires the consent of the householder or prior judicial authorization to allow access of labour inspectors under provisions protecting the right to privacy, which in most of the cases is guaranteed by the Constitution" (ILO, 2014, pg. 26). Making sure the correct incentives for registration are in place and providing information in an efficient and effective way - both for household employers and domestic workers - is key (FORLAC, 2014; Lexartza et al., 2016).

Latin America and the Caribbean is the region with the highest percentage

of domestic workers as a share of total waged employees and is home to almost 40 percent of all domestic workers. In the region, 18 million people (7 percent of the employed population) can be categorized as domestic workers with an informality rate of 77.5 percent in 2013 (Lexartza and Chaves, 2016). In Latin America and the Caribbean, there is also another phenomenon: 93 percent of domestic workers are women, which is almost 15 percentage points higher than the world average. In 2013 1 every 7 occupied women were domestic workers (Lexartza and Chaves, 2016). The region therefore has an important role to play both in fighting informal employment in this sector and in putting in place public policies with the correct set of incentives for registration. Among the countries with the highest share of domestic workers over female labor force participation in the region are Argentina and Paraguay with around 17 percent, and Brazil with over 15.5 percent (Lexartza and Chaves, 2016). When analyzing contributions to the pension scheme in Latin America and the Caribbean, the difference by country spreads - mainly due to several countries lagging behind in regulation that require registration. While Ecuador, Chile and Uruguay had in 2016 more than 40 percent of domestic workers contributing to the national pension scheme, in countries like Mexico the percentage was 0.1 percent. In Bolivia it accounted for 4.4 percent of domestic workers, in Paraguay and Colombia for over 10 percent and in Argentina for over 25.5 percent (Lexartza and Chaves, 2016).

Despite the importance of the occupation in the world economy, domestic work is "One of the most understudied groups within informal sector" (Gudibande and Jacob, 2020, pg. 1), at least in the empirical literature. Mattila (1973) estimates

supply and demand functions for domestic work in the United States in 1960 to analyze its market and to predict the impact on employment of extending minimum wage laws to this occupation (something that was proposed in 1972). He shows that that demand for domestic work is highly sensitive to costs and that its supply is quite sensitive to the availability of alternative income sources, so an increase in minimum wage would imply shorter work-days (rather than the more extreme response of firing domestic workers), fewer working days, and low annual incomes for this group of workers. Mattila (1973) points out that the previous is conditional on: i) government being able to enforce it; ii) law being continually adjusted to inflation; iii) the un-existence of any shock that might increase productivity; iv) no change in the power earning of husbands of domestic workers.

Empirical analysis of the effect of regulations affecting domestic work have been centered on India, South Africa, Belgium, Brazil and Ecuador. Hertz (2005), through a difference-in-difference model, find that the introduction of the minimum wage in the domestic work sector in South Africa in November 2002 increased real wages, average monthly earnings, and total earnings of all employed domestic workers, while decreasing hours of work per week and employment. However, Dinkelman and Ranchhod (2012) find through a similar approach and using the same November 2002 introduction of the minimum wage that wages and formal work arrangements in the domestic work sector increased in the short-run, and did not impact employment or hours of work - and highlight how external sanctions then are not needed for labor legislation to have an impact given that there was actually barely any monitoring and enforcement of it. They cite their differences with Hertz (2005) in that they

focus only in urban workers, use an updated and consistent set of survey weights from the Labor Force Survey and use a higher level of aggregation. Similar results where found by Bhorat et al. (2013). In India, Gudibande and Jacob (2020) find that the introduction of minimum wage legislation for domestic workers had a significant and positive impact on short-run real wages, but that such effect goes away in the long-run. Moreover, they find no effect (neither in the short-run nor in the long-run) on employment nor on any supply-side adjustment. The authors point to the issue of monitoring and enforcement mechanism as well as stronger formalization efforts (such as guaranteeing fundamental labor rights and mandatory registration of labor cards or providing incentives for employers to comply with the legislation) in this sector as a cause for the perceived lack of effect of the policy change in the long-run. On that line, Raz-Yurovich and Marx (2018) study the implementation of the Belgian service voucher scheme in January 2004 to pay for a limited range of domestic services covering more than 70 percent of the cost of the service using time-series analyses and a difference-in-difference approach. They found that the voucher increased the employment rates of both the highly skilled women and also the low-skilled women. In Brazil, Theodoro and Scorzafave (2011) study the the impact of the 2006 introduction of tax deductions of domestic worker's social security contributions (similar to the reform that will be studied in this chapter) for household employers using propensity score matching and difference-in-difference. They found no definitive conclusion on the effect of the legislation on formalization, given the instability of the results found according to the period analyzed. In the same country, Costa et al. (2016) analyze the effect of the extensions of labour rights

to domestic workers in 2013 (similar to the regulation that will be further studied in Argentina in chapter 3) combining the difference-in-differences approach with propensity score reweighting. They find an increase in the number of formal work arrangements, a reduction in the number of hours and no effect on wages for monthly workers (but no effect of any sort for daily ones). However, the authors could not determine if the previous increase in formalization rates was due to a shift from informality to formality of monthly workers - or because there was a substitution of daily workers for monthly workers by the household employers. Such increase in the number of formal work arrangements was highlighted by Gomes and Puig (2013) as well. Similarly, in Ecuador, Wong (2015) finds, using a difference-in-difference approach that the 2008 requirement of social security mandates for domestic workers decreased wages and hours worked. Finally, Tomei (2011) reviews national public schemes for domestic work in Belgium, France, the Canton of Geneva in Switzerland, and Brazil highlighting how they have helped to reduce the incidence of informal domestic work arrangements (even if they are not accompanied by fiscal subsidies for household employers). The author suggests that the previous might not have been well targeted as the increase in registration was accompanied by a decrease in the number of declared hours of work - and that besides all efforts, domestic work is still under-valued. He concludes that on the side of the worker, "Closer attention should be paid to the factors and circumstances that may encourage domestic workers to forgo under-the-counter payments and prefer higher cash income in the short term rather than social benefits in the long term..." (Tomei, 2011, pg. 208). On the side of the employer, the author recognizes that while providing the right set

of incentives is important, it can be seen that it is the better-off households (which in many cases consist of a single earner) the ones that benefit the most from the subsidies schemes - so the effect that it might "...enable well-qualified women to better articulate work and family responsibilities.." (Tomei, 2011, pg. 209) should be revised.

2.2.2 Domestic Work in Argentina: Institutional Context

Domestic work is a relevant sector in the Argentinean economy. In 2004, there were approximately 900,000 urban domestic workers in the country. They represented 17.2 percent of all employed female workers, or 22.7 percent of all salaried female employees (Contartese et al., 2004). The majority of them had not finished high school, were household heads, did not work for over 40 hours per week and did not have access to Social Security. An important group were also migrants - either international or local - and had not worked for their same employer for over a year (Pereyra, 2012; Álvarez and Beccaria, 2013; Poblete, 2014). As it is the case in the rest of the region, Argentinean domestic workers also presented low levels of increasing formality (FORLAC, 2014, Lexartza and Chaves, 2016). While only 5 percent of domestic workers were contributing to the national pension scheme in 2005, that figure was around 25 percent in 2016 (Manzorra et al., 2015, [103]). See Figure 2.1.

Argentina developed different regulations for domestic workers throughout its history (Poblete, 2014). Domestic work in Argentina, as it is the case in others

country of the region, has a work regulation separated from the rest of the private salaried workers in the economy (Lexartza and Chaves, 2016; Poblete, 2014; Blofield, 2009). In other words, while the rest of the urban salaried workers have one common labor regulation, in many countries domestic work has its own. Figure 2.2 shows the timeline of the different reforms targeted at domestic work or indirectly affecting the sector in Argentina.

The first attempt to regulate the sector was the Domestic Worker Statute (1956) [105]. It established that domestic work refers to a paid service provided for a private household with no economic benefit for the employer. To be categorized as a domestic worker under this regulation, the employee had to work for the same employer for a minimum of 16 hours per week distributed in at least 4 days per week for at least a month. The statue also established that domestic workers where salaried workers, meaning that there is a clear employer (the household) and an employee that has to receive a monthly wage (domestic worker). Under what is known as the "Statute of 1956" [105], the domestic worker had restricted access to mandated benefits that were available to other waged workers. Particularly, in what refers to contributions to Social Security, it established that the employer was responsible for making all the contributions to the national pension scheme. Such contributions would allow domestic workers to access the same basic pension plan as the rest of the workers in the economy. In what respects to health coverage, the employer was responsible for making the necessary tax deductions out of domestic workers' wages to cover for it (Manzo, 2014), [105]. It is important to note that even though by law, and contrary to pension contributions, health insurance is sup-

posed to be financed through deductions taken out of an employee's monthly wage, historically it has been the employer who makes the contributions out of his own pocket. This has been true for every reform the sector experienced (ILO, 2018b,c; Martinez, 2020). The statute also considered other aspects such as resting periods, paid vacation time, sick leave and dismissal period. Importantly, this regulation left out benefits like access to maternity leave and general minimum wage (Manzorra et al., 2015, [105]). At the turning of the century the informality rate (employed workers with no contributions to the pension scheme) of this sector was above 90 percent (Poblete, 2014; Manzorra et al., 2015). Moreover, this regulation did not cover almost 53 percent of domestic workers as they did not qualify for it given the characteristics of their work arrangement (Manzo, 2014). See Figure 2.3.

The General Work Contract Convention [110] was sanctioned in 1976. Such law effectively regulated both benefits and responsibilities of every salaried worker in the economy, with the exception of domestic workers and rural workers. Moreover, in 1996, the regulation for Family Allowances emerged under Law 24.714 [111], covering only those workers regulated by the General Work Contract Convention who contribute to the pension scheme: domestic workers where then excluded from access to the cash transfers that the new law stipulated for formal workers with children under 18 whose total family income was below the threshold (Poblete, 2014; Manzorra et al., 2015). See A.1 in Appendix A for an overview of the differences in labor regulations between the sectors.

The Domestic Worker Statute of 1956 [105] was the only regulatory framework for domestic work up to the year 2000 (Manzo, 2014). In that year, the National Tax

Reform became law. It included a "Special Regime of Social Security for workers within Domestic Service" [112] that was mandatory for everyone who was considered a domestic worker under the statute of 1956, plus those who worked as domestic for more than 6 hours per week for at least one of their household employers. The new regime made mandatory the payment to the national pension scheme and the wage deductions for health coverage for the last group of workers. None of the other aspects of the statute of 1956 were conveyed to this new group of workers.

The tax contributions and deductions for pension and health, respectively, were established as lump sums that depended on the weekly worked number of hours. The law established three-hour brackets: 6-12, 12-16 and 16 or more. The contributions made by the employer to the pension scheme allowed domestic workers to have access to the Basic Universal Benefit (basic pension that the rest of the private sector salaried workers also have access to), early retirement due to disability, death allowance, and pension capitalization in case the worker decides to make an extra voluntary payment herself. In terms of health, the deductions made by the employer [1] allowed them to have health insurance (which continued over retirement) and the possibility to add family members for coverage. An important point of the new law is that for those domestic workers employed between 6 and 15 hours, the Social Security lump sum payments were less than the minimum required to actually access pension and health benefits. In other words, it is only those domestic workers in the last hourly bracket – who are also those covered by the statute of 1956 - the

[1] As previously stated, historically this is paid by the employer even though the law mandates that it is a tax deduction taken out from the worker's paycheck

ones who had complete access to Social Security benefits. The rest of the workers covered in the new regime [112] had to cover for the difference themselves in order to be able to have access to the basic benefits previously described (Manzo, 2014). See Figure 2.4.

By the time the new special regime was implemented, it was stipulated that only around 9 percent of domestic workers had a work arrangement that was not covered by any labor regulation - which in turn means no obligation to contribute to the national pension scheme (Manzo, 2014). Nevertheless, Contartese et al. (2004) show that in 2004, even with the regulation in place, 94.5 percent of domestic workers who worked for 6 or more hours per week were not contributing to the national pension scheme. The same figure was 91.4 percent for those working for 16 or more hours. Contartese et al. (2004) also highlights that, while contributions to the pension scheme were scarce among domestic workers, the reality was different for the other mandated benefits. Among those workers covered by the statute of 1956 [105], 86.5 percent reported not having paid vacation, 72.5 percent did not have access to a bonus, 79.2 percent did not have paid sick days and 81.1 percent did not have access to a health insurance. Those figures were slightly higher for those domestic workers who worked 6 or more hours per week for the same employer. Even though the difference between contribution to the pension scheme and access to other benefits is marginal, it still shows a special characteristic of this type of employment: the close relationship between employee and employer means that some labor benefits are kept even though the employment work arrangement is an informal one - which in many cases is a barrier towards registration in this occupation

(ILO, 2013a; Pereyra et al., 2017; Turbin, 1995).

2.3 The reform: Law 26.063 of 2005

2.3.1 Domestic Workers employment characteristics previous to the reform

At the time of the introduction of the fiscal incentives for household employers in 2005, the vast majority of domestic workers in the country showed an informal work arrangement with their household employer (Contartese et al., 2004).

As shown in Table 2.1, almost 80 percent of domestic workers only had one household employer – meaning that they only provided their services at one house. Moreover, on average around 65 percent could be categorized as full-time workers – meaning that they worked for more than 16 hours in their main (or only) household. For formal domestic workers, that figure was a little over 85 percent and for informal, almost 55 percent. Moreover, it is interesting to see that over 50 percent of those who showed a formal work arrangement in the period 2003-2005 had been working for their current employer for over 5 years. For those with an informal work arrangement, that figure was 21 percent. Finally, and as stated by Tizziani (2011) and Persia (2014), Argentina is different from other countries in the region, where there is a high proportion of domestic workers living with their employers. In the country, before 2005, less than 4 percent of the urban domestic workers were living in the same premises as their employers – a number that decreased as time went by and culture changed; by 2014 that number was less than 3 percent as will be shown

in Chapter 3. Note that there are differences between groups: 13 percent of formal domestic workers lived with their household employers and 4 percent of informal domestic workers did.

Finally, it is important to highlight that domestic work is an occupation heavily represented by migrant workers, mainly from border countries: 11 percent of domestic workers before the reform did not hold Argentinean citizenship. The previous goes in line with the migration dynamics of the occupation (Courtis and Pacecca, 2014; Ceriani et al., 2009; Magliano, 2017; Gorbán and Tizziani, 2018). Note that a necessary requirement to be a registered domestic worker is to have a national ID. It is expected that Argentinean citizens will have one, but migrant domestic workers could access it as long as they had the proper documentation. While "...Argentina has opted for an open immigration policy and recognition of the labour rights of migrant workers" (Messina, 2015, pg. 9), having access to a national ID even for migrants that had been residing in the country for a long time was not always easy. In fact, two reforms were implemented at a similar time that the introduction of the fiscal incentives: in June of 2004 the "Program of Normalization of Migratory Documentation" [120], aimed at the regularization of migratory paperwork for irregular immigrants from countries outside MERCOSUR and in April 2006 with the "Big Nation" program ("Plan Patria Grande"), which did the same for those within MERCOSUR[2]. It is estimated that around 30 percent of the foreign MERCOSUR population in the country was irregular at the time, and that the migratory regu-

[2]Between 2004-2006 the members of the South America Trade Bloc (MERCOSUR) were Argentina, Brazil, Paraguay and Uruguay

larization program reduced informality among migrants in 13 percent (Perera and Velázquez, 2013). Messina (2015) and Manzorra et al. (2015) highlight the importance of the previous in the registration of domestic workers.

2.3.2 Fiscal Incentives for Household Employers

Even though by 2005 the regulation in place required that every domestic worker providing services for more than 6 hours per week for a particular household employer should be making contributions to the national pension scheme, less than 5 percent of the employed domestic workers did so. This means that the vast majority of household employers who were mandated by law to register their domestic workers and make contributions to Social Security were not complying with the labor regulation.

In November 2005 national Law 26.063 [43] was sanctioned to increase Social Security efficiency by establishing better uses of the state's resources destined to it. The Law had a particular sub section for domestic workers, where it introduced a set of tax deductions for household employers who registered them (Pereyra et al., 2017). Particularly, it established that both wages and Social Security payments (health insurance deductions and mandatory contributions to the pension scheme - both historically costs for the employer) could be taken as a deduction from an employer's personal income tax. The maximum amount of the deduction at the time was $4,020 per year (around USD1,300[3]), roughly 62 percent of the total annual cost

[3]Average exchange rate in 2005 was 3 pesos per dollar [122]

of employing a full-time formal domestic worker[4].

Table 2.2 shows the Social Security payments at the time of the reform, in current pesos. Note that the total amount that gives domestic workers full access to health insurance and a pension scheme is $55 per month (USD18), of which $35 is responsibility of the employer and $20 of the employee – even though, as previously stated, historically it is the employer who ends up paying the full amount. This means that the only group of workers for whom registration means full access to the mandated benefits are the ones working over 16 hours per week. For those working less than 16 hours (but more than 6 hours, who were the ones covered by regulation at the time of the reform), Social Security payments give them a formal status, but not full access to health insurance and the pension scheme. To have that, the worker needs to pay for the difference to complete a final payment in her name of $55 per month, or to work for more than one household since the contributions of different employers can add up. Finally, for those workers who want to extend access to health insurance to a family member, the regulation at the time required them to pay an extra amount of $20 per month per individual (Manzorra et al., 2015; Clarin, 2005, [105], [112],[43]).

Along with this fiscal incentive to household employers, the tax collection agency put in place a digital portal to facilitate both the registration of domestic workers by their employers and the online payment of Social Security contributions and deductions.

[4]The total monetary cost of a full-time formal domestic worker at the time of the introduction of the reform is calculated at $6,510 per year and includes: 12 monthly wages at the minimum wage of $450 per month; bonus representing an extra monthly wage; 12 pension contributions at $35 per month and 12 health insurance payments at a rate of $20 per month (Clarin, 2005)

The maximum amount for the tax deduction was not set at random: at the time of the introduction of the fiscal incentive, that income level was the non-taxable personal income minimum (AFIP, 2020). Just as it is the case for any other tax deductions, the possibility of taking this one depended on having a reported income that is above the non-taxable minimum. This means that not every household employer could benefit from the introduction of this fiscal incentive – first the employer needed to be subject to personal income taxation. Note that the income tax is a personal tax. Therefore, if one household that employs the services of a domestic worker is made up of two people who are each subject to income tax payments, only one of the individuals could claim to be the employer and take the deductions [125]. The previous Social Security payment amounts were adjusted by inflation in the years following the introduction of the fiscal incentive and the maximum tax deduction amount always followed the evolution of the minimum taxable income[5].

At the moment of the reform, the maximum tax deduction amount of $4,020 per year translated into as much as $1,407 pesos per year (around USD470) of savings for eligible household employers given that the maximum income tax rate that an individual can face in Argentina is 35 percent (Fernández Felices et al., 2014). At the time of the introduction of this fiscal incentive, it was estimated that among those individuals who ended up paying a positive income tax rate – who had income above the minimum non-taxable amount after taking all the possible deductions – 90 percent had a per capita income that placed them on the 10th income decile

[5]Just the year after the introduction of the fiscal incentive, the tax deduction level went up to $6,000 per year given the change in the new non-taxable minimum amount. The total amount of social security payments went up to $59.44 per month and the extra amount to extend health insurance coverage for a family member went up to $24,44 per month (Clarin, 2005)

(Fernández Felices et al., 2014). Moreover, it is also estimated that among those urban households who employ the services of domestic workers, half of them belong to the top income quintile (Persia, 2014).

The previous point shows then that this particular reform was targeted at a specific group of household employers: the high-income ones, who given their income levels can actually be eligible to use the tax deductions. This is reinforced by the strategy that the government adopted to disseminate the information regarding this tax incentive. In early 2006 the tax collection agency sent 200,000 letters to households where there was at least one taxpayer with a monthly income level over $4,000 and no registered domestic worker. The letter informed about the new benefits of the law given they were eligible and urged them to register their domestic worker if they had one (Persia, 2014). The letters were merely informative – no penalty was explicit and no action needed to be done if the household did not employ a domestic worker – but a cost-effective way to deliver information to possible employers.

Given that the tax collection agency specifically sent letters 200,000 households for their information dissemination strategy, it can be thought that the fiscal reform targeted no more than 25 percent of potential household employers who were not complying with the law at the time – specifically, the high-income ones[6].

[6]See Appendix B for a modelling of benefits and costs for household employers and domestic workers under this policy change

2.3.2.1 Interactions with Welfare

Through different mechanisms, domestic workers with children in formal and informal households have access to social protection benefits in the form of welfare cash payments. By the time the formalization process was implemented, the main social protection policy for families with children under 18 years old (or children with disabilities with no age limit) was a system financed through payroll taxes: the Family Allowance Regime, as explained in Section 2.2. Such regime extends protection to families with children who work in the formal sector by providing the household with a monetary transfer per month per child. Such amount decreases as the total reported family income increases until it completely phases out. To be eligible, at least one of the parents has to be employed in the formal sector as a salaried worker under the General Work Contract Convention and the total family income has to be under an income threshold, which by the time of the reform was $2,600 pesos per month (USD860) (Basualdo et al., 2012). It is important to note that the Family Allowance Regime is a contributive one – the employer is in charge of the labor tax of 7.5 percent over the employee's wage of the employee (no matter if the worker is eligible or not). Domestic workers, as was explained, by not being part of the General Work Contract Convention [110], do not have access to this regime even if they are under a formal work arrangement – and thus household employers then not required to pay the previous payroll tax.

While the previous point means that a non-domestic low-income worker with children under 18 years old who enters the formal sector gains access to the Family

Allowance regime and domestic workers do not, the situation also depends on the working status of the father of her children. Specifically, if a domestic worker is married to a formal salaried worker, then her children will be covered by the Family Allowance regime because of his job – the same will happen with non-domestic informal women who are married to formal salaried workers. In such a case, the incentive to formalization of domestic and non-domestic workers follows the same logic: formalization means a higher reported total family income, and as a result a decrease in the amount of the allowance received.

The situation is different for single workers or those married to someone who is unregistered (either because they are out of the labor force, unemployed or employed informally). If that were the case and the woman is non-domestic, then transitioning to a salaried formal job means gaining access to the Family Allowance regime. However, for domestic workers in the same situation, formalization does not give them access to welfare cash payments. See Figure 2.5. For non-mothers and mothers with children over 18, there is no access to welfare payments in any circumstance.

In Argentina then the social protection system during the analyzed period was closely tied with formal salaried employment. Garganta and Gasparini (2015) claim, however, that even though there was no universal welfare payments financed through general taxation for vulnerable households with children at the time - something that changed under the reform analyzed in Chapter 3 - there were still some uncoordinated efforts aimed at providing different types of categorical benefits for those individuals. Some of them were the disability pensions, social benefits for

mothers that have more than 7 children, pensions for veterans and other local benefits given discretionally. For poor unregistered households with children (parents who are either unemployed or informal workers) there were two main programs: Plan Jefes y Jefas de Hogar Desocupados (PJJH); and Plan Familias para la Inclusion Social (Familias), that emerged as a response to the currency crisis that the country experienced in 2001/2002 (Garganta and Gasparini, 2015). The limited funds, the non-universe nature of the subsidies, the eligibility requirements in what respects to employment requirements and the fact that it was fixated to certain geographic locations (Alonso, 2006) meant that the probability a domestic worker with a child under 18 (single or married to an unregistered husband) had a welfare payment transfer through the previous non-contributive systems (that would have to be given up when entering the formal sector) during the period analyzed was relatively low; at least compared to the situation that will be studied in Chapter 3. In fact, Orlansky and Makón (2007) point out that while almost 65 percent of the 1.9 million beneficiaries of PJJH were unemployed women who previously worked as domestic workers, a high proportion were looking for other opportunities beyond the 25 hours of employment that the PJJH required of them. Probably that is the reason why Table 2.4 shows that less than 10 percent of those domestic workers who are mothers of children under 18 that are present in their households were beneficiaries of the PJJH.

Figure 2.6 shows the evolution of the registration for those employed domestic workers who are mothers with their children present in their household between early 2003 and 2008, dividing the group into those for whom the age of their youngest

child is less than 18 and those for whom it is over – as having an underage child is the main eligibility requirement for access to welfare cash payments. It can be seen that while registration seemed to have increased by a little less than 5 percentage points on average for those who have children under 18, the figure is over 10 percentage points for those with children over 18. Such evidence raises the concern whether access to welfare payments might be playing a role in the formalization of domestic workers after the introduction of tax deductions for household employers by acting as a barrier towards registration - and if it is driven either by those who have access to the system financed through payroll taxes or those from general taxation.

2.4 Data, Identification Strategy and Estimating Equations

2.4.1 Data

2.4.1.1 Database

The main data source for this analysis comes from the Argentinean National Household Survey (EPH, for its name in Spanish) for the period 2003-2008 [130]. The EPH is performed by the National Institute of Statistics (INDEC) and contains individual and household micro data for 32 urban areas and as such is representative of 62 percent of the country's total population (Garganta and Gasparini, 2015). Note that besides the Census, there is no other survey in the country that is representative at the national level. Each quarter, 25,000 households accounting for around 100,000 individuals are surveyed through simple random sampling (SRS). The EPH follows

the rotation scheme known as 2-2-2. This means that a household in a certain area enters the sample for two quarters in a row, it retires for two the next two quarters, and then comes back for two more quarters (Comari and Hoszowski, 2014).

The EPH suffered from a methodology reformulation in mid-2003. Therefore, my sample starts in the third quarter of 2003 and ends in the second quarter of 2008 (with both end quarters included in the sample). Starting in the third quarter of 2003 allows me to compile comparable information across time. Moreover, my sample ends in mid 2008 for two reasons. First of all, in December 2008, Congress approved Law 26.476 [132] to promote work registration, which affected both household and non-household employers (Lexartza and Chaves, 2016). Secondly, on October of 2009 and under a Presidential decree (Decree 1602/2009 [105]), the national government implemented the largest cash transfer in the history of the country: the Universal Child Allowance for Social Protection (AUH for its name in Spanish). As shown by Garganta and Gasparini (2015), the introduction of this program implied an increase in informality for low-skilled workers. Given that the introduction of the fiscal incentive for household employers took place in the last quarter of 2005, my selected period of analysis allow me then to have 9 pre-treatment quarters and 10 post-treatment ones[7]. As I am examining the labor market evolution of females in a particular occupation within the economy, and given the overall low levels of formality shown by them – both before and after the implementation of the policy change – I will use the micro data as a repeated quarterly cross-sections. This means that I will not exploit the panel structure of the survey, but rather treat each

[7]Note that the INDEC did not carry out the EPH for the third and forth quarter of 2007

quarterly individual observation as independent (and work with the standard errors in my estimations to account for the correlation between those observations).

The fact that the EPH is the main survey used to analyze both the labor market evolution of the economy, means that it contains detailed individual and household level characteristics of sampled units. Moreover, I will exploit the fact that the EPH has a special module for supply of domestic work to private households[8] to be able to correctly identify those women who were subject to the policy change.

2.4.1.2 Sample

Given that over 90 percent of domestic workers are females in Argentina (Lexartza and Chaves, 2016), my final sample will consist of women between 18 and 59 years old (60 is the retirement age for women in Argentina [108]) who are Argentinean citizens given that, as explained in Subsection 2.3.1 during the period analyzed there were other reforms targeted at migrant workers that could have had an effect on the labor market outcomes of domestic workers who were born outside the country[9]. It includes women who are identified as domestic workers - individuals who report that they are providing domestic work services in private households (Question 4b1) or who are unemployed but report that their last activity was domestic work (Question 11b1) -, as well as those who are not but are

[8] Questions 4b1-4b4 for employed domestic workers and 11b1-11b3 for unemployed domestic workers [130]

[9] While the results of a formalization process in this occupation is particularly different for migrants (as pointed out by Gavanas (2013), the tax deductions introduced in 2007 for domestic work in Sweden seem to have provoked a segmentation based on social network segregation aligned to the conditions of migrants), the fact that there were migratory policies happening at the same time would not allow me to isolate the effect of the introduction of the tax deductions if I were to keep that group of workers

comparable given their income level and poverty status. In particular, I will include non-domestic workers who can be categorized as poor (their household belongs to the 4th income decile or lower) and who are either high school graduates or less. I exclude those workers who (if employed) work over 50 hours per week or have been working for the same employer for more than 25 years. For domestic workers, I will exclude those outliers that appear on the 8th, 9th or 10th household income decile (less than 3 percent of the total sample of domestic workers) given that I am interested in showing the effects for low-skilled, low-income women. I further exclude domestic workers who live with their household employers, as no information can be obtained from their own household (around 4 percent of the total sample of domestic workers). Note that those workers show a registration rate of 12 percentage points before the reform and of almost 25 percentage points after it. Therefore, if anything, not including them underestimates the true effect of the introduction of the fiscal incentives for household employers.

Table 2.3 shows the descriptive statistics; both by occupation as well as by the tag on their urban area (either areas with a high share of potential household employers, or an area with a low share of them - see subsection 2.4.2 for description of this division). Given the construction of the sample, domestic and non-domestic workers seem to be similar in what respects to their poverty level and their education attainment. However, the rest of the variables show signs of how domestic worker is in general, a more vulnerable group. Domestic workers are older, they have a higher probability of being household heads, have a lower probability of being married and, among those who are, have a slightly higher probability of having an unregistered

partner. Moreover, it seems that domestic workers live in smaller households, have a higher probability of being welfare beneficiaries and have a lower number of children under 18 years old living with them. Table 2.3 also shows differences within each occupation between high and low income share areas; it can be seen that the main differences are the ones that are correlated with income level characteristics, as expected: mainly having an informal partner, being a high school graduate, being a household head, the number of household members, the income decile and the probability of being a welfare beneficiary (all showing how those domestic workers in high income share areas show less vulnerability).

For the estimation of the heterogeneous effect of the policy change, I will work with a restricted sample of mothers. In this case, a woman will be considered a mother if a mother-child relationship can be proven within the household to replicate the welfare eligibility requirements. In particular, such relationship can be proven for those women who are head of household or the spouse of the head of household and their sons/daughters, those who are head of household or the spouse of the head of household and their grandchildren if their own sons/daughters are not present or are underage (if that is the case, it can be assumed that the grandmother is in charge). My sample of mothers also includes those women who live with other relatives and are not the head of household or its spouse but given the age of the minor and the relationship status regarding the head of household it can be proven that she is the mother[10]. This means that within each household, there could be

[10]For example, in a household where the head of household (45 years old) lives with a daughter of 19, a daughter of 10 and a grandchild of 2, I will establish the mother-minor relationship to the daughter of 19 - with the daughter of 10 being the child of the head of the household

more than one mother.

Table 2.4 shows the socioeconomic characteristics of the domestic workers who are mothers – both with children under and over 18 years old in their household. It can be seen that domestic workers with older children were in relative terms, in a better position than those with smaller children. They belonged to households of higher income deciles, live in smaller households where more people were employed, and, as expected, had a lower probability of being welfare beneficiaries. However, they graduated high school at a lower rate, and were married at a significantly lower rate – and if they were, they had a higher probability of having an unregistered husband. It can also be seen that before the introduction of the fiscal incentive, they had a higher probability of being formal, and they worked more hours per week.

2.4.1.3 Outcomes

The goal of this paper is to study the effect of the introduction of the fiscal incentives for household employers in different labor market outcomes.

The first one will be the extensive margin – the probability that a woman will be out or in the labor force. Particularly, I am interested to see if she is in the labor force either as a domestic or a non-domestic worker. I will categorize not being in the labor force as those women who claim not to be working nor looking for a job. Moreover, being in the labor force as a domestic worker will categorize those women for whom domestic work is self-reportedly as their main activity. That

includes women who claim that domestic work is their only occupation no matter the number of reported private households where they perform such activity (both if they were and were not working during the reference week), those who have more than one occupation but domestic work is their reported occupation that entails more number of hours (as long as they work only for one private household)[11] and those who are currently unemployed, but who report their last occupation to be as a domestic worker. Non-domestic workers are all the other low-skilled women in the labor force in the sample.

The second margin is the formal one – the probability a woman in the labor force will be either unemployed, employed formally or employed informally. Unemployed workers will be those who claim not to be working at the moment but are looking for a job. Women employed formally are, as previously used in the literature (Garganta and Gasparini, 2015; Tornarolli et al., 2014), those who are salaried workers with contributions[12]. Women who are employed informally are the ones that claim that they are employed but with no contributions. Domestic workers cannot be categorized as self-employees with the current structure of the survey, therefore, they are the only occupation which there is no doubt regarding who is

[11]For domestic workers who claim to have more than one occupation as well as to be employed by more than one private household when they work as domestics it is not possible to determine in which activity (domestic or non-domestic) they spend more hours working and therefore I exclude them. This, if anything, underestimates my findings as domestic work is the urban occupation with the highest rates of informal labor (so, if they are formal, it is possible that it is due to their other non-domestic occupation)

[12]The EPH asks for salaried worker the particular question, "For this job, do you have pension contributions?" (question 7.i.). Note that this question refers to the main occupation – the one with the highest number of hours. For domestic workers that perform their occupation in more than one private household, the question refers to her main employer (the household where she works the longest shift). Everyone who answers "yes" to this question is coded as formal

formal and who is not[13]. However, almost 20 percent of the non-domestic workers in the sample are self-employed. Following Gasparini et al. (2009); Garganta and Gasparini (2015); Tornarolli et al. (2014), and considering the fact that I am using a sample of low-skilled, low-income women, I will label those self-employed workers as informal even though in principle they could be contributing to social security on their own (something that cannot be analyzed with the survey).

The third margin is the intensive one. In particular, I will examine the impact of the change in the law on the number of hours reported. For that, I will use the average number of hours worked by employed workers during the reference week in their main activity. Note that for domestic workers employed by more than one household (a little more than 20 percent of the sample) I will use the hours reported for the house for which they work the most.

Table 2.5 shows the pre-policy change in outcomes for domestic and non-domestic workers, divided by the category of urban area they belong to. While the probability of being unemployed is around 3 percentage points lower for domestic workers, the probability of having an informal arrangement is more than twice as large for domestic than for non-domestic workers, and the probability of having a formal work arrangement is more than 10 times lower for domestic workers (with the situation being worst in low income share areas). It can also be seen that domestic workers work on average less hours than non-domestic ones (something also reported in Contartese et al. (2004); Manzorra et al. (2015)), with domestic workers in low-

[13]Those employed women who claim to work for a private household, are asked the salaried worker module. Under such module, it is possible to claim to be contributing to the pension scheme by yourself if your employer does not do so. Such question is used for domestic workers in contracts under an average of 6 hours per week given the labor regulation at the time

share areas working on average more than those in high-share areas[14].

2.4.2 Identification Strategy and Estimating Equations

2.4.2.1 Double Difference Estimate – Extensive Margin

The first margin over which I will analyze the introduction of the tax deductions of wages and Social Security payments for household employers is the extensive one. Particularly, I will study the effect of the change in the law over the probability a worker will end up working as domestic. To do that, I study the possible effect of the change in the law at the extensive margin through a multiple choice model with three options: not being on the labor force, being on the labor force as a domestic worker or being in the labor force as a non-domestic workers. Given that the values attached to each outcome are arbitrary (the occupational choice depends on individual characteristics of the women under analysis, on characteristics of their place of residence and of the exogenous changes she is subject to) I will employ a multinomial logit model (Wooldridge, 2011; Greene, 2008).

In order to estimate the multinomial logit, I will use the difference-in-difference (DD) methodology. I rely on the geographic variation between urban areas in the share of potential employers that can benefit from the tax deductions given their income level to create a treatment and control group. The tax deduction for household employers was only available for those who had reported income at above the

[14]Note that the fact that domestic workers are not subject to the general minimum wage plus their lower labor intensity translates into less income for her and her family compared to non-domestic workers

non-taxable minimum. That means that not all the household employers were affected by this incentive to the demand. Given that my dataset does not allow me to have matching employer-employee data, I have no way of knowing which domestic worker is actually employed by a household that was taking the tax deduction or even eligible for it. Therefore, as a proxy, I divide the sample between those living in areas of a high share of potential employers eligible for the tax deductions (treatment) and those in low areas (control). Specifically, someone in a high share area will be one that lives and works in an urban area (smallest geographic unit available in the EPH) in which more than 5.5 percent of the total population is categorized as top earners because they exhibit monthly incomes above the non-taxable minimum (and could therefore benefit from the new tax deductions). The figure of 5.5 percent corresponds to one standard deviation above the mean in the weighted distribution of the share of top earners between urban areas. Those areas encompass around 20 percent of the total population represented in the survey. See Table 2.6 for a distribution of the geographic urban areas.

Specifically, the DD estimate for the effect of the fiscal incentive on the extensive margin is estimated by,

$$P(Y_{it} = j) = exp(X_{it}\gamma)/[1 + \sum_{h=1}^{J} exp(X_{it}\gamma_h)] \tag{2.1}$$

where

$$X_{it}\gamma_h = \gamma_0 + \gamma_1 After_{it} + \gamma_2 HighSh_{it} + \gamma_3 After_{it}.HighSh_{it} + \sum_{c=1}^{C} \delta_c X_{it} + \epsilon_{it},$$

and Y_{it} is the outcome variable of interest that takes the value j=0 if the individual i at quarter period t is out of the labor force, j=1 if she is in the labor force as domestic and j=2 if she is in the labor force as non-domestic. $After_{it}$ is an indicator for being in the post-policy change period and $HighSh_{it}$ is an indicator for an observation in a high income share area. X_{it} are a series of control variables, including: age, age squared, number of total children (with a proven dependent relationship), number of people in the household, number of employed family members, a dummy for high school completion and a series of dummies for family structure (single, married to an unregistered husband and married to a registered one). ϵ_{it} is the error term, which will be clustered at the urban center level. Given that the only occupation that could have benefited from the introduction of the fiscal incentive is the domestic work one, finding a significant γ_3 coefficient, which is the DD one, means that the introduction of the fiscal incentive will have produced a change at the extensive margin. The identification assumptions for this analysis are: i. in the absence of the new law, the probability of being a domestic worker for women in high and low income share areas would have been the same; ii. the in-existence of other events contemporaneous to the introduction of the fiscal incentives for household employers that could have involved a different impact in domestic work labor force participation between high and low income share areas (Duflo, 2001; Angrist and Pischke, 2008).

Figure 2.7 shows solely the share of domestic workers over the total population under analysis – my main outcome of interest - between high and low-income share areas. As it can be seen, there seems to be an upward trend for both regions,

but the difference does not seem to be significant – neither before nor after the introduction of the fiscal incentive to household employers. The non-significant difference in the trend of share of female domestic workers before the policy change is confirmed when I run a model of the outcome of interest for the pre-reform period on the treatment dummy, the quarter (coded as quarters 175 to 183) and their interaction (Muralidharan and Prakash, 2017), and find that the coefficients for the interaction term are not significantly different from zero[15]. As a further test, I also run a model of labor force participation on the treatment dummy, quarter dummies and interactions; and then apply an F test in which the null hypothesis is that the coefficients for the interaction terms are jointly equal to zero before the reform (Garganta and Gasparini, 2015; Garganta et al., 2017), which I do not reject (F(9,111251)=1.24; Prob>F=0.2656). Moreover, I do the same but with the outcome being in the labor force as a domestic worker (versus being out of it or being in it as a non domestic) and also do not reject the null hypothesis (F(9,111251)=0.75; Prob>F=0.6603).

Therefore, while the first assumption cannot be tested, the fact that the trends are parallel for the three options in the pre-reform period is an argument in favor of it. Regarding the second assumption, finalizing the analysis in the second semester of 2008 and therefore leaving out the introduction of other regulations that might have impacted registration and not considering migrant workers in the sample play in favor of it.

[15]For j=0 it is -0.0027661 (0.0038747), for j=1 it is 0.0024351 (0.0030359) and for j=2 it is 0.0003311 (0.0026568)

2.4.3 Triple Difference Estimates – Formal and Intensive Margins

In order to understand the effect of the policy change on the formal and the intensive margin, I use a difference-in-difference-in-difference (DDD) methodology.

2.4.3.1 Formal Margin

In this case, the outcome of interest is to see whether there were changes in the probability a domestic worker will be unemployed, employed formally or employed informally as a result of the introduction of the fiscal incentive. In particular, I will analyze the overall possible market responses once the worker is in the labor force – without claiming if what I find is due to changes in worker's incentives or if it is all a result of changes in the actions of household employers (even if the policy change per se is intended for them) given that informality is in many cases, as suggested by the literature, an alternative to unemployment (Bosch and Esteban-Pretel, 2012; Soares and Haanwinckel, 2017). Therefore, I will consider that once the worker is in the labor force, there are three possibilities – unemployment, formal employment and informal employment. I will do so thorough a series of Linear Probability Models where I analyze both the probability of being a registered worker versus an unregistered one (either informal owner or unemployed), the probability of being a formal worker versus an informal one, and the probability of being unemployed versus employed (either formally or informally) following Garganta and Gasparini (2015) and Dinkelman and Ranchhod (2012).

Contrary to the previous case, here I will use a triple difference strategy. For

the first DD, I will use the sample of women in the labor force for whom domestic work is their main activity – and therefore are categorized as such – and divide them into two groups: those in areas with a high share of potential household employers given their income levels (treatment) and those domestic worker in areas with a low share of potential household employers (who by construction are less exposed to the treatment and therefore are used as controls).

The challenge of just using a sample of domestic workers is that I am analyzing the formal margin only for the particular occupation that was subject to the treatment (Wooldridge, 2011; Basu et al., 2017). In other words, if there are other factors unrelated to the regulation of this particular sector of the economy that might affect the general probability a low-skilled woman in the labor force has a formal work arrangement in high income share areas relative to low income share areas, then this DD analysis will not be accounting for it. Therefore, the DD might be actually showing the relatively unequal performance of the economy in the country between high and low income areas that have an impact on labor market outcomes rather than a causal effect of the fiscal incentive on the formal margin.

A different DD analysis would be to use a group of low-skilled workers with similar characteristics who are non-domestic as a control group. I would then compare the employment evolution of domestic workers before and after the introduction of the fiscal incentive, to the evolution of a set of workers that should not have been affected by the treatment, as their employers are not eligible for the tax deductions. Doing so would allow me to account for the impact of the evolution of the economy on low-skilled workers (Duflo, 2001; Angrist and Pischke, 2008). A

potential challenge of this specification is that changes in the probability of being unemployed, or being a formal or informal worker might be systematically different between domestic and non-domestic workers as domestics have a different labor regulation, a different set of mandated benefits and domestic work can be considered an occupation of "last resource" (Valenzuela and Mora, 2009; Brites, 2014; Gorbán and Tizziani, 2018). Therefore, changes in the formal margin could represent those systematic differences rather than the policy change. The DD approach not only needs to test for the parallel trend assumption but also for the common shocks one, which means "...events occurring simultaneously or after the policy will affect both groups equally" (Basu et al., 2017, pg. 5). Given the nature of the domestic work occupation, it will be challenging to justify that time-varying unobserved factors happening at the same moment of the introduction of the fiscal incentive or after it (like economic changes) will affect the employment of domestic and non-domestic workers in the same way.

A more robust analysis can be obtained by using both a control group within the treated occupation as well as a different occupation (Wooldridge, 2011). In other words, use the same two groups – workers in areas of high share of potential household employers and areas of low share of potential household employers – for an "untreated" occupation as an additional control and have a double difference in the estimation.

