

# **MATERNITY LEAVE LEGISLATION AND THE WORK AND PAY OF WOMEN IN COSTA RICA**

**Final Report**

**U.S. Agency for International Development**

**Prepared for:** Bureau for Latin America and the Caribbean,  
Office of Development Planning and Budget  
and  
Bureau for Global Programs, Center for Economic  
Growth, Office of Economic and Institutional Reform

**Prepared by:** Coopers & Lybrand, L.L.P.

**Sponsored by:** Private Enterprise Development Support Project III  
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**May 1995**

**Coopers  
& Lybrand**

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## EXECUTIVE SUMMARY

The participation of women in the labor market is widely regarded as critical to the development process and to the alleviation of poverty throughout the developing world. In Latin America and the Caribbean, women's participation in productive activities has increased steadily since the 1960s and continues to do so despite the economic crisis experienced throughout the region in the 1980s. Overall, between 26 and 45 percent of women aged 15 years or more engage in wage work, and women constitute between 22 and 37 percent of the economically active population in Latin America. At the same time, women continue to face significant discrimination within the labor market. For international donors, such as the United States Agency for International Development (USAID), understanding the opportunities for and constraints to the participation of women in the labor market is important for devising development programs and strategies that can improve the efficiency of the labor market, promoting equitable participation in the marketplace, and helping women attain their full productive potential.

A recent World Bank study on women's employment and pay in 15 Latin American and Caribbean countries identified a significant void in the literature on gender issues: the impact of labor legislation on women's employment and pay (Psacharopoulos and Tzannatos 1992). The present study focuses on the relationship between gender inequities in the labor market and one key aspect of protective labor legislation: mandated maternity leave legislation. We focus on mandated maternity leave legislation for several reasons. First, studies in several Latin American countries indicate that of all protective labor laws, maternity legislation is the most costly. Second, in the case of Costa Rica, gender differentials in the labor code relate primarily to maternity benefits. Third, in Costa Rica, mandated maternity leave is the only gender-specific labor law that is currently effectively enforced. Therefore, we argue that if any legislative measure has had an impact on male-female wage and employment differences, it is mandated maternity leave.

In this study, we examine the impact on wages and employment of three major legislative changes aimed at protecting maternity in Costa Rica: (i) in 1980, mandated paid maternity leave increased from two months to four months in the public sector; (ii) in 1986, the Costa Rican labor code was revised to provide private sector workers the same four-month paid maternity leave that was extended to public sector employees in 1980; and (iii) in 1990, the Law to Promote the Social Equality of Women significantly increased the enforcement of maternity leave legislation and the penalties for violating the law. A woman is paid her full salary while on leave, with 50% of the salary paid by the employer, and 50% by the Social Security Administration.

These three legislative changes provide the basis for our empirical analysis, where we examine the impact of mandated maternity leave legislation on the pay and employment of women and men in three sectors in the economy: public, private and self-employed. Because these

legislative changes apply differently to the three sectors, we expect the legislative changes to differently affect the wages and employment of women and men in each sector. In particular, the 1980 maternity leave change applied only to public sector workers, and not private or self-employed workers, while the 1986 and 1990 laws applied only to private sector workers. We denote the sector where workers are affected by changes in mandated maternity leave as the "affected" sector, while the sectors where workers are not affected by changes in the mandate are referred to as the "unaffected" sectors. In 1980, the public sector was the affected sector, while the private and self-employed sectors were the unaffected sectors. In 1986 and 1990, the private sector was the affected sector, while the public and self-employed sectors were the unaffected sectors.

We derive the expected impact of changes in mandated maternity leave on the wages and employment of workers in each of the sectors under three different assumptions:

1. If benefits are fully valued (at cost) by women, then women treat the benefits the same as money wages. Therefore, in the sector affected by the change in the mandate, women's take-home pay should fall by the cost to employers of the mandate (leaving total compensation--take-home pay plus the cost of the mandate--the same). Because the total cost of employing women does not change, neither the employment of women nor men in the affected sector should change. Also, because employment does not change in the affected sector, no workers will be pushed into the unaffected sectors. Therefore, in the sectors not affected by the change in the mandate, neither relative wages nor relative employment of men and women should change.
2. If women value the benefit at less than its cost, then in the affected sector women's wages will fall. However, because women value the benefit at less than cost, women's wages will fall by less than the cost of the mandate to employers. This will cause the total cost of employing women (take-home pay plus the cost of the benefit) to increase, causing employers in the affected sector to employ fewer women and more men. The women who lose their jobs in the affected sector will be pushed into the unaffected sectors, causing women's wages to fall and employment to rise in the unaffected sectors.
3. If women value the benefit at more than its cost, then in the affected sector the wages of women will fall by more than the cost of the mandate to employers. This will cause the total cost of hiring women to fall and the employment of women in the affected sector to rise. As a result, the demand for men in the affected sector will fall, causing both the wages and employment of men to fall and pushing men into the unaffected sectors. In the unaffected sectors, women's wages will rise, and women's employment will fall while the employment of men will rise and the wages of men will fall.

We then examine how the wages and employment of women and men in the private, public and self-employed sectors changed after the introduction of each of the three legislative changes in mandated maternity leave, controlling for factors not related to mandated maternity leave that might affect wages and employment. Our results indicate that neither the 1980 nor the 1986

legislative changes had any observable impact on the wages and employment of men and women in any of the three sectors. However, for the 1990 legislative change, which increased enforcement under the equal rights law, we find that women's wages in the private sector fell, while women's employment and men's wages and employment in this sector were not affected. Similarly, the 1990 legislative change did not have any observable impact on the wages or employment of men or women in the unaffected public and self-employed sectors. These results are consistent with the first assumption described above, and we conclude that women fully value the benefit of the maternity leave.

These results have several policy implications:

- First, without enforcement mechanisms, legislative initiatives such as mandated maternity leave may be ineffective. We find that in Costa Rica significant changes in mandated maternity leave legislation in 1980 and 1986 had no impact on the labor market. It is only with the passage of the 1990 Law to Promote the Social Equality of Women, which created enforcement mechanisms and increased penalties for violating the maternity leave law, that we find evidence that the law had any impact on the wages and employment.
- Second, to the extent that maternity leave mandates are enforced, they could be a partial explanation for the wage gap that exists between women and men. However, our results indicate that this part of the wage gap is not an indication of a distortion in the labor market or economy.
- Third, we find that in Costa Rica, mandated maternity leave benefits are not distortionary with respect to employment. Our results indicate that the take-home pay of women falls by the cost of the mandate to employers, so the total cost to employers of hiring women does not change. The relative cost of employing women and men does not change, and, consequently, the relative employment of women and men does not change. Finally, because there are no distortionary effects arising from mandated maternity leave policies, these policies do not have a negative impact on economic growth or productivity.

The results presented in this paper refer only to the efficiency effects of mandated maternity leave; we conclude that the mandated maternity leave legislation does not distort patterns of employment, and therefore has no impact on efficiency. Based on our results, we cannot make any conclusions about the desirability of mandated maternity leave. However, others, among them Lawrence Summers, have suggested several reasons why employer mandates may be desirable policy instruments.

Summers (1989) suggests that mandates may be desirable if there are positive externalities to society associated with the action brought about by the mandate. For example, mandated maternity leave may increase women's attachment to the labor force, increasing the average work-life and life-time earnings prospects for women. By increasing the average work-life and

experience level of working women, mandated maternity leave may contribute to increased aggregate production, as well as reduce work-place inequality. Also, with mandated maternity leave, there may be positive externalities related to family and child welfare.

Summers (1989:179) provides a further argument for government intervention in the market place using mandated benefits such as maternity leave: "If employees have more information about whether they will need parental leave or face high medical bills than their employers do, then employers that provide these benefits will receive disproportionately more applications from employees who require benefits and so will lose money. The market thus discourages provision of any fringe benefits." This would imply that, without the mandate, few private sector employers would provide maternity leave, even to those workers who value the benefit at cost.

Our results indicate that, in Costa Rica, the cost to employers of mandated paid maternity leave is shifted to women in the form of lower wages. In this paper we do not consider whether the effect of mandated maternity leave on the wages of women is an equitable outcome. If society is concerned not only with correcting a market failure, but also with ensuring that women are treated the same as men in the work place, then full shifting of the cost of the mandate to women may not be viewed as a desirable outcome (see Gruber 1994:627). In this case, the government may wish to pay to the woman's full salary while she is on maternity leave, thereby significantly reducing the cost of maternity leave to employers. The government may wish to finance this subsidy with tax revenues, even though the collection of payroll taxes may lead to reduced employment.

## CHAPTER I

### INTRODUCTION

The participation of women in the labor force is widely regarded as critical to the development process and to the alleviation of poverty throughout the developing world. In Latin America and the Caribbean, women's participation in productive activities has increased steadily since the 1960s and continues to do so despite the severe economic crisis experienced throughout the region in the 1980s. Overall between 26 and 45 percent of women aged 15 years or more engage in wage work, and women constitute between 22 and 37 percent of the economically active population in Latin America (Brydon and Chant 1989, Servais 1990). At the same time, Latin American women continue to face significant discrimination within the labor market (Arriagada 1990, Birdsall and Sabot 1991, Gindling 1992, Psacharopoulos and Tzannatos 1992).

For international donors, such as the United States Agency for International Development (USAID), understanding the opportunities for and constraints to the participation of women in the labor market is important for devising development programs and strategies that can improve the efficiency of the labor market, promoting equitable participation in the marketplace, and helping women attain their full productive potential. Furthermore, as numerous studies in the developing world have documented, women's ability to participate in the labor market and earn an adequate income has positive implications not only for their own economic welfare but also for the health and education of their children and thus for the work-force for the future (Mulhern and Mauze 1992, Psacharopoulos and Tzannatos 1992, Cohen and House 1993).

A recent World Bank study on women's employment and pay in 15 Latin American and Caribbean countries identified a significant void in the literature on gender issues: the impact of labor legislation on women's employment and pay (Psacharopoulos and Tzannatos 1992). In this study, the World Bank considered the determinants of women's labor force participation and the male-female wage gap and found that a sizeable part of the gross wage differential between women and men remains unaccounted for by differences in human capital investments such as education, training, and work experience. The authors suggest that the remaining unexplained portion might be due, at least in part, to the existence of protective labor legislation.

Protective legislation can present a trade-off between offering benefits that protect women in the labor force, and creating incentives for firms to not hire women or to pay them a lower wage. Under the premise of protection of female employees, labor laws in many Latin American countries often differentiate between male and female workers in terms of the benefits that employers must provide. Protective laws require employers to provide special benefits to female workers (e.g., paid maternity leave, nursing breaks, child care facilities), or restrict or prohibit women's employment in certain specific occupations (e.g., those requiring long hours, night work or arduous work, or other specific occupations such as mining--see Servais 1990, Uishoefer 1990, International Labor Office 1985). To the extent that these laws are enforced, they may contribute to occupational segregation by gender and limit job opportunities for

women. Labor laws may also have the inadvertent effect of increasing the cost to the employer of hiring women rather than men, and thereby reducing women's employment opportunities.

This study focuses on the relationship between gender inequities in the labor market, specifically male-female wage and employment differentials, and one key aspect of protective labor legislation: mandated paid maternity leave legislation. We expect maternity leave legislation to have a larger impact on male-female wage and employment differentials than other types of legislation for several reasons. First, in previous studies in Panama, Peru, and other Latin American countries, employers interviewed in these countries stated that of all the protective labor laws, maternity leave legislation is the most costly (Spinanger 1984, Scott 1986, International Center for Research on Women 1980). Employers are concerned with the costs associated with paid maternity leave, in particular the costs associated with the replacement of the worker during leave time and the disruption in the labor process this may entail. Second, Crummett (1994) reports similar findings for Costa Rica and Honduras: in terms of costs to employers, the gender differentials in the labor code relating to maternity benefits are the most important. In fact, most employers interviewed by Crummett thought that the added cost of employing women was due primarily to the costs associated with maternity benefits. Third, in Costa Rica, mandated maternity leave is the only gender-specific labor law that is currently effectively enforced. Therefore, we argue that if any legislative measure has had an impact on male-female wage and employment differences, it is maternity leave legislation.

This study examines the impact on wages and employment of three major legislative changes aimed at protecting maternity in Costa Rica. These three changes are:

- In 1980, mandated paid maternity leave was increased from two months (30 days prior to expected date of birth and 30 days after childbirth) to four months (one month prior and three months after childbirth) in the public sector. Mandated maternity leave of two months was unchanged in the private sector.
- In 1986, the Costa Rican Labor Code was revised to provide private sector workers the same four month paid maternity leave required for public sector employees under the 1980 law. However, the revised law contained weak enforcement mechanisms.
- In 1990, the *Ley de Promoción de la Igualdad Social de la Mujer* (The Law to Promote the Social Equality of Women) significantly increased the enforcement of mandated maternity leave legislation. For example, prior to the passage of the 1990 legislation, Article 94 of the Labor Code forbade employers from firing a woman during pregnancy and postnatal/nursing leave, yet the Labor Code contained no provisions requiring that the woman be reinstated if she lost her job during pregnancy or following termination of the leave. Typically, women received only those benefits entitled to any worker fired

under "unjustifiable" circumstances.<sup>1</sup> The *Ley de Promoción de la Igualdad Social de la Mujer*, more commonly referred to as the *Ley de Igualdad Real*, reiterates the Labor Code's prohibition on the dismissal of a woman for becoming pregnant and significantly increases the penalties for violating the maternity leave law. In an addendum to Article 94 it specifies a woman's right to immediate reinstatement to the same position at the same pay rate. If the woman does not choose to be reinstated, the employer must pay her, in addition to involuntary dismissal benefits, wages equivalent to pre- and post-natal maternity leave and any wages she failed to receive from the moment she was fired up to eight months of pregnancy. The law also extends maternity leave to women workers adopting an infant or young child. Furthermore, the law establishes new mechanisms for enforcing the law. A new government agency, the *Defensoría de la Mujer* (the Women's Defense Council) is set up to help women file complaints, secure legal advice, or inquire about the specifics of the statute. With the passage of the *Ley de Igualdad Real*, the Ministry of Labor also plays an extended role in enforcement.

The remainder of this paper is organized as follows. Chapter II provides an overview of maternity leave legislation in Costa Rica and discusses in greater detail each of the three legislative initiatives. Chapter III presents the empirical model which we use to test the impact of these legislative changes on women's wages and employment, and the results of these tests. A fourth and final chapter summarizes the main findings of the paper and presents implications for policy.

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<sup>1</sup> Although not required by the maternity leave mandate, some employers opted to dismiss a pregnant woman, paying her wages equivalent to the maternity leave period and other entitlements associated with involuntary dismissal (FLACSO 1993).

## CHAPTER II

### MATERNITY LEGISLATION IN COSTA RICA: EVOLUTION AND ENFORCEMENT

#### A. Overview

The Costa Rican Labor Code, written in 1943, provides numerous measures to protect maternity and the reproductive function of women. The social guarantees outlined in the Constitution addressing the right to work (Article 56), the special protection the State provides families, mothers and children (Article 51), legislation protecting the work of women and children (Article 71), and the rights of workers to be compensated for unjust dismissal (Article 63) set the foundation for many of the maternity benefits contained in the Labor Code.

Since 1943, laws and regulations to protect women workers during maternity have undergone considerable changes, particularly with the implementation of three major legislative reforms carried out in 1980, 1986 and 1990. In 1980 mandated maternity leave is increased from two to four months in the public sector. In 1986 the Labor Code increased paid maternity leave from two to four months to private sector workers. In 1990, the *Ley de Igualdad Real* introduced substantive additions to the legislation on maternity as well as clarified and strengthened existing norms protecting pregnant and lactating workers.

In addition to the Labor Code, regulations from the Costa Rican Social Security Administration contain a number of provisions regarding maternity. Article 43, "Illness and Maternity Regulation," stipulates that during the leave period covering pre-and postnatal leave, employers are responsible for paying the insured woman a subsidy equivalent to 50 percent of her salary; the Social Security Administration covers the remaining 50 percent thus providing the worker cash benefits equivalent to 100 percent of previous earnings. Article 43 states that women can take time off from the remunerated work day for prenatal medical consultations.

In terms of international norms, Costa Rica has not ratified 1919 Convention No. 3 or the revised 1952 Convention No. 103, the two International Labor Office conventions dealing with maternity protection. Nonetheless, the provisions of both conventions (e.g., the prohibition of dismissal during pregnancy and maternity leave, the granting of cash and certain supplementary benefits, the establishment of nursing facilities, etc.) conform closely to the legislation contained in the Labor Code. In 1984, however, Costa Rica ratified the United Nations 1979 Convention to Eliminate All Forms of Discrimination Against Women. One of the key objectives of the Convention is to protect maternity by ensuring women access to family planning and social services. Although ILO conventions supersede all national legislation, there is no evidence that the 1979 Convention significantly strengthened existing legislation protecting maternity in Costa Rica.

The following sections present the legislation as it existed prior to 1980, several major enforcement issues surrounding the legislation in the pre-1980 period, and the specific reforms introduced in 1980, 1986 and 1990.

## **B. Legislation and Enforcement Prior to 1980**

Prior to 1980 mandated maternity leave was two months in both the private and public sectors. Although the legislation provided an array of benefits to pregnant and lactating workers, enforcement mechanisms were vague and thus difficult to implement.

The legislation protecting maternity is found in Chapter 7 of the Labor Code--"The Work of Women and Children"--Articles 94 through 100. The law applies to all employees regardless of the size of the firm or sector (public or private);<sup>2</sup> self-employed workers are not covered by the legislation. Prior to 1980 the Labor Code stipulated the following regulations, presented in abbreviated form here, regarding maternity:<sup>3</sup>

Article 94: Employers are prohibited from firing a woman during pregnancy and postnatal/nursing leave. In addition, employers must notify administrative authorities [e.g., the Ministry of Labor] if a pregnant woman is to be dismissed for "justifiable" reasons.<sup>4</sup>

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<sup>2</sup> Although presumably both public and private sector workers are covered by the labor code, different labor procedures are often followed in each sector. For example, workers from either sector may be dismissed without benefits or compensation during the first three months of employment. After this "trial" period, public sector workers are guaranteed '*estabilidad absoluta*' or absolute labor stability such that dismissal because of pregnancy or for almost any other reason becomes quite difficult. Private sector workers do not have '*estabilidad absoluta*.' (María del Rocio Carro Hernández, personal interview, 1994).

<sup>3</sup> All translations from the Spanish are the authors'.

