Is Divorce a Credible Threat? Unilateral Separation Laws, Household Bargaining and Women's Labor in Egypt

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Abstract

The literature on households indicates that the distribution of bargaining power plays an important role in intra-household resource allocation. In particular, empowering women is found to correlate strongly with improvements in child welfare and consumption. However, there is no empirical evidence of the potential for divorce laws to influence female autonomy in developing countries. This paper examines whether the creation of unilateral divorce laws for women in Egypt alters their bargaining position within the household. It refutes the theory held among proponents of 'separate spheres bargaining models', that changes in outside options for women pose an empty threat in less developed countries. The results presented are significant in the bargaining literature to lend support to models using exit threat scenarios. A theoretical model of discrete labor choice with the introduction of distribution factors is used to derive predictions on female labor force participation. The model provides an alternative to existing ones by allowing for an analysis of labor decisions on the extensive margin. This is particularly important in the context of third world countries where a sizeable proportion of women do not participate in the labor force. Using data from the Demographic and Health Survey for Egypt, I find that the introduction of divorce rights favoring married women led to a significantly higher non-participation rate in labor force relative to widowed counterparts due to the law. For working women, the divorce law also increased female self-employment. Given the nature of the law passed in Egypt, this corresponds with an improvement to the female spousal position within the family. The significant negative Average Treatment Effect to stay out of the labor force is strongest among sub-groups of the population of women with some education and fewer household assets. Results across the agriculture and non-agriculture sectors indicate no signs of women switching between sectors for employment. Noted is improved autonomy for women in the latter sector but not the former, who work mostly without pay. In additon, I derive results on children's schooling enrollment status. I find evidence for an increase in school attendance among first born female children of married women, after the law. The set of results on child enrollment point to a shift in resource allocation determined by gender and birth order. These results suggest that well-defined policy has potential to change the female position and alter the behavior among agents with heterogeneous preferences in a household.

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1 Introduction

In the last decade there has been much focus on the use of policy tools in altering the observed systematic deprivation of women in segments of society, and within the household in developing countries. Recent literature on the household has thus centered on deconstructing spousal roles in the sharing of a common pool of resources within the unit. Empirical studies tend to focus on one of two key aspects of the issue of female empowerment. One strand examines the effect of increased female autonomy on household level outcomes. For example, Thomas (1990), Munshi-Luke (2005) and Lundberg-Pollack-Wales (1997) findings suggest that increasing female bargaining power can favor resource allocation towards children. The other strand focuses on understanding what drives change in female participation in income generating activities - a measure of autonomy. Stevenon (2008), Orrefice (2007), Rangel (2004) and Chiappori et al. (1992, 2002) use women's labor-leisure tradeoff as the focal point of bargaining within the married state. These studies consider exogenous shocks such as legalization of abortion, changes in alimony payments to cohabiting couples, and sex ratios in altering the path of female labor. The latter area is less explored due to issues of causality and difficulty in identifying exogenous empirical drivers of female autonomy. This paper examines the effect of an exogenously determined divorce law on female labor force participation for households with formal marriage contracts. The paper also then explores the subsequent effect of female autonomy on child human capital investment decisions.

I use the implementation of unilateral divorce rights for Egyptian women in the year 2000 as a quasi-experiment to test for a shift in household bargaining power. First, there are a few distinctions to be made among the approaches taken in bargaining theory to model equilibrium behavior of household members. Initial approaches by McElroy-Horney (1981) and Manser-Brown (1980) within the Nash Bargaining framework consider the utility of each spouse relative to their utility from the single state.[1] A threat scenario is recognized if one spouse's outside option changes allowing them a higher utility from breaking the contractual agreement and reverting to the single state. Another type of bargaining model introduced by Pollack-Wales (1993) and with proponents Chen-Woolley (2001), Anderson-Eswaran (2009) argue that the threat scenario, particularly for developing countries where divorce is

[1] Utility in the single state refers to the potential utility of the spouse in the event of marital dissolution.

rare, should be modeled as non-cooperative behavior within the marriage, and not as divorce.

The aim of the current study is to test the latter assertion that divorce as a threat does not suffice in altering the female bargaining position inside marriage via participation in paid labor. Studies by Stevenson (2008), Chiappori (2002) research the impact of unilateral divorce laws finding a reduction in women's labor supply within the United States. In the developing country context this question has not received much attention. Rangel's paper (2004) analyzes the effects of alimony payments favoring the female partner in cohabiting relationships. His findings reveal a significant decline in hours worked on primary job for women in informal relationships, which has been attributed to increased bargaining power. He also finds positive differential effects in investment in daughters by birth-order. As discussed by Gray (1998) and Stevenson (2008), consistent with the Coase theorem, the reassignment of formal rights over divorce does not necessarily lead to an increase in marital dissolution. Rather, bargaining should create an efficient allocation of resources which favors the party supported by the property laws. Egypt provides a good case study of the validity of external threat point models for a developing country in which spousal separation is stigmatized. If the threat of divorce by women does suffice, then the equilibrium within the marriage may shift to a non-cooperative one that favors the wife.

The study uses data from the Demographic and Health Survey (DHS) for Egypt to reveal a few contributions in understanding the impact of Khul[2] divorce. The main identification strategy in the paper relies on the timing of the introduction of the Khul law in combination with parallel behavior of married and widowed women pre-law. The identifying assumption is that in the absence of the law both groups of women would have responded similarly at a regional level to changes in policy or economic conditions. I hypothesize that if the divorce law favors women, this should lead to a transfer of income to the wife, causing lower rates of female participation in earned income activities. My results align with this prediction. Moreover, there is evidence for a lower participation differential that is more pronounced for women with some education and women from households with fewer assets. One caveat, however, is some evidence that for the 20 percent of women among all working women in agricultural jobs, 70 percent of whom do not get paid, there is no observed change in labor. This

[2]The Khul law specific to Egypt will be explained in section 2.

signals for this minority group no effect on bargaining power - a fraction of women who do not gain from the law.

The rest of the paper is organized as follows. Section 2 provides information on the institutional framework of the Khul law, which is important in explaining why the divorce law was beneficial to women. Section 3 provides a theoretical framework using a model of collective household bargaining to make predictions on female labor force participation. Section 4 describes the data and identification strategy. Section 5 provides an estimation framework. Section 6, 7 present results and conclude.

2 Institutional Background

2.1 Unilateral Divorce Reform, the *Khul* Law

The struggle between different entities of a country, government and religious establishments, play a role in shaping the scope and significance of gender roles. In the predominantly Muslim North African and Middle Eastern region laws governing female empowerment are generally seen as unevenly distributed across countries. Some argue that gender inequalities faced by Muslim women in these countries are not based on religion but are the result of traditional, patriarchal practices (Mashour, 2005). Tunisia is often used as an example of one of the only countries in the region that allows women almost equal rights. The two most progressive features of Tunisian law are its abolishment of polygamy and extra-judicial divorce. Egypt's constitution, on the other hand, grants equal opportunity to all citizens but its family law contradicts that through many discriminatory laws and practices biased against women. However, in 2000 a law was passed to give women in Egypt a stronger foothold within the marriage. Sonneveld (2009) in her thesis "*Khul'* Divorce in Egypt; public debates, judicial practices, and everyday life" provides ample anecdotal evidence suggesting that the law had significant influence within domestic spheres by generating a previously non-existent threat to the household and the potential for a reallocation of unearned income, household assets, in the case of divorce.

Talaq is an Islamic term referring to 'repudiation of marriage' in which the man can divorce his wife without any reason by merely saying the word three times. Women's right to divorce in Islam could come from two potential sources. In Egypt, the first and only non-fault based source prior to

reform, in which a woman could divorce a man, came from delegated *talaq*. A wife has the right to divorce only if the husband has delegated it to her. The reforms after the year 2000 allowed a second kind of divorce. Khul divorce by the woman was permitted as long as she relinquishes part or all of her *prompt dower* paid by the man. Dower is a provision accorded by law to a woman from the man at time of marriage. These reforms were pushed through the Ministry of Justice by women activist NGOs known as "The Group of Seven" and international pressure, meaning the law can be viewed as exogenous for the purpose of this study. Relative to existing fault based divorces that took long periods of time Khul divorce could be obtained after a few months of arbitration. Sonneveld (2009) illustrates the significance of the law by depicting the impact and reactions of both proponents and opponents. For example, Sonneveld cites two headlines from the *al-Ahram* weekly reading "a Contract for Equality" and "a prelude to Westernization". She claims these mirrored public opinion post *Khul,* which generated a shift in filings of divorce towards this type.

