

# **Risk of Divorce and Labour Supply Behaviour of Women and Men**

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**Abstract:** This paper investigates the effect of an increase in the divorce risk on the labour supply behaviour of men and women. Previous literature has frequently used the gradual introduction of the unilateral divorce law across different states of the US to account for exogenous increase in the risk of divorce. In this paper we discuss that the legalization of divorce in Ireland in 1996 constitutes a better source of exogenous divorce risk. Then, we follow the labour supply behaviour of individuals who were married before the law passed. We apply a differences-in-differences approach where we use as comparison groups either married individuals in other European countries (who are not affected by the law) or married Irish people who were not affected by the increase in the risk of divorce caused by the law (for example very religious individuals).

# 1. Introduction

This paper investigates the effect of an increase in the divorce risk on the labour supply behaviour of men and women. The real wage growth has usually been considered as the main driving force of the increase in the women's labour supply in the post-war US and in the post-industrial countries (e.g. Smith & Ward, 1985; Blau & Kahn, 2006). Nevertheless, it is noted that in the second half of the 1970s (Parkman, 1992) and after the mid-1990s (Papps, 2006), female labour force participation in the US did not follow the fluctuations in the real wage growth: Women's employment rate continued to increase in the late 1970s and early 1980s although the real wage growth slowed-down during the same time period. On the other hand, it stagnated after mid-1990s; during a period when actually real wages grew at a high rate. Some studies suggest that the changes in the divorce rates might explain at least in part why female employment did not follow the real wage growth during these periods (Peters, 1986; Johnson & Skinner, 1986; Parkman, 1992, Papps, 2006). They claimed that part of the trends in female employment could be driven by married women's reaction to changes in the risk of divorce in these periods.

Indeed, many studies tried to link empirically the increasing rates of divorce and upwards trends of female employment after the Second World War. Noticeably, there is a difference between sociology and economics literature regarding the direction of causality relating these two trends. While the majority of sociology literature focused on the question whether increasing female labour supply affected the probability of divorce (see the review in Oppenheimer, 1997 and South, 2001), economics literature reversed the question and asked whether the increasing risk of divorce can explain the rise in female labour supply (e.g. Green & Quester, 1982; Johnson & Skinner, 1986; Parkman, 1992; Gray, 1995; Stevenson, 2007).<sup>1</sup>

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<sup>1</sup> Greenstein (1990) and Poortman (2005) can be examples of exceptions from the sociology literature since they consider the reverse relationship.

This potential endogeneity has become the point of criticism to many studies that derived the predicted future probabilities of divorce from the same data or that used a sample of actual divorcees (e.g. Greene & Quester, 1982; Johnson & Skinner, 1986; Gray, 1995; Montalto & Gerner, 1998; Sen, 2000; Papps, 2006)<sup>2</sup>. Although some of these studies applied various techniques to palliate the reverse causation problem (e.g. Johnson & Skinner, 1986; Gray, 1995; Sen, 2000, Papps 2006), often their remedies suffered from limitations: such as a cross-sectional research design (e.g. Greene & Quester, 1982; Johnson & Skinner, 1986) or few years of panel data that ignored “the cumulative nature of human capital over the marriage duration” (Papps, 2006; e.g. Gray<sup>3</sup>, 1995) or limited number of variables predicting the divorce probability (e.g. Montalto & Gerner, 1998).

In order to circumvent the endogeneity problem, a second group of researchers looked for an exogenous source of divorce risk. One popular strategy has been using the change in the risk of divorce triggered by the gradual introduction of the unilateral divorce laws in the US. The resulting variation in the divorce rates both across the states and over time is used in estimating the labour supply response of women (e.g. Peters, 1986; Parkman 1992; Gray 1998; Chiappori, Fortin and Lacroix 2002; Genadek, Stock and Stoddard, 2007; Stevenson 2008)<sup>4</sup>. Nonetheless, the extent to which the introduction of unilateral divorce law affected divorce rates remains controversial<sup>5</sup>. Some of the earlier studies claimed that the introduction of unilateral divorce law did not affect divorce rates at all (Peters, 1986, 1992; Gray, 1998; Glenn, 1997, 1999). However, recent evidence shows that unilateral divorce laws had a positive

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<sup>2</sup> These studies typically used either linear probability models to predict individual divorce risks or hazard rates of actual divorce. There are a few non-US examples of this research strand, i.e. Austen (2004) for Australia and Mueller (2005) for Canada, Poortman (2005) for Netherlands.

<sup>3</sup> Gray (1995) found no evidence for the role of the female labor supply on the divorce risk. Oppeheimer, 1997 summarizes the sociological literature and she also concludes that female employment does not increase divorce risk as predicted by “independence hypothesis” (i.e. female employment leads to a less degree of specialization in the marriage, which in turn, decreases the gains from marriage, and hence increases divorce risk)

<sup>4</sup> Kapan (2008) uses a similar law changes in UK (i.e. variation in England, Scotland and Wales.)

<sup>5</sup> For economics literature on this subject see (Freidberg, 1998; Gray 1998; Wolfers, 2006) and for sociology literature see (Nakonezny et al., 1995; Glenn, 1997, 1999; Rogers et al. 1999)

impact (e.g. Friedberg, 1998) on divorce rates though it has been small, immediate and not lasting more than 10 years (e.g. Wolfers, 2006).

Why should an increase in the risk of divorce trigger changes in the labor supply behavior? The explanation bears on Becker's (1981) standard economic specialization theory of the family: A rise in divorce risk may affect the returns to specialization within the marriage. In other words; divorce risk alters the returns to market work relative to domestic work. Such a change in the value of specialization might lead to direct changes in the labor supply behavior of both partners but especially for the female spouse (Stevenson, 2008). If today's labor supply affects the future earnings due to investment in market skills, learning by doing and on the job training... etc., then in divorce, the spouse with the lower wages will work more. In other words, the higher the probability of a forthcoming divorce, the higher the expected value of marketable human capital (Johnson & Skinner, 1986). This can also be partially due to lack of compensation, by most divorce laws, for the depreciation of the human capital during the marriage in particular to the spouse that specializes in the domestic work (Parkman, 1992).

Nevertheless, the existing property division laws or related legislations might influence labour supply behavior by either offsetting or exacerbating the effect of the depreciation of human capital. Two empirical studies; Gray (1998) and Stevenson (2008) took underlying property division laws into account and reached to contradictory conclusions. The former study found no effect of the introduction of unilateral divorce law on the women's labor supply and the impact of divorce law depended only on the existing legislations about the property divisions. On the other hand, Stevenson (2008) claimed unilateral divorce law increased the labour supply of women regardless of the property division. She suggests that who has the right to exit (i.e. unilateral versus mutual consent) affects the bargaining power in the marriage as well as outside options independently from the property division rules. It is this change in

bargaining power which may result an increase in the labour supply of the female spouse even in the absence of a change in the divorce risk.

Additionally, Chiappori, Fortin and Lacroix (2002) built a theoretical model of couple's labour supply behaviour and tested it using sex ratios and divorce legislations on a cross-sectional analysis. They found that when legislations are favorable to women, husbands have higher levels of labour supply and wives have lower levels of labour supply. Finally, Kapan (2008) adopting a similar approach but using British Household Panel Data found that property division laws affect labor supply decisions and the divorce legislations that are favorable to women reduce their labour supply. To sum up; not only the impact of introducing unilateral divorce-law on the divorce risk is controversial but also the labour supply response of women to the changes in the divorce laws is still contradictory.

