Marriage, Cohabitation, and Intrahousehold Bargaining: Evidence from Brazilian Couples

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Abstract

While theoretical models of family and household decision-making that highlight the role of the individual provide sharp empirical predictions, testing lags far behind. This paper provides a robust empirical assessment of those models by focusing on how shifts in the within-household "balance of decision power" affect family-level behavioral choices regarding labor supply and investments in the human capital of children. Using an exogenous source of variation provided by the adoption of a law (extension of alimony rights to cohabitants), and the similar "family status" of cohabitant and married couples, this paper provides empirical evidence that (intra-household) empowerment of women resulted in: a) reduction in hours worked by female heads, including reduced housekeeping activities, and; b) redistribution of household resources towards schooling of teenage girls. The results reveal individualistic characteristics of the parental preferences that are not compatible with the "unitary" representations of the household.

Keywords: Intrahousehold bargaining, cohabitation, alimony, labor supply, investments in children.

JEL codes: O12, D13, J12, J22

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"...the marital couple is not an independent entity with a mind and heart of its own, but an association of two individuals each with separate intellectual and emotional makeup."

The US Supreme Court
Griswold *vs.* Conneccticut, 1965.

1 Introduction

In recent years the study of decision-making within the household has received considerable attention in the social sciences literature. The extent to which members of the same household individualistically pursue their self-interest as opposed to being characterized by a group who share a common goal is an important question for many areas of scientific inquiry. Households are the institution within which life's basic decisions are made - about having and raising children, about time spent on work, about consumption and investment. Therefore, accounting for the potential role of intra-familial bargaining is key to understanding issues which have importance in the measurement of individuals' well-being. Theoretical models of family and household decision-making that highlight the role of the individual have been developed since seminal works by McElroy & Horney (1981), Manser & Brown (1980), and Chiappori (1988). While these models provide sharp empirical predictions, testing of them lags far behind. This paper provides a robust empirical assessment of those models by focusing on how exogenous shifts in the within-household "balance of decision power" affect families' behavioral choices.

At the core of all models of household decision-making is the idea that individuals share the benefits of forming a household in some way. Their premise is that observed behavior is a result of negotiations among family members, reflecting each individual's perception of costs/benefits as well as their relative "power" in asserting their own preferences at the household-level. A key difficulty in this interpretation is the fact that "power" is not clearly defined and is expected to (endogenously) vary across time and social contexts. In order to circumvent the endogeneity problem common to other power measures used in early contributions to the literature, as the non-labor income distribution within households,[1] this paper exploits changes in the Brazilian legal system as a source of exogenous variation. More specifically, the causal inference is based on the extension of alimony rights (previously exclusive to formally married couples) to a large fraction of the adult population living in consensual unions.[2] The hypothesis is that the concession of alimony rights improve the women's outside-option (their welfare level in case of relationship dissolution) and should strengthen their bargaining position within their partnerships. Holding everything else constant, changes in the allocation of resources associated to the legal innovation should reflect the effects of power reallocation only if individual preferences within the household are heterogeneous.

[1]See Thomas (1990, 1993), Schultz (1990), and Bourguignon et al. (1993).

[2]Throughout the text, **cohabitation** and **consensual union** are used interchangeably. They are short for "marital cohabitation without legal marriage", "marriage performed with less solemnity than a true formal marriage", or even marriage "by habit and reputation".

The empirical analysis is based on data from the Brazilian Household Survey (*Pesquisa Nacional de Amostra de Domicilios*-PNAD) from 1992, 1993 and 1995. The PNAD yearly sample consists of approximately 45 thousand observations on adult couples, and 96 thousand observations on "children" (ages 5 to 21). The large samples allow various stratification strategies, which ensure the robustness of the empirical results. The empirical exercises investigate the compatibility of the data with the bargaining power hypothesis raised above by focusing on household-level decisions regarding: i) adults' time allocation to market activities; ii) (dis)investments in children's human capital (school enrollment and labor force participation).

The empirical evidence indicates that (intra-household) empowerment of women reflected into icreases in the female comsumption of leisure and, most importantly, into reallocation of resources towards teenage girls (relative both to their brothers and younger sisters) - particularly in terms of investment in schooling. Interestingly, the latter were shown to be stronger when considering a stratum of the households where the mother would be more dependent of alimony in case of relationship's dissolution. In a stratum of less educated mothers, girls between 14 and 15 years of age have a probability of staying in school 14.8% and 16.4% higher than their younger sisters and same-age brothers, respectively. These changes in allocation of investments in children's human capital in response to outside-option changes are not predicted by models that treat the household as a unit. Therefore, the results reveal individualistic characteristics of the "parental preferences" underlying the within-household allocation of resources. Moreover, in a country where poverty has been shown to be pervasive and strongly correlated with low education and child labor,[3] further understanding of the intrahousehold decision-making process governing investments in the human capital of children may shed light on social mobility issues.

The remaining sections of the paper are organized as follows. Section 2 describes demographic trends of marriage and cohabitation, summarizing their sociological interpretations. In Section 3, the economic theory of the household and its empirical implications are presented. Section 4 focuses on the institutional environment. The description of the data sets used and the econometric identification strategy are presented in Section 5. Section 6 discusses the estimation results, and Section 7 concludes.

2 Marriage, cohabitation, and the family

Cohabitation is reshaping family life all over the world. Among European countries from the mid-1970's to the mid-1990's, the percentage of young-adult women (ages 20 to 24) in a marital union without being formally married increased from 11% to 49% in France, 57% to 78% in Sweden, 48% to 75% in Denmark, and from 11% to 55% in Great Britain.[4] In the United States, even though cohabitation is considered a recent phenomenon, Casper et al. (1999) reports that the proportion of young women (ages 15 to 24) in cohabitation

[3] See Barros (2001).

[4] See sources cited in Emrisch & Fracescone (2000).

scaled up by a factor of three between 1977 and 1997 (2.5% to 7.5%). Finally, according to Westoff et al. (1994)'s analysis of the late 1980's figures, in a handful of African countries and in all countries in Latin America & the Caribbean at least 15% of women in a union were in informal or consensual relationships.

Brazil is not an exception to the cohabitation popularization trend. Even though the ratio of females in marital unions has remained stable (1960-1995),[5] the proportion of cohabitations among all nuptial arrangements has rapidly increased, as seen in the figures reproduced in Table 1. The change in stocks reflects the reduction in legal-marriages and the acceleration of cohabitation, divorce, and separation rates started in the 1980's. They coincide with cultural changes that culminated with a generalized emancipation of women, a period "during which women's opportunities outside home increased substantially", as phrased by Thomas (1994). According to Goldani (1997), those were the most significant changes observed in the Brazilian social and microeconomic environment in the last twenty years. Moreover, the fact that divorce and separation represent instability of marital unions would arguably explain the increased proportion of female single-headed households observed in the late 1990's.[6]

On the other hand, the rise in cohabitation rates can also be interpreted as offsetting the upward(downward) trend in divorce(marriage), what would be an indication that, even though cohabitation had reshaped family life, it did so in a subtle way. In other words, it is plausible that cohabitation "should not be considered an increase in singlehood" or a "retreat from familism", but rather it should be seen "very much like a family status", as expressed in Treas & Lawton (1999) and Bumpass et al (1991), respectively. The increased proportion of children of parents in this alternative family structure reinforces the argument. In the case of Brazil, Lazo (1994) reports that "total marital fertility" is higher among cohabiting couples than among formally married ones, even after controlling for age, education and duration of union.[7]

In this context, two major considerations should be underscored: a) as cohabiting couples represent a large proportion of the population, investigating the effects of law changes which directly impact adults and children in such informal marital arrangement is an important issue in itself; b) the similarities of cohabitation and marriage in terms of familial arrangements makes the latter a plausible control group in the causal inference regarding the effects of shifts in the decision power over intra-household allocation of resources.[8]

Inference about shifts in bargaining power works as a reverse engineering process: from observed behavior, structural characteristics of the decision-making process are validated or not, and, in some cases, even identified. With this objective, the next section briefly introduces relevant household-economics theory, emphasizing its potential for empirical examination.

[5] See Lazo (2002).

[6] See Medeiros et al (2002) and Medeiros & Osorio (2002).

[7] See the briefing paper "Research on Today's Issues" (September, 2002), by the National Institute of Child Health and Human Development (NICHD) for a North-American perspective on the subject. See also Seltzer (2002).

[8] In other words, it is considered that, as with any other familial arrangement, the balance of power is an integral component of the intrahousehold decision making of cohabiting couples. See Sprey (1999).

3 Conceptual framework

Individualistic behavior is a core component of economic thought, and households' internal decision making, as well as family formation, should be dealt with according to this premise. Due to its simplicity and convenience, however, the most well known model of household behavior is based on the assumption that a representative individual can serve as the element of study.[9] In the so-called "unitary model", the implicit assumption is that for a coalition of two or more individuals to act together with a common purpose, each individual has to set aside separate preferences while the group creates something completely new - a set of common preferences for defining their collective behavior. Using this shortcut, individualistic behavior can be directly projected to household units and to households' interactions at the community level, automatically fitting the treatment of consumer choices in the microeconomics literature. Such model leaves unexplored interesting elements of the intrahousehold interaction, however. It is silent, for example, with respect to the formation alternative (informal) marital arrangements, and to the increased rates of households' dissolution. In essence, as posed by Thomas et al. (2002), one can say that the unitary model is based on "assumptions that are neither theoretically appealing nor likely to be innocuous".

In an attempt to fill these gaps, intra-household bargaining and collective decision-making models have lately been developed in the economics literature. These models attempt to relax the above assumptions, while restricting observed behavior in a way that specific nuances of the household decision process could be empirically verified.

3.1 Modeling

The static household welfare evaluation corresponds to a function (or specific weighted aggregation) over the "felicity functions" of both heads:

$$W^h = W[U^m(X, u^c; k^h, \varepsilon^h), U^f(X, u^c; k^h, \varepsilon^h)]$$

Where X represents the consumption vector (including leisure), and the superscripts on the individual felicity functions indicate association with the male (m) or female (f) head. u^c represents the child's "quality of life" (a public good produced in the household), and k^h and ε^h represent observed and unobserved characteristics of the household, respectively.[10] In this formulation, children are passive, with their consumption and time allocations decided by the parents.

[9] See review papers in Rosenszweig & Stark (1997) and in Haddad et al (1997).

[10] Observed and unobserved characteristics ought to be an endogenous decision along with the matching in the marriage market. This study abstracts from matching issues. See Foster (1998) and Bergstrom (1993) for a discussion on the topic.

The children's quality of life is represented by the function u^c, which summarizes an implicit and unknown relation between child outcomes (e.g.: weight and height) and childrearing inputs (breast-feeding, externalities of adult consumption of cigarettes, school enrollment, caloric composition of diet):[11]

$$u^c = u\left(X; k^h, \varepsilon^h, \eta^c\right)$$

Child's individual characteristics not captured in the household characteristics are represented by η^c. It is implicitly assumed, therefore, that parents have the same process of evaluation of children's utility - i.e., they assign the same weights to different types of children's consumption goods and investments. They are, however, allowed to disagree in the valuation of the children's quality of life relative to their own consumption.

Households are constrained in time ($\overline{L}$) and by their budgets. The latter, taking prices $\left[P = (p; w^m; w^f; w^c)\right]$ as exogenous parameters, is represented by:

$$P \cdot X = (w^m + w^f + w^c) \cdot \overline{L} + y^m + y^f$$

Where w is the market wage, and y represents the individual-level non-labor income.

a) the unitary model

In the unitary model, either by the power of consensus (Samuelson, 1956) or by the emergence of a dictator (Becker, 1991), the decision process is summarized by a representative individual utility function. This means that either the household agrees on the utility derived from each choice to be made (therefore, the felicity functions in W are identical) or the choices will be based on the dictators' view of the world (the non-dictator felicity gets zero weight in W).