2.2 The Custom of Dower in Egypt

Prior to a marriage the groom is expected to give the bride a *shabka* consisting of engagement gifts such as gold and house furnishings that are retained by the bride. However, there is also a stipulation that a *prompt dower* be given by the husband that is registered in the marriage contract (Shaham, 1991). Contrary to a common dowry which is brought to the marriage by the woman, in Egypt's dower practice assets and prompt dower are paid by the groom. Evidence suggests however, that the importance of a prompt dower has been declining in Egypt, in particular in urban areas. Families record a very small amount of prompt dower like one pound, to avoid paying a tax equivalent to 5 percent of the dower to the registrar. Generally a higher *deferred dower* is also registered as a disincentive for the husband to leave the wife. In the case of Khul a wife would be expected to pay back the prompt dower paid to her. As evidenced, the prompt dower takes a marginal, symbolic position. Sonneveld (2009), in a collected sample finds prompt dowers ranging from one to fifty pounds. [3] In the case of a dispute over the legitimate registered dower the judge establishes an estimate based on

[3]The size of the sample is not specified. The sample is collected from women litigants, courts, lawyers offices and friends.

the female litigants' class and background. This implies that women hoping to divorce men through Khul would not have a large burden of repayment.

The initial response that Khul divorce would benefit only rich women is misleading. Several authors (Fawzy, 2004; Sonneveld, 2009) puzzle over why Egyptian legislation required the clause conditioning over the return of prompt dower. For women from poorer households obtaining Khul divorce by returning a generally small dower, mostly one pound, should not be an obstacle. I hypothesize that for women from wealthier households the potential threat from Khul divorce may be reduced for two reasons. Firstly, there is the possibility that initial registered prompt dowers are sufficiently high that the woman cannot return it. Secondly, there is a higher risk that the judge reassesses household wealth leaving the woman with a large loss of wealth or debt. Education should increase a woman's autonomy. Therefore, all else equal, a more educated woman should gain more bargaining power from the Khul law. Though there is no evidence, one caveat of the Khul law may be that post 2000 it caused registered prompt dowers to rise.

I will compare married to widowed women to analyze female labor participation through a shift in bargaining power within the household. Widowed women are used as a control group as the *Khul* law would not have affected this group of women. Divorced women are excluded from the comparison, as I cannot establish when women were divorced. If women were getting divorced as a consequence of the law it may be expected that their labor patterns altered. I hypothesize that the change in the divorce laws in 2000 will affect bargaining power of married women and both spouses would view divorce as a credible threat. However, changes in divorce law must have affected different subgroups of the female population differently due to heterogeneity in household assets, female education - a proxy for autonomy, and occupational sector.

3 A Model of Bargaining and Labor

3.1 Basic Framework

Anderson-Eswaran (2009) posits that divorce is not a relevant fallback option in developing countries. However, this claim has not been investigated, thus providing motivation for the current analysis in

which a threat point is created. Despite having to return a nominal dower, the implementation of unilateral divorce put married Muslim women in a position to gain from the division of additional accrued household wealth, if it exists, in the case of relationship dissolution. This is rational from a theoretical perspective and has been shown in qualitative evidence by Sonneveld (2009). It is assumed that the creation of the divorce threat would increase women's bargaining power because the wife can end the marital contract at any time. Given that the wife only has to pay back the registered prompt dower, bargaining theory suggests that the greater leverage of the female spouse can be seen as a threat. As pointed out, (Coase, 1960; Gray, 1998; Stevenson, 2007) theory does not predict that divorce rates must necessarily increase due to the establishment of the divorce law as long as there is symmetry of information and trivial bargaining costs between spouses. [4] According to Coase theorem, regardless of whether property rights specify that spouses consent, or it is unilateral, divorce occurs when spouses' joint utility from being divorced exceeds that in the married state. The efficient outcome (Stevenson, 2007) may remain unchanged but transfers may be made within the marriage.

Initial *unitary* models of resource allocation were valid only in the case of one autonomous decision maker in the household or for identical homothetic preferences of agents within the household. Empirically the unitary model under the assumption of income pooling has been rejected by several studies. Models of intra-household bargaining and collective decision-making, in which outcomes are negotiated, are referenced more frequently at present. However, there is some disparity among theorists on which among these is most salient. Common among these are the Nash bargaining models (Manser and Brown, 1980; McElroy and Horney, 1981), Separate Spheres (Lundberg and Pollack, 1993) and repeated interaction models that refine the decision process to reach an efficient outcome (Chiappori, 1988). The Nash Bargaining models include an Extra Environmental Parameter (EEP) that affects utility if a spouse reverts to a single state. In other words, a change in an EEP like an alimony law change could alter the *threat point* making outside options such as separation more feasible. In these models the female and the male independently seeks to allocate resources towards goods and the final outcome depends on each individuals' ability to assert them-selves in the process. By contrast, seperate spheres bargaining models differ from Nash bargaining models in that the threat point is not divorce but a noncooperative equilibrium reflecting traditional gender roles.

[4] Empirical evidence supports theory in showing that divorce laws do not affect divorce rates Gray (1998), Peters (1986)

I deviate from a generalized model of collective decision-making (Chiappori et al., 1988, 1992, 2002) that assumes labor supplies of both the male and female vary continuously. An extension of the model (derived from Donni, 2003; Blundell et al., 2007) allows for discrete choices and non-participation in employment. In addition, I introduce distribution factors to the choice model to illustrate the effect of a divorce law favoring married women on their participation set. The features presented in this model are important to allow for the fact that a large proportion women in Egypt[5], and other developing countries, do not participate in the labor force. Therefore, it is essential to analyze decisions at the margin for women, under the assumption that labor supply for husbands follows continuity.

The collective household problem generally assumes that the household optimizes a weighted average of spousal utilities, where each spouse also cares about the other spouse's direct consumption, subject to a household budget constraint. However, if we assume that preferences are *egotistic* – each spouse cares about own consumption and labor decisions – then the problem can be split into individual spousal problems, which is not unreasonable. Also, these individual problems that solve for a non-cooperative equilibrium can be shown to achieve the same pareto-optimal results as in the "Becker caring" sense (Chiappori, 1992).

Assume that household welfare can be written as a weighted aggregation of the utility functions of the spouses within the household[6]:

$$W = W[U^m(X,L;z,\varepsilon),U^f(X,L;z,\varepsilon);\Theta,z,\varepsilon] \tag{1}$$

where W is continous, increasing, and quasi-concave in egotistic utilities U^m andU^f. X represents a consumption vector of the household and L represents a vector of leisure. The subscripts m and f represent the male and female spouses respectively. Observed and unobserved household and individual characteristics are given by z,ε . Lastly, Θ is a vector of parameters that characterize the households distributional power which does not affect spousal preferences or the household budget constraint.

Now, in the first stage the household splits up non-labor income Y which can be thought of as accumulated household assets from the previous period. In the second stage, the individual spousal

[5]See Table 1 summary statistics.

[6]General Characterization adapted from Chiappori, 2002; Rangel, 2005

problem involves separately optimizing over the choices of private consumption and labor under the assumption of egotistic preferences. Assume φ denotes the share of non-labor income captured by the wife, analogous to a measure of bargaining power. In this case, $\varphi(p_f, p_m, w_f, w_m, z, \varepsilon, s)$ incorporates s, the introduction of the Khul divorce law as the extra environmental parameter that should affect the weighting factor of the wife. Thus, $\varphi = Y - \varphi^m$ and each individual's budget constraint can be assumed to take the form $p_i x^i \leq \varphi^i + w_i h^i$. Each spouse is assigned a fixed unit of time which is allocated between labor (h) and leisure (l); $l^i = 1 - h^i$. [7] Further, let p_i be the price of the spouse i's private consumption and w_i is the wage earned by providing labor.

Using the two stage representation we can write spouse i's efficient allocation as:

$$\begin{aligned} &\max_{x,h} U^i(x^i, l^i) \\ &s.t. \\ &p_i x^i \leq \varphi^i + w_i h^i \\ &l^i = 1 - h^i, \quad h^i \geq 0 \end{aligned} \tag{2}$$

Then, the spousal labor supplies for an interior solution have the form $\bar{h^i} = \lambda^i(w_i, \phi(w_m, w_f, p_m, p_f, y, s)$.

3.2 Model of Discrete Labor Choice

I assume however, that while m can choose hours of labor freely, f either chooses to participate ($h^f = 1$) or not ($h^f = 0$) . Let $\mathbf{P}$ denote the participation set - the set of wage,income, price bundles under which the female spouse does participate - $\bar{\mathbf{P}}$ the participation frontier and $\mathbf{N}_i$ the non-participation set of spouse i .