Therefore, we propose that legalization of divorce in Ireland provides a better experiment for the exogenously-increased divorce risk. Our claim is based on two observations: First, we claim that legalization of divorce has unarguably increased the risk of divorce in Ireland (see the next section for the discussion). Second, the outcome of the referendum on the divorce legalization was not anticipated and therefore it was exogenous: The previous attempt to legalise divorce has been unsuccessful<sup>6</sup> and in 1995, the law passed only by a very slim margin. As a result, benefiting from the Irish quasi-experiment case, we provide further evidence on the labour supply response of the married individuals to the increase in marital instability.

Because most studies focus on women, how men's labour supply behaviour is affected by an increase in the divorce risk is largely neglected. Yet, the hypotheses about men's behaviour have also contradictory predictions. On one hand, we should not observe any changes in the current labour supply of married men if divorce risk decreases the value of

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<sup>6</sup> In 1986, a referendum to remove the ban on divorce was defeated. The "Yes" vote was only 36.5%.

specialization and increases the value of current human capital and labour market experience. On the other hand, divorce might imply negative economic outcomes also for men. It might suggest increases in the costs of living due to deviation from economies of scale. Divorce can also be costly due to expensive legal process and alimony payments. Therefore, in the anticipation of divorce men might also increase their labour supply in order to self-insure against an upcoming divorce<sup>7</sup>.

We have noted only three papers that consider men's behaviour explicitly. Kapan (2008) finds no change in husband's labour supply after the changes in the divorce laws in UK. On the other hand Chiappori, Fortin and Lacroix (2002), predict that men have higher labour supply if the property division law does not favour them. Mueller (2005) using individual divorce probabilities, claims that husbands increase labour supply about 20% in the anticipation of divorce risk in Canada. In sum, the empirical evidence on men's labour supply response to the changing divorce risk is also inconclusive and far from sufficient. Apart from identifying women's labour supply response to divorce risk, testing which of these predictions regarding to men's labour supply behaviour is observed in practice, is another contribution of this paper.

We use Differences-in-Differences estimation technique in order to isolate the effect of changes in the risk of divorce on labor supply behavior. We use three comparison groups; married individuals in other European countries (who are not affected by the law) or single Irish people or married Irish people who were not affected by the increase in the risk of divorce caused by the law (for example very religious individuals).

The rest of the paper is organised as follows. Section 2 outlines the data and methodology in two subsections. The first subsection gives information about the Irish divorce reform and discusses the nature of experiment. The second part describes control and treatment

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<sup>7</sup> Gonzalez and Ozcan (2008) suggest that one channel of such self-insurance might be increasing savings.

groups, sample and model specification consecutively. Section 3 presents the results of the estimations for all specifications and control groups. Finally, in section 4, paper ends with conclusions.

## **2. Data and Methodology**

### **2.1 The Irish divorce law and the risk of marital dissolution**

We propose to identify the effect of an increase in the risk of marital dissolution by taking advantage of the legalization of divorce in Ireland in 1996, which was followed by a rapid increase in divorce rates.

The Irish Constitution of 1937 banned the dissolution of marriage. After frequent debates over the issue, a referendum was called in November 1995, and the ban on divorce was removed after its opponents defeated its supporters by a very narrow margin of 0.6 per cent (Burley and Regan, 2002). The removal of the ban was subsequently incorporated in the Constitution in June 1996, and the new divorce law became effective in February 1997. Judicial separation was possible with the Irish Judicial Separation and Family Law Act adopted in 1989. New divorce law maintained the important features of the Separation Act especially regarding the economic consequences of the break-up.

The new law dictated that a divorce could be granted only after the partners had been separated during four out of the previous five years<sup>8</sup>. Either spouse can apply for a divorce. One spouse cannot prevent the other from a divorce as long as the court is satisfied with the grounds of the divorce application or that “proper” provision exists or will be made to exist for the spouses and/or any dependent children. The Irish divorce law grants maintenance to the former spouse upon divorce. The maintenance is meant to be life-long except when one of the spouses dies or claimant spouse remarries. In other words there’s no “clean break” in Irish

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<sup>8</sup> Judicial separation is not required for divorce.

divorce (Shannon, 2002). The Irish courts have a wide discretion on defining what is “proper maintenance” in a divorce. The courts take all the factors into consideration, including the contributions made by the two spouses (both pecuniary and non-pecuniary), earning capacity, standard of living, age difference...etc. There’s no explicit or standard calculation for maintenance or asset division. And as of 2005, Irish women are twice as likely to initiate divorce proceedings as men.<sup>9</sup>

The legalization of divorce increased rapidly the number of divorce applications filed as well as the number of divorces granted over the following years. Figure 1 displays the number of divorces granted between 1996 and 2004. In 1998, the second year after the law came into effect, about 1,500 divorces were granted. By 2004, more than 3,000 new divorces were granted a year.

Of course, it is possible that the new divorce law was merely allowing previously separated couples to provide legal burial to their already broken marriage. Our claim, however, is that the legalization of divorce in fact increased marital dissolution rates. In 1994-1995, only 1.78% of Irish adults aged 18 to 65 reported being separated or divorced (Living in Ireland Survey). In 1997-2001, this figure had jumped to a (significantly higher) 2.66%.<sup>10</sup> The next subsection provides additional evidence that certain subgroups of the population experienced substantial increases in the probability of separation or divorce following the 1996 law.

## **2.2 Treatment and Control Groups.**

In order to identify the effect of the increase in the risk of marital dissolution generated by the legalization of divorce, we have to find a source of variation in the increase in divorce risk across the population.

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<sup>9</sup> Irish Independent, 26th November, 2005

<sup>10</sup> The increase was from 3.45 to 4.33% for the ever-married adult population (also statistically significant).



Our first approach is to identify a subgroup of the Irish population that we can plausibly expect would be less affected by the legalization of divorce. One possibility is to use religiosity as a source of variation. It may be plausible to think that very Catholic families would be “less affected” by the legalization of divorce, given that the Catholic Church bans marital dissolution.

Table 1 shows the percentages of the adult population that reported being separated or divorced by religiosity, both pre (1994-95) and post (1997-2001) the legalization of divorce. Individuals are classified as religious if they report attending religious services at least once a week.<sup>11</sup> Before 1996, non-religious individuals were significantly more likely to be separated than religious ones (3.1% versus 1.2%). This difference remains after 1996 (4.3 versus 1.6%).

Moreover, religious individuals did not experience a significant change in their separation and divorce rate after 1996. However, the separation and divorce rate among non-religious adults increased significantly, from 3.06% before 1996 to 4.28% after (a 40 percent increase).<sup>12</sup> We conclude that it is plausible to claim that legalizing divorce affected non-religious individuals differentially, increasing their risk of marital breakup, relative to religious ones.

The additional identifying assumption is that the labor supply behavior of religious and non-religious households would have followed similar trends over time, in the absence of the law change. In section 3.1 we provide some support for this assumption by showing that the trends were similar for both groups in the years preceding the legalization of divorce.