In the model language described above, the unitary model assumptions correspond to the following implications in terms of demand functions:

$$X^i = X\left(P; Y, k^h, \varepsilon^h, \eta^c\right) \tag{1}$$

where $Y = \left(y^m + y^f\right)$, and i indexes the household member (m, f, and c) in case of exclusive/assignable consumption. This implies that only the household's pooled income influences the choices. The household is a single and monolithic decision unit, and the income allocation across household members does not matter for time and expenditure decisions, nor does any parameters affecting individual welfare if the relationship were to dissolve.

[11] It is fair to assume that the parents evaluation of their children quality of life is simultaneously based on multidimensional observation of outcomes and on their effort to improve it (inputs).

b) the cooperative bargaining models

Cooperative bargaining models are essentially an attempt to model cooperative behavior without abandoning the individual decision-theoretic foundations of microeconomic theory. Most of these models are based on Nash's solution to a two-person game where the final payoff (excess utility obtained under agreement among household members) depends exclusively on the reservation utility of each agent when the disagreement takes place. Each individual has, therefore, specific preferences that are pursued while bargaining takes place. In other words, each individual tries as much as possible to allocate the household income towards its personal needs and preferred items.

Two applications of this concept have been used in household economics: Manser & Brown (1980) and McElroy & Horney (1981) explore reservation utilities determined by household dissolution (divorce); Lundberg & Pollack (1993) argue in favor of "threat points" being the result of a non-cooperative game among the household members. In the divorce-threat case, individual power is determined by the attractiveness of the outside option. In the no-cooperation threat case, the bargaining position is determined by individual roles in the provision of household-level public goods affected by the lack of cooperation. [12]

In both cases, however, the axioms of cooperative bargaining correspond to the solutions of the maximization, subject to the same budget constraint as above, of an implicit welfare function represented by the "Nash product":

$$W = \left[U^m(X, u^c; k^h, \varepsilon^h) - V^m\left(P^0; \Psi^m\right)\right] \times \left[U^f(X, u^c; k^h, \varepsilon^h) - V^f\left(P^0; \Psi^f\right)\right]$$

Where V reflects the reservation indirect utility function, $\Psi^i = \Psi(e, y^i, P^i; k^i, \varepsilon^i)$ summarizes characteristics that influence the outside option of each of the heads, and P is partitioned into public (P^0) and private good (P^i) prices. The outside options are, according to the divorce-threat case, a function of the distribution of non-earned income and e represents what McElroy (1990) calls "extrahousehold environmental parameters". These parameters are an allusion to elements that influence the status under the threat point condition (and the decision process as a whole) but do not affect preferences or the budget constraint. Also known as "distribution factors" they encompass, for example, indicators of the (re)marriage market competitiveness, welfare programs conditional on marital status, laws governing divorce and marital property sharing, child support, social networks and religion, or even general "sociocultural norms".

The outcome in terms of reduced-form demand function is represented by:

$$X^i = X\left(P, Y, e, y^m, y^f; k^h, \varepsilon^h, \eta^c\right) \tag{2}$$

[12] See Lundberg & Pollack (1993) and Pollack (2002).

Notice that demands are now affected by the "extrahousehold environmental parameters", as well as by the allocation of income between the heads.

c) collective models

Collective models were developed in Chiappori (1988, 1992) and further explored by the same author in collaboration with other scholars. The basic reasoning in such models is to appeal to the rationality of individuals in a context that abstracts from specific bargaining rules. It axiomatically requires that the actors in the process reach Pareto-efficient agreements. The justification of this assumption is almost invariably based on the repeated nature of the interaction between married individuals, which promotes the exhaustion of efficiency enhancement possibilities. The literature that followed those original papers have attempted to address the major question set by them: "does Pareto efficiency alone imply restrictions upon observable household behavior?".[13] In many interesting cases the answer has been positive.[14]

In the collective model's basic form, the efficiency assumption is equivalent to the following implicit structure for the household maximization problem:

$$\begin{aligned} & \max_{X^f, X^m, X^c} W = \mu U^m \left(X, u^c; k^h, \varepsilon^h\right) + (1-\mu) U^f (X, u^c; k^h, \varepsilon^h) \\ s.t. \quad : \quad & p \cdot X = \left(w^m + w^f + w^c\right) \cdot T + y^m + y^f \\ : \quad & u^c = u\left(X; k^h, \varepsilon^h, \eta^c\right), \end{aligned}$$

where the newly introduced μ is known as the Pareto weight, and reflects the relative importance of each of the heads in the aggregated household utility. Taking these weights as exogenously fixed and interior (bounded away from zero and one), the objective described above reproduces the consensus model *a la* Samuelson (1956). If exogenously set at one or zero, they reproduce the "Beckerian" dictator model. For the purpose of this model, they are assumed to be a function of prices, the income distribution between head and spouse, and the previously discussed environmental parameters: $\mu\left(P, e, y^m, y^f\right)$.

The assumptions of this model imply the following reduced-form demand functions:

$$X^i = X\left(P^0, P^i, Y, \mu; k^h, \varepsilon^h, \eta^c\right)$$

or:

$$X^i = X\left(P, Y, e, y^m, y^f; k^h, \varepsilon^h, \eta^c\right) \tag{3}$$

[13]Chiappori (1988) pp.64.
[14]See Browning & Chiappori (1998).

Note that they, therefore, correspond to the outcome of the bargaining models discussed above. This is a result of the fact that, under symmetric information, the collective model is a generalized version of the cooperative bargaining ones.

3.2 The empirical content of the models

When compared with the unitary model, the most basic difference emerging from models that consider the bargaining processes is that elements that exclusively influence the individuals' outside-option should also affect the allocation of resources within an intact relationship. Therefore, if the unitary model is a valid simplified characterization:

a) redistribution of non-labor income between the heads, holding total non-labor income constant, should not affect expenditure/investment decisions. In other words, the effect of male and female non-labor income should be identical if demand only depends on the pooled non-labor income:

$$\frac{\partial X^i}{\partial y^m} \mid_{dY=0} = \frac{\partial X^i}{\partial y^f} \mid_{dY=0}$$

b) variables that exclusively affect the welfare outside the relationship should not influence outcomes if bargaining among members were not a significant component of the decision process taking place within the household (the unitary model is either a dictatorship or a group with complete agreement about preference ordering):

$$\frac{\partial X^i}{\partial e} = 0$$

In the case of income-pooling restrictions it is somewhat difficult to argue, however, that the cross-sectional differences in the amount of non-labor income assignable to each particular household member are exogenous to the expenditure/time allocation decision itself, or to individuals' unobserved characteristics. To avoid such endogeneity problems, a small number of recent contributions following the seminal work by Lundberg, Pollack & Wales (1997) have exploited "natural experiments". Based on the re-arrangement of household income generated by changes in the child allowances payments from husbands' pay checks to wives' bank accounts, those studies have uncovered important aspects of the intrahousehold decision making.[15] Rubalcava & Thomas (2000) and Gray (1998), in a similar vein, interpret exogenous variation in the income prospects of single women as "quasi-experiments" for intact households. Rubalcava & Thomas (2000) focuses on changes in (potential) welfare payments to single-mothers (AFDC) over time and across US-states, showing that they influence the composition of expenditures in poor households headed by married couples. Gray (1998) explores US state-specific divorce settlements and property division legislation to

[15] See Ward-Batts (2000) and Rubalcava et al (2002), for example.

proxy for changes in the bargain power of married women. These studies can be subject to some limitations, however. Rubalcava & Thomas (2000)'s estimates may be biased if there is welfare-motivated migration amongst poor families, which has recently been shown to be significant by Gelbach (2002). Gray (1998)'s analysis, on the other hand, may be confounded by state-specific trends in the economic conditions.

In this sense, the rejection of the restriction in (b) can provide a more robust challenge to the unitary models since its test can be considered as based on "exogenous variation". It is with this experiment design in mind that this paper "takes the models to the data". The next section draws a general picture of the changes in the Brazilian legal system that are explored in the empirical exercises.

4 Institutional environment

The long-term demographic trends briefly described in Section 2 motivated courts and legislators to rethink the legal basis of the family. In Brazil, this manifested itself as a slow evolution of the laws from guaranteeing rights of a specific "ideal" family unit towards the protection of alternative familial arrangements, and led to the definition of rights and responsibilities of individuals within the family (with respect to the State and to each other).

The first steps taken were in terms of the rights and responsibilities with respect to the State and other third parties (Labor Law, the Social Security Law, and some aspects of the Civil Code). Important legislative measures were: i) extension of inheritance and alimony rights of biological sons born out-of-wedlock (1942, 1949, and 1977); ii) cohabiting spouses were allowed to be the beneficiary of partner's workplace-accidents pension (1944); iii) extension of real state rental contracts to cohabitant spouses after the death of the partner (1961); iv) cohabitant partners could be listed as dependents for income tax purposes (1963, and 1965), and;v) cohabitant partner could be listed as the beneficiary of a social security pension (1962, 1969, 1974, and 1976).

Legislation regarding property division and alimony following the relationship dissolution was, however, much slower to change. Jurisprudence in these areas essentially followed an outdated Civil Code (1942) and consistently denied cohabitants alimony and property division rights.[16] It was only in 1988, with the new Federal Constitution (Article 226, paragraph 3), that new guidelines were set. In its text, the Constitution universalized the spirit of the (topic-specific) laws that ruled the relation between the State and cohabiting couples, establishing that stable consensual unions should be recognized as a legal family entity "**for purposes of protection by the State**".[17] Additionally, religious marriages, considered until then as informal unions for legal purposes, were granted the recognition by the State - provided that they were

[16] See Azevedo (1997).

[17] See Appendix A, for a complete version of the Constitutional Article 226.

confirmed in a "Public Registry Office" in accordance with Law 6015/1973.[18]

In the context of individual rights and obligations between partners, the Constitution had distinct effects in terms of property division and alimony. Jurisprudence on property division, for example, adopted the Federal Supreme Court's Recommendation 380 ("*Sumula 380*" of the *Supremo Tribunal Federal*) to the cohabitation context. Until then, Sumula 380 exclusively ruled rights over property after commercial partnership break up. In practice, it meant that, starting in the early 1990's, cohabitants were given the right over their partner's property when able to prove collaboration on its accumulation.[19]

In the context of alimony/maintenance rights, the Constitutional text was ineffective. Jurisprudence held that cohabitation would not yield maintenance rights to the cohabitants under any circumstances, as it had before 1988.[20] The justification for this was, according to Ribeiro (2002) and Branco (1994), that the Constitution had only established the responsibility of the State with respect to cohabitants, but not the responsibility of one partner to the other in the context of maintenance. Pessoa (1997) and Matielo (1998) further emphasize that, although it had recognized cohabitations as a family unit, "consensual union" and marriage were still distinct entities. In effect, the Constitutional text suggested the necessity of legal facilitation to convert such an arrangement into marriage. In the understanding of the Brazilian courts, this meant that maintenance obligations were only possibly derived from biological paternity/maternity and formal marriages. Post-dissolution alimony rights and obligations pertinent to the latter should, therefore, not be extended to the former. Based on this argument, alimony petitions were normally dismissed without a hearing, and state-level Superior Courts usually corroborated these decisions.[21]

Diverging from the *status-quo*, the Law 8971, of December 1994, introduced alimony rights to cohabitants fulfilling certain criteria.[22] It worked as an extension of the applicability of the Law 5478/1968 ("Alimony Law") to the dissolution of cohabitations. The Law 8971/1994 established that the cohabitant partners of divorced, legally separated, and widowed individuals could require maintenance/alimony upon the relationship's dissolution. Alimony requests would be valid if the cohabitation were publicly known and had **endured for five years or more** (waived in the event of **common offspring**). In other words, the partner requesting alimony must prove with the testimony of neighbors, building managers, or renters, the existence of a stable union for more than 5 years. Alternatively, the registration of a child in the name of both partners would be sufficient to waive the duration requirement. The beneficiary has the right until

[18]Matielo (1998) argues that, due to lack of information about the new Constitution or about the register requirement (not explicit in the Constitutional text), most of religious marriages can still be considered consensual unions for the effects of the law.