<sup>4</sup> Article 81 of the Labor Code specifies the following "justifiable" circumstances enabling employers to terminate the work contract: engaging in immoral behavior or slanderous activity against either the employer/owner of the firm or fellow workers during working hours; engaging in unprovoked slanderous activity against the employer during nonworking hours such that harmonious working relations are impossible; intentional material damage to the firm's property, machinery, tools, or other objects related to the work process; revealing company secrets whether they be technical, commercial or product-related; imprudent or negligent behavior that compromises the security of the work premises and laborers; two consecutive unexcused absences or two or more unexcused absences during a single month; when a worker refuses to follow the necessary security measures in place in order to avoid accidents or illness, or if a worker refuses to follow the most efficient and productive means, as indicated by the employer, to perform the job; leaving the job site during work hours without permission; engaging in political activity; working in an inebriated or drugged state; bearing arms during working hours with the exception of tools or instruments necessary to the work process itself; when the worker upon signing the work contract has misrepresented him/herself as having qualifications that he/she clearly does not possess; when the worker receives a prison sentence; and when the worker incurs any other '*falta grave*' or serious misdeed as stated in the work contract (Código de Trabajo 1994:36-38).

**Article 95:** All pregnant workers have the right to maternity leave consisting of **30 days prior to the expected date of birth and 30 days after childbirth.** Maternity leave will commence once women have obtained medical certification indicating that childbirth will likely take place in the five weeks following the signing of the certificate, or on the date indicated on the certificate. Physicians employed by the State and its institutions will dispense the certificate free of charge; employers will accept the certificate for purposes of implementing the article that follows.

**Article 96:** Women will be paid their full salary during leave time....with employers contributing 50 percent of her salary and the Costa Rican Social Security Administration covering the remaining 50 percent.

In cases of spontaneous abortion or stillbirth, paid leave is reduced by half. In case of illness arising out of pregnancy or childbirth, women have the right to paid leave that does not exceed three months. Women taking maternity leave should be reinstated in the same or comparable job upon returning to work.

**Article 97:** A woman has the right to nurse her child during working hours 15 minutes every three hours, or one-half hour twice a day.

**Article 98:** This article provides guidelines for calculating maternity benefits for workers paid on an hourly or on a per unit basis.

**Article 99:** Maternity benefits may be suspended if during the time of paid leave women engage in other remunerated employment.

**Article 100:** Firms employing more than 30 women should have designated areas where women can nurse (Codigo de Trabajo 1992 and 1994:46-49).

Without a doubt, Articles 94 through 100 of the Costa Rican Labor Code constitute a serious attempt to provide labor stability to expectant and nursing mothers. In practice, however, the law fell considerably short of this goal.

For example, María del Rocio Carro Hernández (1993) finds that the judiciary interpreted Article 94--prohibiting the dismissal of pregnant workers--to apply only in those circumstances in which the employer had previous and full knowledge of the woman's condition. In other words, if there was no proof that the woman was fired because of her pregnancy, or if the employer found out about the woman's pregnancy after she was fired (for reasons other than her pregnancy), the employer had no legal obligation to comply with the leave statute. Yet because this interpretation did not clarify what kind of "proof" or documentation of pregnancy was necessary, court cases invariably pitted the women's testimony (stating that she had notified the employer of her pregnancy) against the employer's (stating that she/he had no prior knowledge

of the women's condition).<sup>5</sup> Litigation was consequently resolved in favor of the party with the best documentation supporting its claims, generally the employer. Carro Hernández (1993) maintains that the ambiguity in the law led employers to fire women in the early stages of pregnancy, when their condition was less noticeable.

Furthermore, article 94 contained no provision requiring that the woman be reinstated if she lost her job during pregnancy or following termination of the leave, and there were no additional financial penalties imposed upon employers beyond those specified for any type of unjustified dismissal.<sup>6</sup> Elsewhere in the Labor Code the law specified that workers fired for "just cause" are not eligible to receive either job discontinuance benefits or other entitlements. Carro Hernández (1993) finds that this provision provided the basis for denying women maternity benefits in addition to other indemnizations in cases where a pregnant or lactating worker was dismissed for just cause.<sup>7</sup>

In summary, the labor legislation protecting maternity in the pre-1980 period fell considerably short of its intent to provide labor stability to pregnant and lactating workers. On the one hand, ambiguities in the legislation itself led to uneven judicial processing whereby it was the practice of the courts was to rule against women complainants. On the other hand, the legislation contained weak enforcement mechanisms and relatively small penalties for violating the law. Subsequent changes in the law, in particular the reforms contained in the 1990 equal rights legislation, attempt to deal with both of these issues.

### C. 1980 Reforms

In 1980 changes introduced into the Civil Service Code by executive decree (Law No. 6440) granted public sector workers one month of prenatal and three months of postnatal leave. Other than extending leave time for public sector employees, the 1980 reform contains no provisions addressing enforcement of the legislation.

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<sup>5</sup> The types of informal indicators requested by the courts as proof of pregnancy included the wearing of maternity clothes; a medical certificate given to the employer; or the woman having directly told her employer of the pregnancy (María del Rocio Carro Hernández, Supreme Court of Costa Rica, personal interview, 1994).

<sup>6</sup> Article 94 contains other ambiguities particularly with respect to the benefits provided to a women dismissed under "justifiable" circumstances (see footnote 4). Here the courts found that maternity benefits are separate and distinct from job discontinuance benefits (*preaviso*) and involuntary dismissal benefits (*auxilio de cesantía*). Article 28, 29, and 30 of the labor code regulate the benefits due workers whose contracts have been terminated. These indemnizations including *cesantía* and *preaviso* are granted only in cases in which termination is involuntary. However, vacation benefits and the *aguinaldo* or thirteenth month of pay are provided regardless of the reason for termination (Carro Hernandez 1993).

<sup>7</sup> Carro Hernández (1993) notes that the courts generally interpreted article 94 to mean that a pregnant or lactating woman justifiably dismissed will lose *preaviso*, *cesantía*, and other labor rights, as stated explicitly in the labor code, but not necessarily that she will be denied maternity benefits.

#### D. 1986 Reforms

In 1986 maternity leave increased from two months to four months for private sector workers. However, the legislation contained no improvements in enforcement.

This law (Law No. 7028), passed in April of 1986, revised article 95 of the Labor Code. It extends maternity leave from two months to four months in the private sector and established the principle that leave time be remunerated. This new version of article 95 came in response to the 1980 reform that extends maternity leave benefits from two to four months to public sector workers. The intent of this change, then, was to provide the full four month maternity leave to all workers. The revised portion of article 95 reads as follows:

"All pregnant workers have the right to paid maternity leave consisting of one month before and three months after childbirth. The three months of postnatal leave will also be considered the minimum period for lactation; an extended nursing leave is possible with medical certification." (Código de Trabajo 1994).

Although there appears to be widespread agreement among Costa Ricans that the mother remain with her child during the first months of life, the extended maternity leave called for in article 95 generated considerable controversy within the private sector. Female employees applauded the leave extension whereas employers generally protested that it would significantly increase the cost of female labor (Carro Hernández 1993; Ribe Bazo and Roman Zuñiga 1988). Arguments against the reform maintain that far from benefitting women, it discriminates against them, as employers would tend to hire men over women.

Clearly, the new version of Article 95 imposed additional labor costs particularly for firms employing large numbers of women. Article 43 ("Illness and Maternity Regulation") contained within the Costa Rican Social Security Administration regulations stipulates that during the maternity leave period covering pre- and postnatal leave, employers are responsible for paying the insured woman a subsidy equivalent to 50 percent of her salary; the Social Security Administration covers the remaining 50 percent thus providing the worker cash benefits equivalent to 100 percent of previous earnings.<sup>8</sup>

Moreover, the employer must also shoulder additional costs associated with maternity leave. These include the training of a substitute worker, the corresponding legal indemnizations due the working mother once she returns to work, her readaptation to the work process, and the

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<sup>8</sup> In Costa Rica in order to be entitled to maternity benefits women must have contributed to a compulsory social insurance scheme for 26 weeks during the 52 weeks preceding confinement (International Labor Office 1985). Until recently, women taking maternity leave did not receive pension pay and their bonus pay (*aquineldo*) was reduced by one-third. In March 1995 the Costa Rican Social Security Administration reformed article 38 of the "Illness and Maternity Regulation" thereby allowing a women on maternity leave to maintain pension benefits, provided that she return to her job after leave (*La Republica* 1995). Other legislation is pending in order to ensure that women receive all entitlements in full in addition to their regular salary.

costs incurred in terminating the substitute which include termination benefits (*preaviso* and *cesantía*) (Carro Hernández 1993:177; Ribe Bazo and Roman Zuñiga 1988:31). Article 43 (Social Security Administration regulations) allows women to take time off during working hours for prenatal medical consultations, another factor which can interfere with the production process.

A 1987 study undertaken by the National Autonomous University of Costa Rica and the *Centro Nacional para el Desarrollo de la Mujer y la Familia* (The National Center for the Development of Women and the Family) shows that employers believe that the 1986 change in the mandated maternity leave legislation significantly increased the costs of employing women (see, Ribe Bazo and Roman Zuñiga 1988). Researchers surveyed 46 large private sector firms, i.e., firms containing at least 50 workers, within six major industrial sectors employing a preponderance of women--textiles, garments, footwear, food processing, chemical products, and machinery. The sample consisted of 46 employers--mostly managers and human resource officers--and 485 female production line workers between the ages of 19 and 44, the prime childbearing years.

In the employer subsample, 58.7 percent of employers responded that article 95 increases female labor costs; another 28.3 percent perceived a "tolerable" increase in labor costs. Nonetheless, the majority of these employers found costs to be most significant among certain categories of jobs, particularly those involving a high degree of skill or those in which substitution was difficult. Interestingly enough, the higher costs for female labor did not necessarily imply a rejection of the legislation. Slightly over 70 percent of employers noted the important health and social benefits women and children derive from the law. The majority of employers surveyed (64 percent) considered reasonable the evenly shared financial responsibility between the Costa Rican Social Security Administration and the firm for maternity leave benefits, although a significant minority of 17.4 percent felt that the Administration should pay the entire subsidy.

The vast majority of women in the survey (88.5 percent of all women and 91.8 percent of women with children) approved of the legislation contained in Law No. 7028, and the health of the mother and child was the most important reason given for their approval. Although 94.8 percent of the women surveyed maintained that firms complied with the legislation, a large percentage of women, 44.5 percent, did not have a correct understanding of either the extent of leave time or the size of the cash benefit provided women taking maternity leave.

Overall, the survey results indicate that the 1986 law did not lead toward discriminatory employment effects any greater than those present prior to the passage of the legislation (Ribe Bazo and Roman Zuñiga 1988:81). The majority of employers, 65.2 percent, maintained that they had not substituted men (or machines) for women employees; indeed, nearly 70 percent of employers stated that "female" attributes (i.e., patience, docility, manual dexterity, etc.) in effect define certain job functions as "women's" work. The authors thus conclude that employers may find

the new legislation tolerable, in part because the costs or difficulties associated with substituting male for female workers may be greater than those introduced by the legislation itself (1988:79).<sup>9</sup>

In short, the study by the National Autonomous University provides evidence that the 1986 maternity mandate effectively increases the cost of employing female workers, at least in certain categories of jobs, and that both employers and workers take the legislation seriously.

#### E. 1990: Ley de Promoción de la Igualdad Social de la Mujer

In contrast to all previous legislation on maternity, Law No. 7142 or the *Ley de Promoción de la Igualdad Social de la Mujer* establishes sanctions against noncomplying employers and mechanisms to ensure compliance with the legislation. Interviews with officials from numerous governmental and nongovernmental agencies indicate that the specification and implementation of maternity enforcement mechanisms represent the single, most important contribution of the 1990 legislation to labor law.<sup>10</sup>

This far reaching piece of legislation aims to increase the effectiveness of existing laws, including the Convention to Eliminate All Forms of Discrimination Against Women, approved by the United Nations in 1979 and ratified by Costa Rica in 1984. In brief, the *Ley de Igualdad Real* establishes governmental responsibility to guarantee and promote equal rights among women and men in the work-place and in society at large. In this regard, the state agrees to undertake all necessary measures to eliminate gender discrimination in government posts and in administrative positions within political parties (by establishing minimum percentages of women in each case). The law also calls for the state to create child care centers for working parents and instructs all educational institutions to implement methodologies and pedagogical tools promoting the social equality of the sexes. In addition, the law reinforces women's property rights and implements institutional safeguards to prevent violence against women. The law also establishes the right for all workers to have access to government-subsidized child care centers. Finally, a vocational education center, the *Instituto Nacional de Aprendizaje* (National Training Institute), is created to train women workers. In terms of labor legislation the most important

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<sup>9</sup> Previous research on male-female wage and employment differences in Costa Rica includes: Gindling (1992) which examines why men earn more than women in Costa Rica; Gindling (1993) which examines the causes of the increase in male-female wage differentials during the 1980-1983 recession; and Gindling (1994) which examines the impact of anti-discrimination legislation on male-female wage differentials.

<sup>10</sup> In our original proposal (Gindling and Crummett 1994), we expected to obtain a quantitative measure of enforcement. This type of measure was not available. It is clear, however, that there was a discrete increase in enforcement brought about by the 1990 *Ley de Igualdad Real*. The dummy variables described in Section III provide one means of capturing a measure of enforcement for the three years (1980, 1986, and 1990) in which mandated maternity leave changed.

change relates to maternity leave: the law grants maternity leave to adoptive mothers and strengthens the maternity provisions of the Labor Code particularly with respect to enforcement.<sup>11</sup>

The 1990 law also created a new government agency, the *Defensoría General de los Derechos Humanos* (Human Rights Defense Council), and within this agency, the *Defensoría de la Mujer* (Women's Defense Council), which was set up with the purpose of monitoring the enforcement of the various norms that establish equality of rights for women, secure improvements in social services for women, and generally to act in the defense of women's rights. Finally, the legislation reformed a series of articles in the Family, Civil, Penal and Labor Codes in order to provide effective equality of rights to women and men.

Changes affecting maternity and women's reproductive function are incorporated into the Labor Code in Article 94, an ancillary article--94 bis--and, a new paragraph in Article 95. The following subsections present the revisions affecting maternity legislation and the nature and extent of enforcement efforts.

### **1. Legislative Changes: Maternity and Postnatal/Nursing Leave**

The revised article 94 of the Labor Code reads as follows:

Employers are prohibited from firing pregnant or lactating workers, except for just cause originating in serious violations of the labor contract such as those established in article 81. In this case, the employer should present the dismissal before the National Direction and the General Labor Inspection [Ministry of Labor], who should then verify the offense. Under exceptional circumstances, the National Direction can order the suspension of the worker until the dismissal effort is resolved.

In order to benefit from the protections established herein, the worker should advise her employer of her pregnancy as well as provide medical certification from the Costa Rican Social Security Office. (Código de Trabajo 1994:46).

The reformed Article 94 clarifies many of the ambiguities found in earlier versions of the law. First, the law now states explicitly that the worker must advise her employer of her pregnancy, and that she must furthermore provide the employer with an official medical certification of the

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<sup>11</sup> Protective laws requiring different health and safety regulations for female workers (and children under 18 years of age) such as night shift limitations (Article 88) remain intact in the Costa Rican labor code. The *Ley de Igualdad Real* does, however, revise the labor code's prohibition on "dangerous, unhealthy or arduous" work for women and children under 18 (Article 87). The new legislation continues to prohibit this kind of work for women and legal minors. However, the revised version of the law now states that if a worker sustains an accident or illness because of employment in a prohibited job, the employer must pay the worker the equivalent of three months wages (Codigo de Trabajo 1994).

pregnancy. In this manner the pregnancy is recognized by the Costa Rican Social Security Office, the government agency in charge of social welfare programs.<sup>12</sup>

Second, the *Ley de Igualdad Real* not only makes reference to "justifiable dismissal" but also specifies that this type of dismissal should conform to the offenses established in article 81 of the Labor Code (see footnote 4). In terms of the procedures that should be followed in cases of justifiable dismissal, previous legislation indicated that labor authorities be notified of the firing; in practice, however, this procedure was not viewed as obligatory. The new law states that a just cause firing should be presented before the Ministry of Labor who in turn will verify the misdoing. Carro Hernández argues that this reform provides substantive judicial powers to the Ministry of Labor (1993:173). Beyond notifying labor authorities, the new law requires that employers explain to the Ministry of Labor the nature of the offense committed by the pregnant worker and why she deserves to be fired. The new law further enhances the power of the Ministry of Labor insofar as it allows that Ministry, in exceptional circumstances, to order the suspension of the worker while dismissal proceedings take place.

In an addendum to Article 94--article 94 bis--the *Ley de Igualdad Real* specifies a woman's right to immediate reinstatement to the same position at the same pay rate. The entire article reads as follows:

A pregnant or working woman that is fired against the norms established in the previous article [Art. 94], can petition the courts for immediate reinstatement with full benefit of all her labor rights.

Once her petition is presented, a labor judge must meet with the employer three days hence. At the end of this time period, within the following five days, the judge will order the worker's reinstatement as well as require the employer to pay lost wages. If either one or both of these conditions are not met the employer risks judicial sanctions.

Judicial sanctions will be taken against the noncomplying employer or representative to extend throughout the time period of noncompliance at the request of the worker or the National Direction and General Labor Inspection. If the woman does not choose to be reinstated, the employer must pay her, in

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<sup>12</sup> This particular reform has been narrowly interpreted by the courts thereby weakening the intent of the legislation. In 1991 the *Tribunal Superior del Trabajo* rejected a worker's petition seeking redress for dismissal during pregnancy because she presented her employer with a laboratory exam documenting the pregnancy, rather than providing a medical certificate or a certificate from the Costa Rican Social Security Administration. Although the legislation specifies that workers provide either one of these latter two documents in order to receive maternity benefits (see Article 94), the intent of the law is to allow women to exercise their right to maternity leave, not to provide employers with a means to circumvent the legislation (CEFEMINA 1992). Subsequent legislative changes allow women to present other forms of proof of pregnancy (Carro Hernández 1993).

addition to involuntary dismissal benefits, wages equivalent to pre-and postnatal maternity leave, and the wages she failed to receive from the moment she was fired up to eight months of pregnancy.

If the case involves a nursing mother, she has the right, in addition to involuntary dismissal benefits, to ten days of worth of wages for damages and injury." (Código de Trabajo 1994:46-47).

Carro Hernández's analysis of article 94 bis finds that the focus on reinstatement to the position held prior to dismissal is without precedent in the private sector (1993). Previously, the right to reinstatement (for involuntary dismissal) applied only to the public sector and the law covered all workers in this sector regardless of sex. Article 94 bis, however, refers specifically to women meeting the conditions outlined in the statute. Significantly, reinstatement is the prerogative of the worker, not the employer, and women who choose not to return to their place of employment are eligible to receive *cesantía*, pre- and postnatal benefits, as well as compensation for lost wages up through the eighth month of pregnancy.