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<sup>11</sup> Studies in the Economics of Religion typically use as measures of religiosity at the individual level either church attendance or self-reported religiosity (answers to the question “How religious are you?”), see Iannaccone’s 1998 survey. The main dataset does not ask about religiosity directly. However, the 2002 EES survey for Ireland asks about both church attendance and self-reported religiosity (on a scale from 0 to 10). Among those who report not being religious (values 0, 1 or 2), only 3.4% report attending church at least once a week, while the percentage is 82.1% among those who report being very religious (8, 9 or 10).

<sup>12</sup> This is even stronger if we look at separation and divorce rates among ever-married adults. While this rate remained stable at 2.3% among religious individuals, it increased significantly from 5.7 to 7.9% for non-religious ones.

It is of course hard to claim that religious families in Ireland were completely unaffected by the legalization of divorce.<sup>13</sup> Thus, we propose an alternative control group, composed of married couples in other European countries where divorce was already legal and no changes in the regulation of divorce took place during the 1990's. Although people in other European countries were certainly not affected by the Irish divorce law, we need to find countries that were plausibly under similar economic conditions during the relevant period. This is not easy given that Ireland experienced an unprecedented period of economic growth during the 1990's.

The three EU-15 countries with more similar economic conditions and trends in particular in terms of female employment to Ireland during the period appear to be the UK, Netherlands and Spain. Figure 2.a and 2.b display female employment rates and real GDP per capita growth rates between 1990 and 2001 in these countries. In all countries, GDP growth slowed down in 1990 and 1991, and then surged up, remaining at a higher level until 2000. That level, however, was about 8% for Ireland, compared with 4% for Spain, Netherlands and the UK. As for the female employment rates, they increased steadily in the all four countries from 1990-91 until 2001. While starting levels were different, both Spain and Ireland experienced around 15 points increase in the female employment rate; the Netherlands around 12 points and UK around 5 points.

Although there are some differences in macroeconomic performance across the four countries, the trends are similar enough to allow for the use of Spain, Netherlands and the UK as alternative control groups. Again, in section 3.2, we provide additional evidence that labor supply behavior displayed similar trends in the three countries in the years before the Irish reform.

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<sup>13</sup> In that sense, our estimates when using religious families as a control group can be seen as lower bounds on the effect of interest.

Finally, it may be possible to use singles as a control group as well, especially since single individuals are less affected by the increasing divorce risk and at the same time they are exposed to the identical economic conditions as the married individuals.<sup>14</sup> Our singles group includes individuals who were continuously single (i.e. either never-married or widow) over the whole time period. We followed two different strategies for singles: First we compared non-religious married women and men to all singles and to religiously married individuals. In the second strategy our treatment group consists of all individuals who are married before the 1996 and they are compared to all singles without the religiosity breakdown.

### 2.3 Econometric specification, data and sample

More formally; we estimate the versions of the following baseline specification:

$$LS_{ijt} = F(\alpha + \beta_1 T_j + \beta_2 Post_t + \beta_3 T_j Post_t + X'_{ijt} \gamma + \varepsilon_{ijt})$$

Where LS is a measure of the Labour Supply Behaviour (see next subsection for the specific variables used) of an individual  $i$  in group  $j$  (treated or control) and year  $t$ . The function  $F$  will depend on the specification (Linear probability model and Tobit models are estimated).  $T$  is an indicator for individuals belonging to the treatment group (either non-religious Irish people or all Irish, depending on which control group we use), while  $Post$  takes value of 1 for all years after divorce was legalized in Ireland. An interaction between  $T$  and  $Post$  is also included, and  $X$  stands for a set of control variables that are likely to affect labor supply, such as age, education and household size.

The coefficient  $\beta_1$  measures the average difference in labor supply behavior between the treatment and the control group, while  $\beta_2$  captures the overall change in labor supply

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<sup>14</sup> It may be hard to claim that singles are totally unaffected by the increasing divorce risk, since it may affect their expectations about the duration of possible marriages leading them invest more on market work.

behavior after the reform. The key parameter is  $\beta_3$ , which indicates the change in the labor supply behavior of treated individuals after the reform, relative to the control group.

The data sets used in the analysis are the Living in Ireland Survey for the Irish sample and the European Commission Household Panel survey for the four-country sample. Both data sets are longitudinal household surveys that cover the period 1994-2001.

The sample is composed of married individuals. In order to avoid the effects of potential selection into marriage (since the legalization of divorce may well affect the incentives to marry), we exclude couples whose marriages took place in 1996 or later. In order to avoid selection due to separation or divorce, we exclude all individuals that are observed getting separated or divorced at any point during the survey. Thus our sample is in practice composed only of “stable marriages that started before 1996”. We include individuals of all ages up to 65 in order to exclude retired individuals. We also try specifications where we drop years 1996 and 1997 from the sample, since this was the period during which the reforms in the divorce legislation were being implemented, thus we consider them as transition or adjustment years that are not included as either pre or post-reform in the analysis. As a result, our pre-reform years are 1994 and 1995, while the post-reform period spans 1998-2001. After all, the sample size becomes about 3188 married men and 3352 married women in the Irish sample.

We used two dependent variables to measure the labour supply behaviour for the Irish sample at the individual level. They are called “Employed” and “Total Hours”. “Employed” is a binary variable which takes the value 1 if an individual reports his/her main status as “currently employed”. “Employed” includes people who are currently working at least 15 hours a week but additionally it also includes the cases where individual is working less than 15 hours temporarily due to sickness leave, maternity leave...etc. “Total hours” is a continuous dependent variable that measures total hours worked per week. This measure includes all the

market work including the ones spent in the second job. For our four-country analysis; we use the dependent variable “work” instead of “employed” because of comparability problems. “Work” indicates whether the individual is currently working at least 15 hours in a week.

From figure 3.a to 3.d show the pre and post reform trends of the labour supply variables in the Irish sample for women and for men respectively. Although the pre-reform period is short, the trends of the dependent variables for both treatment and control groups before the divorce law are very similar.

## **3. Results**

### **3.1 Religious families as control group**

#### ***3.1.1 Descriptives***

Table 2a and 2b shows some descriptive statistics for the Irish men and women samples, separately for religious and non-religious individuals, and for the pre and post-reform years. Religious individuals are defined as those who report going to church more than once a week in all interviews, thus the religiosity indicator is time-invariant for a given individual.

Note that religious women are less likely to work and more likely to spend less hours on market work than non-religious ones. Even though the difference is smaller (and insignificant), religious men are also slightly less likely to be employed than non-religious men and spent less hours in market work than nonreligious men. In 1994-1995, 25% of religious women reported being currently employed, compared with 36% of non-religious ones. Among religious men; around 78% of them reported working in the pre-reform period as opposed to 80% non-religious men. The proportion of employed men in pre-reform period was stable for both control and treatment group, while the proportion of women increased slightly.

Perhaps the most striking difference is the average age between the groups. Non-religious women and men are younger than religious ones (by about 6 years on average), have slightly more education, and live in households with similar size with religious women. Thus, it might be important to control for these factors. The proportion of women that reported being employed and their number of hours spent at work increased for both treatment and control groups after 1996. While these figures stayed relatively stable for religious men, they exhibited a slight increase for non-religious men.