[19]This evolution in the jurisprudence was latter consolidated in the form of law (Law 9278/1996) - if no specific contract had been celebrated, cohabitants were allowed 50% of the assets purchased after the start of the relationship.

[20]The exception was the Superior Court of Rio Grande do Sul, that became known as the unique Brazilian Court where compensation for "domestic services", or "palimony", were granted to some cases immediatley after 1988 as substitutes for alimony.

[21]See, for example, the alimony legal request procedure and rulings described in the Suppreme Court's **Recurso Especial 36040-RJ** - *Joana Darc Andrade versus Joao Rafael da Costa*.

[22]Additionally the law established the right of cohabitants to participate on the partners' inheritance process.

commencing a new (stable) relationship and so long as they can prove **financial necessity** - almost invariably defined by courts in terms of potential earnings (or the individual's stock of human capital).[23] The alimony amounts were established by a judge according with the debtors' financial capabilities (normally 25 to 33% of monthly income converted into minimum wage units for indexation purposes). Notice that these requirements suggest that the adoption of this law would not affect all the cohabitant population. The pool of all cohabitant couples represents, therefore, the collection of couples that are "potentially" exposed to the law innovation "treatment".

Most importantly, the new law also established a process for the alimony request (which reduces the transaction cost) and strong enforceability mechanisms. First, individuals requesting the ex-partner payment of maintenance could make use of a lawyer assigned by the Judicial System (free of charge). Second, the expected litigation duration was dramatically reduced, with the possibility of provisional payments before the final ruling. Third, the law made the information about the legal apparatus surrounding alimony rights publicly available. Finally, enforcement was explicitly specified in the Civil Process Code - failure to meet the required monthly payment, results in imprisonment.

As it induced an exogenous shift in the balance of power within households (cohabitant couples), mostly favoring women, the implementation of Law 8971 is explored as a "natural-experiment" in the empirical exercises below.

5 Data and econometric identification strategy

5.1 The data on cohabitation and marriage

The data set used in this study is from the Brazilian Household Survey (*Pesquisa Nacional de Amostra de Domicilios*-PNAD) undertaken in the years 1992, 1993 and 1995 by the Brazilian Census Bureau (*Instituto Brasileiro de Geografia e Estatistica, IBGE*).[24] Such waves of the survey are appropriate for before-after exercises due to the fixed questionnaire structure. The sampling scheme is based on a three-level multi-stage procedure - a successive selection of municipalities, census sectors and households. The PNAD instrument concentrates on household demographic characteristics, labor supply decisions and human capital investments. For the selected years, it also has information on cohabitation and formal marriages, which is common to decennial demographic censuses, but only sporadically investigated by household surveys.[25] In the remaining years that the survey was conducted, there was no attempt to gather information on the informality of marital arrangements (except for 1976 and 1984), what leaves a small window of opportunity

[23] "Alimony is based on necessity, what is not the case for a woman educated and able to work" [author's translation]. See Agravo de Instrumento # 596030, 8a Camara Civil do TJRGS (Superior Court of Rio Grande do Sul), June-27-1996.

[24] Due to budgetary problems, the PNAD was not conducted in 1994.

[25] See Medeiros & Osorio (2002) and Lazo (2002) for a presentation of the basic structure of the surveys and general outcomes regarding nuptiality and household arrangements.

for the empirical exercises set up by this study. The most important shortcomings of PNAD are the absence of data on the duration of marital relationships, on the official registry of religious marriages, and on the biological father of each child in the sample. Without such information, the group of individuals to which the law adoption is immediately effective (those in informal marriages for more than 5 years or with common offspring) cannot be recovered. The empirical identification discussion below is based, therefore, on the "potentially" exposed group - cohabitation and religious marriages - restricting the analysis to an intent-to-treat framework. This means that an unknown proportion of the group that is eligible to the treatment ends up not being treated.

The exercises below are based on information about households where heads and spouses were older than 15 and younger than 55. Note that, even though there can be married or cohabitant couples living with parents/in-laws, couples that were not on the condition of head/spouse of the household were not used. In the case of the outcomes for children, due to age-limits in the availability of schooling and child-labor information ("investment" allocation variables), the sample was further restricted to sons and daughters born between 1976 and 1988 (ages 5 to 17).

Table 2 presents the basic distribution of marital arrangements across cohorts of the female population both in the general population sample and in the one restricted to household heads/spouses. The figures indicate a higher incidence of cohabitation among younger cohorts. For female spouses (or heads) in their twenties, marriage and cohabitation are almost equal-weight arrangements, for example. Notice, however, that at least 14% of the females heading a household (in all cohorts) live in cohabitation. Comparisons over time indicate an increase in cohabitation (and decrease in marriage). Not only did cohabitation become more attractive to young women leaving their parents' household, but the increase in its incidence among young adult couples may also be the result of extension of their "trial marriage" (cohabitation) - the delay of formal marriages that, in the absence of the new law, would have already occurred.

Table 3 presents general statistics for individual characteristics of women and men in the sample. These figures indicate that, compared to their married counterparts, cohabiting female spouses are (on average) younger and less educated. In all the years, cohabitants with religious certification also have strikingly smaller probability of being literate, of being from the white population, and of living in an urban area. Total income is higher amongst married-by-law women, but non-labor income is slightly higher amongst (non-religious) cohabitants. Home-ownership is more common among married women. In all the cases there is, however, sufficient overlap of characteristics across these groups. In other words, each of the female characteristics (age and education, for example) has representant in both cohabitant and married groups. Finally, notice that individual characteristics of men in cohabitation or marriage follow, in general, the female case.

Table 4 focuses on general statistics (single variable analysis) for adults' behavioral choices. The outcomes in terms of labor supply (market or housework) for adults are, generally, not dramatically different for cohabitants and married couples. When the changes between 1993 and 1995 are investigated, the impression is that cohabitant women have not changed hours worked, are equally likely to hold a full-time job, and have increased labor force participation (by less than the married ones, however).

Finally, in Table 5 the outcomes and basic characteristics of children in the sample are presented. The figures indicate a higher proportion of school enrollment among children of formally married parents. At the same time, the labor force participation is also higher for them than for the children of (non-religious) cohabiting parents. These gaps may be the result of differences in the average age of children in each of these arrangements. - indicating the presence of children/couples on different sections of their life cycle. In addition, it is important to note that the patterns of investment in children are naturally staggered. A comparison of changes in the amount of investment should take this into account. Figure 1 illustrates the pattern of changes in school enrollment and labor force participation. They indicate that in terms of schooling and labor supply, parents face different trade-off's as their children grow old. Between ages 5 and 10 the decisions regarding schooling of children are basically decisions about entry (or timing of entry). After ten year of age, those decisions are in terms of (timing of) exit. Child labor also has a different cost/benefit considerations for those two age-groups - before 10 it is typically a hazard to the children's health and/or schooling quality (high grade repetition, for example), while for a teenager it can (but not necessarily do) represent acquisition of labor market experience.

5.2 Identification strategies

In order to test the compatibility of household decisions with the restrictions of the unitary model, this section discusses identification of the causal impact of alimony law on cohabiting couples' observed behavior. The reasoning is that alimony rights favoring female spouses (in case of dissolution) should correspond to an improvement in their bargaining position (on an intact relationship), affecting allocation decisions on intact households only in case of heterogeneous preferences.

Adopting the notation used in the causal-inference literature, let $X^i(h,t)$ represent the observed outcome of individual i, in household h at the time-period t. Let $T(h)$ be an indicator function, assuming the unit value in the year after the law implementation (post-treatment period). Define $X^i_E(h,t)$ and $X^i_{NE}(h,t)$ as the outcomes of individual i (member of household h) when exposed and non-exposed to the treatment, respectively. Consequently, the effect of the treatment over individual i can be represented by the difference $X^i_E(h,t) - X^i_{NE}(h,t)$. In addition, let $D(h)$ be the indicator of membership in the eligible-to-treatment group, and $Z(h)$ be the vector with individual, household, and community-level observed characteristics. The expected impact of the law on individual-members of households in that group can be theoretically represented by:

$$\tau(Z) = E[X^i_E(h,t) - X^i_{NE}(h,t) \mid Z(h), D(h) = 1, T(h) = 1]$$

Notice that the most basic issue in this evaluation is a missing data problem. For each individual in the eligible group and at $T(h) = 1$, the outcome is observed under the treatment but not under the non-exposition status. In other words, the counter-factual is not available for each individual in the sample, and the observed outcome is a linear combination of the theoretical measures defined above:

$$X^i(h,t) = D(h)T(h) \cdot X^i_E(h,t) + [1 - D(h)T(h)] \cdot X^i_{NE}(h,t)$$

An alternative, and probably the most basic quasi-experimental design in the literature, would be to focus on the changes (before and after the law adoption) in observed outcomes for the eligible group:

$$E[X^i(h,t) \mid Z(h), D(h) = 1, T(h) = 1] - E[X^i(h,t) \mid Z(h), D(h) = 1, T(h) = 0]$$

In principle, this measure could reveal the influence of changes in the intra-household balance of power. This comparison of outcomes before and after the law implementation can be misleading, however. Time-trends in the outcome of interest and the influence of other factors/events aside from the law adoption may confound the inference. Interestingly, if only part of the observed population is subject to the bargaining power shifter (the treatment), a sample of non-treated observations (that are directly affected by the alternative factors) can be used to net out effects of any confounding event. This strategy yields a well designed experiment under the following sufficient identification condition:

Condition 1 *:*

$$\begin{aligned} E[X^i_{NE}(h,t) \quad &| \quad Z(h), D(h) = 1, T(h) = 1] - E[X^i_{NE}(h,t) \mid Z(h), D(h) = 1, T(h) = 0] \\ &= \quad E[X^i_{NE}(h,t) \mid Z(h), D(h) = 0, T(h) = 1] - E[X^i_{NE}(h,t) \mid Z(h), D(h) = 0, T(h) = 0] \end{aligned}$$

Which states that, conditional on covariates, the treatment and the control groups would have followed parallel paths in the absence of the treatment.

Condition 1 implies that the causal-inference can be rewritten as a so-called "difference-in-differences parameter" represented by:

$$\begin{aligned} \tau(Z) &= E[X^i_E(h,t) - X^i_{NE}(h,t) \mid Z(h), D(h) = 1, T(h) = 1] \\ &= \left\{E\left[X^i(h,t) \mid Z(h), D(h) = 1, T(h) = 1\right] - E\left[X^i(h,t) \mid Z(h), D(h) = 1, T(h) = 0\right]\right\} \\ &\quad - \left\{E\left[X^i(h,t) \mid Z(h), D(h) = 0, T(h) = 1\right] - E\left[X^i(h,t) \mid Z(h), D(h) = 0, T(h) = 0\right]\right\} \end{aligned}$$

As in the case of the unconfoundness/selection-on-observables hypothesis in cross-sectional causal inferences, Condition 1 validates the comparison of changes in the outcomes for individuals in the control and treatment groups (after controlling for observed characteristics) in the evaluation of the treatment-effects.

5.2.1 Parametric treatment-effect identification

In order to simplify the connection of the theory with the data, a parametric version of the outcomes derived from the reduced-form bargaining theoretical models discussed in Section 3 can be implemented.[26]

Assuming that Condition 1 is valid, one can define:

$$E\left[X^i(h,t) \mid Z(h)=z, D(h)=d, T(h)=t\right] \equiv \alpha^d(t) + z\beta^d(t)$$

In addition, define $\alpha^d(t) \equiv d\gamma + \alpha + t\alpha^d$, and $\beta^d(t) \equiv d\delta + \beta + t\beta^d$. Therefore, the within-group time-difference can be written as:

$$\begin{aligned} & E\left[X^i(h,t) \mid Z(h)=z, D(h)=d, T(h)=1\right] \\ & -E\left[X^i(h,t) \mid Z(h)=z, D(h)=d, T(h)=0\right] \\ = \; & \alpha^d + z\beta^d \end{aligned} \tag{4}$$

Further defining $\alpha^d \equiv \alpha_0 + d\alpha_1$, and $\beta^d \equiv \beta_0 + d\beta_1$, the across-groups difference in the time-differences represented by equation (4) finally yields the treatment-effect of interest (treatment on the treated):

$$\tau(z) = \alpha_1 + z\beta_1 \tag{5}$$

The treatment-effect on the treated group is, therefore, a composite effect: the level effect common to every individual, and the (differential) effects that depend on individual characteristics (z).