Another important modification emerging from the *Ley de Igualdad Real* refers to the rights of adoptive mothers. A new, final paragraph is added to article 95:

A woman worker adopting a small child will have the right to the same three month leave in order that both mother and child will have a period of adaptation. Leave for adoptive mothers will commence the day immediately following receipt of the child. In order to receive these benefits, the worker must present a certificate from either the *Patronato Nacional de la Infancia* (The National Patrimony for Children), or the *Juzgado de Familia* (Family Judiciary), indicating adoption procedures" (Codigo de Trabajo 1994:47-48).

## 2. Enforcement

By all accounts the *Ley de Igualdad Real* vastly improved enforcement of maternity legislation in Costa Rica.<sup>13</sup> Unlike the 1980 and 1986 changes in the maternity leave mandates, the 1990 law received widespread publicity. First, President Oscar Arias Sanchez's successful 1986 electoral campaign identified equal rights for women as a "requirement for democracy" and called for legislation redressing women's political, educational and labor rights. Second, for nearly two years prior to its passage, Margarita Peñon, the First Lady, spearheaded a national debate among a broad range of social sectors including educators, politicians, unionists, professional and salaried employees, and feminist and women's organizations on the principles established in the *Ley de Igualdad Real* (*Fundación Arias*, n.d. and 1993). By the end of 1989

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<sup>13</sup> Although changes in the 1990 law apply to both public and private sector workers, we believe that this law did not effectively change enforcement in the public sector. This is because mandated maternity leave laws were already effectively enforced in the public sector prior to 1990 (Alejandra Mora, *Defensoría de la Mujer* and María del Rocio Carro Hernández, Sala Segunda, Supreme Court of Costa Rica, personal interviews, 1994).

a national, independent poll found that 71.6 percent of the population agreed with the legislative initiative (*Fundación Arias* n.d.). Third, upon its passage in 1990, numerous governmental and nongovernmental organizations promoted the new law through a variety of media. For example, over an eight month period in 1992-93 the *Fundación Arias para la Paz y el Progreso Humano* (The Arias Foundation for Peace and Human Progress),<sup>14</sup> a private nonprofit institution instrumental in the formulation of the law, sponsored 104 nation-wide training workshops for women's organizations and public institutions, produced 50,000 booklets for popular consumption, distributed hundreds of audiocassette tapes, pamphlets, and posters, as well as created newspaper advertisements, press releases, and radio and television spots. A telephone "hotline" at the Foundation provided information on the new legislation as well as directed women to institutions capable of helping them resolve problems ranging from domestic violence to disputes over property rights to dismissal from work during pregnancy or maternity leave (*Fundación Arias* 1993:4-6).

The *Defensoría de la Mujer* was created in 1991 in order to guarantee effective compliance of the Law to Promote the Social Equality of Women. For the first time in Costa Rican history, a specialized government agency exists where women can present their complaints and seek orientation and legal advice on how to defend their rights. In 1991 the *Defensoría de la Mujer* provided services (either by telephone or in the office itself) to 2,500 women; in 1992, over 3,000 women sought advice from the organization (Bertozzi Barrantes 1994:12).

In addition to providing direct assistance to female clients, the *Defensoría* works with other organizations dedicated to protecting and promoting women's rights. It monitors public and private institutions to ensure that discrimination on the basis of gender does not exist, and attempts to ensure that services provided by such institutions as the Judiciary, the Ministry of Labor, and the Costa Rican Social Security Administration adequately meet the needs of women users (Bertozzi Barrantes 1994:26-27). For example, the *Defensoría* does not have legal jurisdiction over complaints from women workers in the private sector, yet it can put pressure on the Ministry of Labor to pursue a case that appears to have been either improperly or inadequately handled by the labor department (Personal Interview, Alejandra Mora, *Defensoría de la Mujer*, 1994).

Most significant, prior to 1990 the Ministry of Labor had little if any power of enforcement with regard to maternity leave legislation. With the passage of the *Ley de Igualdad Real* the Ministry of Labor now plays an extended role in enforcement. The new mechanisms set up by the 1990 law at the Ministry of labor are as follows:

At the Ministry of Labor women filing complaints against employers for dismissal during pregnancy or postnatal/nursing leave can seek help through one of three avenues: (i) *Asuntos Laborales* or Labor Relations, an office within the Ministry of Labor; (ii) *Inspección de Trabajo*

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<sup>14</sup> Dr. Oscar Arias Sanchez, President of Costa Rica (1986-1990) and 1987 recipient of the Nobel Peace Prize, founded the Arias Foundation in 1988 with the funds received from the award. The Foundation's main objectives are to promote dialogue, reconciliation, social "concertation", and sustainable development in Central America.

or Work Inspection, also located with the Ministry of Labor; or (iii) the *juez laboral* or labor courts. Interviews with Eugenio Selano, Head of Labor Relations, and Rolando Valverde, Director of Enforcement, both at the Ministry of Labor, indicated that in most cases women are directed first to *Asuntos Laborales* for preliminary consultations. Here a women can present her case and request help in resolving the dispute in a friendly manner with the employer. A representative of the Ministry will accompany the women during discussions with the employer.

If the dispute cannot be resolved in a friendly manner--and the majority of cases are not--the woman then proceeds to the *Inspección de Trabajo* where a labor inspector checks for documentation or "proof" of pregnancy; if such evidence is lacking, the inspector will help the women gather the necessary documentation in order to build her case. The woman must then decide if she will request reinstatement or financial indemnization from the firm (including *cesantía*, pre- and postnatal subsidies and lost wages up through the eighth month of pregnancy). If the woman seeks reinstatement, an inspector from the Ministry will go to the firm to begin reinstatement procedures. If, however, the women chooses indemnization, she is then directed to the *juez laboral* or labor courts. According to our interviewees at the Ministry of Labor, most women opt for indemnization. They do so in part because they do not want to return to the workplace after dismissal. More important, however, is the fact that requests for reinstatement can last for years, at which point the position no longer exists or the fired woman has been replaced by another worker. The 1990 legislation calls for a *sumario* or summary implementation of the law--three days to decide the case and five days to reinstate the worker or eight days total--yet the entire process still takes years to complete.<sup>15</sup>

According to Selano and Valverde, women seeking help from the Ministry of Labor file complaints as individuals; unions representing women workers rarely bring complaints. Our interviewees also contend that women filing complaints come from a cross-section of firms in Costa Rica, e.g., small and large private firms as well as those located within and outside of free trade zones. And although the Ministry of Labor carries out regular workplace inspections, these inspections do not attempt to address the extent of a firms compliance with the maternity leave mandate. At present the Ministry of Labor receives approximately 10 maternity related cases per day in its San José Office; another five per day are received throughout the rest of the country.

The empirical model and results presented in Chapter III address the ways in which the 1980, 1986 and 1990 legislative changes affect the wages and employment of women and men in three key sectors of the economy: the public, private, and self-employed.

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<sup>15</sup> According to Carro Hernández (personal interview, 1994), there are two types of legal processes which determine the potential length of a case, *sumario* or rapid and *ordinario* or regular implementation. The terms of the 1990 legislation call for a '*sumario*' implementation of the law but most cases continue to be put in the '*ordinario*' track, as occurred prior to 1990. The *ordinario* cases generally take years to resolve.

## CHAPTER III

### EMPIRICAL ANALYSIS

#### A. Introduction

In Chapter II, we examined three changes in legislation regarding paid mandated maternity leave in Costa Rica: (i) in 1980, mandated maternity leave increased from two to four months in the public sector (remaining at two months in the private sector); (ii) in 1986, mandated maternity leave increased from two to four months in the private sector (remaining at four months in the public sector); and, (iii) in 1990, the *Ley de Igualdad Real* created new mechanisms for enforcing the mandated maternity leave law and increased the penalties on private sector firms for violating this law.<sup>16</sup>

These legislative changes offer several unique characteristics that allow us to isolate the impact of mandated maternity leave on the wages and work of those affected by the law. First, the mandates affect an identifiable group: women of child-bearing age, which we assume to be 15 to 49 years of age in our analysis.

Second, the legislative changes can be expected to affect women and men in different sectors of the labor market in different ways. Below we identify how we might expect the mandate to differently affect the wages and employment of men and women in the public, private and self-employed sectors.<sup>17</sup> The fact that we expect the effects of the legislative changes to differ by sector and gender means that we can isolate observed changes in wages and employment caused by the changes in mandated maternity leave from changes caused by other (possibly unmeasurable) phenomena that might affect wages and employment of both men and women in all sectors. This gives our tests aspects of a natural experiment, with the sector affected by each legislative change as the treatment group, and the other two sectors as the control group.

Two examples of phenomena that might affect the wages of all workers are: (i) the structural adjustment and trade liberalization program implemented in Costa Rica in the mid-1980s, and, (ii) a labor-saving technological change, such as computers. The structural adjustment and trade liberalization program might lead to an increase (or decrease) in the demand for labor, causing the wages of all workers to rise (or fall). The introduction of a labor-saving technological change might lead to a decrease in the demand for labor, causing the wages of all workers to fall. If we find, for example, that in 1986 the wages of men and women in all sectors fell, we

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<sup>16</sup> The mandate was effectively enforced throughout the 1976 to 1993 period in the public sector. Therefore, the 1990 law did not affect enforcement in the public sector. See footnote 13.

<sup>17</sup> "Private" refers to private employees, as distinct from private sector self-employed workers. We refer to private sector self-employed workers as "self-employed."

can conclude that this fall in wages was probably not due to the change in mandated maternity leave, but rather due to some other phenomena that we have not adequately measured (such as trade liberalization or the technological change described above). On the other hand, if we find that in 1986 women's wages in the private sector fell, yet the wages of men and women in the other two sectors did not change, we will be able to conclude that the fall in the wages of women in the private sector is probably due to the 1986 legislative change in mandated maternity leave (because the observed changes in wages are consistent with the changes predicted by theory).

Third, as described below, theory suggests that the changes in the maternity leave law will have an impact not only on wages but also on employment. In our empirical tests, we will examine both the employment and wages of men and women. This will allow us to test precisely the hypotheses derived from theory.

## **B. The Economics of Mandated Maternity Leave Benefits**

Taxes on employment raise the cost of employing workers and distort the patterns of factor use--for example, by increasing the employment of factors other than labor. Government mandates of employer provision of work-place benefits, on the other hand, may not be distortionary if the value that workers place on the benefit received is equal to (or greater than) the cost to employers (Summers 1989). In that case, workers treat the benefit as money wages, paid money wages fall by the amount that workers value the benefit, the fall in wages will be equal to or greater than the cost, and there is no incentive for employers or employees to change employment patterns. On the other hand, if workers value benefits at less than the cost to employers, then workers will not be willing to accept a decrease in paid money wages that fully reflects costs. In that case, costs of employing these workers will rise, and employers will decrease employment levels, thereby distorting patterns of employment and production. Recent research (Gruber and Krueger 1991, and Gruber 1992 and 1994) has suggested that the increased costs of some work-place mandates in the United States are not distortionary; costs are largely shifted to wages, and therefore have little effect on employment.

Gruber (1992) extends Summers' (1989) analysis to a group-specific mandate: mandated maternity benefits on employer-provided health insurance policies. In this paper, he presents a model where a legislative mandate imposes a cost paid by the employer when hiring one group (i.e., women, denoted by F), and not when hiring another group (i.e., men, denoted by M). The average cost per female worker imposed is fixed, and denoted by C. Gruber assumes that members of the group affected by the mandate (women) value the benefit at some proportion (denoted by  $\alpha$ ) of the cost of that benefit to the employer. If  $\alpha = 1$ , then women value the benefit

at its full cost, and having the benefit is the same as having an equivalent amount of money wages. If  $a < 1$ , then women value the benefit at less than its full cost. If  $a > 1$ , then women value the benefit at more than its cost.<sup>18</sup>

Gruber starts with labor supply and demand curves for men and women in an economy where the mandated maternity benefits affect all working women.

$$\begin{aligned} L_F^S &= L_F^S(W_F + aC); & L_M^S &= L_M^S(W_M) \\ L_F^D &= L_F^D(W_F + aC, W_M); & L_M^D &= L_M^D(W_M, W_F + aC) \end{aligned} \quad (1)$$

Where  $L_F^S$  is the labor supply of women,  $L_M^S$  is the labor supply of men,  $L_F^D$  is the labor demand for women,  $L_M^D$  is the labor demand for men,  $W_F$  is the wage of women,  $W_M$  is the wage of men.

Equating supply and demand in each market, and using comparative statics yields:

$$dW_F/dC = \frac{-(a n_F^S - n_M^D)(n_M^S - n_M^D) - (n_{MF}^D)^2}{(n_F^S - n_M^D)(n_M^S - n_M^D) - (n_{MF}^D)^2} \leq 0 \quad (2)$$

$$dW_M/dC = \frac{-n_{MF}^D}{(n_F^S - n_M^D)} * (1 + dW_A/dC) \geq 0 \quad (\text{if } dW_F/dC \geq -1) \quad (3)$$

$$dL_F/dC = \frac{(n_F^D + n_{MF}^D)}{(n_F^S - n_M^D)} * (1 + dW_F/dC) \leq 0 \quad (\text{if } dW_F/dC \geq -1) \quad (4)$$

where  $n_F^S$  is the elasticity of supply for women,  $n_M^D$  is the elasticity of demand for men,  $n_M^S$  is the elasticity of supply for men,  $n_M^D$  is the elasticity of demand for men,  $n_{MF}^D$  is the cross-elasticity of demand, and  $L_F$  is the employment of women when the supply and demand for female labor are equal (Gruber, 1992:11).

Some basic conclusions of the Gruber model are the following:

1. If the benefits are valued fully by the worker receiving them ( $a=1$ ), then women treat the benefits the same as money wages. Total compensation (take-home pay plus the cost of the mandate) for women will not change, although take-home pay ( $W_F$ ) will fall by the dollar amount of the cost of the mandated benefit paid by the employer ( $dW_F/dC=-1$ ). Since total

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<sup>18</sup> This last is not a situation examined by Gruber (1992).

compensation will not change, the employer will not change hiring behavior and the employees will not change their labor supply. Therefore neither the employment of men or women ( $L_P$  and  $L_M$ ) will change, nor will the wages paid to men ( $W_M$ ).

Some caveats are in order, though. For example,  $L_P$  and  $L_M$  represent "labor effort" rather than the number of workers employed. Because the maternity leave mandate imposes a fixed cost that is proportional to the number of employees hired, it is likely that employers will increase the number of hours worked per woman while decreasing the number of women employed (keeping total hours worked the same).

Another caveat is that even if working women fully value the benefits at cost, it may not be possible for the employer to pay women lower take-home pay than men. For example, in Costa Rica, there is legislation mandating equal pay for men and women in the same jobs.<sup>19</sup> In this case, employers may still be able to pay women less by defining women's jobs differently from men's jobs--for example, the employer may segregate men and women into different job categories, paying less to the workers in the category with more women. If this were so, we should see increased segregation of men and women in the work-place after the passage of the mandate.

Finally, cost-minimizing employers, faced with the additional cost of employing women brought on by the mandate, may not reduce the money wages nor the employment of women if they can find some other mechanism by which to adjust compensation, such as reducing other benefits. Unfortunately, we have no information on the extent of other benefits that might be voluntarily provided by employers to women, and which employers might reduce in response to mandated maternity leave.

Gruber (1992:9) notes that if women fully value the benefits which they are receiving, then there is no distortion of the economy because employment and total compensation remain unchanged. "There is no deadweight loss from the mandate: a perfect benefits tax is equivalent to lump-sum taxation."

Next, we extend Gruber's model to an economy where changes in the mandate affect only a subset of working women, rather than all working women. As described previously, in Costa Rica changes in mandated maternity leave legislation are applicable to only a subset of working women. Specifically, the 1980 maternity leave changes apply only to public sector workers, and not to private or self-employed sector workers. The 1986 and 1990 maternity leave changes apply only to private sector workers. We denote the sector where workers are affected by a change in the mandates as the "affected sector," while the sectors where workers are not affected by changes in the mandate are the "unaffected sectors." For the 1980 law, the public sector is the affected sector, while the private and self-employed sectors are unaffected. For the 1986 and 1990 laws, the private sector is the affected sector, while the public and self-employed

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<sup>19</sup> Article 167 of the Labor Code, Article 48 of the Civil Service Code, and the International Labor Office (ILO) Convention No. 100 all contain clauses specifying equal pay for women and men (Carro Hernández 1993).

sectors are unaffected. We can derive the probable impact of the mandate on relative male and female employment in the unaffected sectors. If women fully value the benefit at cost (and are therefore willing to lower their wages), employment in the sectors where the law is enforced does not change. Therefore, there should be no change in the employment of men and women in the unaffected sector. As a result, relative male-female wages and employment in the sector where the law is not enforced (the unaffected sector) should not change either.

2. If employees do not fully value benefits at their monetary cost (if  $a < 1$ ), then, in the affected sector, the wages of women will not fall by the full cost of the benefit ( $-1 < dW_f/dC < 0$ ).<sup>20</sup> In this case, the mandate is like a tax on the employment of women. The mandate will drive down the take-home pay of women, although total compensation--the take-home pay plus the cost of the benefit--will rise. Because the cost of employing women rises, employment of women will fall as employers shift to employing the less costly men. The extent of the shift depends on how much wages for females fall, on the elasticity of demand for female workers, and on the elasticity of substitution between men and women. Because the demand for men goes up (as employers shift employment demand from women), men's wages and employment will rise.

Since benefits are not valued at cost, there will be a deadweight loss to the economy, similar to that with a payroll tax. The amount of the market distortion will be less the more women's take-home wages are lowered to make up for the increased cost of employing women.

The decline in female employment in the affected sector will push women into the unaffected sectors. The employment of women in the unaffected sectors should rise. Similarly, the increased employment of men in the affected sector should pull men out of the unaffected sectors.<sup>21</sup>

The increase in the supply of women, and decrease in the supply of men, to the unaffected sectors should lower the wages of women, and increase the wages of men, in those sectors.

3. If employees value the benefits at more than their monetary cost (if  $a > 1$ ), then, in the affected sector, the wages of women will fall by more than the full cost of the benefit. Because women's wages fall by more than the full cost of the benefit ( $dW_f/dC < -1$ ), the employment

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<sup>20</sup> Two assumptions are necessary to arrive at this conclusion. First, the labor supply curve must be negatively sloped and the own elasticity of demand for each group must be greater than the cross-elasticity of demand. Gruber (1992) also notes that if men and women are perfect substitutes, the wages of women will fall by the full amount of the cost of the benefit (even if women value the benefit at less than its cost), "since employers will not hire members of group A if total labor costs rise above that of group B" (p.11).

<sup>21</sup> The extent of the increase in female employment and the fall in male employment in the unaffected sectors will depend on a variety of factors such as: the elasticity of supply of women, the cross-elasticities of demand between men and women in the affected and unaffected sectors, and the cross-elasticity of demand between the two sectors.

of women will rise ( $dL_F/dC > 0$ ), and the wages of men will fall ( $dW_M/dC < 0$ ), as employers demand the (now) less expensive female labor.

