The impact of legislation on maternity protection in the labor market of Colombian women †

Natalia Ramírez Bustamante •
Ana Maria Uribe Tribin *
Carmiña O. Vargas˚

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Abstract

Our research seeks to determine the impact of the amendment on the Colombian labor law through Ley 1468 of July 2011 in which maternity leave was extended from 12 to 14 weeks on female employment status. To identify this impact we compare labor market outcomes of two groups of women whose age creates a difference mainly in their fertility rate, and we do this by a model of differences in differences. We find evidence that the extension of maternity leave, resulting in an overhead cost in the recruitment of the most fertile women, increases the probability that they choose not to participate actively in the economy. Other findings allow us to associate this result with a perception of this group of women that market conditions worsened for them after the law of 2011.

Introduction

One of the greatest social revolutions that occurred in the last century has been the increasing participation of women in the economically productive life. Colombia, in particular, is the Latin American country with the largest increase in female participation rate in the last three decades (Amador, Bernal & Peña, 2013). Several factors drove this process. At the local level, access to college education for women since 1934, birth control through mass access to contraception, an increasing urbanization and the erosion of the male family wage, among other factors, promoted the increased participation of women in the productive sector. The search for formal equality between men and women has its most important expression in the Colombian Constitutional charter through the clauses of equality and non-discrimination that extend to all fields of social life, including employment, as well as various international treaties, including CEDAW. 

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• Lawyer and Philosopher Universidad de los Andes. LLM and SJD Candidate in Law at Harvard University. Professor College Department of Law University of the Andes. email: nramirez@sjd.law.harvard.edu

* Economist Universidad Javeriana. MA in Economics Javeriana University and Brown University. Ph.D. in Economics from Brown University. Researcher at the Colombian Central Bank. Email: atribiur@banrep.gov.co

˚ Economist Universidad Nacional, M. A. Economics from Universidad Nacional and Brown University; Ph.D. in Economics from Brown University, Researcher at the Colombian Central Bank. Email: cvargari@banrep.gov.co
Challenging this formal equality, however, are a series of biological events (pregnancy, childbirth, and breastfeeding) that directly and primarily affect women. Partly in recognition of this biological disparity and with the aim of promoting the employment of women during the industrialization process, several countries implemented since the early twentieth century the figure of maternity leave. Part of this trend is shown in the adoption of ILO's Convention No. 3 which is mandatory for Colombia since 1931. This instrument translated in the local legal system in the adoption of Ley 129 of 1931 as well as subsequent laws that have modified the subject. According to the laws in force in 2014, pregnant workers in Colombia have two fundamental guarantees: first, the right to enhanced job security, which implies a prohibition against dismissal due to motherhood which protects the worker during the period of pregnancy and maternity leave; and, second, a paid maternity leave of 14 weeks.

For the ILO, the provision of these benefits aims, first, to protect the health of women and children during pregnancy and after birth; and second, to ensure that the reproductive role of women does not adversely affect their economic and job security (ILO, 2005, 2010). The latest ILO interest has been to promote that the maternity leave is paid by social security systems instead of belonging exclusively to employers, in order to prevent discrimination against women workers. Indeed, the ILO has recognized that motherhood and the responsibilities associated with it still have an important influence on the perception towards women in the labor market, and can be used by employers as a discriminatory criterion for recruitment, for which the ILO said that "the problem is how to ensure that employers do not reject candidates of reproductive age who are already taking the larger, heavier burden of family responsibilities and whose absence due to maternity leave or even longer periods generates organizational problems for employers in some cases even assuming the financial burden of paying wages during such absences" (ILO, 1997). The question to be solved is then the inclusion of women in labor markets respecting their sexual and reproductive rights, including the right to be a mother without fear of discrimination, as well as the generation of institutional conditions that reduce the costs associated to maternity leave and that are assumed by the employers.

Some of the "costs" associated with female workers of childbearing age which do not usually weigh when hiring workers of lower fertility or male workers are, among others, the following: to post a temporary-job offer to replace absent workers through newspaper ads or employment bureaus; to select and hire a replacement for the absent worker; to train the replacement worker; and/or the extra-hour work of existing staff; and possibly low productivity assuming that the new employee will not be as productive as the employee on leave. In addition, given the inability to obtain perfect information about job applicants, all women of reproductive age can be treated as "potential mothers" regardless of their actual desire, affecting their access to employment.

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2 ILO has adopted two other Conventions on Maternity that expand the rights included in Convention No. 3. These are conventios 103 (1952) and 183 (2000) which have not been ratified by Colombia (ILO, 2001). A list of ratifications by Convention and Ratifying Country is available at: http://www.ilo.org/public/spanish/standards/relm/ilc/ilc90/pdf/rep-iii-2.pdf Last accessed Janyuary 2014.
3 Colombian law mandates that the worker must take one of the fourteen weeks before the feasible day of birth, and the next 13 afterwards. In the case of premature births, the 14 weeks may be increased by the difference between the initial date of birth and the real date in which the woman bears the child. In the case of multiple births, the length of maternity leave is increased in two weeks.
The listed factors, among others, show the differential impact that maternity and labor legislation designed to protect may have on women's employability. For these reasons, in our view, this type of regulatory intervention is especially important for understanding the functioning of labor markets in its gender dimensions, but its scope is not fully understood yet. Our research seeks to determine the impact of the last employment law legislation (Ley 1468 from 2011, which extended the maternity leave from 12 to 14 weeks (a 17% increase)) has had on women's employment status. We believe that research on these variables could help to identify some of the determinants of female employment and unemployment in Colombia, and in subsequent research serve as a benchmark for comparison with the functioning of labor markets in similar economic and institutional contexts to that of Colombia, as is the case in most countries in the region.

To tackle the change in legislation and its effect on women's labor results, we exploit the differential effect on women that because of their age are associated to different fertility levels. That is, we compare women in ages between 18 and 30 with women in ages between 40 and 55. These two groups have very different fertility rates and therefore the Law 1468 affects women between 18 and 30 years old (the treatment group) but not the group between 40 and 55 (the control group). We use the approach of a difference-in-difference model.

The results show that from 2011 on, the labor market results for fertile (treated) women changes and they are put in disadvantage against the group of women associated to low fertility (control). The relative probability of inactivity increases in 1.2 percentual points for women in the treatment group.

Under the new legislation, it is harder for women in the treatment group to find a job. Two factors discourage women from participating in the labor market: a higher duration of unemployment, and an increase in the probability of indicating that finding a job is getting harder because of the market conditions.

Although the average effect for women in the high-fertility group is a higher probability of being inactive, the subgroup that has higher education, less children, or a higher economic stratification has a higher probability of being active because their characteristics are more valued by the labor market. Those women in the treatment group that belong to the labor force are not in disadvantage because of the change in legislation. For these women, we observed a reduction in the probability of unemployment and an increase in the probability of having a formal-sector job. However, we observe a decrease in the wage perceived by women in the treatment group when controlling for all possible observable characteristics. This result is consistent with the hypothesis that employers translate part of the cost of maternity leave to women. Our hypothesis is that the employer perceives the new law as an increase in the excess cost incurred by hiring women of ages associated with high fertility who could get pregnant during the labor contract period.

We also find that among women of the treatment group that participate in the labor market, those married or cohabitating experience an increase in their probability of unemployment once Law 1468 of 2011 is effective.

Our results highlight the fact that the protection to maternity must be linked to a group of incentives so that the employer do not exclude from the labor market women with a high probability of having children. We propose some public policy measures to correct for the
distortions created by the legislation so that labor market results for women are not worsened and they can enjoy the 14 weeks of maternity leave they have the right to.