The participation decision of the female spouse is modeled in terms of a reservation wage (Donni, 2003). At this wage, it is expected that the wife is indifferent between working and not working and (solving (2)) this reservation wage at the optimum is defined as;

$$\bar{\gamma}^f(w_m, w_f, y, s) = -\frac{u_h^f(1, \varphi^f(w_m, w_f, y, s)/p^f)}{u_x^f(1, \varphi^f(w_m, w_f, y, s)/p^f)} \tag{3}$$

[7] The time endowment may be further broken down to include time spent on public goods such as household chores, child care but these are omitted in the context of this problem.

This above equation is the marginal rate of substitution between the leisure and consumption along the axis $h^f = 0$ for a given share of income φ^f / p^f predetermined in the first stage, which in this case is equal to x^f (similarly for the husband). For each member there exists a function $\bar{\gamma}^i(w_j, y, s)$ defined on $\mathbf{R}^2_{++}$ such that member i participates in the labor market if and only if $w^i > \bar{\gamma}^i(w_j, y, s)$ Consequently, $\mathbf{R}^3_{++}$ can be partitioned into four connected sets, illustrated by (modified version of Donni, 2003):

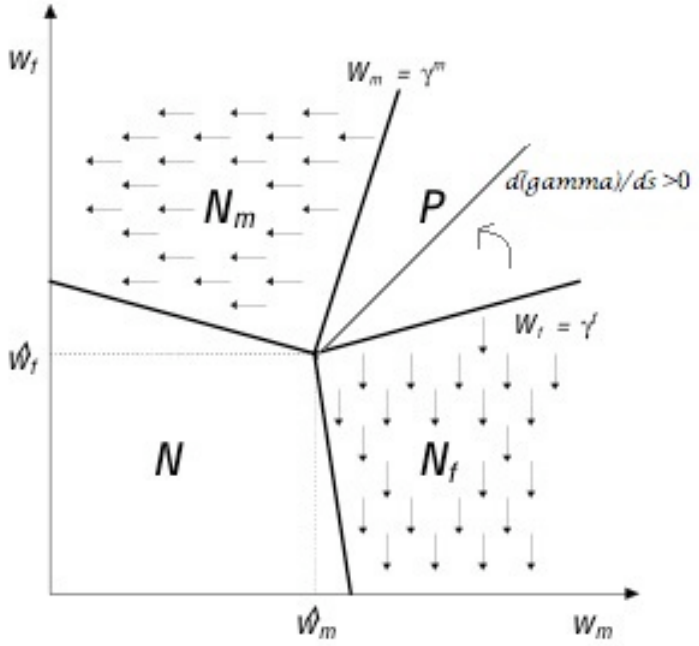

Figure 1: Participation and Non-participation Sets

As in the figure, spouses do not work when their respective market wage is below a given reservation wage and for a given (y, s) the participation frontiers of the husband and wife intersect at a single point. I derive, below a proof for the inverse relationship between increased bargaining power, as a result of Khul, and female labor force participation.

Theorem 1 *Assume that* $(w_f, w_m, y, s) \in R$ *where R is a partition of* $\mathbf{R}^3_{++}$ *defined by* $(w_f, w_m, y, s) \in R$ *if f* $\bar{L}^f \neq 0$ *or* $\bar{L}^m \neq 0$. ***IF*** $\frac{\partial \varphi^i}{\partial s} > 0$ *- that is the distribution factor increases the share of income controlled by spouse i in the first stage of the bargaining process- and if* $U^i_{h\varphi}(\cdot) \leq 0$, $U^i_{x\varphi}(\cdot) \leq 0$, ***THEN*** *the spouse's reservation wage* $(\bar{\gamma}^i(w_m, w_f, y, s))$ *increases. Therefore, the potential participation set* **P** *is smaller leaving fewer wage bundles over which the spouse chooses to work, and labor force participation declines.*

Proof. Suppose the law favors the female spouse. Along the participation frontier $h^f = 0$. Then taking the derivative w.r.t. s in equation (3);

$$\frac{\partial \bar{\gamma}^f}{\partial s} = -\left[\frac{[U^f_{h\varphi}(\cdot)U^f_x(\cdot) - U^f_h(\cdot)U^f_{x\varphi}(\cdot)]\frac{\partial \varphi}{\partial s}\frac{1}{p_f}}{[U^f_x(\cdot)]^2}\right] \tag{4}$$

Assuming $U^i_h(\cdot) < 0 \quad , U^i_x(\cdot) > 0, U^i_{h\varphi}(\cdot) \leq 0$ and $U^i_{x\varphi}(\cdot) \leq 0$ then, $\quad [-U^f_{h\varphi}(\cdot)U^f_x(\cdot) + U^f_h(\cdot)U^f_{x\varphi}(\cdot)] > 0$ which implies $\frac{\partial \bar{\gamma}^f}{\partial s} > 0$.

A shift in the divorce law is presumed to have a positive effect on the wife's bargaining power. If leisure is normal an increase in φ^f should increase the reservation wage of the wife (fig. 1) leading to a decline in the potential (w_f, w_m) bundles over which the female spouse works. Hence female labor force participation falls. Q.E.D

3.3 Alternate Framework

While the general theoretical illustration presented is based on a discrete choice model, as illustrated below it is possible to derive a similar hypothesis for women's labor under a continous framework with interior solutions. This is dependent on the assumption that marginal changes in individual female labor supply translate into an *aggregate average effect* - observed in the empirical analysis - on labor force participation. The utility function, say, of the wife is assumed to be:

$U_f(x^f, l^f) = \beta_f \ln x^f + \delta_f \ln(1 - h^f)$ [8] where $0 \leq \beta_f, \delta_f \leq 1$ and $\beta_f + \delta_f = 1$.

In this scenario I can solve for optimal labor and consumption using equation (2) and take the derivative of labor with respect to s, the change in the divorce law.

Suppose the equilibrium is fully interior then,

$$\frac{\partial h^f}{\partial s} = -\frac{\partial \varphi}{\partial s}\left[\frac{\delta_f}{\delta_f + \beta_f} \cdot \frac{1}{w_f}\right] \quad \begin{cases} \leq 0 if & \frac{\partial \varphi}{\partial s} \geq 0 \\ \geq 0 if & \frac{\partial \varphi}{\partial s} \leq 0 \end{cases} \tag{5}$$

The law is expected to have a positive effect on the wife's bargaining and at the household level this induces a reduction in female labor supplied which *in aggregate* translate to a lower level of fe-

[8] The Cobb-Douglas function was adapted from Eswaran and Anderson (2008). Results also generalize to Stone-Geary utility function form.

male labor force participation. While the impact of bargaining power of spouses is the most likely explanation for the correlation between divorce laws and household labor supply, there may be other explanations linked to socioeconomic or cultural factors (Ellman, Lohr 1998). If unobservable socioeconomic factors that affect spousal labor also affect widowed labor, no correlation between the divorce law and widowed labor should be observed, to justify the collective model.

The explicit use of distribution factors within the collective framework, introduced by Chiappori et al. (2002) play an important role in understanding the mechanism through which spousal labor and/or consumption decisions are affected in the household. It is necessary to observe that women's labor is theoretically substantiated to be affected by the divorce law via the indirect effect of the law on female bargaining power. The shift in bargaining power itself comes from the implicit change in spousal control over total household income driven by such factors as divorce laws, sex ratios. Chiappori et al. (2002) suggest, whenever the distribution factor under consideration (e.g., Khul divorce law) is favorable to one member (e.g., females due to divorce rights) then the respective weights in the decision process will be shifted in their favor. All else equal, standard income effects should lead to a reduction in female labor supply. [9]

4 Data

The data for empirical analysis comes from the Demographic and Health Survey for Egypt mandated through the USAID. I use waves 1995, 2000, 2005 and 2008 for which each survey period generates a repeated cross section drawn from a random sample of a representative population.[10] The survey data periods and fixed questionnaire design provide an ideal cutoff for the difference-in-difference estimation strategy. The Khul law was passed in 2000 but there is no reliable citing on when the law became effective. Based on empirical considerations, I treat 1995, 2000 as pre-treatment and 2005, 2008 as post-treatment periods.[11] Each survey period contains individual data ranging from

[9] Grossbard-Shectman, Neideffer (1997) find labor force participation and labor supply of married women decline due to an increase in the sex ratio. Angrist (2002) finds a similar result.

[10] The sampling frame relies on multiple stages of stratification. The strata are based on four major governate domains (shown in the empirical analysis) further divided into Primary Sampling Units (PSU). The units of selection are shiakhas/ towns in urban areas and villages in the rural areas. The PSU's are split into equal part segments and for each survey year, a systematic sample of households is chosen for selected segments.