In this case then, the policy effect coefficient would be the DDD, which is the interaction of three dummies: a post policy change period, working in an area with a high share of potential household employers that could benefit from the fiscal

incentives and being a domestic worker. By doing this, the estimation will filter out not only overall changes in the formal margin outcomes among types of workers, but also among the two groups of domestic workers (more and less exposed to the policy).

Specifically, the effect of the introduction of the fiscal incentive at the formal margin will be estimated (only for those women in the labor force) by,

$$F_{it} = \alpha_0 + \alpha_1 After_{it} + \alpha_2 HighSh_{it} + \alpha_3 DW_{it} + \alpha_4 After_{it}.HighSh_{it} + \alpha_5 After_{it}.DW_{it} + \alpha_6 HighSh_{it}.DW_{it} + \alpha_6 After_{it}.HighSh_{it}.DW_{it} + \sum_{c=1}^{C} \delta_c X_{it} + \nu_{it}, \tag{2.2}$$

where

F_{it} is the binary outcome variable of interest that takes the value of 1 if the woman i at quarter period t exhibits a formal work arrangement, and 0 otherwise (1 if she is unemployed, and 0 otherwise). $After_{it}$ is an indicator for being in the post-policy change period, $HighSh_{it}$ is an indicator for an observation in a high income share area and DW_{it} is an indicator for having domestic work as her main activity. Coefficients α_4 to α_6 are the estimates of the double interaction terms, and the DDD coefficient is α_7. X_{it} are the same control variables as for the extensive margin. ν_{it} is the error term clustered at the urban center level.

As it was previously stated, the DDD estimator effectively is a double DD for each of the formal margin outcomes. The first DD is the difference in the before-after estimation of domestic workers in high-income share areas with the before-after estimation of domestic workers in the low-income share areas. The second DD

is the difference in the before-after estimation of low-skilled non-domestic workers with the before-after estimation of low-skilled non-domestic workers. In this case, the identification assumption is: i. in the absence of the new law, the difference in the probability of being unemployed, formally employed or informally employed between domestic workers in high and low income share areas and non-domestic workers in high and low income share areas would have been the same[16] [17].

Figure 3.4 shows the trend for formalization rates and for unemployment for the four groups under analysis. In terms of formalization (versus the non-registered group compromised of the unemployed and the informal workers), it can be seen that before the introduction of the fiscal incentive for household employers, the trends seem relatively flat and steady for the four groups (with non-domestic workers in high income areas having more variation than the rest), but not after it. It is clear that there is a steep increase for domestic workers (and for those in higher income areas particularly), while the same situation is not seen for non-domestic ones (they continue their downward trend). For unemployment (compared to the employed, which is made up of both formal and informal workers), the situation is different. Before the policy change, it can be seen that the unemployment rate was decreasing at a similar rate for domestic workers in both areas, as well as for non-domestic workers

[16] As analyzed by Olden and Møen (2020),"Even though the triple difference is the difference between two difference-in-differences, it does not need two parallel trend assumptions. Rather, it requires the relative outcome of group B and group A in the treatment state to trend in the same way as the relative outcome of group B and group A in the control state, in the absence of treatment" (Olden and Møen, 2020, pg. 9)

[17] The DD on non-domestic workers is an estimate of the area-specific time-varying confounder free from treatment, and as such removes any bias if there was any other event that could have involved a different impact on registration between high and low income share areas (Wing et al., 2018)

in low-income share areas. However, for non-domestic workers in high-income areas, unemployment seems to be slightly increasing. After the introduction of the fiscal incentive, unemployment seems to continue the same downward trend for domestic workers, while for non-domestic workers in low-share areas, it seems to be slightly increasing and for non-domestic workers in high-income areas, decreasing. To test the pre-program parallel trend assumption, I run a model of the outcome of interest for the pre-reform period on the treatment dummies, the quarter (coded as quarters 175 to 183) and their three double interaction and one triple interaction (Muralidharan and Prakash, 2017), and find that the coefficients for the interaction term are not significantly different from zero except for unemployment[18]. Given the previous, as a further test, I also run a model of registered employment (versus unemployment and informal employment) on the treatment dummies, quarter dummies, double interactions and triple interactions; and then apply an F test in which the null hypothesis is that the coefficients for the triple interaction terms are jointly equal to zero before the reform, which I do not reject (F(9,57971)=0.73; Prob>F=0.6828). Moreover, I do the same but excluding the unemployed: F(9,47385)=0.49; Prob>F=0.8845. Finally, I check for the outcome being unemployment (versus being employed either formally or informally) and also do not reject the null hypothesis (F(9,57971)=1.33; Prob>F=0.2140). As will be seen in the results section, I will further estimate as an alternative specification the models with a "false" treatment date to check for the validity of my results.

[18]For registered versus unregistered status it is 0.0010145 (0.002228), for registered versus unregistered status (excluding the unemployed) it is 0.0005482 (0.0028414) and for unemployed versus employed status, -0.0063542 (0.0028565)

2.4.3.2 Intensive Margin

The last margin I will examine is the intensive one. This is particularly important to understand the dynamic of the domestic labor market after the implementation of the tax deductions. If the amount of the tax deduction were not enough to cover the increasing cost of formalization, then it could be the case that household employers find alternative ways of reducing those costs. That could be achieved by either letting them go or by adjusting the number of hours of domestic work that they employ.

In order to test for the effect of the introduction of the tax deductions on the intensive margin, I will employ the same DDD strategy and estimate Equation 2.3 where the outcome variable is now one of the three hour category arrangement (less than 6 hours per week, between 6 an 16 and more than 16 hours) performed through a multinomial logit estimation[19].

Figure 2.9 shows the trend of the share of full time workers (defined as those working for more than 16 hours per week) for the four different group of workers – domestic and non-domestic workers, divided by high and low income share workers. For non-domestic workers, it can be seen that there does not seem to be a difference in the share of full time workers between locations regarding their income levels, and both trends seem flat during the period analyzed. In what respects to domestic

[19]I will also perform an OLS to see if there was an effect on the number of hours treated as a continuous variable - however, due to the measurement errors that usually take place in household surveys related to the self-reporting of hours (Bound et al., 2001; Rodgers et al., 1993; Barrett and Hamermesh, 2019), doing it by segments which are tied to different costs for both household employers and domestic workers could be a better way to have a better picture of the effect at this margin

workers, it does not seem to be a difference between high and low income share trends (both before and after the introduction of the fiscal incentives) – but the trend seems to be upward for both groups, with the ones in high share areas being more volatile than for those in low share areas. To test the pre-program parallel trend assumption, I run a model of the outcome of interest for the pre-reform period on the treatment dummies, the quarter (coded as quarters 175 to 183) and their three double interaction and one triple interaction (Muralidharan and Prakash, 2017), and find that the coefficients for the interaction term are not significantly different from zero[20]. Moreover, I also run a model of full-time employment (versus all forms of part-time employment) on the treatment dummies, quarter dummies, double interactions and triple interactions; and then apply an F test in which the null hypothesis is that the coefficients for the triple interaction terms are jointly equal to zero before the reform, which I do not reject (F(9,45703)=1.31; Prob>F=0.2276).

2.4.3.3 Heterogeneous Effects: integrated labor markets

As it was stated, by the time of the introduction of the fiscal incentive, the eligibility criteria for welfare effectively treated workers differently depending on having children under 18 years old, on the working status of the partner (if any) and on the total amount of reported family income. I will therefore analyze if there are differences in terms of formalization rates of domestic workers based on their specific household and individual characteristics linked to welfare eligibility.

[20]For j=0 it is 0.000382 (0.0058797), for j=1 it is -0.0030039 (0.010922) and for j=2 it is 0.0026219 (0.0113954)

Specifically, I will work with a sample of mothers (with children under and over 18 in their households)[21] in the labor force, for whom domestic work is their main activity and analyze differences at the formal margin. I will re-estimate Equation 2.3 for the sample of domestic workers who are mothers, where now

$$\begin{aligned} F_{it} = \beta_0 + \beta_1 After_{it} + \beta_2 HighSh_{it} + \beta_3 Childit + \beta_4 After_{it}.HighSh_{it} \\ + \beta_5 After_{it}.Child_{it} + \beta_6 HighSh_{it}.Child_{it} \\ + \beta_6 After_{it}.HighSh_{it}.Child_{it} + \sum_{c=1}^{C} \delta_c X_{it} + \mu_{it}, \end{aligned} \tag{2.3}$$

where

F_{it} is the binary outcome variable of interest that takes the value of 1 if the woman i at quarter period t exhibits a formal work arrangement, and 0 otherwise. $After_{it}$ and $HighSh_{it}$ are the same as before, and now $Child_{it}$ is an indicator for having a child under 18 years old (it takes the value of 0 if all children of the domestic worker are over 18). The main parameter of interest in this case is β_7. X_{it} are individual control variables (age, age squared, marital status, high school completion and number of household members). μ_{it} is the error term clustered at the urban center level. In this case, the identification assumption is: i. in the absence of the fiscal incentives, the difference in the probability of being registered between mothers with children under 18 years old in high and low income share areas and mothers with children 18 or older in high and low income share areas would have been the same.

Note that even though I am only using a sample of domestic workers who

[21] I decided to work only with a sample of mothers and not the complete sample of domestic workers, given that women who have children might be different than those without them in both observable and unobservable characteristics, and therefore might face different incentives regarding formalization and not be a good comparison group

are mothers in this case, I will still be seeing the differences between women with children under and over 18 years old, in high income shares and low ones, and then seeing the differences between those. The idea behind the strategy being still try to isolate the effect of the introduction of tax deductions and welfare on registration rates and unemployment.

As previously stated, Figure 2.6 shows the trend in formalization between domestic workers with children under and over 18 whose employers were subject to the benefits of the tax deductions. It can be seen that prior to the introduction of the fiscal incentive, formality rates were stable for both groups, with no apparent difference in their trends. However, after the introduction of the policy change, it can be seen that formalization increased for both groups of mothers, with the ones with children over 18 having a steeper trend than the ones with children under 18 – an apparent significant difference. The non-significant difference in the trend before the policy change is confirmed when I run a model of registered work (versus unemployment or informal employment) on the treatment dummies, quarter dummies and interactions; and then apply an F test in which the null hypothesis is that the coefficients for the interaction terms are jointly equal to zero before the reform (Garganta and Gasparini, 2015; Garganta et al., 2017), which I do not reject (F(9,13936)=1.48; Prob>F=0.1476). Moreover, I do the same but with the outcome being unemployed (versus being employed either formally or informally) and also do not reject the null hypothesis (F(9,13936)=1.09; Prob>F=0.3693)[22]

[22]I also run the same tests, but independently depending on the marital status of the domestic worker. For those who are either single or married to an unregistered workers, I find for registration that I reject the null F(9,10343)=1.69; Prob>F=0.0859), but I do not for unemployment F(9,10343)=1.01; Prob>F=0.4301). For those who are married to a registered worker, I find for

2.5 Results

In every analysis presented in this section, fixed effects are both by region[23] and year-quarters (Garganta and Gasparini, 2015; Garganta et al., 2017; Berniell et al., 2017). Standard errors are clustered at the urban center level to account for the fact that there might be correlation between the individuals belonging to the same local labor market over time (Bleakley and Lin, 2012; Cameron and Miller, 2015). Moreover, given that I am using the sample as a repeated cross section, some observations are for the same individual over different periods. Clustering at the urban level already takes into consideration this source of serial correlation as the same household appears in the same urban area across periods (Berniell et al., 2017)[24].

2.5.1 Extensive Margin

Table 2.7 shows the marginal effects of the multinomial logit estimations for the extensive margin. While being in the after treatment period and working in an area of high share of potential employers that can benefit from the tax deduction

registration that I cannot reject the null F(9,3323)=0.34; Prob>F=0.9633), and the same for unemployment F(9,3323)=1.01; Prob>F=0.4370). Given the previous, I further restrict the sample only to those mothers with children between 12 and 25 years old - thinking that they are probably more comparable. In this case, I find for registration that I cannot reject the null F(9,5207)=0.95; Prob>F=0.4763), and the same for unemployment F(9,5207)=1.40; Prob>F=0.1800). Furhtermore, for those who are married to a registered worker, I find for registration that I cannot reject the null F(9,1510)=1.22; Prob>F=0.2760), and the same for unemployment F(9,1510)=1.49; Prob>F=0.1469).

[23]There are six regions in the country

[24]I also perform the same estimations (not shown) but: 1) clustering at the household level; 2) clustering the standard errors in two dimensions: at the urban area level (to account for correlated errors within urban areas over time) and household level (to account for correlated errors within the same household over time given the panel rotation scheme of the survey) following Cameron et al. (2011). In both instances I find similar results

independently have a positive effect on the extensive margin for domestic workers (as expected), the DD coefficient is not significant. The policy change is then not appearing to have an effect on the probability a woman will end up working as a domestic worker.

In particular, and following the vision inspection, the multinomial logit that includes the individual and household level control variables as well as regional and time fixed effects shows that after the introduction of the fiscal incentives to employers, there was an increase of 9.45 percentage point in the probability that a low-skilled women is out of the labor force, an increase of 2.35 percentage points in the probability a low-skilled women is in the labor force as domestic worker, and, therefore, a decrease in 11.80 percentage points in the probability a low skilled women is in the labor force as a non-domestic worker. It also shows that living in an area of high top income earners means the probability that a low skilled women is in the labor force as domestic worker is 2.32 percentage points higher in an area of high income earners compared to an area of low. Nevertheless, the causal effect of interest - the estimate for the DD coefficient (Angrist and Pischke, 2008) - of the introduction of the tax deductions in the probability of entering or not the labor force (and doing so as a domestic or non-domestic worker) for those more affected by the change in regulation, is not significantly different from zero. That means that the fiscal incentive does not seem to have caused an effect at the extensive margin for those workers with a higher probability of being exposed to it compared to those with a lower one after accounting for the time trend.

This goes in line with the nature of the reform, which was targeted at the

demand of domestic labor rather than the supply of it. From the side of the worker, it seems like the potential increase in the probability of formal employment was not enough to shift inactive women to enter the labor force as a domestic worker, or even to shift low-skilled women from a non-domestic occupation towards that sector. In other words, it appears that the disadvantages inherent to the domestic sector (Brites, 2014; Poblete, 2014; Manzo, 2014) still overcome the benefits that being employed as a formal domestic worker can bring.

2.5.2 Formal Margin

The second margin of response I will examine is the formal one. As shown in Table 2.8, I run three regressions under a Linear Probability Model[25]: 1) following Garganta and Gasparini (2015), the outcome is to have a be a registered worker or not. In this case, the outcome will be a dummy variable that takes the value of 1 if the worker has a formal working arrangement and 0 if the worker is unregistered (meaning that she has no contributions to Social Security, which happens either if she has an informal arrangement or if she is unemployed); 2) also based on Garganta and Gasparini (2015), the outcome is to have a formal work arrangement or to have an informal one (that means, exclude the unemployed); 3) the outcome is either to be employed (formally or informally) or unemployed, as done by Dinkelman and Ranchhod (2012) to isolate the possibility of employers adjusting on the extensive margin. It seems logical to divide the formal margin this way, as while unemployment is a

[25]Estimates from a Linear Probability Model are similar that the ones obtained from the non-linear Probit one (Angrist and Pischke, 2008)

decision of the employer having a formal or informal work arrangement is the result of both the employer and the worker (Slonimczyk, 2014; Almeida and Carneiro, 2012; Amaral and Quintin, 2006; Galiani and Weinschelbaum, 2012; Magnac, 1991; Maloney, 2004)[26].

It can be seen first that there is no difference neither on registration nor unemployment across areas after the introduction of the reform for all low-skilled women in the labor force. However, it is clear that when we compare the evolution of the outcomes for domestic workers versus non-domestic workers there is an increase in registration and a decrease in unemployment after the change in the law: an increase in registration of 5.71 percentage points (7.95 percentage points when we exclude the unemployed) and a decrease in unemployment of 4.15 percentage points. Finally, the DDD coefficient show that while the increase in registration is further 8.52 percentage points higher for domestic workers in high share areas compared to those in low share ones (11.55 percentage points if we exclude the unemployed), that is not the case for unemployment which seems not to have changed differently after the introduction of the tax deductions by geographic area. These findings are in line with authors such as Tomei (2011); Hertz (2005); Raz-Yurovich and Marx (2018) as well as the predictions of Mattila (1973) which point out that the demand of domestic workers is highly sensitive to its costs.

As robustness check to my findings (and given that as shown in Section 2.4, for

[26]For consistency I also estimated a multinomial logit model (not shown) whith three options: being a formal worker, an informal worker or unemployed. I find similar results: a decrease in informal employment of 9.7 percentage points divided in an increase in formal employment of 7.17 percentage points and of unemployment of 2.5 percentage points. I present the results of the LPM to follow the literature

the unemployment rate one of the pre-parallel trend assumption test did not hold), I run a series of placebo tests, changing the reform period for the fourth quarter of 2003 and the fourth quarter of 2004. Table 2.9 shows the results of those estimations restricted to true pre-reform period observations (before the fourth quarter of 2005). As it can be seen, the estimate for the DDD coefficient is not significantly different from zero in any case for any of the two false experiments (and the magnitudes are also relatively close to zero, particularly for registration).

2.5.3 Intensive Margin

Given the fact that there can be measurement error in the reporting of number of hours of work in household surveys as previously mentioned, I perform the analysis over the intensive margin with a discrete rather than a continuous approach - even though I also present the results of the continuous estimation[27]. In particular, I conduct the same triple difference strategy than in the previous sub section, but in this case the outcome are categories of average number of hours of work per week: less than 6, between 6 and 16 and 16 or more. I model this through a multinomial logit approach. Table 2.10 shows the results of such estimations.

In the continuous approach, it can be seen that in the period after the introduction of the tax deductions there seems to be a decrease of 1.78 hours in the average number of hours of work per week for workers in high share areas overall, and of 1.44 hours of work for domestic workers compared to non-domestic ones. In

[27]Note that I am confident in doing this because the previous sub section showed that the introduction of the fiscal incentive did not have an effect on unemployment, meaning that the share of low-skilled domestic and non-domestic workers who are employed within the labor force did not experience a change.

this case, the DDD coefficient seems to be positive, but of a small magnitude (0.36 hours) and not significantly different from zero - pointing out that the observed changes for domestic workers did not change by geographic area.

Interestingly, when the same exercise is performed with discrete groups (to account for the possible measurement error in hours of work in household surveys), it can be seen that the double difference for geographic areas point out that after the introduction of the tax deductions there was overall an increase in 2.47 percentage points in the share of low-skilled women working less than 6 hours, but no significant changes in the share of women working either 6-15 hours or more than 16 hours. Moreover, it can also be seen that for domestic workers after the reform there was an increase of 4.55 percentage points in the share of full-time work arrangements compared to non-domestic workers (and a decrease of 1.47 and 3.09 percentage points in the share of part-time works arrangements of less than 6 hours per week and 6-15 hours, respectively). The DDD coefficient shows that such increase seems to have been generalized across areas, though the decrease in the number of work arrangements of less than 6 hours per week seems to be more pronounced for domestic workers in high share areas. The analysis points then that the amount of the deductions was enough to cover the incremental cost of formality as it incentivized more full-time work arrangements.

2.5.4 Heterogeneous Effects

The previous analyses show that part of the increase in formalization is due to reductions in informality, which opens up the question whether that is the result of integrated labor markets. Changes in unemployment are involuntary from the side of the worker, by definition. Nevertheless, the fact that the increase in formality appears to come from a reduction in informality opens up the possibility of the worker deciding whether to hold a formal or informal job.

Table 2.11 shows the results of the triple differences only for domestic workers who are mothers, both for registration and unemployment, and by marital status- which is the second requirement for access to welfare as explained in Section 2.3.

Panel A of Table 2.11 shows that for the entire sample of domestic workers who are mothers with children living in their households, the estimate for the DD coefficient between the after period and having a child under 18 is negative for all the groups and all the registration specifications (though the effect is larger in magnitude for those married to a formal worker). Nevertheless, the DDD coefficient is not significantly different from zero, pointing out that such difference does not differ by geographic variations. In the case of unemployment, it can be seen that almost none of the interaction terms are statistically significant, meaning that there seems to be no differences in the rate of unemployment between the groups after the introduction of the tax incentives.

To control for any change in behavior of employers[28] and to the fact that, as

[28]From the side of the employer, it can be thought that they might take advantage of knowing the domestic worker married to a formal spouse has health and pension (at the household level)

exposed in Section 2.4 the pre-parallel trend assumption for registration seemed not to hold for those domestic workers who were single or married to an unregistered worker, I performed the same estimation as before but only for mothers who have a child between 12 and 25 years old, as shown in Panel B of Table 2.11. I find the same results, but magnified. In particular, I find the double difference in the probability that a domestic worker married to a formal worker has a formal working arrangement after the introduction of the tax deductions of 13.63 percentage points in favor of those for whom the age of the youngest child is between 18 and 25 compared to those for whom the age of the youngest child is between 12 and 17. For those who are married to an unregistered worker or who are single, such figure is almost half: 7.50 percentage points. Nevertheless, when I incorporate the element of geographic differences, the DDD coefficient is statistically not significant in any case. As it can also be seen in Panel B, there seems to be no effect on unemployment.

It looks like the difference in formalization regarding having children under and over 18 years old is more pronounced for those domestic workers married to a formal one, in line with the reality of Social Security payments at the time the tax incentive was introduced. Given that the universal welfare cash transfer to the unemployed and the informal workers started in 2009 [156], at the time this reform took place, the only way a low-income worker could be guaranteed a transfer per child was to be a formal worker under the General Work Contract Convention or

covered through their partner, and therefore she might not push so hard for formalization. This might happen if we go to the theory that the market is a matching one, and therefore specific employers match with specific employees (Abowd et al., 1999, 2009; Mendes et al., 2010). In this case, workers for whom the tax deduction is not enough to incentivize them to offer a formal arrangement will want to match with employees who come from a formal household in order not to have someone that pushes so much for formalization

to be married to one. However, as it was seen, there seems not to be significant differences when we introduce to the analysis another difference: the one between domestic workers more and less exposed to the changes given the urban center in which they reside. It is possible that, as explored in Section 2.3, given that welfare cash payments at the time for those who were single or married to an unregistered worker could be, among other things, tied to certain geographic locations (and not universal and distributed by the federal government as it is the case in my analysis of Chapter 3), adding such layer of differences is creating noise in my estimations.

2.6 Conclusion

2.6.1 Cost-Effectiveness of the intervention

The previous results show that the introduction of the fiscal incentives for employers was effective in increasing the registration rate of domestic workers (particularly for those working in areas with a high share of potential household employers that could benefit from the tax deductions), overall reduced unemployment in the sector and increased the number of full-time work arrangements. The main result of the analysis shows that the effect of the introduction of the tax deductions was an increase in registration of 5.71 percentage points (7.95 percentage points when we exclude the unemployed) and a decrease in unemployment of 4.15 percentage points. I also found that while the increase in registration is further 8.52 percentage points higher for domestic workers in high share areas compared to those in low share ones (11.55 percentage points if we exclude the unemployed), that is not the case for

unemployment which seems not to have changed differently after the introduction of the tax deductions by geographic area. Moreover, I found that for domestic workers after the reform there was an increase of 4.55 percentage points in the share of full-time work arrangements compared to non-domestic workers but such increase seems to have been generalized across areas - an indication that the amount of the deductions was enough to cover the incremental cost of formality. The findings of this paper are in line with authors such as Tomei (2011); Hertz (2005); Raz-Yurovich and Marx (2018) as well as the predictions of Mattila (1973) which point out that the demand of domestic workers is highly sensitive to its costs. It also highlights how tax rates are a more effective tool for reducing the size of the informal sector than enforcement (Dinkelman and Ranchhod, 2012; Galiani and Weinschelbaum, 2012; Tomei, 2011) considering that the workplace of this occupation is a private dwelling and therefore monitoring is low.

While the effectiveness of the policy change has been established, the question remains of whether it was a cost-effective one. This is important given that the regulation was targeted at providing savings to high-income household employers who were in fact not complying with the law to begin with - something that might be potentially controversial particularly given the unbalanced power relationship that exists between employers and employees in this occupation (Gorbán and Tizziani, 2014; Pereyra et al., 2017).

The cost of the policy can be calculated as the loss in tax collection experienced by the government through the tax deductions, plus the cost of disseminating the information (both sending the letters to 200,000 taxpayers as well as making

TV, radio and newspaper announcements). Each new registered domestic worker represents $4,020 (the maximum amount of the tax deduction)[29] per year that the government is not taxing at a 35 percent rate. This is a conservative measure, since not everyone who is eligible for the tax deduction and actually used is taxed at the highest rate. However, those at the highest tax rate are the ones that have a higher incentive to take advantage of the tax deduction and are the ones that received the letter from the tax authority (for those households taxed at a lower rate, the loss in tax revenue from the side of the government is lower). Each registered domestic worker then means $1,407 (USD470) per year lost in tax collection. In other words, the cost in lost tax revenue per domestic worker is $117 (USD39) per month. Assuming a conservative total cost of information dissemination of $3 per month per worker, the total cost of the policy is of $120 (USD40) per month per domestic worker that transitions to a formal work arrangement.

The previous figure can be compared to the cost that represents for an employer to have a formal domestic worker. At the time of the introduction of the tax deduction, the amount of contributions and deductions for access to health insurance and pension for full-time domestic workers was $55 per month (USD18.3 per month or $220 per year). Moreover, those employers with a formal arrangement have to adhere to the minimum wage scale for the sector, which at the time of the implementation of the policy change was $450 per month for the general worker category (Clarin, 2005). In fact, in the EPH, the average income coming from the

[29]Note that the cost (between wages and Social Security contributions) of a full-time domestic worker is higher than $4,020 as shown in Section 2.2 and therefore I am using the full amount of the tax deduction to make my calculations

main work activity for full-time formal domestic workers in the post-intervention period was $487 and for full-time informal domestic workers in the post-intervention period was exactly $314. The difference then in wages between the mandatory formal monthly wage and the average informal one is $173 per month. It is also important to add that when the worker is formal, it is mandatory for the employer to pay 13 wages in a year rather than 12 (one month is considered a bonus). If we consider that under an informal work arrangement household employers do not make such bonus payments, then total cost of a formal work arrangement versus an informal one for the employer is $265.5 per month or USD88.5 – as it includes $55 in social security payments, $173 of wage differential between formal and informal arrangements and $37.5 of the mandatory bonus.

The previous means that, if the government wanted to give direct access to a pension plan and health insurance to this group of workers, the cost would be USD18.3 ($55) per month per worker. Moreover, if the government also wanted to guarantee that this group receives what formal domestic workers get, the cost would be USD76 ($228) per month per worker. If on top of that, the government wanted to guarantee access to the bonus (so that domestic workers have in fact 13 salaries in a year), then the cost would be USD88.5 per month per worker ($265.5). Through the policy of giving tax deductions for household employers, the government effectively reaches the previous target for USD40 per month per worker – and therefore producing savings of USD35 per month per domestic worker in the formal sector, as it seems that such part of the cost is absorbed by the household employer. Note then that the intervention could be considered cost-effective only if the objective was to

increase registration with all the extended set of benefits that it entails: access to pension, health insurance, vacation time, bonus and minimum wage. However, if the objective was only to guarantee access to a pension scheme then the intervention would not be cost-effective – just by a little less than USD12 ($35) per month per worker the government could guarantee pension contributions to every domestic worker. Therefore, for the same amount that the government is spending for fully formalizing one domestic worker (USD40), it could have provided access to a basic pension to 3.3 workers[30].

As a final note, and looking at the administrative records provided by the Ministry of Labor [102], it can be seen that in 2005, 105.377 domestic workers were registered in the country. By 2008, there were 320.00. That means that roughly extra 215.000 new workers were incorporated to the formal economy during this period – more than 200.000, which is the number of potential household employers that received the notification. Therefore, even though the informality rate among those working domestic workers is still over 85 percent by 2008 (which proves that there is still room for more work to be done regarding this sector), the fact that, in the conservative side, I estimated that the effect of the fiscal incentive was an increase of around 5.71 percentage points in the probability of registration plus the apparent cost-effectiveness of the measure if the objective was to provide this group of low-skilled workers achieve a comprehensive social security protection means that this was a good first policy approach to the problem. As it will be shown in Chapter

[30]In this calculations, I am not considering unemployment, which can be thought as increasing the cost for the government - the amount of unemployment insurance

3, after the International Labour Organization established in 2011 the Domestic workers Convention C189 [157], Argentina - among other countries in the world and particularly in Latin America and the Caribbean - reformed labor regulations in the sector.

2.6.2 Evidence of integrated labor market hypothesis

My results when analyzing only the sample of mothers show that there is some indication that domestic workers with children under 18 compared to those with children over 18 years old - and particularly those married to a formal worker - have a lower probability of holding a formal work arrangement after the introduction of the tax deductions. The previous particularly holds when analyzing those mothers with children between 12 and 25 years old. However, as it was explained the rules for welfare eligibility (particularly for those domestic workers who are single or married to an unregistered husband) were not straightforward at the time, which means that there could be some noise in my estimations.

However, there is an implication that should be considered: workers make decisions and therefore have a role in determining the market equilibrium between the formal and the informal sector – so their incentives should be taken into consideration at the time of designing policy, to be sure that workers who need registration probably the most do not have to face these trade-offs.

2.6.3 Implications for further policy

There are different lessons learned regarding the introduction of the fiscal incentive for household employers that overall contributed to the literature on the institutional aspects of public policies on labor informality and to further develop and improve policies to increase work formalization for vulnerable groups.

The first one is that the structure of the tax deductions and the amount seemed to have been efficient in increasing the registration of domestic workers in a cost-effective way. Therefore, targeting the demand of domestic work can be an effective way of dealing with the problem of labor informality, particularly in a context of lack of active enforcement. It is important to notice that the mechanism under which the tax deductions worked was efficient not only to provide basic pension access and health insurance to those domestic workers that formalized, but also an array of benefits that go beyond the basic mandated ones.

However, the policy seems to not have been enough. By the end of the period analyzed, within those working domestic workers, over 85 percent show an informal work arrangement. While the policy was a good start, it primarily targeted high-income household employers. Given that around 15 percent of the female work force in the country is linked to domestic work, it is clear that many of the households employing domestic work do not belong to that category and cannot benefit from it. Moreover, and as previously stated, the fact that the policy provided benefits to high-income households who were not complying with the law to begin with can be controversial.

Given the particular target of this reform, it is still a limitation of this study not to be able to have data on employers. The analysis shown in this paper could be enriched through the use of matching employer-employee data, and in that sense understand better the mechanisms through which the new formal work arrangements emerge and are settled. However, such data is not available for the period covered in this chapter. A beneficial aspect of using household surveys though is to have detailed data on workers who were subject to the reform. A key lesson that rises from the previous analysis based on such survey is that there seems to be some evidence for the integrated labor market hypothesis, and therefore it is important to consider the unintended consequences over a worker's decision-making process when introducing new policy.

The fact that I have shown that welfare might reduce the efficiency of a government lead formalization is especially important in the Argentinean context, given that the next big reform regarding domestic workers took place in 2013, and at the time, the AUH, which was a universal subsidy for the unemployed and informal workers was in place. The analysis of such reform and its interaction with the welfare structure at the time is developed in Chapter 3.

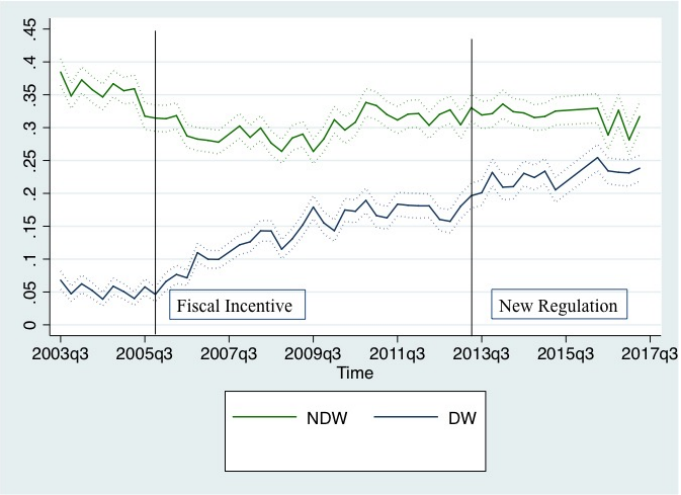


Figure 2.1: Percentage of low-skilled females in the Labor Force contributing to the pension scheme by occupation, 2003-2017.
Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130] using population weights.

Table 2.1: Employed Domestic Workers' characteristics, pre-reform

	(1)	(2)	(3)
	Employed Domestic Workers		
Variable	Formal	Informal	Total
Hours in main household			
Less than 6	2.61	12.71	9.79
Between 6 and 16	11.26	32.83	25.47
16 or more	86.13	54.46	64.73
Number of employers			
1 HH	79.47	78.45	78.50
2 HH	13.90	14.09	14.08
3 or more HH	6.63	7.46	742
Length of employment			
Less than 1 year	11.39	36.51	47.93
Between 1 and 5 years	37.61	42.50	33.95
More than 5 years	51.00	20.99	18.12
Live with employer	12.79	4.25	3.77
Migrant	11.34	11.51	11.10
Total	5.21	94.79	100.00

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130], 2003-2008 using population weights.

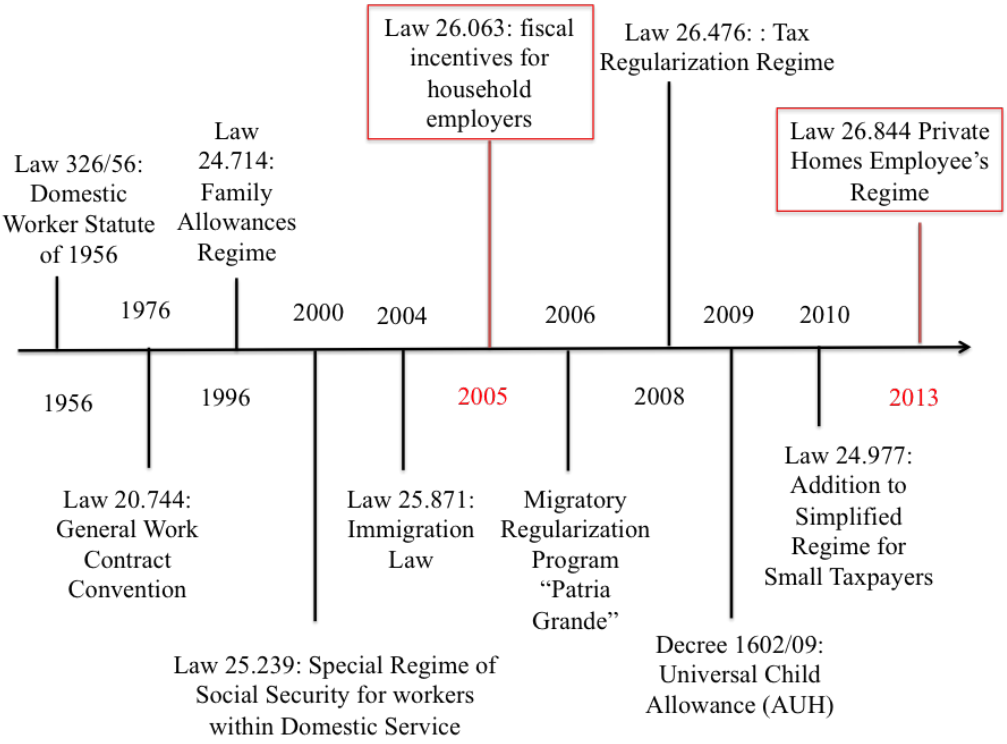


Figure 2.2: Domestic Workers' regulation timeline.
Source: Author's compilation based on Domestic Workers' regulations [43; 46; 105; 110; 111; 112; 121; 132; 156; 158; 159]

Table 2.2: Domestic Worker's Social Security Contributions (pesos), 2005

	(1)	(2)	(3)
	Hours of Work per Week		
Concept	**6-11 hrs**	**12-15 hrs**	**≥16 hrs**
Pension (employer)	12	24	35
Health Insurance (employee)	8	15	20
Difference to be Covered by Employee	35	16	0
Health Insurance for Dependent (employee)	20	20	20

Source: Clarin (2005)

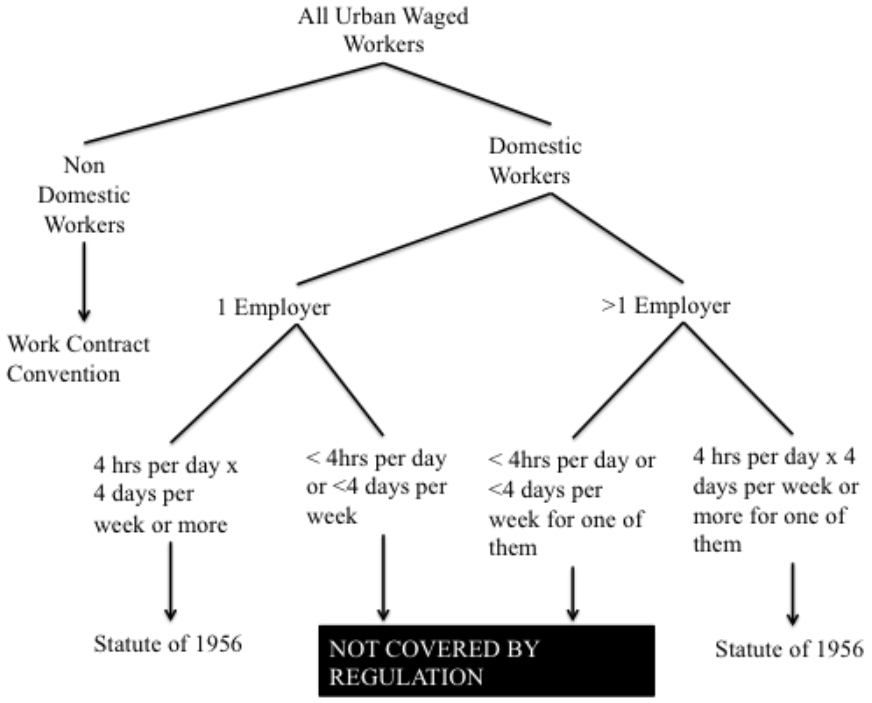


Figure 2.3: Domestic Workers' Regulation Coverage, 1956-2000. Source: Manzo (2014)

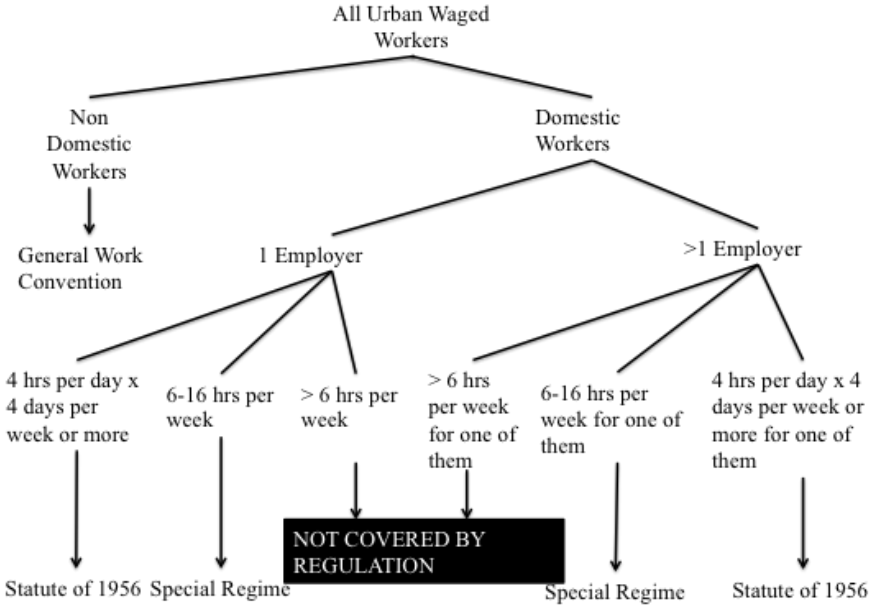


Figure 2.4: Domestic Workers' Regulation Coverage, 2000-2010. Source: Manzo (2014)

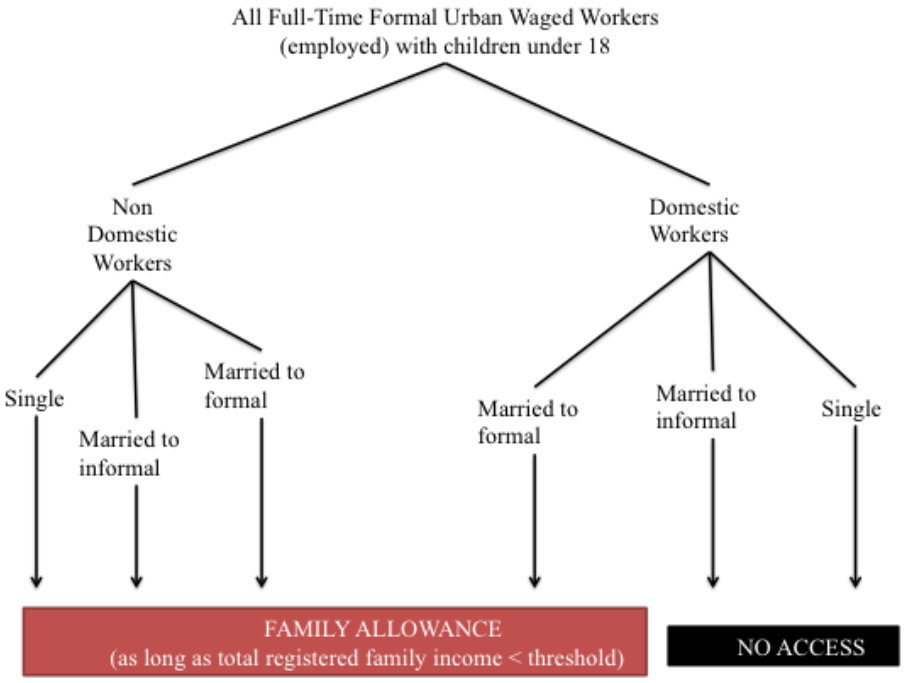


Figure 2.5: Access to Family Allowance Regime.
Source: Author's compilation based on Domestic Workers' regulations [43; 46; 105; 110; 111; 111; 112; 156]

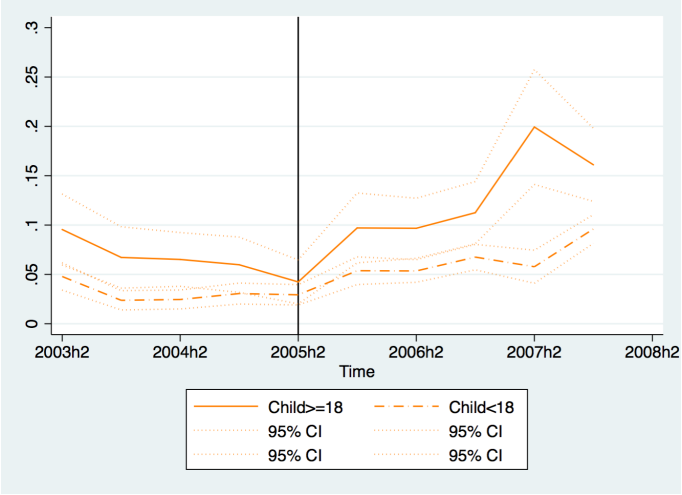


Figure 2.6: Percentage of registered Domestic Workers (contributing to the pension scheme) by age of youngest child, 2003-2008
Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130] using population weights.