This document is divided into seven parts. In the first we describe the related literature. In the second part we briefly recount the Colombian legislation on maternity protection. In the third we present a stylized model that allows us to understand the effects of maternity protection on the labor market. In the fourth part we describe the data we use. In the fifth part we show the empirical methodology we chose. In the sixth part we present the results and in the seventh we conclude and propose public policies.

**History of legislation in Colombia**

The Convention 3 of the International Labour Organization (ILO) adopted in 1919, was the first impulse towards globalization of maternity protection in industrial and commercial labor contexts. The agreement established a number of benefits for workers who remain in employment during pregnancy including the authority not to work during the six weeks before delivery, and maternity leave of six weeks after the same, as well as the payment of benefits throughout the period of absence through an insurance system or by the public treasury. These benefits were adopted entirely in the Colombian legal system by Ley 129 of 1931 which ratified the convention, and were later modified by Ley 53 of 1938 which laid the foundations of protection still in force in the field of employment law. The most significant changes made by Ley 53 of 1938 are twofold. First, reduced paid maternity leave to eight weeks for workers in the public and private sectors, and second, Ley 53 extended the warranties of Convention 3 to establish the prohibition of dismissal of workers because of pregnancy or lactation during the period pregnancy and maternity leave and the right to reinstatement to employment after the leave. Beginning in 1938, it is possible to identify in the national legislation a special concern to protect workers from the adverse treatment that pregnancy may have on the working lives of women. Specifically, the establishment of a presumption that the dismissal is motivated by the pregnancy when it occurs during the period of pregnancy or maternity leave, and when the employer does not have prior authorization from a labor inspector is a protection that reduces the power of dismissal the employer subjecting it to a process that seeks to protect the job security of the workers.

Indeed, the recognition that there is a certain vulnerability of women workers to discriminatory treatment because of pregnancy has generated particular interest from international organizations to create a regulatory framework that effectively protects them in labor relations. For this reason, various international treaties and conventions ratified by Colombia, including the Universal Declaration of Human Rights, the International Covenant on Economic and Social Rights, the Convention on the Elimination of All Forms of Discrimination against Women and ILO’s Convention 111 on discrimination in employment have the cross interest of protecting the right of women to be mothers and have some basic protections and benefits, while trying to reduce the chances that women are subject to a adverse treatment because of pregnancy. These international commitments of Colombia, and which have become part of our domestic law have been added to the protection included in Article 43 of the Colombian Charter which provides for equal rights and opportunities for men and women, the prohibition of any form of discrimination against women, and the duty of the State to provide special protection and assistance for women "during pregnancy and after childbirth."

Legislative and jurisprudential developments of the protection of pregnant workers has been considerable. On the legislative front, the general trend has been to extend the duration of
maternity leave, while in the field of constitutional law there has been an interest in strengthening the protection against dismissal during pregnancy and the license; effectively guaranteeing the rights of pregnant workers to basic social services and non-discrimination, and finally, an effort to broaden the spectrum of protection to workers who had previously been excluded (Ramirez 2008).

Currently our labor law includes, within the general social security system, a package of protection for pregnant workers comprising the following benefits: i) the prohibition of dismissing the worker on account of pregnancy during the period of pregnancy and maternity leave; ii) a paid leave of 14 weeks around the time of birth; and iii) after the end of maternity leave, the reinstatement of the employee in the older post as well as two breaks of 30 minutes each, for feeding the child during the first six months of life. Payment of maternity leave is done by the health insurance system to which the worker is affiliated from the contributions made by the worker and his employer over the employment contract. In contrast to this protection package, men rely exclusively on a paid eight working days license after the birth of the child (Law 755 of 2002).

The general rule was that the above measures benefited the formal sector workers tied to an employer by an employment contract for an indefinite term. However, finding that the recruitment of women through short-term contracts was being used by employers to circumvent the protection of workers during pregnancy, since 1997 the Constitutional Court extended similar protections for workers linked through fixed-term contracts. Under this judicial interpretation, if the term agreed arrives, and the worker is pregnant the employer must obtain authorization from a labor inspector to proceed with the termination. Similar protection has been extended to workers hired through contracts to provide services.

In summary, the jurisprudence of the Colombian Constitutional Court evidences a continuous effort to ensure the constitutional rights of pregnant workers, and to do this effectively, the Court had to harmonize the rights of freedom of contract with the special protections of motherhood under the Constitution and labor law, which leads to recruitment constraints such as exposed. The important task of the Constitutional Court makes the analysis of the impact of legislation on the participation of women in employment much more complex, and it would be an interesting field of research to try to replicate the research we did in this work with those judicial decisions. The most relevant for the purposes of the period studied in this paper is to point out that while the extension of maternity leave was increased through the law 1468 of 2011, the protection of other fields of employment were coming under the field implementation of laws on maternity protection.

Related literature

Most industrialized and developing countries have some form of maternity leave that provides job protection for women around the time of childbirth, but the variation between countries in terms of the period protected against dismissal, the duration of the pregnancy leave, or the funding source licenses is considerable (ILO 2010). Considering only maternity leave, a wide variation can be found between countries. Depending on the particular framework of protection, for example, some of the items subject to change are the requirements that must be met by the worker to be a beneficiary; duration of leave; if the leave is paid or unpaid, and if so, what percentage of salary is paid; the source of funding which may come from the state, an insurance system, a mixed system, or just the employer; and the possibility (or not) that mothers waive a portion of their license to share it with the father (ILO, 2010). This variation
across countries complicates the comparison of results when it comes to measuring the impact of maternity protection in the employment relationship of women in the labor market. For this reason, the comparison of the Colombian case with research in other institutional contexts in terms of outcomes for women in the labor market should take into account these differences and the impact they can have.

An important part of research devoted to studying the effects of motherhood on the results of women in the labor market assesses the effect of motherhood on wages. In this regard, and based on studies from different countries of Western Europe and North America, the empirical evidence is mixed. Regarding wages after delivery, some studies find that maternity leave reduces the wages of women (Schönberg and Ludstekc, 2007; Ruhm, 1998), while others find an increase in wages (Rossin-Slater et al, 2013), while others find no effect (Baum, 2003; Baker and Milligan, 2008; Hashimoto et al, 2004).

Looking at the return to work after childbirth, some studies find that it is more likely that women return to work, either with the previous employer or another, if they have maternity leave (Ruhm, 1998; Baum, 2003; Baker and Milligan, 2008, Rossin-Slater et al, 2013), but other studies found only a very modest or nonexistent effect on employment (Baum, 2003; Hashimoto et al, 2004). Finally, in the context of the European Union researchers have found that public policies that extend the licenses postpartum also to parents, and state provision of care services in early childhood contribute to increasing female labor participation (because they relief the mother from assuming the entire burden of motherhood) and to reduce the wage gap (Kamerman, 2000).

Another line of research focuses on trying to establish whether there is discrimination against workers because of motherhood. These investigations seek to determine whether at the time of hiring employers discriminate against women, and are less willing to hire them because of social beliefs associated with motherhood or whether, on the other hand, there is some penalty wage offered specifically to women because of motherhood. Cuddy, Fiske, and Glick (2004) show that describing a consultant as a mother leads evaluators to qualify her as less competent than when the same candidate was described as a woman without children. Similarly, other studies show that visibly pregnant managers are judged as less committed to their work, less reliable and with less leadership, but warmer, more emotional and more irrational than other managers, equally talented, but are not visibly pregnant (Halpert, Wilson and Hickman, 1993; Corse, 1999).