[11] I assume that households adaptation to the law was not immediate due to information and adjustment costs. As will be shown in the empirical results (table 2), a bogus treatment is used to establish that no observable changes occured in the 2000 period and therefore justifies the use of this year as a pre treatment period.

approximately 14,460 to 17,970 observations for a sample of women between ages 15 - 49. In a household any women within this age range are eligible for face-to-face interviews. [12]

The treatment group used for the purpose of analysis is all formally married women. The Khul law technically only affects Muslim women. This constitutes roughly 95 percent of the sample. [13] Widowed women are used as a control group, as trends in behavior on outcomes prior to the law are expected and observed to run parallel. The sample of widows used was widowed at the time of survey and there are no remarried widows included in this subsample. Based on the variables 'year of first marriage' and the 'number of unions', I selected only women who had been married once and married prior to 2000 – the year the Khul law was passed. Similarly, the widowed sample chosen were married prior to the passing of the Khul law. However, there is no way to determine if potential selection into the control group may have been affected by women who chose to remain unmarried as a consequence of the law. There is no significant concern that the treatment could have had a large effect on remarriage rates of widows.

Except for the effects of the law, both groups of women are expected to respond to other policy and environmental changes in a similar manner. To the extent that widowed women may be affected by changes in marriage markets, as a consequence of the law, they may be a less than perfect control group. However, the features of the law do not suggest that there would be any effect on this group. The widowed sample also controls for possible changes in wages that may have occured in the post Khul regime. If for instance women's wages declined after the law then women would opt out of the labor force. Presumably no group of women is insulated from the change. Thus any wage effects are absorbed by the inclusion of the widowed control group. The subsample of divorced women is excluded from the sample for two reasons. Firstly, it is not possible to identify women who divorced as a consequence of the Khul law in the post-treatment periods. Secondly, divorced women are potentially different from married women along some unobservable dimensions of characteristics. [14]

[12] Egypt DHS are only carried out on female respondents in a private setting.The DHS data for women in Egypt is always restricted to women aged 15-49, taken to be the primary reproductive age for females. Thus, my analysis is limited to women within this age group.

[13] The data could not be separated into a married, muslim sample as the 'religion' variable was omitted from the 2000 survey due to survey size. The ATET is perceived as being inclusive of any spill over effects the law may have had on non-Muslim married women.

[14] This study does not examine the behavior in employment among married men as data on employment for this group is not available. Also, employment among married men cannot be used as a control as the law may have affected behavior of

One weakness of the paper is that the treatment and control groups do not consist of balanced samples. The survey aims to capture a representative sample of the population through regional stratified sampling. Given this structure of the survey, the fraction of widowed women is significantly smaller than the married women (Table 1). For each survey year only about 5 percent of the sample is widowed ranging from 645 observations to 776 observations per year. However, the sample is sufficiently large and the unbalanced nature of the sample is not a big concern as I am able to find desired significance in the results generated.

As detailed in the prior sections the primary focus of the paper is to understand the effect of divorce laws on a female spouse's labor force participation, which is assumed to negatively correlate with a shift in bargaining power within households. The economic outcomes used from the survey allow an examination of women's labor decisions at the extensive margin. The primary variable of interest being examined is 'works for pay' for the female respondent. This variable is created using 'currently working' and 'paid for work' variables. For a developing country such as Egypt, agriculture and informal services are important, especially for females, and so need to be combined in measures of labor participation. Survey questions used to create 'works for pay';

"As you know, some women take up jobs for which they are paid in cash or kind. Others sell things, have a small business or work on the family farm or in the family business. In the last seven days, have you done any of these things or any other work even if it was only for a short period of time?" and

"Are you paid in cash for this work or are you not paid at all?".

Approximately 90 percent of the 'currently working' sample was earning cash for work. For the 'works for pay' variable data was subdivided by household wealth level and female education. This tests the importance of the woman's financial autonomy at divorce on labor participation. The sample of women used throughout the data analysis, with some education, has completed schooling at the time of the survey. The data was stratified by household asset level above and below the sample mean. The DHS generated wealth index[15] classifies households as above and below a mean zero for each

this group.

[15]The wealth index used is created by the Demographic Health Survey using a variety of household assets and other components such as water sources, vehicles, flooring, walling, ownership of bank accounts. Using Principal Component Analysis procedure, an index is created that is normalized with mean zero and standard deviation one.

sample year. Further, households were assigned to poor, middle and rich categories for the bottom two, third and top two wealth quintiles respectively. The effect of the divorce law on labor is also tested for different levels of female respondent education. Education is stratified by no education and some education. The biggest portion of respondents fall into the no education criteria. Subdividing the data more finely would make control group samples too small and cause more concern over loss of power in the statistical analysis. Also, this stratification reflects an aspect of the Egyptian labor market in which individuals with no education are considered unskilled laborers.

For the subgroup of working women, I also analyze if married women were more or less likely to be self-employed or work for the family business compared to working for someone else. Finally, the empirical analysis examines the labor force participation decision for women stratified by agricultural jobs vs. non-agricultural jobs compared to not engaging in paid labor. Although the focus of this paper is on women in paid labor, I also perform a similar analysis that includes unpaid labor, by job type. While the number of women working in agriculture is roughly 22 percent, this analysis is done primarily as approximately 70 percent of those - a significant proportion - are not paid at all and thus inferred to be working on family farms or husband's plots. The additonal result allows for an understanding of changes in the bargaining position of women for whom labor may not equate with financial independence.[16] The dependent variables used in the study are dummy variables capturing the decision to work and type of work on the extensive margin.

The secondary focus of the paper is to understand the subsequent effects of the passing of Khul divorce law on child related outcomes. The outcome considered in the paper is child enrollment, whether a child is currently attending school. The purpose of analyzing this variable is to study variations within children birth order and gender on the relative growth of school enrollment. I would use this information to discuss the casuality of the change in the Khul law on the role of female bargaining in child resource allocation. DHS data shows an enrollment rate (in the 7 to 18 year age group) of 77.9 percent for boys and 69.9 percent for girls in 1995. This was a 8percent gender differential in human capital investment by gender in Egypt. However, by 2008 88.1 percent of boys relative to 87.5 percent of girls were enrolled in schooling. The present day gap has shrunk to a mere 0.6 percent. Conditional on this information, it is useful to emprically test the role a change in

[16]Unpaid labor is excluded from the main analysis as it does not reflect labor force participation. However, including all women, both paid and unpaid, in all analysis does not change the fundamental results.

autonomy married mother's post law on influecing this outcome.

Table 1 presents descriptive statistics for married and widowed women in the sample.[17] For all labor related outcomes of interest participation among widowed women is always strictly higher in level for each year. However, pre-treatment trends between married and widowed are parallel. Post-treatment directional trends are also the same for the treatment and control groups but the rates of change after the law differ. The behavior of widowed women mirrors the married women very closely in trend suggesting that the group serves as a good control.

The data indicates that compared to their married counterparts, widowed women are on average 8 years older as expected and T tests for the given years indicate a difference in means. However, the age gap between the two groups does not widen over time. Widowed women are also slightly less educated, less literate and come from fractionally smaller households than married women in all time periods. While T tests reveal a difference in means in married and widowed samples; again, the relative difference in education does not increase over time. There is no significant difference in wealth between the two groups except in the 2000 time period. By T test there is no significant differences between married and widowed households over time by region, except in 2008 in urban governate and frontier and in 1995 in the frontier region. The proportion of the population located in the frontier region is not large. There is no significant difference in household ownership of electricity or television between the two groups at any time.

5 Estimation Strategy

The empirical idea of this paper is to test changes in married female labor force participation that resulted from an important adaptation of a unilateral divorce law in Egypt. In the absence of the law the rate of change in labor force participation of married women should mirror that of widowed women. If there were changes in labor market conditions that affected female labor force participation these would be absorbed by the inclusion of the control group. The underlying assumption is that an increase in bargaining power for married women stemming from the creation of a threat option would

[17] High illiteracy rates for female respondents match statistics from UNESCO for 1995 and 2005. There was no external data compatible with DHS female educational attainment rates.

reduce the group's labor force participation as theory predicts.

Region level fixed effects are used to purge the data of fixed differences across regions and time year effects are used to control for average changes in labor force participation in the data period. The analysis is also done with the inclusion of region-year effects to control for policy changes, trends in employment -both agricultural and non-agricultural - that may have occurred at the regional level over time.