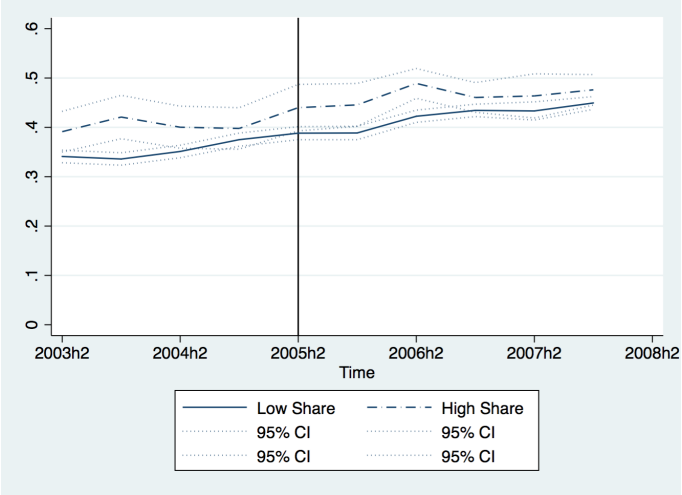
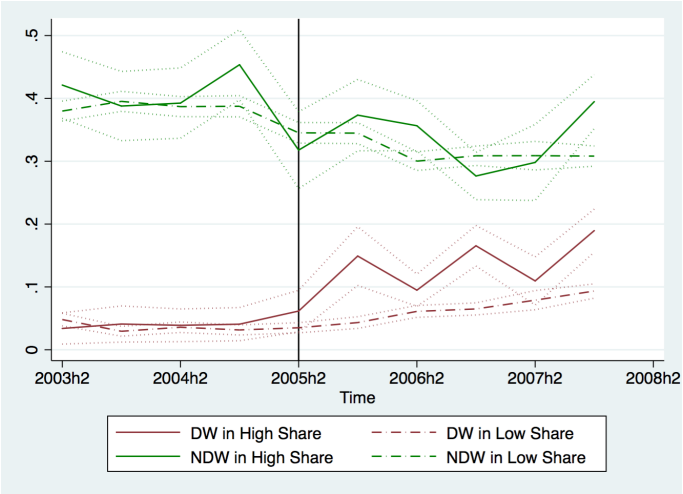
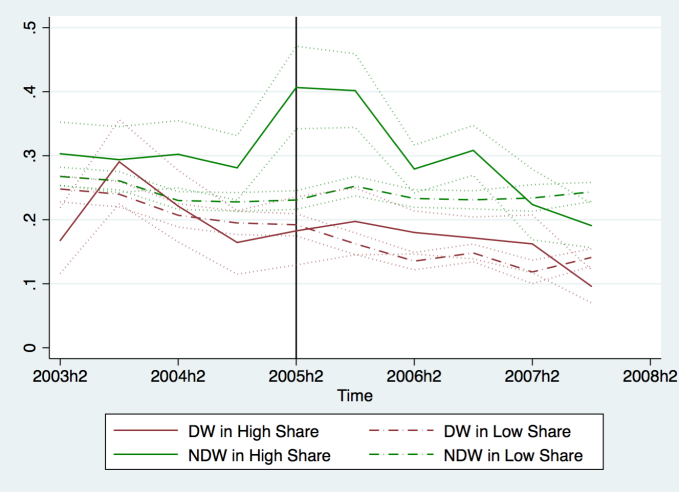


Figure 2.7: Percentage of Domestic Workers Over Low-Skilled Female Labor Force, 2003-2008
Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130] using population weights.
Note: High Share = woman lives in an urban area with a high share of potential domestic workers' household employers that can benefit from tax deductions given their income levels. Low Share = woman lives in an urban area with a low share of potential domestic workers' household employers that can benefit from tax deductions given their income levels



(a) Registration Rates for Low-Skilled Women in the Labor Force, 2003-2008



(b) Unemployment Rates for Low-Skilled Women in the Labor Force, 2003-2008

Figure 2.8: Registration and Unemployment Rates for Low-Skilled Women in the Labor Force, 2003-2008
Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130] using population weights.
Note: DW = Domestic Worker. NDW = Non Domestic Worker. High Share = woman lives in an urban area with a high share of potential domestic workers' household employers that can benefit from tax deductions given their income levels. Low Share = woman lives in an urban area with a low share of potential domestic workers' household employers that can benefit from tax deductions given their income levels

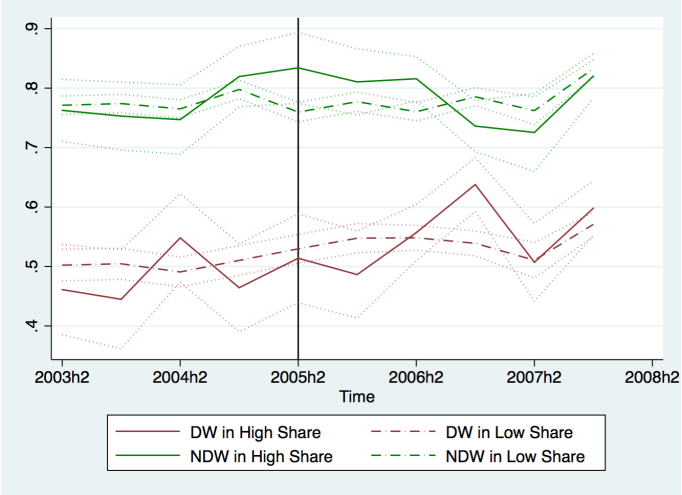


Figure 2.9: Full-Time Rates for Employed Low-Skilled Workers, 2003-2008
Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130] using population weights.
Note: DW = Domestic Worker. NDW = Non Domestic Worker. High Share = woman lives in an urban area with a high share of potential domestic workers' household employers that can benefit from tax deductions given their income levels. Low Share = woman lives in an urban area with a low share of potential domestic workers' household employers that can benefit from tax deductions given their income levels. Full-Time = works for 16 or more hours in main activity

Table 2.3: Descriptive Statistics

	(1)	(2)	(3)	(4)	(5)	(6)
		DW			**NDW**	
Variable	HS	LS	Total	HS	LS	Total
Age	37.297	37.644	37.607	35.202	35.227	35.225
	(11.576)	(11.434)	(11.449)	(11.572)	(11.700)	(11.690)
Married	0.518	0.497	0.500	0.611	0.632	0.630
	(0.500)	(0.500)	(0.500)	(0.488)	(0.482)	(0.483)
Informal Husband (married=1)	0.543	0.620	0.612	0.541	0.602	0.597
	(0.498)	(0.485)	(0.487)	(0.498)	(0.490)	(0.491)
HH Head	0.294	0.266	0.269	0.180	0.162	0.164
	(0.456)	(0.442)	(0.443)	(0.384)	(0.369)	(0.370)
Number children ≤ 18	1.012	1.075	1.068	1.471	1.504	1.501
	(1.222)	(1.378)	(1.362)	(1.545)	(1.598)	(1.593)
HH Members	4.178	4.699	4.645	4.791	5.188	5.156
	(1.874)	(2.245)	(2.215)	(2.000)	(2.226)	(2.211)
HH Employed Members	1.941	2.097	2.081	1.397	1.597	1.581
	(0.996)	(1.127)	(1.115)	(0.900)	(1.050)	(1.040)
HH Income Decile	3.834	3.142	3.214	2.626	2.315	2.340
	(1.950)	(1.837)	(1.862)	(1.092)	(1.106)	(1.108)
High School	0.278	0.234	0.239	0.332	0.259	0.265
	(0.448)	(0.424)	(0.426)	(0.471)	(0.438)	(0.441)
Program JJH Beneficiary	0.051	0.064	0.063	0.050	0.048	0.048
	(0.220)	(0.245)	(0.242)	(0.218)	(0.214)	(0.214)
N	2,911	19,101	22,012	8,558	77,555	86,113

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130], 2003-2008. Note: Weighted means. Standard Deviation in parenthesis. (1), (2) & (3) sample of Domestic Workers. (4), (5) & (6) sample of Non Domestic Workers. HS= woman lives in an urban area with a high share of potential domestic workers' household employers that can benefit from tax deductions. LS= woman lives in an urban area with a low share of potential domestic workers' household employers that can benefit from tax deductions

Table 2.4: Descriptive Statistics, Domestic Workers by age of youngest child

Variable	(1) Child<18	(2) Child≥18
Age	37.835	50.594
	(8.651)	(5.665)
Married	0.695	0.549
	(0.461)	(0.498)
Informal Husband (married=1)	0.580	0.655
	(0.494)	(0.475)
HH Head	0.316	0.470
	(0.465)	(0.499)
Number children ≤ 18	2.067	0.000
	(1.235)	(0.000)
HH Members	4.737	4.007
	(1.827)	(1.668)
HH Employed Members	1.906	2.329
	(0.975)	(1.042)
HH Income Decile	2.888	3.914
	(1.726)	(1.953)
High School	0.184	0.143
	(0.387)	(0.350)
Program JJH Beneficiary	0.100	0.023
	(0.299)	(0.150)
Unemployed (pre-reform)	0.1646	0.1026
Informal (pre-reform)	0.7868	0.8017
Formal (pre-reform)	0.0486	0.0957
Average Weekly Hours (pre-reform)	18.0427	19.3221
N	10,980	2,838

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130], 2003-2008. Note: Sample restricted to Domestic Workers with Children living in the same household. Weighted means. Standard Deviation in parenthesis.

Table 2.5: Outcomes, pre- reform

	(1)	(2)	(3)	(4)	(5)	(6)
		DW			**NDW**	
Variable	HS	LS	Total	HS	LS	Total
Unemployed	0.2117	0.2176	0.2170	0.3018	0.2447	0.2494
Informal	0.7533	0.7464	0.7471	0.2870	0.3698	0.3629
Formal	0.0350	0.0360	0.0359	0.4112	0.3855	0.3877
Average Weekly Hours	17.7361	18.8039	18.6941	25.7086	23.6463	23.8049

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130], 2003-2008.
Note: Weighted means. (1), (2) & (3) sample of Domestic Workers. (4), (5) & (6) sample of Non Domestic Workers. HS= woman lives in an urban area with a high share of potential domestic workers' household employers that can benefit from tax deductions. LS= woman lives in an urban area with a low share of potential domestic workers' household employers that can benefit from tax deductions

Table 2.6: Urban Area's Distribution based on Share of Potential Household Employers that can Benefit from Tax Deductions

Urban Area		
Gran La Plata	Bahia Blanca	Gran Rosario
Gran Santa Fe	Gran Parana	Posadas
Gran Resistencia	Comodoro Rivadavia	Gran Mendoza
Corrientes	Gran Cordoba	Concordia
Formosa	Neuquen	Santiago del Estero
Jujuy	Rio Gallegos	Gran Catamarca
Salta	La Rioja	San Luis
Gran San Juan	Gran Tucuman	Santa Rosa
Ushuaia - Rio Grande	BA City	Gran BA
Mar del Plata	Rio Cuarto	San Nicolas
Rawson - Trelew	Viedma	

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130], 2003-2008.
Note: Highlighted are those urban areas that are considered "High Share" given that more than 5.5 percent of the total population is categorized as a top earner (and could potentially benefit from the introduction of the new tax deductions). Those areas encompass around 20 percent of the total population represented in the survey.

Table 2.7: Effect of tax deductions for household employers on low-skilled female labor force participation

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	NLF (j=0)		DW (j=1)		NDW (j=2)	
After	0.0598***	0.0955***	0.0110**	0.0235***	-0.0708***	-0.1189***
	(0.00810)	(0.01162)	(0.00458)	(0.00767)	(0.00734)	(0.01316)
High Share	-0.0304	-0.0376	0.0430***	0.0235*	-0.0126	0.0142
	(0.04218)	(0.04949)	(0.01158)	(0.01371)	(0.03654)	(0.04165)
After x High Share	-0.0034	-0.0138	0.0054	0.0024	-0.0020	0.0114
	(0.03394)	(0.03444)	(0.01434)	(0.01479)	(0.02607)	(0.02616)
N	108,125	108,125	108,125	108,125	108,125	108,125
Controls	YES	YES	YES	YES	YES	YES
FE	NO	YES	NO	YES	NO	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130], 2003-2008.
Note: Marginal effects of multinominal logit estimations. Clustered standard errors at the urban center in parenthesis. NLF= Not in the Labor Force; DW= in the Labor Force as a Domestic Worker; NDW= in the Labor Force as a Non Domestic Worker. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members. Fixed effects include region and quarterly dummies. * significant at 10% ** significant at 5% *** significant at 1%

Table 2.8: Effect of tax deductions for household employers on registration and unemployment

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Registered				Unemployed	
After	-0.0218	-0.0174	-0.0409**	-0.0436*	-0.0240***	-0.0446***
	(0.01714)	(0.01951)	(0.01989)	(0.02496)	(0.00705)	(0.01262)
DW	-0.3649***	-0.3651***	-0.4597***	-0.4592***	-0.0156	-0.0146
	(0.02698)	(0.02672)	(0.02884)	(0.02844)	(0.00979)	(0.00972)
High Share	0.0836	0.0601	0.1554***	0.1194**	0.0612	0.0460**
	(0.05679)	(0.04485)	(0.05623)	(0.05717)	(0.03813)	(0.02191)
After x High Share	-0.0379	-0.0576	-0.0574	-0.0721	-0.0018	0.0125
	(0.04861)	(0.04595)	(0.05675)	(0.05572)	(0.02059)	(0.01982)
After x DW	0.0555***	0.0571***	0.0794***	0.0795***	-0.0382***	-0.0415***
	(0.01895)	(0.01754)	(0.02187)	(0.02044)	(0.00867)	(0.00793)
High Share x DW	-0.0600	-0.0661	-0.1300**	-0.1319**	-0.0605***	-0.0548**
	(0.05389)	(0.05412)	(0.05265)	(0.05325)	(0.01917)	(0.02037)
After x High Share x DW	0.0859*	0.0852*	0.1151**	0.1155**	0.0168	0.0188
	(0.04489)	(0.04417)	(0.05140)	(0.05162)	(0.01966)	(0.01860)
N	56,631	56,631	46,322	46,322	56,631	56,631
Controls	YES	YES	YES	YES	YES	YES
FE	NO	YES	NO	YES	NO	YES
Excluding Unemployed	NO	NO	YES	YES	NO	NO

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130], 2003-2008.

Note: Results of Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Registered = formal vs. (informal or unemployed). Unemployed = unemployed vs. employed formally or informally. In (3) & (4) sample restricted to employed workers. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members. Fixed effects include region and quarterly dummies. * significant at 10% ** significant at 5% *** significant at 1%

Table 2.9: Effect of tax deductions for household employers on registration and unemployment - false experiment dates

	(1)	(2)	(3)	(4)	(5)	(6)
Variable		Registered			Unemployed	
			Panel A: 2003			
After	-0.0446***	0.0685***	-0.0239	-0.0407***	0.0720***	-0.0313**
	(0.01081)	(0.01776)	(0.01482)	(0.01038)	(0.01379)	(0.01383)
DW	0.0550***	0.4196***	-0.4746***	0.0589***	0.4403***	-0.4991***
	(0.02079)	(0.03483)	(0.04643)	(0.01753)	(0.02132)	(0.03505)
High Share	-0.0122	-0.0867	0.0990**	0.0364**	-0.0855	0.0491
	(0.03239)	(0.05874)	(0.04274)	(0.01692)	(0.06150)	(0.04850)
After x High Share	0.0885***	-0.0334	-0.0551***	0.0744***	-0.0753***	0.0009
	(0.03335)	(0.03680)	(0.01451)	(0.02040)	(0.01876)	(0.02555)
After x DW	-0.0046	0.0125	-0.0079	-0.0180*	-0.0203	0.0382**
	(0.01545)	(0.03423)	(0.03549)	(0.00973)	(0.01795)	(0.01916)
High Share x DW	-0.0990	0.0889	0.0101	-0.0723***	0.0549	0.0174
	(0.06094)	(0.09052)	(0.07332)	(0.02458)	(0.04297)	(0.05245)
After x High Share x DW	0.0121	-0.0149	0.0028	-0.0419	0.0500	-0.0081
	(0.06203)	(0.08621)	(0.06737)	(0.04025)	(0.03914)	(0.04876)
			Panel B: 2004			
After	-0.0207**	-0.0375**	-0.0400***	-0.0645***	-0.0236***	-0.0346***
	(0.00958)	(0.01547)	(0.01213)	(0.01970)	(0.00792)	(0.00972)
DW	-0.3665***	-0.3673***	-0.4677***	-0.4687***	-0.0118	-0.0118
	(0.02716)	(0.02698)	(0.02864)	(0.02820)	(0.01250)	(0.01256)
High Share	0.0896	0.0671	0.1509**	0.1252	0.0446	0.0425**
	(0.06110)	(0.05412)	(0.06311)	(0.07631)	(0.04011)	(0.01585)
After x High Share	-0.0168	-0.0159	0.0155	0.0176	0.0561**	0.0558**
	(0.03298)	(0.03276)	(0.03875)	(0.03850)	(0.02678)	(0.02586)
After x DW	0.0226**	0.0233**	0.0420***	0.0425***	-0.0192*	-0.0194*
	(0.00856)	(0.00867)	(0.01157)	(0.01146)	(0.01064)	(0.01060)
High Share x DW	-0.0679	-0.0710	-0.1250*	-0.1251*	-0.0507***	-0.0460**
	(0.06120)	(0.06140)	(0.06129)	(0.06119)	(0.01779)	(0.01814)
After x High Share x DW	0.0232	0.0144	-0.0150	-0.0208	-0.0347	-0.0260
	(0.04078)	(0.03877)	(0.04575)	(0.04480)	(0.04761)	(0.04597)
N	25,345	25,345	20,212	20,212	25,345	25,345
Controls	YES	YES	YES	YES	YES	YES
FE	YES	YES	YES	YES	YES	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130], 2003-2008.

Note: Results of Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Registered = formal vs. (informal or unemployed). Unemployed = unemployed vs. employed formally or informally. In (3) & (4) sample restricted to employed workers. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members. Fixed effects include region and quarterly dummies. * significant at 10% ** significant at 5% *** significant at 1%

Table 2.10: Effect of tax deductions for household employers on full-time employment levels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Hours per Week		Hour Group					
Variable			< 6hrs		6-15 hrs		≥16 hrs	
After	2.4652***	3.9567***	-0.0067	-0.0114	0.0149	0.0010	-0.0083	0.0104
	(0.25325)	(0.52194)	(0.00461)	(0.00814)	(0.01054)	(0.01793)	(0.01342)	(0.02189)
DW	-4.0277***	-4.0017***	0.0646***	0.0639***	0.1779***	0.1764***	-0.2426***	-0.2403***
	(0.77289)	(0.78745)	(0.00653)	(0.00456)	(0.01085)	(0.01137)	(0.01453)	(0.01409)
High Share	1.1289	1.2147	-0.0041	-0.0041	0.0289	0.0241	-0.0248	-0.0200
	(0.73385)	(0.90129)	(0.01101)	(0.00688)	(0.03617)	(0.02480)	(0.04611)	(0.02769)
After x High Share	-1.2499*	-1.7851**	0.0176*	0.0247***	-0.0196	-0.0108	0.0020	-0.0139
	(0.73284)	(0.82398)	(0.01060)	(0.00661)	(0.03426)	(0.03090)	(0.04056)	(0.03495)
After x DW	-1.4397***	-1.4374***	-0.0138***	-0.0147***	-0.0302***	-0.0309***	0.0441***	0.0455***
	(0.37632)	(0.37594)	(0.00371)	(0.00336)	(0.01147)	(0.01133)	(0.01296)	(0.01278)
High Share x DW	-1.5391	-1.6728	0.0081	0.0103	-0.0378	-0.0371	0.0297	0.0267
	(1.60092)	(1.54284)	(0.00993)	(0.01015)	(0.03036)	(0.02954)	(0.03310)	(0.03155)
After x High Share x DW	0.3269	0.3609	-0.0171*	-0.0166*	0.0376	0.0399	-0.0206	-0.0233
	(1.45025)	(1.41759)	(0.00948)	(0.00930)	(0.03204)	(0.03203)	(0.03713)	(0.03663)
N	44,687	44,687	44,687	44,687	44,687	44,687	44,687	44,687
Controls	YES	YES	YES	YES	YES	YES	YES	YES
FE	NO	YES	NO	YES	NO	YES	NO	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130], 2003-2008.
Note: Sample restricted to employed workers. In (1) & (2), results of OLS. In (3)-(8), marginal effects of multinomial logit estimations. < 6= works for less than 6 hours in main activity; 6-15= works between 6 and 15 hours in main activity; ≥16= works for 16 hours or more in main activity (full-time status). In all columns, Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members. Clustered standard errors at the urban center in parenthesis. Fixed effects include region and quarterly dummies. * significant at 10% ** significant at 5% *** significant at 1%

Table 2.11: Effect of tax deductions for household employers on registration and unemployment of Domestic Workers by age of youngest child & marital status

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			Registered					Unemployed	
Variable	Total		S&MU		MF		Total	S&MU	MF
Panel A: All mothers									
After	0.1277***	0.1315***	0.1088***	0.1121***	0.1951***	0.2021***	-0.0744***	-0.0545	-0.1239**
	(0.02972)	(0.03122)	(0.03021)	(0.03195)	(0.05617)	(0.06184)	(0.02641)	(0.03461)	(0.04849)
High Share	0.0095	0.0148	0.0124	0.0215	0.0003	0.0002	0.0397	0.0526	-0.0226
	(0.02869)	(0.03143)	(0.03071)	(0.03542)	(0.03516)	(0.03998)	(0.06880)	(0.07563)	(0.03891)
Child	-0.0017	-0.0031	-0.0095	-0.0120	0.0424	0.0476	0.0205	0.0155	0.0399
	(0.01071)	(0.01165)	(0.01104)	(0.01207)	(0.02666)	(0.03004)	(0.01507)	(0.01803)	(0.03050)
After x Child	-0.0611***	-0.0628***	-0.0579***	-0.0585***	-0.0861*	-0.0942*	-0.0113	-0.0096	-0.0226
	(0.02101)	(0.02231)	(0.01862)	(0.01951)	(0.04648)	(0.05014)	(0.01627)	(0.01953)	(0.03203)
After x High Share	0.0666	0.0838	0.0518	0.0584	0.1099	0.1594*	0.0343	-0.0010	0.1595**
	(0.05003)	(0.06016)	(0.05773)	(0.06906)	(0.08230)	(0.08980)	(0.05771)	(0.06555)	(0.07184)
Child x High Share	-0.0232	-0.0293	-0.0356	-0.0481	0.0056	0.0112	-0.0323	-0.0458	0.0357
	(0.03225)	(0.03813)	(0.03358)	(0.03856)	(0.04299)	(0.04909)	(0.05135)	(0.06667)	(0.02883)
After x Child x High Share	-0.0233	-0.0305	-0.0199	-0.0208	-0.0475	-0.0768	-0.0095	0.0059	-0.0976
	(0.04824)	(0.05516)	(0.05436)	(0.06311)	(0.09970)	(0.10594)	(0.06188)	(0.06740)	(0.09184)
N	13,818	12,018	10,419	9,097	3,399	2,921	13,818	10,419	3,399

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			Registered					Unemployed	
Variable	Total		S&MU		MF		Total	S&MU	MF
Panel B: Mothers with children between 12 and 25 years old									
After	0.1629***	0.1667***	0.1293***	0.1312***	0.2916***	0.3059***	-0.0962***	-0.0794***	-0.1389*
	(0.04230)	(0.04447)	(0.04159)	(0.04449)	(0.07513)	(0.07891)	(0.02553)	(0.02856)	(0.07050)
High Share	-0.0083	-0.0067	-0.0220	-0.0226	0.0505	0.0717	0.0216	0.0200	0.0263
	(0.02345)	(0.02661)	(0.02307)	(0.02989)	(0.07074)	(0.07942)	(0.05013)	(0.04843)	(0.08264)
Child	0.0072	0.0060	-0.0058	-0.0088	0.0679*	0.0716	0.0020	-0.0015	0.0188
	(0.01600)	(0.01730)	(0.01394)	(0.01500)	(0.03873)	(0.04277)	(0.01721)	(0.01896)	(0.03623)
After x Child	-0.0804***	-0.0849***	-0.0725***	-0.0750***	-0.1253**	-0.1363**	-0.0079	-0.0020	-0.0395
	(0.02647)	(0.02854)	(0.02503)	(0.02687)	(0.05268)	(0.05671)	(0.01739)	(0.01893)	(0.03555)
After x High Share	0.0539	0.0698	0.0396	0.0487	0.0654	0.1036	0.0433	0.0184	0.1115
	(0.05528)	(0.06621)	(0.05950)	(0.07100)	(0.09965)	(0.11435)	(0.05280)	(0.06037)	(0.09059)
Child x High Share	-0.0073	-0.0096	-0.0247	-0.0322	0.0092	0.0199	-0.0254	-0.0358	0.0076
	(0.03961)	(0.04822)	(0.02765)	(0.03511)	(0.09515)	(0.10938)	(0.04567)	(0.05933)	(0.05813)
After x Child x High Share	0.0010	-0.0061	-0.0067	-0.0094	0.0304	0.0023	-0.0123	0.0028	-0.0657
	(0.05219)	(0.06039)	(0.05836)	(0.06924)	(0.12149)	(0.13090)	(0.06226)	(0.06668)	(0.11229)
N	6,869	6,183	5,283	4,787	1,586	1,396	6,869	5,283	1,586
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Excluding Unemployed	NO	YES	NO	YES	NO	YES	NO	NO	NO

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [130], 2003-2008.
Note: Marginal effects of multinominal logit estimations. Clustered standard errors at the urban center in parenthesis. Unemp.= unemployed; Informal= employed informally for 6 hours or more; Formal= employed formally for 6 hours or more. Panel A: Sample restricted to domestic workers with children under and over 18 years old. Panel B: sample restricted to mothers with children between 15 and 20 years old. In (1), (2) & (3) domestic worker is Single; in (4), (5) & (6) domestic worker is Married to an Unregistered worker; in (7), (8) & (9) domestic worker is Married to a Registered worker. Same controls and fixed effects.
* significant at 10% ** significant at 5% *** significant at 1%

Chapter 3: Formal Sector Regulation and Access to Welfare Payments

3.1 Overview

In this chapter, I examine whether it is possible that poorly designed policies might lead low-skilled workers to stay in off-the-books jobs that leave them outside the formal economy. The previous chapter of this dissertation gave evidence to the possibility that welfare payments could be acting as a barrier for formalization, preventing domestic workers who are eligible for it to transition to a formal work arrangement. However, at the time of the implementation of the tax deductions for household employers, access to social protection for domestic workers with children under 18 years old and who were either single or married to an informal spouse was non-universal with no clear rules for access. The same was not true in 2013, when a new change in the sector took place. In this chapter, I will use the introduction of the new regulation for domestic workers in Argentina which offers new benefits under a formal arrangement in an attempt to match them with those available to the rest of salaried workers (national Law 26.844 of 2013: "Private Homes Employee's Regime"[46]), to show how some interventions targeted at encouraging

formalization might have unintended consequences. In particular in this case, I find that the probability of a domestic worker exhibiting a formal work arrangement with contributions to the national pension scheme after the introduction of the new formal sector regulation is around 4 percentage points lower for those eligible for welfare payments compared to domestic workers non-eligible for such payments. This translates into a 9 percent reduction in the probability of formalization for domestic workers with children under the age of 18 - the main requirement for welfare eligibility at the time - compared to those with children over 18 in their household. This exposes the (perceived) trade off between social protection and formal employment that low-skilled female workers with small children face.

As seen in Chapter 2, the size of the formal domestic worker sector in Argentina had been slowly increasing for the period prior to the introduction of the new regulation, and its introduction does not seem to have had a sizeable effect altering such trend (see Figure 2.1). While the previous might be due to the characteristics of the demand of domestic work, highly sensitive to costs (Mattila, 1973) which undoubtedly increased with the new regulation, as previously stated, empirical studies like Gudibande and Jacob (2020); Dinkelman and Ranchhod (2012); Bhorat et al. (2013) find that increasing costs for domestic work through increases in minimum wages do not cause a decrease in the number of formal work arrangements. Moreover, when analyzing the extension of labor rights for domestic workers in Brazil in 2013 (similar to the regulation under analysis in this chapter), Costa et al. (2016) find an increase in the number of formal work arrangements, a reduction in the number of hours and no effect on wages for monthly workers. The previous increase is also

highlighted by Gomes and Puig (2013). Such reduction in the number of hours after an increase in costs for this occupation is also shown by Hertz (2005) in South Africa and Wong (2015) in Ecuador, but not by Dinkelman and Ranchhod (2012) also in South Africa neither by Gudibande and Jacob (2020) in India. Mattila (1973) also state that the supply of domestic work is quite sensitive to the availability of alternative income sources, and Tomei (2011) exposes that it is important to understand that there might be factors that encourage those workers to prefer higher income in the short run rather than social benefits in the long run. In this chapter, then I will analyze if what I observe is the product then of a reaction of the supply of domestic work after the sanction of the new regulation. As seen in Figure 3.1 in those post-reform years there emerged a difference in the share of employed domestic workers not contributing to the pension scheme between those eligible for welfare payments (with children under 18 years old) and those non-eligible (with children over 18 years old). The wording of the new regulation and the rules for welfare eligibility may have lead domestic workers with small children not to transition to a formal work arrangement out of fear of losing welfare payments. At the time of the sanction of the new regulation, it was not clear if welfare payments available to domestic workers under an informal work arrangement would be lost when entering the formal sector, something highlighted in qualitative studies (Pereyra et al., 2017; Persia, 2014; Pereyra, 2015) and anecdotal evidence (Del Rio, 2018; Bravo, 2018; Iglesia, 2014). This issue of taxpayer's misperception or knowledge diffusion of cumbersome tax systems has been highlighted in the literature, particularly in the United States where households have been shown to misperceive their marginal tax

rates (Romich and Weisner, 2000; Smeeding et al., 2000; Maag et al., 2005) - mainly in what refers to the Earned Income Tax Credit (Chetty et al., 2013; Feldman et al., 2016).

I use the Argentinean Household Survey (EPH) for the period 2010-2017 to assess not only the overall effect of the reform on registration but also to compare the probability of exhibiting a formal work arrangement between those domestic workers eligible for welfare payments (with children under 18 years old) and those who are not (with children over 18 years old), before and after the new regulation. I found an increase in registration of 6 percentage points, but contrary to Chapter 2 also an increase in unemployment of around 2 percentage points. More importantly, even though domestic workers do not lose benefits under a formal work arrangement with the new regulation[1], I find that the the probability of exhibiting a formal domestic work arrangement was lower for those eligible for welfare payments compared to those not eligible. The results are statistically significant and robust to different specifications, including doing the analysis at the 18 year old margin (and therefore comparing registration rates only for those women who have children who are either 15, 16 or 17 versus 18, 19 or 20), doing the analysis by number of children (given that welfare payments are per child), as well as adding to the analysis the difference in

[1]When analyzing the parliamentary debate that took place for the sanction of the new domestic work regulation law, Poblete (2016) highlights that congressmen pointed out that if domestic workers did not have access to family allowances nor to the universal welfare structure under a formal work arrangement, then they will ask their employers to be informal; that they would prefer to be informal and be able to cash welfare rather than to be registered (pg. 163). Congressmen were aware of the tension between the need to formalize working arrangements in the sector and effectively extend social protection and as such decided that registered domestic workers would be eligible for welfare available for the unemployed and the informal workers even if they earn over the minimum wage - they would be the exception to the rule.

registration of women with children under and over 18 years old but are non-domestic employees (a *triple difference* estimation) to account for any possible difference between the groups related to a contemporaneous event in the Argentinean economy rather than to the introduction of the new regulation. I also explore a series of alternative hypothesis that could be explaining the differences between groups and are not related to access to welfare payments. The previous include analyzing the need of domestic workers with smaller children of having more cash available today, access to health services, length of employment with main household employer, access to maternity leave and number of hours worked for main employer. I also perform the estimations using the panel component of the EPH and find similar results. In none of those analysis I can reject the hypothesis that it is the fear of losing welfare what is in fact driving the results.

Studies like Camacho et al. (2014); Bosch and Campos-Vazquez (2014); Levy (2010); Garganta and Gasparini (2015); Amarante et al. (2011) have shown that the extension of welfare - even if effective as a tool for poverty reduction - discourages workers in the informal sector from transitioning to the formal one. The analysis presented in this chapter contributes to this growing literature, and analyzes how the fear of losing such welfare makes the probability of having a formal work arrangement lower than expected after the introduction of an increase in mandated benefits such as maternity leave and paid vacation time. The previous is key from a policy perspective since this perceived trade off might contribute to perpetuating the cycle of inequality and lack of intergenerational mobility that arises when young children are raised *in the shadows* (Levy, 2010; Hinrichsen, 2017; Docquier et al.,

2017). In terms of policy recommendations, having a welfare structure with simple and straightforward eligibility criteria, communicating policy changes in a clear way and a timely manner to targeted populations and considering how reality and the political context might impact law implementation are among the main ones provided in this chapter. Applying such recommendations in a sector like domestic work is particularly relevant, as, at it was stated in the previous chapter, it is the urban sector that contributes the most to the problem of labor informality. As such, this chapter also contributes to the literature on policy design and implementation showing how there are distortions in the process of executing policy and how communication strategies for disseminating information to targeted population can be a way to overcome that (May, 2003; Howlett and Mukherjee, 2014; Chindarkar et al., 2017).

The chapter is organized as follows. Section 3.2 describes the specifics of the reform and the interaction with the welfare payments structure in Argentina. Section 3.3 describes the data and empirical strategy and Section 3.4 shows results. Finally, Section 3.5 concludes.

3.2 The reform

3.2.1 Domestic Workers employment characteristics prior to the reform

In Argentina in 2015, 18.7 percent of all employed females were domestic workers, or 23.9 percent of all waged female employees (Manzorra et al., 2015).

That means that at the urban level, there were over 1.3 million domestic workers in the country, with around 83 percent showing an informal work arrangement. Of those workers, around 70 percent only had one household employer - meaning that they only provided their services at one house as seen in Table 3.1. Little over 58 percent could be categorized as full-time workers - meaning that they worked for 16 hours or more in their main (or only) household - that figure is around 82 percent for domestic workers with a formal work arrangement, and 49 percent for those with an informal one. Moreover, it is interesting to see that almost 9 percent of those with a formal work arrangement before the introduction of the new domestic worker regulation had been working for their main household employer for less than a year, and over 46 percent for more than five years. However, for those who show an informal work arrangement, the inverse is true: around 33 percent had been working for less than a year, and 17 percent for over five years. As stated by Persia (2014), Argentina is different from other countries in the region, where there is a high proportion of domestic workers living with their employers. In Argentina, less than 0.5 percent of domestic workers show that work arrangement. Finally, migrant workers still represent a high proportion of domestic work: 12.55 percent of domestic workers before the reform had not been born in Argentina (the figure was around 17 percent for those working informally, and almost 12 percent for the ones with a formal work arrangement). Contrary to what happened in Chapter 2, at this time, Argentina had an open migratory policy that included a recognition of the labor rights of migrant workers (Messina, 2015).

3.2.2 Incentives to the *supply* of formal domestic work through Law 26.844 of 2013

As highlighted in Chapter 2, in 2011 the ILO instrumented the Domestic Workers Convention [67] to incentive signing countries to develop national laws to transition domestic workers to formality. Several countries in Latin America signed the Convention, and experienced changes in their labor legislation in what respects to domestic work (Lexartza et al., 2016). Among those countries that instrumented a new regulation is Argentina, with Law 26.844 of 2013 [46]. Figure 3.2 shows the administrative data for the evolution of workers contributing to the national pension scheme system (SIPA for its acronym in Spanish [166]) by type of worker. It can be seen that right after the sanction of the new regulation and for the next six months domestic workers are the ones with the highest increase in the rate of registration of workers into the pension scheme. However, the trend goes back to be similar to the other groups afterwards.

Table A.1 presents the differences between the new regulation and the previous one (Statute of 1956 [105]), as well as with the regulation that covers the rest of the private salaried workers in the country (General Work Contract Convention [110]). The new regulation covered every domestic worker (understood as before as those workers who have a paid job for a private household for an activity - including cleaning, cooking or assisting children, sick or older people - that does not represent an economic benefit for the employer) with no distinction regarding the number of hours, number of days or even number of household employers. Contrary

to the regulation that was in put in place by Brazil which established a different employment relationship depending if the person is a monthly or daily worker (Costa et al., 2016), every domestic work relationship in Argentina is covered by the same law (Pereyra et al., 2017; Poblete, 2016). Moreover, even with a separate regulation aimed only at this sector, it implied an increase in access to mandated benefits for domestic workers trying to match them with the ones available to the rest of private sector workers (Pereyra et al., 2017; Poblete, 2016; Soto, 2017).

Table A.1 highlights the specifics of the increase in mandated benefits available for domestic workers. It includes paid vacation time (linked to tenure), paid sick days, regulated working hours, marriage and pregnancy protection - all paid by the employer, as well as maternity leave that is paid through Social Security. The previous are still lower than what is available for the rest of the salaried workers: less paid sick days, no access for breastfeeding periods, not subject to the general monthly minimum wage (they have own only targeted for them, which is lower than the general one), and no access to the Family Allowance Regime which was described in Chapter 2.

In terms of monetary contributions, Table 3.2 shows the responsibilities for both household employers and domestic workers, before and after the introduction of the new regulation. Contributions to the pension scheme are a responsibility of the household employer. Just as before the change, for those domestic workers working less than 16 hours, Social Security payments give them a formal status, but not full access to a pension at the time of retirement. To have that, the worker needs to pay for the difference to complete a final Social Security payment in her name, or

to work for more than one household since the contributions of different employers add up[2]. The same is true for contributions to health insurance[3]. For household employers, a new contribution was the employment insurance benefits (introduced in October 2014)[4].

The new regulation stipulated also that household employers could still use the tax deductions for both salary and mandated contributions that were introduced back in 2005. The maximum amount of the deduction at the time of the introduction of the reform covered 37.5 percent of the total annual cost of employing a full-time formal domestic worker[5]. Given the advancement of inflation and the non correction of the deduction scales, the incentive for household employers was not as strong during this reform than during the 2005 one. In 2012/13 it was estimated that households in the fourth and fifth income quintil employed around 70 percent of the total domestic work labor force in the economy (Persia, 2014). Given that those are the households that have a positive income tax rate it means that at least 70

[2]Under this new regulation, every household employer is required by law to make Social Security contributions, even if the domestic worker provides the service for just one hour per week. Therefore, if the domestic worker works for five different households in a week, there should be five different household employers making five different Social Security contributions under her name (ILO, 2018b)

[3]In theory the employer is responsible for making the deductions to the worker's paycheck according to the number of hours that the worker is employed for to cover for health insurance. However, historically as it was explained in Chapter 2 it is the household employer the one making the contributions of their own pockets (ILO, 2018b; Martinez, 2020)

[4]The monthly installments for this contribution cover any accident that might occur to the worker at the workplace or on her way to or from the workplace. It also covers any health related incident linked to work. While this represent an increase in the cost for household employers, it also means that through the payment of the monthly installments they protect their assets against possible legal claims (ILO, 2018c)

[5]The total monetary cost of a full-time formal domestic worker at the time of the introduction of the reform is calculated at $39,149 per year and includes: 12 monthly wages at the minimum wage of $2,886.93 per month; bonus representing an extra monthly wage; 12 pension contributions at $35 per month; 12 health insurance payments at a rate of $100 per month and 12 work insurance payments at $230 per month - starting in October 2014 (AFIP, 2019)

percent of household employers can benefit from the tax deductions.

The extra monetary and non-monetary cost, as well as the decrease in the percentage of the total annual cost that can be taken as a fiscal deduction for employing a full-time domestic worker, seems to be a disincentive for registration for household employers.

In terms of differences in benefits of the new regulation for household employers is the fact that it acted as a debt-forgiveness instrument, since informal work arrangements that were regularized during the six-month period after the implementation of the law would not be penalized for the contributions that were not made in the past. At this point it is important to highlight that the law also contemplated changes to the audit and penalization of employers with the aim of increasing registration and adherence to norms. In terms of auditing, the law stipulated the creation of a Special Court for Domestic Workers where domestic workers can report household employers who are not willing to register them. When the informal relationship is proved, the court stipulates a fine of 100 percent the value of the dismissal compensation, which is a monthly wage for every year worked. The increase in auditing after the introduction of the new regulation also came form the side of the tax-collecting agency. Failure to comply with the contribution payments meant the tax-collecting agency had the authorization to put the employer's name on an official list of debtors. Moreover, in June 2013 the tax collection agency sent letters to households with no registered domestic workers who were considered top-income earners, urging them to register their domestic worker if they had one (Persia, 2014). These mechanisms of monitoring and enforcement are urged in

studies like Gudibande and Jacob (2020), though Dinkelman and Ranchhod (2012) show that "...external sanctions are not necessary for new labor legislation to have a significant impact on informal sector of developing countries..." (Dinkelman and Ranchhod, 2012, pg. 1).

In terms of the mechanism behind the institutional aspect of this reform, while in Chapter 2 the focus was on the benefit for household employers, in this chapter for household employers the changes go in different directions regarding the incentive to engage in a formal work arrangement, but the benefits were centered on the benefits for domestic workers. On paper, the introduction of the new regulation implied an increase in benefits for formalization for all groups of domestic workers, while not increasing the cost of transitioning to a formal work arrangement. See Tables A.2 and A.3. However, the interaction between the new regulation and access to welfare is a possible source of conflict for domestic workers. When the new regulation was discussed in Congress, it was established that including this group of workers in the general Family Allowance regime (available to the rest of low-income formal private sector workers, as shown in Chapter 2) would be too expensive for household employers who would not be able to face increased payroll taxes. On the other hand, including them in the universal welfare structure would be problematic as such social protection system is intended for the unemployed or workers employed informally. Finally, even though it was recognized that it can be seen as contradictory to be stimulating the formal employment of domestic workers by including them in the welfare system designed for informal workers, Congressmen opted for that option in light that excluding them altogether from being eligible for

welfare payments would be an incentive against formalization (Poblete, 2016, 2018). Nevertheless, as qualitative studies (Pereyra et al., 2017; Persia, 2014; Pereyra, 2015) and anecdotal evidence (Del Rio, 2018; Bravo, 2018; Iglesia, 2014) have shown, it seems that domestic workers eligible for welfare cash payments do see them as an incentive against formalization. In fact, as of 2017 most of the government campaigns related to this sector highlight the compatibility between social plans and being a formal domestic worker as seen in the pamphlet of the tax collection agency (Figure 3.3)[6].