Correll and Bernard (2007) tested the hypothesis that the "motherhood penalty" on wages and evaluation of the adequacy and job performance of women occurs, at least partly, because the cultural role of motherhood is seen as incompatible with the cultural beliefs associated to the role of the "ideal worker." This leads to the evaluators, perhaps unconsciously, to qualify for mothers as less competent and less committed to their jobs. In both studies (experiment and audit), participants evaluated application materials for a pair of candidates of the same gender equally qualified for the position, but differing in their parental status. The researchers found that mothers were penalized because of their alleged less competence for the job; mothers were rated as less competent than non-mothers, less committed to their professional development and evaluators recommended starting salaries for them that were less than suggested for non-mothers. Mothers also were rated as significantly less promotable and less recommended for management positions. In contrast, men were not penalized and instead sometimes benefited from being parents. For example, parents were perceived as more
committed to their jobs than non-parents, and the former were offered an entry salary significantly higher than men who were not fathers.

Research in the Colombian context has suggested a connection between motherhood costs and on the one hand a female wage penalty, or on the other, lower labor force participation of women. Thus, research conducted in the 70 and 90 sought to determine the influence of high labor costs caused by maternity leave in female labor participation. These investigations concluded that, in effect, part of the lower female participation in the employed population could be explained as an effect of specific female labor overhead related to the absence workers during maternity leave (Junguito, 1970; Saade Forero, 1991). It should be noted that some of the time periods analyzed by these researchers coincided with the period in which Colombia did not have a social security system. However, since 1975 the direct costs of the license maternity went from being made solely by the employer, to be shared by the employer and the employee from the contributions made to social security.

More recently research has established a relationship between motherhood and a female wage penalty (Olarte and Peña, 2010; Badel and Peña, 2010) and, secondly, a higher rate of female unemployment and underemployment (Pena-Parga and Glassman, 2004; Peña et al, 2013). It has been suggested, for example, that the overall costs of hiring women are greater than the costs of hiring a male, which may explain a greater willingness of employers to hire male workers which results in a higher male employment in the formal labor market. While wage costs during maternity leave are paid by the social security system, the increase in "global" costs associated with the recruitment of women would have at least three different causes. First, "organizational" costs would include hiring a temporary worker to replace the absent worker and/or training other workers for the temporary performance of the work, as well as the joint work between the employee departing in leave and her replacement. Second, some other costs could be identified as associated with the "duties of motherhood and childrearing" resulting from the social idea of motherhood and caring as work developed mainly or exclusively by women, such as care for ill children which rightly or not, is related with absenteeism of women workers from the workplace, which again can be interpreted as a minor female commitment to the demands of work. Third, the maternity provisions, i.e. the ban of dismissal for women, which covers in average twelve and a half months (nine of pregnancy and three and one half) is a provision that limits the ability of the employer to lay off workers during these shocks on the demand for the employers' product or service. Indeed, the dismissal of pregnant workers must be based on a just cause, and be authorized by a labor inspector, all of which increases the administrative costs of the same procedure by comparison with the dismissal of a male worker. The grouping of these, among other costs, would result in a lower demand for female labor in the formal labor market (Ramirez, 2008).

Other research suggests that as a result of the above, and aggravated by the restricted offer of services for the care of early childhood and the elderly, women, despite having on average with more years of education than men participate have a higher participation in the informal economy and are more affected by structural unemployment (Pena-Parga and Glassman, 2004).

Among the works that seek to evaluate the impact of maternity leave in the labor market, the work of Lai and Masters (2005) reviews the effect of introducing compulsory maternity leaves on women's labor demand in Taiwan. They conclude that, in the short term, this mechanism worsens the economic situation of women because it reduces the probability of being employed and also their salary. Gruber (1994) studies the effects on the labor market of
legislative systems in the United States that occurred between 1975 and 1978 that required companies to include the costs of maternity and delivery within health plans for employees. The study found that there was a significant decrease in wages, but not in employment levels.

In the Colombian context, the work of Molinos (2012) evaluated the effect of a judicial decision (C-470 1997) judgment on female labor participation. This ruling of the Constitutional Court establishes the invalidity of the dismissal and reinstatement of all workers who are pregnant within three months after delivery. Using data from the National Household Survey for the second quarter of 1996, 1998 and 2000, finds that female labor participation declined, especially for women between 15 and 29 years of age.

**Theoretical Model**

The legislation on maternity leave belongs to a type of mandate known as *accommodation mandates*. The characteristic of his type of mandates is that a clearly identifiable group is affected by them. Legislation that rules against discrimination in the labor market by age, disability or gender belongs to this type of mandates. In general, this type of legislation increases the cost of employing the particular group affected by them and, therefore, when evaluating the efficiency of these policies, we must take into account the effect on wages as well on employment levels.

In this section, we use a stylized model to explore the consequences of demanding that the employer provides a maternity leave period to its female employees. We follow very closely the model by Acemoglu and Angrist (2001).

This is a standard competitive model with two types of workers: men and women. The objective is to discuss how maternity leave could reduce the level of employment of women by increasing the cost of hiring them. The women’s labor supply function is given by the function $n_f(w_f)$, the one for men is given by $n_m(w_m)$, where $w_i$ is the wage received by worker type $i$, $i = f, m$. The functions $n_i(.)$ are increasing in wages. All workers are infinitely lived, risk neutral, and exhibit a discount factor $\beta < 1$.

There are $Z$ firms in the labor market, that never exit, and a sufficiently large number of potential firms that could enter if they pay the cost $\Gamma$. This assumption allow us to characterize a market with free entry of firms (when $Z \to 0$) as well as one where the number of firms is fixed ($Z > 0$ y $\Gamma \to \infty$). Every firm is risk neutral and discounts the future at the rate $\beta$.

Each firm has access to the production function $G(M_t, e * F_t)$, where $M_t$ is the number of male workers at time $t$, $F_t$ is the number of female workers at time $t$, and $e \leq 1$ is the relative efficiency of female workers “perceived” by the firm. This characteristic includes the case in which firms discriminate against women because of preferences (taste), as in Becker (1971). The function $G(.)$ exhibits decreasing returns to scale.

In each period $t$, there is a probability $s$ that productivity of a worker in its current firm falls to cero. These are shocks for the specific combination worker-firm that we denominate compatibility shocks. Therefore, the quantities $F_t$ and $M_t$ in $G$ include only those workers that do not receive the compatibility shock. A female worker that gets fired could sue the firm with probability $q_f$ for a compensation that implies for the firm a cost $\phi_f$. For a male worker the

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$^4$ $Z$ is the minimum number of active firms in the market that would have non-negative benefits in equilibrium, and such that the entry cost for a potential firm is higher than the profits if enters.
values are \( q_m \) and \( \phi_m \), respectively. Therefore, the expected value of firing a worker is
\[ f_i = q_i * \phi_i. \]
We are going to consider the simple case in which the cost \( f_i \) is paid by the firm, but it is not received by any other economic agent. We assume that \((1 - \beta)f_i < w_i\) so that it is optimal for the firm to fire the fraction \( s \) of its employers that receive the negative compatibility shock.

Following the current legislation in this economy, firms must provide maternity leave. This license is given only to those female workers that are pregnant and give birth, which occurs with probability \( \delta \) per female worker. This probability captures information about the percentage of female workers that are in a fertile age, as well as about the fertility rates per age.\(^5\) The firm has to pay a cost \( C \) per female worker that enjoys the maternity leave. This assumption intends to capture the costs of searching for and training a person to replace the woman who is on maternity leave, as well as adjustments in organization and production, and other costs that are generated during the leave period.

However, providing maternity leave also generates benefits for the firm. The literature that studies the effects of providing maternity leave on the labor decisions of women find that those with maternity leave have a higher probability of going back to work afterward, which is beneficial for the firm as long as it can retain a person that already has specific knowledge about the firm. Furthermore, there is a hypothesis that firms that provide maternity leave are able to attract women that are more qualified and with a higher commitment to stay in the labor market.\(^6\) In this model, we capture this benefits by assuming that each female worker (independently of it pregnancy status) increases firm’s revenue in the amount \( B \).

Legislation mandates that employees must provide maternity leave. If it were the case that \( C < B \), firms would provide them voluntarily even in the absence of such legislation. The fact that governmental regulation is required suggests that in general \( C > B \).