Because the legislative change increases the employment of women and decreases the employment of men in the affected sector, it is likely that men will be pushed into the unaffected sectors, leading to a fall in the wages of men in the unaffected sectors. Similarly, some women in the unaffected sectors will likely move to the now more available jobs in the affected sector, leading to decreased employment for women in the unaffected sectors. Therefore, in the unaffected sectors, the wages of women will rise relative to those of men, and the employment of women will fall relative to the employment of men.

It is important to note that the fall in the wages of women in the affected sector may be only a short-run phenomenon. In the longer run the maternity leave legislation, by strengthening women's attachment to the labor force, could lead to higher wages. This is because women will, on average, have longer work-lives and gain more experience. It may also be true that maternity leave provisions convince employers that women will remain at their jobs for more years, making it more likely that employers will provide on the job training for women (see Blau and Ferber 1992).

In summary, the following empirically testable hypotheses can be derived from this theoretical model:

If benefits are fully valued (at cost) by women, then, in the sector affected by the change in the mandate, women's take-home pay should fall relative to men's take-home pay, while relative employment of men and women should not change. In the sectors not affected by the change in the mandate, neither relative wages nor relative employment should change.

If women value the benefit at less than its cost, in the affected sector, women's wages will fall relative to men's wages, and employment of women will fall relative to the employment of men. In the unaffected sectors, women's wages will fall, and women's employment will rise, relative to male wages and employment.

If women value the benefit at more than its cost, in the affected sector the wages of women will fall while the employment of women will rise. There will be a fall in demand for men in the affected sector, causing both the wages and employment of men in the affected sector to fall. In the unaffected sectors, women's wages will rise, and women's employment will fall, while the employment of men will rise, and the wages of men will fall.

Table 1 summarizes the impact of mandated maternity leave legislation on the wages and employment of men and women in the affected and unaffected sectors under the three different assumptions considered here.

**Table 1**

**Possible Impacts of Mandated Maternity Leave on the Wages and Employment of Men and Women in the Affected and Unaffected Sectors, Under Three Different Assumptions**

<b>1. ASSUMPTION: Women FULLY Value the Benefit at Cost</b>						
	<b>Private Sector</b>		<b>Public Sector</b>		<b>Self-Employed</b>	
	Men	Women	Men	Women	Men	Women
<b>1980:</b>						
Wages	NC	NC	NC	-	NC	NC
Employment	NC	NC	NC	NC	NC	NC
<b>1986:</b>						
Wages	NC	-	NC	NC	NC	NC
Employment	NC	NC	NC	NC	NC	NC
<b>1990:</b>						
Wages	NC	-	NC	NC	NC	NC
Employment	NC	NC	NC	NC	NC	NC
<b>2. ASSUMPTION: Women Value the Benefit at LESS THAN Cost</b>						
	<b>Private Sector</b>		<b>Public Sector</b>		<b>Self-Employed</b>	
	Men	Women	Men	Women	Men	Women
<b>1980:</b>						
Wages	+	-	+	-	+	-
Employment	-	+	+	-	+	-
<b>1986:</b>						
Wages	+	-	+	-	+	-
Employment	+	-	-	+	-	+
<b>1990:</b>						
Wages	+	-	+	-	+	-
Employment	+	-	-	+	-	+

**NOTES:**

1. NC denotes that, under the stated assumption, there should be no change in this variable.
2. - denotes that, under the stated assumption, this variable should decrease.
3. + denotes that, under the stated assumption, this variable should increase.

Table 1: continued

<b>3. ASSUMPTION: Women Value the Benefit at MORE THAN Cost</b>						
	<b>Private Sector</b>		<b>Public Sector</b>		<b>Self-Employed</b>	
	Men	Women	Men	Women	Men	Women
<b>1980:</b>						
Wages	-	+	-	-	-	+
Employment	+	-	-	+	+	-
<b>1986:</b>						
Wages	-	-	-	+	-	+
Employment	-	+	+	-	+	-
<b>1990:</b>						
Wages	-	-	-	+	-	+
Employment	-	+	+	-	+	-

NOTES:

1. NC denotes that, under the stated assumption, there should be no change in this variable.
2. - denotes that, under the stated assumption, this variable should decrease.
3. + denotes that, under the stated assumption, this variable should increase.

### C. Econometric Model

We will test the hypothesis that changes in maternity leave legislation affected male-female wage and employment differentials in the affected and unaffected sectors in Costa Rica using pooled time-series/cross-section data. Specifically, we estimate the following sets of equations.

#### 1. Wage Equations

For each sector and sex, we estimate the following equation:

$$\ln W_{ijlt} = B_0 + \sum_{t=1976}^{1993} \underline{B}_{1jt} \underline{X}_{ijlt} + \underline{B}_{2j} \underline{Z}_t + B_{80jl} D80 + B_{86jl} D86 + B_{90jl} D90 + e_{ijlt} \quad (5)$$

where  $i$ =individual,  $j$ =sex,  $l$ =sector, and  $t$ =year.  $\ln W_{ijlt}$  is the natural log of the real wage (in 1976 colons) of worker  $i$  in sector and sex  $j$  and year  $t$ ,  $\underline{X}_{ijlt}$  is a vector of individual specific productivity-related characteristics which control for individual-specific characteristics not related to the legislative change,  $\underline{Z}_t$  is a vector of year-specific variables that represent macroeconomic changes that might affect the wages of workers, and  $e_{ijlt}$  is an error term, assumed to be normally distributed.  $\underline{B}_{1jt}$  is a vector of coefficients on the individual-specific characteristics that differ by sex, sector and year, and  $\underline{B}_{2j}$  is a vector of coefficients on the year-specific variables that differ by sex and sector.

D80, D86 and D90 are dummy variables that indicate the years in which the maternity leave legislation changed. D80 indicates the legislative change in 1980, which affected the public sector (D80=0 if  $t=1976-1979$ , D80=1 if  $t=1980-1993$ ). D86 indicates the legislative change in 1986, which affected the private sector (D86=0 if  $t=1976-1985$ , D86=1 if  $t=1986-1993$ ). D90 indicates the legislative change in 1990 which affected the private sector (D90=0 if  $t=1976-1989$ , D90=1 if  $t=1990-1993$ ). The coefficients on these dummy variables measure the increase or decrease in the wages of workers of sex  $j$  and sector  $l$  caused by the legislative changes in 1980, 1986 and 1990. For example, a positive, significant coefficient on D80 for women in the public sector would indicate that the legislative change in 1980 caused an increase in female wages.

## 2. Employment Probit Equations

The dependent variable in the employment equations is qualitative--either the worker is employed in the affected sector or not. The Probit technique was developed to estimate such equations with a qualitative dependent variable. We estimate the following equation using the Probit technique for each sex.

$$\Pr(I_{ijt}=1) = F(B_0 + \sum_{t=1976}^{1993} \underline{B}_{1jt} \underline{X}_{ijt} + \underline{B}_{2j} \underline{Z}_t + B_{80jt} D80 + B_{86jt} D86 + B_{90jt} D90) \quad (6)$$

We estimate two probit equations, which we will call the "private sector equation" and "the public sector equation."

In the private sector equation,

$$I_{ijt} = \begin{cases} 1 & \text{if the individual works in the private sector,} \\ 0 & \text{if the individual works in the public or self-employed sector.} \end{cases}$$

In the public sector equation,

$$I_{ijt} = \begin{cases} 1 & \text{if the individual works in the public sector,} \\ 0 & \text{if the individual works in the private or self-employed sector.} \end{cases}$$

In these equations,  $i$ =individual,  $j$ =sex,  $l$ =sector,  $t$ =year,  $\underline{X}_{ijt}$  is a vector of variables that control for individual-specific characteristics not related to the legislative change, and  $\underline{Z}_t$  is a vector of year-specific variables that represent macroeconomic changes that might affect the numbers of hours worked.  $\underline{B}_{1jt}$  is a vector of coefficients on the individual-specific characteristics that differ by sex and year, and  $\underline{B}_{2j}$  is a vector of coefficients on the year-specific variables that differ by sex.  $F(.)$  is the cumulative normal distribution function.

D80, D86 and D90 are dummy variables, defined above, that indicate the years in that the legislation changed. The coefficients on these dummy variables can be interpreted as the effects on the probability that a worker can be found in the private sector. For example, a negative coefficient on D80 for woman in the public sector equation would indicate that the probability that a women is found in the public sector fell after the 1980 law was in place. In other words, that the employment of women in the public sector (compared to the private and self-employed sectors) fell after 1980. A negative coefficient on D90 for women in the private sector equation would indicate that the employment of women in the private sector (compared to the public and self-employed sectors) fell. In 1980, the legislative change affected the public sector, therefore

we are interested in (and report) the coefficient on D80 from the public sector equation. In both 1986 and 1990, the legislative change affected the private sector, therefore we are interested in the coefficients on D86 and D90 from the private sector equations.<sup>22</sup>

### 3. Average Hours Worked Equations

For each sector and sex, we estimate the following equation:

$$H_{ijlt} = B_0 + \sum_{t=1976}^{1993} \underline{B}_{1jt} \underline{X}_{ijlt} + \underline{B}_{2j} \underline{Z}_t + B_{80jl} D80 + B_{86jl} D86 + B_{90jl} D90 + e_{ijlt} \quad (7)$$

where  $i$ =individual,  $j$ =sex,  $l$ =sector,  $t$ =year.  $H_{ijlt}$  is weekly hours worked of worker  $i$  in sector  $l$ , sex  $j$  and year  $t$ ,  $\underline{X}_{ijlt}$  is a vector of variables that control for individual-specific characteristics not related to the legislative change, and  $\underline{Z}_t$  is a vector of year-specific variables which represent macroeconomic changes which might affect the numbers of hours worked.  $\underline{B}_{1jt}$  is a vector of coefficients on the individual-specific characteristics which differ by sex/sector and year, and  $\underline{B}_{2j}$  is a vector of coefficients on the year-specific variables which differ by sex/sector.

D80, D86 and D90 are dummy variables which indicate the years in which the legislation changed. These are as defined above.

#### D. Data and Sample Definition

The primary source of the data we use are the Costa Rican Household Surveys of Employment and Unemployment for 1976 to 1993. These surveys are conducted by the Costa Rican General Directorate of Statistics and Census and the Ministry of Labor and Social Security and contain information on wages, employment, jobs, education, age, position in household (such as household head), firm size, region and other work-place and household characteristics. From 1976 to 1983 the surveys were conducted three times a year (March, July and November). In 1984 the surveys were conducted twice (March and November) and after 1984 they were conducted only once a year (July). Each time approximately 1% of the population of the country was surveyed.

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<sup>22</sup> Since we are not interested in the coefficients on D86 and D90 from the public sector equation, nor in the coefficients on D80 from the private sector equation, we do not report these coefficients in table 5. These coefficients are reported in appendix 1.

We use only the July surveys because only the July surveys provide enough information on personal and work-place characteristics (such as earnings, education, firm size, etc.) to estimate the equations described in the last section.<sup>23</sup> In addition, after 1984 only July surveys were conducted.

There are some problems with the data. From 1976 to 1978 the earnings of self-employed workers are not reported. Therefore, we cannot examine the impact of the 1980 legislative change on self-employed workers. More importantly for our results, there were changes in the design and sample of the Household Surveys between 1985 and 1987. First, the relative weights assigned to households in different geographic areas changed (in response to the 1984 census which, among other things, showed that there were more people living in rural areas than had been assumed). Second, the definitions of many important variables-- salary, unemployment and some regional classifications--changed. We address these survey problems in two ways. First, we use data only from a geographic region whose coverage and definition remained the same in all surveys--the Metropolitan Area of San José. In addition, we expect that mandated maternity leave is effectively enforced only in urban areas (and not effectively enforced in rural areas), and therefore use data from only the Metropolitan Area of San José, which is completely urban. By using data only from the Metropolitan Area of San José we also control for regional variations in wages and employment. Second, we use consistently defined variables for all years. That is, we use the definitions of income, employment, etc. from the 1976-1985 surveys to construct variables for the 1987-1993 surveys that are consistent with those in the 1976-1985 surveys. However, for some variables there still appear to be changes which we cannot explain between 1985 and 1987 (for example, the average schooling levels fall).<sup>24</sup>

We restrict the sample to men and women 15 to 49 years old. According to Costa Rican demographic statistics, these are the typical child-bearing ages for women.<sup>25</sup> We do this because we expect changes in mandated maternity leave legislation to increase the costs of hiring only those women of child-bearing ages.

In addition to information from the Household Surveys we use data on the Gross Domestic Product and the Consumer Price Index for Medium and Low Income Households in the Metropolitan Area of San Jose. Both are taken from Central Bank of Costa Rica publications.

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<sup>23</sup> We do not use July surveys for 1984 and 1986. In 1984 no July survey was conducted. In 1986 the survey data was never fully made available on computer. We omit 1984 and 1986 in our analysis.

<sup>24</sup> Another possible data problem are workers interviewed who do not report wages. This problem is especially acute for the recession years of the early 1980s. For example, the share of employees not reporting incomes rose from a range of about 2-5% during the 1976-1979 period to 15-30% during 1981-82 (the most serious level of non-reporting occurred in 1982). The share of employees not reporting incomes then fell to 2-5% once again after 1986. These missing wage data could bias our results if those workers not reporting incomes are not a representative cross-section of all workers. However, our analysis of the characteristics of these nonreporting employees does not suggest a high degree of nonrandomness (see Gindling and Berry, 1992).

<sup>25</sup> See *Ministerio de Planificación*, et al. 1988.

## E. Specification of Variables

### 1. Wage Equations

Dependent Variable: We estimate two wage equations for each sex and sector, one where the dependent variable is the hourly wage, the other where the dependent variable is the monthly salary. The Household Surveys report the monthly salaries of workers and the number of hours worked per week. Because of this incompatibility, we cannot precisely calculate an hourly wage. Therefore, we estimate the hourly wage as:

monthly salary/(hours worked per week multiplied by 4.3 weeks per month).

We deflated nominal wages using the July Consumer Price Index for Low and Medium Income Households in the Metropolitan Area of San José (1976=100). We use the wage for the primary employment of each worker (ignoring second jobs). We deleted any observations where the reported hours worked are zero, where reported wages are zero, and where salary is not reported.<sup>26</sup>

Independent Variables: The independent variables should control for factors that might affect the wages of workers. The individual specific variables ( $X_{ijt}$ ) in the relative wage equations include: family size, whether the worker is the head of a household, and the human capital variables available from the Household Surveys (years of formal education and potential experience, the latter defined as age minus years of education minus 6). The macroeconomic variables,  $Z_t$  include measures of the business cycle: Gross Domestic Product (in 1966 colons) and the unemployment rate for each sex in each year. Also included as independent variables are the dummy variables which indicate the years of the legislative changes: 1980 (D80), 1986 (D86), and 1990 (D90).

We control for education and experience in the wage equations because we expect that wages increase with increasing levels of each of these human capital variables. We use experience-squared because we expect that as workers accumulate more experience the marginal return for each additional year of experience will diminish.

We control for the business cycle (with the GDP and the unemployment rates) because we expect that changes in aggregate economic activity will cause the demand for labor, and hence wages and employment, to change. We expect the coefficient on GDP to be positive, and the coefficient on the unemployment rate to be negative. Also, recessions and expansions may affect the wages and employment of men and women differently. For example, Gindling (1993) shows that in Costa Rica the ratio of male to female wages increased, and that the male-female employment ratio decreased, during the recession of 1980-1983. Another way in which business

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<sup>26</sup> We also eliminated the observation if a re-coded salary variable indicated that the reported salary was unreliable.

cycles may affect male and female wages is illustrated in Beller (1980), who notes that the unemployment rate may affect the degree of enforcement of worker protection legislation (such as equal pay or mandated maternity laws); with a high unemployment rate workers may be less likely to confront an employer who is violating the law.

Killingsworth (1983) notes that family size has an important effect on whether a woman enters the labor force. Specifically, larger family size is likely to mean the woman stays home and does not enter the labor force. Therefore, if average family size is smaller, we would expect more women to enter the labor force. Gindling (1993) notes the proportion of women entering the labor force in Costa Rica is likely to affect average female wage differentials through the process of selection. Assuming that only those women who might earn higher wages find it worthwhile to enter the labor force, we would expect a smaller average family size, and therefore more women in the labor force, to result in larger male-female wage differentials (because as more women enter those women who might earn lower wages also enter the work force, causing average female wages to fall).

Waldfogel (1994) notes that married women tend to earn less than unmarried women, while married men earn more than unmarried men. This may result because of perceived conflict between work and family responsibilities for women. Beller (1982) also notes that family size and marital status may affect the types of jobs that women choose. Specifically, women may choose a lower paying job if it provides the opportunity to better care for children (for example, if working hours are more flexible). We include a dummy variable which is one if the worker is the head of household, and the number of children in the household.<sup>27</sup>

## 2. Employment Probit Equations

Dependent Variables: We estimate two employment probit equations. In each, the dependent variable in the employment equation is a qualitative variable. In one equation (the private equation), this variable indicates if the worker is employed in the private sector or not. In the other equation (the public equation), the variable indicates if the worker is employed in the public sector or not.

Independent Variables: The independent variables used in the employment probits include variables which measure phenomena which affect the employment of an individual of each sex in each year. The individual specific variables,  $X_{ijt}$ , include years of education, experience, family size, and whether or not the worker is the head of the household. The macroeconomic variables include: GDP (in 1966 colons), a variable which indicates the degree to which structural adjustment policies have brought about more jobs for women, and (in the female equation) the over-all female labor force participation rate.

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<sup>27</sup> We examined the sensitivity of our wage equation results by estimating equations with only subsets of these variables, as well as subsets of the legislative dummy variables. The results of this sensitivity analysis are reported in appendix 2.

Business cycles (which we measure with GDP) will indicate changes in the aggregate demand, and hence employment, of labor. We expect the coefficient on GDP to be positive.

Killingsworth (1983) notes that women with larger families are less likely to enter the labor force (probably because women, and not men, are generally responsible for child care). Therefore, if average family size is smaller, we would expect more women to enter the labor force, increasing the relative employment of women to men. Killingsworth (1983) also notes that, especially among women, household heads are more likely to enter the labor force than non-household heads. This probably also reflects the fact that women are traditional child-care providers in the family.

Killingsworth (1983) notes that workers with higher education levels are more likely to be in the labor force. Therefore, with increasing education levels we would expect more women to enter the labor force. We also expect that men and women with more experience are more likely to enter the labor force.