3.2.3 Interactions with welfare

Among the benefits related to having an informal work arrangement for workers is the access to subsidies and the cash transfers that a worker would need to disregard when accepting a formal job. This means that welfare - even if well intentioned - might inadvertently lead to a situation in which workers are hired in the informal sector. Gasparini et al. (2009) show, using matching techniques, that the likelihood that an unemployed household head will work in the informal sector increases by 5 percentage points with a cash transfer program in Argentina. Moreover, Camacho et al. (2014) used panel data and a variation across municipalities to estimate that the expansion of health insurance to the poor in Colombia. They show that it increased the probability of a worker operating in the informal sector by 4 percentage points. Garganta and Gasparini (2015) show that the introduction of a

[6]In fact, web pages belonging to different branches of the government give different information as it can be seen in Figure A.1. Moreover, blog posts such as Rodriguez (2017); Vida (2018) and news articles like do Rosario (2013); Diaz Virzi (2016) also highlight the income limit to be able to cash welfare under a formal work arrangement

conditional cash transfer to unregistered workers with children in Argentina meant a reduction in the incentive to transition to labor formality among low-skilled workers of 8 percentage points. Azuara and Marinescu (2013) show how the introduction of Seguro Popular in Mexico (universal health insurance) is associated with a small but significant increase in informality for those workers with less than 9 years of schooling - however, the same study shows that the overall expansion of the social protection system through both Seguro Popular and Oportunidades did not seem to have had an effect on informality. Bosch and Campos-Vazquez (2014), on the other hand, show using Social Security data that Seguro Popular had a negative effect on the number of registered workers in firms with less than 50 employees. In Uruguay, Bérgolo et al. (2011) find that the extension of health benefits to dependent children of private sector salaried workers decreased informality rates by 1.3 percentage points - but workers responded to the increase in the formal sector incentive so that only one member of the household to be employed in such sector. In "Good Intentions, Bad Outcomes", Levy (2010) shows how the incentive structure of social protection programs in Mexico lead workers to be employed and firms to invest in low-productivity activities thus contributing to increase the informal sector. The previous mean that "...in some countries, social security and social protection programs are a source of social exclusion and segmentation" (Levy, 2010, pg. 6). Designing welfare programs with the correct set of incentives then is relevant to increase the effectiveness of social protection schemes and labor policies (Garganta and Gasparini, 2015).

As exposed by Poblete (2016, 2018), policymakers were aware of the potential

trade off that domestic workers with children under 18 could face between welfare and formal work arrangements, and acted accordingly. Figure 3.4 shows the evolution of registered work for domestic workers who are mothers with children in their household between early 2010 and 2017, dividing the group into those for whom the age of their youngest child is less than 18 and those for whom it is over - and comparing it to what is observed for the entire population as well as for comparable low-skilled women. It can be seen that while registration seems to have increased by a little less than 5 percentage points for those who have children under 18, the figure is around 10 percentage points for those with children over 18. The previous is not experienced neither by the rest of the female population in the country, neither by the rest of low-skilled women. Figure 3.5, moreover, shows the evolution of registered work and unemployment for low-skilled workers in the labor force who are mothers with children in their household between early 2010 and 2017 - both domestic and non-domestic workers. In terms of registration, the same conclusion arises as in the case of Figure 3.4. For unemployment (which, by definition is involuntary for workers), it can be seen that before the introduction of the new regulation, the rate was stable for domestic workers both with and without children under the age of 18. However, after the regulation, it seems like unemployment slightly increase for mothers with smaller children, and slightly decrease for those with older ones - but the difference does not resemble the difference in registration. That trend seems to follow a similar pattern observed by non-domestic workers (though the variability for that group is much larger).

The previous raises the concern that even though *de jure* welfare should not be

an incentive against formalization, *de facto* it appears to be one. In fact, "The realities of a policy in practice often differ from intentions on paper because distortions in the process of implementing the policy...The design perspective in particular calls attention to matching content of a given policy to the political context in which the policy is formulated and implemented" (May, 2003, pg. 223-234). In a way then, it seems that it is not enough to design policy under theoretical considerations, as implementation will be limited by reality - in this case, I will argue, the problems in communication and the fear of domestic workers of losing an important source of income that might be preventing them to forgo under-the-counter payments (Tomei, 2011).

3.2.3.1 Domestic workers married to formal spouses

By the time the new regulation was sanctioned the main social protection policy for families with children under 18 years old (or children with disabilities with no age limit) with parents who are formal salaried workers was the contributive system described in Chapter 2, linked to a worker's job: the Family Allowance Regime controlled by Social Security. Domestic workers under the new regulation still do not have access to this regime even if they are under a formal work arrangement - and thus household employers then not required to pay such payroll tax. However, if a domestic worker is married to a formal salaried worker, then her children will be covered by the Family Allowance Regime through their spouse's job (and the same will happen with non-domestic informal women who are married to formal salaried

workers). For this family structure, the incentive to formalization of domestic and non-domestic workers follows the same logic: formalization means a higher reported total family income, and as a result a decrease in the amount of the allowance received. See Figure 3.7 (a) & (b) for the evolution of registration and unemployment for domestic workers married to formal spouses and not contributing to the pension scheme, by having the age of their youngest child.

3.2.3.2 Domestic workers single or married to unregistered spouses

By the time of the implementation of the new domestic work regulation, the main social protection policy for families with children under 18 years old (or children with disabilities with no age limit) with parents who were not formal salaried workers was a non-contributive or universal system: Universal Child Allowance for Social Protection (AUH for its acronym in Spanish)[7]. The AUH is a federal conditional cash transfer that provides a monthly benefit per child to households were the parent is either unemployed or works in the informal sector, and earns less than the general monthly minimum wage. Cash amounts are only adjusted by zone of residence[8]. To be eligible, a couple (or single parent) should have a child, be Argentinean or have over 3 years of legal residence, none of the parents should be registered as a formal worker in the national Social Security pension scheme system, and the child should comply with the vaccination regime and be enrolled in school if she is more than 5 years old. The AUH can be perceived up to a maximum of 5 children per parent in

[7]Presidential Decreee 1602/2009 of October 2009 [156]

[8]There are a total of 5 zones, with the majority of eligible households belonging to what is referred to as 'Normal Zone' (AFIP, 2020)

charge (Garganta and Gasparini, 2015)[9]. In November 2009 and through national resolution 393/2009, it was established that if one of the parents is registered in the Social Security pension scheme system as a domestic workers and earns less than the general monthly minimum wage, then she would have access to the AUH as well [175]. Domestic workers were then the only salaried workers for which an exception of formality had been made: receive the AUH, as long as their income was below the general monthly minimum wage (Lucero, 2016).

The AUH fulfilled the job of having universal coverage. Only six months after its implementation, 80 percent of all eligible children were beneficiaries of the program. It's introduction implied that children of unregistered households would have access to the same protection system as children of registered households, as the amount of the AUH resembles the amount of the Family Allowance for the poorest households (Garganta and Gasparini, 2015).

At the time of the implementation of the new regulation for formal domestic workers, it was established that they would have access to the AUH even under a formal work arrangement - and that the minimum wage threshold will not be applied to them (ILO, 2018b; Poblete, 2018). Nevertheless, not only did different government agencies as well as blogs and newspaper articles at the time of the reform (which cited lawyers, public officials and representatives of the domestic worker's union) gave contradictory messages regarding access to welfare payments[10], but also

[9]The AUH was later extended to cover pregnancy as well, through the Universal Pregnancy Allowance for Social Protection (AUE for its acronym in Spanish)[174]

[10]For example, the same site argentina.gob.ar states first that "If you are a domestic worker you can still receive the AUH and the minimum wage threshold will not be applied to you" as well as "If you are a domestic worker you can still collect the AUH if you earn less than the minimum wage" - see Figure A.1

qualitative studies (Pereyra et al., 2017; Persia, 2014; Pereyra, 2015) show that the new law gave room to different interpretations regarding this issue for domestic workers in unregistered households. To understand the magnitude of the possible incompatibility, Table A.4 shows the evolution of the monthly cash amount of the main component of the universal welfare structure (the AUH) per child, and of the monthly minimum wage for full-time domestic workers[11]. It can be seen that in 2013, the income that the mother perceived just for 1 child represented 13 percent of her monthly wage as a full-time (16 hours or more) domestic worker - and such percentage kept increasing in the years post reform[12]. Figure 3.7 (c) & (d) shows the evolution of registration and unemployment for domestic workers who are either single or married to an informal spouse, by the age of the youngest child. With full information, if anything we should have observed the opposite - domestic workers with smaller children should have a higher incentive of being in the formal sector. While part of the difference in registration could be attributed to unemployment - as seen in Figure 3.7 (d), it does not account for all of it. The differences in the level of registration then point out to the possibility that domestic workers might be facing a trade off at the formal margin based on the perceived probability of losing access to welfare transfers, and acting accordingly. I will therefore test this hypothesis and quantify the effect[13].

[11]For this calculation I use the AUH perceived in the "Normal Zone", the lowest one

[12]Note that this is the lower bound of what welfare cash payments represent, as it considers only the AUH, and the share is computed over the monthly minimum wage of a full-time domestic workers. For those who work for less than 16 hours per week, it represents more as their monthly wage is lower

[13]See Appendix B for a modelling of benefits and costs for household employers and domestic workers under this policy change

3.3 Data and Empirical Strategy

3.3.1 Sample

The data source for this analysis comes, as in the previous chapter, from the Argentinean National Household Survey (EPH, for its name in Spanish) - in this case for the period 2010-2017[14]. In order to maximize the number of observations used in the estimations, I will use the data as a repeated cross section. However, to corroborate my conclusions under a stricter specification, in subsection 3.4.4 I show the results of the same estimations done using solely the panel structure of the survey. There, following the strategy of Garganta and Gasparini (2015), I construct six annual panels, each with one observation in the first half of the year t and the other on the first half of the year $t+1$. The rotation scheme of the EPH allows for the construction of short panels that can follow the same individual for a maximum of a year and a quarter (with a gap in the middle) to assess the impact on the transition from informal to formal jobs. Analysis done at both levels point out to the same final conclusions.

My final sample consists of women between 18 and 59 years old who are Argentinean residents. In this case, I feel confident in adding to the analysis migrants who have been in the country for at least 5 years given the migratory policy that was in place in the country at the time of the reform - which guaranteed both labor rights and social protection benefits for this group (Messina, 2015). It includes women who

[14]The EPH was not collected for the entire second semester of 2015, nor for the first quarter of 2016 [103]

are identified as domestic workers with the same definition like in Chapter 2[15], as well as those who are not but are comparable given their income level and poverty status. In particular, I include women who can be categorized as poor (the totally family income of the household puts them in the 4th income decile or lower of their urban center) and who are high school graduates or less[16]. Since having access to the universal welfare cash transfer depends solely on having a child under 18 and being either on the informal sector or jobless, I include in the previous group women who have those characteristics with no consideration to their activity status (out of the labor force, unemployed, or employed either formally or informally). I further exclude those workers who (if employed) have been working for the same employer for more than 25 years, and those who work for over 50 hours per week. Given that I am particularly interested in examining access to welfare as a possible restriction towards formalization after the introduction of the new domestic worker regulation, I further restrict my sample to those women who are mothers with children in the household - as it was defined in Chapter 2.

Table 3.3 shows the distribution of women in the sample. The table shows that given the way I constructed my sample the number of women who have a child over the age of 18 is considerable smaller than the group of workers who have a

[15]I exclude domestic workers who live with their employers, as no information can be obtained from their own household

[16]Note that contrary to the sample of Chapter 2, here I categorize as poor a woman whose totally family income of the household puts them in the 4th income decile or lower of their urban center (while in the previous chapter, it was someone in the 4th income decile or lower of the entire survey) The reason is that in this chapter, I need non-domestic workers not only to be similar to domestic workers, but also to assure that they are eligible for welfare cash transfers. Since the AUH is a federal program but the total cash amount is adjusted by zones depending on the urban center where the individual resides(Administración Nacional de la Seguridad Social, 2020), I use the decile distribution of the their own urban center

child under 18, both for domestic and non-domestic workers. The reason is that while women with young children tend to live with them in the same household that is not the reality for those who have older children. I constructed the sample this way because the incentive for formalization between women who are mothers and who are not mothers or who do not live with their children might be different in many unobservable characteristics like their predisposition to move for a job, their discount rate, or even their personality and the way they negotiate a work arrangement with an employer - all factors that can potentially bias the results (Benard and Correll, 2010; Correll et al., 2007; Budig and England, 2001; Budig, 2014; Budig and Hodges, 2010). Moreover, women who are not mothers but who are in their reproductive years might also be different from those who already have a child: they might look for different work arrangements, or even might be seen under the eyes of their employers as a potential lower productive employee due to the "risk" of becoming pregnant (Ali, 2017; Petit, 2007; Becker et al., 2019) - all factors that might bias the results as well[17].

3.3.2 Descriptive Statistics

Table 3.4 shows the descriptive statistics for the sample of low-skilled mothers by age of their youngest child - either over or under 18. It can be seen that compared

[17]I also performed the estimations on the alternative sample of women over 42 years old - without imposing the mother condition (not shown). For those women, the decisions regarding motherhood have already been made. Under this scenario, I compare the reality of women over 42 who have a child under 18 living with them with those who are also over 42 and either have an older child living with them, or more probably are also mothers but their children are not in the same households following Eissa and Liebman (1996); Meyer and Rosenbaum (2001); Eissa and Hoynes (2004) when examining the effects of welfare on labor market outcomes. Main results hold

to other low-skilled women, domestic workers are older, have a lower probability of being married, have less children, graduate high school at a lower rate, have a higher probability pf being migrants, work for less hours per week and have been working for their current employer for a shorter period of time. They also live in slightly larger households and given the construction of the sample, they belong to a higher income decile.

Within domestic workers, there are several distinct characteristics among those with children under and over 18 in their household. First, and given the fact that I am only working with a sample of mothers, those without children over 18 are significantly older than those with children under 18. Just as in the case for non-domestic workers, those with children over 18 have a lower probability of being married, a higher probability of having an unregistered spouse (if they are married), a higher probability of being the household head, live in slightly smaller households where more members are employed and also have a lower probability of having graduated high school. Domestic workers with children over 18 have been working for their household employer for longer than those with children under 18, work for more hours per week and belong to households in higher income deciles. Just as for the other group of low-skilled women, there are no differences in the migrant status of workers according to the age of the youngest child.

3.3.3 Impact of new regulation on domestic worker's registration

Given that I will use the new domestic worker regulation as a natural experiment to understand if and how access to welfare payments might impose a restriction towards formalization when new benefits under a formal work arrangement are introduced, I first analyze the general impact the policy change had on the affected group of workers (who are mothers with children in their household). While previously I showed that administrative data point out to an increase in the registration of domestic workers after the government introduced the reform to regulate the sector, I analyze if the effect is still present in my sample, and if causality can be established.

In order to estimate the effect of the introduction of the new regulation on the probability that a domestic worker will exhibit a formal work arrangement, I use a difference-in-difference methodology (DD) where I will estimate the differences in the probability of exhibiting a formal work arrangement and unemployment (the outcomes of interest) between domestic and non-domestic workers, before and after the introduction of the reform following Garganta and Gasparini (2015) and Dinkelman and Ranchhod (2012). The identification assumption is that in the absence of a new domestic worker's regulation, the labor formalization (unemployment) trends between domestic workers and other low-skilled women would have been similar. I will further assume that there is no other event in the Argentinean economy happening at the same time that can explain the differences in outcomes between the groups(Duflo, 2001; Angrist and Pischke, 2008; Card and Krueger, 1994; Bertrand

et al., 2004)[18]. The previous Figure 3.4 (b) shows the evolution of registered work for both groups, before and after the introduction of the reform; Figure 3.5 (a) shows the same but only for those mothers in the labor force, and 3.5 (b) shows the evolution of unemployment rate between the groups. While the previous two assumptions cannot be tested, what can be seen is that the trends between the two groups were parallel before the introduction of the new regulation for every case. The previous is further tested by running a model of the outcome of interest on the treatment dummy, quarter dummies and interactions; and then applying an F test in which the null hypothesis is that the coefficients for the interaction terms are jointly equal to zero before the new law (Garganta and Gasparini, 2015; Garganta et al., 2017). I do not reject the null hypothesis in any case: for registration in the entire sample F(13, 263606)=0.68, Prob>F=0.7826; for registration in the sample of women in the labor force F(13, 157334)=0.87, Prob>F=0.5858; for registration in the sample of women who are employed F(13, 148413)=0.93, Prob>F=0.5185; for unemployment F(13, 157334)=0.87, Prob>F=0.5895. I also feel confident in running this analysis because the share of domestic workers over both the entire female population and the female labor force has been stable both before and after the introduction of the new regulation (see Figure 3.6[19]).

[18]In this case I will not use as a different DD high and low income share areas because, as explained, the advancement of inflation and the non correction of the tax scales mean that the difference in the intensity of the law is not as clear in 2013 as in 2005. Moreover, the change under analysis in this chapter is federal

[19]The Figure is restricted to women between 18 and 60 years old who are mothers and have a child living with them in their household. A simple t-test shows that the before-after difference in the share of domestic work over the entire female population is of 0.0146 percentage points, though not statistically significantly different from zero. In the case of female labor force participation, the difference is of 0.1904 percentage points, once again not statistically significant

Specifically, the DD estimate for the differentiated effect of the introduction of the new regime on the formalization rate of workers by being subject to the change in regulation is,

$$F_{it} = \beta_0 + \beta_1 After_{it} + \beta_2 DW_{it} + \beta_3 After_{it}.DW_{it} + \sum_{c=1}^{C} \delta_c X_{it} + \epsilon_{it}, \tag{3.1}$$

where F_{it} is a binary outcome that takes the value of 1 if the woman exhibits a formal work arrangement in period t, and 0 otherwise (or 1 if the woman is unemployed in period t, and 0 otherwise). $After_{it}$ is an indicator for being in the post-policy change period and DW_{it} is a variable that takes the value of 1 if the worker is self-identifies as a domestic worker in period t, and 0 if she does not (for those who are unemployed, their occupation sector will be the one of her last employment). X_{it} are a series of control variables, including: age, age squared, number of total children (with a proven dependent relationship), number of people in the household, a dummy for high school completion, a dummy for being Argentinean and a series of dummies for family structure (single, married to an informal worker and married to a formal worker). My estimations will also include fixed effects by region and by period (quarter per year). ϵ_{it} is the error term, which will be clustered at the urban center level. The DD parameter is represented by β_3, given that domestic workers are the only ones that are affected by the new regulation (and, as shown in Figure 3.6, the share of domestic workers is stable over time for the period analyzed).

3.3.4 Effect of access to welfare on the impact of the new regulation

The main analysis of this paper is to study the changes in the probability of exhibiting a formal work arrangement for a group of women who were exposed to a change in their work regulation, but who differ in their eligibility to access welfare cash transfers. If access to welfare is not a restriction towards formalization, then I should not find differences among the groups in the proportion of women who transition after the new formal sector regulation (or even should expect women with small children to register at a higher rate due to the extended coverage that the new regulation represents). I will do so, as well, through a DD strategy, where in this case I will only use the sample of women in the labor force for whom domestic work is their main activity - and therefore are categorized as such - and divide them into two groups: those for whom their youngest child is less than 18, and those for whom their youngest child is over 18. Given that the data used for the estimation does not include questions to identify welfare beneficiaries, following Garganta and Gasparini (2015) I will divide the group based on potential eligibility (intention to treat). Figure 3.7 shows the evolution of registered work for domestic workers with children under and over 18, before and after the change depending as well on the marital status of the worker.

In this case, the difference-in-difference estimation for the differentiated effect of the introduction of the new regulation on the formalization rate of domestic workers by eligibility to welfare is estimated by,

$$F_{it} = \gamma_0 + \gamma_1 After_{it} + \gamma_2 Child_{it} + \gamma_3 After_{it}.Child_{it} + \sum_{c=1}^{C} \delta_c X_{it} + \mu_{it}, \qquad (3.2)$$

where F_{it} is a binary outcome that takes the value of 1 if the domestic worker exhibits a formal work arrangement in period t, and 0 if she is either an informal worker or unemployed, with her last occupation being domestic work (or takes the value of 1 if the domestic worker is unemployed in period t, and 0 otherwise). $After_{it}$is an indicator for being in the post-policy change period and $Child_{it}$ is a variable that takes the value of 1 if the domestic worker has a child under 18, and 0 if the age of her youngest child is over 18 years old. X_{it} the same set of control variables as in (3.1). Once again, I will perform the previous estimation taking into account region and period (quarter per year) fixed effects. μ_{it} is the error term which will be clustered at the urban center level. The DD parameter in this case is represented by γ_3 given that domestic workers with children under 18 are the only ones that are eligible for welfare cash payments and could therefore face the potential trade-off between formalization and social protection after the introduction of the new regulation.

To perform the previous estimation, I will assume that: (i) in the absence of the perceived incompatibility between welfare payments and formalization under the new domestic work regulation, the labor formalization trends between domestic workers eligible and non eligible for welfare would have been similar; (ii) there is no other event in the Argentinean economy happening at the same time that can

explain the differences in outcomes between the groups. Once again, while the previous two assumptions cannot be tested, what can be seen is that the trends between the two groups were parallel before the introduction of the new regulation. That is tested by running a model of the outcome of interest on the treatment dummy, quarter dummies and interactions; and then applying an F test in which the null hypothesis is that the coefficients for the interaction terms are jointly equal to zero before the new law (Garganta and Gasparini, 2015; Garganta et al., 2017). I do not reject the null hypothesis in the case of registration in the entire sample F(13, 28287)=1.03, Prob>F=0.4213, and registration in the sample of domestic workers in unregistered households F(13, 20878)=1.16, Prob>F=0.3040 (as well as individually only for those single domestic workers Prob>F=0.9133 or those who are married to an unregistered husband Prob>F=0.1880). However, in the case of registration in the sample of domestic workers married to a husband who is employed formally F(13, 7096)=1.72, Prob>F=0.0502 - and therefore the null hypothesis is rejected. In the case of unemployment, I cannot reject the null hypothesis for the entire sample F(13, 28287)=0.35, Prob>F=0.9842, nor for the sample of domestic workers in unregistered households F(13, 20878)=0.48, Prob>F=0.9392 (as well as individually only for those single domestic workers Prob>F=0.5244 or those who are married to an unregistered husband Prob>F=0.9996), nor for the sample of domestic workers married to a husband who is employed formally F(13, 7096)=0.73, Prob>F=0.7302. Moreover, as shown in Figure 3.8 the share of groups in both the total population and for those on the labor force was stable during the period of analysis - which is why I feel confident as well in running the previous model. Particularly, the share of

domestic workers with children over 18 on the population is around 13 percent (the t-test shows that the before-after difference is of 0.554 percentage points, though not statistically significantly different from zero), and for those with children under 18 is around 10.5 percent (with the before-after difference of 0.186 not statistically significantly different from zero). When the shares are analyzed over the female labor force participation, it can be seen that domestic workers with children over 18 represent 21 percent of all active females whose youngest child is 18 years old or more (with the before-after difference of 0.55 not statistically significantly different from zero), and domestic workers with children under 18 represent around 17.5 percent of all active females whose youngest child is less than 18 years old during the period analyzed (with the before-after introduction of the new regulation difference of 0.426 percentage points not statistically significantly different from zero). Finally, in section 3.4.3 I relax the second assumption by adding to the analysis non-domestic workers in a triple difference specification.

3.4 Results

In this section, I present the results using the sample of mothers at the cross section level. In every estimation, fixed effects are by region and by period (year per quarter). The standard errors are clustered at the urban area to account for the fact that there might be correlation between the individuals belonging to the same local labor market over time (Bleakley and Lin, 2012; Cameron and Miller, 2015). Just as it was explained in the analysis presented in Chapter 2, given that

I am using the sample as a repeated cross section, some observations are for the same individual over different periods. Clustering at the urban level already takes into consideration this source of serial correlation as the same household appears in the same urban area across periods (Berniell et al., 2017)[20]. As presented in Section 3.3, all the estimations are performed through a Linear Probability Model (as its estimates are not far from the nonlinear Probit model (Angrist and Pischke, 2008)).

3.4.1 Impact of new regulation on domestic worker's registration

3.4.1.1 Main Result

Table 3.5 shows the results of the different alternative specifications for the model of the probability of having a formal work arrangement. It can be seen that for the entire sample of mothers (Panel A), the introduction of the new regulation implied an increase of 5.96 percentage points in the probability that a domestic worker will exhibit a formal work arrangement, compared to non-domestic workers. A similar result holds for the restricted sample of workers who are either single or married to an informal spouse (5.04 percentage points). When the sample is divided between those with children under and over 18, it can be seen that there are significant differences. While for those domestic workers with children over the age of 18 the introduction of the new regulation implied an increase of more than 8 percentage points in the probability of having a formal work arrangement (compared

[20]I also perform the same estimations (not shown) but: 1) clustering at the household level; 2) clustering the standard errors in two dimensions: at the urban area level (to account for correlated errors within urban areas over time) and household level (to account for correlated errors within the same household over time given the panel rotation scheme of the survey) following Cameron et al. (2011). In both instances I find similar results

to non-domestic workers), for those with children under 18 that difference is of a little less than 5 percentage points. The previous goes in line with the idea that it is necessary to examine possible difference in registrations based on the age of the youngest child of the domestic worker after the introduction of the new regulation.

The increase of almost 6 percentage points translates into a mean increase in registration of around 40 percent [21]. The introduction of the new regulation was therefore effective in increasing registration in the sector. However, two things have to be highlighted. On the one hand, the fact that the increase in registration seems to be concentrated over those with children over 18 years old raises the question of possible problems in the design of the regulation that was not as effective over the most vulnerable group within the affected population. On the other, and as it can be seen in Figure 2.1, the introduction of this new regulation seems not to have been as effective as a tool to increase registration as the introduction of the tax deductions in 2005.

The same Table 3.5 shows the same estimations but with a different sample of low-skilled workers. With the sample of low-skilled women in the labor force (Panel B), it can be seen that the introduction of the new regulation implied an increase of 7.42 percentage points in the probability that a domestic worker will exhibit a formal work arrangement, compared to non-domestic workers. Such figure is 6.73 for workers who are either single or married to an informal spouse, and the difference is still seen based on age of youngest child - for those with small children,

[21] This result is similar to the one developed at a similar time frame but separately by (Feld, 2020)

the introduction of the new regulation implied an increase of 6.19 percentage points in the probability that a domestic worker will exhibit a formal work arrangement, compared to non-domestic workers; and for those with older children the figure is 11.23 percentage points. In Panel C of the same table, the same is observed but excluding the unemployed. The results still hold - though the magnitudes are slightly larger.

3.4.1.2 Robustness Checks

Table 3.6 shows the same estimations, but the outcome of interest in this case is unemployment, which by definition is a decision solely of the household employer. It can be seen that for every case, unemployment seems to have increased in around 2 percentage points for domestic workers (compare to non-domestic ones) after the introduction of the new regulation. This goes in line with the view of Mattila (1973) who states that demand of domestic work is highly sensitive to changes in costs. An important point to highlight, though, is that while changes in registration seems to be different depending on the age of the domestic worker youngest child, the same is not true for unemployment. Table 3.6 shows that after the introduction of the new regulation, unemployment increased by 2.26 percentage points for domestic workers with children under 18 years old (compared to non-domestic ones), and such figure was 2.08 percentage points for those with older children.

Finally, as a robustness check to the previous findings I run a series of false experiments, where I restrict the sample to the pre-reform period and change the

timing of the reform to the second quarter of 2011 and the second quarter of 2012. Table 3.7 shows the results for the "false" post-reform period. It can be seen that the DD coefficients are not significant in any alternative - something that reinforces the validity of the assumptions that were made to carry out the analysis.

3.4.2 Welfare as a restriction for formalization

3.4.2.1 Main Result

Table 3.8 shows the results of the DD estimation for the effect of welfare on the probability of domestic workers becoming formal after the introduction of the new regulation. In Panel A, it can be seen that for domestic workers eligible for welfare based on the age of their youngest child, the probability of being registered is 4.31 percentage points lower than for domestic workers non-eligible for welfare after the introduction of the reform. Table 3.8 is also divided by the marital status of the domestic worker, given that such condition determines the type of welfare for which they are eligible and the different incentive structures they face. Domestic workers who are either single or married to an informal spouse present the same results as the entire sample (4.26 percentage points). Results also hold independently for those who are single (4.06 percentage points), and those who are married to an informal spouse (4.77 percentage points). For domestic workers who are married to a formal spouse, the DD estimate is 5.78 percentage points - but in this case causality cannot be determined as, at it was pointed out in Section 3.3 the trends are not parallel prior to the reform for this group. It is surprising then that for those workers who

can keep collecting welfare payments in full under a formal work arrangement, the results point out to a decrease in their probability of formalization after the new regulation compared to a similar group of domestic workers who are non eligible.

Given that the previous results compare mothers with children who can be very different in ages, in Panel B I present the same results but restricted to those mothers for whom the age of their youngest child is between 12 and 25. As it can be seen, for the sample of teenage children the results hold both for the entire group of mothers, as well as for those who are single or married to an unregistered spouse (though the magnitudes are smaller). Moreover, now for those who are married to a formal spouse[22], there seems to be no difference (the DD coefficient in this case is 0.87 percentage points, not significantly different from zero) - meaning that for those group of workers who actually see their welfare payments get reduced with a formal work arrangement, there are no differences based on the age of the youngest child.

To be even more restrictive, in Panel C I present the same estimations but at the 18 year old margin. Specifically, I just compare the registration rates before and after the introduction of the new regulation for domestic workers with children between 15, 16 and 17 and those for whom the age of their youngest child is between 18, 19 or 20. Once again, the results hold. Now the DD coefficient in the entire sample, is 3.54 percentage points; for those who are either single or married to an informal spouse it is 4.53 percentage points; and once again, for those married to a formal spouse the coefficient is not statistically different from zero. Following

[22]In this particular case the trend do hold; F(13, 3461)=1.39, Prob>F=0.1563

Garganta and Gasparini (2015) and also as I did in Chapter 2, in Table 3.9 I present the same estimations but excluding the unemployed, and the main results hold.

The results of the previous estimation highlight two important conclusions. First, since there is nothing in the regulation itself that specifically implies a higher cost of holding a formal work arrangement for domestic workers with children under 18 compared to those with children over 18 (for those who are single or married to an informal spouse), the fact that I find differences even at the narrower margin supports the hypothesis of the fear of losing welfare payments as the mechanism behind this behavior. Second, while it is true that holding a formal work arrangement for those who are married to a formal spouse and have a child under 18 implies an increase in registered income and therefore a decrease in the amount the household gets through Family Allowances, that was the case both before and after the new regulation. In other words, the new regulation did not change their perceived cost that holding a formal work arrangement represent for that particular group of worker (who, also have health insurance coverage for herself and her children through their husband), which might explain the absence of differences.

If we consider that the effect on domestic workers with children over 18 is the "true" effect of regulation of the formal sector, then the decrease in 4.31 percentage points in the probability of having a formal work arrangement means that the perceived incompatibility with welfare represents a mean reduction of around 9 percent in the probability of formalization for domestic workers with children under 18 compared to domestic workers with children over 18 after the introduction of the new regulation. In the specific case of just those who are single or married to

an informal spouse, the 4.26 percentage points translate into a mean reduction of around 11 percent.

3.4.2.2 Robustness Checks & Heterogeneous Effects

My hypothesis is that the previous difference is explained, at least partially, by a perceived trade off faced by the worker, between social protection and a formal work arrangement. However, it can still be the case that this result is a product of decision solely of the employer. On the one hand, employers might be less open to sign a formal work arrangement with mothers with small children: those workers might tend to miss work or get there late more often, might be more distracted in the workplace or even be more tired - all factors seen as less "ideal" for employers (Crowley, 2013). Moreover, since they are younger they might also have a higher probability of becoming pregnant again (Petit, 2007), which under the new regulation, implies a higher cost for household employers. Finally, given that domestic workers with school-aged children might have more needs at home than those mothers with older children, household employers could "take advantage" of that by offering them an informal arrangement (in a way, and as stated by Pereyra (2015), employers have a power relation with respect to their employees).

Given that I do not observe household employers in my data, I perform the same estimations but instead of using registration as my outcome of interest, I use unemployment. Table 3.10 shows the result for the entire sample of domestic workers who are mothers. As it can be seen in Panel A, for all workers there seems not to be

a difference in the probability of being unemployed after the introduction of the new regulation between those with children under and over 18 (the DD coefficient is 1.04 percentage points, but not statistically significant different from zero). The same is true for those who are married to a formal spouse, as well as for those who are either single or married to an informal spouse. However, when analyzed separately, it can be seen that for single domestic workers, the introduction of the new regulation increased the probability of being unemployed for those with children under 18 of 2.16 percentage points compared to those with children over 18 (for those married to an unregistered house, it is 0.27 percentage points not significantly different from zero). As in the main section, in Panel B I do the same estimation but only for those workers who have children between 12 and 25 and find the same results. When I further restrict the analysis to those workers with children between 15 and 20 in Panel C, the probability of being unemployed is no different between groups before and after the introduction of the new regulation - and in the particular group of those eligible for the universal welfare cash payments (single or married to an unregistered husband) the non-significant difference is also of a small magnitude: 0.04 percentage points.

The previous show that while the introduction of the new regulation seem to have increased unemployment for single domestic workers with smaller children - another unintended consequence of this reform - when the effect is analyzed at the 18 years old margin, such effect is gone. The difference in registration is coming then not from an increase in unemployment for domestic workers with children under 18 (which is based on a decision of the employer) but rather from a persistence of

informal work arrangements. A persistance that is present even at the narrower margins, when there are minor differences in the non-monetary costs for household employers of employing formally a domestic worker with a 16 year old versus one with a 19 year old, but that for the domestic worker in her view might imply 13 percent of her income.

As seen in Table 3.11 I also perform another series of alternative estimations as robustness checks. In Panel A and B I show the results of the previous estimations but with false experiment dates. In particular, I restrict the sample to those observations previous to the reform and tried two different false experiments: the second quarter of 2011 (Panel A) and the second quarter of 2012 (Panel B). As it can be seen, the DD coefficient is not significant in any case except for those who are married to a formal spouse in 2011, and for unemployment for those who are single or married to an informal spouse in 2012 (which might show a possible anticipatory effect from household employers).

Second, in order to check that it is specifically being under 18 what is causing the results, I run a series of false experiments where I change the age for the treatment effect. Instead of using 18 as the cutting point I use 14 (Panel C) and 22 (Panel D). In the first case, I analyze the difference between domestic workers for whom the age of the youngest child is either 11, 12 and 13 versus those for whom the age of the youngest child is either 14, 15 or 16. In the second case, I analyze the difference between domestic workers for whom the age of the youngest child is either 19, 20 and 21 versus those for whom the age of the youngest child is either 22, 23 or 24. The DD coefficient is not significant in any case.

Table 3.11 also includes the results of the estimation performed for a different sample: non-domestic workers, given that they were not subject to the new regulation. The DD is also not significantly different from zero, as expected (Panel E).

The final robustness check that I run is to estimate the main model by the number of children in the household eligible for welfare. Given that the cash transfer is fixed per child, and that for every child it represents around 13 percent of the wage of a full-time domestic worker at the time of the reform as seen in A.4, eligible domestic workers would benefit more from welfare the higher the number of children that can claim the subsidy. As such, the disincentive towards formalization should be higher for those domestic workers who have more children under 18 than for those with just one child. Columns (1) and (2) of Table 3.12 show the result of the estimation (restricted to domestic workers who are either single or married to an informal spouse). Because of the small number of domestic workers over which I am estimating the results, I divide the sample between those who have just one child, and those who have more than one. Moreover, and given that women with more children tend to work less than women with less children, I restrict the analysis to those domestic workers who work for 16 or more hours per week and as such can be considered full-time workers. It can be seen that the DD estimate is negative and significant for both groups. Specifically, the probability of having a formal work arrangement after the new regulation for domestic workers with one child under 18 is 3.73 percentage points lower than for domestic workers with one child over 18, while the coefficient is not statistically significant different from zero. When I look

at those with two or more children, such figure goes in the same direction, but the magnitude is larger and significant, 8.14. The fact that the magnitude of the effect is significantly larger for those women with more children goes in the direction of what was expected given the structure of the welfare transfers.

3.4.2.3 Discussion - Alternative Hypothesis

While the previous findings and robustness checks seem to point out to welfare as the cause for the difference in the probability of having a formal work arrangement between those domestic workers with children under and over 18, there are still alternative hypothesis that could also explain these results. Specifically, I explore:

a. Cash today: Domestic workers with children under 18 might have more needs that make them prefer more cash today rather than potentially a lower wage today plus contributions to the pension scheme and health insurance (Tomei, 2011). I then perform the same main estimation for domestic workers who are either single or married to an informal spouse but instead of using the age of the youngest dependent child, I use the age of the youngest child present in the domestic worker household (and exclude those households where a dependent relationship was established for children under 18). Table 3.12, Column (3) shows the results. As it can be seen, the DD coefficient is also negative, but almost zero in magnitude and not statistically different. Therefore, it is not the fact that there are children under 18 present in the household (that have to be fed, sent to school and their needs have to be covered) what is making the

difference, but rather than those children under 18 have a proven dependent relationship with the domestic worker - the key criteria for welfare eligibility.

I also present the results of the main estimation by the age of the own youngest child, where I conditioned the treatment group to having just one child under the age of 18. This means that the amount received in terms of transfers will be the same for every age group (the cash transfer is the same for a 5 year old than for a 15 year old [175]). If the reason behind the difference in the rate of formalization between domestic workers with children under and over 18 is the necessity of having more liquidity rather than access to welfare, then the effect should be significantly larger in magnitude for those with teenagers rather than those with smaller children as the cost of raising a child increases with age (Lino et al., 2014). Table 3.12 (columns (4) - (7)) shows the results of the previous estimation. It can be seen that the DD estimate is negative and significant for every group - and there are almost no differences among mothers for whom the age of their only child is between 0-5, from those for whom it is 6-11, 12-15 or 15-17. It seems then that it is just the binary effect of having or not having a child under 18 what is driving the results, rather than the age of the child itself - which goes in line with the structure of welfare rather than the necessity of having more liquid resources in the present.

b. Access to health services: While domestic workers who hold a formal work arrangement can decide which health insurance system to hold with the new regulation (ILO, 2018b,c), qualitative studies have pointed out at fear of losing

a husband's health care system (if spouse is formal) or access to the system of public hospitals (if domestic worker is either single or married to an informal spouse) if they formalize - and having instead to use the domestic work union's health insurance perceived as a lower quality one - as another source of possible misinformation (Pereyra et al., 2017; Persia, 2014; Pereyra, 2015). Therefore, it could be the case then that domestic workers with children under 18 value access to a specific health care service more than those with older children who could be working formally and having access to their own health insurance system. Then the DD parameter would be reflecting the preference towards keeping their current healthcare system not only for them but also for their children. To test this, I estimate the main model for those who are single or married to an informal spouse, but further restricting the entire household to be unregistered. This means every adult member of the household is either out of the labor force, unemployed or works in the informal sector. By doing so, I am ruling out the possibility that children over 18 could be formally employed. In a sense, mothers in both groups should be equally concerned about the healthcare access of their children. Columns (8) and (9) show the results of the previous estimation for the total sample of domestic workers, and for the restricted sample of teenagers dependents (those between 12 and 25 years old). It can be seen that in both cases the DD coefficient is still negative and significant - in favor of the hypothesis that it is the fear of losing welfare rather than of not having access to the public health system for their children the driver of the differentiated results based on the age of the youngest child.

c. Length of employment with main household employer: Domestic workers who have been working for the same household employer for longer have a higher chance of holding a formal work arrangement as shown in Table 3.1. Not only their household employers have a higher incentive to formalize them due to the forgiveness of past debt that the new regulation introduced [46], but there is also a longer relationship between employer and employee and therefore possibly more intimacy between the two (Gorbán and Tizziani, 2014; Brites, 2014). Given that domestic workers with children over 18 have been working for their employers for a significantly longer period of time than those with children under 18 - as shown in Table 3.4 - then it might be possible that the differences that I am finding are related to domestic worker's length of employment in the household rather than welfare. In order to test this, I estimate the main model dividing the sample between those domestic workers who have been employed for their current household employer for less than a year and those over a year. Columns (10) and (11) present those estimations for the sample of domestic workers who are either single or married to an informal spouse. As it can be seen, the DD coefficient is still negative for both groups, though the magnitude and the level of significance is higher for those domestic workers who have been working for the same household employer the longest, favoring my hypothesis.

d. Maternity Leave: A main source of increased cost for household employers after the introduction of the new domestic worker regulation is maternity leave.

As previously stated, having children under 18 might be correlated with an increased probability of having more children as those mothers are relatively younger - and as such what the estimation might be reflecting is a decrease in the incentive of household employer to formalize those who will eventually use such benefit (Ali, 2017; Petit, 2007; Becker et al., 2019). I perform then the main estimation but restricting the age of the domestic worker to those who are not on their reproductive years; 40-59 years old and 45-59 years old. As it can be seen in Table 3.13, the DD is still negative, significant and of relatively the same magnitude both for the entire sample and restricted to domestic workers who are single or married to an informal spouse (and still negative and not significant for those married to a formal spouse).

e. Full-Time vs. Part-Time: As shown in Table 3.4, domestic workers with children under 18 work on average less hours than domestic workers with children over 18. Therefore, it is possible that the difference in registration between those groups is representing the gap in registration between part and full-time domestic workers, as household employers might feel less responsible for the registration of part-time domestic workers than of full-time ones (Pereyra and Poblete, 2015). Table 3.14 present the results by full-time (16 hours per week or more) or part-time (less than 16 hours per week) status. The results show that for those domestic workers who can be considered full-time, having a child under 18 years old means a formalization rate 5 percentage points lower than for those with children over 18. Such figure is 5.70 for domestic workers who

are single or married to an informal spouse, and negative but not significant for those married to a formal spouse. For those who are part-time, the DD coefficient is also negative and significant but of lower magnitude (2.31 percentage points). For domestic workers that work for less than 16 hours per week and are either single or married to an informal spouse, the DD coefficient is also negative but not statistically significant different from zero. For those part-time married to a formal spouse, there is a significant difference of 6.19 percentage points. The fact that the effect is negative and significant for the sample of full-time workers who are either single or married to an informal spouse is evidence in favor my hypothesis.

3.4.3 Triple Difference Estimate (DDD)

The challenge of just using a sample of domestic workers, though, lies in the fact that I am analyzing the formal margin only for the particular occupation that was subject to the treatment (Wooldridge, 2011; Basu et al., 2017). As such, I am basing my results in the assumption that there were not other events contemporaneous to the introduction of the new domestic worker regulation that could have implied a different impact on the probability of exhibiting a formal work arrangement between workers with children under and over 18. A more robust analysis can be obtained by using both a control group within the treated occupation as well as a different occupation (Wooldridge, 2011). In other words, use the same two groups - workers with children under and over 18 years old - for an "untreated" occupation

as an additional control and have a double difference in the estimation. This means incorporating to the previous analysis, another double difference: the difference in the proportion of women with children under and over 18 years old with a formal work arrangement who are also low-skilled but non-domestic, like in Chapter 2. Doing so allows me to account for the potential impact of any other changes happening in the country at the time of the reform that might have an impact on the overall probability that a low-skilled woman with small children (both domestic an non-domestic) has a lower probability of being a registered worker after April 2013. Figure 3.9 shows the trend in registration for low-skilled women who are either single or married to unregistered workers by age of youngest child and occupation. It can be seen that before of the introduction of the new regulation, the trends for the four groups were stable, and after it there is a clear increase for domestic workers with children over the age of 18, a slight one for domestic workers witch children under 18 and practically no change for non-domestic workers. Specifically then, I will estimate,

$$\text{F}\dot{}\text{it}=\alpha_0+\alpha_1 After_{it}+\alpha_2 DW_{it}+\alpha_3 Child_{it}+\alpha_4 After_{it}.DW_{it}++\alpha_5 After_{it}.Child_{it}+$$

$$\alpha_6 Child_{it}.DW_{it}+\alpha_7 After_{it}.DW_{it}.Child_{it}+\sum_{c=1}^{C}\delta_c X_{it}+\epsilon_{it},$$

(3.3)

In this case then, the policy effect coefficient is α_7, the DDD, which is the interaction of three dummies: a post policy change period, having a child under the age of 18 and being a domestic worker. Before this estimation, I test that the trends across the groups were parallel before the introduction of the new regulation by running a model of the outcome of interest on the two treatment dummies, quarter dummies and interactions and then applying an F test in which the null hypothesis is that the coefficients for the triple interaction terms are jointly equal to zero before the new regulation. For registration in all the sample, I find that F(12, 263552)=0.91, Prob>F=0.5386 (in the case of unemployment, it is F(12, 157280)=0.64, Prob>F=0.8112); for those single or married to an unregistered workers, I find that F(12, 138133)=0.88, Prob>F=0.5699 (in the case of unemployment, it is F(12, 86489)=0.41, Prob>F=0.9601); for those single or married to an unregistered workers, I find that F(12, 122933)=1.62, Prob>F=0.0780 (in the case of unemployment, it is F(12, 69317)=0.92, Prob>F=0.5251). Therefore, it can be seen that in every case (except for registration in women who are married to a spouse employed in the formal sector) I do not reject the null hypothesis[23].