One could raise concern that observed treatment effects are not causal effects of the law but changes in employment conditions that affects only married women. There is no a priori evidence that married women somehow responded differently to working conditions than widowed women. However, this statement is qualified using a falsification test in the empirical estimation. Another cause for worry could be that the law affected only married Muslim women and so all married women should not be included. Approximately 95 percent of the population is Muslim and I anticipate that average treatment effect on Married women reflects the changes for this majority as well as any 'neighbor' effects the unilateral divorce law may have had on non-Muslim women.

For the estimation strategy[18]let T_{it} be the indicator function that takes on a value of one in the periods after the instigation of the Khul divorce law. T_{it} is one if t=2005, 2008. Let Y_{ij} be the outcome variable - a measure of female labor force participation - with j indexing the outcome of interest. Further, a dummy $D_i$is set to one for female in the treatment group i.e. Married. Then let $Y_{ij}(1)$ and $Y_{ij}(0)$ be the outcome, in terms of optimal labor allocation for the wife, when exposed to the treatment ($\triangle s \neq 0$) and not exposed to the treatment ($\triangle s = 0$) via the extra environmental change in the law. Hence the impact of the treament on the treated, where Z denotes other covariates;

$$\gamma_j(Z) = E[Y_{ij}(1) - Y_{ij}(0), D_i = 1, T_{it} = 1] \tag{6}$$

Observing these requires knowledge of the counterfactual of potential outcomes for the treated in the case of not receiving treatment during the specified treatment period. However, since there exists a sample of the population that does not receive the treatment, i.e. widowed, this group can be used as a means of modeling the counterfactual demand of the treatment group. Then the ATET in the post

[18]See Lundberg-Pollack (1997), Rangel (2004), Angrist-Pischke (2009)

treatment period medium time horizon for outcome j;

$$\gamma_j(Z) = \{E[Y_{ij} \mid Z_{i,}D_i = 1, T_{it} = 1] - E[Y_{ij} \mid Z_{i,}D_i = 1, T_{it} = 0]\}$$
$$- \{E[Y_{ij} \mid Z_{i,}D_i = 0T_{it} = 1] - E[Y_{ij} \mid Z_{i,}D_i = 0, T_{it} = 0]\} \quad (7)$$

Given the data and identification strategy discussed above the following estimation strategy is presented. Consider the following equation for outcome Y_j for woman i, in region k, at time t, with η_{ikt} capturing unobservable characteristics:

$$Y_{ijkt} = \alpha + \beta(D_i * T_{it}) + \gamma D_i + \delta_t + \mu_k + \mu_k * \delta_t + \Lambda X_{ikt} + \eta_{ikt} \quad (8)$$

where δ_t are time dummies, μ_k controls for differences across regions and $\mu_k * \delta_t$ are region-time level fixed effects that control for any region level changes over time. The X_{ikt} vector represents individual level characteristics. Separate time dummies are incorporated as opposed to the T_{it} dummy indicating post-treatment period to allow greater flexibility in the time trends over the specified periods.

The primary coefficient of interest in the above equation spanning data from 1995, 2000, 2005, 2008 is on $D_i * T_{it}$ reflecting the Average Treatment Effect on the Treated. In other words, the coefficient on this variable would denote the magnitude and direction of the effect of Khul divorce law on female labor participation based on the particular outcome being observed. For the primary outcome of interest - works for pay - the above estimation is also run for various stratified samples and broad occupation types of agriculture versus non-agriculture. The strata are developed by household wealth and education with the expectation that, as discussed, the effects of the law on household allocation decisions could vary for different 'types' of married women.

The next section presents the empirical results from linear probability models to test the effect of the creation of unilateral divorce in Egypt on married women's labor force participation. The years 2005 and 2008 are used as post treatment periods and widowed is used as a control group. The dependent variables used in the estimation are dummy variables capturing labor decisions on the

extensive margin.

6 Estimation Results

6.1 Average Treatment Effects on Female Labor Force Participation

Table 2 presents the estimation results of the Average Treatment Effect on the Treated (ATET) driven by the divorce law. The β coefficients of interest from estimation equation (8) are attached to the dummy variable 'Married*Post' for married women aged 15-49 in the post treatment periods 2005 and 2008. The dependent variable used in column (1) is works for pay, i.e. labor participation, and in column (2) is works for pay outside the household (away from home). Column (3) captures an additional effect on the variable self-employed conditional on working.

One plausible concern is that despite parallel behavior between the treatment and control groups, the results may pick up a treatment effect that is not a consequence of the Khul divorce law but rather an imbalance in characteristics between the two groups that drive the outcome. The other concern is that individuals may have adapted behavior, prior to the implementation of the law, in anticipation of the treatment. These concerns are mitigated by results from bogus treatments[19] presented in columns (4) - (6) of table 2. This falsification uses 1995 as the pre-treatment period and 2000 as the post treatment period acting as if the law was implemented sometime in-between. Any differences other than the difference in the levels and time trend between married and widowed would be captured by the coefficient on the 'married*post' variable. The absence of statistically significant effects and small coefficients on the 'Married*Post' variable of the bogus treatment suggests these concerns are not validated. This empirical evidence lends support to the hypothesis that household adaptation would not be effective in the immediate year following the passing of the Khul divorce law. The year 2000 can hence be used as a pre-treatment period to study labor effects.

For the outcome of interest I observe that among married women participation for paid labor after the law was 5.2 percent lower relative to widowed women. [20] Similar regression output is generated

[19] This empirical falsification test is adopted from Rangel (2004)

[20] It is important to note that inclusion of the region*year fixed effects did not alter the magnitude or significance of the coefficient of interest in any of the estimations.

excluding the group of women who work from home. Approximately 90 percent of paid female employees work outside the household, and as anticipated, selection into this group does not alter the results. Results of labor force participation for married women outside the household shows a 5.1 percent negative differential post law. The entrance of married women into the labor force remained flat, controlling for other such effects as regional, policy and children, while that of widowed women increased by more. In both cases, married women are more likely to stay out of the labor force as a result of the Khul law. This finding corroborates with predictions from theory and results of other studies (Stevenson, 2008; Rangel, 2004; Chiappori, 2002). Theory suggests that an increase in bargaining power generated by the creation of the divorce law would increase the reservation wage of women, reducing the potential set of wages for which they are willing to participate in the labor force. On aggregate this will translate into a negative Average Treatment Effect (ATE) among married women.

Column (3) of table 2 presents findings that there is a 6 percent increase in the fraction of self employed married women among those employed in the post periods. [21] The result is significant at the 10 percent level but this may be from a lack of power due to the smaller sample size of the control group. Married women are less likely to be both employed and self-employed than widows in level, as expected.

The regression results from Table 3 explores a stratification of the sample by household wealth levels. This indicates that the differential effects of Khul on married women differed across sub samples of the population. Women living in households with wealth levels below the sample mean were less likely to be employed by 6 percentage points compared to those widowed. Whereas, women from households with assets above the mean are likely to experience a 3.8 percent lower labor force participation rate compared to widowed. The finding implies that, as hypothesized, the external threat of divorce may have a larger impact on the bargaining position of women from less wealthier households. However, in order to probe the sensitivity of the results the data is further divided based on the distribution of wealth. Using wealth quintiles given in each sample year by the DHS, the poorest, middle and richest factions of the sample are represented separately. The ATET from columns (3), (4)

[21] Similar linear probability regressions were run seperately for dependent variables 'works for family' and 'works for someone else'. The results were insignificant and not presented in Table 2.

and (5) reveal that the law has significant, large effects - of magnitudes 4.7 percent and 6.3 percent respectively - on households in the poorest and middle wealth groups. The results imply that women in the middle of the wealth distribution experienced the largest gains in bargaining power. While a significant relative change in paid employment among the women from the wealthiest households is absent, I cannot reject the idea that the law affected this group. One potential weakness of the statistical analysis is the loss in power from subdividing the sample too finely by wealth.

Since the law was also expected to affect women depending on their education - which proxies for degree of autonomy at divorce - the same estimation strategy is employed for women with no education and those with some education individually. As shown in the descriptive statistics nearly half of both the married and widowed populations have no education. The sample of respondents with some education is not split by level of education, as the proportion of widowed falling into each group is too small for estimation. Table 4 examines the changes in bargaining position for women of different education levels. The results suggest that the response to the Khul divorce law is stronger among more educated women. Participation in paid labor of any form among women with some education is 6.7 percent lower given the treatment. The observed effects do not contradict expectations. This lends support to the contention that utility from reverting to the single state is higher for more educated women.