The structural adjustment program, begun in 1984, may have increased the demand for female labor. This is because the manufacturing industries that developed as export industries under the structural adjustment policies are industries that, traditionally, use a lot of female labor: electronic assemble and textiles (see Gindling and Berry 1992). Unfortunately, we cannot identify electronic assemblers in the data. Therefore, we will include a variable which measures the proportion of employment in textiles, as a proxy for the structural adjustment program.

In the employment probit for women, we include the economy-wide female labor force participation rate to control for increases in the supply of labor to the economy. This increase is independent of changes in the maternity leave mandates, and has led, for the past 20 years, to gradually increasing labor force participation rates for women.

### 3. Hours Worked Equations

Dependent Variables: The dependent variable in the hours worked equation is the hours worked during the week of the survey in the worker's primary employment. We delete any observations where the reported hours worked are zero, where reported wages are zero, and where salary is not reported.

Independent Variables: The independent variables used in the hours worked equation are the same as the independent variables used in the employment probits.

The dependent and independent variables used in the estimation of the wage, hours worked, and employment equations are summarized in Table 2.

## F. Descriptive Statistics

Table 3 presents male-female wage and employment differentials for the sample of workers between 15 and 49 years old in the Metropolitan Area of San José for the affected and unaffected sectors. Table 3 also presents the averages of the male-female wage and employment differentials for the four periods for which mandated maternity leave legislation differed: 1976-1979, 1980-1985, 1987-1989, and 1990-1993.<sup>28</sup> From 1976 to 1979 mandated maternity leave was 2 months in both the private and public sectors; from 1980 to 1985 mandated maternity leave remained 2 months in the private sector but increased to 4 months in the public sector (therefore, the affected sector in 1980 was the public sector, with the private and self-employed sectors the unaffected sectors); from 1987 to 1990 mandated maternity leave increased to 4 months in the private sector (the affected sector in 1986 was the private sector, with the public and self-employed sectors the unaffected sectors); in the 1990-1993 period, enforcement of mandated maternity leave increased in the private sector (the affected sector was the private sector, the public and self-employed the unaffected sectors).

It is not clear from the descriptive statistics in Table 3 which of the hypotheses discussed in Section III.B are correct. Observed changes in the male-female wage differentials and the male-female employment differentials are not consistent with what we would expect under any of the three assumptions outlined above.

The male-female wage differential in the public sector after 1980 was lower than the average from 1976-1979 (female wages increased relative to male wages). This result is not consistent with any of the above assumptions, from which we would expect female wages to fall in the public sector after 1980. The male-female wage differential also fell in the private sector between 1976-1979 and in the private and self-employed sectors between 1980-1985. It is likely that some phenomena not associated with the change in maternity leave legislation caused the falling male-female wage differential in both the public and private sectors.

From 1980 to 1993, male-female wage and employment differentials in the private and self-employed sectors fell. The ratios fell despite the changes in mandated maternity leave in 1986 and 1990. This evidence is not consistent with the expected effects of the mandated maternity law. We conclude that some phenomena not associated with the changes in maternity leave legislation caused the improvement in women's wages and employment (relative to men) in the

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<sup>28</sup> Data for 1984 and 1986 are unavailable.

**Table 2**  
**Variables Used in the Estimation of the Relative**  
**Wage, Hours Worked and Employment Equations**

**a. Wage Equations**

Dependent Variable

We will estimate two equations, with two dependent variables, for each sex and sector. These are the natural logarithm of

- i. Hourly Wages, and
- ii. Monthly Salary

Independent Variables

- i. Dummy variables to measure the impact of maternity leave legislation, indicating changes in 1980, 1986 and 1990--D80, D86, and D90.
- ii. Individual Specific Variables-- $X_{ijt}$ 
  - a. Years of formal education
  - b. Years of experience (age-education-6).
  - c. Family Size
  - d. Dummy variable indicating if worker is the head of household.
- iii. Macroeconomic Variables-- $Z_t$ 
  - a. GDP (1966 colons)
  - b. Unemployment rate (for each sex).

**b. Employment Probit Equations**

Dependent Variable

Two equations are estimated. The dependent variable in each is a qualitative variable indicating if the worker is

- 1. employed in the private sector or not, or
- 2. employed in the public sector or not.

Independent Variables

- i. Dummy variables to measure the impact of maternity leave legislation, indicating changes in 1980, 1986 and 1990--D80, D86, and D90.
- ii. Individual Specific Variables-- $X_{ijt}$ 
  - a. Years of formal education
  - b. Years of experience (age-education-6).
  - c. Family Size
  - d. Dummy variable indicating if worker is the head of household.
- iii. Macroeconomic Variables-- $Z_t$ 
  - a. GDP (1966 colons)
  - b. Economy-wide female labor force participation rate
  - c. The proportion of the work force in textiles and electronic assembly.

**c. Hours Worked Equations**

Dependent Variable

Hours Worked in primary employment.

Independent Variables

The independent variables are the same as those in the employment probit, which are described above.

Table 3: Male-Female ratios for hourly wage, monthly salary, employment, and total hours worked, for the private sector, public sector, and self employed workers, 1976-1993.

YEAR	Private Sector				Public Sector				Self-Employed			
	Hourly Wage Ratio	Monthly Salary Ratio	Employment Ratio	Average Hours Ratio	Hourly Wage Ratio	Monthly Salary Ratio	Employment Ratio	Average Hours Ratio	Hourly Wage Ratio	Monthly Salary Ratio	Employment Ratio	Average Hours Ratio
1976	1.67	1.74	1.64	0.99	1.03	1.15	1.62	1.10	-	-	-	-
1977	1.64	1.68	1.88	1.05	1.08	1.23	1.62	1.08	-	-	-	-
1978	1.42	1.55	1.83	1.06	0.97	1.16	1.39	1.14	-	-	-	-
1979	1.57	1.70	1.84	1.05	0.96	1.09	1.65	1.09	-	-	-	-
1980	1.42	1.58	1.90	1.07	0.99	1.12	1.53	1.11	1.36	2.23	3.99	1.40
1981	1.50	1.61	1.82	1.04	0.98	1.05	1.50	1.07	1.73	2.41	3.67	1.27
1982	1.31	1.73	1.77	1.04	0.88	1.01	1.63	1.11	0.98	2.70	3.93	1.68
1983	1.46	1.66	1.57	1.05	1.01	1.13	1.72	1.10	1.50	2.07	3.46	1.42
1985	1.27	1.43	1.59	1.08	1.00	1.10	1.55	1.09	1.27	1.95	3.48	1.33
1987	1.35	1.60	1.74	1.09	1.12	1.16	1.34	1.08	0.84	1.69	2.74	1.40
1988	1.21	1.40	1.63	1.11	0.96	1.05	1.33	1.08	1.14	1.98	4.13	1.72
1989	1.33	1.56	1.75	1.17	1.07	1.15	1.36	1.10	0.99	2.19	2.29	1.75
1990	1.22	1.47	1.64	1.15	1.15	1.23	1.40	1.06	0.88	1.78	2.70	1.63
1991	1.03	1.37	1.62	1.25	1.07	1.15	1.56	1.10	1.01	2.32	1.69	1.87
1992	1.08	1.35	1.66	1.16	1.07	1.12	1.29	1.02	1.02	2.24	2.06	1.75
1993	1.05	1.28	1.81	1.16	1.06	1.13	1.29	1.05	0.80	1.73	2.16	1.67
Averages												
1976-1979	1.58	1.67	1.80	1.04	1.01	1.16	1.57	1.10	-	-	-	-
1980-1985	1.39	1.60	1.73	1.06	0.97	1.08	1.59	1.10	1.37	2.27	3.70	1.42
1987-1989	1.30	1.52	1.71	1.13	1.05	1.12	1.34	1.08	0.99	1.96	3.05	1.63
1990-1993	1.10	1.37	1.68	1.18	1.09	1.16	1.38	1.06	0.93	2.02	2.15	1.73

Sample: Workers 15-49 years old living in the metropolitan area of San José

private sector over the 1980 to 1993 period. In addition, the fact that the male-female employment ratios fell in all three sectors indicates that these changes are not due to maternity leave mandate changes (which should affect workers in different sectors differently), but to some other phenomenon which affected workers in all three sectors similarly. In the estimated equations, we include variables to control for such phenomena. For example, these phenomena might include changes in the education or experience of women, changes in family structure, or changes in the macro-economy. Table 4 presents the male-female education, experience, family size, and household head ratios for workers in our sample for all three sectors for the years 1976 to 1993.<sup>29</sup>

A possible explanation for the fall in the male-female wage ratios in the two private sectors is the change in the male-female experience ratio. In the private sector, the average experience ratio by time period falls over the four periods. This trend indicates that the average working woman in the private sector became more experienced (and older) relative to the average man.

Falling male-female education ratios may explain the decline in the male-female wage differential among self-employed workers. Between 1980 and 1993, the male-female education ratio for self-employed worker fell from 1.11 to 0.908. In the estimation of the wage, employment and hours worked equations, we control for changes in education and experience.

The increase in the male-female employment ratios may be due to changing cultural mores which have made it more acceptable for women to work outside of the home. These changing cultural mores are not measurable. However, we may be able to get an idea of the impact of these changes by measuring the country-wide female labor force participation rate. The female labor force participation rate rose from 1976 to 1993, increasing from 19.5% in 1976 to 31.0% in 1993. During this time, the male labor force participation rate (not shown in Table 4) declined. In the female employment and hours worked equations, we control for the country-wide female labor force participation rate.

## **G. Results and Interpretation--Coefficients on the Maternity Leave Dummy Variables**

Tables A1 to A3 in appendix 1 present the entire set of estimated coefficients for the wage, employment and hours worked equations. The results indicate that the equations are generally

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<sup>29</sup> Between 1986 and 1987 the possible answers to the question on position in household changed. Specifically, between 1980 and 1986, people were asked if they were in one of two categories: the household head (*jefe*) or not, after 1986 people were asked if they were in one of 10 categories, including household head, child, spouse, niece or nephew, parents, domestic servants, or retirees. (The categories were also slightly different between 1976 and 1979.) While it should have been possible to construct a consistent variable for all years, there are clearly unrealistic changes in the household head male-female ratios presented in table 4 (for example, the ratio increases from 1.9 to 3.5 between 1985 and 1987). Because of doubts about the reliability of this variable, we estimated wage, employment and hours worked equations that both included and excluded the household head variable. The results of both specifications were similar, indicating that our results are not sensitive to this possible unreliable variable (see appendix 2 for a detailed description of the sensitivity analysis we carried out).

well-specified; the coefficients on the variables that are not related to the maternity leave changes are generally of the expected signs and significance levels. These coefficients are discussed in detail in appendix 1.

Table 5 presents the estimated coefficients on the dummy variables that indicate changes in mandated maternity leave legislation for the wage and employment equations for the private, public and self-employed sectors. Table 6 summarizes the results of these tests in a manner consistent with Table 1 (which presented the expected effect of changes in mandated maternity leave on the wages of men and women under three different assumptions). The results presented in Table 6 summarizing the observed changes in wages and employment for 1980 and 1986 are not consistent with any of the assumptions summarized in Table 1. However, the results presented in Table 6 summarizing the observed changes in wages and employment in 1990 are consistent with the assumption that women fully value the benefits of mandated maternity leave. Specifically, the estimated coefficients on the maternity leave dummy variables indicate that changes in mandated maternity benefits had no impact on wages and employment in 1980 and 1986. However, the increase in enforcement in 1990 did have an impact. The impact of the increase in enforcement in 1990 on the wages and employment of men and women is consistent with the assumption that women fully value the benefit received at cost; women's wages fall in the private sector but remained the same in the public and self-employed sectors. Similarly, the employment of men and women does not change significantly in any sector.

The following three sub-sections describe in detail the coefficients on the dummy variables measuring the changes in mandated maternity leave in 1980 (D80), 1986 (D86), and 1990 (D90).

#### **1. 1980 (public sector leave increases from 2 to 4 months)**

The coefficients on the dummy variables indicating the change in mandated maternity leave in 1980 are not significantly different from zero for all sexes in all sectors for all of the wage, hours worked and employment equations, with the exception of the coefficient on monthly salaries for women in the private sector, which was significantly negative.<sup>30</sup> We interpret this as indicating that in the public sector the mandated increase in maternity leave had no effect on the wages and employment of men and women. Additional evidence that this may be so is that the coefficients on the other variables in the wage and employment equations indicate that the public sector does not set wages and employment in the manner of a cost-minimizing firm. For example, in the public sector wage equations, none of the macro-economic variables (GDP and unemployment rates) are significant, while these variables are significant and of the expected sign in the equations for the private sector. This indicates that macroeconomic phenomena which should affect costs in the public and private sectors, only affects wages and employment in the private sector.

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<sup>30</sup> In the discussion of the significance of the coefficients on the maternity leave dummy variables (D80, D86, and D90), "significant" means significant at the 5% level, "insignificant" means not significant at 5%.

Table 4: Descriptive Statistics

YEAR	Public Sector				Private Sector				Self-Employed			
	Education	Experience	Household	Family	Education	Experience	Household	Family	Education	Experience	Household	Family
	Ratio	Ratio	Head	Size	Ratio	Ratio	Head	Size	Ratio	Ratio	Head	Size
1976	1.021	1.125	2.158	1.204	0.837	1.248	5.386	1.306	.	.	.	.
1977	0.996	1.061	2.311	1.138	0.862	1.280	3.585	1.099	.	.	.	.
1978	0.966	1.069	2.212	1.186	0.831	1.060	4.264	1.219	.	.	.	.
1979	1.009	1.065	2.374	1.132	0.881	1.071	4.796	1.061	.	.	.	.
1980	0.985	1.088	2.033	1.210	0.863	1.166	3.482	1.029	1.110	0.980	1.928	1.055
1981	1.072	0.981	2.094	1.010	0.890	1.058	3.875	1.166	1.218	0.992	2.750	1.070
1982	1.026	1.064	2.344	1.165	0.864	1.024	3.238	1.256	1.001	1.070	3.325	0.776
1983	1.057	1.079	1.964	1.181	0.938	1.021	3.703	1.409	1.011	0.909	2.562	0.955
1985	0.992	1.083	1.891	1.132	0.858	1.136	4.707	1.325	1.115	0.934	2.206	1.224
1987	1.006	1.030	3.519	1.000	0.853	1.140	4.653	1.195	0.995	0.987	3.971	0.923
1988	0.964	1.087	3.924	1.210	0.849	1.193	5.629	1.282	0.983	1.091	4.216	0.931
1989	1.016	0.975	3.443	1.040	0.895	1.114	3.896	1.163	1.007	1.015	5.280	1.182
1990	0.964	1.063	4.186	1.071	0.895	1.018	4.135	1.475	0.931	1.063	2.926	1.079
1991	0.975	1.015	3.210	1.268	0.846	1.050	2.776	1.603	1.020	0.955	3.231	1.191
1992	0.957	1.023	2.776	1.295	0.879	1.142	4.145	1.440	1.020	0.974	2.091	1.136
1993	0.994	0.989	2.908	1.369	0.918	1.076	2.733	1.396	0.908	1.124	2.644	1.229
Averages												
1976-1979	0.998	1.080	2.264	1.165	0.853	1.165	4.508	1.171	.	.	.	.
1980-1985	1.026	1.059	2.065	1.139	0.883	1.081	3.801	1.237	1.091	0.977	2.554	1.016
1987-1989	0.995	1.031	3.629	1.083	0.866	1.149	4.726	1.214	0.995	1.021	4.489	1.012
1990-1993	0.972	1.023	3.270	1.251	0.885	1.071	3.447	1.479	0.970	1.029	2.723	1.159

Year	GDP (:1966 colons)	Female Labor Force Participation Rate	Unemployment Rate	
			Male	Female
1976	7864.8	19.5	5.0	10.6
1977	8586.9	21.5	3.9	6.8
1978	9125.1	23.1	3.6	7.2
1979	9575.8	23.7	3.9	7.6
1980	9647.8	24.4	5.3	7.8
1981	9429.6	25.9	8.2	10.4
1982	8729.6	27.0	8.8	9.6
1983	8992.9	25.2	8.6	11.4
1985	9784.6	25.5	6.5	7.9
1987	10618.3	29.4	4.7	7.9
1988	11189.6	30.3	4.4	8.0
1989	11823.6	29.7	3.3	5.3
1990	12244.5	30.3	4.2	5.9
1991	12521.1	30.6	4.8	7.4
1992	13433.6	30.0	3.5	5.4
1993	14500.0	31.0	3.6	5.3

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**Table 5: Coefficients on the Dummy Variables Representing Maternity Leave Changes (1980, 1986 and 1990) in the Wage and Employment Equations.**

Standard errors are below the coefficients and in smaller type.  
Significant coefficients are in bold-face type.

		Private Sector		Public Sector		Self-Employed	
		Men	Women	Men	Women	Men	Women
<b>1980:</b>							
Wages	Hourly Wages	.0426 .140	-.0059 .118	-.0517 .221	.128 .166	.	.
	Monthly Salaries	.181 .137	<b>-.261</b> .124	-.0057 .213	.120 .167	.	.
Employment	Employment Probits	.	.	-.043 .179	-.197 .284	.	.
	Average Hours	.464 1.526	-3.50 3.03	-2.04 2.44	.897 4.01	.	.
<b>1986:</b>							
Wages	Hourly Wages	-.168 .118	<b>.378</b> .152	.303 .190	.0062 .209	.036 .392	.122 .738
	Monthly Salaries	<b>-.231</b> .116	.168 .159	.254 .183	.0036 .212	.037 .374	.131 .741
Employment	Employment Probits	<b>.583</b> .309	.126 .454	.	.	.	.
	Average Hours	-1.63 3.39	2.63 5.09	2.18 5.26	4.383 7.148	-42.8 32.95	-2.12 6.815
<b>1990:</b>							
Wages	Hourly Wages	.030 .127	<b>-.369</b> .170	-.150 .206	-.153 .248	-.433 .444	.435 .794
	Monthly Salaries	-.034 .125	<b>-.609</b> .178	-.251 .199	-.386 .251	<b>-.72*</b> .424	.853 .798
Employment	Employment Probits	.350 .247	-.472 .351	.	.	.	.
	Average Hours	-4.28 2.85	-1.12 4.17	-6.53 4.38	-2.64 5.80	-19.5 14.8	.875 5.649

Note: The coefficients in bold were significantly different from zero at the 5% level (one coefficient, denoted with an "\*", was significant at 10% but not 5%).