The Irish experiment is strong and we are interested only total hours of worked and employment rate. Therefore, other than the mentioned variables, we don't include any other control variable. Except in one case where we tried a specification with real wage (not reported). Adding real wages as a control variable did not affect our results. Probably it is because we are looking at changes for a given individual over time and the Irish divorce case probably did not affect wages directly. We exclude this control from the final specification since it is probably endogenously determined. However, we use individual fixed effects to control for unobserved time-invariant individual characteristics in the estimations.

One important complexity in diff-in-diff estimations is distinguishing the effects of pre-existing trends from the dynamic effects of the treatment (Wolfers, 2006). An example of it in the Irish case can be the economic boom experienced in Ireland during the 90s. If the occupations are highly segregated by religiosity in the pre-reform period, this might result differentiated earnings growth in treatment and control groups during the economic boom. Consequently, one may confound the effect of divorce law and pick up the differential wage effects which were happening around the same time period on labor supply. When we controlled for wages, the results did not change. Yet, it might be informative to look at occupational class in religious and non-religious individuals. We found that both samples have very similar occupational class distributions in general (not reported). The differences are

negligible. For example while the percentage of semi-skilled manual worker women appears to be slightly higher in the non-religious group (not significant). Furthermore we found close to a zero correlation between religiosity and belonging a particular occupational class (0.005,  $p > 0.000$ ) in Ireland before the reform.

### **3.1.2 Results**

The regression results for women are reported in Tables 3.a and 3.b respectively. In these tables treatment group is; “individuals living in non-religious household”. Table 3a shows the results for continuous dependent variable “total hours worked”. Models 1 to 3 uses religious married individuals as a control group model 4 and model 5 includes singles as additional control groups. Different specifications have been reported, the first model shows a linear probability model with basic demographic controls. The second model estimates the same specification with individual fixed-effects. Model three uses the random effects Tobit estimation for the weekly total hours worked.

The negative sign of the coefficient of treatment\*post interaction shows that, after 1996, non-religious women decreased their labor supply in terms of working hours significantly more than the religious ones. Different specifications with added control variables or applying fixed effects have not changed these results substantially. However, some of these control variables might be endogenously determined; therefore the results should be interpreted with caution. Furthermore, we found that the married women in non-religious households also reduced their market work hours relative to single women.

In all these specifications, we tried to control the presence of children under 12 years-old in the household with a binary variable. It yielded very similar results to the models where we used household size instead. Because the variable “children” is only available after the first wave, it reduced the sample size and the overall models had slightly poorer fits. We also don't

report here the coefficient of the control variables, but vast majority had been significant at the 99% level.

Table 3b shows the results for our binary dependent variable “employed”. Again, columns 1 to 3 show the models where control group is the married women in religious households. Models 4 and 5 use singles as the only control group where all the married women becomes the treatment group. Finally, model 6 uses both married women in religious households and singles as control groups. Again except for the last specification, all models estimated a negative coefficient for women in the treatment group after the reform although coefficients are only significant at the 90% level. In model 6, the effect of being in the treatment group after the law has been positive but very small. We can conclude that over all women in the treatment group are less likely to be employed after the reform than the ones in the control group, by about 5 percentage points<sup>15</sup>.

We also experimented with different clustering strategies in the individual-level specifications, to consider whether the relevant variation is over time and by group (treated versus control). This lead a reduction in the significance of the estimated coefficients, as one would expect.

Notice that non-religious married men are significantly more likely to be currently employed than the married men in the religious households, by about 2 percentage points. They also spend more hours in the main work. However, these results are not consistent in all specifications. When singles are used as the only control group, the coefficients change their sign. Thus, married men after 1996 are less likely to be employed when compared to all singles. Yet, when we compare them to singles and to the married man in the religious households together, we find that they are still more likely to be employed after the law.

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<sup>15</sup> These percentage point figures are marginal effects and are only calculated for model 3. Since marginal effects cannot be calculated for the individual fixed effects model on the binary dependent variables, we reported the logit coefficients for model 2.



In sum, after the divorce law in Ireland while married women in non-religious households decreased their labour supply, married man in non-religious household increased their labor supply as compared to their counterparts in religious households and to singles. This finding is consistent with the findings of Chiappori, Fortin, and Lacroix (2002) for the US when they consider the property sharing rules. Parkman (1992) suggested that the absence of unilateral law, divorce process required some sort of bargaining with the spouse and usually where female partner has the chance to negotiate for a compensation for her depreciated human capital in the marriage. Our results are in line with these suggestions since Irish divorce law is not a unilateral law and property sharing rule is based on court decision, in other words ambiguous for the partners.

## **3.2 Spain, Netherlands and the UK as control groups**

### ***3.2.1 Descriptives***

Tables 4a and 4b show some summary statistics by women and men respectively, for the four-country sample, separately for Ireland, Spain, Netherlands and the UK and including the pre and post-reform periods. Pre-1996, women's employment rates were much higher in the UK than in Ireland, Spain or Netherlands (59% compared with 34 %, 29% and 40% in 1995). Before the reform, the female employment rates were already increasing in all countries, although the increase was particularly steep in Netherlands. In terms of total weekly hours, female labor supply was highest again in the UK and clearly increasing for the rest of the three countries after 1996.

We don't observe big differences in the rest of the demographics among these countries. The age profile is similar in the all four countries. Household size was highest in Ireland and Spain follows it closely. UK and Netherlands are somewhat lower than Spain and have very similar average household size.

Pre-1996 shows a similar pattern for men in all countries. Although, UK has not the highest employment rate for men in this period, except Spain the employment rates of the Netherlands, Ireland and UK are very similar (around 80 %). Before the reform, the employment rate among men has been increasing very slightly in all countries. The number of hours spent in a week in the main job, decreased a little in the UK, while it increased somewhat in other countries.

Average age of men does not differ significant among our control countries. Overall after the reform, both the proportion of men who work and the number of weekly hours spent in the main job increase in all countries including Ireland.

### **3.2.2 Results**

The regression results for the four-country sample are reported in tables 6 and 7. In table 6, columns 1 to 3 show the results where our treatment group is married Irish women and the control group is married women in other countries. Model 1 shows the Tobit model with basic control variables. Model 2 reports the OLS estimations and includes the same control variables. The total hours of worked by married women in Ireland show similar patterns as in the non-religious sample.

After 1996, the likelihood that married women's weekly working hours decreased in Ireland increased, relative to the married women UK, Netherlands and Spain, and this effect is significant in the specifications where we allow the error terms to correlate over time. Their labour supply decreased even when we compare them to singles in all four countries.

For men results have not been consistent across specifications and the definition of control groups. Model 1 shows the simple differences in means. There is no significant difference in means with the married men in Ireland and married men in other countries after 1996. Other models use Tobit and OLS, FE estimations respectively. As usual, the last

columns show the case where we use singles as a control group additionally. While both conditional and unconditional fixed effects estimations give positive sign indicating a higher amount of work for married men in Ireland, Tobit estimation resulted a negative prediction. Overall, 1996 divorce reform did not generate a significant increase in the labour supply of married men in Ireland when we use other countries as controls. We conclude that labor supply behavior of men has been positively (although weak evidence) and women labour supply behavior has been negatively affected by the increase in divorce risk in Ireland after 1996-97, relative to the control countries.<sup>16</sup>

## **4. Conclusions**

We have shown that, between 1994-95 and 1998-2001, the labor supply of women increased significantly in Ireland. But this increase was significantly less among non-religious individuals, compared with religious ones. The impact of divorce law was also more pronounced among women than men. The increase in labor supply of married women in Ireland was also significantly less than in other European countries over the same period.