The maximization problem for a firm at time \( t=0 \) can be written as
\[
\max_\{F_t, M_t\} \pi \equiv \sum_{t=0}^{\infty} \beta^t \left\{ G(M_t, eF_t) - w_{mt}F_t - w_{ht}M_t - \delta CF_t + BF_t - sf_m F_{t-1} - sf_h M_{t-1} \right\},
\]
where \( F_{-1} = M_{-1} = 0 \). The first line of the maximization problem is revenues minus wage costs. The second line introduces the costs of maternity and of terminating contracts.

When \( F_t = F_{t-1} \) and \( M_t = M_{t-1} \), the number of workers is stable over time, and the firm hires \( sF_{t-1} \) women and \( sM_{t-1} \) men to replace those that got fired in the previous period. Given that costs are lineal, and that there is no aggregate uncertainty, firms adjust immediately to steady state levels. For each period, \( M_t = M, F_t = F, w_{mt} = w_m, \) and \( w_{ft} = w_f \).

Equilibrium levels of employment and wages must satisfy:

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\(^5\) In our empirical exercise, this probability would be determined by the percentage of women between the ages of 18 and 30, with their respective fertility rates, relative to the population of women between 40 and 55 years old with their fertility rates.

\[
\frac{\partial G(M,eF)}{\partial F} = w_f + \delta C - B + \beta sf_f \\
\frac{\partial G(M,eF)}{\partial M} = w_m + \beta sf_m
\]

To determine the equilibrium, we impose the condition that the market for men empties:
\[n_m^{-1}(zM) = w_m\] where \(z\) is the number of firms in equilibrium. This number is determined by the conditions \(\pi \leq \Gamma, z \geq Z\), which are satisfied either because profits are equal to entry costs, or because there is no entry and the number of firms, \(z\), is equal to the minimum, \(Z\). Wages perceived by women are given by \(w_f = \max\{n_m^{-1}(zM), \eta w_m\}\), where \(\eta\) is a parameter equal to one if the mandates about equality of wages between men and women are effectively enforced. When there are no restrictions about women’s wages, \(\eta = 0\), so that they are on their supply curve. Most likely, in reality \(\eta \in (0,1)\).

From the equilibrium conditions, we obtain the following conclusions:

1. Legislation on maternity leave seems to have increased increased \(f_f\) considerably more than \(f_m\), since terminating the contract to a pregnant worker increases the probability of the firm being sued, and it has to incur in costs to prove that the worker is not fired due to her pregnancy. Also, the amount of compensation if the litigation is favorable to her increases. Furthermore, the costs of hiring women increase in \(\delta C - B\). Therefore, in reality, it is more likely that legislation on maternity leave decreases women’s employment and wages.

2. The mandate of equality in wages between men and women\(^5\) (i.e., \(\eta > 0\), and probably very close to 1) could have resulted in women’s wages higher to the one that would equilibrate their market, generating involuntary unemployment of women (they are outside of their supply curve). The mandate of equality in wages interacts also with firing costs and maternity leave costs by preventing wages from decreasing in order to offset those costs, decreasing even more employment levels of women.

3. If, starting from a situation in which \(z > Z\) and \(\pi = \Gamma\), legislation results in a decrease of profits for the firm, it could cause the exit of some firms, decreasing employment and wages of both men and women. More generally, the contrast between the cases of free entry and fixed number of firms suggests that legislation reduces more the employment levels in firms or industries for which profits are already very close to entry costs. Most likely these are the smallest firms.

The theoretical discussion concludes that the net effect of the legislation on maternity leave depends on which mandates are more important. The costs of maternity leave and firing cost most likely reduce employment. If the mandate on equality of wages is not effectively enforced, the equilibrium would be on the supply curve of both men and women, and the decrease in employment will be accompanied by decrease in wages. In practice, however, the mandates on maternity leave generate involuntary unemployment of women.

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\(^5\) In Colombia, a mandate of this sort is given by Código Sustantivo del Trabajo, article 143.
In this model we assumed that the labor supply curves are given by \( n_i(w_t) \) for each type of worker, \( i = m, f \). In that sense, the initial effect of providing maternity leave is an increase in women’s involuntary unemployment. In a general equilibrium analysis, however, it is very likely that the increase in unemployment decreases women’s incentives to participate in the labor market, shifting down the supply curve and, therefore, the final effect of the legislation is to increase women’s inactivity rate.

Data

In this study we use monthly data from the Integrated Survey of Households - GEIH – in the period between January 2009 and September 2013. The survey is conducted by the National Administrative Department of Statistics (DANE), and it is the main source of information on employment in Colombia. This survey provides data on the size and structure of the labor force, the household income and population characteristics such as gender, education, age, marital status, etc. The period of time we selected includes time intervals before and after the new maternity leave legislation in July 2011.

The population we studied consists of respondents in the 13 metropolitan areas covered by the GEIH.\(^8\) Our database has information on 1,727,288 individuals for the entire period of analysis (with expansion factors, this corresponds to an average 20,081,028 individuals per month). Total observations is reduced to 920,454 by restricting the sample to only women, and considering only ages comprising the treatment and control groups we end up with a total of 403,253 individuals( taking into account the expansion factor, this corresponds to an average of 4,562,633 individuals per month). The reduction of the sample serves the purpose of obtaining comparable groups in the analysis to isolate the effect of the law on women in fertile age.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Total Observations 2009-2013</th>
<th>Weighted Total Observations - Monthly averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Data</td>
<td>1.776.373</td>
<td>20.081.028</td>
</tr>
<tr>
<td>Only Women</td>
<td>949.210</td>
<td>10.454.246</td>
</tr>
<tr>
<td>Ages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-30</td>
<td>214.237</td>
<td>4.562.633</td>
</tr>
<tr>
<td>40-55</td>
<td>197.487</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows the distribution of each category for the treatment and control groups. Between active and inactive, the percentage of women in the treatment group is higher. Interestingly, the greatest difference is for the group of unemployed women aged 18 to 30 years. Women between 18 and 30 years old represent 72% of the unemployed in our sample.

\(^8\) The 13 metropolitan areas are: Barranquilla, Bogotá, Bucaramanga, Medellín, Cali, Cartagena, Cúcuta, Ibagué, Manizales, Montería, Pasto, Pereira and Villavicencio.
Table 2. Distribution of the labor market variables for the treatment and control groups. Period 2009-2013.

<table>
<thead>
<tr>
<th></th>
<th>From 18 to 30 years old</th>
<th>From 40 to 55 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Labor force (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Employed</td>
<td>47.46</td>
<td>52.54</td>
</tr>
<tr>
<td>◦ Informal</td>
<td>38.28</td>
<td>61.72</td>
</tr>
<tr>
<td>◦ self employed</td>
<td>33.96</td>
<td>66.04</td>
</tr>
<tr>
<td>• Unemployed</td>
<td>71.70</td>
<td>28.30</td>
</tr>
<tr>
<td><strong>Inactivity (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• lack of job search activity</td>
<td>29.44</td>
<td>70.56</td>
</tr>
</tbody>
</table>

Table 3 presents a disaggregated framework for the structure of the population. The results show that that women in the treatment group that are part of the labor force are more educated relative to inactive women in the same group. It is therefore important to control for this variable, it is expected that education encourages active participation in the market. Also, there are more treated women who are inactive in the lowest classification of economic strata (strata 1) and less in the strata 2 and 3 compared with the treated women in the labor force. Women in the treatment group who are inactive report to cohabite or being married at higher rates compared to women in the labor force. Finally, women aged 18 to 30, who are inactive, live in households with more children under 12 years than women of the same group in the labor force. In summary, it can be inferred that inactivity among women in the treatment group was partially explained by their individual characteristics – which are used as controls in this study – that are less valued in the labor market.