6.2 Is Married Women's Choice to Stay Out of the Labor Force a Signal of *More* or *Less* Bargaining Power?

To the extent that labor and leisure are substitutes and more leisure increases utility, a non-participation in labor is clearly beneficial to the female spouse. Theoretically an increase in bargaining power should translate into a transfer of income from husband to wife enabling the decline in wife's participation in labor markets. In other words, the wife's greater financial control after the law reflects in household decision making. However, there may be some minor concern that women's decision to stay out of the labor force stems from aggregate inefficiency. In other words, that the general trend of increased participation by women in paid labor over time is seen to be dampened for married women as a

consequence of the law may be counter-intuitive. There is a likelihood that the observed result may be viewed as an attempt by the husband to counteract gains in bargaining power to women due to the Khul law. [22] If at all, I consider this a second order effect of the law. The dampened rise in female spousal labor force participation driven by an increase in her implicit control of a share of household income is the primary (dominating) effect. There is no way for the husband to counteract gains to women from Khul, by theatening violence if the wife worked, for example, without increasing the probability that the wife would divorce.

The design of the law and the custom of dower in Egypt make it unlikely by deduction, as explained below, that the negative ATET in female labor force participation stems from husband control. If the observed effect on labor force participation were a perverse signal of a reduction in female bargaining power, then one would expect the effect to be more apparent for women with less education and consequently a weaker outside option. [23] The empirical results indicate a strongly significant 6.7 percent lower participation rate in labor for married women, relative to widowed, with some education and an insignificant change for women with no education respectively. That is, the strong negative ATET in labor force participation among more educated women - with a higher external threat factor - contradicts the idea that this effect is primarily due to husbands' attempts to control gains from Khul for women.

In addition, the effect of the law is found to be strongly negative, in relative terms compared to widowed, in labor for both middle class and poor women. One may hypothesize that men's reaction to reduce women's gains from Khul should be observed among the households' with mid level assets and not among the poor. This is because the poor women can't afford not to work and men in mid level households may be more able to support housewives. However, the empirical results show a 4.7 percent negative ATET in the poor group's labor force participation at the 5 percent level. This lends credibility to an explanation of greater bargaining power for women, especially poor women. Given the facets of the law, it is easiest for poor women to leave their husbands making them the group with the biggest threat towards male spouses. If husbands' reaction to reduce women's gains from Khul via

[22] This alternative explanation relies on an assumption that labor force participation may be a sign greater autonomy for the woman. Thus not working would be a negative consequence of the law. This explanation, however, cannot be justified as is explained.

[23] One caveat, however, is that a differential effect may not be observed for this group of women because in these households neither spouse can afford not to work due to low total household income. However, if this were the case, by a similar logic, we should observe no significant delcine in female labor among poor or below mean wealth households.

labor force participation were large, then I would not expect to observe a significant reaction among poor women. Rather, I should see significant non-participation in women's labor among wealthier women who stand to lose more assets if divorce were to occur. The empirical evidence suggests no significant labor effect on women from wealthy households, thus refuting an explanation of husband control and supporting a primary effect of gains in female bargaining power.

To examine differential labor trends for women by agricultural and non-agricultural sectors[24], an alternative specification is employed. In the sample, roughly 22 percent of all working women are employed in agriculture and of these only 31 percent work for pay. Further, 97 percent of all women in agriculture work at home. Estimation in table 5 focuses only on women working for pay by sector. Table 6 presents results for all working women, including those not receiving compensation, by sector. Both tables do not show any results in support of between sector switching , by agriculture and non-agriculture, conditional on working. This allows for a futher test of whether women switch out of the labor force into either sector.

Results of table 5 and 6 point to significantly higher non-participation in the labor force for married women, relative to their widowed counterparts, in non-agricultural jobs . The direction and significance of this finding complements the other results discussed above. No change in the agricultural sector for married women working for pay is found post Khul (table 5). However, this could be due to the extremely small sample size of women in agriculture actually working for pay. The inclusion of working women that do not receive compensation in the sample, also fails to reject the hypothesis that women who do not work for pay gain from the law. This provides additional information to exclude homogeneity in labor responses for women working for pay, compared to those working without compensation in mostly non-agricultural jobs.

In particular, the empirical finding adds further evidence to the analysis that the reduction in labor supply for women working for pay can be seen as a sign of increased bargaining power. This hypothesis is justified through the lack of an observed effect in labor supply for women working without pay. This implies female spouses who do not *'bring home a share of the bacon'* despite working on the farm already have a smaller bargaining share, and a fewer outside options, and therefore do not gain from the law. For example, one can imagine a situation where one woman works on the household plot in comparison to another woman working in an industrial job for pay. I would expect the woman

[24]Results are broadly divided into to agriculture and non-agriculture sectors as dividing more finely would not provide sufficiently large groups by married and widowed.

in agriculture to have less autonomy, all else equal, prior to the law. After Khul, the lack of a visible change in labor force participation among women working in agriculture is consistent with the prerequsite of a financial outside option for women to benefit from the law. On the other hand, for women working for pay, the negative ATET in labor supply can be explained by their existing outside threat of financial stability in the case of divorce. This increases their bargaining position within the household.

6.3 The Effect of *Khul* on Human Capital Investments in Children

Tables 7 and 8 and 9 provide some empirical evidence on the post divorce law effects on school attendance status of children of married women post Khul. Before observing this difference-in-difference effect, there are a few general sub-population trends that may be noted. As observed in Table 7, relative to widowed women, boys of married women, independent of birth order, are significantly more likely to be enrolled in school. The table also indicates significant increases over time in investment in human capital among both boys and girls. However, the size and scale of the increases are somewhat larger among girls. Simply, human capital investments in girls were accelerating faster than boys, as the former play catch up. This is not particular to Egypt and is a common trend among developing countries (Rangel, 2005; Duflo 2000). Of particular importance, the results in Table 7 point to a 2.2 percent differential increase in the probability on school attendance among first-born girls of married women after the law. In addition, while first-born male children do not show any incremental effect of the Khul law, growth in school enrollment among younger male siblings is almost 5 percent slower in comparison to counterparts with widowed mothers.

Table 8 and 9 show school enrollment status stratified by household wealth levels, child gender and birth order. The results in Table 8 show a 6.3 percent differential increase, significant at the 10 percent level, in the likelihood that a first born daughter from a household with wealth below the mean would be enrolled in school. There are no observed significant effects for first born girls from wealthier households or first born boys regardless of wealth. The findings paint an interesting story of the importance of increased female spousal bargaining power in financially constrained households' on shifting resources towards girls. However, as indicated Table 9 there is discrimination by birth order. Older girls are favored in school enrollment decisions of poorer households than youger girls, for whom no differential post law effect is observed. Table 9 also shows that the slower increase

in enrollment rates among younger boys of households affected by the Khul Law, roughly 6 percent slower, is indiscriminate of wealth levels. This could be, to a small extent, taken as evidence of a substitution effect in preferences for allocation of resources towards girls. It does not imply a pareto inefficiency in households' with married women post Khul. Girl welfare can be made better off at a faster rate than boys without reducing the resources allocated to boys.

7 Conclusion

Using Egypt DHS data this paper investigates the impact of an exogenous creation of a divorce law on married women's likelihood to engage in labor. I also introduce a discrete model of labor choice with distribution factors that form a theoretical premise of divorce law effects on labor force participation. Unilateral divorce for women in Egypt post 2000 is expected to improve the bargaining position of women. As per Coase theorem, a change in the assignment of property rights over terminating marriage is not required to lead to an increase in the likelihood of divorce. However, these changes could potentially lead to transfers in the allocation of resources within the marriage. The results favor the conclusion that divorce is a credible threat within Egyptian society, leading to changes in labor force participation that presumably correlate strongly with bargaining power within the household.

The difference-in-difference empirical estimation strategy reveals that women in marriages are much less likely to enter the labor force as a consequence of the law compared to their widowed counterparts. These results align with findings from similar studies (Stevenson, 2008; Rangel, 2004; Chiappori et al., 2002). The labor effects are shown to be strongest for women from moderately wealthy households with a significant negative ATET in paid labor also observed for women from poorer households. This is consistent with certain aspects of the law and theoretical predictions. Women from mid level and poorer households are expected to have very small, negligible prompt dowers recorded at the time of marriage. As a result it would be easier for poorer women to pay back the prompt dower and to exit a marriage at any time. At the same time, however, women from very poor households would have no assets to gain from the household's pot of unearned income at divorce. There is a higher probability that women from households with a moderate level of assets would walk away with gains, such as jewelry and furniture. In contrast, women from wealthier households could

stand to lose more due to a higher probability that judges order an evaluation of assets to determine the 'true' value of the prompt dower.