We claim that the reason for this decline in the rise of labour supply of married Irish women is the legalization of divorce that took place in 1996. On one hand, it increased the risk of marital breakup, especially for non-religious families. On the other hand, the higher divorce risk was mediated through an ambiguous sharing rule and the required consensus for divorce. Overall, women appear to have less worried for the depreciation of human capital. The results for women are consistent with the findings of the recent literature that takes into account property sharing rules and household bargaining.

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<sup>16</sup> Note that the Irish sample includes both religious and non-religious households. Thus, if religious families are less affected by the divorce law, the estimated coefficient would be underestimating the true effect on the treated group (non-religious households). Unfortunately, the ECHP does not include any religiosity variables, so we cannot separate religious from non-religious families in Spain and the UK.

Additionally, we observe an increase in the labor supply of men after the introduction of the divorce law in Ireland. Non-religious men have increased their labor supply significantly more than the religious men. Also married Irish men after the divorce law increased their labor supply more than married men in other countries. Economic specialization hypothesis suggest no role to the rising divorce risk on the labor supply of men. However, our results imply that men also try to self-insure themselves against divorce. This suggests that divorce legislation may affect not only marital breakup rates and the income of individuals directly affected by a divorce, but also the economic behavior of individuals who stay married, who may adjust to the change in the risk of future marital separation. One channel of adjustment is likely to be labor supply.

Divorce rates in the US have been at the highest levels during the early 80s and it is exhibiting a slight declining trend since then. If the divorce risk had positively affected female labor supply, then in the long run we would observe a decline in the female labour supply. Our study suggests that this might not necessarily be the case since the positive relationship between the divorce risk and female labour supply is contingent on the underlying property sharing rules.

Some caveats of this analysis are worth mentioning. First, we lack a true control group, thus our analysis uses alternative “comparison groups”, but the results may understate the true effect if the comparison group is also partially affected by the legal change. This might be especially true if religiosity itself affects labor supply of married women as indicated by Lehrer (1995). In that case again, our estimates might be on the lower margin. And secondly, we only have access to two pre-reform years, and are thus unable to control for long-term pre-reform trends, which would strengthen our identification strategy. These caveats suggest that the results should be interpreted with caution. Further strategies might be required to confirm their robustness. We are also working on a number of additional robustness checks, such as macro

(aggregate-level) estimations, different religiosity measures using church donations etc. Preliminary results of these checks, though not reported yet here, appear to be in the same line with our findings.

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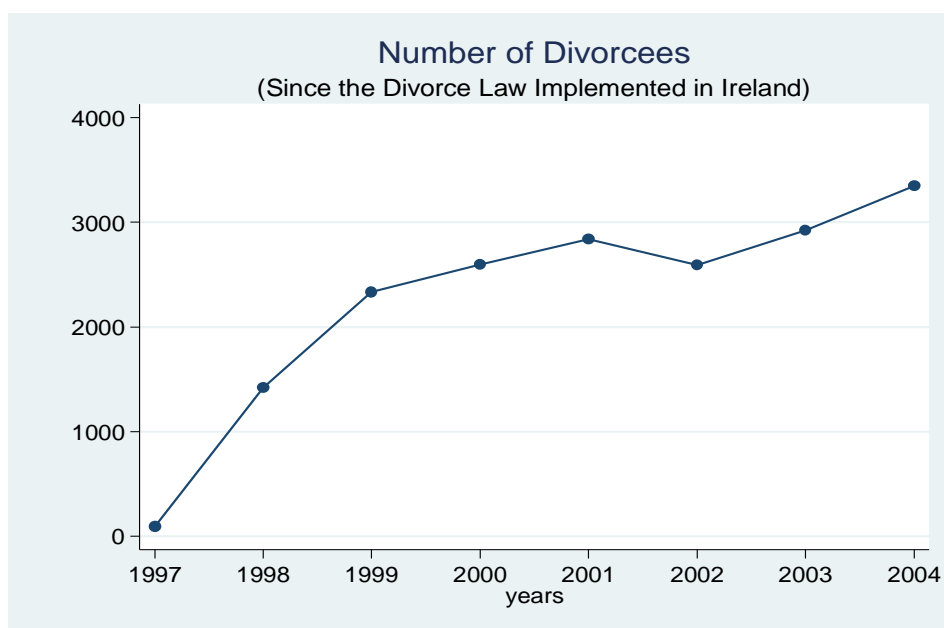
Rodgers, Joseph Lee., Paul A. Nakonezny, Robert D. Shull.1999. Did No-Fault Divorce Legislation Matter? Definitely Yes and Sometimes No, *Journal of Marriage and the Family*, Vol. 61, No. 3 , pp. 803-809

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**Figure 1. Annual Number of Divorces, Ireland 1996-2004**



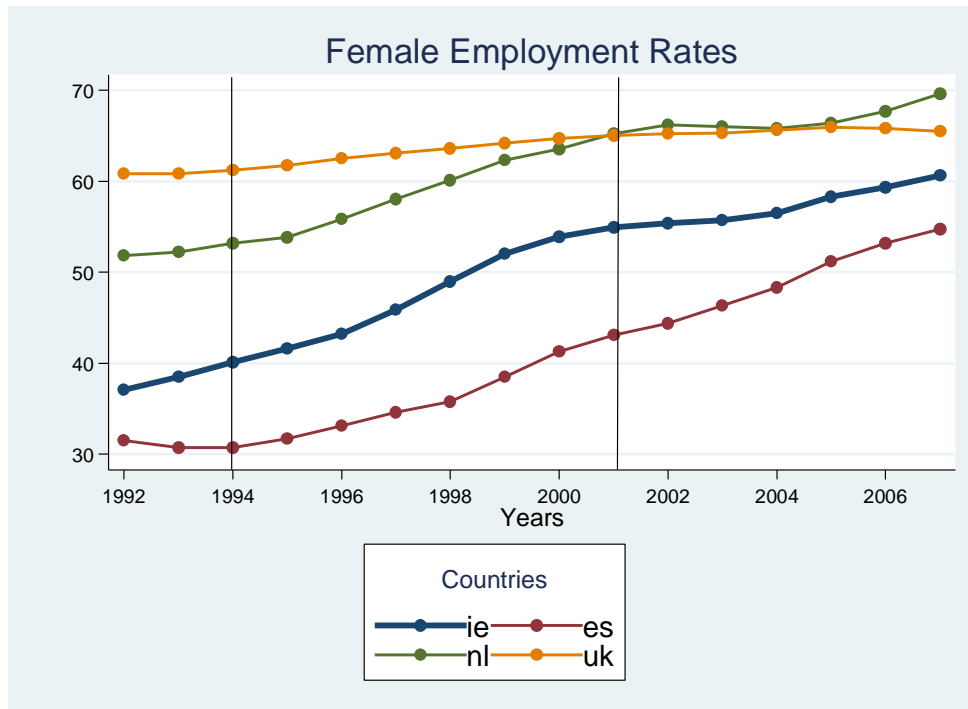
**Table 1. Separation and divorce rates by religiosity, Ireland 1994-2001**

	1994-95	1997-2001	Difference
Religious	1,181 (0,108)	1,552 (0,124)	0,371 (0,164)
Nonreligious	3,059 (0,172)	4,278 (0,202)	1,219 ** (0,265)
Difference	1,878 ** (0,203)	2,726 ** (0,237)	0,848 ** (0,312)

Note: The main body of the table show the percentage of the population aged 18 to 65 (by religiosity) who reported being either separated or divorced in each time period. "Religious" is defined as "attends church at least once a week". One asterisk indicates significance at the 95% level, two indicate 99% significance.