Table 3. Characteristics of the treatment and control groups in the labor force and in the inactivity. Period 2009-2013

<table>
<thead>
<tr>
<th>Education</th>
<th>Inactivity (%)</th>
<th>Labor Force (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ages 18 to 30</td>
<td>Ages 40 to 55</td>
</tr>
<tr>
<td>None</td>
<td>3.56</td>
<td>7.93</td>
</tr>
<tr>
<td>Primary Education</td>
<td>11.35</td>
<td>36.89</td>
</tr>
<tr>
<td>Secondary Education</td>
<td>77.82</td>
<td>44.74</td>
</tr>
<tr>
<td>Higher Education</td>
<td>7.27</td>
<td>10.45</td>
</tr>
<tr>
<td>Economic Strata</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>30.12</td>
<td>21.59</td>
</tr>
<tr>
<td>2</td>
<td>36.37</td>
<td>38.16</td>
</tr>
<tr>
<td>3</td>
<td>23.05</td>
<td>29.65</td>
</tr>
</tbody>
</table>
Table 4. Descriptive statistics of control variables. Period 2009-2013

<table>
<thead>
<tr>
<th>Variable</th>
<th>Average</th>
<th>Standard deviation</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of Education</td>
<td>10.16</td>
<td>4.13</td>
<td>0 – 26</td>
</tr>
<tr>
<td>Age</td>
<td>34.96</td>
<td>12.35</td>
<td>18 – 55</td>
</tr>
<tr>
<td>Strata</td>
<td>2.32</td>
<td>1.07</td>
<td>1 – 6</td>
</tr>
<tr>
<td>Children &lt;12 per household</td>
<td>0.86</td>
<td>1.04</td>
<td>0 – 12</td>
</tr>
<tr>
<td>Total People in the Household</td>
<td>4.32</td>
<td>1.98</td>
<td>1 – 22</td>
</tr>
</tbody>
</table>

Methodology

We primarily rely on differences-in-differences as our empirical strategy in that we compare the differential effect of changes in legislation, on maternity protection at work on labor market variables for the group of women with ages associated to a high rate fertility (treatment group) compared with women associated with ages associated with a lower rate of fertility (control group).

Women between 18 and 30 years are the treatment group and those between 40 and 55 years old are the control group.⁹

Table 5 shows the differences in fertility rates for women in the treatment group and control group reported by DANE. On average during the period analyzed -2009 to 2013 - fertility rates in the treatment group hover around 11.5 % while the control group range around 1.18

---

⁹ In addition, the control group take women from age 40 to ensure that these women were not part of the treatment group at any time during the period analyzed.
These differences in fertility rates allow us to have two comparable groups where only one of them is affected by changes in the law.¹⁰

Table 5. Fertility rates by age

<table>
<thead>
<tr>
<th>Period</th>
<th>Age Groups</th>
<th>Global Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20-24</td>
<td>25-29</td>
</tr>
<tr>
<td>1985-1990</td>
<td>0,17</td>
<td>0,15</td>
</tr>
<tr>
<td>1990-1995</td>
<td>0,16</td>
<td>0,14</td>
</tr>
<tr>
<td>1995-2000</td>
<td>0,15</td>
<td>0,13</td>
</tr>
<tr>
<td>2000-2005</td>
<td>0,14</td>
<td>0,12</td>
</tr>
<tr>
<td>2005-2010</td>
<td>0,13</td>
<td>0,11</td>
</tr>
<tr>
<td>2010-2015</td>
<td>0,12</td>
<td>0,11</td>
</tr>
<tr>
<td>Average 2005-2015</td>
<td>0,12</td>
<td>0,11</td>
</tr>
</tbody>
</table>

Source: DANE.

Figures 2, 3 and 4 give an indication of the change in the status of women after the implementation of the law. The highlight of the graphs is that the change in regulation in 2011 extending the days of maternity leave from twelve to fourteen days affects the labor situation of women with ages associated with high fertility rates.

Figure 2. Difference in inactivity rates of treatment and control groups from 2009 to 2013.

¹⁰ The results of our empirical model are robust to changes in the definition of high fertility group. For example, the results hold when the treated group consists of women aged 25 to 30 years, or 25 to 35 years.
Figure 3. Differences in unemployment rates of treatment and control groups from 2009 to 2013.

Figure 4. Differences in unemployment rates of women living with and without a partner in the treatment group.
Figure 2 shows the difference between the annual average of inactivity rate for women in the treatment group and for women in the control group.\(^{11}\) The change in maternity legislation increases the relative incidence of inactivity in women associated with high fertility ages. Moreover, Figure 3 shows that the law reduces the unemployment rate of women in the treatment group.\(^{12}\) However, to analyze the data in detail, figure 4 shows that women in the treatment group who cohabit with a partner experience an increase in their unemployment rate after the implementation of the law.\(^{13}\) This suggests that there is an effect on the demand for women who have a high probability of obtaining the benefits of the new law, increasing inactivity among women in the treatment group, and unemployment for those women living with a partner.

In order to understand the impact of the extension of the period of maternity leave on the group of women aged high fertility, we propose the following empirical model:

\[
y_t = \gamma_0 + \gamma_1 \text{fertile}_t + \gamma_2 \text{law2011} + \gamma_3 \text{fertile}_t \times \text{law2011} + \Gamma X_t + \theta_t + \epsilon_t
\]  
(1)

Where \(y_t\) are variables such as labor inactivity, unemployment, type of contract, unemployment duration, etc. \(\text{fertile}_t\) is a dummy variable that takes the value of 1 if the person is a woman between 18 and 30 years old and 0 if it is a woman between 40 and 55. \(\text{law2011}\) is a variable that takes the value of 1 for all periods from July 2011, when the legislation on maternity protection is introduced. \(X_t\) corresponds to a vector of control variables that capture individual characteristics that affect the outcome of the labor market.

Each estimation controls by age of women, age squared, economic strata (corresponding to the rate for electric service in the house); the number of years of education, number of children under 12 in the household and the number of people registered in the household survey. In addition, we use dummies identifying whether the woman is a student, whether she is married or living with a partner, if she is the head of household and whether the survey was conducted in Bogotá or not. \(\theta_t\) is the fixed effects of time, we control for years and month. We are interested in the coefficient of the interaction, which indicates whether the legislation considered differentially affected women in the treatment group.

Additionally, we consider the following regression:\(^{14}\)

\[
y_t = \gamma_0 + \gamma_1 \text{fertile}_t \times \text{law2011} \times \text{partner} + \Gamma X_t + \theta_t + \epsilon_t
\]  
(2)

Where the interaction \(\text{fertile}_t \times \text{law2011} \times \text{partner}\) captures the effect of being a woman in the treatment group and live with partner after July 2011. With this interaction we intend to

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\(^{11}\) Difference in inactivity rate = \(\frac{\text{inactive treated} – \text{inactive control}}{\text{total inactive}}\)

\(^{12}\) Difference in rate of unemployment = \(\frac{\text{Unemployed treated} – \text{unemployed control}}{\text{total unemployed}}\)

\(^{13}\) Difference in rate of unemployment = \(\frac{\text{Partner unemployed treated} – \text{No partner unemployed treated}}{\text{total unemployed treated}}\)

\(^{14}\) All regressions include main effects.
locate the group of active women with a high probability of having children, since society perceives that live partner implies stability conducive to procreate.

We estimate the equations using ordinary least squares (OLS) and probit to compare results. With the above econometric model we want to explore the distortion that arise in the labor market by including two more weeks of maternity leave equivalent to an increase of 17% in the time of license.

Results

In this section we present the results found using OLS and probit estimates. In general, the estimated coefficients for the probit model are similar to those estimated by OLS.