Findings on the impact of Khul on female labor force participation stratified by education are also supported by predictions. Women with more education have a higher likelihood of finding a job and being able to support themselves should marital dissolution occur. As expected, the significant non-participation in labor markets response was stronger for this group of women. Lastly, the empirical results by agriculture and non-agriculture sectors are consistent with the other findings. An interesting conclusion that can be drawn from these results is that only women working for pay may gain an increase in bargaining power. By contrast, women in the agricultural sector, most of whom do not work for pay, may not see a change in autonomy within the household.

The results of this paper contradict the notion put forward by Eswaran-Ramaswamy (2009) and Lundberg-Pollack (1993) that divorce is not a relevant threat to internal household bargaining, especially in developing countries. Unilateral divorce for women, where no prior law existed, potentially changes a woman's leverage inside the marriage without altering the efficient outcome from marriage to divorce. Proponents favoring models with internal threat points, such as a cash transfer from wallet to purse, argue that a non-cooperative bargaining outcome is invariant to changes in outside options. It is shown here that in fact even in less developed countries like Egypt, an amendment to a law can have a large impact on women's labor decisions. From a policy perspective the findings of this paper shed light on the effect of altering divorce laws, akin to *Khul*, which could be amplified if the law was supported by well-defined alimony laws favoring the female spouse.

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Table 1: Detailed summary statistics

	Married				Widowed			
	1995	2000	2005	2008	1995	2000	2005	2008
Dependent Variables of Interest								
Works for Cash [a]	0.156	0.151	0.164	0.146	0.201	0.206	0.265	0.229
	(0.003)	(0.003)	(0.003)	(0.003)	(0.015)	(0.015)	(0.016)	(0.017)
Self Employed [b]	0.144	0.100	0.141	0.214	0.420	0.350	0.313	0.355
(Conditional on working)	(0.007)	(0.006)	(0.006)	(0.008)	(0.038)	(0.037)	(0.031)	(0.039)
Works for Cash- By Wealth [Above mean] [c]	0.155	0.248	0.112	0.143	0.203	0.268	0.198	0.226
	(0.004)	(0.005)	(0.004)	(0.004)	(0.021)	(0.026)	(0.020)	(0.025)
[Below mean] [d]	0.157	0.065	0.204	0.147	0.199	0.164	0.331	0.231
	(0.004)	(0.003)	(0.004)	(0.004)	(0.021)	(0.017)	(0.024)	(0.022)
Works for Cash-By Education [No educ.] [e]	0.053	0.046	0.079	0.060	0.168	0.161	0.220	0.182
	(0.003)	(0.006)	(0.003)	(0.003)	(0.017)	(0.017)	(0.020)	(0.020)
[Some educ.] [f]	0.240	0.227	0.211	0.188	0.258	0.247	0.324	0.290
	(0.005)	(0.005)	(0.004)	(0.004)	(0.027)	(0.026)	(0.025)	(0.027)
Sample [a]	13718	13855	17192	14679	741	734	776	645
Sample [b]	2540	2383	3752	2365	261	163	227	152
Sample [c]	6993	6498	7499	6609	380	291	383	274
Sample [d]	6725	7357	9693	8070	361	443	393	371
Sample [e]	6417	5830	6108	4857	470	446	437	362
Sample [f]	7571	8025	11084	9822	271	288	339	283
Respondent Age	32.34	33.109	32.871	32.896	41.282	42.094	42.238	42.149
	(0.073)	(0.073)	(0.066)	(0.072)	(0.229)	(0.213)	(0.217)	(0.249)
Respondent Education – Proportion with No Education	0.448	0.421	0.355	0.331	0.634	0.607	0.563	0.561
	(0.004)	(0.004)	(0.004)	(0.004)	(0.018)	(0.018)	(0.018)	(0.020)
Proportion with Primary	0.237	0.179	0.156	0.121	0.269	0.236	0.204	0.175
	(0.004)	(0.003)	(0.003)	(0.003)	(0.016)	(0.016)	(0.014)	(0.015)
Proportion with Secondary	0.257	0.319	0.397	0.439	0.074	0.123	0.178	0.212
	(0.004)	(0.004)	(0.004)	(0.004)	(0.010)	(0.012)	(0.014)	(0.016)

Table 1 contd.

	Married				Widowed			
	1995	2000	2005	2008	1995	2000	2005	2008
Proportion with Higher	0.058	0.082	0.091	0.109	0.023	0.034	0.055	0.051
	(0.002)	(0.002)	(0.002)	(0.003)	(0.006)	(0.007)	(0.008)	(0.009)
Number of Household Members	7.195	6.639	6.372	5.888	5.825	5.338	5.447	5.141
	(0.035)	(0.032)	(0.029)	(0.027)	(0.132)	(0.109)	(0.121)	(0.131)
Respondent Literacy -								
Proportion Cannot Read	0.541	0.482	0.414	0.362	0.752	0.691	0.657	0.611
	(0.004)	(0.004)	(0.004)	(0.004)	(0.016)	(0.017)	(0.017)	(0.019)
Proportion Reads with Difficulty	0.097	0.078	0.062	0.071	0.085	0.101	0.072	0.082
	(0.003)	(0.002)	(0.002)	(0.002)	(0.010)	(0.011)	(0.009)	(0.011)
Proportion Reads Easily	0.362	0.439	0.522	0.567	0.163	0.207	0.267	0.307
	(0.004)	(0.004)	(0.004)	(0.004)	(0.014)	(0.015)	(0.016)	(0.018)
Proportion Households with Electricity	0.944	0.974	0.992	0.995	0.906	0.971	0.991	0.994
	(0.002)	(0.001)	(0.001)	(0.001)	(0.011)	(0.006)	(0.003)	(0.003)
Proportion Households with Television	0.796	0.911	0.934	0.954	0.709	0.855	0.924	0.940
	(0.003)	(0.002)	(0.002)	(0.002)	(0.017)	(0.020)	(0.010)	(0.009)
Wealth Index (mean)	-0.026	-0.062	-0.078	-0.072	-0.010	-0.234	0.005	-0.111
	(0.009)	(0.008)	(0.007)	(0.008)	(0.036)	(0.035)	(0.035)	(0.039)
Region								
Urban Governate	0.178	0.195	0.178	0.141	0.143	0.189	0.153	0.107
	(0.003)	(0.003)	(0.003)	(0.003)	(0.013)	(0.014)	(0.013)	(0.012)
Lower Egypt (Urban)	0.097	0.117	0.078	0.104	0.107	0.125	0.070	0.126
	(0.003)	(0.003)	(0.002)	(0.003)	(0.011)	(0.012)	(0.009)	(0.013)
Lower Egypt (Rural)	0.217	0.280	0.227	0.287	0.247	0.300	0.216	0.302
	(0.004)	(0.004)	(0.003)	(0.004)	(0.016)	(0.017)	(0.015)	(0.018)
Upper Egypt (Urban)	0.103	0.104	0.125	0.117	0.096	0.116	0.142	0.130
	(0.003)	(0.003)	(0.003)	(0.003)	(0.011)	(0.012)	(0.013)	(0.013)
Upper Egypt (Rural)	0.318	0.242	0.345	0.294	0.354	0.219	0.380	0.299
	(0.004)	(0.004)	(0.004)	(0.004)	(0.018)	(0.015)	(0.017)	(0.018)
Frontier	0.086	0.061	0.047	0.057	0.054	0.050	0.039	0.036
	(0.002)	(0.002)	(0.002)	(0.002)	(0.008)	(0.008)	(0.007)	(0.007)
Sample	13718	13855	17192	14679	741	734	776	645

Std. Error in Parenthesis

Table 2: Post divorce law effect on married women's labor

	Actual Treatment (2005, 2008 –post)			**Bogus Treatment (2000-post)**		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Var.	Works For Pay	Works For Pay (outside the household)	Self Employed (conditional on working)	Works For Pay	Works For Pay (outside the household)	Self Employed (conditional on working)
Married*Post	**-0.052*** **	**-0.051*** **	**0.060***	**-0.019**	**-0.020**	**0.009**
	(0.015)	**(0.014)**	**(0.003)**	**(0.020)**	**(0.019)**	**(0.048)**
Married	-0.026**	-0.011	-0.141	-0.045***	-0.028**	-0.119***
	(0.010)	(0.010)	(0.025)	(0.014)	(0.013)	(0.035)
2000	-0.037***	-0.033***	-0.020**	-0.025	-0.020	-0.029
	(0.004)	(0.004)	(0.009)	(0.020)	(0.019)	(0.047)
2005	0.012	-0.012	-0.088***			
	(0.015)	(0.014)	(0.033)			
2008	-0.030**	-0.028**	0.021			
	(0.015)	(0.014)	(0.033)			
Region*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	62294	62246	11752	29036	29037	5260
R-squared	0.190	0.202	0.165	0.226	0.236	0.242

Robust standard errors in parentheses, pre-treatment years 1995,2000, post-treatment years 2005, 2008

* significant at 10%; ** significant at 5%; *** significant at 1%

Controls of female respondent and household characteristics include; respondent age, education, literacy, number of household members, wealth index, electricity, television, regional dummies.