Table 3.15 shows the results of such estimation, with standard errors clustered at the urban center. In terms of registration, it can be seen that for the total sample as well as for those who are either single or married to an informal spouse, the DDD

[23]The same holds when I restrict the sample to low-skilled women in the labor force, or those who are employed

coefficient is negative and significant. After the the new law, domestic workers with children under 18 show a probability of having a formal work arrangement that is 4.29 percentage points lower than for domestic workers with children over 18 after accounting for the difference in formalization rates between workers with children over and under 18 years old in other sectors of the economy. For those who are single or married to an informal spouse, such figure is 3.89 percentage points. When the sample is restricted to those women in the labor force, the previous figures are 5.19 and 6.29 percentage points, respectively. And finally when only employed mothers are considered, they are 5.30 and 6.44 percentage points[24].

Table 3.15 also shows the same estimation with the outcome being unemployment. In this case, none of the DDD coefficients are significant (and the magnitude of the effect is also close to zero), meaning that the introduction of the new regulation seems not have created a change in the probability of being unemployed for domestic workers based on the age of their youngest child.

This last robustness check shows through another perspective that while the introduction of the new domestic work regulation produced an increase in the formalization of workers in that sector compared to what would have happened in the absence of the policy change, the effect was significantly lower for domestic workers with children under 18 than for those with children over 18. The result holds particularly for those domestic workers who are single or married to an informal spouse, and therefore presumably beneficiaries of the universal welfare cash transfers (if they

[24]Note that in none of the cases the coefficient for mothers married to a formal worker is significant; however the fact that the parallel trend assumption does not hold for this particular group implies that conclusions cannot be made for them

have a child under 18).

3.4.4 Panel Analysis

As a series of last robustness checks, following the strategy of Garganta and Gasparini (2015); Garganta et al. (2017), I use the data to construct six annual panels, each with one observation in the first half of year *t*, and one in year *t+1*. In other words, I use the first and last observation of each individual, as long as they appear in two consecutive years. The EPH went through changes and a lack of collection during the some of the quarters of the period covered in my analysis, which meant that there are panels that could not be constructed. In particular, the EPH was not collected for the entire second semester of 2015, nor for the first quarter of 2016. This implied that at the time collection was resumed in the second quarter of 2016, the entire sample was new (Arakaki, 2016). In order to maximize the number of panels (and considering that a 2015-2016 panel was not possible to construct, nor with first or second semester observations), I used only first semester panels and as such be able to have a panel covering the 2014-2015 period. Nevertheless, that decision meant that the panel 2013-2014 (the one in the middle of the reform, as the passage of the law took place in April 2013) has 20 percent of the observations of the rest of the panels, and the panel 2016-2017, 60 percent[25]. I work then with 6 panels that cover the period 2010-2017, with three panels covering the pre reform period, and three the post reform that took place in April 2013. Table 3.16 shows the

[25]In late 2013 there was a change in the sample frame of the EPH that resulted in a replacement of the sample between the third quarter of 2013 and the first quarter of 2014 which implied that between the second quarter of 2013 and the second quarter of 2014 there are no common observations (Arakaki, 2016)

distribution of women by panel. All of them are informally employed and mothers in t.

In order to estimate the effect of the introduction of the new regulation on the probability that an informal worker transitions to formality, I use the same DD strategy. Particularly, I estimate the differences in the probability of transitioning between domestic and non-domestic workers, before and after the introduction of the reform as,

$$F_{it} = \beta_0 + \beta_1 After_{it} + \beta_2 DW_{it} + \beta_3 After_{it}.DW_{it} + \sum_{c=1}^{C} \delta_c X_{it} + \epsilon_{it}, \tag{3.4}$$

where F_{it} is a binary outcome that takes the value of 1 if the woman exhibits a formal work arrangement in *t+1* within the same occupation as in t, and 0 otherwise. $After_{it}$ is an indicator for being in the post-policy change period and DW_{it} is a variable that takes the value of 1 if the worker is self-identifies as a domestic worker in t, and 0 if she does not. X_{it} are a series of control variables, including: age, age squared, number of total children (with a proven dependent relationship), number of people in the household, a dummy for high school completion, a dummy for being Argentinean and a series of dummies for family structure (single, married to an informal worker and married to a formal worker). The DD parameter is represented by β_3. ϵ_{it} is the error term clustered at the urban center level. My estimations also include fixed effects by region and by panel (Garganta and Gasparini, 2015). To test for pre-reform parallel trends, I run a model of the outcome of interest (in this

case, a dummy for the transition to a formal job) on a constant, a treatment dummy (being a domestic worker in t), quarter dummies and interactions and apply a Chi2 test in which the null hypothesis is the jointly equality of zeros of the interaction terms which cannot be rejected (Chi2(7) =6.95; Prob>=0.4337).

The DD estimate for the differentiated effect of the introduction of the new regulation on the formalization rate of domestic workers by access to welfare is estimated by,

$$F_{it} = \gamma_0 + \gamma_1 After_{it} + \gamma_2 Child_{it} + \gamma_3 After_{it}.Child_{it} + \sum_{c=1}^{C} \delta_c X_{it} + \mu_{it}, \qquad (3.5)$$

where F_{it} is a binary outcome that takes the value of 1 if the domestic worker exhibits a formal work arrangement within the same occupation during the period covered by the panel, and 0 otherwise. $After_{it}$is an indicator for being in the post-policy change period and $Child_{it}$ is a variable that takes the value of 1 if the domestic worker has a child under 18 in t, and 0 if the age of her youngest child is over 18 years old. X_{it} the same set of control variables as in Equation 3.4. The DD parameter in this case is represented by γ_3. μ_{it} is the error term clustered at the urban center level. Once again, I will perform the previous estimation taking into account region and panel fixed effects (and I also cannot reject the pre-parallel trend assumption, as Chi2(7) =11.65; Prob>=0.1128).

In every estimation, I present results with no controls nor individual fixed effects, with controls but no individual fixed effects, and with individual fixed effects.

Controls and distinction by marital status are in t (as are the two treatment effects). I present the results of the marginal effects of using a Linear Probability Model.

Table 3.17 shows the results of the estimation of the probability that the introduction of the new regulation had an effect on the transition of a domestic worker from an informal to a formal work arrangement. It can be seen that the individual effects go in the expected direction and are significant, but the DD coefficient is not in any case showing the relatively weak effect of the reform.

Table 3.18 shows the results of the estimation for the effect of welfare on the probability of domestic workers becoming formal after introduction of new regulation. The estimations show that for domestic workers eligible for welfare based on the age of their youngest child, the probability of transitioning is between 3.32-3.55 percentage points lower than for domestic workers non-eligible for welfare after the introduction of the reform. Even more, when the estimation considers individual fixed effects, the effect is larger: 7.32 percentage points. It can be seen that even for those mothers with children between 15 and 20 years old (those in the margin) and single or married to an informal spouse, the effect is also negative and significant: -13.42 percentage points.

Table 3.19 shows the results of a triple difference with a panel structure. It can be seen that for registration, the DDD coefficient is negative and significant for every specification, showing that after the introduction of the new regulation, domestic workers with children under 18 show a probability of transition from an informal work arrangement to a formal one is lower than domestic workers with children over 18 after accounting for the difference in formalization rates between workers

with children over and under 18 years old in other sectors of the economy. On the contrary, for unemployment, the DDD coefficient is not significantly different from zero in any case. Table 3.19 also shows the same estimation as before but conditional on working over 6 hours for one employer. Once again, for unregistered households, the DDD estimate shows that after the passage of the law, domestic workers with children under 18 show a probability of transitioning that is 3.38 percentage points lower than domestic workers with children over 18 after accounting for the difference in formalization rates for non-domestic mothers based on the age of their youngest child.

3.5 Conclusions and Recommendations

The main goal of this chapter was to analyze how the regulation of the formal sector might have unintended consequences over the formal margin - mainly differentiated registration rates based on access to welfare (as well as unemployment). While I found that the introduction of a new regulation that increased benefits increased registration but also unemployment in the sector in line with the results of Mattila (1973); Hertz (2005); Costa et al. (2016); Gomes and Puig (2013), in particular, I examined how the fear of losing welfare payments might have been a restriction to work registration for low-skilled workers. According to Mattila (1973) domestic worker supply is highly sensitive to the availability of alternative income, which is the basis of this chapter. Through a series of estimations, my analysis confirm that such fear was at least partially responsible for the lower probability of exhibiting a

formal work arrangement that domestic workers with children under 18 experienced after the new regulation compared to those with children over 18. Specifically, I find the difference in the probability of registration for those affected by the change and eligible for welfare payments being on average 4 percentage points lower than for those who were also subject to the new regulation but were not eligible for welfare. This translates into a decrease of almost 9 percent in the probability of exhibiting a formal work arrangement for domestic workers with small children, compared to those with children over 18 and exposes the trade off between social protection and formal employment. My analysis does not rule out the possibility that part of the results are driven by a change in behavior of the household employer. However, the fact that results are robust to different specifications (particularly those analysis done at the 18 year old margin) and alternative hypothesis, such as access to maternity leave being the driver of the change, support the hypothesis that part of the differences are explained by a decision of the worker. Moreover, once I control for the possibility of concurrent events in the Argentinean economy affecting the differentiated probability for mothers with children under and over 18 years old through a DDD strategy, I find similar results. The same is true for the panel analysis, when I evaluate the probability of transitioning from an informal work arrangement to a registered one. Finally, the small effect on unemployment (which does not hold at the margin, in the DDD specification or in the panel analysis) also supports my hypothesis. The findings of this chapter contribute to the literature on the effects of welfare on formalization. However, rather than analyzing the extension of welfare like Camacho et al. (2014); Bosch and Campos-Vazquez (2014); Levy (2010);

Garganta and Gasparini (2015); Amarante et al. (2011), I study the extension of mandated benefits under a formal work arrangements and how welfare might act as a restriction towards it. Moreover, it also contributes to the literature of misperception on tax systems and tax complexity (Romich and Weisner, 2000; Smeeding et al., 2000; Maag et al., 2005; Chetty et al., 2013; Feldman et al., 2016) given that on paper domestic workers still had access to welfare payments after the passage of the new law but the contradicting information lead to the belief that they could be lost with formality.

There are several policy conclusions that arise from my findings given that this chapter also contributes to the literature on policy design and implementation (May, 2003; Howlett and Mukherjee, 2014; Chindarkar et al., 2017). First of all, given that the magnitude of the effect is not negligible, it should be taken into consideration. The fact that domestic workers with children under 18 years old have a lower probability of exhibiting a formal work arrangement than those with children over 18 after the introduction of the new regulation is relevant from a public policy perspective, as living in an informal household means perpetuating the cycle of inequality and lack of inter generational mobility. It is also a gender-inequality phenomenon as most workers in the sector are women. Finding ways in which to promote formal work for domestic workers in particular (without increasing unemployment) is not only relevant given that it is the urban sector with the highest informality rates, but also because this might be undermining their children opportunities. In Latin America, where 1 out of 7 employed women work as a domestic worker, this is an urgent issue. As more countries sign into ILO's C189 Convention regarding regulation

of domestic work, the findings of this paper gain importance to shed light into ways to improve the efficiency of upcoming policy changes. While paying attention to the incentives faced by both household employer and domestic workers are considered in guidelines for regularization of the sector (ILO, 2016b) - and particularly the issue of access to social protection is highlighted (Lexartza et al., 2016) - considering the effect in domestic workers with smaller children should be a priority. Secondly, the paper shows the relevance of one feature of policy design: the importance of being aware of previous legislation and the context in which it is implemented that might be producing confusion or potential incompatibilities. As stated by May (2003), it is not enough to design policy just with theoretical considerations given that implementation will be limited by reality and the political context. When policymakers were designing this new regulation, the issue of potential trade offs between registration and access to welfare cash payments was analyzed and taken into consideration (Poblete, 2016, 2018). The law itself therefore was designed in a way that there was no incompatibility: domestic workers who are either single or married to an informal spouse and register under the new regulation are still eligible for welfare payments if they have children under 18 years old. However, the results I find are consistent with a fear of losing welfare payments. Whether the previous is because domestic workers did not completely understand the compatibility between registration and access to social protection under the new regulation, because they are used to having an informal work arrangement and a secure income source in the form of welfare cash payments for their children that they are afraid to lose, or because they simply do not trust that the system will let them keep their universal cash payments with

a formal work arrangement points out to implementation being limited by reality.

Third, this study also highlights the importance of being clear in the dissemination of the effects of a new policy for the targeted population at the time of implementation. As it was shown in Figure 3.3, campaigns for registration even years after the introduction of the new regulation had to explicitly state "You keep collecting social inclusion plans". In fact, the effects that I find are still present in my analysis that goes until 2017. As it was shown in the chapter, dissemination of information at the time of the implementation of the new regulation was fuzzy in what refers to access to social plans for registered domestic workers. Such fuzziness translated into domestic workers eligible for it not registering at the rate that domestic workers with older children did. It was a missed opportunity for the registration of vulnerable workers: women with small children. Communicating policy change in a timely manner and targeted to the affected population is important since the beliefs and perceived costs and benefits of formalization from the side of the workers play a role in the determination of the size of the informal sector. The results of this analysis show that workers make decisions not based on what is actually true, but on what the believe to be true. Making sure then that they have the correct information is key not to put them in front of a fictitious trade off, which is harder to mend as time goes by.

This paper also points out to the specifics of welfare design as a variable affecting worker's decisions at the formal margin. In Argentina, the multiplications of social protection plans at the local level, the lack of coordination among different governmental offices and the fact that the main universal welfare scheme started

as a cash transfer for unregistered workers (unemployed and those in the informal sector) but then incorporated more categories of workers - each with its own set of rules and exceptions - might be creating confusion in low-skilled worker's decision making process. Getting rid of exceptions and special rules for different types of workers within the economy, might simplify the eligibility criteria and allow low-skilled workers with small children make better-informed decisions at the formal margin.

Finally, it is important to consider that, as it was exposed, domestic workers are different from rest of the private salaried workers both in terms of their legal status, the nature of their activity and characteristics of their employer and work-place. They tend to be more isolated and therefore rely more on non-traditional networks to know about changes in their work benefits and potential job opportunities (Hondagneu-Sotelo, 1994). Also, they have a lower bargaining power in the labor market than possibly other occupations (Gorbán and Tizziani, 2014). The previous mean that it is possible that the effects that are present for domestic workers will not be there for other low-skilled workers. Therefore the magnitude of the effect in the informal sector size of the perceived trade off between formalization and social protection for domestic workers is a lower boundary. In occupations where workers have more power, the effect might be even larger. If the target of policymakers is to reduce the size of the informal urban sector, then acknowledging how domestic workers make decisions at the formal margin should be a priority. Not only because of what can be learned for other occupations, but also because it is one of the main employers for low-skilled women.

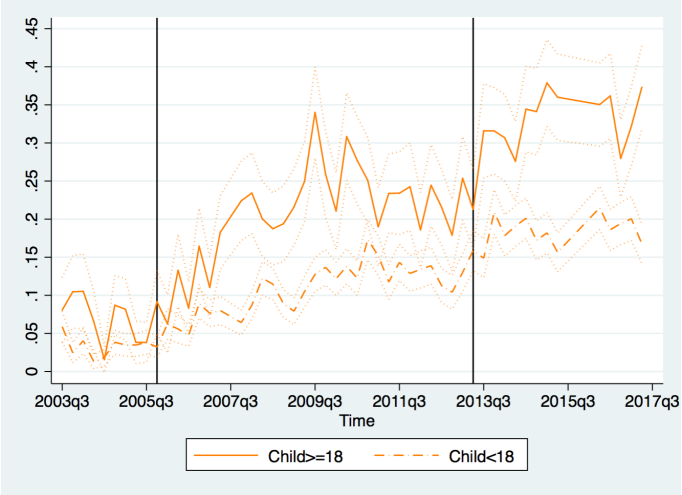


Figure 3.1: Share of domestic workers in the labor force contributing to the pension scheme (registered work) by age of youngest child, 2003-2017
Source: Own calculations based on the Argentinean Permanent Household Survey(EPH) [130] using population weights.

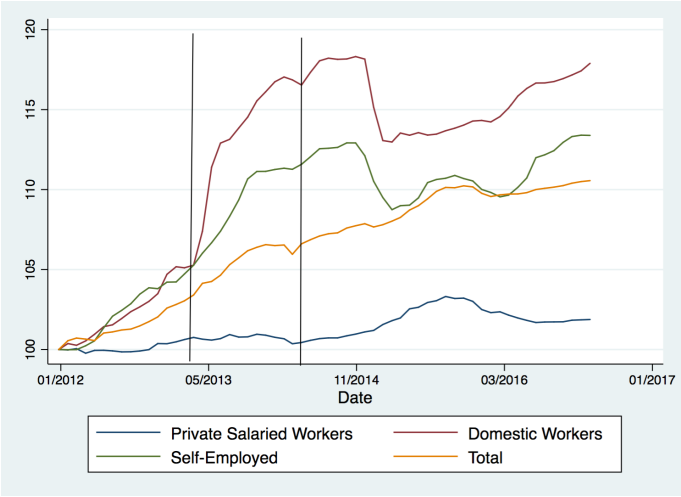
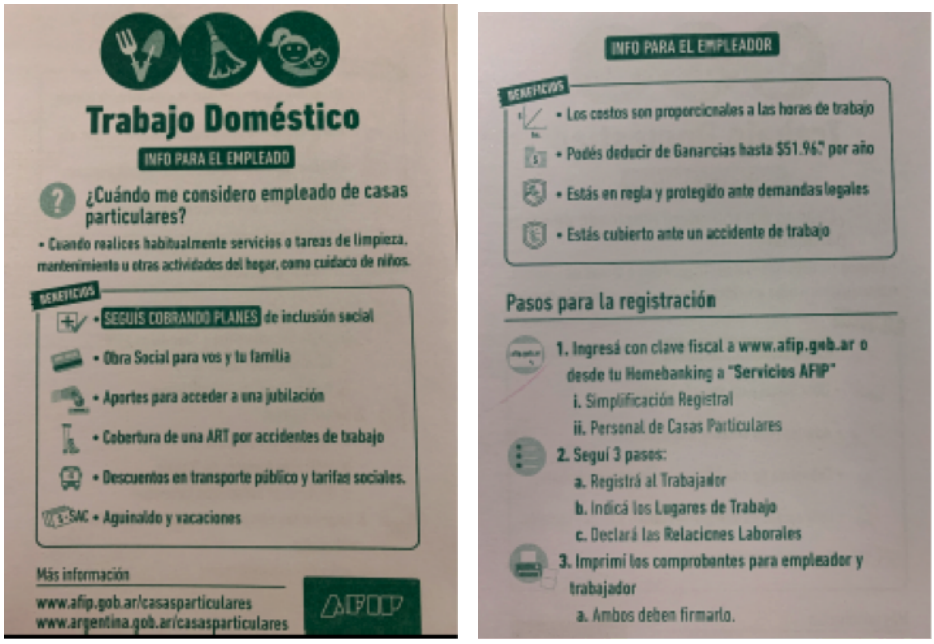
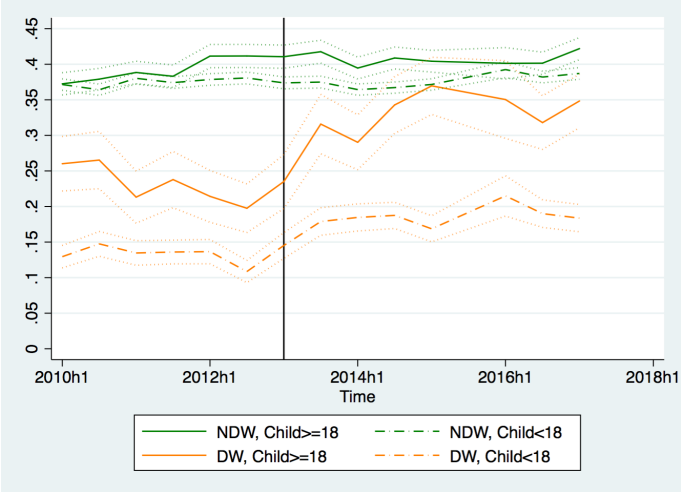


Figure 3.2: Evolution of registered employment (with contributions to the pension scheme) by occupation, 2012-2016 (administrative records)
Source: Argentinean Social Security (SIPA) [166]

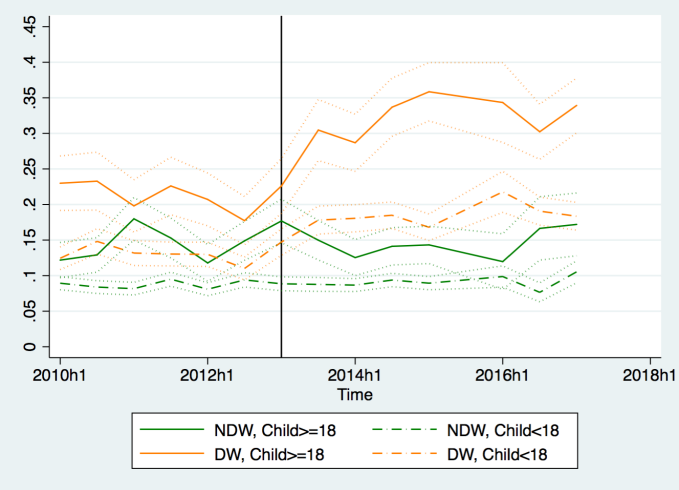


(a) Domestic Workers (b) Household Employers

Figure 3.3: Tax collection agency pamphlet explaining benefits of formalization for domestic workers and household employers (2018)
Note: In (a) benefits of registration for domestic workers are listed; the highlighted reads "You keep collecting social inclusion plans". In (b) benefits of registration for household employers (and steps for registration) are listed - they include the fact that costs are proportional to the number of hours of work, the tax deductions, protection against legal claims and work accidents

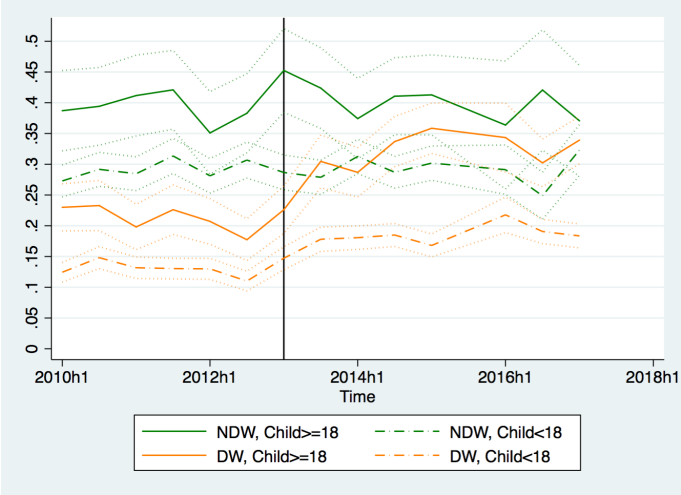


(a) Women between 18-60 years old with children

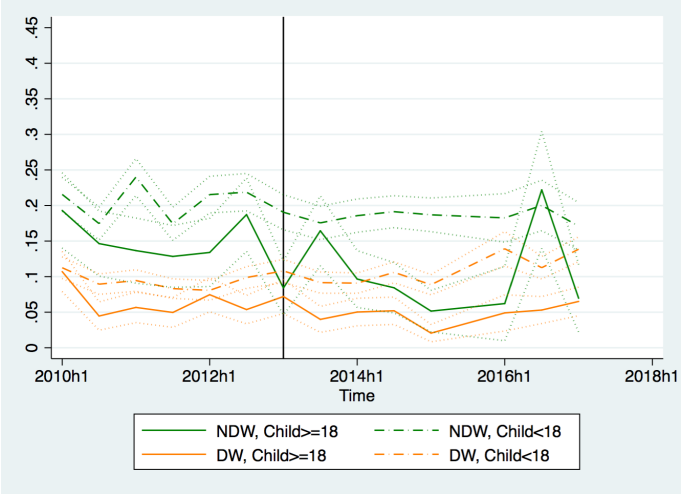


(b) Low-skilled women between 18-60 years old with children

Figure 3.4: Share of mothers contributing to the pension scheme (registered work) by age of youngest child, 2010-2017
Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103] using population weights.
Note: DW = Domestic Worker with children in the same household. NDW = Non Domestic Worker with children in the same household. In (a) registration rates for mothers between 18 and 59 years old. In (b) registration rates restricted to sample of mothers who are domestic workers or those with low education (high school or less) and in the first four total household income deciles of their urban area



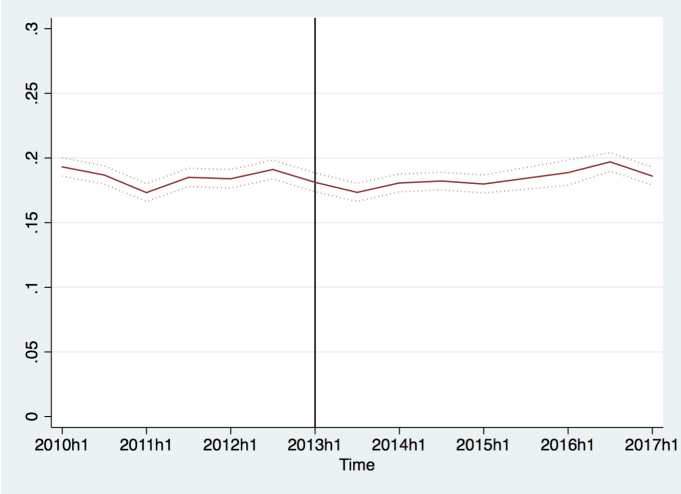
(a) Registration Rates, Low-Skilled Women with children in the Labor Force



(b) Unemployment Rates, Low-Skilled Women with children in the Labor Force

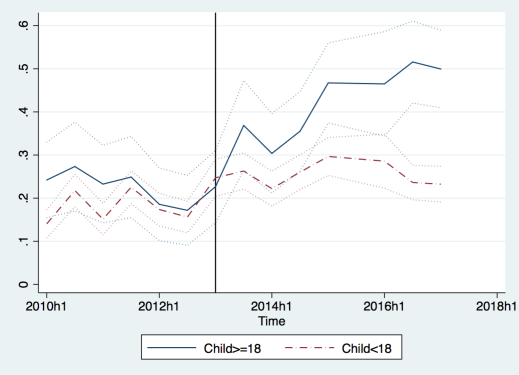
Figure 3.5: Registration and Unemployment Rates for Low-Skilled Women in the Labor Force by age of youngest child, 2010-2017
Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103] using population weights.
Note: DW = Domestic Worker with children in the same household. NDW = Non Domestic Worker with children in the same household. Sample restricted to employed and unemployed mother between 18 and 59 years old with children in the same household who are either Domestic Workers or Non Domestic ones with low education (high school or less) and in the first four total household income deciles of their urban area

(a) Women between 18-59 years old with children

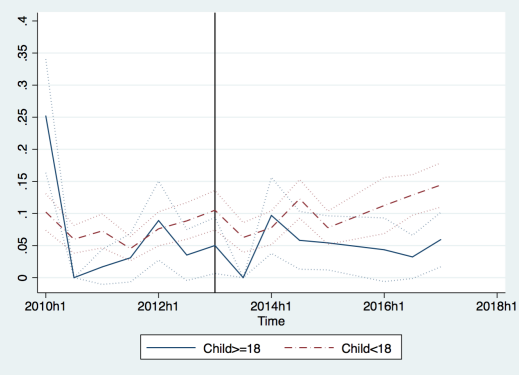


(b) Women in the labor force between 18-59 years old with children

Figure 3.6: Share of Domestic Work over female population and female labor force, 2010-2017
Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103] using population weights.
Note: In (a) sample restricted to mothers with children in their household. In (b) sample restricted to mothers in the labor force with children in their household.

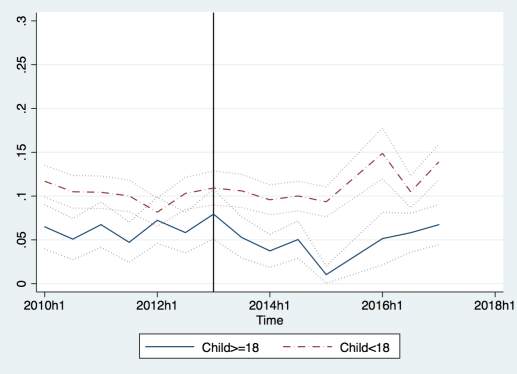


(a) Registration rate, Domestic Workers with children married to a formal spouse



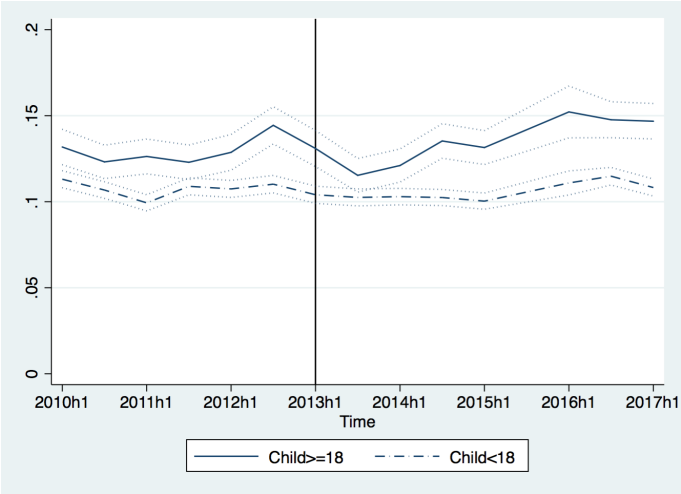
(b) Unemployment rate, Domestic Workers with children married to a formal spouse

(c) Registration rate, Domestic Workers with children single or married to an unregistered spouse

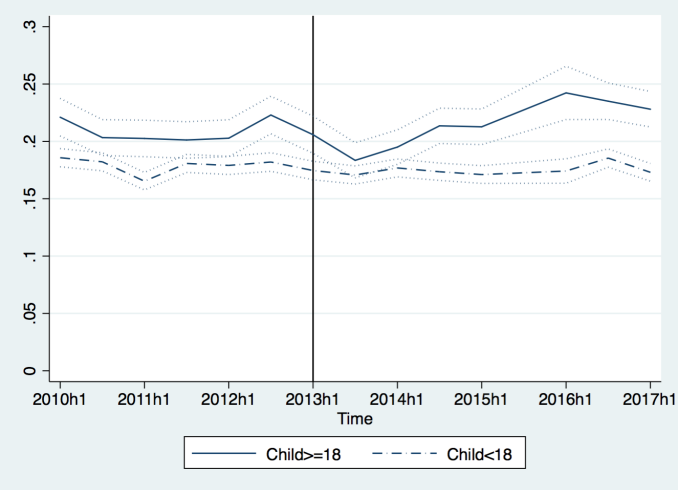


(d) Unemployment rate, Domestic Workers with children single or married to an unregistered spouse

Figure 3.7: Registration and Unemployment Rates for Domestic Workers by age of youngest child and marital status, 2010-2017
Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103] using population weights.
Note: sample of employed and unemployed Domestic Workers between 18 and 60 years old with children in the same household. In (a) & (b), sample restricted to Domestic Workers married to workers who contribute to the pension scheme. In (c) & (d), sample restricted to Domestic Workers who are either single or married to workers who do not contribute to the pension scheme (informal or unemployed workers, or out of the labor force).



(a) Women between 18-59 years old with children



(b) Women in the labor force between 18-59 years old with children

Figure 3.8: Share of domestic work over female population and female labor force by age of youngest child, 2010-2017
Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103] using population weights.
Note: In (a) sample restricted to mothers with children in their household. In (b) sample restricted to mothers in the labor force with children in their household.

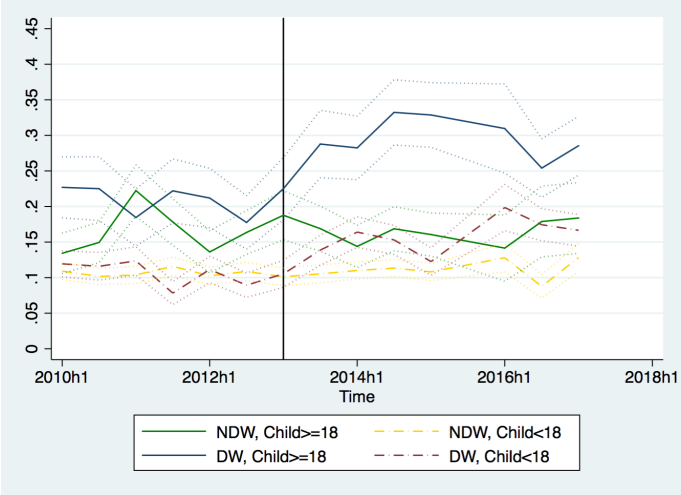


Figure 3.9: Percentage of Low Skilled Women - who are either single or married to workers who do not contribute to the pension scheme (informal or unemployed workers, or out of the labor force) - contributing to the pension scheme (registered work) by age of youngest child, 2010-2017
Source: Own calculations based on the Argentinean Permanent Household Survey(EPH) [103] using population weights.
Note: DW = Domestic Worker with children in the same household. NDW = Non Domestic Worker with children in the same household. Sample restricted for employed and unemployed mothers between 18 and 59 years old with children in the same household who are either Domestic Workers or Non Domestic with low education (high school or less) and in the first four total household income deciles of their urban area

Table 3.1: Employed domestic worker's characteristics, pre-reform

	(1)	(2)	(3)
	Employed Domestic Workers		
Variable	Formal	Informal	Total
Hours in main household			
Less than 6	1.49	11.64	9.06
Between 6 and 16	15.72	39.33	32.29
16 or more	82.79	49.03	58.65
Number of employers			
1 HH	76.37	70.94	71.87
2 HH	14.67	16.56	16.24
3 or more HH	8.95	12.50	11.90
Tenure			
Less than 1 year	8.93	33.10	35.04
Between 1 and 5 years	44.85	49.64	44.65
More than 5 years	46.22	17.26	20.31
Live with employer	1.76	0.06	0.32
Migrant	17.32	11.92	12.55
Total	17.07	82.93	100.00

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103] , 2010-2017 using population weights.

Table 3.2: Domestic Worker's Social Security Contributions, pre and post reform

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Pre				**Post (04/13-10/14)**			**Post (10/14-)**		
Concept	<6 hrs	6-12 hrs	12-16 hrs	≥16 hrs	<12 hrs	12-16 hrs	≥16 hrs	<12 hrs	12-16 hrs	≥16
Panel A: Pesos										
Pension (employer)	0	12	24	35	12	24	35	12	24	35
Pension difference (employee)	35	23	11	0	23	11	0	23	11	0
Health insurance (employee)	0	8	15	100	8	15	100	19	35	233
Health Insurance for Dependent (employee)	100	100	100	100	100	100	100	233	233	233
Work insurance (employer)	-	-	-	-	-	-	-	130	165	230
Hourly minimum wage	20	20	20	20	25	25	25	30	30	30
Panel B: Dollars										
Pension (employer)	0	1.33	2.66	3.89	1.33	2.66	3.89	0.89	1.71	2.50
Pension difference (employee)	3.89	2.56	1.22	0	2.56	1.22	0	1.64	0.79	0
Health insurance (employee)	0	0.23	1.67	11.11	0.23	1.67	11.11	1.36	2.50	16.60
Health Insurance for Dependent (employee)	11.11	11.11	11.11	11.11	11.11	11.11	11.11	16.6	16.6	16.6
Work insurance (employer)	-	-	-	-	-	-	-	9.29	11.79	16.43
Work insurance (employer)	2.22	2.22	2.22	2.22	2.78	2.78	2.78	2.14	2.14	2.14

Source: Argentinean Federal Agency of Public Income (AFIP), Domestic Workers Online Portal (2019) [168] & Investing.com
Note: In Panel A, amounts are in current pesos. In Panel B, amounts are converted to current Dollars using the unofficial ("Blue") exchange rate. While pension and work insurance contributions are by law in charge of the employer, contributions to health insurance are in charge of the employee. Nevertheless, customs and traditions determined that de facto health insurance contributions for domestic workers are in charge of household employers. Domestic workers are in fact in charge of contributions to health insurance for her dependents, as well as the difference in contributions to the pension scheme if she is not a full-time worker. After October 2014 contributions have been continuously adjusted by inflation (adjustment proportional for full-time and part-time workers).

Table 3.3: Sample Distribution

	(1) **All**	(2) **Single & Married to Unregistered**	(3) **Married to Formal**
		Panel A: Domestic Workers	
Child < 18	20,563	14,748	5,621
Child ≥ 18	6,516	5,173	1,288
Total	**27,079**	**19,921**	**6,909**
		Panel B: Non Domestic Workers	
Child < 18	43,248	30,401	12,381
Child ≥ 18	8,001	6,650	1,245
Total	**51,249**	**37,051**	**13,626**
Overall Total	**78,328**	**56,972**	**20,535**

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Observations correspond to mothers per quarter per year. Women are Argentinean residents between 18 and 59 years old. For those employed, they have been working for current employer for less than 25 years and they work less than 50 hours per week. In Panel A, sample restricted to Domestic Workers (employed or unemployed) living in their own dwellings. In Panel B, sample restricted to women whose total family income belongs to the first three income deciles (are categorized as poor) and who are high school graduates or less. It includes women who are out of the labor force as well as those in the labor force (employed and unemployed). Observations in column (1) are the sum of observations in columns (2) and (3). Differences are due to missing information regarding the labor status of some women's husbands. In column (2) women are either single or married to an unregistered man (out of the labor force, unemployed or with an informal employment). In column (3), women are married to a man who is employed formally.

Table 3.4: Descriptive Statistics: Mothers

	(1)	(2)	(3)	(4)	(5)	(6)
	Domestic Workers			**Non-Domestic Workers**		
Variable	Child≥18	Child<18	Total	Child≥18	Child<18	Total
Age	51.080	38.838	41.795	51.914	35.229	37.549
	(5.650)	(8.563)	(9.528)	(5.665)	(9.226)	(10.539)
Married	0.567	0.658	0.636	0.571	0.760	0.733
	(0.495)	(0.474)	(0.481)	(0.495)	(0.427)	(0.442)
Informal Husband (married=1)	0.621	0.552	0.567	0.704	0.606	0.617
	(0.485)	(0.497)	(0.496)	(0.456)	(0.489)	(0.486)
HH Head	0.497	0.394	0.419	0.493	0.305	0.331
	(0.500)	(0.489)	(0.493)	(0.500)	(0.460)	(0.471)
Number children *leq* 18	0.000	1.897	1.439	0.000	2.115	1.821
	(0.000)	(1.090)	(1.249)	(0.000)	(1.203)	(1.335)
HH Members	4.025	4.610	4.469	3.539	4.412	4.291
	(1.743)	(1.768)	(1.780)	(1.414)	(1.526)	(1.541)
HH Employed Members	2.461	1.932	2.060	1.254	1.069	1.095
	(1.062)	(0.954)	(1.007)	(0.813)	(0.606)	(0.642)
HH Income Decile	5.972	4.684	4.991	2.655	2.601	2.608
	(3.050)	(2.859)	(2.957)	(1.290)	(1.272)	(1.275)
High School	0.228	0.283	0.270	0.291	0.330	0.325
	(0.419)	(0.450)	(0.444)	(0.454)	(0.470)	(0.468)
Argentinean citizen	0.888	0.883	0.884	0.918	0.918	0.918
	(0.315)	(0.322)	(0.320)	(0.275)	(0.274)	(0.274)
Length of employment (months)	60.186	34.965	41.113	86.313	60.491	64.773
	(66.650)	(46.952)	(53.545)	(41.118)	(43.639)	(44.283)
Weekoy hours for main Household	21.316	18.491	19.193	28.447	27.482	27.646
	(13.057)	(12.161)	(12.450)	(13.465)	(13.602)	(13.583)
N	6,516	20,563	27,079	8,001	43,248	51,249

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Weighted means. Standard Deviation in parenthesis. (1), (2) & (3) sample of Domestic Workers. (4), (5), & (6) sample of Non Domestic Workers. In (1) & (4), women's youngest child within the household is 18 years or older. In (2) & (5) women's youngest child within the household is less than 18 years old.