**Table 6: Summary of the Results: Coefficients on the Dummy Variables Representing Changes in Mandated Maternity Leave.**

	Private Employees		Public Employees		Self-Employed	
	Men	Women	Men	Women	Men	Women
<b>1980:</b>						
Wages	NC	NC/-	NC	NC	.	.
Employment	NC	NC	NC	NC	.	.
<b>1986:</b>						
Wages	NC/-	+ /NC	NC	NC	NC	NC
Employment	+	NC	NC	NC	NC	NC
<b>1990:</b>						
Wages	NC	-	NC	NC	NC	NC
Employment	NC	NC	NC	NC	NC	NC

**Notes:**

1. NC indicates that the coefficients were not significantly different from zero at the 5% level.
2. - indicates that the coefficient was negative and significant at 5%.
3. + indicates that the coefficient was positive and significant at 5%.
4. -/NC or +/NC indicates that the coefficient was significant in the hourly waged equation, but not significant in the monthly salary equation.
5. NC/- or NC/+ indicates that the coefficient was not significant in the hourly wage equation, but was significant in the monthly salary equation.
6. Employment increases occur if either the number of people employed increases, or the average number of hours worked increases.

Our results indicate that the public sector in Costa Rica is not a cost-minimizing employer. Therefore, when the cost of employing women increased because of the increase in the number of months of mandated maternity leave this did not cause a change in the wages or employment of women in the public sector.

## 2. 1986 (private sector leave increases from 2 to 4 months)

For wages, the 1986 coefficients are insignificant for both men and women in the self-employed sector, insignificant for women and men in the public sector, negative and significant for men in the private sector, and positive and significant for women in the private sector. The coefficients on the employment probit are insignificant for women, and positive and significant for men, indicating that the employment of men in the private sector increased with the 1986 change in mandated maternity leave legislation. The coefficients in the hours worked equations are insignificant for all sectors and sexes.

These results indicate that the 1986 legislation led to falling wages for men in the affected sector (the private sector), increases in wages for women in the affected sector, and an increase in male employment in the affected sector. However, these results are not consistent with the predictions derived from the theoretical model presented in Section III.B under any of the three assumptions. Because of this, we believe that it is unlikely that these measured changes in the wages of men and women are due to the legislative change. It may be that phenomena that we are not able to measure are causing the wages and employment of men and women to change between the period prior to 1986 and the period after 1986. For example, the first structural adjustment and trade liberalization program in Costa Rica began in 1984 and the first reductions in tariffs were implemented in 1987. The structural adjustment program led to significant changes in the Costa Rican economy in the later half of the 1980s (see Gindling and Berry 1992). Also likely is that the changes in the survey sample and design between 1985 and 1987 (as described in Section III.D) led to the observed change in wages and employment. We conclude that the 1986 legislation had no observable impact on the wages and employment of men and women in any of the three sectors.

## 3. 1990 (private sector enforcement increased)

The coefficients on the 1990 dummy variable in both wage equations for women in the private sector are significantly negative.<sup>31</sup> The coefficients on D90 in the wage equations for women in the other sectors, and for men in all sectors, are not significantly different from zero. In the employment probits and in the hours worked equations, the coefficients on D90 are not significantly different from zero for men or women.

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<sup>31</sup> We cannot say with much precision the magnitude of the fall in women's wages in the private sector. For example, we estimate the fall in the hourly wages of women in the private sector in 1990 to be -36.9% plus or minus 27.9% (the 95% confidence interval). In other words, we estimate the fall in women's wages was between 8.9% and 65%. The lower estimate is probably more consistent with the increase in costs to employers.

These results indicate that the 1990 legislative change led to a fall in the wages of women in the affected (private) sector, but did not affect the employment of women or men in that sector. Similarly, the 1990 legislative change did not affect the wages of men or women in the unaffected sectors (public and self-employed). These results are consistent with the theoretical model presented in Section III.B under the assumption that women fully value the benefit of the maternity leave.<sup>32</sup>

## **H. Summary**

Our results are consistent with the hypothesis that women value the maternity leave at the full cost to the employer. When the law was enforced in 1990, the wages of women fell in the private sector but neither wages nor employment for women or men changed in any other sector. This indicates that the maternity leave law did not lead to a distortion in employment patterns.

The econometric results also suggest that the increase in mandated maternity leave from two to four months was not effectively enforced in the private sector when it was passed in 1986. This increase in mandated leave did not lead to the expected changes in male and female wages and employment. Only when mechanisms were put into place to effectively enforce the law in 1990 did it have an impact on women in the labor market.

Based on the results presented in Table 5 and the tables in appendix 1, our analysis indicates that the public sector in Costa Rica is not a cost-minimizing employer. Therefore, when the cost of employing women increased in 1980 because of the increase in the number of months of mandated maternity leave, this did not cause a change in the wages or employment of women in the public sector.

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<sup>32</sup> Note that our results reflect averages for women--individuals may differ in their valuation of the benefits.

## CHAPTER IV

### CONCLUSIONS AND POLICY IMPLICATIONS

Our results indicate that neither the 1980 nor the 1986 legislative changes had any observable impact on the wages and employment of men and women in any of the three sectors. For the 1990 legislative change, however, which increased enforcement under the equal rights law, we find that women's wages in the private sector fell, while women's employment and men's wages and employment in this sector were not affected. Similarly, the 1990 legislative change did not have any observable impact on the wages or employment of men or women in the unaffected public and self-employed sectors. These results are consistent with first assumption described above, and we conclude that women fully value the benefit of the maternity leave. These results have several policy implications:

- First, without enforcement mechanisms, legislative initiatives such as mandated maternity leave may be ineffective. We find that in Costa Rica significant changes in mandated maternity leave legislation in 1980 and 1986 had no impact on the labor market. It is only with the passage of the 1990 Law to Promote the Social Equality of Women, which created enforcement mechanisms and increased penalties for violating the maternity leave law, that we find evidence that the law had any impact on wages and employment.
- Second, to the extent that maternity leave mandates are enforced, they could be a partial explanation for the wage gap that exists between women and men.<sup>33</sup> However, our results indicate that this part of the wage gap is not an indication of a distortion in the labor market or economy.
- Third, we find that in Costa Rica, mandated maternity leave benefits are not distortionary with respect to employment. Our results indicate that the take-home pay of women falls by the cost of the mandate to employers, so the total cost to employers of hiring women does not change.<sup>34</sup> The relative cost of employing women and men does not change, and, consequently, the relative employment of women and men does not change. Finally, because there are no distortionary effects arising from mandated maternity leave policies, these policies do not have a negative impact on economic growth or productivity.

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<sup>33</sup> Mandated maternity leave does not completely explain the male-female wage gap. For example, while mandated maternity leave itself led to an increase in the male-female wage gap adjusted for changes in education, experience, GDP, etc. after 1990, the unadjusted male-female wage gap actually fell after 1990. Clearly, other factors besides mandated maternity leave, such as discrimination, may also be responsible for the gap in male and female wages.

<sup>34</sup> Again, we note that the employer pays only 50% of the woman's salary while she is on leave, with the Social Security Administration paying the other 50%.

The results presented in this paper refer only to the efficiency effects of mandated maternity leave; we conclude that the mandated maternity leave legislation does not distort patterns of employment, and therefore has no impact on efficiency. Based on our results, we cannot make any conclusions about the desirability of mandated maternity leave. However, others, among them Lawrence Summers, have suggested several reasons why employer mandates may be desirable policy instruments.

Summers (1989) suggests that mandates may be desirable if there are positive externalities to society associated with the action brought about by the mandate. For example, mandated maternity leave may increase women's attachment to the labor force, increasing the average work-life and life-time earnings prospects for women. By increasing the average work-life and experience level of working women, mandated maternity leave may contribute to increased aggregate production, as well as reduce work place inequality. Also, with mandated maternity leave, there may be positive externalities related to family and child welfare.

Summers (1989:179) provides a further argument for government intervention in the market place using mandated benefits such as maternity leave: "If employees have more information about whether they will need parental leave or face high medical bills than their employers do, then employers that provide these benefits will receive disproportionately more applications from employees who require benefits and so will lose money. The market thus discourages provision of any fringe benefits." This would imply that, without the mandate, few private sector employers would provide maternity leave, even to those workers who value the benefit at cost.

Our results indicate that, in Costa Rica, the cost to employers of mandated paid maternity leave is shifted to women in the form of lower wages. In this paper we do not consider whether the effect of mandated maternity leave on the wages of women is an equitable outcome. If society is concerned not only with correcting a market failure, but also with ensuring that women are treated the same as men in the work place, then full shifting of the cost of the mandate to women may not be viewed as a desirable outcome (see Gruber 1994:627). In this case, the government may wish to pay a woman's full salary while she is on maternity leave, thereby significantly reducing the cost of leave to employers. The government may wish to finance this subsidy with tax revenues, even though the collection of payroll taxes may lead to reduced employment overall.

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## **APPENDIX 1**

### **ESTIMATED WAGE, EMPLOYMENT AND HOURS WORKED EQUATIONS**

## **Appendix 1**

### **Estimated Wage, Employment and Hours Worked Equations**

Tables A2 to A4 present the entire set of estimated coefficients for the wage, employment and hours worked equations for all sectors and sexes. (Table A1 presents the abbreviations used in Tables A2 to A4.) The results indicate that the wage and employment equations are well-specified; the coefficients on the variables not related to the legislative changes are generally of the expected signs and significance levels. The R-squared for the wage equations ranges from 0.2 (for the female-self-employed sector equation) to over 0.5 (for the male-private sector equation). For the employment equations, the log likelihood ratio indicates that the coefficients, as a group, are significant. The hours worked equations are less well specified; fewer coefficients are significant and the R-squared is generally low (always below 0.11).

#### **a. Wage Equations**

Table A2 presents the estimated coefficients for the hourly wage and monthly salary equations. The coefficients in the private sector wage equations on the two business cycle variables, GDP and the unemployment rates, are significant and of the expected signs; the coefficients are positive and significant for GDP (for both sexes) and negative and significant for the unemployment rate (only significant in the equations for men). In the public and self-employed sector, these business cycle variables are not significantly different from zero. These results indicate that changes in aggregate demand for labor affect private sector workers more than they affect public and self-employed workers. We interpret this to mean that public sector employers may not be cost minimizers.

In the wage equations for all sexes and all samples the coefficients on years of formal education and years of potential experience are generally positive and significant. The coefficients on the other individual-specific variables are more likely to be significant in the male equations than in the female equations, and in the private sector rather than in the public or self-employed sector equations. Similarly, while the R-squared are generally quite large (from 0.2 to over 0.5), the R-squared is generally larger in the equations for women rather than men, and generally larger in the private sector rather than the public or self-employed sector equations.

#### **b. Employment Probit Equations**

Table A3 presents the estimated coefficients from the private and public employment probit equations for men and women. In the private employment probit equations, the coefficients on the business cycle variable, GDP, are negative and significant for men, but insignificant for women. This indicates that faster economic growth leads to fewer men in the private sector (and more in the self-employed and public sector). The coefficients on the other time-series variables (PARTIC RATE and TEXTILES) are insignificant in both the male and female equations. In the public employment probit equations, none of the time-series variables are significant. Among the individual-specific variables, in both the private and public equations, and for both sexes, the coefficients on years of potential experience are generally positive and significant.

This indicates that more experienced workers (and therefore older workers) are more likely to be employed in the private or public sectors than in the other self-employed sector.

In the private equation for women, the coefficients on family size are generally positive and significantly different from zero. This indicates that women with larger families are more likely to work in the private sector than the public and self-employee sectors. For men, the coefficients on the variable which is one if the worker is a head of household (JEFE\*\*) is generally positive and significant, indicating that men who are household heads are more likely to work in the private sector.

In the public equations for men, the coefficient on family size is often significant and negative, indicating that men with larger families are less likely to work in the public sector than the other two sectors. For women, household heads are less likely to work in the public sector.

### c. Hours Worked Equations

Table A4 presents the estimates of the coefficients for the hours worked equations. The hours worked equations appear to be less well specified than the wage and employment equations: the R-squared is generally smaller, less than 0.1 for all but one equation, and fewer coefficients are significantly different from zero.

In the hours worked equations for all sexes and sectors, the coefficients on the business cycle variable (GDP), the variables which indicates the impact of the structural adjustment program (TEXTILES), and the female labor force participation rate (PARTIC RATE), are not significantly different from zero. The only exception is that the coefficient on the overall female labor force participation rate is significant for women in the private sector.

In the hours worked equations for all sexes in the private and public sectors the coefficient on years of formal education is generally negative and significant. This indicates that more educated workers generally work fewer hours than less educated workers in these sectors. This may be because, in these sectors, the standard work week for production workers is likely to be 48 hours, while for many professionals the average work-week is more likely to be 40 hours. In the self-employed sector, the coefficient on education is significant, indicating that in this sector more educated workers tend to work longer hours. This may be because less educated workers are more likely to be part-time workers in the self-employed sector.

For women, in all three sectors, the coefficients on the variables indicating household head (JEFE\*\*) is positive and significant. This indicates that women who are household heads work longer hours than women who are not household heads.

The coefficients on the other individual-specific variables, in general, are not significantly different from zero. When they are significant, they are more likely to be significant in the male equations rather than in the female equations, and in the private sector rather than in the public or self-employed sector equations.

**Table A1: Abbreviations Used in Tables A2 through A4.**

1. GDP	Gross Domestic Product in 1966 colons,
2. UMEMPL RATE	Unemployment rate for each sex,
3. S**	Years of formal education, coefficient for 19**, where ** ranges from 76 to 93,
3. X**	Years of experience, coefficient for year 19**, where ** ranges from 76 to 93,
3. EXP2**	Experience squared, coefficient for year 19**, where ** ranges from 76 to 93,
3. JEFE**	Dummy variable which is one if the worker is the household head, coefficient for year **, where ** ranges from 76 to 93,
4. FAMSZ**	Number of people in the worker's family, coefficient for year 19**, where ** ranges from 76 to 93,
5. TEXTILES	Proportion of workers in the Metropolitan Area of San Jose employed in textiles, and
6. PARTIC RATE	Economy-wide female labor force participation rate.

**Table A2, Estimated Wage Equations, By Sex and Sector**  
**Dependent Variable: Natural Log of Monthly Salary (in 1976 colons)**

**Parameter Estimates**

Variable	Private Sector Female	Private Sector Male	Public Sector Female	Public Sector Male	Self-Employed Sector - Female	Self-Employed Sector - Male
INTERCEP	2.477510*	4.902847*	5.567052*	6.124159*	6.276699	3.957153
D80	-0.261498*	0.180674	0.120331	-0.005719		
D86	0.168257	-0.230500*	0.003584	0.254130	0.131424	0.037177
D90	-0.608913*	-0.034154	-0.385509	-0.250991	0.852785	-0.719478*
GDP	0.000279*	0.000113*	0.000039175	-0.000036001	-0.000116	0.000217
UNEMPL RATE	0.041543	-0.099254*	-0.007503	0.029411	-0.011282	-0.062023
S76	0.117783*	0.117611*	0.102636*	0.101097*		
X76	0.067444*	0.067741*	0.038304*	0.038512*		
EXP276	-0.001421*	-0.001228*	-0.000583	-0.000544*		
JEFE76	-0.306252*	0.252659*	0.075461	0.158471*		
FAMSZ76	-0.024320	-0.001689	0.014468	-0.026432		
S77	0.118548*	0.101725*	0.085691*	0.111120*		
X77	0.057352*	0.072403*	0.065257*	0.040192*		
EXP277	-0.001089*	-0.001262*	-0.001085*	-0.000565*		
JEFE77	-0.077881	0.172186*	0.010803	0.138517*		
FAMSZ77	0.002212	-0.004659	-0.016288	-0.016424		
S78	0.123233*	0.107017*	0.095418*	0.115183*		
X78	0.054017*	0.067532*	0.057612*	0.039265*		
EXP278	-0.001028*	-0.001209*	-0.000860*	-0.000421*		
JEFE78	-0.117025*	0.234223*	0.058252	0.230792*		
FAMSZ78	-0.009862	-0.006370	0.022256	-0.021011		
S79	0.119447*	0.111857*	0.105656*	0.113937*		
X79	0.055052*	0.068809*	0.045709*	0.041018*		
EXP279	-0.001319*	-0.001304*	-0.000558	-0.000553*		
JEFE79	-0.134170*	0.242030*	0.002340	0.132918*		
FAMSZ79	-0.016022	-0.002810	0.005157	0.034417*		
S80	0.127942*	0.110829*	0.098159*	0.112595*	0.157811*	0.135021*
X80	0.072369*	0.055971*	0.046875*	0.046842*	0.006564	0.022847
EXP280	-0.001522*	-0.000886*	-0.000921*	-0.000695*	0.000490	-0.000131
JEFE80	-0.297000*	0.216719*	-0.014317	0.067904	0.227076	0.248976*
FAMSZ80	-0.008647	0.026165*	0.019190	0.001387	-0.009413	0.006335
S81	0.119152*	0.113293*	0.091825*	0.099655*	0.133880*	0.109850*
X81	0.047317*	0.057954*	0.029590*	0.024435*	0.052353	0.035542*
EXP281	-0.001013*	-0.000940*	-0.000240	-0.000250	-0.000827	-0.000607
JEFE81	-0.156214*	0.270273*	0.032518	0.116923*	-0.042134	0.495550*
FAMSZ81	-0.001460	-0.000771	0.002492	-0.002388	-0.138593	0.033255
S82	0.110241*	0.107772*	0.072950*	0.067917*	0.115637*	0.102863*
X82	0.043770*	0.046833*	0.019061	0.012623	-0.061040	0.051676*
EXP282	-0.000905*	-0.000787*	-0.000135	-0.000158	0.002370*	-0.000791*
JEFE82	-0.154675*	0.361919*	0.090930	0.155478*	0.064519	0.407136*
FAMSZ82	-0.024493	-0.020506	0.037852	0.027379	0.045419	-0.034081

\* Significant at 10%

Parameter Estimates (continued)  
 Dependent Variable: Natural Log of Monthly Salary