Equations (1), (2) look at the decision on the extensive margin of earning an income versus not. Equation (3) looks at the working woman's decision to be self-employed relative to working for a family member or someone else. There is no significant observed change in decision to work for someone else or family and hence these results are omitted. Equations (4),(5),(6) present a robustness check using 1995 as pre-treatment period and 2000 as post (placebo) treatment.

Table 3: The effect of the divorce law on labor supply stratified by HH wealth

	(1)	(2)	(3)	(4)	(5)
Dependent Var.			Works for Pay		
Wealth Strata	[Below Mean]	[Above Mean]	[Poor]	[Mid]	[Wealthy]
Married*Post	**-0.060*** **	**-0.038***	**-0.047****	**-0.063****	**-0.038**
	(0.021)	**(0.022)**	**(0.022)**	**(0.032)**	**(0.026)**
Married	-0.024*	-0.031**	-0.063***	-0.015	-0.004
	(0.014)	(0.016)	(0.016)	(0.021)	(0.017)
2000	-0.060***	-0.015**	-0.057***	-0.062**	-0.037***
	(0.005)	(0.006)	(0.005)	(0.009)	(0.007)
2005	0.022	-0.005	0.016	0.003	-0.035
	(0.021)	(0.022)	(0.022)	(0.032)	(0.026)
2008	-0.020	-0.043*	-0.019	-0.032	-0.081***
	(0.021)	(0.022)	(0.022)	(0.032)	(0.027)
Region*Year FE	Yes	Yes	Yes	Yes	Yes
Observations	33384	28910	24790	12146	25358
R-squared	0.173	0.210	0.109	0.129	0.232

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Poor, Middle and Rich strata created from wealth quintiles. The top two quintiles were assigned as rich, third quintile as middle and bottom two as poor. Controls of female respondent and household characteristics include; respondent age, education, literacy, number of household members, wealth index, electricity, television, regional dummies.

Table 4: The effect of the divorce law on labor supply stratified by Education

	(1)	(2)
Dependent var.	Works For Pay	
	[No Educ.]	[Some Educ.]
Married*Post	**-0.021**	**-0.067*****
	(0.019)	**(0.026)**
Married	-0.098***	-0.048**
	(0.012)	(0.019)
2000	0.006	-0.034**
	(0.015)	(0.013)
2005	0.052**	0.013
	(0.025)	(0.028)
2008	0.037	-0.027
Region*Year FE	Yes	Yes
Observations	24639	37655
R-squared	0.037	0.141

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Controls of female respondent and household characteristics include; respondent age, education, literacy, number of household members, wealth index, electricity, television, regional dummies.

Table 5: Post divorce law effect on married women's labor (paid): non- agriculture vs. agriculture jobs

Dependent var.	(1) Work for pay (agriculture vs. non-ag.)	(2) Not working vs. work for pay in non-agriculture	(3) Not working vs. work for pay in agriculture
Married*Post	**0.028**	**-0.099*** **	**0.010**
	(0.028)	**(0.028)**	**(0.009)**
Married	-0.010	-0.008	-0.030**
	(0.021)	(0.019)	(0.006)
2000	-0.013*	-0.077***	-0.002
	(0.007)	(0.007)	(0.001)
2005	-0.041	0.005	0.018*
	(0.028)	(0.028)	(0.009)
2008	-0.053*	-0.073***	0.014
	(0.028)	(0.028)	(0.009)
Region*Year FE	Yes	Yes	Yes
Observations	9790	61490	53210
R-squared	0.216	0.317	0.026

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Controls of female respondent and household characteristics include; respondent age, education, literacy, number of household members, wealth index, electricity, television, regional dummies.

Table 6: Post divorce law effect on married women's labor (paid and unpaid): non- agriculture vs. agriculture jobs

Dependent var.	(1) Working (agriculture vs. non-ag.)	(2) Not working vs. working in non-agriculture	(3) Not working vs. working in agriculture
Married*Post	**0.001**	**-0.097*** **	**0.012**
	(0.028)	**(0.029)**	**(0.001)**
Married	-0.064**	-0.002	-0.026**
	(0.022)	(0.020)	(0.007)
2000	-0.011	-0.082***	-0.008***
	(0.008)	(0.008)	(0.002)
2005	-0.061**	0.007	0.031***
	(0.028)	(0.029)	(0.011)
2008	-0.023	-0.083***	-0.013
	(0.028)	(0.029)	(0.011)
Region*Year FE	Yes	Yes	Yes
Observations	11716	59809	52967
R-squared	0.510	0.209	0.058

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Controls of female respondent and household characteristics include; respondent age, education, literacy, number of household members, wealth index, electricity, television, regional dummies.

Table 7: Post divorce law effect on child school enrollment status, (for children aged 7-18)

Dependent var.	(1)	(2)	(3)	(4)
	School Enrollment (0/1)			
	Female Child (first born)	Female Children (younger)	Male Child (first born)	Male Children (younger)
Married*Post	**0.022****	**-0.005**	**-0.032**	**-0.049****
	(0.010)	**(0.024)**	**0.036**	**(0.023)**
Married	-0.043	-0.013	0.047*	0.035**
	(0.028)	(0.017)	(0.027)	(0.018)
2000	0.070***	0.069***	0.043***	0.041***
	(0.012)	(0.007)	(0.011)	(0.006)
2005	0.067*	0.095***	0.073**	0.088***
	(0.037)	(0.025)	(0.035)	(0.026)
2008	0.065*	0.090***	0.053	0.067***
	(0.035)	(0.025)	(0.036)	(0.023)
Region*Year FE	Yes	Yes	Yes	Yes
Observations	7385	21841	8266	23157
R-squared	0.232	0.237	0.144	0.142

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Controls of female respondent and household characteristics include; respondent age, education, literacy, number of household members, wealth index, electricity, television, regional dummies. Controls for child characteristics; age, educational attainment (completed level), gender.

Table 8: Post divorce law effect on child school enrollment status by household wealth, (for children aged 7-18)

	(1)	(2)	(3)	(4)
Dependent var.	First Born Female		First Born Male	
Wealth level:	[above mean]	[below mean]	[above mean]	[below mean]
Married*Post	**-0.050**	**0.063***	**-0.002**	**-0.052**
	(0.034)	**(0.032)**	**(0.036)**	**(0.034)**
Married	0.011	-0.064	0.011	0.067
	(0.044)	(0.041)	(0.041)	(0.044)
2000	0.067***	0.070***	0.039***	0.034***
	(0.014)	(0.019)	(0.014)	(0.017)
2005	0.175***	0.021	0.055	0.021
	(0.056)	(0.050)	(0.056)	(0.054)
2008	0.137***	0.055	0.024	0.066
	(0.056)	(0.050)	(0.056)	(0.054)
Region*Year FE	Yes	Yes	Yes	Yes
Observations	3441	3890	3781	4433
R-squared	0.224	0.250	0.147	0.148

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%
Controls of female respondent and household characteristics include; respondent age, education, literacy, number of household members, wealth index, electricity, television, regional dummies. Controls for child characteristics; age, educational attainment (completed level), gender.

Table 9: Post divorce law effect on child school enrollment status by household wealth, (for children aged 7-18)

	(1)	(2)	(3)	(4)
Dependent var.	Younger Female Children		Younger Male Children	
Wealth level:	[above mean]	[below mean]	[above mean]	[below mean]
Married*Post	**0.048**	**-0.055**	**-0.064***	**-0.059***
	(0.037)	**(0.035)**	**(0.034)**	**(0.033)**
Married	-0.012	-0.017	0.034	0.044*
	(0.024)	(0.026)	(0.027)	(0.024)
2000	0.079***	0.054***	0.052***	0.034***
	(0.009)	(0.011)	(0.009)	(0.009)
2005	0.052	0.115***	0.111	0.084
	(0.038)	(0.035)	(0.034)	(0.033)
2008	0.047	0.128***	0.070**	0.086**
	(0.038)	(0.035)	(0.033)	(0.034)
Region*Year FE	Yes	Yes	Yes	Yes
Observations	10096	11655	10598	12489
R-squared	0.238	0.240	0.141	0.147

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%
Controls of female respondent and household characteristics include; respondent age, education, literacy, number of household members, wealth index, electricity, television, regional dummies. Controls for child characteristics; age, educational attainment (completed level), gender.