Alternatively, by introducing such notation to an observation-based model, the linear version of the demand functions in (3) can be described as:

$$X^i(h,t) = D(h)\left[\alpha^1(t) + Z(h)\beta^1(t)\right] + [1-D(h)]\left[\alpha^0(t) + Z(h)\beta^0(t)\right] + v(h,t)$$

where $v(h,t)$ represents the household/individual-level unobserved characteristics and transitory shocks. Using the parameters' definitions:

$$\begin{aligned} X^i(h,t) \; = \; & \alpha + T(h)\alpha_0 + D(h)\gamma + \\ & D(h)Z(h)\delta + Z(h)\left[\beta + T(h)\beta_0\right] \\ & + D(h)T(h)\left[\alpha_1 + Z(h)\beta_1\right] + v(h,t) \end{aligned} \tag{6}$$

[26] Semi-parametric inference on the difference-in-differences framework is still incipient. See Alberto Abadie's "*Semi-Parametric Difference-in-Differences Estimators*", mimeo., July, 2002.

Assuming no group-specific influence of covariates over the treatment-effects or over the outcome levels in the absence of treatment ($\beta_1 = 0$, $\delta = 0$), a simplified (and widely adopted in the applied literature) version is obtained:

$$X^i(h,t) = \alpha + T(h)\alpha_0 + D(h)\gamma + Z(h)\left[\beta + T(h)\beta_0\right] + \left[D(h)T(h)\right] \cdot \tau + v(h,t) \quad (7)$$

The **sufficient identifying assumption** described in Condition 1 can be represented in the parametric model as:

$$E[v(h,t) \mid T(h), Z(h), D(h)] = 0$$

which would allow the consistent estimation of τ by standard **ordinary least squares** on the pooled cross-sectional samples of the treatment and control populations. In other words, the identification and consistent estimation of the treatment effect are subject to the exogeneity of the group indicator - they require absence of (across-groups) selection bias in response to the law. If observable characteristics are not changing across groups due to the law adoption, all one need is that the expected effect of the unobservables over outcomes are either constant over time (across groups) or constant within groups (over time).

5.2.2 Parametric differential treatment-effect identification

There are reasons to believe that selection bias might play a role in the empirical exercise when using repeated cross-sectional samples. In that event, the selection bias generated would be a result of changes (between cross-sectional sample draws) in the composition of unobservable characteristics in either the treatment or the control group. In the context of treatment effect evaluation, selection on those unobservables, which may directly affect the outcomes of interest, undermines the attempt to isolate the effect exclusively attributable to the treatment.

A simple strategy to work around this issue is to focus on differential effects of the treatment. Exploiting a particular characteristic of the data set (the panel structure introduced by the existence of multiple-child households) and **assuming that the unobserved characteristics can be decomposed into individual and household-level additive components** ($v(h,t) = \eta^i(h,t) + \varepsilon^h(h,t)$), siblings' fixed-effects can be used to wash-out household-level unobserved characteristics. In this formulation household-level observed characteristics are also extracted from the model, so it is no longer possible to directly infer the effect of the treatment (a household-level variable) on the demand function associated with a specific child (individual). The idea is to explore heterogeneity in child characteristics (gender and age, for example) and in their influence over the outcomes of siblings. The existence of heterogeneity (in both outcomes and characteristics) guarantees consistent inference of the *differential treatment-effect* $\left(\frac{\partial \tau}{\partial Z} = \beta_1\right)$ within each household.

Let $Z(h)$ be partitioned into household and individual level characteristics, respectively: $\begin{bmatrix} Z^h(h) & Z^i(h) \end{bmatrix}$. Re-writing the model in (6):

$$\begin{aligned} X^i(h,t) &= \alpha + T(h)\alpha_0 + D(h)\gamma \\ &+D(h)Z^h(h)\delta^H + Z^h(h)\left[\beta^H + T(h)\beta_0^H\right] + [D(h)T(h)]\left[\alpha_1^H + Z^h(h)\beta_1^H\right] \\ &+D(h)Z^i(h)\delta^I + Z^i(h)\left[\beta^I + T(h)\beta_0^I\right] + [D(h)T(h)]\left[\alpha_1^I + Z^i(h)\beta_1^I\right] \\ &+\eta^i(h,t) + \varepsilon^h(h,t) \end{aligned} \tag{8}$$

The elimination of household-specific effects reduces the empirical exercise to the ordinary least squares estimation of:

$$\begin{aligned} X^i(h,t) - \overline{X}(h,t) &= D(h)\left[Z^i(h) - \overline{Z}(h)\right]\delta^I \\ &+\left[Z^i(h) - \overline{Z}(h)\right]\left[\beta^I + T(h)\beta_0^I\right] \\ &+[D(h)T(h)]\left[Z^i(h) - \overline{Z}(h)\right]\beta_1^I \\ &+\vartheta^i(h,t) \end{aligned} \tag{9}$$

where $\vartheta^i(h,t)$ represents individual level unobserved characteristics. From equation (9) the estimation of the partition β_1 related to observed individual characteristics is consistent even under sample-selection issues.

6 Regression results

6.1 Adults: "Intent-to-treat" Level-Effects

Estimation of the level-effects of alimony law implementation is based on equation (7). The outcome of interest is the division of labor (housekeeping and market work) between husbands and wives. The results of the difference-in-differences least-squares regressions are presented in Panel A of Table 6 (in the "All Controls" column). Adult outcome regressions control for education, age, and non-labor income of both men and women, as well as for household demographics and geographic location. Results indicate that working women favored by the extension of the alimony law (cohabitants) were shown to significantly reduce, relative to their married counterparts, hours supplied to the labor market (3.5%). Additionally, once again relative to married females, cohabitant women perform housekeeping activities less frequently than before (0.5%). Combined, these results indicate that the transfer of power towards women was associated with increased consumption of leisure.

A couple concerns related to the strategy above are addressed in Panel B of Table 6: a) the possibility that individuals may have anticipated implementation of the law, adapting their behavior before the administration of the treatment, and b) the possibility that imbalance (between control and treatment) in the distribution of covariates that directly influence the outcomes may have driven the results. Both concerns are investigated using a "placebo" treatment, which consists of the reproduction of the treatment effect calculations as if the law change had occurred between the 1992 and 1993 waves of PNAD, before the law was actually implemented. Since no significant difference between cohabitant and married outcomes were observed before the law implementation, the placebo treatment experiment yields some robustness to the inference on the actual treatment.

The "placebo" treatment strategy just described does not solve another potential problem: shocks occurring between 1993 and 1995 that affect individuals in the treatment group differently than individuals in the control group. This will be an issue if characteristics (observed and unobserved) determining the response to concurrent events are unevenly distributed across those two groups. The inflation stabilization plan adopted in July of 1994 is a confounding "treatment" candidate. It is well known that an exchange-rate based stabilization, as was used in Brazil at that time, promotes a decrease in the relative prices of tradable with respect to non-tradable goods. This suggests that economic sectors (rural and urban), regions, and individuals with varying wealth levels and portfolio compositions, may have been differently affected by the stabilization. While the experimental design allows for the possibility that factors aside from the law change may influence both the treatment and the control groups, if the imbalance in characteristics across-groups is not controlled completely, observed effects may capture both the stabilization and the power reallocation effects.

To verify that covariates included in the model were able to sufficiently control for across-groups differences in observed characteristics, columns two and three of Panel A in Table 6 re-estimate the model excluding covariates that would control for characteristics that potentially influence labor market conditions in the direction observed in the experiment above. The idea is that if changes in macroeconomic conditions were solely responsible for the estimated effects because individual characteristics (as the ones mentioned in the previous paragraph) were not correctly controlled for (wrong functional form or omitted variables), the exclusion of additional variables would alter the estimated parameters in a particular direction. If, for example, cohabitant and married couples were confined to two geographical locations with different macroeconomic prospects (the former in a recession region, say), the reduction in worked hours could be exclusively reflecting the contraction of labor demand and not the alimony law implementation. The indicators of geographic location are intended to control for such factors and, if that is the case, their exclusion would drive up the misleading negative effect over worked hours. A similar reasoning applies to educational levels. The results indicate that exclusion of controls do not affect the estimated effects.

In a second attempt to address the same issue, this paper proposes an alternative strategy. Since the objective is to disentangle effects of the treatment (alimony law) from the concurrent stabilization shock, the paper explores a "pseudo" treatment experiment. The strategy is based on the fact that the control group, married couples, can be subdivided into categories that differ in terms of individual characteristics in such a way that approximately reproduces differences between cohabitant and married couples.[27] Taking married-by-law as the "pseudo-treatment" group and the married-by-law & religion as the "pseudo-control" group, the exercise calculates treatment effects identical to those used for the actual treatment. The results presented in Table 7 corroborate the existence of treatment effects that are exclusive to the cohabitant couples, reinforcing the idea that the alimony law impacted couples' behavior.

Importantly, models that investigate the level effects of alimony law implementation are potentially subject to selection bias. In other words, the adoption of the law may have altered the attractiveness of cohabitation for both men (negatively) and women (positively), potentially changing the composition of the treatment and control groups between 1993 and 1995. This is the case when one considers the effect of divorce costs on the likelihood of marriage formation/dissolution, for example.[28] Similar reasoning would suggest compositional effects resulting from the alimony law adoption. The problem emerges if the composition of the groups changed in terms of variables that are unobservable (from the econometrician's perspective) but intrinsically connected to the outcomes of interest (ability or "comparative advantage", in market work or in childrearing, are good examples). The focus on differential effects proposed in the next subsection works around this concern.

Before investigating child outcomes it is interesting to note that the selection itself, if relevant, is a result of the law implementation. In this sense, it may reflect the fact that matching decisions are related to relationship security and/or power distribution within the household. It is, therefore, possible that individuals adjusted their group membership in response to the treatment - by accelerating(delaying) their exit from singlehood(cohabitation). Interpreting these results would require, however, a better knowledge of how the concurrent stabilization shock influenced marriage/cohabitation decisions. The cohabitation/marriage cross-sectional data used in this paper (without retrospective history of marital relationships) is not appropriate to the investigation of this specific topic, though.

6.2 Children: "Intent-to-Treat" Differential-Effects

The analysis in this subsection exploits within family variation in outcomes of interest such as school enrollment and labor force participation, and its connection with the law adoption. These two outcomes can be considered as part of a broader decision regarding the allocation of resources towards investments in the human capital of children. Investigation of outcomes amongst children of married and cohabiting couples is

[27]These descriptive statistics for the differences are reproduced in Table 3.1 (cohabitant versus married, and married by law versus married by law & religion).

[28]See Bougheas & Geogellis (1999) for a theoretical model, and Frieberg (1998) for the US-based empirical evidence.

not complete, however, without the investigation of differential effects. The idea is that the pattern of investments in the schooling and labor market activities of children evolves differently across child gender, age and/or cohort-of-birth. Without allowing for these patterns, the aggregation might cancel out heterogeneous effects across age-gender groups.

The model estimated is the one described in equation (8). The assumption underlying the included covariates is that the intent-to-treat effects can parametrized as:

$$\tau(gender^i, age^i) = \alpha_1 + gender^i \beta_{11}^I + age^i gender^i \beta_{22}^I$$

All regressions estimated in this section include controls for additional child individual level characteristics, namely years of education (splines and dummies). The controls for parental characteristics are the same as were used for the adult outcomes (age, education, income and assets).