TABLE A2

Variable	Private Sector Female	Private Sector Male	Public Sector Female	Public Sector Male	Self-Employed Sector - Female	Self-Employed Sector - Male
S83	0.116392*	0.116578*	0.061177*	0.074726*	0.090844*	0.138483*
X83	0.039149*	0.056311*	0.055195*	0.031489*	-0.030821	0.018767
EXP283	-0.000640*	-0.000884*	-0.001022*	-0.000450	0.001378	-0.000113
JEFE83	-0.161813*	0.177249*	-0.010914	0.157112*	0.036505	0.334429*
FAMSZ83	0.000874	0.021252	0.041495	-0.012187	0.178603*	-0.015691
S85	0.120660*	0.098808*	0.079353*	0.096839*	0.074690*	0.105156*
X85	0.047252*	0.068250*	0.046252*	0.042020*	0.118347*	0.019147
EXP285	-0.000790*	-0.001136*	-0.000860*	-0.000571*	-0.002547*	-0.000240
JEFE85	-0.048096	0.091741*	0.118377	-0.038984	0.523964*	0.501206*
FAMSZ85	-0.003223	0.008039	-0.017556	-0.008160	-0.327542*	0.056030
S87	0.104989*	0.111064*	0.093013*	0.097295*	0.155813*	0.085030*
X87	0.034682*	0.070536*	0.037481*	0.036819*	0.019738	0.051400*
EXP287	-0.000595*	-0.001168*	-0.000649	-0.000532	0.000160	-0.001056*
JEFE87	0.190474*	0.105918*	0.168660*	0.188161*	0.343246	0.328947*
FAMSZ87	-0.039891	0.004882	-0.032657	-0.027983	-0.108490	-0.046594
S88	0.085614*	0.101117*	0.073837*	0.099007*	0.145001*	0.087190*
X88	0.035256*	0.047884*	0.050038*	0.023316*	0.035966	-0.001780
EXP288	-0.000845*	-0.000707*	-0.000962*	-0.000147	-0.000491	0.000183
JEFE88	0.205369*	0.218729*	0.295923*	0.132056	0.112791	0.500314*
FAMSZ88	-0.013776	0.031855*	0.048913	0.004595	-0.093352	0.071936
S89	0.085860*	0.103982*	0.069930*	0.083465*	0.141126*	0.061210*
X89	0.037373*	0.042610*	0.066457*	0.050010*	0.012836	0.053973*
EXP289	-0.000977*	-0.000724*	-0.001150*	-0.000791*	0.000130	-0.001137*
JEFE89	0.124952	0.299858*	-0.056042	0.163225*	0.210364	0.200907
FAMSZ89	-0.040020	-0.041539*	-0.038477	0.002026	-0.058197	-0.117489*
S90	0.117037*	0.089692*	0.097507*	0.103178*	0.093403*	0.084240*
X90	0.045911*	0.063443*	0.047117*	0.062162*	-0.039479	0.050236*
EXP290	-0.000972*	-0.001313*	-0.000667	-0.001004*	0.001121	-0.001008*
JEFE90	0.083979	0.220683*	-0.040022	0.067851	0.739322*	0.458943*
FAMSZ90	-0.032789	0.001063	0.029950	-0.015285	0.104477	0.020628
S91	0.096486*	0.076434*	0.118055*	0.126770*	0.041605	0.083453*
X91	0.036607*	0.063070*	0.035859*	0.010724	-0.001550	0.040900*
EXP291	-0.000822*	-0.001434*	-0.000488	0.000129	-0.000051658	-0.000943*
JEFE91	0.124669	0.298386*	-0.052913	0.283404*	0.276258	0.629364*
FAMSZ91	0.019443	0.029665*	-0.058510	0.008803	-0.004448	-0.050245
S92	0.103395*	0.086495*	0.099987*	0.126689*	0.111569*	0.086251*
X92	0.031367*	0.034276*	0.061240*	0.009338	-0.044631	0.040879*
EXP292	-0.000764*	-0.000587*	-0.001101*	-0.000051767	0.001494	-0.000613
JEFE92	0.063285	0.247394*	-0.084012	0.456962*	0.442935*	0.167136
FAMSZ92	-0.004297	0.004550	-0.059196*	-0.029641	-0.119058	-0.016834
S93	0.091692*	0.072752*	0.124660*	0.119971*	0.107879*	0.065852*
X93	0.030863*	0.059304*	0.025549	0.034853*	0.013978	0.021763
EXP293	-0.000697*	-0.001171*	-0.000325	-0.000502	-0.000039721	-0.000707
JEFE93	0.114536	0.167661*	-0.084438	0.342949*	-0.001736	0.528638*
FAMSZ93	-0.049898*	-0.030723*	-0.026498	-0.018524	-0.030558	0.030284
Number of Observations:	6158	10640	2561	3815	916	2265
R-squared	.3360	.4338	0.3853	.5100	.2470	.3173

\* Significant at 10%

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**Table A2, Estimated Wage Equations, By Sex and Sector**  
**Dependent Variable: Natural Log of Hourly Wage (in 1976 colons)**

**Parameter Estimates**

Variable	Private Sector Female	Private Sector Male	Public Sector Female	Public Sector Male	Self-Employed Sector - Female	Self-Employed Sector - Male
INTERCEP	-1.121420	-0.465832	0.106157	0.665021	-4.275936	1.099170
D80	-0.005904	0.042591	0.127908	-0.051687		
D86	0.378614*	-0.167879	0.006244	0.302551	0.121939	0.035829
D90	-0.369400*	0.029845	-0.153256	-0.150257	0.434665	-0.433262
GDP	0.000135*	0.000114*	0.000026589	-0.000035517	0.000310	0.000042845
UNEMPL RATE	-0.033594	-0.067223*	0.004769	0.064471	0.255820	-0.114702
S76	0.144034*	0.118803*	0.128333*	0.112012*		
X76	0.072084*	0.055839*	0.033329*	0.028837*		
EXP276	-0.001313*	-0.000976*	-0.000440	-0.000328		
JEFE76	-0.474378*	0.258111*	-0.059851	0.140652*		
FAMSZ76	-0.041624*	-0.017098	0.042933	-0.025322		
S77	0.130940*	0.109011*	0.124909*	0.114298*		
X77	0.053655*	0.055130*	0.047943*	0.038385*		
EXP277	-0.000894*	-0.000882*	-0.000654	-0.000563*		
JEFE77	-0.251363*	0.162944*	-0.027868	0.154459*		
FAMSZ77	-0.002654	-0.009013	-0.022740	-0.013110		
S78	0.136089*	0.113510*	0.123470*	0.129266*		
X78	0.063250*	0.054029*	0.052514*	0.030400*		
EXP278	-0.001089*	-0.000941*	-0.000621*	-0.000254		
JEFE78	-0.227488*	0.216394*	-0.054385	0.214423*		
FAMSZ78	-0.008192	-0.016700	0.048903*	-0.028997		
S79	0.146940*	0.118077*	0.134578*	0.125225*		
X79	0.053180*	0.058179*	0.043798*	0.035229*		
EXP279	-0.001015*	-0.001080*	-0.000498	-0.000396		
JEFE79	-0.251233*	0.185985*	-0.084058	0.143551*		
FAMSZ79	0.020654	-0.004021	0.024675	0.018246		
S80	0.146558*	0.118022*	0.127772*	0.124445*	0.145767*	0.122201*
X80	0.053011*	0.056479*	0.043997*	0.034847*	-0.003732	0.010516
EXP280	-0.000842*	-0.000929*	-0.000714*	-0.000415	0.000529	-0.00007406
JEFE80	-0.392201*	0.140095*	-0.095644	0.081228	-0.052734	0.120150
FAMSZ80	0.021833	0.010051	-0.008159	-0.004581	-0.029482	-0.021894
S81	0.138691*	0.119007*	0.118343*	0.105347*	0.063089	0.123426*
X81	0.056113*	0.047251*	0.020785	0.014761	0.022469	0.012202
EXP281	-0.000997*	-0.000684*	0.00003047	-0.000064285	-0.000836	0.000039942
JEFE81	-0.337947*	0.230176*	0.024895	0.086884	-0.118103	0.156937
FAMSZ81	0.001218	-0.007089	0.002732	-0.005610	-0.158843*	0.011750
S82	0.126268*	0.117921*	0.101963*	0.074647*	0.136691*	0.094495*
X82	0.031798*	0.027820*	0.003189	0.000605	-0.032413	0.021414
EXP282	-0.000442	-0.000335*	0.000332	0.000108	0.000778	-0.000251
JEFE82	-0.375424*	0.313883*	0.036875	0.107644	-0.533911*	0.447093*
FAMSZ82	0.033480*	-0.016465	0.087372*	0.016552	0.022451	-0.090995*

\* Significant at 10%

Parameter Estimates (continued)

TABLE A2

Dependent Variable: Natural Log of Hourly Wage

Variable	Private Sector Female	Private Sector Male	Public Sector Female	Public Sector Male	Self-Employed Sector - Female	Self-Employed Sector - Male
S83	0.137952*	0.122269*	0.094764*	0.077198*	0.048815	0.120470*
X83	0.044072*	0.040814*	0.030532*	0.019261*	-0.048288	-0.000137
EXP283	-0.000511*	-0.000511*	-0.000376	-0.000147	0.001247	0.000272
JEFE83	-0.266008*	0.150315*	-0.005735	0.134262*	-0.207112	0.270600*
FAMSZ83	0.026120	0.026305*	0.080394*	-0.006947	0.058931	-0.005385
S85	0.130351*	0.107521*	0.103543*	0.115683*	0.118906*	0.092436*
X85	0.050596*	0.062843*	0.046634*	0.019084	0.035282	-0.008990
EXP285	-0.000741*	-0.001066*	-0.000850*	-0.000086169	-0.000850	0.000355
JEFE85	-0.194575*	0.017218	-0.019265	-0.009515	0.086460	0.522057*
FAMSZ85	0.023140	0.010946	0.005523	-0.009793	-0.200923*	0.022421
S87	0.124488*	0.121750*	0.118636*	0.117430*	0.125923*	0.076569*
X87	0.012058	0.061354*	0.035386*	0.019207	-0.011088	0.019755
EXP287	0.000272	-0.000979*	-0.000534	-0.000100	0.000068187	-0.000359
JEFE87	0.112381	0.042649	0.066416	0.164984*	0.012521	0.382801*
FAMSZ87	-0.035219	0.000136	-0.018039	-0.046386	-0.029196	-0.045652
S88	0.109151*	0.112916*	0.095460*	0.101147*	0.098031*	0.078953*
X88	0.024603*	0.038254*	0.052307*	0.025109*	-0.021391	-0.016056
EXP288	-0.000430	-0.000468*	-0.000948*	-0.000225	0.000456	0.000520
JEFE88	0.174997*	0.129832*	0.221724*	0.166803*	0.054204	0.323156*
FAMSZ88	-0.000982	0.035784*	0.041783	-0.017167	-0.055475	0.080384
S89	0.097323*	0.118249*	0.106502*	0.093628*	0.130455*	0.068671*
X89	0.032394*	0.030608*	0.042089*	0.050176*	-0.009719	0.056953*
EXP289	-0.000697*	-0.000324	-0.000394	-0.000792*	0.000346	-0.001271*
JEFE89	-0.001047	0.248925*	0.016104	0.099249	0.197738	-0.056940
FAMSZ89	-0.030124	-0.066217*	-0.009530	0.004373	-0.045762	-0.147285*
S90	0.120989*	0.099554*	0.124338*	0.117685*	0.070418*	0.087818*
X90	0.026837*	0.051071*	0.021264	0.042917*	-0.041331	0.020846
EXP290	-0.000278	-0.001033*	0.000049528	-0.000606*	0.000934	-0.000290
JEFE90	-0.060976	0.147313*	-0.119934	0.042059	0.228060	0.358869*
FAMSZ90	0.000576	-0.011152	0.005688	-0.015870	0.132987*	-0.003029
S91	0.113610*	0.091877*	0.131195*	0.128649*	0.017983	0.091261*
X91	0.048594*	0.039554*	0.030250	0.003051	-0.043001	0.018201
EXP291	-0.000955*	-0.000898*	-0.000373	0.000324	0.000588	-0.000482
JEFE91	-0.019699	0.243968*	-0.068593	0.231281*	0.163788	0.439000*
FAMSZ91	-0.005698	0.012731	-0.043019	0.022306	0.051729	-0.017225
S92	0.110554*	0.095083*	0.116149*	0.133165*	0.051515	0.096923*
X92	0.026001*	0.021194*	0.047676*	0.004183	-0.029557	0.020604
EXP292	-0.000479	-0.000249	-0.000735*	0.000084679	0.000200	-0.00028243
JEFE92	0.047276	0.172698*	-0.167974*	0.383363*	0.260135	-0.035118
FAMSZ92	-0.004326	-0.009485	-0.049354	-0.028141	0.020549	-0.020682
S93	0.104647*	0.084658*	0.135048*	0.121369*	0.084313*	0.092900*
X93	0.020866*	0.033432*	0.021729*	0.030835*	-0.035020	0.047198
EXP293	-0.000161	-0.000602*	-0.000273	-0.000551	0.000331	-0.001025
JEFE93	0.259138*	0.139767*	-0.111837	0.314871*	-0.118165	-0.084177
FAMSZ93	-0.014193	-0.013205	0.008010	0.009212	-0.056534	-0.004184
Number of Observations:	6158	10640	2561	3815	916	2265
R-squared	.4261	.4145	0.47617	.5222	.2069	.2654

\* Significant at 10%

Table A3: Estimates of the Probit Equations, by Sex

Variable	Private Equation Female <sup>1</sup>	Private Equation Male <sup>1</sup>	Public Equation Female <sup>2</sup>	Public Equation Male <sup>2</sup>
INTERCEP	-2.0980063	0.20618707	-4.5541081*	-1.0819971
D80	0.06300864	0.16586701	-0.1975224	-0.04308
D86	0.12601984	0.58326554*	-0.0301377	-0.1553826
D90	-0.4718538	0.34962722	-0.1197482	0.07741874
PARTIC RATE	-0.0001982	0.00009715	-2.3478E-6	-0.0000125
GDP	0.00018871	-0.0002106*	0.00016467	-0.0000556
TEXTILES	-0.2078071	-0.0095322	-0.1051746	-0.0774208
S76	-0.0220173	-0.0041177	0.31923723*	0.13095896*
X76	0.08030283*	0.04226453*	0.04406142*	0.01342533
EXP276	-0.0006926	-0.0003226	-0.0004031	0.00011682
JEFE76	-0.4627871*	-0.0089753	-0.1802684	0.0752328
FAMSZ76	0.03560458	-0.0466636	0.07766623*	-0.0004088
S77	0.01800671	0.02646831*	0.29631528*	0.12886552*
X77	0.08317956*	0.02658506	0.0787764*	0.03352358*
EXP277	-0.0009746	0.00004128	-0.0011561*	-0.0002793
JEFE77	-0.3328212*	0.13897897	-0.018036	-0.0060537
FAMSZ77	0.08868634*	-0.0236446	0.04126573	-0.0011402
S78	-0.0134749	0.00712696	0.27663606*	0.12171876*
X78	0.08023645*	0.03976569*	0.07126558*	0.05325099*
EXP278	-0.00121*	-0.0002335	-0.0006096	-0.0009045*
JEFE78	-0.064132	0.30143075*	-0.3518403*	-0.042732
FAMSZ78	0.04502119	-0.0122754	0.00158899	-0.0332755
S79	-0.000122	-0.0068976	0.25085694*	0.13075755*
X79	0.05337042*	0.05445549*	0.06774209*	0.03227402*
EXP279	-0.0005057	-0.0004733	-0.0007345	-0.0003725
JEFE79	-0.0101974	0.05110536	-0.3276168*	-0.0301996
FAMSZ79	0.09855452*	-0.0295012	-0.0047467	-0.0699412*
S80	0.00574845	0.01339768	0.27272306*	0.11863034*
X80	0.00742186	0.03768267*	0.05391409*	0.02454607*
EXP280	0.00080701	-0.0003257	-0.0001027	7.47377E-6
JEFE80	0.03105961	0.30008756*	-0.0510857	0.14708483
FAMSZ80	0.08838423*	0.00196144	0.04314095	-0.0559995*
S81	-0.0252441	0.01302487	0.26496501*	0.11015294*
X81	0.06488357*	0.04844276*	0.07628687*	0.03337402*
EXP281	-0.0008879	-0.000528	-0.0009613	-0.0002667
JEFE81	-0.2256816	0.09291488	-0.0823159	-0.0538314
FAMSZ81	-0.0017896	-0.0336397	0.04217398	0.03571335
S82	0.00584175	0.03331254*	0.26088767*	0.1137944*
X82	0.05464319*	0.02115059	0.07669045*	0.033815*
EXP282	-0.0008128	0.0001316	-0.0006678	-0.0004608
JEFE82	-0.3034185*	0.05320338	-0.0003004	-0.0339675
FAMSZ82	0.10156353*	-0.0122068	-0.1135987*	-0.0460084
S83	0.00610853	-0.0122585	0.25434477*	0.13094912*
X83	0.04878092*	0.06687766*	0.09920605*	0.00278452
EXP283	-0.0001156	-0.0010435*	-0.0014994*	0.00020235
JEFE83	-0.1773816	0.25060601*	-0.0138061	0.2728181*
FAMSZ83	0.10998985*	-0.024351	-0.0557597	-0.0099859

<sup>1</sup> Private Equations: Dependable Variables are:

1 if the worker is in the private sector  
0 if the worker is in the public or self-employed sector.

<sup>2</sup> Public Equations: Dependable Variables are:

1 if the worker is in the public sector  
0 if the worker is in the private or self-employed sector.

\* Significant at 10%

Table A3: Estimates of the Probit Equations, by Sex (continued)

Variable	Private Equation Female <sup>1</sup>	Private Equation Male <sup>1</sup>	Public Equation Female <sup>2</sup>	Public Equation Male <sup>2</sup>
S85	-0.0290677	-0.001005	0.24409299*	0.11745738*
X85	0.05502054*	0.04285738*	0.04085335*	-0.0018176
EXP285	-0.000528	-0.0001965	0.0001262	0.00043465
JEFE85	-0.057736	0.27141653*	-0.1349505	0.20263699*
FAMSZ85	0.00525919	0.02799396	0.04856913	0.05859523*
S87	-0.0040023	0.00271149	0.27471494*	0.11995115*
X87	0.07583916*	0.04431893*	0.02236744	0.03155885*
EXP287	-0.0009274	-0.0005064	0.00075583	-0.0002782
JEFE87	-0.0223167	0.01701387	-0.0791276	0.32778646*
FAMSZ87	0.07134204	0.00894332	-0.0438437	-0.0131851
S88	-0.0161262	0.00001465	0.23157588*	0.12306254*
X88	0.04224918*	0.04750509*	0.06977634*	0.03679511*
EXP288	-0.0003279	-0.0005987	-0.0007209	-0.000339
JEFE88	-0.1122905	0.0679166	-0.0931999	0.09460442
FAMSZ88	0.1044946*	-0.0063579	-0.0199075	0.02009899
S89	-0.0110505	0.01883613*	0.22726547*	0.1286039*
X89	0.06313944*	0.02320034	0.06293956*	0.02657737
EXP289	-0.0008515	0.00028726	-0.0008541	0.00005026
JEFE89	-0.38979*	0.10176191	0.11905309	0.13691063
FAMSZ89	0.00929894	0.04003252	0.0248313	-0.0297785
S90	-0.0157678	-0.0159939	0.22017733*	0.13744068*
X90	0.08049121*	0.04358339*	0.06727032*	0.00997132
EXP290	-0.001304*	-0.0003832	-0.0007182	0.00037669
JEFE90	0.03084574	0.21250212*	-0.1314809	-0.0406155
FAMSZ90	0.09907331*	-0.0122881	-0.0736724	0.02212305
S91	-0.0090302	-0.0040995	0.23260929*	0.11431023*
X91	0.1082574*	0.01521859	0.04699601*	0.06933215*
EXP291	-0.0017706*	0.00023481	-0.0001182	-0.0011807*
JEFE91	-0.1040357	0.34289225*	0.12190265	-0.0209654
FAMSZ91	0.06693267	0.03637284	-0.1076627*	-0.0118322
S92	-0.0349052*	-0.0005747	0.21074347*	0.10415526*
X92	0.07682767*	0.04602042*	0.05471461*	0.05315729*
EXP292	-0.0010849*	-0.0004876	-0.0002554	-0.000885*
JEFE92	0.17578324	0.17527694	-0.2511435	0.23502877*
FAMSZ92	0.01263637	-0.0074217	-0.0633332	0.00836825
S93	-0.0143407	-0.0253201*	0.22956398*	0.12797516*
X93	0.06416902*	0.06284329*	-0.0009777	0.06329578*
EXP293	-0.0010825*	-0.0008196*	0.00085434	-0.0012772*
JEFE93	0.22862492	0.54831143*	0.06779881	-0.0675112
FAMSZ93	0.01740115	0.04915469	-0.0337691	-0.0437142
Number of Observations:	11797	21035	11797	21035
Log Likelihood:	-4264.61437	-9782.723544	-4922.140789	-9765.606477

<sup>1</sup> Private Equations: Dependable Variables are: 1 if the worker is in the private sector  
0 if the worker is in the public or self-employed sector.