Population over 18 years

Column 1 of Table 6 shows the effect on inactivity of the law 1468 on highly fertile women. Inactivity is a dummy variable that takes the value 1 if the woman is inactive in the labor market. The coefficient of the interaction for women in the treatment group after the implementation of the law is positive and significant. Specifically, the results suggest that being in the female group with high fertility after July 2011 have an impact of 0.87 percentage points over inactivity with regard to women in the control group. This means that women associated with high fertility ages have a higher probability of being inactive after the law is implemented.

From the definition of inactivity we use two answers that indicate that the person is able and willing to work, but has not follow the steps to get a job. We decide to implement this exercise to isolate from the definition of inactivity causes that are not associated with labor market conditions. The new variable lack of job search activity, is a dummy that takes the value of 1 if the person in the survey reports that after his last employment or during the last 12 months has not done any diligence to find a job or set up a business. In the second column of Table 6 we see that the probability of being inactive because the lack of job search activity, but he or she can and want to work, increases for the treatment group of women by 0.19 percentage points after the law is implemented.

15 A person is classified as inactive if in the survey if she or he has an affirmative answer for at least one of the following statements: 1. handicapped. 2. Doesn’t want to get paid work or set up a business. 3. Want to work, but has not made steps to search for a job or set up a business because: a. self-reported as very young / old for work. b. Family responsibilities. c. Health problems. d. Full time student. e. Other. 4. After his last job he or she hasn’t done any diligence to find a job or set up a business. 5. During the last 12 months has not done any diligence to find work or set up a business. 6. He or she was not available for work.

16 As a check for robustness we decide to allocate treatment and control groups randomly and the results don’t hold, this is that the results depend on the election of the group.

17 You may know that these people can and want to work because for answering the following questions: 1. After his last job has not done any diligence to find work or set up a business and 2 During the past 12 months has not done any diligence to find work or set up a business, they should not be classified as inactive in the first 3 statements footnote 25.
Table 6. Effects of the law 1468 of 2011 on labor market variables for women in fertile age.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1) Inactivity</th>
<th>(2) Lack of job search activity</th>
<th>(3) Labor market reasons</th>
<th>(4) Duration of unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law2011 * fertile</td>
<td>.0087</td>
<td>.00196</td>
<td>.0016</td>
<td>1.352</td>
</tr>
<tr>
<td></td>
<td>(.000)</td>
<td>(.000)</td>
<td>(.000)</td>
<td>(.034)</td>
</tr>
<tr>
<td>R²</td>
<td>.111</td>
<td>.0088</td>
<td>.0079</td>
<td>.045</td>
</tr>
</tbody>
</table>

Probit

| Law2011 * fertile      | .032           | .018                           | .0036                    |
|                        | (.0003)        | (.0008)                        | (.0006)                  |
| R² Adjusted            | .105           | .048                           | .033                     |
| Observations           | 408.992        | 408.992                        | 408.992                  | 49.251                      |

Note: All coefficients are significant at a significance level of 5%. Standard errors are in parentheses. All estimates control for education, age, age squared, economic strata, total number of children and people in the household, dummies to indicate if the person is studying, if living with a partner, if she is the head of household and she lives in Bogotá; additionally we control for fixed effects of month and year.

To understand whether the treatment group has not made the steps to get a job mainly for reasons attributable to the labor market after 2011, we used a question that allows us to distinguish people who want to work but haven’t done the steps to find work due to adverse working conditions. Column 3 shows the results using this indicator as a dependent variable. The results indicate that women with ages associated with high fertility rates are more likely to report that market conditions are more difficult since 2011 as a reason for not doing diligences to find a job.

The analysis of the duration of unemployment also allows us to investigate whether women associated with high fertility rates have more difficulty finding employment after law is implemented. Column 4 shows that the duration of unemployment increases by 1.35 weeks for women associated with high fertility rate after 2011.

Overall, these results are consistent with our hypothesis that women in ages associated with a high rate of fertility are less attractive to the market after the law and because of this, the probability of being inactive increases.

\(^{18}\)The question we use is the following: Although...... you want to work, why are you not searching for a job during the past 4 weeks? And we create a dummy variable for those who responded affirmatively to the following options for that question: • Employers consider you very young or very old. • You do not have resources to set up a business. • You lack the necessary experience. • You are tired of searching. • You don’t know how to search for a job • Waiting to be called. • There are no jobs available in the city or region / cannot find a job in her profession.
The personal characteristics of women in the treatment group participating in the labor market after July 2011 and the ones in the control group allow us to conclude that several personal characteristics play a crucial role in increasing the probability of being part of the labor force. Women in the treatment group who choose to participate in the market have different characteristics than those that are inactive.

Table 7 shows that there is indeed a significant difference between women in the group of active and inactive for the treatment group, active women are on average older, more educated, of higher economic status and live with less number of children under 12. These are features represent, in general, better tools to compete in the market. The data also show that differences remain significant with the enactment of the 1468 law, which suggests that women with less favorable characteristics have been most affected by the law.

Table 7. Comparison of means test for active and inactive young women

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Period 2009-2013</th>
<th>before the law 1468</th>
<th>After the law 1468</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of Education</td>
<td>.957 (.014)</td>
<td>.88 (.02)</td>
<td>1.03 (.021)</td>
</tr>
<tr>
<td>age</td>
<td>1.77 (.017)</td>
<td>1.77 (.023)</td>
<td>1.78 (.025)</td>
</tr>
<tr>
<td>Economic strata</td>
<td>.076 (.004)</td>
<td>.075 (.006)</td>
<td>.078 (.007)</td>
</tr>
<tr>
<td>Children at home</td>
<td>-.102 (.005)</td>
<td>-.092 (.007)</td>
<td>-.11 (.007)</td>
</tr>
</tbody>
</table>

Note: All coefficients are significant at a significance level of 5%. Standard errors are in parentheses.

Table 8 confirms the above hypothesis. In the first column we see that the triple interaction shows that by decreasing the education of women in the treatment group, after the law enters into force, the likelihood of inactivity increases. Being closer to 30 years old, have more children at home and have more people at home will increase the likelihood of inactivity for women between 18 and 30 years old, when law was implemented. Finally, have a higher Economic strata in the treatment group will increase the inactivity, this result could be driven by women with the higher level of economic status who have children that have the ability to decide to leave the market to stay with the children.
Table 8.

<table>
<thead>
<tr>
<th>Characteristics:</th>
<th>Inactivity (1)</th>
<th>Inactivity (2)</th>
<th>Inactivity (3)</th>
<th>Inactivity (4)</th>
<th>Inactivity (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law2011 * fertile * Education</td>
<td>-0.0023</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Law2011 * fertile * age</td>
<td></td>
<td>0.0047</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Law2011 * fertile * Children</td>
<td></td>
<td></td>
<td>-0.0041</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Law2011 * fertile * people in the household</td>
<td></td>
<td></td>
<td></td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>Law2011 * fertile * Economic strata</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.0035</td>
</tr>
</tbody>
</table>

R²            | .112            | .112            | .111            | .111            | .111            |
Observations  | 408.992         | 408.992         | 408.992         | 408.992         | 408.992         |

Workforce

Now we focus the analysis on the group of women that is part of the economically active population, i.e. women who are unemployed or employed. Within the group of employed women we analyze indicators of job quality in order to investigate the impact of the law. Column 1 of Table 9 shows that the probability of being unemployed decreases by 2.1 percentage points for women associated with high rates of fertility after the law entered into force. This result seems counterintuitive. However, women who are part of the economically active population have certain characteristics that make them very valuable in the market and protect them from being discriminated for being associated with a high rate of fertility ages. 19

Column 2 to column 5 of Table 9 shows the results for some indicators of job quality. Column 2 shows that being a woman in fertile age decreases the probability of being informal. One

---

19 Another possible explanation is that the law "Formalizing and Employment Generation" known as first employment law implemented in 2010 can be driven this result, since it promotes the recruitment of young people with tax incentives. Although this law also promotes the recruitment of women over age 40, the effect is greater on younger women. We estimate the effect of this law on women in the age groups 18-28 and 40-55 using as a control group women not sheltered by law (29 to 39 years who are not household heads) one year before and after the law entered into force. For the first group, unemployment decreased by 1.3 percentage points; while for the second group unemployment decreased by 1 percentage point. For the entire period 2008-2013 this gap widens: for the first group, unemployment decreased by 1.5 percentage points, while for the second group unemployment rises 0.24 percentage points. These regressions are available upon request.
possible explanation for this result is that the informal sector could be included by the decisions of the Court that have been extended the protection package for women working in less formal conditions. Therefore hiring a women in the treatment group can be very expensive for the informal sector, as there is a likelihood that workers interpose actions when pregnant to get the benefits from law. The dependent variables that capture the type of contract show that after the law 1468 of 2011, which extended maternity leave, women in the treatment group are more likely to have a formal contract, and this should be the result of the law, which states that women should have all the benefits, or otherwise the employer must pay all the maternity leave.