Table 8 reports the results of the fixed-effect regressions based on two sampling schemes, depending on family composition. For the overall population, which includes couples that were not actually treated (but that cannot be identified), the intent-to-treat effects over children of cohabitant couples indicate an increase of 7% in education investments for girls of ages 10 to 15 (relative to their sisters of ages 5 to 9). Even though indications are that less schooling investments were allocated to boys older than 10, the differences with respect to girls were not statistically significant. These results are sufficient, however, to corroborate the findings against the unitary model found for the adults' labor supply decisions.

Table 9 explores characteristics of the law requirements that identify a stratum of the cohabitant population that was (or had higher probability of being) subject to the treatment. The idea is to stratify the sample into less and more educated women (low and high potential earnings), in an attempt to extract the most of the law's "necessity clause". The results in Panel A indicate striking differences going in the expected direction: bigger effects among women with less then elementary school, and almost no significant effect among the more educated ones. For 16 and 17 years old girls of less educated cohabiting women, the probability of staying in school is, in some cases, 22.5% higher than for their sisters aged 5 to 9 (what implies that the exit probability is smaller, in absolute value, than the entry one). More dramatically, boys at that age can have 25% less chance of staying in school. Panel B, in Table 9, reproduces the experiment the "placebo" experiment described above for child schooling outcomes. The results reconfirm the existence of treatment effects of the alimony law, with the shift in power having both age and gender differential effects within households headed by cohabiting couples.

These results reject the unitary formulation of the household decision process. They also confirm findings in the literature regarding the "preference" of mothers for investments in the human capital of their daughters. Contrary to the early contributions, however, the inference presented here can bypass criticisms that the ones based on maternal education or maternal income are subject to. Education can alternatively represent specificities of the home production technology and not increased bargaining power, while income measures are subject to endogeneity issues already discussed along the text. Here, the exogenous shift in the intra-household balance of power promoted by the alimony law adoption suggests that women and men have different preference ranking regarding the investment in human capital of their daughters and sons.[29] Moreover, being based on a difference-in-differences approach, the results presented here are not subject to gender differential effects based on shocks in the return to schooling that are different for boys and girls. If that were the case, married and cohabitant couples would have changed investments decisions in the same way. Bargaining power shifts and heterogeneous preferences within the household emerge as the most plausible explanations for the empirical results presented here.

7 Conclusion

This paper investigates the effect of a shift in the balance of decision power within households. Using an exogenous source of variation provided by the adoption of a law (extension of alimony rights to cohabitants), and the similar "family status" of cohabitant and married couples, this paper has provided empirical evidence that (intra-household) empowerment of women resulted in: a) reduction in hours worked by female heads, including reduced housekeeping activities, and; b) redistribution of household resources towards teen girls (relative to their brothers and younger sisters) - particularly in terms of school enrollment. The latter was shown to be stronger when considering a stratum of households where the mother is likely to be more dependent on alimony in case of relationship dissolution.

Changes in the allocation of investments in children's human capital in response to outside-option changes are not predicted by models that treat the household as a unit. Therefore, the results yield insight into "the nature of parental preferences" which underlie the within-household allocation of resources. They reaffirm the idea that the unitary model is not a satisfactory representation of household decision-making regarding labor supply and investments in children's human capital. Further, the results reveal that such investments are outcomes of an elaborate process; observed decisions result from bargaining and negotiation amongst parents with different preferences and varying ability to assert their "vision of the world" at the household level.

[29] An alternative is the idea that, for mothers, the returns to investments in daughters are higher than the ones in sons. This could be reflecting the fact that female children are more attached to their mothers later in life, being a better "social security substitute" than their brothers.

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Appendix A - Brazilian Federal Constitution of 1988

CHAPTER VII

FAMILY, CHILDREN, ADOLESCENTS AND THE ELDERLY

Article 226. The family, which is the foundation of society, shall enjoy special protection from the State. Paragraph 1 - Marriage is civil and the marriage ceremony is free of charge.

Paragraph 2 - Religious marriage has civil effects, in accordance with the law.

Paragraph 3 - For purposes of protection by the State, the stable union between a man and a woman is recognized as a family entity, and the law shall facilitate the conversion of such entity into marriage.

Paragraph 4 - The community formed by either parent and their descendants is also considered as a family entity.

Paragraph 5 - The rights and the duties of marital society shall be exercised

equally by the man and the woman.

Paragraph 6 - Civil marriage may be dissolved by divorce, after prior legal separation for more than one year in the cases set forth by law, or after two years of proven de facto separation.

Paragraph 7 - Based on the principles of human dignity and responsible parenthood, family planning is a free choice of the couple, it being within the competence of the State to provide educational and scientific resources for the exercise of this right, any coercion by official or private agencies being forbidden.

Paragraph 8 - The State shall ensure assistance to the family in the person of each of its members, creating mechanisms to suppress violence within the family.

Appendix B - Tables and Figures

Attached

Table 1: Marital Arrangements (all ages, as % of all marital relationships)

	1960 [1]	1970 [1]	1976 [2]	1991 [2]	1995 [3]	2000 [3]
Formal Realtionships	73.4	78.6	82.9	76.5	72.1	67.3
Informal Realtionships	26.6	21.4	17.1	23.6	28.0	32.6

Sources: [1] Goldani & Wong (1980), [2] Lazo (1994), and [3] IBGE.

Table 2: Marital arrangements by cohort of birth, women aged 15 to 55

	All Women			All Women in a Realtionship		
	1992	1993	1995	1992	1993	1995
Cohort Born in the 1970's						
Cohabitation	9.7	11.1	14.0	44.9	46.4	48.6
Marriage (law+religion)	6.4	7.0	8.4	29.6	29.3	29.2
Marriage (religion)	1.0	1.1	1.2	4.6	4.6	4.2
Marriage (law)	4.5	4.7	5.2	20.8	19.7	18.1
Single	75.1	72.3	66.8			
Divorced	3.1	3.6	4.2			
Widowed	0.1	0.1	0.1			
Observations	*21,022*	*24,246*	*31,102*	*4,541*	*5,795*	*8,957*
Cohort Born in the 1960's						
Cohabitation	17.8	18.8	21.2	27.4	27.6	29.9
Marriage (law+religion)	31.0	32.3	33.0	47.7	47.4	46.6
Marriage (religion)	2.2	2.2	2.4	3.4	3.2	3.4
Marriage (law)	14.0	14.8	14.2	21.5	21.7	20.1
Single	26.2	23.0	18.7			
Divorced	8.1	8.2	9.6			
Widowed	0.8	0.8	1.0			
Observations	*27,277*	*27,026*	*27,525*	*17,730*	*18,405*	*19,488*
Cohort Born in the 1950's						
Cohabitation	15.2	15.4	16.1	19.9	20.2	21.3
Marriage (law+religion)	43.3	43.7	42.6	56.7	57.2	56.4
Marriage (religion)	2.5	2.3	2.5	3.3	3.0	3.3
Marriage (law)	15.3	15.0	14.3	20.1	19.6	18.9
Single	10.2	9.3	8.5			
Divorced	10.9	11.3	12.4			
Widowed	2.6	3.0	3.5			
Observations	*21,998*	*21,935*	*22,118*	*16,784*	*16,758*	*16,699*
Cohort Born in the 1940's						
Cohabitation	11.1	10.4	11.1	15.1	14.5	15.9
Marriage (law+religion)	46.9	46.2	44.3	64.0	64.6	63.4
Marriage (religion)	3.6	3.5	3.1	4.9	4.9	4.4
Marriage (law)	11.7	11.4	11.4	16.0	15.9	16.3
Single	6.3	6.7	6.4			
Divorced	12.2	13.0	13.3			
Widowed	8.3	8.7	10.4			
Observations	*14,611*	*14,625*	*14,594*	*10,710*	*10,457*	*10,202*
Cohort Born in the 1930's						
Cohabitation	7.5	7.8	9.1	11.6	11.9	14.1
Marriage (law+religion)	43.2	44.8	43.0	66.6	68.2	66.7
Marriage (religion)	4.0	4.6	4.5	6.2	7.0	7.0
Marriage (law)	10.2	8.5	7.9	15.7	12.9	12.2
Single	6.1	6.6	5.8			
Divorced	12.1	11.7	11.8			
Widowed	16.8	15.9	17.8			
Observations	*4,556*	*3,619*	*1,367*	*2,957*	*2,378*	*882*

Source: PNAD (1992-1995)

Table 3: Descriptive Statistics - General Characteristics of Men/Women aged 15 to 55 in a Marital Realtionship