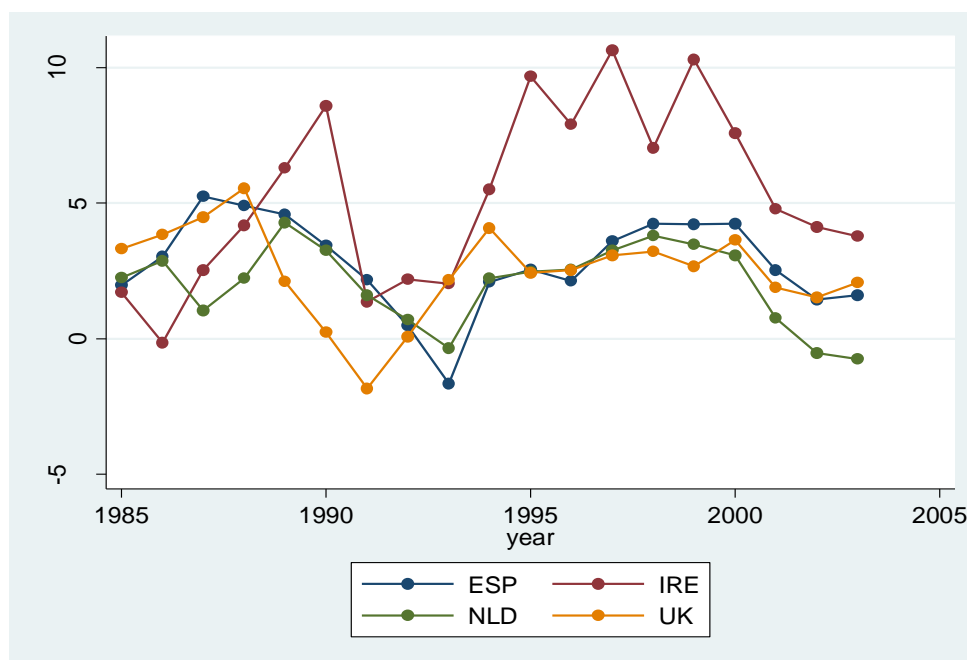
**Figure 2.a. Female Employment Rates, Ireland, Spain, Netherlands and UK (1991-2001)**





**Source:** EUROSTAT. “The female employment rate is calculated by dividing the number of women aged 15 to 64 in employment by the total female population of the same age group. The indicator is based on the EU Labour Force Survey. The survey covers the entire population living in private households and excludes those in collective households such as boarding houses, halls of residence and hospitals. Employed population consists of those persons who during the reference week did any work for pay or profit for at least one hour, or were not working but had jobs from which they were temporarily absent.”

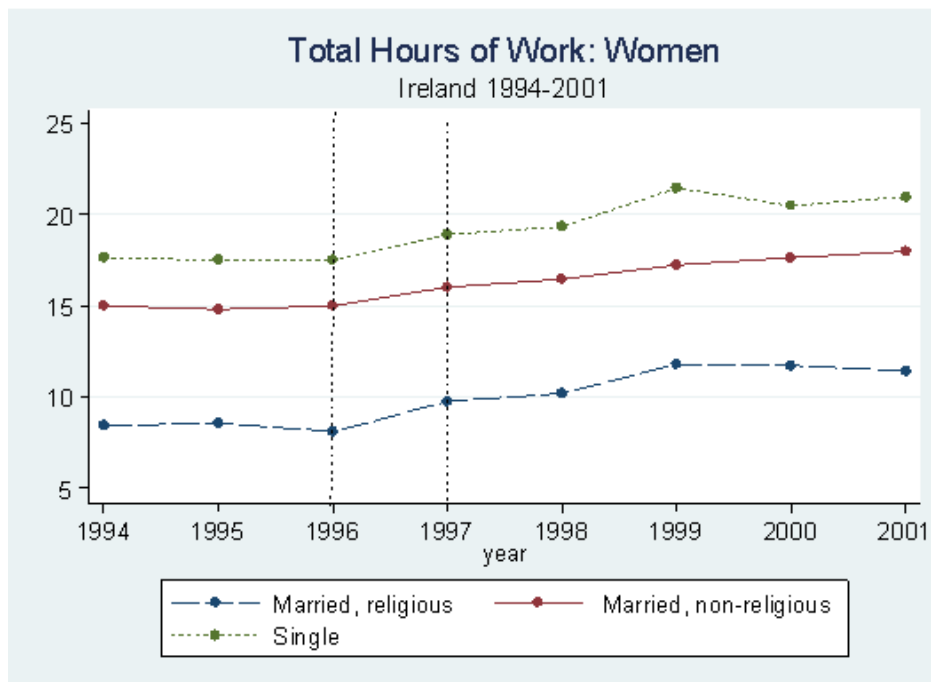
**Figure 2.b. Growth rate of real GDP per capita, Ireland, Spain, Netherlands and UK (1985-2004)**



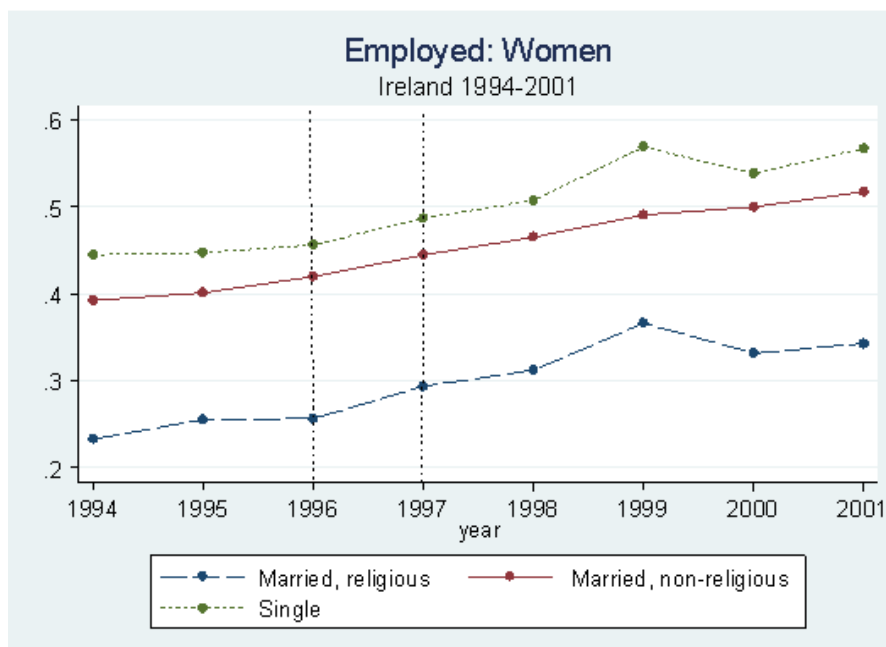
Source: Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006.