Table 9. Effects of the law 1468 in 2011 on other labor market variables for women in fertile ages participating in the labor market.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(1) Unemployment</th>
<th>(2) Informal</th>
<th>(3) Contract</th>
<th>(4) written contract</th>
<th>(5) Self-employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law2011 * fertile</td>
<td>-.021 (.000)</td>
<td>-.0102 (.000)</td>
<td>.0268 (.000)</td>
<td>.002 (.000)</td>
<td>.0011 (.0001)</td>
</tr>
<tr>
<td>R²</td>
<td>.063 .204</td>
<td>.139 .234</td>
<td>.002 .072</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Probit

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(1) Unemployment</th>
<th>(2) Informal</th>
<th>(3) Contract</th>
<th>(4) written contract</th>
<th>(5) Self-employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law2011 * fertile</td>
<td>-.023 (.000)</td>
<td>-.027 (.000)</td>
<td>.112 (.000)</td>
<td>.0361 (.0000)</td>
<td>.0034 (.0004)</td>
</tr>
<tr>
<td>R² Adjusted</td>
<td>.073 .164</td>
<td>.11 .215</td>
<td>.056</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>290.630</td>
<td>241.379</td>
<td>241.379</td>
<td>138.921</td>
<td>241.379</td>
</tr>
</tbody>
</table>

Note: All coefficients are significant at a significance level of 5%. Standard errors are in parentheses. All regressions control for education, age, age squared, economic strata, total number of children and people in the household, dummies to indicate if she study, if she is living with a partner, if she is the head of household and she lives in Bogotá; additionally, we control for fixed effects of month and year.

Variables: Informal, contract, written contract and self-employed only have the values of 0 and 1 for the employed population. Informal variable is a dummy that is 1 if the person works in a company that has 5 or fewer people, if she is a worker without payment or if she is housekeeper. The variable contract is a dummy that takes the value of 1 if the person has some kind of contract for her job. Written contract is a dummy that takes the value of 1 if the contract she has is written, and 0 if the contract is verbal. The dependent variable self-employed is a dummy that is 1 if the person claims to be self-employed.

To get a clearer picture of the working conditions of women in the treatment group who are employed, we analyze the wage differential between treatment and control group. This analysis restricts the sample to employed women, between the ages considered in the treatment and control groups who reported a salary in the GEIH. Table 10 analyzes the wage gap between women associated with a high rate of fertility and women associated with low fertility. The results show that the real wage decreases by 0.48 percentage points for women in the treatment group when the law takes effect. This would indicate that employers transmit the overrun of maternity on women in the treatment group in the form of lower wages.

Table 10. Effects of the law 1468 in 2011 on the logarithm of the nominal and real wages.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(1) Log wages</th>
<th>(2) Log real wages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law2011 * fertile</td>
<td>-.0039 (.0002)</td>
<td>-.0038 (.0002)</td>
</tr>
<tr>
<td>R²</td>
<td>.414</td>
<td>.411</td>
</tr>
<tr>
<td>Observations</td>
<td>127.767</td>
<td>127.767</td>
</tr>
</tbody>
</table>
The results in Table 9 column 5 show that women associated with high fertility, after 2011, are more likely to be self-employed workers. Specifically, belong to the group of women associated with high fertility after the law 1468 of 2011 increases the probability of being self-employed by 0.11 percentage points. Olarte and Peña (2010) find that self-employment jobs for the Colombian mothers are characterized mainly for being low quality jobs. It is therefore possible that the treatment group that is affected by the law ends in low-paying jobs where they are not protected by the law, and where they have to assume the cost of their own motherhood. Our data show that women aged 18 to 30 who are self-employed have less favorable characteristics compared to other women participating in the labor market. Table 10 shows that the treatment group who reported to be self-employed have on average less education, being older, belonging to a lower economic stratum, and living in households with more children under 12 years than other women in treatment group who are part of the workforce.

Table 11. Means test for treated women in the workforce between self-employed and not self-employed

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Period 2009-2013</th>
<th>Before the law 1468</th>
<th>After the law 1468</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of education</td>
<td>.793 (.02)</td>
<td>.839 (.029)</td>
<td>.743 (.029)</td>
</tr>
<tr>
<td>Age</td>
<td>-.512 (.023)</td>
<td>-.504 (.032)</td>
<td>-.519 (.033)</td>
</tr>
<tr>
<td>Economic strata</td>
<td>.233 (.006)</td>
<td>.258 (.009)</td>
<td>.206 (.009)</td>
</tr>
<tr>
<td>Children in the</td>
<td>-.284 (.007)</td>
<td>-.289 (.01)</td>
<td>-.28 (.009)</td>
</tr>
<tr>
<td>household</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: All coefficients are significant at a significance level of 5%. Standard errors are in parentheses.
percentage points. The results for inactivity remain, this is, fertile women, regardless of their marital status, has a probability of staying out of the workforce with the new maternity law.

This paper gives us a broad view of the situation of women with a high fertility rate once the law, extending maternity, takes effect. We found that women of childbearing age will experience an increase in the probability of being inactive with the new law. We show that only a select group, that is women between 18 and 30 years for the market with valuable characteristics, are going to be favored with formal contracts to provide all the guarantees and with a lower probability of being unemployed. However, their salaries will be lower compared to women with low fertility, indicating that the employer will punish women for being in ages associated with having high fertility rates. Women in the workforce, with high fertility rates and who live with a partner experience an increase in the probability of being unemployed, which is consistent with a discrimination by employers against women who have a high probability of having children.

**Women and men**

If in addition to women in low fertility rates, we consider men of both age groups (18-30 and 40-55 years) as part of the control group, the negative effect of the law 1468 on women of childbearing age in the main labor market variables remain, and for the specific case of inactivity the effect increases to 2 percentage points. Thus, women in the treatment group are not only at a disadvantage compared to their peers in non-reproductive ages, but also to men who doesn’t assume the responsibility and cultural implications of procreating. Thus, inactivity has become the may channel to exclude younger women, since they are considered to have a higher cost than other candidates.
Table 12. Effects of the law 1468 when the control group is complemented by men

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1) Inactivity</th>
<th>(2) lack of job search activity</th>
<th>(3) labor market reasons</th>
<th>(4) Unemployment duration</th>
<th>(5) Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law2011<em>women</em> fertile</td>
<td>.0203 (.0001)</td>
<td>.0004 (.000)</td>
<td>.00037 (.000)</td>
<td>0.854 (.0488)</td>
<td>-.0083 (.001)</td>
</tr>
<tr>
<td>Observation</td>
<td>751.581</td>
<td>751.581</td>
<td>751.581</td>
<td>85.753</td>
<td>594.479</td>
</tr>
</tbody>
</table>

Note: All coefficients are significant at a significance level of 5%. Standard errors are in parentheses.