		Legal Marriage			Cohabitation			Religious Marriage		
		1992	1993	1995	1992	1993	1995	1992	1993	1995
Individual Characteristics	Male age	37.88	38.17	38.67	34.18	34.14	34.39	38.24	37.94	37.44
		(0.048)	(0.047)	(0.047)	(0.092)	(0.088)	(0.081)	(0.246)	(0.242)	(0.238)
	Female age	34.54	34.81	35.42	30.69	30.63	30.99	34.08	33.82	33.72
		(0.048)	(0.048)	(0.047)	(0.088)	(0.084)	(0.078)	(0.249)	(0.249)	(0.236)
	Male education (years)	5.96	6.09	6.21	4.83	4.96	4.99	3.09	3.22	3.40
		(0.024)	(0.024)	(0.024)	(0.039)	(0.038)	(0.035)	(0.093)	(0.097)	(0.092)
	Female education (years)	6.12	6.24	6.44	4.77	4.90	5.06	3.46	3.76	3.99
		(0.023)	(0.023)	(0.023)	(0.038)	(0.036)	(0.033)	(0.095)	(0.097)	(0.095)
	Male literacy rate	88.40	89.10	89.30	82.30	83.20	83.70	65.30	62.60	65.90
		(0.200)	(0.200)	(0.200)	(0.400)	(0.400)	(0.300)	(1.200)	(1.200)	(1.200)
	Female literacy rate	90.10	90.60	91.40	81.70	83.30	84.70	68.00	70.20	72.70
		(0.200)	(0.200)	(0.200)	(0.400)	(0.400)	(0.300)	(1.200)	(1.200)	(1.100)
	Male white	59.20	58.90	58.80	41.80	42.10	42.40	31.30	32.30	33.40
		(0.300)	(0.300)	(0.300)	(0.500)	(0.500)	(0.400)	(1.200)	(1.200)	(1.200)
	Female white	61.70	61.70	61.10	43.40	44.00	43.50	33.80	35.40	34.30
		(0.300)	(0.300)	(0.300)	(0.500)	(0.500)	(0.400)	(1.200)	(1.200)	(1.200)
Household Demographics	Household members (#)	4.56	4.54	4.45	4.17	4.17	4.17	5.29	5.23	5.11
		(0.010)	(0.010)	(0.009)	(0.018)	(0.017)	(0.015)	(0.058)	(0.060)	(0.054)
	Household families (#)	1.04	1.04	1.05	1.04	1.04	1.05	1.06	1.05	1.05
		(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.007)	(0.006)	(0.006)
	Sons and daughters (#)	2.34	2.32	2.24	1.94	1.94	1.93	2.99	2.97	2.85
		(0.009)	(0.009)	(0.008)	(0.016)	(0.015)	(0.014)	(0.054)	(0.056)	(0.051)
	Relatives (#)	0.18	0.18	0.18	0.20	0.20	0.21	0.25	0.22	0.21
		(0.003)	(0.003)	(0.003)	(0.006)	(0.006)	(0.006)	(0.018)	(0.016)	(0.015)
Female Fertility History	Live birth occurrence	92.00	92.30	92.00	87.50	88.80	88.50	92.60	91.70	92.40
		(0.100)	(0.100)	(0.100)	(0.300)	(0.300)	(0.300)	(0.700)	(0.700)	(0.700)
	Miscarriage occurrence	5.10	5.10	4.50	6.40	6.40	5.50	8.70	8.70	8.70
		(0.100)	(0.100)	(0.100)	(0.200)	(0.200)	(0.200)	(0.700)	(0.700)	(0.700)
	Age youngest son	7.25	7.47	8.10	5.43	5.40	5.75	5.72	5.65	5.85
		(0.035)	(0.035)	(0.037)	(0.062)	(0.060)	(0.058)	(0.149)	(0.154)	(0.153)
Geographic Location	Urban area	81.80	82.20	82.30	85.10	84.70	84.80	59.20	58.60	61.30
		(0.200)	(0.200)	(0.200)	(0.400)	(0.400)	(0.300)	(1.200)	(1.300)	(1.200)
	Metropolitan area	38.90	38.90	38.40	45.80	46.90	45.00	18.40	18.90	18.30
		(0.300)	(0.300)	(0.300)	(0.500)	(0.500)	(0.400)	(1.000)	(1.000)	(0.900)
	North region	4.40	4.40	4.30	8.90	9.00	8.50	9.40	10.10	10.20
		(0.100)	(0.100)	(0.100)	(0.300)	(0.300)	(0.200)	(0.700)	(0.800)	(0.700)
	South region	21.60	21.40	21.00	15.40	15.80	15.70	7.10	8.80	11.00
		(0.200)	(0.200)	(0.200)	(0.400)	(0.400)	(0.300)	(0.600)	(0.700)	(0.800)
	SouthEast region	38.00	38.30	38.20	30.40	30.00	28.20	13.00	12.10	9.70
		(0.300)	(0.300)	(0.300)	(0.500)	(0.400)	(0.400)	(0.800)	(0.800)	(0.700)
	NorthEast region	24.20	24.00	24.30	31.80	31.90	33.90	52.20	52.70	51.40
		(0.200)	(0.200)	(0.200)	(0.500)	(0.500)	(0.400)	(1.300)	(1.300)	(1.200)
	CenterWest region	11.90	11.90	12.10	13.50	13.40	13.70	18.30	16.30	17.80
		(0.200)	(0.200)	(0.200)	(0.300)	(0.300)	(0.300)	(1.000)	(0.900)	(0.900)
Household and Individual Income & Assets	House ownership	62.00	62.80	64.50	52.60	52.00	54.50	66.90	67.40	66.40
		(0.300)	(0.300)	(0.300)	(0.500)	(0.500)	(0.400)	(1.200)	(1.200)	(1.200)
	Per capita hh total income	361.26	397.79	418.61	259.96	277.90	303.63	177.98	179.38	202.27
		(3.466)	(4.296)	(3.540)	(3.996)	(5.253)	(5.265)	(8.984)	(8.064)	(8.756)
	Per capita hh non-labor income	72.95	88.44	84.50	48.34	50.16	51.53	24.11	28.46	32.56
		(2.538)	(2.859)	(2.384)	(2.646)	(3.702)	(3.050)	(3.091)	(3.348)	(3.983)
	Male non-labor income	52.51	61.71	62.17	23.38	28.86	26.49	10.46	16.80	17.81
		(2.207)	(2.377)	(1.909)	(1.974)	(3.254)	(2.504)	(1.887)	(2.804)	(3.190)
	Female non-labor income	11.28	14.86	13.46	18.31	16.50	18.63	7.04	7.83	9.87
		(0.698)	(1.107)	(0.825)	(1.273)	(1.317)	(1.248)	(1.207)	(1.363)	(1.571)
	HH pc income top quartile	27.10	27.60	27.80	17.60	17.60	17.60	15.00	16.30	17.60
		(0.200)	(0.200)	(0.200)	(0.400)	(0.400)	(0.300)	(0.900)	(0.900)	(0.900)
	HH pc income med-top quartile	25.20	25.40	25.50	23.90	24.80	25.40	21.90	22.10	22.90
		(0.200)	(0.200)	(0.200)	(0.400)	(0.400)	(0.400)	(1.000)	(1.100)	(1.000)
	HH pc income med-bottom quartile	23.90	23.80	23.90	28.20	28.40	28.50	27.80	28.30	24.90
		(0.200)	(0.200)	(0.200)	(0.400)	(0.400)	(0.400)	(1.100)	(1.100)	(1.100)
	HH pc income bottom quartile	22.90	22.90	22.20	29.60	28.90	28.00	34.60	32.90	33.40
		(0.200)	(0.200)	(0.200)	(0.500)	(0.400)	(0.400)	(1.200)	(1.200)	(1.200)
	Sample size	*33,156*	*33,241*	*33,204*	*10,051*	*10,560*	*12,749*	*1,582*	*1,549*	*1,661*

Source: PNAD.

Notes: Standard-errors in parenthesis. Income variables are in real values as of September 1999 (deflated with regional specific inflation rates)

Table 3.1: Differences in Covariates Within Actual and Pseudo-Treatment Designs

Covariates	1993 Cohabitants-Married	1993 Married by Law - Married by Law&Religion	1995 Cohabitants-Married	1995 Married by Law - Married by Law&Religion
Fem. Age	-4.20	-2.70	-4.40	-2.30
	(0.10)	*(0.11)*	*(0.09)*	*(0.11)*
Male Age	-4.00	-2.40	-4.30	-2.20
	(0.10)	*(0.11)*	*(0.09)*	*(0.11)*
Fem. Born in the 1940's	-9.54	-7.88	-8.53	-5.68
	(0.36)	*(0.45)*	*(0.32)*	*(0.43)*
Fem. Born in the 1950's	-8.95	-3.27	-11.33	-4.72
	(0.51)	*(0.59)*	*(0.46)*	*(0.58)*
Fem. Born in the 1960's	7.54	7.60	4.47	5.05
	(0.55)	*(0.60)*	*(0.51)*	*(0.60)*
Fem. Born in the 1970's	11.78	4.52	15.37	5.63
	(0.41)	*(0.36)*	*(0.43)*	*(0.42)*
Male Literate	-7.29	-3.80	-6.72	-4.14
	(0.40)	*(0.39)*	*(0.35)*	*(0.38)*
Fem. Literate	-0.18	0.00	0.01	0.44
	(0.24)	*(0.40)*	*(0.23)*	*(0.29)*
Fem. Education (yrs)	-1.30	-1.10	-1.40	-1.10
	(0.04)	*(0.05)*	*(0.04)*	*(0.05)*
Male Education (yrs)	-1.10	-1.00	-1.20	-1.00
	(0.05)	*(0.05)*	*(0.04)*	*(0.05)*
Fem White	-17.56	-16.74	-17.63	-17.47
	(0.55)	*(0.61)*	*(0.51)*	*(0.61)*
Male White	-16.76	-17.12	-16.38	-15.75
	(0.55)	*(0.61)*	*(0.51)*	*(0.61)*
Urban	2.51	3.58	2.47	3.22
	(0.41)	*(0.45)*	*(0.38)*	*(0.45)*
Metropolitan Sector	7.92	8.36	6.65	7.48
	(0.55)	*(0.61)*	*(0.52)*	*(0.61)*
Total Non-labor Income	-35.85	-33.98	-35.67	-35.59
	(4.03)	*(4.22)*	*(3.15)*	*(3.45)*
Upper Quartile Income Distrubution	-11.22	-11.66	-11.25	-11.19
	(0.44)	*(0.49)*	*(0.41)*	*(0.49)*
Lower Quartile Income Distrubution	8.52	10.28	7.88	8.15
	(0.51)	*(0.56)*	*(0.47)*	*(0.56)*

Notes: Standard-errors in (parenthesis).

Table 4: Descriptive Statistics - Outcomes of Interest of Men/Women aged 15 to 55 in an marital relationship

	Legal Marriage			Cohabitation			Religious Marriage		
	1992	**1993**	**1995**	**1992**	**1993**	**1995**	**1992**	**1993**	**1995**
Female housekeeping	97.12	97.81	98.02	96.96	97.96	97.71	97.09	97.87	97.35
	(0.092)	*(0.080)*	*(0.077)*	*(0.171)*	*(0.137)*	*(0.133)*	*(0.423)*	*(0.367)*	*(0.394)*
Male housekeeping	39.81	45.80	50.52	40.38	47.03	51.83	34.51	42.93	47.56
	(0.269)	*(0.273)*	*(0.274)*	*(0.490)*	*(0.486)*	*(0.443)*	*(1.196)*	*(1.259)*	*(1.226)*
Traditional Division of Labor	28.30	25.26	21.84	29.38	26.96	23.34	30.85	24.55	22.34
	(0.247)	*(0.238)*	*(0.227)*	*(0.454)*	*(0.432)*	*(0.375)*	*(1.162)*	*(1.095)*	*(1.023)*
Female working	50.72	51.45	54.67	46.09	45.99	48.64	50.82	54.87	57.13
	(0.275)	*(0.274)*	*(0.273)*	*(0.497)*	*(0.485)*	*(0.443)*	*(1.258)*	*(1.265)*	*(1.215)*
Male working	93.75	94.00	93.68	92.66	92.42	93.03	95.01	95.67	94.64
	(0.133)	*(0.130)*	*(0.134)*	*(0.260)*	*(0.258)*	*(0.226)*	*(0.548)*	*(0.518)*	*(0.553)*
Female in lab. force (week)	53.79	54.28	57.53	51.80	51.14	53.63	52.84	57.39	59.42
	(0.274)	*(0.273)*	*(0.271)*	*(0.499)*	*(0.487)*	*(0.442)*	*(1.256)*	*(1.257)*	*(1.206)*
Male in lab. force (week)	96.48	96.43	96.25	97.04	96.82	96.90	97.35	97.61	96.99
	(0.101)	*(0.102)*	*(0.104)*	*(0.169)*	*(0.171)*	*(0.154)*	*(0.404)*	*(0.389)*	*(0.420)*
Female in lab. force (year)	59.62	60.32	63.32	60.49	60.37	62.89	60.56	64.24	66.59
	(0.270)	*(0.268)*	*(0.265)*	*(0.488)*	*(0.476)*	*(0.428)*	*(1.230)*	*(1.219)*	*(1.158)*
Male in lab. force (year)	97.64	97.56	97.64	98.43	98.47	98.48	98.86	98.71	98.80
	(0.083)	*(0.085)*	*(0.083)*	*(0.124)*	*(0.120)*	*(0.108)*	*(0.267)*	*(0.287)*	*(0.268)*
Female nonpaid-work	13.01	12.87	12.65	7.99	7.32	8.18	22.76	22.21	23.72
	(0.185)	*(0.184)*	*(0.182)*	*(0.271)*	*(0.254)*	*(0.243)*	*(1.055)*	*(1.057)*	*(1.044)*
Female full-time work	23.16	23.88	26.57	24.85	25.29	26.50	17.51	19.04	18.84
	(0.232)	*(0.234)*	*(0.242)*	*(0.431)*	*(0.423)*	*(0.391)*	*(0.956)*	*(0.998)*	*(0.960)*
Male full-time work	90.65	89.51	90.46	90.50	90.01	90.69	88.50	84.57	87.60
	(0.160)	*(0.168)*	*(0.161)*	*(0.293)*	*(0.292)*	*(0.257)*	*(0.803)*	*(0.918)*	*(0.809)*
Female jobs (#)	0.53	0.54	0.58	0.48	0.48	0.51	0.53	0.57	0.60
	(0.003)	*(0.003)*	*(0.003)*	*(0.005)*	*(0.005)*	*(0.005)*	*(0.014)*	*(0.014)*	*(0.014)*
Male jobs (#)	1.00	1.01	1.01	0.96	0.96	0.97	1.03	1.08	1.05
	(0.002)	*(0.002)*	*(0.002)*	*(0.003)*	*(0.003)*	*(0.003)*	*(0.009)*	*(0.010)*	*(0.010)*
Female hours worked	32.44	32.56	33.18	35.38	35.36	35.36	28.55	28.66	27.46
	(0.130)	*(0.127)*	*(0.123)*	*(0.251)*	*(0.243)*	*(0.218)*	*(0.565)*	*(0.539)*	*(0.540)*
Male hours worked	47.64	47.09	47.30	47.78	47.00	47.13	46.36	45.80	45.79
	(0.102)	*(0.102)*	*(0.098)*	*(0.198)*	*(0.186)*	*(0.167)*	*(0.444)*	*(0.451)*	*(0.434)*
Working Couples Only									
Female hours worked all jobs	31.53	31.65	32.31	34.47	34.43	34.46	27.60	27.78	26.53
	(0.131)	*(0.127)*	*(0.123)*	*(0.252)*	*(0.244)*	*(0.219)*	*(0.569)*	*(0.546)*	*(0.542)*
Male hours worked all jobs	46.83	46.34	46.53	46.92	46.12	46.22	45.43	44.90	45.16
	(0.103)	*(0.102)*	*(0.099)*	*(0.200)*	*(0.187)*	*(0.167)*	*(0.446)*	*(0.452)*	*(0.435)*
Female full-time work	45.09	46.02	48.18	53.08	54.40	54.24	34.43	34.52	32.26
	(0.395)	*(0.391)*	*(0.382)*	*(0.762)*	*(0.745)*	*(0.657)*	*(1.725)*	*(1.665)*	*(1.558)*
Male full-time work	89.03	87.44	88.99	88.51	87.81	88.44	86.07	84.58	85.26
	(0.248)	*(0.260)*	*(0.239)*	*(0.487)*	*(0.489)*	*(0.422)*	*(1.257)*	*(1.265)*	*(1.182)*
Female hourly wage	2.28	2.58	2.73	1.80	1.89	2.08	1.06	0.91	1.20
	(0.034)	*(0.062)*	*(0.039)*	*(0.046)*	*(0.053)*	*(0.051)*	*(0.083)*	*(0.056)*	*(0.097)*
Male hourly wage	3.96	4.50	4.63	2.71	3.09	3.18	1.99	1.85	1.97
	(0.063)	*(0.109)*	*(0.062)*	*(0.067)*	*(0.128)*	*(0.076)*	*(0.145)*	*(0.119)*	*(0.096)*
General Sample	*33,156*	*33,241*	*33,204*	*10,051*	*10,560*	*12,749*	*1,582*	*1,549*	*1,661*
Working Couples Sample	*15,859*	*16,248*	*17,132*	*4,290*	*4,478*	*5,754*	*761*	*817*	*902*