### Figure 3. Labor Supply Measures.

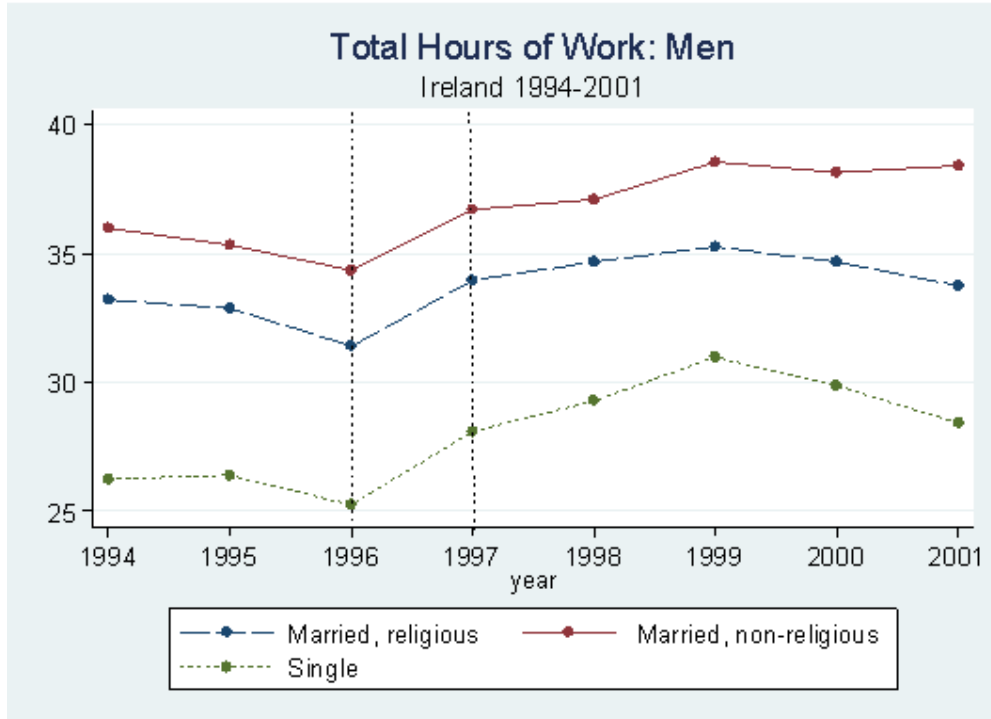
#### 3.a. Total Hours of Work: Women



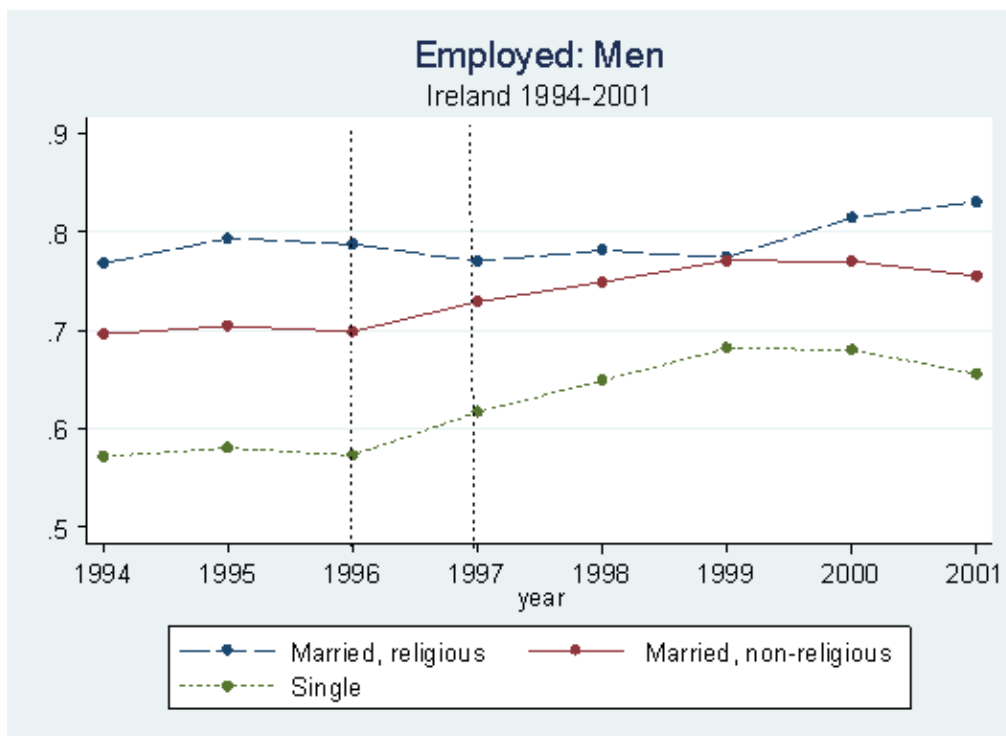
#### 3.b. Currently Employed: Women



3. c. Total Hours of Work: Men



3.d Currently Employed: Men



**Table 2.a. Summary statistics, Irish Married Sample: Women**

<b>Married WOMEN</b>				
	<b>Religious</b>		<b>Non-religious</b>	
	<b>pre(1994-1995)</b>	<b>post (1997-2001)</b>	<b>pre(1994-1995)</b>	<b>post (1997-2001)</b>
<b>Total Hours</b>	8.22 ( 14.62 )	11.02 ( 15.93 )	12.61 ( 17.88 )	13.51 ( 17.15 )
<b>Employed</b>	0.25 ( 0.43 )	0.33 ( 0.47 )	0.36 ( 0.48 )	0.41 ( 0.49 )
<b>Age</b>	50.25 ( 9.58 )	51.25 ( 8.98 )	43.30 ( 10.20 )	46.36 ( 9.61 )
<b>Univ.Degree</b>	0.12 ( 0.33 )	0.12 ( 0.32 )	0.12 ( 0.33 )	0.14 ( 0.34 )
<b>HH Size</b>	4.33 ( 1.79 )	4.10 ( 1.63 )	4.42 ( 1.62 )	4.31 ( 1.50 )
<b>N</b>	1037	1126	5243	6181

N indicate person-years. Standard deviations are in parentheses.

**Table 2.b. Summary statistics, Irish Married Sample: Men**

<b>Married MEN</b>				
	<b>Religious</b>		<b>Non-religious</b>	
	<b>pre(1994-1995)</b>	<b>post (1997-2001)</b>	<b>pre(1994-1995)</b>	<b>post (1997-2001)</b>
<b>Total Hours</b>	36.35 ( 23.19 )	36.76 ( 22.76 )	38.41 ( 23.67 )	39.34 ( 0.37 )
<b>Employed</b>	0.78 ( 0.41 )	0.79 ( 0.41 )	0.80 ( 0.40 )	0.83 ( 21.75 )
<b>Age</b>	50.40 ( 9.07 )	52.03 ( 8.29 )	44.95 ( 10.27 )	47.54 ( 9.34 )
<b>Univ.Degree</b>	0.19 ( 0.39 )	0.19 ( 0.39 )	0.15 ( 0.36 )	0.16 ( 0.37 )
<b>HH Size</b>	4.47 ( 1.79 )	4.24 ( 1.64 )	4.47 ( 1.61 )	4.40 ( 1.48 )
<b>N</b>	897	961	5055	5775

N indicate person-years. Standard deviations are in parentheses.