Conclusions

Our research seeks to determine the impact of the last employment law legislation (Ley 1468 from 2011, which extended the maternity leave from 12 to 14 weeks (a 17% increase)) has had on women's employment status. We believe that research on these variables could help to identify some of the determinants of female employment and unemployment in Colombia, and in subsequent research serve as a benchmark for comparison with the functioning of labor markets in similar economic and institutional contexts to that of Colombia, as is the case in most countries in the region.

To tackle the change in legislation and its effect on women's labor results, we exploit the differential effect on women that because of their age are associated to different fertility levels. That is, we compare women in ages between 18 and 30 with women in ages between 40 and 55. These two groups have very different fertility rates and therefore the Law 1468 affects women between 18 and 30 years old (the treatment group) but not the group between 40 and 55 (the control group). We use the approach of a difference-in-difference model.

The results show that from 2011 on, the labor market results for fertile (treated) women changes and they are put in disadvantage against the group of women associated to low fertility (control). The relative probability of inactivity increases in 1.2 percentual points for women in the treatment group.

Under the new legislation, it is harder for women in the treatment group to find a job. Two factors discourage women from participating in the labor market: a higher duration of unemployment, and an increase in the probability of indicating that finding a job is getting harder because of the market conditions.

Although the average effect for women in the high-fertility group is a higher probability of being inactive, the subgroup that has higher education, less children, or a higher economic stratification has a higher probability of being active because their characteristics are more valued by the labor market. Those women in the treatment group that belong to the labor force are not in disadvantage because of the change in legislation. For these women, we observed a reduction in the probability of unemployment and an increase in the probability of having a formal-sector job. However, we observe a decrease in the wage perceived by women in the treatment group when controlling for all possible observable characteristics. This result is consistent with the hypothesis that employers translate part of the cost of maternity leave to
women. Our hypothesis is that the employer perceives the new law as an increase in the excess cost incurred by hiring women of ages associated with high fertility who could get pregnant during the labor contract period.

We also find that among women of the treatment group that participate in the labor market, those married or cohabitating experience an increase in their probability of unemployment once Law 1468 of 2011 is effective.

Our results highlight the fact that the protection to maternity must be linked to a group of incentives so that the employer do not exclude from the labor market women with a high probability of having children. We propose some public policy measures to correct for the distortions created by the legislation so that labor market results for women are not worsened and they can enjoy the 14 weeks of maternity leave they have the right to.

Our proposals address different dimensions of both the legislation and complementary public policies. The first major dimension to address has to do with the costs associated with motherhood, which as we have explained, are placed on women, and in particular on those in most fertile ages. In this regard, we propose a set of legislation and policy actions affecting cultural perceptions on parenting and childcare. The second dimension relates to addressing the hiring process, and specifically to reduce discrimination against these women.

Within the first dimension, our proposed policy concentrates on suggesting that differences in coverage of labor legislation on women and men are reduced, i.e., by promoting the recognition of paternity leave to the same extent and with the same benefits as the license that working mothers now have, as well as incentives for parents to actually enjoy them. Alternatively, one may also think of a "parental leave" that can be enjoyed by both parents in equal proportions. This is the path some EU countries such as Sweden and Finland and others like Canada have begun successfully. In the case of Sweden, the Swedish government's interest was to provide parents with incentives to increase their participation in child care and to promote gender equality and women's participation in the labor market. In the words of the Swedish government "It is important that parents take paternity leave. Increasing use of parental leave by fathers should contribute to a change in the attitudes of employers, who will understand paternity leave as a natural event to consider and to coordinate and organize work in a company. This change of attitude is necessary for both men and women to enjoy paid paternity and maternity without feeling that they risk their careers or their opportunities for career advancement.

Another reason to increase the use of these licenses by parents, is that the chances of women to achieve equality in employment opportunities with men will be always limited if women are responsible for the care of home and children. If the responsibility for the care of children were shared equally by fathers and mothers, this would lead to a more equal distribution of labor disruptions between men and women, and therefore women would achieve better development opportunities and career advancement (Ekberg, Eriksson, Friebel, 2013). To meet this objective, in 1995 the Swedish government implemented a reform of its licensing system, which booked one month paternity leave for the father. Ekberg, Eriksson and Friebel, assessed the impact of this reform in terms of the possible increase in the enjoyment of these licenses by the parents, and if this enjoyment generated a long-term effect on employment outcomes of men and women. These researchers found that short-term incentives work, and that men increased their enjoyment of licenses by 50%, although this has not translated into greater male participation in child care duties.
As a result of the existence of a shared cultural perception that the costs of care and upbringing of children are borne by women, people tend to evaluate working mothers as less competent, less committed to the job, and potentially less reliable. Policy recommendations for this dimension are related to the promotion of cultural changes that highlight the importance that both fathers and mothers take an active part in similar proportions in the care and upbringing of children and domestic chores in general. An interesting initiative, for example, is the "Equipares" program promoted by the Ministry of Labour in order to "transform the structures of work and human resource management within companies, seeking to eliminate possible gender inequalities that make the company miss its human resource." As part of this program TV ads have been issued that show, for example, a woman pushing a shopping cart at a supermarket while at the same time pulling with ropes to a man sitting at a desk. The narrator's voice says, "Without your help, she must strive twice. When you support your partner her job opportunities improve. Support employment equity, it's a matter of development." Although the initiative is interesting, because it talks directly to parents in order to highlight the importance of their contribution to housework, the ads seem to have had little broadcast on national television. Similar initiatives but directed to employers, as seems to be the goal of Equipares program, are also desirable in order to refine and reduce beliefs that women in general and mothers in particular have a smaller commitment with the impositions of the workplace compared to men, making them less competent candidates for the same jobs.

Indeed, the equitable distribution of workloads imposed by childrearing on mothers and fathers in terms of absences, licensing, or domestic calamities, should reduce the absences of women in the labor market contributing to human capital accumulation similar to that of men. This would reduce the reasons that explain part of the wage gap for both men and women, and that relate to absences from the job since they would be for similar periods. This would also contribute to discourage discriminatory reasons for preferring men over women who are mothers or are in a reproductive age, since would share equally the costs for prospective parents and potential mothers who already have children.

Among the policies to address the topic of recruitment, one proposal has to do with the promotion of effective control mechanisms on the principle "equal pay for equal work" which lie in the work of surveillance and control exercised the Ministry of Labour and the labor courts. As evidenced, part of the wage gap between men and women in our study and in other investigations is explained as a cost-effective transfer of maternity costs from employers to workers in the form of lower wages (elsewhere the wage gap is usually explained as discrimination). The recognition that the reproduction is a social cost, which may not apply only to women, should generate interest in encouraging employers to pay equally the work of men and women a task that can be led by the national government initiatives.

Associated with the above, and to prevent discrimination against women in ages of greater fertility, another dimension that would explain the differential employment outcomes between men and women has to do with the existence of conscious or unconscious discriminatory motives on the employers at the time of recruitment. Policy proposals to reduce the impact of

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discrimination in women outcomes highlight the importance of recruitment and promotion of staff procedures that are transparent and not influenced by the gender or parental status of the candidates. Research in this area has shown, for example, that the recruitment of women to be professional musicians in the top five orchestras in the United States increased substantially (explaining between 30 and 50% of the increase in hiring women) when the methodology of "blind auditions" in which the candidate's identity was unknown to the evaluators was adopted (Goldin and Rouse, 2000). Similarly, the establishment of "gender blind" hiring processes and parental status should reduce the discriminatory impact against women some of the causes we have already noted. Such measures should be promoted by the Ministry of Labour, and could be supplemented by tax breaks or incentives for companies to achieve gender equality and equal pay between men and women in all job levels.

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