Source: PNAD

Notes: see Table 3. Traditional division of labor refers to women exclusively housekeeping and men exclusively in the labor force.

Table 5: Descriptive Statistics for children aged 5 to 21, by parents' marital relationship

	Legal Marriage			Cohabitation			Religious Marriage		
	1992	**1993**	**1995**	**1992**	**1993**	**1995**	**1992**	**1993**	**1995**
Male	51.83	51.68	51.62	51.88	50.88	51.32	52.72	53.54	53.80
	(0.213)	*(0.213)*	*(0.215)*	*(0.459)*	*(0.448)*	*(0.406)*	*(0.873)*	*(0.887)*	*(0.870)*
Average Education (years)	3.00	3.09	3.36	1.81	1.87	2.04	1.68	1.63	1.74
	(0.013)	*(0.013)*	*(0.014)*	*(0.022)*	*(0.021)*	*(0.020)*	*(0.040)*	*(0.041)*	*(0.041)*
Average Age	11.54	11.61	11.86	10.45	10.43	10.62	11.36	11.30	11.20
	(0.018)	*(0.018)*	*(0.018)*	*(0.037)*	*(0.036)*	*(0.033)*	*(0.074)*	*(0.077)*	*(0.073)*
School Enrollment Rate	77.82	79.74	82.45	70.63	73.60	75.12	65.45	66.57	72.70
	(0.177)	*(0.171)*	*(0.164)*	*(0.419)*	*(0.395)*	*(0.351)*	*(0.831)*	*(0.839)*	*(0.777)*
Labor Force Participation	27.12	26.42	27.14	20.60	19.41	20.06	32.78	34.79	34.54
	(0.189)	*(0.188)*	*(0.191)*	*(0.372)*	*(0.354)*	*(0.325)*	*(0.820)*	*(0.847)*	*(0.830)*
Literacy Rate	77.76	78.89	81.58	64.69	65.37	67.94	56.56	53.86	59.13
	(0.177)	*(0.174)*	*(0.167)*	*(0.439)*	*(0.426)*	*(0.379)*	*(0.866)*	*(0.887)*	*(0.858)*
Observations	*74,425*	*74,459*	*72,924*	*15,969*	*16,802*	*20,497*	*4,420*	*4,266*	*4,434*

Source: PNAD

Note: Standard-errors in parenthesis.

Table 6: "Intent-to-Treat" Level-Effects of the Alimony Law, Adult Outcomes (OLS Estimations)

	PANEL A: Actual Treatment (1993-1995)			PANEL B: Placebo Treatment (1992-1993)
Outcomes	**All Controls**	**No Education Controls**	**No Geography Controls**	**All Controls**
Fem. Housekeeping	-0.512	-0.492	-0.502	0.198
	*[2.36]**	*[2.26]**	*[2.35]**	*[0.81]*
Male Housekeeping	0.535	0.523	0.041	0.264
	[0.73]	*[0.71]*	*[0.06]*	*[0.35]*
Fem. In School	0.416	0.404	0.375	0.121
	[1.61]	*[1.55]*	*[1.47]*	*[0.48]*
Male In School	0.140	0.127	0.117	-0.064
	[0.71]	*[0.64]*	*[0.60]*	*[0.33]*
Fem. In Labor Force	-0.178	-0.226	-0.277	-0.705
	[0.25]	*[0.31]*	*[0.39]*	*[0.95]*
Male In Labor Force	0.162	0.155	0.139	-0.239
	[0.66]	*[0.63]*	*[0.57]*	*[0.94]*
Both In Labor Force	0.215	0.166	0.314	-0.841
	[0.30]	*[0.23]*	*[0.45]*	*[1.14]*
Sample restricted to working couples				
Fem. Hours Worked - Prim. job (log)	-3.079	-3.126	-2.894	-0.992
	*[2.14]**	*[2.16]**	*[2.02]**	*[0.66]*
Male Hours Worked - Prim. job (log)	-0.965	-0.947	-0.551	-0.072
	[1.36]	*[1.33]*	*[0.78]*	*[0.10]*
Fem. Hours Worked - All jobs (log)	-3.519	-3.581	-3.304	-0.680
	*[2.30]**	*[2.33]**	*[2.17]**	*[0.42]*
Male Hours Worked - All jobs (log)	-0.839	-0.814	-0.432	-0.305
	[1.17]	*[1.13]*	*[0.61]*	*[0.41]*
Fem. Full Time Job	-2.143	-2.173	-1.912	0.442
	*[2.06]**	*[2.09]**	*[1.85]*	*[0.40]*
Male Full Time Job	-1.304	-1.292	-0.805	1.048
	[1.83]	*[1.81]*	*[1.14]*	*[1.40]*
Male-Female Diff. In Worked Hours	0.416	0.431	0.477	-0.127
	[1.04]	*[1.08]*	*[1.20]*	*[0.30]*
Male-Female Diff. In Tot. Worked Hours	0.448	0.436	0.497	-0.195
	[1.11]	*[1.15]*	*[1.24]*	*[0.46]*
Male-Female Ratio of Worked Hours (log)	2.105	2.168	2.331	0.950
	[1.37]	*[1.40]*	*[1.52]*	*[0.59]*
Observations		*92,940*		*90,107*
Observation Working Couples		*45,311*		*42,425*

Notes: a) Coeficients are reported after multiplied by 100 (except for hours differences). t-statistics in [brackets] are calculated with jacknifed standard-errors.

b) Regressions further control for education splines (male and female), age polinomial (male and female), non-labor income and assets (house ownership) for male and female, and geography indicators. The income, assets and geography effects are allowed to vary across years.

* Classical significance of 5% or more.

Table 7: "Intent-to-Treat" Level-Effects of the Alimony Law, Adult Outcomes

Actual and Pseudo-Treatment (OLS Estimations)

Outcomes	PANEL A: Actual Treatment **Treated Group*Year**	PANEL B: Pseudo-Treatment **Treated Group*Year**
Fem. Housekeeping	-0.512	0.025
	*[2.36]**	*[0.10]*
Male Housekeeping	0.535	-1.056
	[0.73]	*[1.21]*
Fem. In School	0.416	0.592
	[1.61]	*[1.89]*
Male In School	0.140	0.000
	[0.71]	*[0.00]*
Fem. In Labor Force	-0.178	-0.911
	[0.25]	*[1.06]*
Male In Labor Force	0.162	0.256
	[0.66]	*[0.83]*
Both In Labor Force	0.215	-0.417
	[0.30]	*[0.49]*
Sample restricted to working couples		
Fem. Hours Worked - Prim. job (log)	-3.079	-0.510
	*[2.14]**	*[0.30]*
Male Hours Worked - Prim. job (log)	-0.965	-1.435
	[1.36]	*[1.72]*
Fem. Hours Worked - All jobs (log)	-3.519	0.025
	*[2.30]**	*[0.01]*
Male Hours Worked - All jobs (log)	-0.839	-1.567
	[1.17]	*[1.81]*
Fem. Full Time Job	-2.143	0.251
	*[2.06]**	*[0.20]*
Male Full Time Job	-1.304	-1.684
	[1.83]	*[1.96]*
Male-Female Diff. In Worked Hours	0.416	-0.455
	[1.04]	*[0.95]*
Male-Female Diff. In Tot. Worked Hours	0.448	-0.519
	[1.11]	*[1.07]*
Male-Female Ratio of Worked Hours (log)	2.105	-0.947
	[1.37]	*[0.51]*
Observations	*92,940*	*66,441*
Observation Working Couples	*45,311*	*33,368*

Notes: a) Coeficients are reported after multiplied by 100 (except for hours differences). t-statistics in [brackets] are calculated with jacknifed standard-errors.

b) Regressions further control for education splines (male and female), age polinomial (male and female), non-labor income and assets (house ownership) for male and female, and geography indicators. The income, assets and geography effects are allowed to vary across years.

* Classical significance of 5% or more.