Table 3.5: Effect of new regulation on Domestic Worker's registration (job making contributions to the pension scheme)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variable	Total		S & MU		Child < 18		Child ≥ 18	
				Panel A: All Sample				
After	-0.0096**	-0.0096	-0.0121**	-0.0159	-0.0094**	-0.0136	-0.0108	0.0024
	(0.00361)	(0.01167)	(0.00440)	(0.01381)	(0.00369)	(0.01076)	(0.01010)	(0.02955)
DW	0.0113	0.0128	-0.0310**	-0.0281**	-0.0023	-0.0004	0.0669***	0.0663***
	(0.01267)	(0.01185)	(0.01409)	(0.01286)	(0.01280)	(0.01169)	(0.01810)	(0.01806)
After x DW	0.0623***	0.0596***	0.0553***	0.0504***	0.0504***	0.0484***	0.0945***	0.0889***
	(0.01021)	(0.01032)	(0.01007)	(0.00976)	(0.00948)	(0.00972)	(0.02017)	(0.02016)
N	78,328	78,328	56,972	56,972	63,811	63,811	14,517	14,517
				Panel B: In the Labor Force				
After	-0.0272**	-0.0219	-0.0312***	-0.0330	-0.0254**	-0.0235	-0.0342	-0.0258
	(0.01030)	(0.01815)	(0.00931)	(0.02030)	(0.01141)	(0.01847)	(0.02397)	(0.04895)
DW	-0.2388***	-0.2300***	-0.2568***	-0.2455***	-0.2364***	-0.2276***	-0.2453***	-0.2374***
	(0.02880)	(0.02548)	(0.02793)	(0.02433)	(0.02925)	(0.02554)	(0.03579)	(0.03388)
After x DW	0.0778***	0.0742***	0.0737***	0.0673***	0.0646***	0.0619***	0.1196***	0.1123***
	(0.01304)	(0.01328)	(0.01228)	(0.01188)	(0.01398)	(0.01414)	(0.02665)	(0.02672)
N	42,691	42,691	33,182	33,182	33,478	33,478	9,213	9,213
				Panel C: Excluding the Unemployed				
After	-0.0414***	-0.0430**	-0.0469***	-0.0562***	-0.0385***	-0.0449**	-0.0521**	-0.0465
	(0.01009)	(0.01759)	(0.00929)	(0.01952)	(0.01112)	(0.01776)	(0.02418)	(0.04725)
DW	-0.3013***	-0.2921***	-0.3121***	-0.2999***	-0.3028***	-0.2932***	-0.2918***	-0.2847***
	(0.03030)	(0.02647)	(0.02901)	(0.02483)	(0.03144)	(0.02707)	(0.03523)	(0.03317)
After x DW	0.0979***	0.0930***	0.0947***	0.0875***	0.0838***	0.0799***	0.1406***	0.1318***
	(0.01267)	(0.01271)	(0.01188)	(0.01114)	(0.01359)	(0.01354)	(0.02759)	(0.02694)
N	38,133	38,133	29,727	29,727	29,449	29,449	8,684	8,684
Controls	YES	YES	YES	YES	YES	YES	YES	YES
FE	NO	YES	NO	YES	NO	YES	NO	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Panel A: all observations used. Panel B: sample restricted to women in the labor force. Panel C; sample restricted to women who are employed. In (3) & (4) woman is single or married to an unregistered husband. In (5) & (6), woman's youngest child is less than 18 years old. In (7) & (8) woman's youngest child is 18 years old or older. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies. * significant at 10% ** significant at 5% *** significant at 1%

Table 3.6: Effect of new regulation on Domestic Worker's unemployment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variable	Total		S & MU		Child < 18		Child ≥ 18	
After	-0.0170*	-0.0350**	-0.0194**	-0.0331**	-0.0148	-0.0353*	-0.0275**	-0.0364
	(0.00996)	(0.01624)	(0.00851)	(0.01591)	(0.01090)	(0.01745)	(0.01151)	(0.02605)
DW	-0.0816***	-0.0820***	-0.0655***	-0.0650***	-0.0864***	-0.0861***	-0.0625***	-0.0648***
	(0.00888)	(0.00893)	(0.00836)	(0.00861)	(0.00931)	(0.00928)	(0.01240)	(0.01249)
After x DW	0.0227***	0.0213***	0.0258***	0.0253***	0.0234**	0.0226**	0.0243**	0.0208**
	(0.00772)	(0.00771)	(0.00857)	(0.00841)	(0.00871)	(0.00853)	(0.00937)	(0.00951)
N	42,691	42,691	33,182	33,182	33,478	33,478	9,213	9,213
Controls	YES	YES	YES	YES	YES	YES	YES	YES
FE	NO	YES	NO	YES	NO	YES	NO	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Sample restricted to women in the labor force. In (3) & (4) woman is single or married to an unregistered husband. In (5) & (6), woman's youngest child is less than 18 years old. In (7) & (8) woman's youngest child is 18 years old or older. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies. * significant at 10% ** significant at 5% *** significant at 1%

Table 3.7: Effect of new regulation on Domestic Worker's registration & unemployment - false experiment dates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	2011				2012			
Variable	Registered	Registered	Registered	Unemployed	Registered	Registered	Registered	Unemployed
After	-0.0061	-0.0116	-0.0158	-0.0001	-0.0076	-0.0132	-0.0201	-0.0080
	(0.00800)	(0.01817)	(0.01884)	(0.01584)	(0.00780)	(0.01650)	(0.01809)	(0.01633)
DW	0.0127	-0.2365***	-0.2991***	-0.0777***	0.0117	-0.2324***	-0.2958***	-0.0840***
	(0.01490)	(0.03196)	(0.03229)	(0.01152)	(0.01350)	(0.02823)	(0.02940)	(0.00904)
After x DW	0.0014	0.0159	0.0175	-0.0080	0.0061	0.0187	0.0246	0.0051
	(0.00942)	(0.01747)	(0.01780)	(0.01163)	(0.01140)	(0.01703)	(0.01950)	(0.01005)
N	39,778	20,817	18,472	20,817	39,778	20,817	18,472	20,817
Sample	All	LF	Employed	LF	All	LF	Employed	LF
Controls	YES	YES	YES	YES	YES	YES	YES	YES
FE	YES	YES	YES	YES	YES	YES	YES	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies. Sample restricted to true pre-reform period observations (before second quarter of 2013). In (1), (2), (3) & (4) *After* equals 1 in the period after quarter 2 of 2011; in (5), (6) , (7) & (8), after quarter 2 of 2012. In (4) & (8) outcome is Unemployment (vs. employed formally or informally). * significant at 10% ** significant at 5% *** significant at 1%

Table 3.8: Effect of welfare on the probability of Domestic Workers becoming a registered worker after new regulation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Total		S & MU						MF	
Variable			S & MU		S		MU			
Panel A: All Domestic Workers with children										
After	0.0901***	0.1093***	0.0808***	0.0891***	0.0742***	0.0829**	0.0914***	0.0986***	0.1291***	0.1798***
	(0.01682)	(0.01853)	(0.01562)	(0.02311)	(0.01906)	(0.03365)	(0.02338)	(0.03295)	(0.03423)	(0.03742)
Child	-0.0166	-0.0187	-0.0172	-0.0192	-0.0025	-0.0075	-0.0334	-0.0328	-0.0060	-0.0090
	(0.01373)	(0.01441)	(0.01370)	(0.01415)	(0.01707)	(0.01714)	(0.02116)	(0.02182)	(0.04200)	(0.04106)
After x Child	-0.0461***	-0.0431***	-0.0442**	-0.0426**	-0.0433*	-0.0406*	-0.0474**	-0.0477**	-0.0658*	-0.0578*
	(0.01566)	(0.01500)	(0.01651)	(0.01581)	(0.02378)	(0.02279)	(0.01920)	(0.01861)	(0.03468)	(0.03356)
N	27,079	27,079	19,921	19,921	11,067	11,067	8,854	8,854	6,909	6,909
Panel B: All Domestic Workers with youngest child between 12 & 25 years old										
After	0.0841***	0.1033***	0.0783***	0.0796**	0.0761***	0.0731*	0.0810***	0.0905**	0.1023**	0.1713***
	(0.01854)	(0.02649)	(0.01746)	(0.03339)	(0.02139)	(0.04078)	(0.02585)	(0.04269)	(0.04393)	(0.06082)
Child	0.0109	0.0093	0.0183	0.0160	0.0407*	0.0345	-0.0070	-0.0052	-0.0130	-0.0146
	(0.02118)	(0.02168)	(0.01898)	(0.01934)	(0.02191)	(0.02227)	(0.02684)	(0.02711)	(0.05970)	(0.05932)
After x Child	-0.0350*	-0.0325*	-0.0408*	-0.0396**	-0.0456*	-0.0431*	-0.0331	-0.0357	-0.0198	-0.0087
	(0.01854)	(0.01779)	(0.02031)	(0.01924)	(0.02670)	(0.02501)	(0.02469)	(0.02369)	(0.04649)	(0.04667)
N	14,163	14,163	10,503	10,503	5,962	5,962	4,541	4,541	3,515	3,515
Panel B: All Domestic Workers with youngest child between 15 & 20 years old										
After	0.0803***	0.1204***	0.0814***	0.1020***	0.0555*	0.1003**	0.1196***	0.1127**	0.0823*	0.1708**
	(0.02123)	(0.02936)	(0.02362)	(0.03611)	(0.03028)	(0.04917)	(0.03129)	(0.04933)	(0.04563)	(0.07425)
Child	0.0245	0.0247	0.0301	0.0303	0.0389	0.0370	0.0246	0.0281	0.0131	0.0102
	(0.02387)	(0.02296)	(0.02498)	(0.02351)	(0.03067)	(0.02964)	(0.03205)	(0.03095)	(0.05062)	(0.05219)
After x Child	-0.0358*	-0.0354*	-0.0442*	-0.0453*	-0.0182	-0.0200	-0.0803**	-0.0829**	-0.0178	-0.0089
	(0.02033)	(0.01810)	(0.02446)	(0.02316)	(0.03233)	(0.02940)	(0.03604)	(0.03552)	(0.04768)	(0.04670)
N	9,388	9,388	6,858	6,858	3,870	3,870	2,988	2,988	2,429	2,429
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies.
* significant at 10% ** significant at 5% *** significant at 1%

Table 3.9: Effect of welfare on the probability of Domestic Workers becoming a registered worker after new regulation, excluding the unemployed

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Total		S & MU						MF	
Variable			S & MU		S		MU			
Panel A: All Domestic Workers with children										
After	0.0914***	0.1010***	0.0766***	0.0841***	0.0640***	0.0750**	0.0950***	0.0970**	0.1530***	0.1672***
	(0.01894)	(0.01954)	(0.01826)	(0.02327)	(0.02064)	(0.03368)	(0.02445)	(0.03604)	(0.03629)	(0.03899)
Child	-0.0199	-0.0227	-0.0237	-0.0263*	-0.0145	-0.0200	-0.0323	-0.0331	0.0043	0.0010
	(0.01344)	(0.01370)	(0.01523)	(0.01535)	(0.01955)	(0.01986)	(0.02320)	(0.02331)	(0.03976)	(0.03834)
After x Child	-0.0451**	-0.0416**	-0.0383**	-0.0364**	-0.0333	-0.0308	-0.0473**	-0.0467**	-0.0857**	-0.0776**
	(0.01699)	(0.01617)	(0.01822)	(0.01742)	(0.02493)	(0.02414)	(0.01958)	(0.01853)	(0.03454)	(0.03327)
N	26,201	26,201	19,322	19,322	10,770	10,770	8,552	8,552	6,642	6,642
Panel B: All Domestic Workers with youngest child between 12 & 25 years old										
After	0.0834***	0.0966***	0.0693***	0.0739**	0.0624**	0.0672	0.0779***	0.0834*	0.1335***	0.1656**
	(0.02012)	(0.02759)	(0.01987)	(0.03323)	(0.02355)	(0.04112)	(0.02589)	(0.04663)	(0.04555)	(0.06635)
Child	0.0099	0.0079	0.0122	0.0095	0.0301	0.0236	-0.0065	-0.0058	0.0067	0.0045
	(0.01989)	(0.01995)	(0.01935)	(0.01916)	(0.02340)	(0.02368)	(0.02660)	(0.02605)	(0.05509)	(0.05426)
After x Child	-0.0334*	-0.0310*	-0.0310	-0.0296	-0.0351	-0.0333	-0.0243	-0.0258	-0.0504	-0.0416
	(0.01883)	(0.01778)	(0.02126)	(0.02015)	(0.02784)	(0.02678)	(0.02467)	(0.02332)	(0.04636)	(0.04642)
N	14,152	14,152	10,524	10,524	6,001	6,001	4,523	4,523	3,486	3,486
Panel B: All Domestic Workers with youngest child between 15 & 20 years old										
After	0.0858***	0.1167***	0.0781***	0.0978**	0.0495	0.0979*	0.1206***	0.1065*	0.1176**	0.1699**
	(0.02418)	(0.03264)	(0.02637)	(0.03818)	(0.03382)	(0.05101)	(0.03079)	(0.05561)	(0.04730)	(0.08166)
Child	0.0267	0.0277	0.0306	0.0315	0.0354	0.0351	0.0314	0.0329	0.0225	0.0216
	(0.02434)	(0.02317)	(0.02584)	(0.02382)	(0.03333)	(0.03167)	(0.03123)	(0.03027)	(0.04869)	(0.05018)
After x Child	-0.0394*	-0.0396*	-0.0409	-0.0421	-0.0160	-0.0201	-0.0764**	-0.0759**	-0.0456	-0.0412
	(0.02258)	(0.02000)	(0.02724)	(0.02536)	(0.03722)	(0.03408)	(0.03438)	(0.03399)	(0.04828)	(0.04677)
N	9,328	9,328	6,833	6,833	3,871	3,871	2,962	2,962	2,395	2,395
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies.
* significant at 10% ** significant at 5% *** significant at 1%

Table 3.10: Effect of welfare on the probability of Domestic Workers becoming unemployed after new regulation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Total		S & MU						MF	
Variable			S & MU		S		MU			
Panel A: All Domestic Workers with children										
After	-0.0033	-0.0139	-0.0050	-0.0008	-0.0086	0.0083	-0.0015	-0.0171	0.0075	-0.0472
	(0.00773)	(0.01544)	(0.00893)	(0.01844)	(0.01077)	(0.02421)	(0.01001)	(0.02614)	(0.01226)	(0.03438)
Child	-0.0058	-0.0078	-0.0073	-0.0086	-0.0164	-0.0176	0.0003	-0.0021	-0.0014	-0.0037
	(0.00576)	(0.00611)	(0.00827)	(0.00801)	(0.01112)	(0.01111)	(0.00893)	(0.00834)	(0.02281)	(0.02334)
After x Child	0.0097	0.0104	0.0129	0.0126	0.0219*	0.0216*	0.0017	0.0027	-0.0029	-0.0001
	(0.00971)	(0.00916)	(0.00939)	(0.00890)	(0.01203)	(0.01154)	(0.01037)	(0.00985)	(0.02001)	(0.01930)
N	27,079	27,079	19,921	19,921	11,067	11,067	8,854	8,854	6,909	6,909
Panel B: All Domestic Workers with youngest child between 12 & 25 years old										
After	-0.0030	-0.0097	-0.0048	0.0068	-0.0131	0.0139	0.0057	-0.0127	0.0069	-0.0553
	(0.00906)	(0.01938)	(0.01127)	(0.01992)	(0.01417)	(0.02436)	(0.01232)	(0.03061)	(0.01466)	(0.04501)
Child	-0.0073	-0.0099	-0.0073	-0.0097	-0.0231	-0.0250	0.0115	0.0081	-0.0068	-0.0093
	(0.00743)	(0.00742)	(0.01199)	(0.01158)	(0.01553)	(0.01564)	(0.01378)	(0.01203)	(0.02476)	(0.02539)
After x Child	0.0080	0.0088	0.0079	0.0082	0.0245*	0.0245*	-0.0147	-0.0124	0.0072	0.0082
	(0.00853)	(0.00821)	(0.00999)	(0.00969)	(0.01338)	(0.01327)	(0.01235)	(0.01182)	(0.02257)	(0.02195)
N	14,163	14,163	10,503	10,503	5,962	5,962	4,541	4,541	3,515	3,515
Panel C: All Domestic Workers with youngest child between 15 & 20 years old										
After	0.0035	-0.0122	0.0050	0.0063	-0.0035	0.0144	0.0163	-0.0108	0.0060	-0.0598
	(0.01237)	(0.02076)	(0.01696)	(0.02423)	(0.02063)	(0.03275)	(0.01635)	(0.03404)	(0.02387)	(0.05392)
Child	-0.0142	-0.0167	-0.0087	-0.0110	-0.0231	-0.0259	0.0061	0.0025	-0.0305	-0.0331
	(0.01205)	(0.01192)	(0.01826)	(0.01789)	(0.02487)	(0.02458)	(0.01455)	(0.01386)	(0.03163)	(0.03155)
After x Child	0.0025	0.0038	-0.0015	-0.0004	0.0138	0.0136	-0.0216	-0.0182	0.0117	0.0132
	(0.01292)	(0.01241)	(0.01748)	(0.01678)	(0.02069)	(0.02036)	(0.01708)	(0.01647)	(0.03117)	(0.03043)
N	9,388	9,388	6,858	6,858	3,870	3,870	2,988	2,988	2,429	2,429
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies.
* significant at 10% ** significant at 5% *** significant at 1%

Table 3.11: Effect of welfare on the probability of Domestic Workers becoming a registered worker or unemployed after new regulation - false experiments

	(1)	(2)	(3)	(4)	(5)	(6)
	Registered			**Unemployed**		
Variable	Total	S & MU	MF	Total	S & MU	MF
Panel A: False date - 2011						
After	0.0109	0.0118	-0.0040	-0.0006	0.0126	-0.0623*
	(0.02307)	(0.02692)	(0.05662)	(0.01477)	(0.01331)	(0.03307)
Child	-0.0397*	-0.0258	-0.0925	-0.0088	0.0043	-0.0616
	(0.02307)	(0.02170)	(0.07188)	(0.01141)	(0.01065)	(0.03894)
After x Child	0.0247	0.0023	0.1090*	-0.0005	-0.0108	0.0487**
	(0.02108)	(0.02387)	(0.06015)	(0.00973)	(0.00879)	(0.02320)
N	12,734	9,362	3,235	12,734	9,362	3,235
Panel B: False date - 2012						
After	0.0194	0.0114	0.0435	0.0021	0.0140	-0.0431*
	(0.02212)	(0.02665)	(0.03974)	(0.01080)	(0.01077)	(0.02170)
Child	-0.0272	-0.0254	-0.0320	-0.0073	0.0022	-0.0357
	(0.02159)	(0.01847)	(0.05076)	(0.00730)	(0.00885)	(0.02652)
After x Child	0.0139	0.0030	0.0501	-0.0040	-0.0128*	0.0248
	(0.01931)	(0.02123)	(0.04004)	(0.00725)	(0.00735)	(0.01584)
N	12,734	9,362	3,235	12,734	9,362	3,235
Panel C: False margin - 14						
After	0.0369	0.0359	0.0642	0.0286	0.0226	0.0565
	(0.03875)	(0.04022)	(0.11173)	(0.02193)	(0.02931)	(0.03418)
Child	-0.0356**	-0.0189	-0.0788*	-0.0023	-0.0006	0.0089
	(0.01736)	(0.02141)	(0.04178)	(0.00677)	(0.00947)	(0.01377)
After x Child	0.0307	0.0329	0.0256	-0.0053	-0.0076	-0.0114
	(0.01999)	(0.02828)	(0.06300)	(0.00954)	(0.01192)	(0.02177)
N	6,673	4,884	1,718	6,673	4,884	1,718

	(1)	(2)	(3)	(4)	(5)	(6)
		Registered			**Unemployed**	
Variable	Total	S & MU	MF	Total	S & MU	MF
Panel D: False margin - 22						
After	0.0578	0.0379	0.1115	-0.0250	-0.0201	-0.0355
	(0.04273)	(0.04577)	(0.10190)	(0.03964)	(0.04450)	(0.06243)
Child	0.0077	0.0001	0.0255	-0.0132	-0.0160	-0.0127
	(0.02054)	(0.02516)	(0.04209)	(0.00995)	(0.01333)	(0.01388)
After x Child	-0.0258	-0.0175	-0.0293	0.0088	0.0004	0.0320
	(0.02890)	(0.03849)	(0.05868)	(0.01523)	(0.01835)	(0.02560)
N	4,705	3,395	1,256	4,705	3,395	1,256
Panel E: False margin - Non Domestic Workers						
After	-0.0776*	-0.0954**	0.0412	-0.0499	-0.0568*	0.0167
	(0.04232)	(0.04293)	(0.13350)	(0.03268)	(0.03190)	(0.09055)
Child	-0.0364*	-0.0484**	0.0554	0.0063	0.0071	-0.0047
	(0.02000)	(0.02203)	(0.06891)	(0.01034)	(0.01095)	(0.03857)
After x Child	0.0174	0.0309	-0.0961	0.0072	0.0051	0.0107
	(0.02485)	(0.02519)	(0.10074)	(0.01277)	(0.01324)	(0.05878)
N	15,612	13,261	2,162	15,612	13,261	2,162
Controls	YES	YES	YES	YES	YES	YES
FE	YES	YES	YES	YES	YES	YES
Exclude Unempl.	NO	NO	NO	NO	NO	NO

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.

Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies. Panel A: sample restricted to true pre-reform period observations (before second quarter of 2013); *After* equals 1 in the period after quarter 2 of 2011. Panel B: sample restricted to true pre-reform period observations (before second quarter of 2013); *After* equals 1 in the period after quarter 2 of 2012. Panel C: sample restricted to women whose youngest child is between 11 & 16; *Child* equals 1 if age of youngest child ≤ 13. Panel D: sample restricted to women whose youngest child is between 19 & 24; *Child* equals 1 if age of youngest child ≤ 21. Panel E: sample restricted to non domestic workers in the labor force. S & MU: woman is either single or married to an unregistered husband (out of the labor force, unemployed or informally employed). MF: woman is married to a formally employed husband. In (1), (2) & (3) outcome is Registered vs. (unemployed or informally employed). In (4), (5) & (6) outcome is Unemployed vs. employed (formally or informally). * significant at 10% ** significant at 5% *** significant at 1%

Table 3.12: Effect of welfare on the probability of Domestic Workers becoming a registered worker after new regulation - robustness checks and alternative hypothesis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	#Children		**No Dependency**	**Age youngest child**				**Unregistered Members**		**Tenure (years)**	
Variable	1	≥2		$0-5$	$6-10$	$11-14$	$15-17$	Total	≥12 & ≤25	<1	≥1
After	0.0622	0.1411***	0.0895*	0.0873***	0.1027***	0.0900**	0.0891***	0.0891***	0.0945***	0.0664***	0.0699**
	(0.05011)	(0.04958)	(0.04973)	(0.03044)	(0.03014)	(0.03364)	(0.03001)	(0.02311)	(0.03199)	(0.02132)	(0.03053)
Child	-0.0468**	0.0001	-0.0298*	-0.0056	-0.0098	-0.0043	-0.0003	-0.0192	0.0131	0.0054	-0.0179
	(0.01792)	(0.02787)	(0.01745)	(0.01730)	(0.01660)	(0.01773)	(0.01530)	(0.01415)	(0.01836)	(0.01247)	(0.01864)
After x Child	-0.0373	-0.0814***	-0.0033	-0.0459***	-0.0436***	-0.0459**	-0.0406**	-0.0426**	-0.0408**	-0.0131	-0.0384*
	(0.02810)	(0.02766)	(0.02590)	(0.01633)	(0.01579)	(0.01852)	(0.01642)	(0.01581)	(0.01865)	(0.01666)	(0.02151)
N	6,928	7,088	5,173	12,007	11,544	11,326	11,209	19,921	10,024	6,432	13,489
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Exclude Unempl.	NO	NO	NO	NO	NO	NO					

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies. In all estimations, sample restricted to single Domestic Workers or those married to an unregistered husband (out of the labor force, unemployed or employed informally). In (1) sample restricted to fill-time Domestic Workers with 1 child . In (2) sample restricted to full-time Domestic Workers with 2 or 3 children. In (3) sample restricted to Domestic Workers with Child≥18 and *Child* equals 1 if age of youngest child present in the household is <18 (instead of child with proven dependency to the Domestic Worker). In (4)-(7) sample restricted to Domestic Workers with 1 child; *Child* equals 1 if age of that child is in the specific age group <18 and 0 if that child is ≥18 (with no particular age group within that group). In (8) & (9) sample restricted to Domestic Workers in a household with all unregistered adult members (out of the labor force, unemployed or employed informally). In (9) sample further restricted to Domestic Workers whose youngest child is between 12 and 25 years old. In (10) sample restricted to employed Domestic Workers that have been working for < 1 year for principal household employer. In (11) sample restricted to employed Domestic Workers that have been working for ≥1 for principal household employer. * significant at 10% ** significant at 5% *** significant at 1%

Table 3.13: Effect of welfare on the probability of Domestic Workers becoming registered workers after new regulation - not reproductive age

	(1)	(2)	(3)	(4)	(5)	(6)
	Total		S & MU		MF	
Variable	$40-59$	$45-59$	$40-59$	$45-59$	$40-59$	$45-59$
After	0.1196***	0.1329***	0.0869**	0.1036**	0.2278***	0.2470***
	(0.02566)	(0.03464)	(0.03235)	(0.04113)	(0.06010)	(0.08560)
Child	-0.0086	-0.0006	-0.0067	-0.0034	-0.0087	0.0107
	(0.01778)	(0.02014)	(0.01509)	(0.01758)	(0.05420)	(0.05642)
After x Child	-0.0363*	-0.0472**	-0.0361**	-0.0510**	-0.0410	-0.0313
	(0.01782)	(0.02074)	(0.01742)	(0.01949)	(0.03915)	(0.04598)
N	15,307	9,649	11,627	7,619	3,534	1,940
Controls	YES	YES	YES	YES	YES	YES
FE	YES	YES	YES	YES	YES	YES
Exclude Unempl.	NO	NO	NO	NO	NO	NO

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies. In (3) & (4), sample restricted to single Domestic Workers or those married to an unregistered husband (out of the labor force, unemployed or informally employed). In (5) & (6), sample restricted to Domestic Workers married to a formally employed husband. 40-62: sample restricted to Domestic Workers between 40 and 62 years old; 45-62: sample restricted to Domestic Workers between 45 and 62 years old. * significant at 10% ** significant at 5% *** significant at 1%

Table 3.14: Effect of welfare on the probability of Domestic Workers becoming registered workers after new regulation - full-time vs. part-time Domestic Workers

	(1)	(2)	(3)	(4)	(5)	(6)
	Total		S & MU		MF	
Variable	<16	≥16	<16	≥16	<16	≥16
After	0.1107***	0.1100***	0.0870***	0.0938**	0.1904***	0.1605***
	(0.02159)	(0.02971)	(0.02204)	(0.03559)	(0.05866)	(0.05833)
Child	-0.0069	-0.0062	-0.0126	-0.0021	0.0112	-0.0092
	(0.01287)	(0.01931)	(0.01480)	(0.01802)	(0.03087)	(0.05848)
After x Child	-0.0231*	-0.0505**	-0.0140	-0.0570**	-0.0619*	-0.0343
	(0.01279)	(0.02096)	(0.01472)	(0.02224)	(0.03343)	(0.05065)
N	10,498	16,581	7,610	12,311	2,798	4,111
Controls	YES	YES	YES	YES	YES	YES
FE	YES	YES	YES	YES	YES	YES
Exclude Unempl.	NO	NO	NO	NO	NO	NO

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies. In (1), (3), & (5) sample restricted to employed Domestic Workers working <16 hours per week for main household employer. In (2), (4) & (6) sample restricted to employed Domestic Workers working ≥16 hours per week for main household employer. * significant at 10% ** significant at 5% *** significant at 1%

Table 3.15: Triple Difference: Effect of welfare on the probability of having a formal work arrangement & being employed after passage of new regulation by occupation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
					Registered						Unemployed	
Variable	Total	S & MU	MF	Total	S & MU	MF	Total	S & MU	MF	Total	S & MU	MF
After	-0.0107	-0.0175	0.0169	-0.0301	-0.0524	0.1136	-0.0554*	-0.0797**	0.1239	-0.0420**	-0.0381*	-0.0399
	(0.01605)	(0.01800)	(0.02363)	(0.03088)	(0.03418)	(0.10492)	(0.02915)	(0.03228)	(0.12390)	(0.01997)	(0.02085)	(0.05830)
Child	0.0154*	0.0223**	0.0402***	-0.0265	-0.0353	0.0995	-0.0163	-0.0286	0.1236	0.0066	0.0005	-0.0089
	(0.00855)	(0.00911)	(0.01446)	(0.02177)	(0.02258)	(0.06950)	(0.02299)	(0.02421)	(0.08296)	(0.00942)	(0.00954)	(0.04497)
DW	0.0654***	0.0344*	0.2188***	-0.2330***	-0.2526***	-0.0324	-0.2806***	-0.2959***	-0.1002	-0.0682***	-0.0586***	-0.1712***
	(0.01749)	(0.01793)	(0.03115)	(0.03293)	(0.03372)	(0.06681)	(0.03237)	(0.03234)	(0.08371)	(0.01244)	(0.01412)	(0.04152)
After x Child	0.0004	0.0007	-0.0069	0.0093	0.0227	-0.1017	0.0146	0.0283	-0.1211	0.0084	0.0062	0.0059
	(0.01018)	(0.01063)	(0.01656)	(0.02586)	(0.02684)	(0.09817)	(0.02601)	(0.02735)	(0.11835)	(0.01226)	(0.01334)	(0.06093)
After x DW	0.0914***	0.0787***	0.1245***	0.1141***	0.1154***	0.0479	0.1334***	0.1364***	0.0358	0.0194**	0.0208*	0.0038
	(0.02063)	(0.01815)	(0.03825)	(0.02704)	(0.02562)	(0.10225)	(0.02772)	(0.02630)	(0.11881)	(0.00923)	(0.01107)	(0.06258)
DW x Child	-0.0647***	-0.0798***	-0.1026***	0.0049	0.0097	-0.1179	-0.0133	-0.0043	-0.1435	-0.0175	-0.0084	0.0052
	(0.01402)	(0.01453)	(0.02946)	(0.02369)	(0.02353)	(0.06971)	(0.02472)	(0.02420)	(0.08723)	(0.01081)	(0.01190)	(0.04189)
After x DW x Child	-0.0429**	-0.0389**	-0.0530	-0.0519*	-0.0627**	0.0416	-0.0530*	-0.0644**	0.0625	0.0032	0.0067	-0.0030
	(0.01734)	(0.01770)	(0.03532)	(0.02754)	(0.02951)	(0.10003)	(0.02827)	(0.03099)	(0.11782)	(0.00979)	(0.01206)	(0.06134)
N	78,328	56,972	20,535	42,691	33,182	9,071	38,133	29,727	8,021	42,691	33,182	9,071
Sample	All	All	All	LF	LF	LF	Employed	Employed	Employed	LF	LF	LF
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Clustered standard errors at the urban center in parenthesis. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. Fixed effects include region and quarterly dummies. S & MU: woman is either single or married to an unregistered husband (out of the labor force, unemployed or informally employed). MF: woman is married to a formally employed husband. In (1)-(9) outcome is Registration; in (10)-(12) outcome is Unemployment. In (1)-(3), all observations are used. In (4)-(6) & (10)-(12), sample restricted to women in the labor force. In (7)-(9) sample restricted to women who are employed. * significant at 10% ** significant at 5% *** significant at 1%

Table 3.16: Distribution of low-skilled mothers who are informally employed in *t*, by panel

	(1)	(2)	(3)	(4)	(5)
	Domestic Workers		**Non-Domestic Workers**		**Total**
Panel *(t)-(t+1)*	Child≥18	Child<18	Child≥18	Child<18	
2010-2011	95	348	26	171	640
2011-2012	96	319	34	200	649
2012-2013	105	317	33	183	638
2013-2014	18	84	10	44	156
2014-2015	87	343	28	207	665
2016-2017	55	208	19	115	397
Total	456	1,619	150	920	3,145

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Observations correspond to mothers with an observation in year t and a second observation in *t+1*. Women are Argentinean residents between 18 and 62 years old who are informally employed workers in *t* and have been working for current employer for less than 25 years and they work less than 50 hours per week. In (1) & (2), women are informally employed Domestic Workers in *t*. In (3) & (4) women are informally employed Non Domestic Workers in *t*. In (1) & (3), the age of the worker's youngest child is ≥18 in *t* and in (2) & (4) the age of the worker's youngest child is <18 in *t*.

Table 3.17: Effect of new regulation on Domestic Workers' transition to registered employment

	(1)	(2)	(3)	(4)	(5)	(6)
Variable		Total			S & MU	
After	0.0232**	0.0220**	0.1117***	0.0211**	0.0198*	0.0970***
	(0.00930)	(0.00931)	(0.02291)	(0.01015)	(0.01016)	(0.02528)
DWt	-0.0203***	-0.0208***	0.0000	-0.0220***	-0.0225***	0.0000
	(0.00748)	(0.00755)	(.)	(0.00814)	(0.00820)	(.)
After x DWt	0.0054	0.0055	-0.0134	0.0059	0.0058	-0.0016
	(0.01146)	(0.01147)	(0.02795)	(0.01249)	(0.01251)	(0.03068)
N	6,290	6,290	6,290	4,844	4,844	48,44
Controls	NO	YES	NO	NO	YES	NO
Individual FE	NO	NO	YES	NO	NO	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. In (1), (2) & (3) sample restricted to workers who are informally employed in t. In (4), (5) & (6) sample restricted to workers who are informally employed in t and are either single or married to an unregistered husband (out of the labor force, unemployed or informally employed) in t. The dependent variable is equal to 1 is the individual became a registered worker in their own work category (Domestic or Non Domestic Worker) and 0 otherwise during their panel. In (1) & (4), no controls and no individual fixed effects are used. In (2) & (5), controls in t are used (no individual fixed effects). In (3) &(6) individual fixed effects are used. * significant at 10% ** significant at 5% *** significant at 1%

Table 3.18: Effect of welfare on Domestic Workers' transition to registered employment after new regulation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variable	Total				S & MU			
After	0.0548***	0.0552***	0.1548***	0.1379**	0.0633***	0.0632***	0.1618***	0.1905***
	(0.01345)	(0.01343)	(0.03116)	(0.05722)	(0.01405)	(0.01404)	(0.03256)	(0.05912)
Child$t$	0.0003	0.0233*	0.0000	0.0000	0.0035	0.0233*	0.0000	0.0000
	(0.00972)	(0.01218)	(.)	(.)	(0.01028)	(0.01288)	(.)	(.)
After x Child$t$	-0.0332**	-0.0355**	-0.0732**	-0.0480	-0.0468***	-0.0490***	-0.0873**	-0.1341**
	(0.01520)	(0.01517)	(0.03550)	(0.06589)	(0.01600)	(0.01600)	(0.03735)	(0.06730)
N	4,150	4,150	4,150	1,537	3,196	3,196	3,196	1,188
Sample	All	All	All	15≤Child≤20	All	All	All	15≤Child≤20
Controls	NO	YES	NO	NO	NO	YES	NO	NO
Individual FE	NO	NO	YES	YES	NO	NO	YES	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. In (1), (2), (3) & (4) sample restricted to Domestic Workers who are informally employed in t. In (5), (6), (7) & (8) sample restricted to Domestic Workers who are informally employed in t and are either single or married to an unregistered husband (out of the labor force, unemployed or informally employed) in t. The dependent variable is equal to 1 is the individual became a registered Domestic Worker and 0 otherwise during their panel. In (1) & (5), no controls and no individual fixed effects are used. In (2) & (6), controls in t are used (no individual fixed effects). In (3), (4), (7) & (8) individual fixed effects are used. In (4) & (8), sample restricted to age of Domestic Workers' youngest child being either (15, 16, 17) or (18, 19, 20) in t. * significant at 10% ** significant at 5% *** significant at 1%

Table 3.19: Triple Difference: Effect of welfare on the probability of transitioning to a registered employment after new regulation, by occupation & age of youngest child

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Registered						**Unemployed**					
Variable	Total			S & MU			Total			S & MU		
After	0.0047	0.0043	0.0000	0.0059	0.0054	0.0000	-0.0281	-0.0288	0.0000	-0.0252	-0.0259	0.0000
	(0.02501)	(0.02501)	(0.05786)	(0.02543)	(0.02544)	(0.06094)	(0.01845)	(0.01845)	(0.04233)	(0.01966)	(0.01967)	(0.04672)
Child$t$	0.0255	0.0263	0.0000	0.0193	0.0200	0.0000	-0.0023	-0.0006	0.0000	0.0002	0.0014	0.0000
	(0.01725)	(0.01729)	(.)	(0.01768)	(0.01771)	(.)	(0.01273)	(0.01275)	(.)	(0.01367)	(0.01369)	(.)
DWt	0.0013	0.0013	0.0000	-0.0086	-0.0087	0.0000	-0.0097	-0.0098	0.0000	-0.0069	-0.0070	0.0000
	(0.01837)	(0.01837)	(.)	(0.01883)	(0.01883)	(.)	(0.01355)	(0.01355)	(.)	(0.01456)	(0.01456)	(.)
After x Child$t$	0.0210	0.0212	0.1325**	0.0176	0.0178	0.1171*	0.0337*	0.0343*	0.0530	0.0335	0.0340	0.0631
	(0.02694)	(0.02694)	(0.06300)	(0.02773)	(0.02773)	(0.06695)	(0.01987)	(0.01987)	(0.04609)	(0.02144)	(0.02144)	(0.05134)
After x DWt	0.0501*	0.0505*	0.1548**	0.0573*	0.0578*	0.1618**	0.0342	0.0349	0.0476	0.0268	0.0274	0.0588
	(0.02884)	(0.02884)	(0.06681)	(0.02963)	(0.02964)	(0.07049)	(0.02127)	(0.02127)	(0.04888)	(0.02291)	(0.02292)	(0.05405)
DWt x Child$t$	-0.0252	-0.0253	0.0000	-0.0157	-0.0157	0.0000	0.0049	0.0048	0.0000	0.0015	0.0015	0.0000
	(0.02013)	(0.02013)	(.)	(0.02089)	(0.02089)	(.)	(0.01485)	(0.01485)	(.)	(0.01615)	(0.01615)	(.)
After x DWt x Child$t$	-0.0542*	-0.0545*	-0.2057***	-0.0643**	-0.0648**	-0.2045***	-0.0290	-0.0298	-0.0474	-0.0199	-0.0205	-0.0568
	(0.03145)	(0.03145)	(0.07360)	(0.03270)	(0.03270)	(0.07833)	(0.02320)	(0.02320)	(0.05384)	(0.02528)	(0.02528)	(0.06006)
N	6,290	6,290	6,290	4,844	4,844	4,844	6,290	6,290	6,290	4,844	4,844	4,844
Controls	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO
Individual FE	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES

Source: Own calculations based on the Argentinean Permanent Household Survey (EPH) [103], 2010-2017.
Note: Linear Probability Model. Controls include: age, age squared, marriage status, husband's labor status, number of children, household head status, high school graduation status, number of household members, number of employed household members. In (1)-(3) & (7)-(9) sample restricted to women who are informally employed in t. In (4)-(6) & (10)-(12) sample restricted to Domestic Workers who are informally employed in t and are either single or married to an unregistered husband (out of the labor force, unemployed or informally employed) in t. In (1)-(6), the dependent variable is equal to 1 is the individual became a registered worker (within same occupation) and 0 otherwise during their panel. In (7)-(12) the dependent variable is equal to 1 is the individual became unemployed and 0 otherwise during their panel.In (1), (4), (7) & (10) no controls and no individual fixed effects are used. In (2), (5), (8) & (11) controls in t are used (no individual fixed effects). In (3), (6), (9) & (12) individual fixed effects are used. * significant at 10% ** significant at 5% *** significant at 1%

Chapter 4: Occupational Licensing and Labor Informality: Evidence for Nail Technicians

4.1 Overview

Labor informality is not new to the developing world. Nevertheless, studies that have formality considered as a possible margin of response in developed economies are not as widespread (Williams and Windebank, 1998; Williams and Lansky, 2013; Medina and Schneider, 2018). In this chapter, then, I analyze a possible channel through which another policy, regulations, might affect the formal margin in the United States. Specifically I study the effect of occupational licensing requirements on the informal employment of a particular group of low-skilled workers: nail technicians[1]. My hypothesis is that stricter regulations for obtaining a license increase the cost of operating in the formal sector, and therefore holding an off the book job can be a possible response mechanism to try to avoid it.

By exploiting state-level variation in the strictness of the regulation to get a nail technician license, the chapter analyzes the effect of the regulation on two proxies for informality. The first is the probability that a nail technician is self-employed

[1] Along the chapter I will use either the term nail technicians or manicurists to refer to the same group of workers in the nail industry

rather than a salaried employee. The second approach is the probability that a nail technician reports not to hold a professional license in states that require one to work in such occupation. To test the first approach, I will use the 2012-2016 5-year American Community Survey (ACS), and the Current Population Survey (CPS) for the period 2015-2017. For the second one, I will use questions on occupational licensing added to the CPS starting in January 2015 (also for the period 2015-2017).

The study uses characteristics of the state-level Board of Cosmetology as instruments for the strictness of the regulation measure in a instrumental variable (IV) estimation. Results show a small bust significant effect of stricter occupational licensing requirements on the probability of nail technician being self-employed but an opposite one on the probability of working without a valid license. Results differ by worker's origin.

This chapter analyzes a dimension that has not been considered so far in the context of occupational licensing regulation in the United States: the link between this form of regulation and off the book employment. Defining informality in the setting of standard household surveys in the United States is a hard task. While in the chapter I will point out towards the limitations of the use of both proxies, it is a first attempt to explore this relationship in the context of a developed economy for a low-skill occupation mostly made up of a female workforce.

Bracha and Burke (2016) found through the Survey of Informal Work Participation within the Survey of Consumer Expectations that in 2015, 20 percent of those over 21 years old generated some sort of income informally (not taxed or registered by the government). The previous translates into 16 percent of full-time workers

participating in informal work in the United States. Nightingale and Wander (2011), on the other hand, claim that the range of estimated informal employment in the United States ranges from 3 to 40 percent of the total non-agricultural workforce given the number of self-employed workers. The authors also state that, even at the low end of such range (excluding the self-employed), it means that around 4-5 million people in the United States are informal workers. Polivka and Sorrentina (2008) state that the concept of informal labor is not applicable in the United States as it is in other countries. For the authors, most workers in the United States are covered by the law and do pay taxes on their earnings – what varies is who is the party responsible for such payment (employer or employee). That is why they developed twelve different categories of nonstandard work arrangements[2] rather than labeling them as informal labor. The authors find that nonstandard work represented between 11 to 20 percent of the workforce during the 1990's, with the number growing due to immigration. Kalleberg et al. (2000) find that these forms of nonstandard employment (compared to standard forms) are more likely to be associated with "bad jobs": lower pay, lack of health insurance and lack of pension benefits. Moreover, Losby et al. (2002) look at trends in informal employment in the world, and particularly in the United States by using an approach that takes into consideration the proportion of workers in specific occupations not contributing to Social Security and the estimated percentage of the urban population operating in the informal sector. They find that informal employment in Los Angeles County in the early

[2]They include: part-time workers (both for economic and non-economic reasons); self-employed workers (both incorporated and unincorporated); independent contractors; unpaid family workers; temporary help services; leased employees; contracted out workers; on-call workers; day laborers and direct hire temporary workers

2000 accounted for 9-29 percent of total employment. In terms of characteristics of informal workers, authors agree that within a country, low levels of human capital and working in small businesses are correlated with operating in the informal sector (Amaral and Quintin, 2006; Galiani and Weinschelbaum, 2012; Nightingale and Wander, 2011). Nightingale and Wander (2011) also state that informal employment is concentrated among the poor, and that it disproportionately affects women in the United States.

The issue of informal employment in the United States is also currently getting the attention of policymakers. On January 1st, 2020 California enforced the Assembly Bill No. 5, under which an individual is presumed to be an employee rather than an independent contractor unless the employer can prove that: "A) the worker is free from control and direction of the hiring entity... B) the worker performs work that is outside the usual course of the hiring entity's business; and C) that the worker is customarily engaged in an independently established trade, occupation, or business of the same nature as the work performed" (Alexander, 2019). The basis for such regulation is to try to account for the fact that many workers under a contractor status have no access to labor regulation - like unemployment insurance and minimum wage. Aside from ride-hailing drivers, other occupations that are largely affected by this new regulation are janitors, construction workers and nail salon workers. Coalition of workers in states like New York, Oregon and Washington State are also trying to push for similar legislation (Conger and Scheiber, 2019). The previous is based on the fact that misclassification of employees as independent contractor is something that occurs in low-skilled occupation such as construction

work (Deknatel and Hoff-Downing, 2015) and nail technicians (Sharma et al., 2018; White et al., 2015).

Having a large share of the labor force operating in the shadows may have an impact not only on a deficient economic growth, but as explored in Chapters 2 and 3 also on an expanding inequality. The fact that it is usually the low-skilled, low-income workers the ones that end up in the informal sector can add to the increasing inequality in before-tax income experienced by many countries – both developing and developed - in the last decades. As Corak (2013) states, increasing inequality in outcomes in high-income countries is likely to limit economic mobility for the next generation because it shapes opportunities. Therefore, addressing the issue of off the book work (and policies that might be affecting it) is not trivial for advanced economies - not only from a tax collection perspective, but also from the possible impacts it might have on growth and, particularly, inequality - one of the central economic issues of the past several years in the United States (Swagel and Boruchowicz, 2017).