<sup>2</sup> Public Equations: Dependable Variables are: 1 if the worker is in the public sector  
0 if the worker is in the private or self-employed sector.

\* Significant at 10%

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**Table A4, Estimated Hours Worked Equations, by Sex and Sector.  
Dependent Variable: Weekly Hours Worked.**

**PARAMETER ESTIMATES**

Variable	Priv. Employee Sector - Female	Priv. Employee Sector - Male	Public Sector Female	Public Sector Male	Self-Employed Sector - Female	Self-Employed Sector - Male
INTERCEP	89.882767	35.970152	71.799619	31.388751	-221.563919	37.381825
D80	-3.502385	0.463571	-0.897375	-2.039510		
D86	2.629445	-1.626379	4.382864	2.183726	-42.755059	-2.124233
D90	-1.116399	-4.276231	-2.643872	-6.530811	-19.552612	0.875163
GDP	-0.001391	0.001566	-0.001143	0.000947	0.002410	0.001325
TEXTILES	-2.503583	-0.373097	-0.985831	1.074085	1.437141	-1.775545
PARTIC RATE	-0.003510*		-0.000061348		8.450840	
S76	-1.129205*	-0.171975	-0.998316*	-0.455575*		
X76	-0.189145	0.446224*	-0.030520	0.189097		
EXP276	-0.004104	-0.009879*	-0.000168	-0.004688		
JEFE76	8.762051*	0.408638	4.714585*	1.353445		
FAMSZ76	0.741152*	0.658301*	-1.140053*	0.140779		
S77	-0.793833*	-0.244829*	-1.131259*	-0.156623		
X77	-0.081075	0.675419*	0.259797	-0.090147		
EXP277	-0.002939	-0.014899*	-0.004734	0.004035		
JEFE77	8.381807*	1.071691	2.239599	-0.591992		
FAMSZ77	-0.212882	0.283119	0.727764	-0.180240		
S78	-0.778215*	-0.357574*	-0.838545*	-0.560662*		
X78	-0.329153	0.441516*	0.095549	0.354690		
EXP278	0.002616	-0.008716*	-0.006805	-0.005576		
JEFE78	5.320033*	1.627299	6.150657*	0.757553		
FAMSZ78	-0.278976	0.684846*	-1.215791*	0.442056		
S79	-0.711715*	-0.415404*	-0.982089*	-0.408242*		
X79	0.251126	0.222007	-0.072211	0.210159		
EXP279	-0.012355*	-0.004299	0.001483	-0.005444		
JEFE79	6.025634*	2.930510*	2.347281	-0.552876		
FAMSZ79	-0.958008*	0.007780	-0.753694	0.874960*		
S80	-0.903298*	-0.266378*	-0.917571*	-0.401168*	0.068758	0.530320*
X80	0.269709	0.009309	0.017028	0.520126*	1.926971*	0.394440*
EXP280	-0.013513*	0.001626	-0.004654	-0.012003*	-0.040309*	-0.004657
JEFE80	5.562774*	2.998423*	2.738050	-0.637790	6.933307	2.494771
FAMSZ80	-0.940729*	0.708935*	1.054357*	0.348640	-2.480487*	0.222829
S81	-0.828435*	-0.421495*	-0.961527*	-0.293778*	1.039886*	0.791761*
X81	-0.231134	0.255301	0.150461	0.175143	-0.326432	0.207992
EXP281	-0.003079	-0.006760	-0.005032	-0.002149	0.013471	-0.002119
JEFE81	7.533514*	1.483411	-0.296005	1.411541	-1.265723	4.332777*
FAMSZ81	-0.218969	0.424660	0.165355	0.140103	0.234080	0.291204
S82	-0.949519*	-0.551449*	-1.105854*	-0.333769*	-0.308449	0.144832
X82	0.187152	0.624391*	0.500871	0.293597	-0.130827	0.503442*
EXP282	-0.013388*	-0.015165*	-0.015810	-0.005994	0.007852	-0.010019
JEFE82	10.072448*	2.498354*	1.641287	1.451519	12.148281*	6.208288*
FAMSZ82	-2.058864*	0.169083	-1.736013*	0.687988	-4.015863*	1.100595*

\* Significant at 10%

Variable	Priv. Employee Sector - Female	Priv. Employee Sector - Male	Public Sector Female	Public Sector Male	Self-Employed Sector - Female	Self-Employed Sector - Male
S83	-0.622444*	-0.370619*	-1.054135*	-0.260193*	0.587808	0.479309*
X83	0.114636	0.512125*	0.521773	0.284731	0.657063	0.421778
EXP283	-0.011461*	-0.013242*	-0.012955	-0.008679	-0.017004	-0.009174
JEFE83	5.892472*	1.397425	0.052571	1.122112	7.819279*	6.947013*
FAMSZ83	-0.732302	-0.143697	-1.247159*	-0.339285	-1.403323	0.152809
S85	-0.729012*	-0.280255*	-0.688278*	-0.584589*	0.239985	0.549147*
X85	-0.267238	0.011958	-0.234339	0.654632*	1.704446*	0.551569*
EXP285	0.001113	0.003453	0.007730	-0.012388	-0.043692*	-0.008136
JEFE85	7.141208*	2.768221*	4.690039*	-0.895841	6.937913	2.016497
FAMSZ85	-0.842909*	0.086396	-0.993984	0.069801	-2.225176	0.270250
S87	-0.800277*	-0.280822*	-0.738680*	-0.932370*	1.443070*	0.436750
X87	0.721894*	0.160148	-0.066301	0.387223	-0.123789	1.193412*
EXP287	-0.026168*	-0.002606	-0.000327	-0.010898	0.003496	-0.020511*
JEFE87	0.718366	3.260894*	2.607010	-0.285878	2.797301	1.393858
FAMSZ87	-0.000022782	0.300608	-0.350327	0.749661	-2.140797	0.702202
S88	-0.922282*	-0.425859*	-0.779333*	-0.315161*	0.504733	0.469054*
X88	0.430485	0.249964	-0.129809	-0.261081	-0.005507	0.504816
EXP288	-0.016046*	-0.006431	0.001980	0.006109	-0.002496	-0.011187
JEFE88	2.101619	3.962780*	2.429592	-1.158935	4.333120	6.452277*
FAMSZ88	-0.814372	-0.085321	0.331577	0.850154	-3.762322*	0.129804
S89	-0.633879*	-0.570620*	-0.980174*	-0.526927*	0.617997	0.408278
X89	-0.011601	0.460355*	0.656067	-0.029372	0.939997	0.914750*
EXP289	-0.004367	-0.014914*	-0.021500*	-0.000418	-0.027389	-0.020741*
JEFE89	3.640650	2.093674	-1.483287	1.429058	8.864419	2.670826
FAMSZ89	-0.617974	1.064612*	-1.212639	-0.225808	-3.345053*	1.100812
S90	-0.671573*	-0.386643*	-0.945667*	-0.499789*	1.457003*	-0.065400
X90	0.279453	0.395293*	0.533115	0.505403*	0.163826	0.898373*
EXP290	-0.014238*	-0.007375	-0.016580	-0.008411	0.008432	-0.020180*
JEFE90	4.197025*	3.358375*	2.897811	-0.876108	13.328635*	7.124288*
FAMSZ90	-0.741378	0.366431	0.792490	0.419289	1.416071	0.173888
S91	-0.505245*	-0.646480*	-0.603790*	-0.226061	1.172139*	0.162953
X91	-0.192634	0.978804*	0.181775	0.007341	-0.612393	0.780416*
EXP291	0.000496	-0.022137*	-0.004473	-0.002531	0.026001	-0.015006*
JEFE91	6.420918*	1.656542	0.232884	1.765399	8.666143	2.014557
FAMSZ91	0.838068	0.619955	-0.894029	0.048622	-0.802280	0.034076
S92	-0.340259*	-0.486600*	-0.760295*	-0.351417*	0.693035	-0.120826
X92	0.031104	0.548605*	0.661313*	0.005078	1.047588	0.582617*
EXP292	-0.003759	-0.014523*	-0.018769*	-0.001698	-0.018805	-0.014835*
JEFE92	-0.360984	3.460261*	3.753362	2.947300	17.696022*	6.250658*
FAMSZ92	0.103262	0.436052	-0.249795	0.044016	-0.458782	0.583408
S93	-0.243688	-0.543238*	-0.216794	-0.197402	0.520893	-0.006681
X93	0.626265*	0.841865*	-0.017532	-0.207259	-0.063621	0.521947
EXP293	-0.023156*	-0.018886*	0.001514	0.010784	0.010266	-0.013193
JEFE93	-3.538470	1.866988	3.107507	1.542833	7.459031	4.758325*
FAMSZ93	-0.477935	-0.820170*	-1.288159*	-1.014598	-1.606694	0.279060
Number of Observations:	6162	10650	2562	3816	1531	6012
R-square	0.0940	0.0517	0.1036	0.0630	0.0870	0.0542

\* Significant at 10%

**APPENDIX 2**  
**SENSITIVITY ANALYSIS**

## Appendix 2 Sensitivity Analysis

We examined whether or not our results are sensitive to changes in the specification of the independent variables in the wage, hours worked, and employment equations. We found that our results are not sensitive to the specification of the independent variables.

### a. Wage Equations

In the wage equations we address two questions: (1) how sensitive are the results to changes in the specifications of the independent variables, and (2) why do the wage equation results (which control for the impact of the independent variables) indicate that the male-female wage ratio for private sector workers widened after 1990 while the unadjusted male-female wage ratio fell after 1990 (see table 3)? Here, we first show that the wage equation results are not sensitive to changes in the specifications of the maternity leave dummy variables nor to changes in the sample used to estimate these equations. We then show that our results are not sensitive to changes in the specification of the other independent variables. If we include only the maternity leave dummy variables as independent variables (D80, D86 and D90), the results indicate that the male-female wage ratio in the private sector fell in all three periods, replicating the results presented in table 3. However, including GDP and education or experience to the wage equations reverses this result for 1990, and indicates that the male-female wage ratio fell after 1990.

We examined whether the results are sensitive to changes in the specifications of the maternity leave dummy variables. We estimated hourly wage and monthly salary equations for the three sectors and two sexes using sub-sets of the maternity leave dummy variables. In the equations where we included only D80 and D90, the results were similar to those reported in section III.G; that is, the coefficient on D90 for women in the private sector is significant and negative, while the coefficients on the other dummy variables for men in the private sector and both men and women in the other sectors are insignificant. In the equations where we included only D80 and D86, the results are also similar to those reported in section III.G.

It is possible that the impact of the change in mandated paid maternity leave will be weak in the first year after its passage, affecting wages and employment only after employers have had time to adjust to it. In this case, the change in mandated maternity leave will not have an impact on wages in the first year, but only in later years. We consider this possibility in two ways. First, by estimating wage equations using maternity leave dummy variables which indicate the time period beginning one year after the introduction of the legislation (that is,  $D80L = 1$  for 1981 to 1993 and 0 for 1976 to 1980,  $D86L = 1$  for 1987 to 1993, and 0 for 1976 to 1986, and  $D90L = 1$  for 1991 to 1993, and 0 for 1976 to 1990). For identification purposes, we will call these the "lagged" dummy variables. The results from the regressions using the "lagged" dummy variables were the same as the results reported in section III.G.

Another way to capture the possibility that the change in mandated maternity leave does not affect wages until several years after the maternity leave change is to interact each of the maternity leave dummy variables with a time trend (this will also capture the possibility that the effect of the change in the mandate was greater in earlier years than in later years). We did this, including both the maternity leave dummy variables described in section III.C and three variables interacting these dummy variables with a time trend. We then tested the joint significance of the dummy variable and the interaction term for 1980, 1986 and 1990. The results using the dummy variables interacted with a time trend were similar to the results presented in section III.G. We found that, except for the coefficients on the variables indicating the 1990 legislative change for women in the private sector, all coefficients were jointly insignificantly different from zero. For women in the private sector, the coefficients on the dummy variable indicating the legislative change in 1990 and on the interaction term were both significant and negative, indicating that the 1990 legislative change did have a bigger negative impact on women's wages several years after rather than immediately.

We also estimated hourly wage and monthly salary equations using data for only full-time workers (we define full-time workers as those who work more than 48 hours a week).<sup>35</sup> The results using this sub-sample were similar to those reported in section III.G. Specifically, in 1990 the coefficients on the dummy variables were negative for women and insignificant for men, and the coefficients on the dummy variables for 1980 and 1986 were either insignificant or not consistent with any of the theoretical possibilities discussed in section III.B.

The most important result reported in section III.G is that the coefficients on the dummy variables representing the maternity leave change in 1990 were negative for women in the private sector, while they were not significant for men in the private sector or for men or women in the other sectors. This is surprising given that the (unadjusted) male-female wage gap fell in all three sectors between the late 1980's and the early 1990's (see table 3). In order to better understand why, we examined additional specifications of the independent variables in the wage equations for the private sector only. The coefficients on the dummy variables for 1980, 1986 and 1990 using these different specifications were similar to those reported in section III.G for the following specifications of the hourly wage equations<sup>36</sup>:

- . including the unemployment rate of the other sex,
- . excluding the head of household variable,
- . excluding the head of household variable and the number of children,
- . excluding the unemployment rate,
- . excluding GDP,
- . excluding both the unemployment rate and GDP,
- . excluding education,

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<sup>35</sup> 48 hours (8 hours a day for six days) is the standard work week in the private sector in Costa Rica. In the public sector, the work week ranges from 36 to 48 hours, depending on the agency and occupation of the worker.

<sup>36</sup> That is, the coefficients on the D90 dummy variable for women were negative, and the coefficients on the other dummy variables for men and women were either insignificant or not consistent with any of the theoretical possibilities discussed in section III.B

- . excluding experience and experience squared,
- . excluding both education and experience squared,
- . excluding all variables except education, aggregate demand and the maternity leave dummies,
- . and excluding all variables except experience, experience squared, aggregate demand, and the dummies.

When we include only education and experience, the coefficient on the dummy variable for 1990 for women is insignificant, and the dummy variable for men is significant and positive. It is only when we exclude all variables except education, or all variables except for experience and experience squared, that the results are inconsistent with the results reported in section III.G. In these cases, the coefficients on the dummy variables for 1990 for both men and women are insignificantly different from zero. And, finally, it is only when we exclude all independent variables except for the legislative dummy variables that we replicate the results of table 3; that is, when we exclude all but the dummy variables, the coefficient on the dummy variables for women is always positive, while the coefficient on the dummy variables for men is negative in 1980 and 1990, and positive but smaller than the coefficient for women in 1986.

The above sensitivity analysis indicates that our results relative to the wage equations are not sensitive to changes in the specification of the independent variables in the wage equations.

#### **b. Employment Probit Equations**

In the estimated employment probits reported in section III.G, the alternative to being employed in the private sector is being employed in the public or self-employed sectors (1=employed in the private sector, 0=employed in the public or self-employed sectors). In the public equations, the alternative to being employed in the public sector is being employed in the unaffected sectors. In estimating the equations this way we are implicitly assuming that workers pushed out of the affected sector will find work in the one of the unaffected sectors. This may be a poor assumption if workers pushed out of the affected sector cannot find jobs in the public or self-employed sectors and either remain unemployed or leave the labor force. We estimate employment probits that take into account this last possibility. In the private equation, 1=employed in the private sector, 0=everyone else who is 15 to 49 years old. The results using this sample are similar to the results reported in section III.G. That is, the coefficients for all dummy variables for all sexes and sectors are insignificant except for men in the private sector in 1986, when the coefficient is significant and positive.

We also estimated employment probits using the alternative specifications of the maternity leave dummy variables described in section a above. The results from the employment probits using the dummy variables interacted with a time trend are similar to those reported in section III.G; the coefficients on all dummy variables are insignificant except for men in the private sector in 1986 (when the coefficient is positive and significant). In the employment probits using the "lagged" dummy variables, all coefficients on the maternity leave dummy variables for women and for men in the public sector were insignificant. However, the coefficients on the dummy variables for 1986 and 1990 for men in the private sector are significant and positive. This last

result is consistent with the hypothesis that women value the benefit of maternity leave at less than the cost to the employer, and that therefore employers substituted men for women in employment.

### **c. Hours Worked Equations**

We estimated hours worked wage equations using the alternative specifications of the maternity leave dummy variables described in section a. above. When we estimated hours worked equations using only D80 and D86, or only D80 and D90, the coefficients on the maternity leave dummy variables were insignificant for all sexes and sectors. These are similar to the results reported in section III.G.

When we estimated hours worked equations using the "lagged" dummy variables, we found that all dummy variables in all sectors and sexes were insignificant except for men in the private sector for 1986 and 1990. For men in the private sector, the coefficients on D86 and D90 were negative, indicating that the hours worked of men fell in these years. This result is consistent with the hypothesis that women valued the benefit at more than the cost to employers, and therefore the wages of women fell by more than the cost, causing employers to substitute the now less expensive women for men, causing the total number of hours worked by men to fall.

When we estimated the hours worked equations using the maternity leave dummy variables and the dummies interacted with a time trend, we found that all coefficients were insignificant except for women in 1990 in the private sector. The coefficient on the dummy variable D90 for women in the private sector was negative, while the coefficient on the interaction term was positive. This indicates that women's hours worked may have fallen in 1990, and that the impact of the change in the mandate was greater immediately rather than later. This result is consistent with the hypothesis that women value the mandate at less than the cost to employers, and that therefore employers substituted men for women in employment.

In summary, we found that our results are not sensitive to the specification of the independent variables in the wage, hours worked, and employment equations.