Table 8: "Intent-to-Treat" Differential Effects of the Alimony Law - Child Gender and Age Group (Fixed-Effects Estimations)

	In School		Working Year		Working Week		Exclusively in School	
*Cohabitant*Year*...*	FE1	FE2	FE1	FE2	FE1	FE2	FE1	FE2
Age Differentials								
Girl*(Ages 16 to 17)	3.96	9.93	-1.03	1.94	-4.54	-2.64	2.97	3.56
	[1.00]	*[1.97]*	*[0.24]*	*[0.36]*	*[1.10]*	*[0.50]*	*[0.67]*	*[0.66]*
Girl*(Ages 14 to 15)	6.08	4.66	-4.65	-6.27	-4.75	-5.38	8.28	7.57
	[1.92]	*[1.23]*	*[1.38]*	*[1.58]*	*[1.56]*	*[1.47]*	*[2.23]**	*[1.74]*
Girl*(Ages 12 to 13)	4.70	7.05	2.21	1.59	3.73	3.02	3.74	5.46
	[1.87]	*[2.50]**	*[0.85]*	*[0.55]*	*[1.60]*	*[1.17]*	*[1.21]*	*[1.58]*
Girl*(Ages 10 to 11)	3.58	2.40	-1.66	-1.56	-0.69	0.03	5.88	5.72
	[1.49]	*[0.91]*	*[0.74]*	*[0.66]*	*[0.34]*	*[0.01]*	*[2.07]**	*[1.86]*
Boy*(Ages 16 to 17)	-0.56	-3.49	-3.45	-3.98	-3.66	-4.44	3.98	3.14
	[0.15]	*[0.76]*	*[1.02]*	*[1.04]*	*[1.03]*	*[1.07]*	*[1.07]*	*[0.73]*
Boy*(Ages 14 to 15)	3.79	5.95	-1.58	-0.33	-0.04	-0.41	4.62	5.09
	[1.18]	*[1.58]*	*[0.48]*	*[0.09]*	*[0.01]*	*[0.11]*	*[1.29]*	*[1.24]*
Boy*(Ages 12 to 13)	1.15	1.22	-1.84	-0.68	0.54	1.26	2.95	2.24
	[0.44]	*[0.41]*	*[0.63]*	*[0.20]*	*[0.20]*	*[0.40]*	*[0.90]*	*[0.61]*
Boy*(Ages 10 to 11)	2.76	1.13	-2.60	-3.82	-1.83	-2.20	4.36	4.16
	[1.15]	*[0.43]*	*[1.03]*	*[1.38]*	*[0.77]*	*[0.83]*	*[1.46]*	*[1.29]*
Gender Differentials								
Boy - Girl (Ages 5 to 9 - reference)	1.70	1.71	0.41	0.44	-1.01	-1.29	1.24	1.07
	[0.83]	*[0.70]*	*[0.27]*	*[0.22]*	*[0.81]*	*[0.76]*	*[0.55]*	*[0.40]*
(Boy-Girl)*(Ages 16 to 17)	-4.53	-13.42	-2.42	-5.92	0.88	-1.80	1.01	-0.42
	[0.85]	*[1.94]*	*[0.45]*	*[0.89]*	*[0.17]*	*[0.27]*	*[0.18]*	*[0.06]*
(Boy-Girl)*(Ages 14 to 15)	-2.30	1.29	3.07	5.94	4.71	4.97	-3.65	-2.48
	[0.53]	*[0.23]*	*[0.67]*	*[1.05]*	*[1.10]*	*[0.93]*	*[0.73]*	*[0.40]*
(Boy-Girl)*(Ages 12 to 13)	-3.55	-5.83	-4.05	-2.27	-3.19	-1.75	-0.78	-3.22
	[0.98]	*[1.33]*	*[1.05]*	*[0.49]*	*[0.89]*	*[0.41]*	*[0.18]*	*[0.60]*
(Boy-Girl)*(Ages 10 to 11)	-0.82	-1.27	-0.94	-2.26	-1.14	-2.23	-1.53	-1.56
	[0.24]	*[0.31]*	*[0.28]*	*[0.57]*	*[0.36]*	*[0.60]*	*[0.37]*	*[0.32]*

Notes: t-statistics in [brackets] calculated with infinitesimal jacknife standard-errors. Samples are restricted to households with at least two children and at least one of each gender (FE1), and further restricted to households with children in both reference and included age groups (FE2). Sample sizes are 91,060 and 51,134, respectively.

Table 9: "Intent-to-Treat" Differential Scooling Effects of the Alimony Law - Child Gender and Age Group (Fixed-Effects Estimations)

	PANEL A: Actual Treatment				PANEL B: Placebo Treatment			
	FE1		FE2		FE1		FE2	
*Cohabitant*Year*...*	Less educated mothers	More educated mothers	Less educated mothers	More educated mothers	Less educated mothers	More educated mothers	Less educated mothers	More educated mothers
Age Differentials								
Girl*(Ages 16 to 17)	14.49	-5.49	22.65	-11.82	-7.74	-1.95	-8.10	10.15
	*[2.64]**	*[0.71]*	*[3.41]**	*[1.05]*	*[1.40]*	*[0.26]*	*[1.24]*	*[0.93]*
Girl*(Ages 14 to 15)	14.79	-1.07	12.37	-4.54	-8.05	10.96	-5.83	15.91
	*[3.28]**	*[0.20]*	*[2.37]**	*[0.65]*	*[1.80]*	*[1.73]*	*[1.14]*	*[1.94]*
Girl*(Ages 12 to 13)	7.56	-0.61	10.43	-0.84	-6.90	5.53	-8.62	7.18
	*[2.09]**	*[0.15]*	*[2.64]**	*[0.17]*	*[1.88]*	*[1.15]*	*[2.16]**	*[1.24]*
Girl*(Ages 10 to 11)	5.30	0.38	3.20	-2.41	-4.03	-0.59	-2.23	-0.88
	[1.50]	*[0.09]*	*[0.86]*	*[0.51]*	*[1.17]*	*[0.14]*	*[0.61]*	*[0.17]*
Boy*(Ages 16 to 17)	-0.57	1.25	-2.38	5.80	0.93	7.04	0.90	6.73
	[0.11]	*[0.15]*	*[0.41]*	*[0.49]*	*[0.19]*	*[0.77]*	*[0.16]*	*[0.53]*
Boy*(Ages 14 to 15)	-1.65	6.92	0.17	12.56	1.96	-0.13	0.24	-2.68
	[0.37]	*[1.20]*	*[0.03]*	*[1.67]*	*[0.44]*	*[0.02]*	*[0.05]*	*[0.32]*
Boy*(Ages 12 to 13)	3.52	-5.09	3.76	-6.03	-5.02	2.05	-4.65	0.41
	[0.93]	*[1.12]*	*[0.92]*	*[1.11]*	*[1.32]*	*[0.40]*	*[1.13]*	*[0.07]*
Boy*(Ages 10 to 11)	2.43	1.07	0.46	3.88	-0.02	-4.46	-0.36	-7.92
	[0.70]	*[0.26]*	*[0.12]*	*[0.83]*	*[0.01]*	*[0.98]*	*[0.10]*	*[1.53]*
Gender Differentials								
Boy - Girl (Ages 5 to 9 - reference)	5.32	-0.42	5.77	-6.53	-4.73	0.93	-3.49	5.75
	[1.76]	*[0.12]*	*[1.68]*	*[1.44]*	*[1.60]*	*[0.23]*	*[1.03]*	*[1.13]*
(Boy-Girl)*(Ages 16 to 17)	-15.06	6.74	-25.03	17.62	8.67	8.99	8.99	-3.42
	*[2.08]**	*[0.61]*	*[2.81]**	*[1.04]*	*[1.18]*	*[0.77]*	*[1.02]*	*[0.20]*
(Boy-Girl)*(Ages 14 to 15)	-16.44	7.98	-12.20	17.10	10.01	-11.10	6.07	-18.59
	*[2.63]**	*[1.08]*	*[1.64]*	*[1.59]*	*[1.61]*	*[1.29]*	*[0.83]*	*[1.54]*
(Boy-Girl)*(Ages 12 to 13)	-4.05	-4.48	-6.67	-5.19	1.88	-3.48	3.97	-6.77
	[0.77]	*[0.74]*	*[1.10]*	*[0.64]*	*[0.35]*	*[0.50]*	*[0.66]*	*[0.74]*
(Boy-Girl)*(Ages 10 to 11)	-2.87	0.69	-2.74	6.29	4.00	-3.88	1.87	-7.04
	[0.57]	*[0.11]*	*[0.49]*	*[0.81]*	*[0.81]*	*[0.60]*	*[0.34]*	*[0.84]*

Notes: t-statistics in [brackets] calculated with infinitesimal jacknife standard-errors. See Notes of Table 8 for sample description (FE1 and FE2).

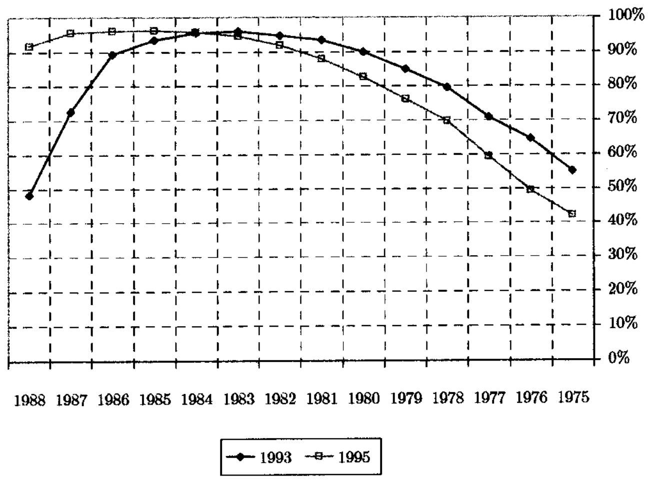
Less educated mothers have less than elementary school (4 years), while more educated have more than 6 years of schooling.

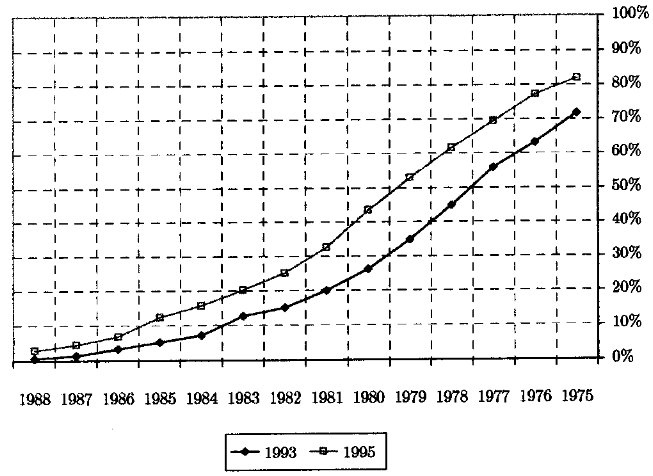
Samples sizes are 36,693 (less educ.) and 25,849 (more educ.), 27,165 (less educ.) and 12,361 (more educ.) for FE1 and FE2, respectively, in Panel A.

In Panel B, the sample sizes are 41,833 (less educ.) and 27,659 (more educ.), 26,082 (less educ.) and 12,204 (more educ.) for FE1 and FE2, respectively.

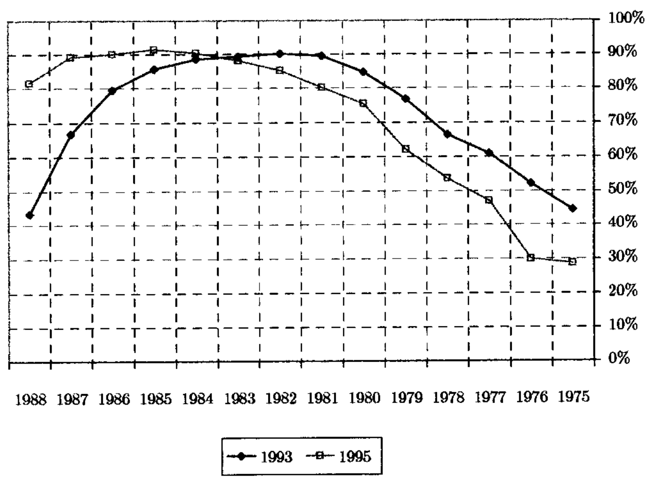
Figure 1: Children's School Enrollment and Labor Force Participation Rates by Cohort of Birth

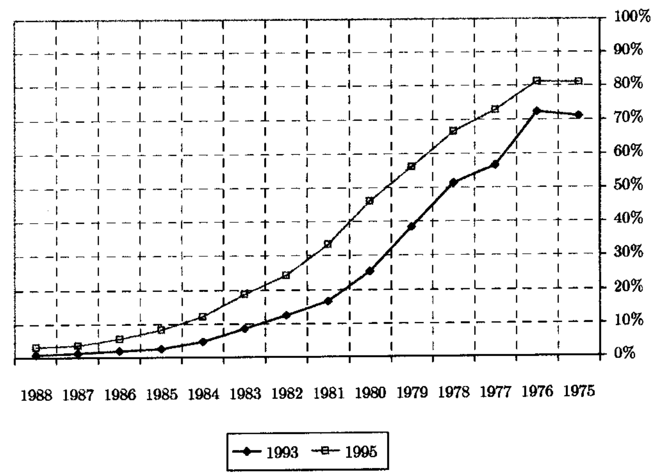
PANEAL A: Children of Married (Law) Couples





PANEL B: Children of Cohabiting Couples





PANEL C: Children of Married (Religious) Couples