The chapter is organized as follows. Section 4.2 presents a review of the existing literature that examines the effect of occupational licensing over different labor market outcomes. Section 4.3 briefly describes the cosmetology industry in general, and the nail technician profession in particular. Section 4.4 describes the model that links regulation to labor informality and the data used for the analysis. Section 4.5 shows the empirical results, and Section 4.6 concludes with final remarks.

4.2 Previous research on occupational licensing

Labor regulation, by affecting the benefits and costs of working on the books, can influence the size of the informal sector (Almeida and Carneiro, 2012; Ulyssea, 2010). Regulations in the labor market take different forms: the establishment and protection of worker's rights, the determination of compensation and working conditions, and the rules that dictate the initiation and termination of employment relationships. In general, governments decide to intervene in the labor market for two reasons: market failures and/or exploitation (Betcherman et al., 2001). Even in the less regulated economies, the set of rules that take away certain degree of flexibility to labor markets have an impact on employment, productivity and innovation. In this chapter I will explore the possible relationship between labor regulations in the form of occupational licensing and the informal employment of a subset of low-skilled workers in the United States.

The effect of occupational licensing on different labor market outcomes – including labor force participation, employment, wages and wage dispersion and worker mobility – has been extensively studied. Off the book employment, to the best of my knowledge, has not been an outcome explored within this literature so far. This paper aims to add to the current discussion of possible unintended consequences of excessive regulation over the labor market as well as provide recommendations for policy action in what entails to occupational licensing in specific low-skilled industries.

Occupational licensing surged from the government's intention to offer health

and safety protection to consumers from unqualified service providers (Kleiner, 2015). By requiring a license for certain occupations that have an impact on consumer's health and safety, it is expected that the government will be able to improve service quality (Shapiro, 1986), limit negative externalities (Kleiner, 2006) and reduce the information asymmetries (Akerlof, 1970) present in those sectors.

Currently, around 30 percent of the workforce in the United States is required to obtain some form of licensing. That number was 4 percent in the 1950s (Zapletal, 2017). While one third of the increase in the percentage of licensed workers in the country can be explained by changes in the composition of the labor force (people moving to the service industry and leaving the manufacturer one where unions are more common), two thirds is explained by simply the growth in the number of occupations that have become licensed over time (House, 2015).

Different factors account for the previous growth. One theory is that practitioners in new sectors may view licensing as a path to professionalization, as it encourages individuals to invest in occupational skills (House, 2015).

The other theory states that incumbent workers in a certain area push for an occupational license as a way to influence policy through an active professional association. By creating entry barriers for certain occupations, occupational licensing is expected to raise wages for licensed workers (House, 2015) – even though it is not expected to reduce earning variations since the transfer of income to workers in the form of higher wages comes from consumers via higher prices (Kleiner, 2015). In other words, regulation could emerge as a way to limit competition and realize rents (Hazlett and Fearing, 1998).

Academics working on the White House Council of Economic Advisors report agree with the notion that "...the current licensing regime in the United States also creates substantial costs, and often the requirements for obtaining a license are not in sync with the skills needed for the job" (House, 2015, pg. 3). Among the different costs associated with this form of regulation, authors list restricted mobility across states, increased costs of goods and services, reduced access to jobs in licensed occupations (and worker's economic opportunity more broadly), difficulty for immigrants to work on their field of expertise - which deprives the United States market of their skills - and reduced innovation, entrepreneurship and overall growth by setting fixed arbitrary rules (House, 2015).

It is not only the before mentioned costs the ones that make an occupational licensing reform something relevant from a policy perspective, but that such costs appear to outweigh the benefits: empirical evidence has proven that occupational licensing has reduced employment and increased prices more than it has improved the quality and safety of services (Kleiner, 2015).

Kleiner and Krueger (2013) show first that licensing enhances earnings, but particular individual provisions (testing, education and fees) do not produce additive impacts. Secondly, the authors show that additional requirements beyond becoming licensed do not contribute to enhanced wages – meaning that the occupational license requirement acts like a signal rather than actually being an investment. The authors also point out that other forms of regulations such as certifications (which are less strict that licensing) have a smaller effect on wages. Finally, they also show that occupational licensing does not diminish wage variations.

On this point, it is important to differentiate the effect of occupational licensing on labor market outcomes for high-skilled and low-skilled practitioners. As Timmons and Thornton (2008) state, the literature overall supports the notion that in occupations requiring graduate education, occupational licensing increases the wages and reduces the number of practitioners within the licensed profession. Studies focused on lawyers, CPAs, dentists, radiologic technologist and physicians find robust evidence that stricter regulations increase wages, reduce labor force participation and increase prices of services (Timmons and Thornton, 2008; Kleiner, 2000; Kleiner and Kudrle, 2000; Kugler and Sauer, 2005; Jackson, 2006; Wanchek, 2010).

In terms of worker's mobility, DePasquale and Stange (2016) find no effect of the Nurse Licensure Compact (NLC) adoption – which permits registered nurses living in member states to practice across state lines and makes licensure easier to obtain for them - on the likelihood of working across state lines. They do found positive effects on travel time to work for nurses living in metropolitan staistical areas (MSAs), but not on those living in border counties. They also found minimal effects on workers' overall likelihood to move across state lines – the effect being greater for young and mobile workers.

The presence of the previous effects are not that clear when the profession under analysis is a low-skilled one, with the literature finding mixed evidence.

Adams et al. (2002) found that occupational licensing implied an increase in the price of the service and a decrease in number of visits to beauty shops. The authors estimate that imposing minimum regulations to the industry translates into $1.7 annual rents for cosmetologists, and $111 million in deadweight loss.

Timmons and Thornton (2016) examine the 1983 effect of the de-licensing of barbers in Alabama by relying on a synthetic control strategy that uses a combination of other southern states. They conclude that the de-licensing of the occupation resulted in a slight rise in the number of practitioners and a drop in relative earnings. The study is a follow up of Timmons and Thornton (2010), who found that stricter barber licensing increased worker's earnings by 11-22 percent, and resulted in a smaller number of practitioners.

Zapletal (2019) finds no effect of occupational licensing in the cosmetology industry on the number of practitioners or prices of services. However, he finds that such requirement reduces entry and exit rates. Moreover, the author also finds that states with more requirements (measured as number of mandatory hours of training required) have more instructors, a larger median size of training facilities and larger school revenues and gross profits. Nevertheless, instructors do not earn more in those states.

Following with the studies on the cosmetology industry, Timmons and Konieczny (2017) estimate the effect of Virginia's 2012 hair brading de-licensing and conclude that the removal of the hair brading license in Virginia was associated with an increase in 7 percent in the growth rate of beauty shops and expanded the opportunity for owner-operated ones by 8 percent.

For the specific occupation of nail technicians, Federman et al. (2006a) study the effect of state regulations on the entry of practitioners and their dispersion. They use the requirement of English proficiency to analyze the entry of Vietnamese immigrants into manicuring and their dispersion across the United States. They find that

the English regulation results in a fewer number of Vietnamese manicurists (which is likely to raise the price of the services they provide) and that it dissuades Vietnamese pioneers from entering new markets. More generally, they claim that such requirement prevents assimilation from this particular group of working migrants. Using the same set of workers but looking specifically at the case of California between 1987 and 2002 (and relying on administrative records of licensed manicurist in that state), Federman et al. (2006b) look at the effects of the displacement of native manicurist due to the increase in Vietnamese migrants into the occupation. They found that, contrary to the belief that migrant workers displace native ones in low-skilled occupations, displacement appears to be due to a reduction in the number of non-Vietnamese entering the industry rather than an increase in their exit rate.

4.3 The Cosmetology Industry

As seen in the previous section, cosmetology has been widely used to study the effects of occupational licensing. The industry is primarily made up of practitioners in different personal care occupations: cosmetology (aesthetics), hairdressing, hairstyle and design, hair braiding, barbering, electrology, nail technology and (in some states) body artists. According to the Professional Beauty Association, in 2012 there were over 1.1 million salon and spa establishments in the United States – which translates into a 50 billion dollar business (Association et al., 2014).

Zapletal (2019) state that there are different reasons that make the cosmetology industry a good case study. The main ones are the high cost of the license relative to the expected earnings, the variation in licensing requirements across states, the fact that it is a local phenomenon (given that it is a non-tradable service), and that it is an industry where businesses mainly employ workers from this specific occupation.

Within the industry, there is a clear distinction across occupations. While skincare specialists show the highest expected earnings and the stricter requirements to obtain a license, nail technicians have the lowest (with cosmetologists and hairdressers being in the middle). According to the Occupational Employment Statistics [230] of the Bureau of Labor Statistics (BLS), in May 2017 hairdressers, hairstylists and cosmetologists reported a mean hourly wage of $14.66, a median of $11.95 and an interquartile range of $7.17. For skincare specialists, the mean hourly wage was $16.89, the median $14.46 and the interquartile range $9.74. For manicurists, on the other hand, the mean hourly wage was $12.01; the median $11.17 and the interquartile range $3.03. In fact, as it can be seen in Table 4.1, the distribution of hourly wages for nail technicians/ manicurists resembles more the one of childcare workers or maids and housekeeping cleaners than any other occupation within the cosmetology industry. That is why nail technicians make a good candidate to study the effect of licensing for low-skilled workers. While they face an hourly wage distribution similar to childcare workers, maids or housekeeping workers, nail technicians face higher entry barriers marked by mandatory training hours required to apply for a license. In fact, childcare workers are licensed in some states. Maids and

housekeeping cleaners do not need a license to practice, and manicurists do for every state but Connecticut. None of the states require graduate education to work as a nail technicians – or as maids/housekeeping workers (Institute for Justice (2012, 2017)[231; 232]).

The nail industry is the fastest growing industry within cosmetology (Quach et al., 2008) and includes the largest population of licensed workers in the United States for a single profession (Walsh, 2012). The Bureau of Labor Statistics added a job classification in the 1980s to account specifically for workers in the nail industry, in line with the booming of the occupation: there are more than three times the number of nail salons today than 20 years ago and the estimate for the growth of manicurists for the period 2008-2018 is of almost 20 percent (Walsh, 2012). The popularity showed by the nail industry in the United States is explained by the Vietnamese immigration that transformed it and made it affordable by pushing for the opening of nail salons that exclusively dealt with manicures and pedicures (instead of being part of the services provided by general beauty salons). The concept of retail in the nail industry, the fact that nail technician is an attractive occupation for newly immigrants since English is not such a strong requirement, and the relatively low requirements that are needed (compared to other beauty related occupations) are responsible for the performance of the occupation in the last three decades (Wahowiak, 2015). Just to understand the importance of this industry Walsh (2012) notes that for every Starbucks in the United States, there are 4 nail salons.

The evolution of the industry was followed by changes in the regulation of its

practitioners. By 1985, 12 states did not require a license to work as a manicurist. In 1988 that number was cut in half. In the early 1990s Illinois (1992) and New York (1994) decided to regulate the industry (NAILS (1995)). Today, nail technicians are required to have a license to practice in every state except Connecticut, where the activity is unregulated (Institute for Justice (2012, 2017)[231; 232]).

According to NAILS (2018) – a special publication that reports on the ongoing trends of the nail industry – there were almost 400,000 active manicurist licenses in the United States in 2017. California, Texas, Florida and New York are the states with the largest share of manicurists. A survey performed by the same publication highlights that in 2017: a) 97 percent of workers were female; b) 56 percent were Vietnamese; c) 53 percent worked exclusively in a nail salon, 33 percent on a beauty salon and 4 percent on a mobile or a home-based salon; d) 37 percent claimed to be the salon owner doing nails while, 24 percent booth renters paying an average of $371 per month on rental and the rest were either employees, salon managers or apprentices; e) 33 percent of manicurist claimed to have more than one license (either cosmetology or esthetician) while 4 percent of surveyed manicurist claimed not to have a license at all; f) 44 percent of manicurist claimed their ultimate goal was to open their own salon; and g) almost 20 percent claimed that they learned what they needed to be successful in the business once they started working at a nail salon instead that at beauty school (NAILS, 2018). Similar findings are listed in the UCLA Labor Center report that explores the labor conditions of workers in the nail industry (Sharma et al., 2018).

Within the nail technician occupation, requirements vary depending by state.

Figure 4.1 shows the distribution of different aspects of the licensing requirement (on those states that require one): number of business days that have to be spent in beauty school to be allowed to apply for a license, number of mandatory training hours at beauty school required to apply for a license, the average fees charged by the state to obtain a license and the minimum grade necessary to be a manicurist. It also includes the same distribution of requirements for other professions within the cosmetology industry: barbers and cosmetologists/hair stylists. As it can be seen, the requirements for manicurists within the industry are the lowest. Moreover, across states, the variation in the requirements is substantive: required training hours range from 100 in Massachusetts to 750 in Alabama, the numbers of days go from 23 to 175, the fees can be as low as $51 or as high as $391 and while several states do not have a minimum grade required to obtain a license, others require individuals to be high school graduates.

4.4 Model and Data

4.4.1 The Model

The basic model in this paper studies the relationship between the strictness of the nail technician licensing regulation and the probability a practitioner in that occupation will be informal or off the books. For that, I will use two proxies: self-employment and claiming not to have a license in states that require one.

Self-employed nail technicians are expected not pay in full into the national pension scheme and not be affected by many other aspects of the regulatory or tax

system (Conger and Scheiber, 2019; Sharma et al., 2018; White et al., 2015). In other words, being self-employed in this approach rather than a salaried employee means having room for underreporting income in tax returns. The use of self-employment as a way to avoid taxation has been studied in the United States. The IRS report "Individual Income Tax Gap Estimates for 1985, 1988 and 1992" claims that while on average, for the years analyzed, only 2.5 percent of income earners did not file tax returns, 13 percent underreported income. While 0.0225 percent of the underreporting came from wage income, 24 percent came from informal supplier income – the highest source of underreported income after tax credits (Thomas et al., 1996). The IRS defines informal supplier income as "individuals who provide products or services through informal arrangements which frequently involve cash-related transactions or "off the books" accounting practice" (Thomas et al., 1996, pg. 43).

When trying to analyze the extent of tax evasion in the United States, Alm and Erard (2016) use self-employment data from the Current Population Survey (CPS) and findings from the Consumer Expenditure Survey (CES) to estimate the tax gap that comes from informal supplier income. In particular, they use a set of 11 industry categories where informal activities are concentrated (for example: domestic workers, street-side vendors, construction, personal services and childcare) and compare self-employed earnings from workers in those industries to IRS statistics on the amounts actually reported for tax purposes in the same categories.

Raijman (2001) also uses self-employment as a measure to analyze the extent of informal work of Mexican immigrants in Chicago. When analyzing the underground

economy in the United States, McCrohan and Smith (1983) also define workers in the informal economy as those with individual income tax returns with Schedule C (business) that appear to come from informal sources. Losby et al. (2002) state that one of the measure that can be used for calculating the percent of the population in urban areas that work informally is "...identifying individuals in public use data sets based employment characteristics associated with informality such as self-employment...in industries with a high proportion of small scale businesses..." (Losby et al., 2002, pg. 34). Nail salons and nail technicians fall under this category. The same authors categorize hairdressers and cosmetologists as one of the main industries with informal labor after childcare workers.

Finally, Abraham and Amaya (2019) conduct an experiment to try to capture the extent of informal work activity in the United States. Among the different ways to test for individuals having "side jobs", providing services to other people or to a self-employed individual or business appears as one of the main sources of labor informality.

In the particular case of the nail industry, Sharma et al. (2018) highlight that the rate of self-employment in the industry is three times higher than the national average. There are concerns that workers that should be classified as employees are purposely misclassified as self-employed in order to avoid labor and safe regulations (Sharma et al., 2018; White et al., 2015; Hoang, 2015). Adding to the consequences of not making the necessary contributions to the pension scheme, being self-employed in this case can also mean not having access to health insurance (Sharma et al. (2018) estimate that almost 30 percent of the workers in the industry

do not have it). This is particularly worrisome in an industry where workers might be at risk for occupational health conditions given the products they work with (Roelofs et al., 2008; Reutman et al., 2009; Quach et al., 2011; Huynh et al., 2019).

Regarding the second proxy, I will assume that workers claiming not to have a government issued license when one is required [3] are off the book workers. Working on the books without a license basically means exposing yourself to being "caught" and facing a punishment, as it is illegal to do so (Timmons and Thornton, 2010). Moreover, the nature of the industry means that there might be several unregistered businesses (Sharma et al., 2018) where nail technicians could perform without a license. Finally, Sharma et al. (2018) list as the main barriers for nail technicians to obtain a valid license the required hours of training at beauty schools, the years of mandatory schooling and the fact that some states require English proficiency [4].

Figure 4.2 (a)-(d) shows the two proxies for informality[5] and the number of mandatory hours of Beauty School training required to become a nail technician- which will be the main variable to measure the strictness of the occupational licensing regulation - by state. Moreover, Table 4.2 shows the rate of self-employment and of nail technicians claiming not to have a license, divided by type of state that the individual belongs to. For visualization purposes, states are categorized either as "high restriction" (with 400 hours of beauty school training required or more) or

[3]Which is every state but Connecticut during the time frame under analysis

[4]Even though a proportion of foreign born manicurists could be undocumented immigrants (Sharma et al., 2018), states like California have initiatives that allow them to still be able to obtain a proper license (CE, 2015). Nevertheless, as stated by Munson (2019), being an undocumented worker might mean being more vulnerable to work in the shadows. That is why in my analysis I control for years since migration (for estimations with the ACS sample), as well as race and ethnicity (for both ACS and CPS samples)

[5]In the case of self-employment, from two sources: ACS [250], and CPS [251]

"low restriction" (with less than 400 hours of beauty school training required). As it can be seen, there is a significant difference of between 4 and 5 percentage points in the rate of self-employment between the groups, but no difference in the rate of manicurists with no valid license[6]. The fact that the average rate of workers without a license is so high (and possibly also why it might be almost identical between both groups) can raise concerns regarding the validity of this proxy. While unlicensed workers have been reported in the literature (Sharma et al., 2018; White et al., 2015) and can be found in the list of sanitation violations in almost every state, identifying them in household surveys is not straightforwards as there is measurement error in the collection of information on licensing (something that is already observed in the licensing information in the Survey of Income and Program Participation (Gittleman et al., 2014)). Therefore, the analysis of this proxy will be mainly used as a robustness check for the ones on self-employment.

Increased regulation (either in the form of more mandatory hours of required beauty school training , stricter minimum education requirements, or additional fees) can translate into higher costs of entering the profession. As it was described, previous research on occupational licensing studied if licensing reduce the number of workers in the occupation, as increased regulation means a higher entry barrier for potential practitioners. In low-skilled professions it seems that it is not always the case that higher costs associated with entering (and remaining) in the industry mean

[6]For the same time frame the share of massage therapists that claim not to have a license was 24.7%, for hairstylist and cosmetologists it was 27.1% and for barbers 37.9%. Outside the cosmetology industry, 47.5% of pest control applicators (a licensed occupation) claim not to have a license. For maids and housekeeping workers that number was 94.3% and for fast food workers it was 97.4%. The last two occupations are unregulated

a reduced number of practitioners. That is why in this chapter I aim to examine if it is possible that, once faced with stricter regulations, the new equilibrium is not one where workers leave the labor force and/or change occupations but rather remain as a practitioner in that particular industry but as an off the book worker[7] Turning into the informal sector could be a way to either avoid the regulation cost or try to at least compensate for it.

In order to study this hypothesis, I follow Zapletal (2019); Timmons and Thornton (2016); Federman et al. (2006a) that analyze the impact of state-level regulation on the labor force participation of professionals in the industry as well as Amaral and Quintin (2006); Galiani and Weinschelbaum (2012); Garganta and Gasparini (2015) that study the main determinants of labor informality among low-skilled workers. Specifically, the main worker-level model is,

$$OB_{it} = \beta_0 + \beta_1 R_{ij} + \beta_2 Y_{it} + \sum \delta S_{ijt} + \sum \gamma X_{it} + \epsilon_{it} \tag{4.1}$$

where OB_{it} is a dummy that takes the value of 1 if the individual is an off the books nail technician and zero otherwise and R_{ij} is a measure of the strictness of the regulation faced by each individual (based on the state j where she performs her professional activities[8]). Y_{it} stand for years fixed effects, S_{ijt} for state-specific

[7]It is important to note that in Connecticut, the only state where there is no occupational licensing requirements for nail technicians, 91 nail salons and spas were ordered to temporarily close due to violations in the way they pay their employees between 2015 and 2019. Munson (2019) point to vulnerable workers who are undocumented immigrants and therefore cannot file any labor complaint, and business owners who in many cases are also immigrants themselves and do not know the law as possible causes for having workers off the books. While this chapter do not rule out such possibility, I aim to analyze if occupational licensing requirements can be another possible cause.

[8]Note that during the time analyzed, and as far as I checked, no state changed the core requirements for being a nail technician. There were adjustments (in terms of apprenticeships) in New

characteristics that depend on the period in which the individual appears in the sample and X_{it} is a matrix of individual-level characteristics. ϵ_{it} are robust standard errors.

The previous model represents a basic attempt to associate regulations to the probability an individual will be off the books. Nevertheless, it is possible that it suffers from endogeneity given that the distribution of hours by state is not random. First there might be omitted variable bias if some other market level factor not controlled in the analysis is correlated with both the licensing regulation and informal employment. For example: i) the share of high skilled workers (like CPAs, lawyers and physicians) in the state who might push for higher regulatory patterns overall as a way of obtaining higher wages and but who also aim flexibility so the overall labor market structure favors more self-employment; ii) ideology of the state given that non-interventionist government that favors less control overall can also give room for more off the book practices; iii) share of general illegal immigrants that have no option but to be off the books and therefore it is a common practice in the state. Moreover, there could be reverse causality given that occupational licensing might be more stringent in states with a greater number of off the book practitioners because of business leaders having more power there and pushing for stricter regulations to realize rents through off the book employment and being less exposed to enforcement mechanisms. In fact, lack of transparency in regulatory agencies' salon inspections, fear of employer retaliation and outdated regulatory

York in 2015 (after the publication of the article "The Price of Nails" in the New York Times (Nir, 2015) and Alaska in 2017 (Heser et al., 2017). Estimations were performed with all the states and excluding Alaska and New York and I find similar results (not shown). In none of the specification is Connecticut included.

standards have been listed as common practices in the industry (Sharma et al., 2018; Quach et al., 2015; Taykhman, 2016). It could also be the case that there is self-selection: individuals that have more propensity to be off the books can actually decide to work as manicurists on states with higher regulations given that, as shown in Section 4.2, wages tend to be higher there. Finally, in the case of the estimations with CPS data, the fact that there is no distinction between state of residence and state where the individual works implies that there might be an incorrect imputation of the strictness measure if the worker commutes. This could mean measurement error in the main independent variable, and therefore the estimate of the effect could be biased towards zero (Greene, 2008).

To eliminate any possible endogeneity, I propose an instrumental variable (IV) approach using different instruments linked to the characteristics of the Board of Cosmetology. In this approach, the instruments have to be correlated to the probability of a state imposing stricter licensing regulations, but not with the probability that a manicurist will be an off the book worker.

The first stage, following Timmons and Thornton (2008), of the estimation will be,

$$R_{ij} = \beta_0 + \beta_1 INST_{ij} + \beta_2 Y_{it} + \sum \delta S_{ijt} + \sum \gamma X_{it} + \nu_{it} \tag{4.2}$$

where R_{ij} is a measure of the strictness of the regulation, $INST_{ij}$ is the instrument (based on characteristics of the Board of Cosmetology)[9], and the rest are

[9]Note that the use of instruments related to the Board of Cosmetology are still done at the state level, and therefore do not solve the possible measurement error that comes from the fact

the same exogenous variables from the basic model.

The second stage then will be,

$$OB_{it} = \beta_0 + \beta_1 \hat{R}_{ij} + \beta_2 Y_{it} + \sum \delta S_{ijt} + \sum \gamma X_{it} + \epsilon_{it} \tag{4.3}$$

where $\hat{R}_{ij}$ is the estimated strictness of the regulation of Equation 4.1.

4.4.2 Data

4.4.2.1 Dependent variable and controls

a. Proxy 1: self-employment In order to use self-employment as proxy for off the book employment, I will estimate the model using the micro data sample of the 2012-2016 5-year American Community Survey (ACS) and the Current Population Survey (CPS) for the period June 2015 - December 2017[10] in IPUMS.

The ACS is a national survey collected continuously every year in every county in the United States. Therefore the ACS estimates are aggregation of data collected over a five-year period (Pollard and Jacobsen, 2018). In particular, I will restrict my sample to those individuals who are categorized as "miscellaneous

that on CPS data there is no distinction between state of residence and state where the individual works. This means that the results could still be underestimating the true effects of regulation on the probability a nail technician is an off the book worker and therefore represent a lower bound

[10]In May 2015 changes to the apprenticeship program in New York were introduced after the NYT article titles "The Price of Nails" (Nir, 2015) and therefore I start my analysis after that. Moreover, as will be explained for the other proxy, in January 2015 a set of questions on occupational licensing were added to the CPS. Given that it takes time for respondents to adjust to new questions, I decided not to use the first months of implementation of the survey. Moreover, in April 2018 California ruled to impose stricter requirements to classify individuals either as employees or independent contractors. Even though, as it was previously exposed, the legislation entered into effect on January 2020 (Alexander, 2019), to prevent any possible anticipatory effects I finished my sample in December 2017.

personal appearance workers"[11] who work in "nail salons and other personal care services" or in "beauty salons" following Federman et al. (2006a,b)[12]. The final sample consists of 10,982 working nail technicians, distributed along 5 years and across every state that requires a license to be part of that occupation. Note that the ACS does not follow the same person across years (not a panel) and therefore observations are treated as repeated cross sections. Moreover, note that Connecticut is not part of the final sample as it is the only state that does not require a license to be a nail technician.

Table 4.3 presents a set of individual-level and state-level characteristics for the 2012-2016 5-year ACS sample of manicurist. Individual characteristics include age, gender, marital status, high school completion, family size, race, Hispanic origin, Vietnamese ancestry (given the importance of this group in the industry), English proficiency, years in the United States if an immigrant, place of work dummy and commuting time in minutes (as a proxy for personal wealth)[13]). In terms of state-level controls, the ones included are per capita income (current prices), urbanization level, women labor force participation,

[11] In the ACS dataset, "miscellaneous personal appearance workers" is codified with the code 4520. Among those working in "nail salons and other personal care services", miscellaneous personal appearance workers account for 50% of the sample (around 34% are massage therapists, 6% are first-line supervisors and 8% are other personal care and service workers)

[12] Federman et al. (2006a,b) only use "miscellaneous personal appearance workers" working in "nail salons and other personal care services" (industry code 8990); I add "beauty salons" (industry code 8980) given that many manicurists work in those locations according to the Occupational Employment Statistics (Division of Occupational Employment Statistics, 2017) and NAILS Magazine (NAILS, 2018). I present results for the whole sample and also restricted to "nail salons and other personal care services"

[13] Higher wages are usually located in urban areas, but there housing prices are also higher. Therefore, workers that do not earn enough to live close to urban areas have to incur in more commuting time (So et al., 2001; Dauth and Haller, 2019. I will then assume that higher commuting time in minutes means a lower personal wealth.

minimum wage, share of foreigners and share of cosmetology practitioners over state's total labor force participation.

As it can be seen, nail technicians that work in states categorized as "high restriction" (400 or more hours of mandatory training in beauty schools) live in poorer, less urbanized states that present lower shares of foreign-born residents, lower levels of women labor force participation and lower minimum wages. They are also slightly younger, being a male is more common (although for both groups the share of females is over 80 percent), have a higher probability of being from a Vietnamese origin (and less of being considered whites or Hispanic) and are slightly wealthier as they commute less.

The Current Population Survey (CPS), on the other hand, is the household survey of the United States, conducted by the United States Census Bureau for the Bureau of Labor Statistics (BLS). It is collected monthly and encompasses about 60,000 U.S. households; its main objective is to analyze the demographic characteristics and employment status of the population. Once again I will restrict my sample to those individuals who are categorized as "miscellaneous personal appearance workers" (code 4520) and work in "nail salons and other personal care services" (code 8990) or in "beauty salons" (code 8980) for the period June 2015 – December 2017. The sample consists of 2,269 working nail technicians observations. In this case an individual and a quarter uniquely identify each observation given the rotating nature of the CPS survey[14]. Table 4.4 presents the summary statistics for this sample. In

[14]For estimations, robust standard errors and years fixed effects are used to be able to prevent

this case, the individual characteristics include: age, marital status, gender, family size, a dummy for living in a city, race[15], high school completion, family income and a dummy that takes the value of one if the place of work is a nail salon and zero otherwise. For the estimations using this sample, I will also include state level characteristic variables for the corresponding years that come from the ACS data set. It can be seen that manicurists in states with low restrictions have a lower probability of being married and have smaller families; they graduate high school at higher rates, have a higher probability of being white, a lower one of being Asian and work in an exclusive nail salons at a lower rate.

The differences between the sample size, the representation level and the objective of each survey (which determines the questions that are asked) makes it virtually impossible to compare the results of both measures for off the book work. Nevertheless, the direction of the effect and overall magnitude should be similar if results hold[16]

b. Proxy 2: self-reporting of no professional license The idea for such proxy comes from the fact that the Current Population Survey (CPS) added a set of questions on occupational licensing starting January 2015. The new questions were,

the correlation of the error term for different quarters for the same individual

[15]The CPS does not include questions regarding ethnic origin. Nevertheless, given the important presence of the Vietnamese community in the nail industry, I divide the race variable into dummies for Whites, Asians (as a proxy for Vietnamese) and all other

[16]Moreover, as it was explained in previous sections, the fact that in the CPS there is no distinction between state of residence and state where the individual works implies that there might be an incorrect imputation of the strictness measure if the worker commutes.

1. Has active professional certification or license?
2. Has government-issued certification or license?
3. Is certification required for job?

Since anyone answering **NO** to the first question of occupational licensing in the CPS appears as missing for the rest of the questions, it is not possible to use the difference between requirement and having a license as a direct measure of informality within the database. Therefore, I will use occupation and state where the individual lives to determine the license requirement, and then tag as informal those who do not have an active license or who claim to have one but it is not a government issued one. As it was previously stated, this proxy will be used as a first exploration of the new questions added to the CPS. While in theory it could be used as a measure for informal employment given that working on the books without a license basically means exposing yourself to being "caught" and facing a punishment, as it is illegal to do so (Timmons and Thornton, 2010), given the measurement error concerns surrounding it I will mostly use it as a robustness check for the results on self-employment.

The fact that I use household survey data for my analysis means that I have detailed data on workers but not on employers - therefore the results that I observe are a product of an interaction between both nail technicians and business owners.

4.4.2.2 Main independent variable: strictness of the regulation

Neither the ACS nor the CPS carry information regarding strictness of licensing requirements for manicurists. Therefore, in order to test my hypothesis, it was necessary to merge the previously mentioned datasets with information from external sources. Information regarding the requirements to become a nail technician comes from the report "License to Work – A National Study of Burdens from Occupational Licensing" from the Institute for Justice (Carpenter et al., 2012, 2017).

The previous report provides licensing requirements information for 102 low-income occupations across all the states, exposing how "...these barriers to entry can pose substantial difficulties for job seekers and would-be entrepreneurs" (Executive Summary). By doing a thorough review of licensing requirements, the report finds that occupations within the cosmetology industry, as well as truck and bus drivers and pest control applicators, are the ones that are licensed by almost all states, making it one of the hardest profession to enter. Moreover, it also states that cosmetology requirements are disproportionate compared to the actual risk to public health and safety: while cosmetologists on average need to complete a year of education to get a license, emergency medical technicians just need a month.

The report not only ranks states regarding their licensing requirements for the 102 low-income occupations, or occupations given their average requirements, but also provides state-level information regarding number of mandatory hours of beauty school training, fees, minimum grade and number of exams necessary to obtain each license.

I will use the number of beauty school training hours required by the Board of Cosmetology to obtain the license (which did not experience changes between 2012 and 2017 - the two editions of the report) as the measure of strictness of the regulation following authors like Zapletal (2019); Adams et al. (2002). Hours of training is a measure easy to compare across states that represents the opportunity cost of obtaining the license. However, I also performed the estimations on other strictness measures such as number of days of Beauty School required, fees in dollars required to get a license and the minimum grade that needs to be completed to work as a registered manicurist with similar results (not shown).

4.4.2.3 Instruments

Following Timmons and Thornton (2008); Adams et al. (2002); Jang (2003); Graddy and Nichol (1989), the first instrument I will use is the size of the Board of Cosmetology for each state. The literature states that the size of the board should be positively related to the measures of strictness of the regulation (having more people, each of them with their own claims and ideas, should mean that the state ends up with more regulations than a Board with less people where a consensus is easier to reach to). However, such measure on its own should not influence the probability a worker is on or off the books. The data for the size of the Board of each state comes from the National-Interstate Council of State Boards of Cosmetology (NIC) and each Board's legislation. NIC provides information on legislative changes for each particular state regarding the regulation of the cosmetology industry, as well

as information for test takers and data of the industry overall. On average the Board of Cosmetology has 8.1 members. However, the variation is big: while some states have Boards of just 4 members, others have as much as 14. See Figures 4.2 & 4.4.

I will also use as an instrument the training requirement (in mandatory hours of beauty school training) to obtain a barber license. Barbering is a profession that is regulated by the same Board as manicurists in most states (Timmons and Thornton, 2010), but it is unlikely that people will transition from one profession to the other based on changes in requirements (particularly considering that most manicurists are female and most barbers are men). The same is not true for the other occupations within the cosmetology industry. According to Timmons and Thornton (2016) the only service within the industry for which cosmetologists and barbers cannot be substitutes is precisely nail technicians: while cosmetologists can perform the tasks of a nail technician, it is illegal for barbers to do so. Therefore, requirements to become a barber are correlated with the strictness of the regulation of the manicurist profession (they are regulated by the same Board), but unlikely have incidence in the probability a nail technician will work off the books as their services are not interchangeable. In fact, the last point is the one that prevents me from using cosmetologists/hairdressers requirements as an instrument: not only people in those professions can also perform the tasks of a manicurist (while the reverse is not true), but it can also be the case that changes in the requirements for those occupations incentivize manicurists to change professions within the industry. The data for barber's requirements come from the Institute for Justice. See previous Figure 4.2.

4.5 Results and Discussion

4.5.1 Proxy 1: self-employment

To study the possible impact of regulation on the probability of being an off the book nail technician, I estimate Equation 4.1 using both the data for nail technicians from the ACS and the CPS.

Table 4.5 shows the results of the estimation of a Linear Probability Model[17]. The basic model shows the expected results in terms of direction and significance, while the magnitudes are relatively small. In particular, the ACS data shows that 100 more hours of mandated Beauty School training increases the probability that a nail technician will be self-employed in 1.04 percentage points. When divided by ethnic origin, it can be seen that there seems to be no effect for Vietnamese manicurists, but for non-Vietnamese the effect is doubled as that of the entire sample. For the CPS data, the same table shows that 100 more hours of required Beauty School increases the probability that a nail technician will be self-employed in 2.19 percentage points or 2.55 percentage points for those manicurists only working in nail salons. For Asians, the effect of 100 more hours of mandated training is an increase in 1.92 percentage points in the probability of being self-employed (with the figure being 1.47 for those working solely in nail salons). For non-Asians, 100 more hours of required Beauty School increases the probability of self-employment in 3.53 percentage points (5.45 percentage points for those working only in nail salons).

[17] I also estimated the model using a Probit model. Results of the marginal effects of such estimation give almost identical results as the LPM

The conclusion from this first approach would be that regulations have a relatively small effect in the probability that a nail technician is an off the book worker, after controlling for different individual and state level characteristics.

Nevertheless, as it was explained in the previous section, it is possible that the regulation measure suffers from endogeneity. To control for such possible endogeneity problem, I perform an Instrumental Variable regression and fit a linear model in both stages[18].

Table 4.6 shows the results of Equations 4.2 and 4.3. In terms of self-employment measured in the ACS dataset, the results of the first stage show the validity of the instruments and the ones from the second stage validate the previous findings. In particular, it can be seen that the effect of 1 more member of the Board of Cosmetology translates into an increase of 58 hours of mandated training, and that 100 more hours of required training for barbers means an increase of 115 hours in the mandated training for nail technicians (effects vary for the different restricted samples; all show the similar size, direction and significance except for Board Size for non-Vietnamese). It can also be seen that the partial R^2 of the two instruments account for 33% of the total R^2 of the model fitted in the first stage. The effects of the second stage go in the expected direction, but are of a higher magnitude than when I was not controlling for possible endogeneity. In particular, a 100 hour increase in the requirement of Beauty School for nail technicians now translates into an increase of 4.95 percentage points in the probability of being self-employed

[18]I also perform the same estimations using the IVPROBIT package where the second stage is a binary dependent variable and I arrive to similar results (not shown)

within that occupation. For Vietnamese there seems not to be an effect, and for non-Vietnamese the previous figure is 7.51 percentage points (and 4.82 percentage points for those working only in nail salons).

When the same is calculated using the CPS data set (see Table 4.6) an increase in 100 hours in the requirement of mandated beauty school training translates into an increase of 2.14 percentage points in the probability of being self-employed, though such increase seems to be statistically significant only at 10 percent level. For those nail technicians only working on nail salons, such figure is not statistically significant different from zero. Moreover, the effect for Asians is not significant, and the one for non-Asians is still positive and significant. For those non-Asians working in both beauty salons and nail salons, an increase in 100 hours in the training hours of beauty school translates into an increase of 7.69 percentage points in the probability of being self-employed. For those only working in nail salons, that figure is 9.76 percentage points (the double of the OLS estimates)[19].

Two conclusions can be drawn from this analysis. First, the estimations with both samples point out to similar effects: positive and significant for the the total sample, and for the sample of non-Vietnamese nail technicians (both in beauty salons in nail salons, and solely in nail salons) as expected; and not significantly different from zero for Vietnamese workers. A possible explanation for the differences between ethnic origin could be that Vietnamese manicurists make their working decisions within their own network (Sharma et al., 2018; Eckstein and Peri, 2018;

[19]See that the first stage with this sample gives the same sign and significant that in the case of the ACS, but: 1) the effect of the instrument Board Size is larger in magnitude; 2) the partial R^2 represents a higher percentage of the first stage R^2 (56% for the entire sample)

Garcia-Navarro, 2019) and therefore it could be the case that they are not moved by changes in state regulations. Second, the results of the IV estimation show that the OLS seems to have underestimated the effect of the strictness of the regulation on self-employment.

4.5.2 Proxy 2: Self-Reporting of No Professional License

I perform next the same estimations as before with the CPS data set and using no having license when one is required as a measure of informality or off the book work. Contrary to what I expected, the results of the Linear Probability Model estimation of Equation 4.1 do not present the positive significant sign for the different measures of regulation as expected. Table 4.7 shows that hours of beauty school required do not seem to impact the probability of not having a nail technician license when it is required. That is true both for the unrestricted sample as well as when the analysis is done only for those working exclusively at nail salons. The previous conclusions hold when I only analyze the effect for those who self-identify as Asians as well as non-Asians. The results are not surprising given what was observed in Table 4.2, and considering the issues already exposed regarding this outcome.

I also perform an IV estimation using the same instruments. Table 4.8 shows the results of both stages for the entire sample, and later I also present the results for both Asians and non-Asians (also divided by working in both beauty salons and nail salons, and also only for nail salons). For the entire sample as well as for

the restricted sample of Asians and contrary to what I expected, the results are significant and negative, meaning that stricter regulations reduce the probability a nail technician will practice without a license when one is required. In particular, for the entire sample, an increase of 100 hours of mandated training decreases the probability of claiming to be unlicensed in 6.42 percentage points. For non-Asians the results are of similar magnitude and negative, but not statistically significant different from zero.

The previous findings go against my working hypothesis. One possible explanation for this counter intuitive result is that people might associate stricter regulations to a stricter enforcement; and since working without a valid license is a crime in those state that require one, manicurist might be less tempted to work illegally when the requirements are high. This goes in line with Timmons and Thornton (2010) who claim, "... the regulations are indeed enforced" (Timmons and Thornton, 2010, pg. 744-45). To account for this, I collected information regarding fines (in USD) for practicing without a license analyzing each state sanitary violation code. Figure 4.3 shows the frequencies of the average fine (for the first, second and third offense) in the different states that license this occupation. I included such variable as another covariate in the previous analysis to control for the "risk" of working off the books, but results do not differ (except for working without a license, in which case results are slightly smaller in magnitude, but still negative and significant). In fact, the correlation between fines and self-employment is -0.0260 and with reporting not having a license is 0.0361 in the CPS data, and -0.0052 for self-employment in the ACS data. At the state level, the correlation between fines and hours of Beauty School

training required is -0.0526 - meaning that the relationship is negative, contrary to what was expected. While I do not have information regarding the enforcement of the previous fines Sharma et al. (2018) states that there are challenges in enforcing labor rights. Given that there seems to be no relationship between the punishment for non-compliance, strictness of the regulation and measures of off the book employment, the previously mentioned measurement error in licensing questions in household surveys (something that is already observed in the licensing information in the Survey of Income and Program Participation (Gittleman et al., 2014)) is another explanation. The high proportion of workers without a license within this occupation that I find (see Table 4.2) contributes to a hypothesis of sampling issues. Therefore, conclusions regarding the second proxy sould be taken with caution.

4.6 Conclusion

Policy practitioners are considering changes to the occupational licensing regulation based on the findings of different empirical research (Kleiner, 2015; Sharma et al., 2018; House, 2015). Alternative forms of occupational regulations, like certification (allowing any person to legally perform the relevant tasks, but with the government administrating an examination and certificating those who have achieved the requisite level of skill and knowledge), registration or mandatory bonding (a guarantee of performance that can cover the cost of a claim from an unsatisfied client) are seen as possibilities. Not only the previous alternatives would reduce the cost of administering and enforcing the regulation, but they would also be a way

of reducing barriers and stimulate competition – which would allow consumers to benefit from lower costs, and therefore could increase the quantity of services demanded and boost tax revenues for those services that are taxed. In the case of the nail industry, it is interesting to note that both businesses and workers are licensed. However, most of the current issues for nail salon workers arise from businesses not complying with labor, health and safety regulation (Sharma et al., 2018; Nir, 2015). Occupational licensing reform is targeted then at reducing barriers for licensing for workers, and in no case it is aiming at reducing the assurance of the industry's health standards. This paper is intended to add to the previous discussion by examining another margin at which occupational licensing might be having an impact: off the book employment. As it was presented in this paper, the risks of having a high proportion of off the book workers in low-skilled occupations go from not having workers adhere to the laws and regulations that are standard for salaried employees to higher turnover rates - and the risk of not having a permanent job which creates all sorts of distortions for low-income populations. At the macro level, a higher share of off the book workers in occupations characterized by small scale businesses and low levels of human capital can lead to less tax revenue and less contributions to the national pension scheme - possibly contributing to the increase of inequality.

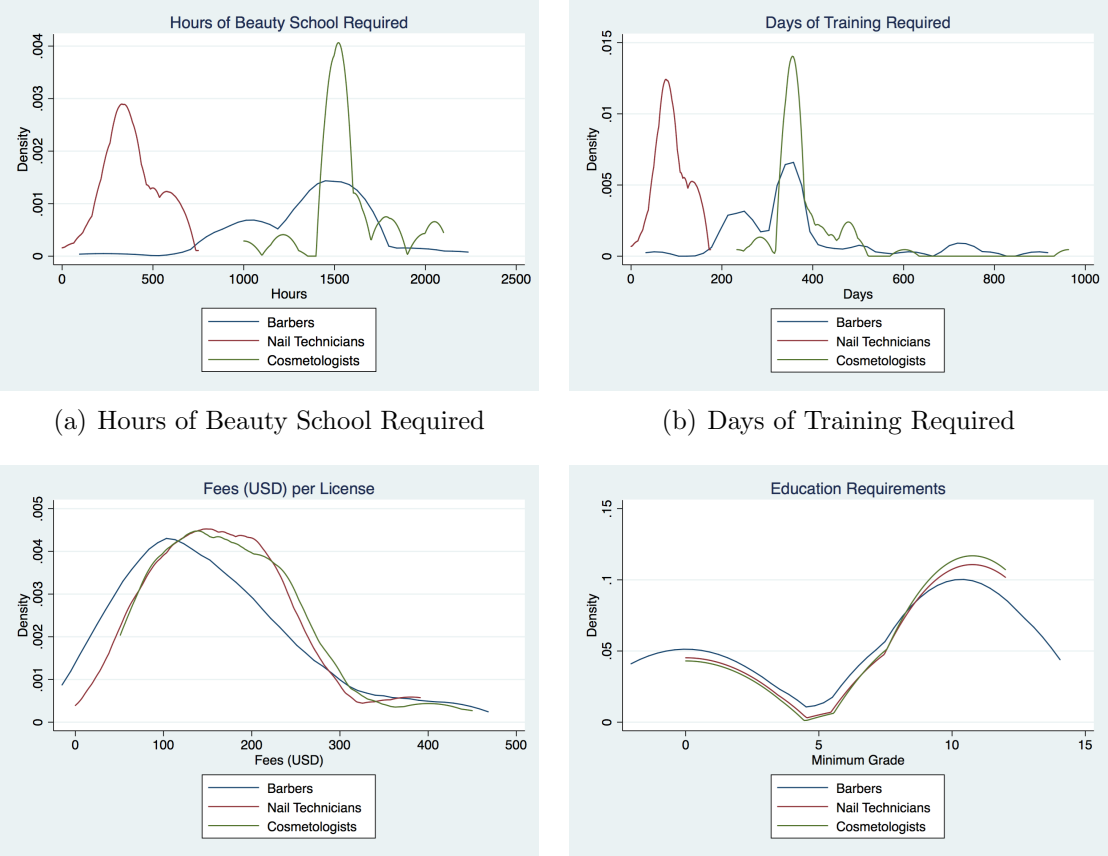
Results of the estimations performed in this chapter show that in the case of self-employment, stricter regulations are associated with a higher probability that a nail technician will be off the books. When looking specifically at the impact by ancestry, it can be seen that the previous point holds for non-Vietnamese workers, but not for Vietnamese ones who, as previously stated, might be making their

employment decisions within their social network.

In the case of working without a license when one is required by the government, I find that stricter regulations actually decrease the probability a manicurist will be an informal worker. The results hold when I add as another control the average fine amount for non compliance as a measure of enforcement. This result should be taken with caution given the possible measurement error that information on licensing present in household surveys.

This chapter is a first attempt to explore the relationship between strictness of the occupational licensing regulation in low-skill occupations and proxies for informal labor in the context of a developed economy. As such it contributes to the literature on the labor market outcomes effects of occupational licensing in low-skilled occupations as well as to the literature of the overall effects of the entry costs on determining the size of the informal sector. From a policy perspective, as an anecdote, after the publication of the article about the working conditions in nail salons in New York City by The New York Times (Nir, 2015), the response of the state was to create the free "Nail Specialty Trainee" training program as a way to reduce the strictness of the occupational licensing regulation (Bisulco, 2015). The results of the estimations of this chapter show, in line with the previous fact, that there is a relationship between the variables that could be added to the outcomes under analysis when considering reforms to occupational licensing. Given that this was a first attempt to explore this relationship , it could be taken as a stepping stone for further research: for example doing event studies as a way to look for the possible biggest shock (exploiting the availability of time series labor market data at

the state level and the difference in timing in the introduction of the nail technician license per state - like the introduction of the nail technician license in New York back in 1994).



(a) Hours of Beauty School Required

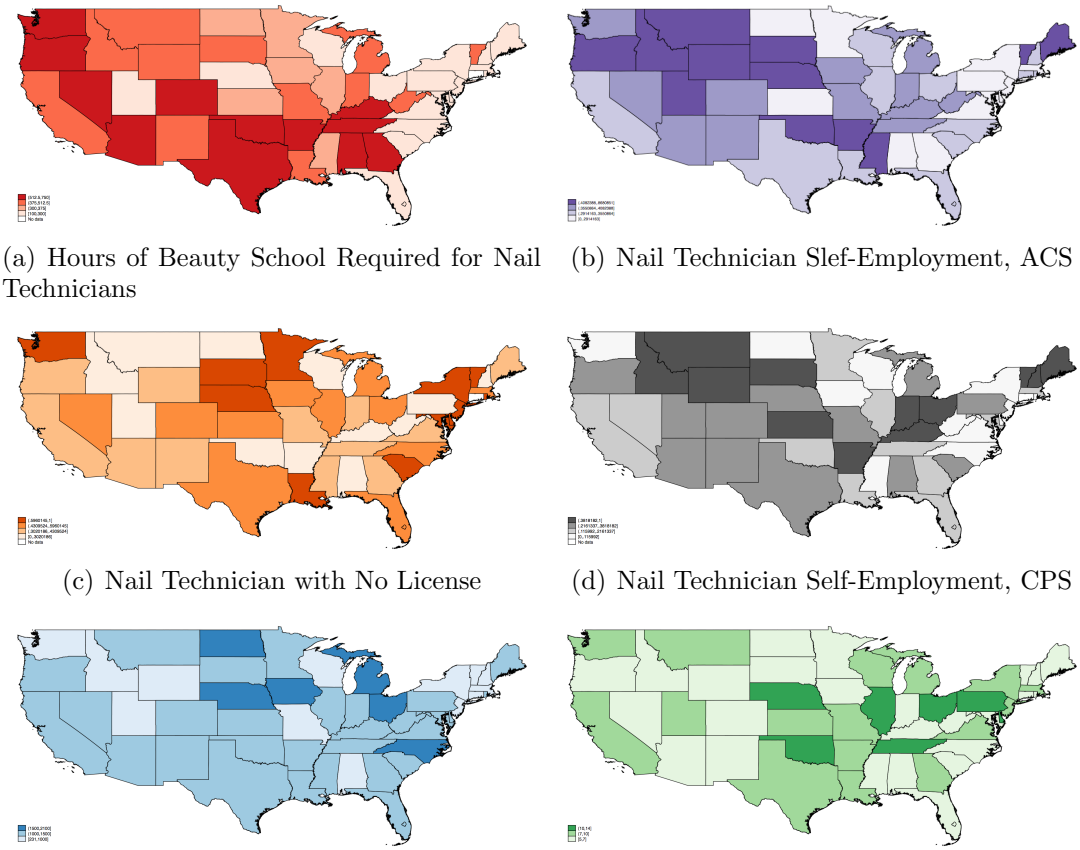
(b) Days of Training Required

(c) Fees (USD) per License

(d) Education Requirements

Figure 4.1: Distribution of Occupational Licensing Requirements by Occupation, Cosmetology Industry

Source: Institute for Justice (2012, 2017)[231; 232]



(a) Hours of Beauty School Required for Nail Technicians

(b) Nail Technician Slef-Employment, ACS

(c) Nail Technician with No License

(d) Nail Technician Self-Employment, CPS

(e) Hours of Beauty School for Barbers

(f) Board of Cosmetology - Size

Figure 4.2: Occupational Licensing Regulations for Nail Technicians and Barbers, Off the Book Employment for Nail Technicians and Board of Cosmetology Size (by State)

Source: Institute for Justice (2012, 2017)[231; 232], IPUMS-American Community Survey (ACS) 2012-2016 [250], IPUMS-Current Population Survey (CPS) 2015-2017 [251], author's compilation based on individual States' Board of Cosmetology regulations

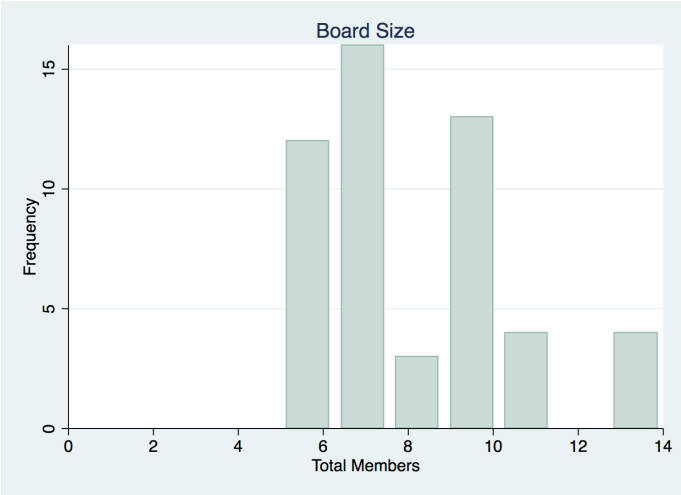


Figure 4.3: Distribution of Cosmetology Board Sizes

Source: Author's compilation based on individual States' Board of Cosmetology regulations

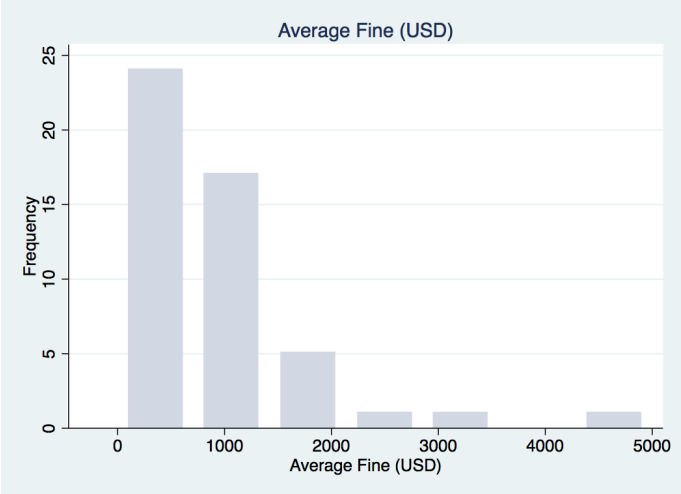


Figure 4.4: Distribution of Average Fines (USD) for Nail Technicians Working Without a License

Source: Author's compilation based on individual States' Board of Cosmetology regulations

Table 4.1: Hourly Wage Distribution (USD) - Selected Occupations (2017)

	10%	Median	90%	Mean
Cosmetology Industry				
Cosmetologist/Hairdresser/Hairstylist	8.73	11.95	24.36	14.66
Manicurist	9.37	11.17	15.89	12.01
Barber	8.95	12.33	23.31	14.65
Skincare	8.97	14.46	28.27	16.98
Other Low-Income Occupations				
Childcare Worker	8.41	10.72	15.76	11.42
Maids/Housekeeping	8.52	10.99	16.87	11.84

Source: Occupational Employment Statistics (OES), May 2017 [230].
Note: Childcare workers are licensed in some states (the literature suggests it is the occupation with the highest rates of non compliance to Social Security contribution - around 85% (Losby et al., 2002)); maids and housekeeping cleaners are not required to hold a professional license in any state (Institute for Justice (2012, 2017)[231; 232])

Table 4.2: Outcomes for Nail Technicians

	(1)	(2)	(3)	(4)
Variable	**Low Strictness**	**High Strictness**	**Difference**	**p-score**
Panel ACS				
Self-Employment	0.299	0.337	-0.038	0.001
	(0.458)	(0.473)		
N	7,686	3,296		
Panel CPS				
Self-Employment	0.159	0.207	-0.048	0.009
	(0.366)	(0.405)		
No License	0.477	0.476	0.000	0.988
	(0.500)	(0.500)		
N	1,504	765		

Source: IPUMS-American Community Survey (ACS) 2012-2016 [250] for Panel ACS & IPUMS-Current Population Survey (CPS) 2015-2017 [251] for Panel CPS.
Note: Weighted means. Standard Deviation in parenthesis. (1): Nail Technicians in states where hours of beauty school required to become one are ≤ 400. (2): Nail Technicians in states where hours of beauty school required to become one are > 400

Table 4.3: Summary Statistics, ACS

Variable	(1) Low Strictness	(2) High Strictness	(3) Difference	(4) p-score
Individual Characteristics				
Age	40.742	39.916	0.826	0.003
	(11.175)	(10.869)		
Female	0.847	0.812	0.035	0.001
	(0.360)	(0.391)		
Married	0.552	0.570	-0.181	0.170
	(0.497)	(0.495)		
Family size	3.503	3.571	-0.068	0.163
	(1.775)	(1.795)		
HS	0.801	0.813	-0.012	0.216
	(0.399)	(0.390)		
English proficiency	0.669	0.686	-0.017	0.163
	(0.470)	(0.464)		
White	0.274	0.240	0.034	0.003
	(0.446)	(0.427)		
Hispanic	0.091	0.059	0.032	0.000
	(0.287)	(0.235)		
Vietnamese	0.432	0.568	-0.135	0.000
	(0.495)	(0.495)		
Migrant years	11.900	11.675	0.225	0.439
	(11.251)	(11.346)		
Commuting minutes	23.747	21.394	2.353	0.000
	(19.795)	(19.523)		
Work in nail salon	0.746	0.806	-0.060	0.000
	(0.435)	(0.395)		
State Characteristics				
Income per capita (USD)	50,122.916	46,455.203	3,667.714	0.000
	(6023.690)	(3624.752)		
Urbanization	0.823	0.700	0.123	0.000
	(0.176)	(0.148)		
Share foreigners	0.202	0.140	0.062	0.000
	(0.105)	(0.061)		
Female LFP	0.558	0.541	0.017	0.000
	(0.029)	(0.023)		
Minimum wage	8.158	7.581	0.578	0.000
	(0.803)	(0.627)		
N	7,686	3,296		

Source: IPUMS-American Community Survey (ACS) 2012-2016 [250].
Note: Weighted means. Standard Deviation in parenthesis. (1): Nail Technicians in states where hours of beauty school required to become one are ≤ 400. (2): Nail Technicians in states where hours of beauty school required to become one are > 400

Table 4.4: Summary Statistics, CPS

	(1)	(2)	(3)	(4)
Variable	**Low Strictness**	**High Strictness**	**Difference**	**p-score**
Individual Characteristics				
Age	41.523	41.284	0.239	0.677
	(12.003)	(11.647)		
Female	0.823	0.801	0.022	0.254
	(0.382)	(0.399)		
Married	0.534	0.631	-0.097	0.000
	(0.499)	(0.483)		
Family size	3.522	3.917	-0.395	0.000
	(1.864)	(1.961)		
HS	0.828	0.812	0.016	0.398
	(0.378)	(0.391)		
City	0.433	0.361	0.072	0.002
	(0.496)	(0.481)		
White	0.263	0.182	0.081	0.000
	(0.440)	(0.387)		
Asian	0.653	0.725	-0.072	0.001
	(0.476)	(0.447)		
Family Income	67,692.620	72,235.900	-4,543.280	0.073
	(49,865.670)	(53,575.480)		
Work in Nail Salon	0.764	0.837	-0.073	0.000
	(0.425)	(0.369)		
State Characteristics				
Income per capita (USD)	52,093.430	48,500.300	3,593.130	0.000
	(5,511.793)	(3,239.162)		
Urbanization	0.842	0.715	0.127	0.000
	(0.163)	(0.133)		
Share Foreigners	0.221	0.146	0.075	0.000
	(0.096)	(0.057)		
Female LF	0.552	0.539	0.013	0.000
	(0.028)	(0.021)		
Minimum Wage	8.701	7.853	0.848	0.000
	(1.054)	(1.001)		
N	1,504	765		

Source: IPUMS-Current Population Survey (CPS) 2015-2017 [251]
Note: Weighted means. Standard Deviation in parenthesis. (1): Nail Technicians in states where hours of beauty school required to become one are ≤ 400. (2): Nail Technicians in states where hours of beauty school required to become one are > 400

Table 4.5: Effect of Stricter Regulation on the Probability a Nail Technician will be Self-Employed

	(1)	(2)	(3)	(4)	(5)	(6)
	All		**Vietnamese**		**Non-Vietnamese**	
Variable	Total	Nail Salons	Total	Nail Salons	Total	Nail Salons
			Panel ACS			
Hours of Beauty School (in 100s)	0.0104 ***	0.0016	-0.0036	-0.0013	0.0216***	0.0044
	(0.00380)	(0.00432)	(0.00530)	(0.00553)	(0.00551)	(0.00688)
Controls & Year FE	YES	YES	YES	YES	YES	YES
R^2	0.1145	0.1129	0.0627	0.0622	0.1637	0.1751
N	10,982	8,306	4,909	4,404	6,073	3,902
			Panel CPS			
Hours of Beauty School (in 100s)	0.0219***	0.0255***	0.0192***	0.0147**	0.0353***	0.0545***
	(0.00594)	(0.00643)	(0.00640)	(0.00673)	(0.01224)	(0.01587)
Controls & Year FE	YES	YES	YES	YES	YES	YES
R^2	0.1638	0.1521	0.1161	0.1179	0.1744	0.2124
N	2,269	1,788	1,488	1,352	781	436

Source: Own calculations based on IPUMS-American Community Survey (ACS) 2012-2016 [250] for Panel ACS & IPUMS-Current Population Survey (CPS) 2015-2017 [251] for Panel CPS.
Note: Results of Linear Probability Model. Robust Standard Errors in parenthesis. Population weights used in estimations. In CPS data, the Asian race category is used as a proxy for Vietnamese origin. In (1), (3) & (5) sample of nail technicians working in beauty schools and nail salons. In (2), (4) & (6) sample restricted to nail technicians working solely in nail salons. Controls include: age, age squared, gender, marriage status, number of household members, high school graduation status, English proficiency (only Panel ACS), race, Hispanic origin (only Panel ACS), Vietnamese origin, years since migration (only Panel ACS), income (family income in Panel CPS; commuting time in minutes in Panel ACS), work in a nail salon dummy and state level characteristics (income per capita, urbanization, share of foreigners, female labor force participation and minimum wage). Fixed effects per year. * significant at 10% ** significant at 5% *** significant at 1%

Table 4.6: Effect of Stricter Regulation on the Probability a Nail Technician will be Self-Employed - IV

	(1)	(2)	(3)	(4)	(5)	(6)
	All		**Vietnamese**		**Non-Vietnamese**	
Variable	Total	Nail Salons	Total	Nail Salons	Total	Nail Salons
			Panel ACS			
First Stage						
Board Size	5.7597***	7.4071***	9.2549***	10.2608***	2.2349	3.1899*
	(1.11143)	(1.25880)	(1.70043)	(1.74231)	(1.48278)	(1.85009)
Hours of	0.1150***	0.1155***	0.1041***	0.1095***	0.1164***	0.1166***
Beauty School (Barbers)	(0.00361)	(0.00423)	(0.00945)	(0.00963)	(0.00371)	(0.00449)
R^2	0.2843	0.2936	0.2763	0.2865	0.2911	0.3023
Partial R^2	0.0940	0.0959	0.0548	0.0633	0.1202	0.1266
Controls & Year FE	YES	YES	YES	YES	YES	YES
Second Stage						
Hours of	0.0495***	0.0194	-0.0150	-0.0307	0.0751***	0.0482***
Beauty School (IV)	(0.01169)	(0.01300)	(0.02238)	(0.02183)	(0.01439)	(0.01696)
(in 100s)						
Controls & Year FE	YES	YES	YES	YES	YES	YES
R^2	0.1014	0.1102	0.0615	0.0537	0.1423	0.1606
N	10,982	8,306	4,909	4,404	6,073	3,902

	(1)	(2)	(3)	(4)	(5)	(6)
	All		**Vietnamese**		**Non-Vietnamese**	
Variable	Total	Nail Salons	Total	Nail Salons	Total	Nail Salons
			Panel CPS			
First Stage						
Board Size	19.3722***	18.3822***	21.7403***	20.1291***	16.7780***	15.3023***
	(2.32712)	(2.83872)	(3.00641)	(3.29695)	(3.61370)	(4.77227)
Hours of	0.1410***	0.1484***	0.1357***	0.1426***	0.1437***	0.1760***
Beauty School (Barbers)	(0.00622)	(0.00737)	(0.00764)	(0.00817)	(0.01247)	(0.01789)
R^2	0.3338	0.3292	0.3910	0.3778	0.3210	0.3813
Partial R^2	0.1866	0.1780	0.1903	0.1838	0.1805	0.2105
Controls & Year FE	YES	YES	YES	YES	YES	YES
Second Stage						
Hours of	0.0214*	0.0134	0.0110	-0.0020	0.0769***	0.0976***
Beauty School (IV)	(0.01289)	(0.01463)	(0.01494)	(0.01649)	(0.02524)	(0.02846)
(in 100s)						
Controls & Year FE	YES	YES	YES	YES	YES	YES
R^2	0.1638	0.1500	0.1150	0.1134	0.1584	0.1948
N	2,269	1,788	1,488	1,352	781	436

Source: Own calculations based on IPUMS-American Community Survey (ACS) 2012-2016 [250] for Panel ACS & IPUMS-Current Population Survey (CPS) 2015-2017 [251] for Panel CPS.
Note: Results of Linear Probability Model. Robust Standard Errors in parenthesis. Population weights used in estimations. In CPS data, the Asian race category is used as a proxy for Vietnamese origin. In (1), (3) & (5) sample of nail technicians working in beauty schools and nail salons. In (2), (4) & (6) sample restricted to nail technicians working solely in nail salons. Controls include: age, age squared, gender, marriage status, number of household members, high school graduation status, English proficiency (only Panel ACS), race, Hispanic origin (only Panel ACS), Vietnamese origin, years since migration (only Panel ACS), income (family income in Panel CPS; commuting time in minutes in Panel ACS), work in a nail salon dummy and state level characteristics (income per capita, urbanization, share of foreigners, female labor force participation and minimum wage). Fixed effects per year. * significant at 10% ** significant at 5% *** significant at 1%

Table 4.7: Effect of Stricter Regulation on the Probability a Nail Technician will have No License

	(1)	(2)	(3)	(4)	(5)	(6)
	All		**Asian**		**Non-Asian**	
Variable	Total	Nail Salons	Total	Nail Salons	Total	Nail Salons
Hours of Beauty School (in 100s)	0.0012 (0.00779)	-0.0015 (0.00884)	0.0080 (0.00959)	0.0011 (0.01005)	0.0064 (0.01279)	0.0122 (0.01634)
Controls & Year FE	YES	YES	YES	YES	YES	YES
R^2	0.1365	0.1285	0.1532	0.1579	0.2584	0.2892
N	2,269	1,788	1,488	1,352	781	436

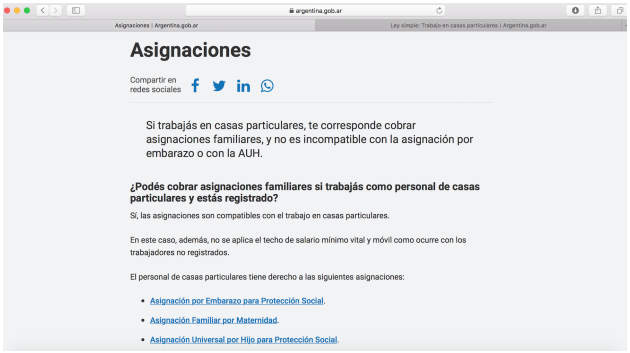
Source: Own calculations based on IPUMS-Current Population Survey (CPS) 2015-2017 [251].
Note: Results of Linear Probability Model. Robust Standard Errors in parenthesis. Population weights used in estimations. Asian race category is used as a proxy for Vietnamese origin. In (1), (3) & (5) sample of nail technicians working in beauty schools and nail salons. In (2), (4) & (6) sample restricted to nail technicians working solely in nail salons. Controls include: age, age squared, gender, marriage status, number of household members, high school graduation status, race, family income, work in a nail salon dummy and state level characteristics (income per capita, urbanization, share of foreigners, female labor force participation and minimum wage). Fixed effects per year. * significant at 10% ** significant at 5% *** significant at 1%

Table 4.8: Effect of Stricter Regulation on the Probability a Nail Technician will have No License - IV

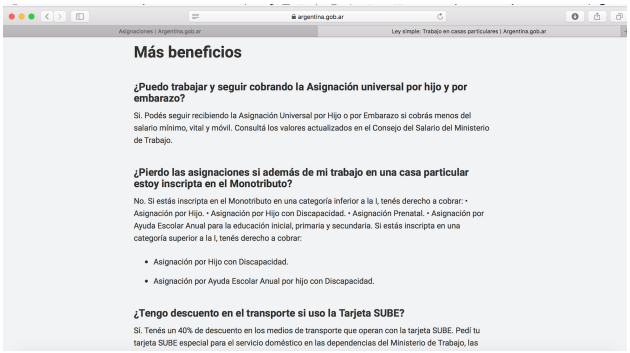
	(1)	(2)	(3)	(4)	(5)	(6)
	All		**Asian**		**Non-Asian**	
Variable	Total	Nail Salons	Total	Nail Salons	Total	Nail Salons
First Stage						
Board Size	19.3722***	18.3822***	21.7403***	20.1291***	16.7780***	15.3023***
	(2.32712)	(2.83872)	(3.00641)	(3.29695)	(3.61370)	(4.77227)
Hours of	0.1410***	0.1484***	0.1357***	0.1426***	0.1437***	0.1760***
Beauty School (Barbers)	(0.00622)	(0.00737)	(0.00764)	(0.00817)	(0.01247)	(0.01789)
R^2	0.3338	0.3292	0.3910	0.3778	0.3210	0.3813
Partial R^2	0.1866	0.1780	0.1903	0.1838	0.1805	0.2105
Controls & Year FE	YES	YES	YES	YES	YES	YES
Second Stage						
Hours of	-0.0642***	-0.0696***	-0.0599***	-0.0657***	-0.0276	-0.0143
Beauty School (IV)	(0.01704)	(0.01969)	(0.02168)	(0.02247)	(0.02620)	(0.03340)
(in 100s)						
Controls & Year FE	YES	YES	YES	YES	YES	YES
R^2	0.1036	0.0925	0.1207	0.1260	0.2494	0.2836
N	2,269	1,788	1,488	1,352	781	436

Source: Own calculations based on IPUMS-Current Population Survey (CPS) 2015-2017 [251].
Note: Results of Linear Probability Model. Robust Standard Errors in parenthesis. Population weights used in estimations. Asian race category is used as a proxy for Vietnamese origin. In (1), (3) & (5) sample of nail technicians working in beauty schools and nail salons. In (2), (4) & (6) sample restricted to nail technicians working solely in nail salons. Controls include: age, age squared, gender, marriage status, number of household members, high school graduation status, race, family income, work in a nail salon dummy and state level characteristics (income per capita, urbanization, share of foreigners, female labor force participation and minimum wage). Fixed effects per year. * significant at 10% ** significant at 5% *** significant at 1%

Appendix A: Domestic Work Regulations - Argentina



(a) Allowances



(b) Domestic work

Figure A.1: Contradictions found on different parts of the Argentina.gob.ar portal between formal domestic employment, access to welfare cash payments and minimum wage restrictions.
Note: In (a) "If you work as a formal domestic worker, you should receive family allowances, and it is not incompatible with the Pregnancy Allowance or the AUH" Source: Argentina.gob.ar, Ministerio de Trabajo, Empleo y Seguridad Social, Casas Particulares, Trabajadoras de Casas Particulares, 2020 [265] In (b) "You can keep collecting the Universal Allowance per Child or per Pregnancy if you earn less than the minimum wage" Source: Argentina.gob.ar, Ministerio de Justicia y Derechos Humanos, Derecho Fácil, Ley Simple, Trabajo, 2020 [266]

Table A.1: Work Regulations: General Work Contract Convention vs. Domestic Worker's Regimes

	1956-2013		2013-present
	General Work Contract Convention	**Domestic Worker's Statute**	**Private Home Employee's Regime**
Type of worker	Employed by private firm	Employed by private household for more than 16 hours per week	Employed by private household
Mandated Benefits			
Daily hours	8	12	8
Daily resting hours	12	9	12
Weekly resting period	Saturday 13 hrs - Sunday 24 hrs	24 hours or two sets of 12 hours	Saturday 13 hrs - Sunday 24 hrs
Paid vacation	14 days if tenure <n 5 years (increasing after that, maximum of 35 days)	14 days if tenure < 5 years, 20 days if ≥5 years	14 days if tenure < 5 years (increasing after that, maximum of 35 days)
Sick leave days	365	30	90 (if tenure < 5 years); 180 (if tenure ≥5 years)
Marriage leave days	10	0	10
Maternity leave days	90	0	90
Breastfeeding period	2 sets of 30 minutes for 1 year	0	0
Family Allowances	YES, decreasing on family income	NO[a]	NO[b]
Pension	Basic Universal Provision	Basic Universal Provision	Basic Universal Provision
Health insurance	YES	YES	YES
Wages			
Subject to General Minimum Wage	YES	NO	NO
Bonus (monthly wage per year)	YES	YES	YES

	1956-2013		2013-present
	General Work Contract Convention	**Domestic Worker's Statute**	**Private Home Employee's Regime**
Termination of Contract			
Dismissal: days notice	15	5	10
Dismissal: compensation	Full monthly wage per year worked	Half monthly wage per year worked	Full monthly wage per year worked
Labor Taxes[c]			
Pension Scheme	16% of wage as mandatory contribution paid by employer; 11% of wage deducted from employer's wage	Contribution paid in full by employer; fixed amount	Contribution paid in full by employer; fixed amount
Health Insurance	5% of wage as mandatory contribution paid by employer; 3% of wage deducted from employer's wage	Deducted in full from employer's wage as a fixed amount, but historically paid in full by employer	Deducted in full from employer's wage as a fixed amount, but but historically paid in full by employer
Work Insurance	3.5% of wage as mandatory contribution paid by employer	NO	Contribution paid in full by employer; fixed amount
Family Allowances	7.5% of wage as mandatory contribution paid by employer	NO	NO

Source: Own compilation based on work regulations
Notes: **[a]** Access to non-contributive regime - conditional on having earnings under the monthly minimum wage
[b] Access to non-contributive regime - non-conditional on having earnings under the monthly minimum wage - source of contradictions
[c] % correspond to 2019

Table A.2: Changes in Incentives for Domestic Workers after Law 26.844 of 2013

	Pre			**Post**		
	< 12hrs	**12-16 hrs**	**≥ 16hrs**	**< 12hrs**	**12-16 hrs**	**≥ 16hrs**
Domestic Worker's Benefits						
Mandated Benefits						
Special licenses (marriage, maternity, birth of child)	Not regulated	Not regulated	NO	YES (= private sector)	YES (= private sector)	YES (= private sector)
Sick leave	Not regulated	Not regulated	YES (< private sector)	YES (> before but < private sector)	YES (> before but < private sector)	YES (> before but < private sector)
Paid vacation time	Not regulated	Not regulated	YES (< private sector)	YES (> before but < private sector)	YES (> before but < private sector)	YES (> before but < private sector)
Maternity leave	Not regulated	Not regulated	NO	YES (> before but < private sector)	YES (> before but < private sector)	YES (> before but < private sector)
Breastfeeding period	Not regulated	Not regulated	NO	NO	NO	NO
Access to Pension	YES	YES	YES	YES	YES	YES
Access to Health	YES	YES	YES	YES	YES	YES
Access to Health for Family Member	YES	YES	YES	YES	YES	YES
Work Environment						
Hours per day	Not regulated	Not regulated	YES (< private sector)	YES (> before but < private sector)	YES (> before but < private sector)	YES (> before but < private sector)
Rest periods	Not regulated	Not regulated	YES (< private sector)	YES (> before but < private sector)	YES (> before but < private sector)	YES (> before but < private sector)

	Pre			Post		
	< 12hrs	**12-16 hrs**	**≥ 16hrs**	**< 12hrs**	**12-16 hrs**	**≥ 16hrs**
Domestic Worker's Benefits						
Monetary						
Minimum wage	Not regulated	Not regulated	YES (< private sector)	YES (> before but < private sector)	YES (> before but < private sector)	YES (> before but < private sector)
Bonus	Not regulated	Not regulated	YES (< private sector)	YES (> before but < private sector)	YES (> before but < private sector)	YES (> before but < private sector)
Dismissal compensation	Not regulated	Not regulated	YES (< private sector)	YES (> before but < private sector)	YES (> before but < private sector)	YES (> before but < private sector)
Access to welfare	YES (= unemployed)	YES (= unemployed)	YES (= unemployed)	YES (= unemployed)[a]	YES (= unemployed)[a]	YES (= unemployed)[a]
Domestic Worker's Costs						
Monetary						
Pension - difference for full acces	35	23 (6-12 hrs); 11 (12-16 hrs)	0	23	23 (6-12 hrs); 11 (12-16 hrs)	0
Health insurance - difference for full access	100	92 (6-12 hrs); 85 (12-16 hrs)	0	92	92 (6-12 hrs); 85 (12-16 hrs)	0
Payment for family member health insurance	100	100	100	100	100	100

Source: Own compilation based on work regulations
Notes: **[a]** source of contradiction

Table A.3: Changes in Incentives for Household Employers after Law 26.844 of 2013

	Pre			Post		
	< 12hrs	**12-16 hrs**	**≥ 16hrs**	**< 12hrs**	**12-16 hrs**	**≥ 16hrs**
Household Employer's Benefits						
Monetary						
Tax deductions	NO	YES, maximum up to minimum of personal income tax	YES, maximum up to minimum of personal income tax	YES, maximum up to minimum of personal income tax	YES, maximum up to minimum of personal income tax	YES, maximum up to minimum of personal income tax
Settlement if accident, illness, non-compliance	Not regulated, informal settlement	Not regulated, informal settlement	Not regulated, informal settlement	Work insurance protects employer	Work insurance protects employer	Work insurance protects employer
Household Employer's Costs						
Monetary						
Pension Contributions	0	12 (6-12 hrs); 24 (12-16 hrs)	35	12	12 (6-12 hrs); 24 (12-16 hrs)	35
Health Insurance Contributions	0	8 (6-12 hrs); 15 (12-16 hrs)	100	8	8 (6-12 hrs); 15 (12-16 hrs)	100
Work Insurance Contributions (since October 2014)	0	0	0	130	165	230
Bonus	Not regulated	Not regulated	YES (< private sector)	YES (= private sector)	YES (= private sector)	YES (= private sector)
Minimum wage	Not regulated	Not regulated	YES (< private sector)	YES (= private sector)	YES (= private sector)	YES (= private sector)
Paid vacation time	Not regulated	Not regulated	YES (< private sector)	YES (= private sector)	YES (= private sector)	YES (= private sector)
Dismissal compensation	Not regulated	Not regulated	YES (< private sector)	YES (= private sector)	YES (= private sector)	YES (= private sector)
Penalty for non-compliance	NO	Not regulated, informal settlement	Not regulated, informal settlement	YES	YES	YES
Non-monetary: days absent from work						
Special licenses	NO	NO	YES (< private sector)	YES (> before but < private sector)	YES (> before but < private sector)	YES (> before but < private sector)
Maternity leave (wage paid in full by Social Security)	NO	NO	NO	YES (= private sector)	YES (= private sector)	YES (= private sector)
Non-monetary: dismissal						
Dismissal restriction	NO	NO	YES (< private sector)	YES (> before but < private sector)	YES (> before but < private sector)	YES (> before but < private sector)

Source: Own compilation based on work regulations

Table A.4: Evolution of AUH and full-time domestic work minimum wage (in pesos)

	(1)	(2)	(3)
Year	AUH per child	Monthly MW	(%)
2010	220	1,847.6	11.91
2011	270	2,309.5	11.69
2012	340	2,886.9	11.78
2013	460	3,580	12.85
2014	644	4,296	14.99
2015	837	5,632	14.86
2016	1,103	7,030.5	15.69
2017	1,412	8,875.5	15.91

Source: Unión Personal Auxiliar de Casas Particulares (2020); Di Santi (2015); Stang (2016, 2017); Casanova et al. (2015).
Note: as both values (AUH and domestic work minimum wage (MW)) are updated twice per year to account for inflation, I use the latest value for every year. AUH values correspond to the normal zone - the minimum value (in some zones of the country, the AUH is higher)

Appendix B: Model: Benefits and Costs of the Domestic Work Formal Sector

In this model, which is developed as an adaptation of Galiani and Weinschelbaum (2012) and Mattila (1973) and consists of household employers and workers, there is a probability associated with the loss of welfare under a formal work arrangement. Such probability will depend on the information available for domestic workers regarding the compatibility between welfare cash payments and a formal job. In particular, in this model households choose whether to hire domestic workers formally or informally based on relative benefits, while workers decide to offer their services in the formal or informal sector based on their relative utility. The main assumptions that I will make are that: i) Domestic workers have one household employer; ii) Domestic workers are considered full-time (meaning they work enough number of hours so that it is the responsibility of household employers to make the necessary contributions to health insurance and the pension scheme, which guarantees full access); iii) Domestic workers cannot split their hours of work between formal and informal employment (they are therefore completely formal or completely informal); iv) Within a household employer, income paid to an employee cannot be split in on-the-book and on-the-book; v) Contributions to the pension

scheme are the responsibility of the household employer and a lump sum; vi) There is a distribution of formal and informal household employers such that workers can move from one sector to the other freely; vii) The amount received as a pension plan once the worker is formal enters the model as a lump sum; viii) Household employers can benefit from tax deductions if they operate in the formal sector; ix) Domestic workers are either single or married to an informal spouse (and therefore they have access to non-contributive social plans for every children they have under 18 years old, both under a formal or informal work arrangement)

B.0.1 Household employers

Household employers have two options. If they employ formal workers, their benefit is,

$$\pi_f = f(y,l) - w_f l - B - C + (y - w_f l - C)\theta(y) \tag{B.1}$$

while the benefit of employing an informal worker is,

$$\pi_i = [f(y,l) - w_i](1-q) + [\Gamma + \Delta(y)].q, \tag{B.2}$$

where $f(y,l)$ is the household production function that depends on hours of domestic labor l and the household's income level y[1]. w_f and w_i are the hourly wages that the household pays to the domestic worker in each sector, C are the

[1]In some specifications, Mattila (1973) also incorporate the price of substitutes for domestic workers such as take away food and external cleaning and pressing, as well as female labor force participation rate given that domestic work is the outsourcing of household chores. However for this model, I will use the general specification

monetary contributions that households need to pay to have a registered domestic worker, B are the mandated benefits for domestic workers (in monetary terms) that act as a cost for household employers and $\theta(y)$ is the tax rate corresponding to the household income level (and therefore $(y - w_f l - C)\theta(y)$ represent the tax deduction amount). Moreover, q represents the probability that authorities will discover the informal work arrangement, Γ the penalty that household employers have to pay if that actually happens and the out of pocket cost that household employers and $\Delta(y)$ is the out of pocket cost (which is a function of household income) they face in case of an accident or a legal demand given that they do not have employment insurance. For a household employer to have a formal work arrangement it has to be the case that,

$$\pi_f > \pi_i, \tag{B.3}$$

With a Cobb-Douglas production function (f(y,l)=$y^{\beta}l^{1-\beta}$) the previous translates as,

$$y > \left(\frac{[\Gamma + \Delta(y)].q + w_f l + b + C + (w_f l + C)\theta(y)}{q.l^{(1-\beta)} + \theta(y)} \right)^{1/\beta} \tag{B.4}$$

B.0.2 Domestic Workers

Domestic workers also have two options. On the one hand, if they decide to work in the formal sector, their utility can be described as,

$$U_f = w_f l + B + P^{(1/\alpha)} + \Psi.n(1-\zeta) \tag{B.5}$$

On the other, if they work informally, their utility is described by,

$$U_i = [w_i l + \Psi.n](1-q) + [\Gamma + \Psi.n]q \tag{B.6}$$

where P is the amount received as a pension discounted by the rate $(1/\alpha)$, Ψ is the welfare cash transfers by child under 18 years old, n is the number of children under 18 years old that the domestic worker has and ζ is the perceived probability that welfare is lost with a formal work arrangement that goes from 0 (complete certainty that welfare and a formal work arrangement are compatible) to 1 (complete certainty that welfare and a formal work arrangement are not compatible)[2]. For a domestic worker to prefer a formal work arrangement, it has to be the case that,

$$U_f > U_i \tag{B.7}$$

so that,

$$l > \frac{\Gamma.q - B - P^{(1/\alpha)} + \Psi.n.\zeta}{(w_f - w_i) + w_i q} \tag{B.8}$$

[2]Mattila (1973) incorporate as alternative sources of income the husband's earnings as well as earnings in alternative jobs. In this case given that the model is only for those domestic workers who are single or married to an unregistered spouse per my assumptions, the alternative source of income is thought only as the welfare cash transfer

B.0.3 Predictions

In chapter 2, the policy change is the introduction of $(y - w_f l - C)\theta(y)$ for household employers, as well as the increase in q due to the extra auditing. Both factors point out to an increase in the relative benefit of a formal work arrangement.

On the other hand, in chapter 3, the introduction of a new regulation for formal domestic work implied changes in more specific parameters of the previous model. In the case of household employers, an increase in w_f (as required by law), an increase in q due to the extra auditing, in the mandated benefits B, and probably in the fixed contributions C that household employers have to make to Social Security. The previous means that the introduction of the new regulation seems to decrease the incentive for the demand of formal domestic work, unless the probability of getting caught is high enough and the household is wealthy enough.

In what refers to domestic workers, the introduction of a new regime would imply an increase in the gap between U_f and U_i in favor of a formal work arrangement. In other words, and as seen in Equation B.8 the changes in the previous parameters imply a decrease in the threshold for the supply of work in the formal sector. However, the introduction of a new regulation can also increase the confusion regarding access to welfare once formalized if information regarding compatibility of social plans is not clear at the time of the reform (meaning an increase in ζ). The increase in ζ implies an decrease in U_f with respect to U_i. In particular, it can be seen that welfare cash transfers for formal domestic workers (represented by $\Psi.n.\zeta$) can be zero either if the domestic worker does not have any children under 18, or if the an

eligible domestic worker knows for certain that she will not lose access to welfare if she holds a formal work arrangement (ζ=0). Under both scenarios, welfare should not affect U_f. It should be the case then that in the absence of a perceived trade off between welfare cash payment transfers and a formal work arrangement, domestic workers with and without children under 18 should not show different formalization patterns after the introduction of the government attempt to regulate the sector. However, if the previous is not true (meaning that ζ >0), then domestic workers with children under 18 would have a lower incentive to transition to a formal work arrangement. This is the prediction I test in chapter 3. Note that this model assumes that there is no reason to believe that overall rich household employers, which have a higher incentive to hold formal work arrangements, are less likely to hire domestic workers without children under 18. If that were the case, then the difference in formalization between those workers with and without children under 18 could be a product of rich household employers moving to a formal work arrangement rather than a decision of the worker. Even though the lack of matching employer-employee data prevents to test the previous, in the empirical estimations, in chapter 3 I run a series of robustness checks to control for this possibility.

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