**Table 3.a . Irish Sample , Dependent Variable "Total Hours Worked", Women**

	1	2	3	4	5
Treatment	1.859 ***		1.959 ***		
	0.545		0.669		
Post 1996	2.590 ***	1.427 ***	1.23 **	1.986 ***	1.446 **
	0.680	0.538	0.524	0.595	0.527
Treatment*Post	-1.270 *	-1.172 **	-0.981 **	-1.074 *	1.399 **
	0.742	0.512	0.491	0.575	0.554
Control Group	Rel. Marriages	Rel. Marriages	Rel. Marriages	Rel. Marriages, Singles	Rel. Marriages, Singles
Control variables	Age, Age-sq, Education Hh size	Age, Age-sq Hhsize	All	Age, Age-sq, Children (Hh Size)	Age, Education, Hh Size
Specification	Linear	Linear, Indiv. Fixed Effects	Tobit	Linear Indiv. Fixed effects	Tobit
N	13587	13587	13587	21654	22424

Note: The married sample includes all couples married before 1996 and never separated or divorced. The singles sample includes all never married individuals who do not change marital status. One asterisk indicates a 90% confidence level, two indicate 95%, and three indicate 99%. "All" controls in col. 3 include age, age squared, four educational attainment dummies, a linear time trend, log household size (or a dummy for children). Tobit estimations assumed random effects.

**Table3.b. Irish Sample , Dependent Variable "Employed", Women**

	1	2	3	4	5	6
Post 1996		0.538 **		0.033 **	0.19 ***	0.032 **
		0.238		0.015	0.008	0.015
Treatment	0.097 **		0.111 ***			
	0.015		0.016			
Treatment*Post	-0.038 *	-0.41 *	-0.045 *	-0.028 **	-0.148 ***	0.005 ***
	0.021	0.229	0.024	0.013	0.003	0.002
Control Group	Rel. Marriages	Rel. Marriages	Rel. Marriages	Singles	Singles	Rel. Marriages Singles
Control variables	Education Hh size, time trend	None	Education, Hhsize time trend	All	None	None
Specification	Linear	Logit, Indiv. Fixed Effects	Probit (m.e)	Linear Indiv. Fixed effects	Linear Indiv. Fixed effects	Linear Indiv. Fixed effects
N	13587	3930	13587	21654	21654	21654

Note: The married sample includes all couples married before 1996 and never separated or divorced. The singles sample includes all never married individuals who do not change marital status. One asterisk indicates a 90% confidence level, two indicate 95%, and three indicate 99%. "All" controls in col. 4 include age, four educational attainment dummies, a linear time trend, log household size (or Children dummy). Probit estimations reports marginal effects.

**Table 3.c. Irish Sample , Dependent Variable "Total Hours Worked", Men**

	1	2	3	5
Treatment	2.059 **	-7.936 ***	-2.693 ***	
Post 1996	0.545	1.688	0.951	
Treatment*Post		1.556 **	1.583 **	1.382 **
		0.712	0.692	0.553
Control Group	Rel. Marriages	Rel. Marriages	Rel. Marriages	Rel. Marriages, Singles
Control variables	None/All controls	Age, Age-sq Age cube, Hhsize	All	All
Specification	Linear	Linear, Indiv. Fixed Effects	Tobit	Tobit
N	12688	12688	12688	22424

Source : Living in Ireland Survey

Note: Only significant coefficients are reported. Standard errors are clustered at the individual time level where possible. All control variables include Age, Education dummies, a linear time trend, Children (or log household size).



**Table 3.d. Irish Sample , Dependent Variable "Employed", MEN**

	1	2	3	4
Post 1996		0.058 ***	0.141 ***	-0.035 **
Treatment	0.0122 *	0.012	0.007	0.014
Treatment*Post	0.016	0.249 ***		-0.218 ***
	0.0179 **	0.017	-0.133 ***	0.037
	0.024	-0.058 ***	0.009	0.101 ***
Control Group	Rel. Marriages	Singles	Singles	Rel. Marriages Singles
Control variables	All	All	None	None/ Children
Specification	Probit (m.e)	Linear	Linear Indiv. Fixed effects	Linear Indiv. Fixed effects
N	13587	22483	22483	22483

Source: Living in Ireland Survey

Note: Only significant coefficients are reported. Standard errors are clustered at the individual-time level where possible. All control variables include Age, Education dummies, a linear time trend, Children (or log household size). Probit estimations reports marginal effects.

**Table 4.a. Summary Statistics for the Four-Country Sample: Married Women**

	<b>Ireland</b>		<b>Spain</b>		<b>UK</b>		<b>Netherlands</b>	
	<b>Pre (1994-1995)</b>	<b>Post(1997-2001)</b>	<b>Pre (1994-1995)</b>	<b>Post(1997-2001)</b>	<b>Pre (1994-1995)</b>	<b>Post(1997-2001)</b>	<b>Pre (1994-1995)</b>	<b>Post(1997-2001)</b>
<b>Total Hours Worked (per week)</b>	11.71	12.20	10.95	11.70	19.93	19.34	11.17	12.31
<b>Age</b>	44.32	47.34	44.77	47.00	43.65	46.63	43.12	45.72
<b>Univ. Degree</b>	0.12	0.14	0.12	0.14	0.25	0.33	0.15	0.16
<b>HH Size</b>	4.44	4.34	3.90	3.91	3.25	3.30	3.37	3.41
<b>N</b>	4356	5585	7342	11029	3585	7432	4596	8130

Source: ECHP data.

Note: Sample includes all women who are married before 1996 and younger than 65 and never separated or divorced or became widow.

**Table 4.b. Summary Statistics for the Four-Country Sample: Married Men**

	<b>Ireland</b>		<b>Spain</b>		<b>UK</b>		<b>Netherlands</b>	
	<b>Pre (1994-1995)</b>	<b>Post(1997-2001)</b>	<b>Pre (1994-1995)</b>	<b>Post(1997-2001)</b>	<b>Pre (1994-1995)</b>	<b>Post(1997-2001)</b>	<b>Pre (1994-1995)</b>	<b>Post(1997-2001)</b>
<b>Total Hours Worked (per week)</b>	38.58	38.66	34.17	35.24	37.92	37.70	34.98	35.12
<b>Age</b>	45.86	48.37	46.51	48.46	45.14	47.99	44.76	47.38
<b>Univ. Degree</b>	0.16	0.18	0.17	0.19	0.40	0.47	0.24	0.25
<b>HH Size</b>	4.49	4.44	3.95	3.96	3.30	3.35	3.42	3.48
<b>N</b>	4108	5062	7000	10157	3113	6185	4279	7451

Source: ECHP data.

Note: Sample includes all men who are married before 1996 and younger than 65 and never separated or divorced or became widow.

**Table 5. Four Country Sample , Dependent Variable "Total Hours", WOMEN**

		1	2	3	4
Post 1996		0.395 **	3.514 ***		1.635 ***
		0.198	0.286		0.140
Treatment		0.848 *	0.822 *	1.671 **	3.434 ***
		0.435	0.435	0.731	0.372
Treatment*Post		-1.733 ***	-1.714 ***	0.812 ***	-0.874 **
		0.38	0.353	0.216	0.323
Control Group	Married women in UK, Spain and Netherlands	Married women in UK, Spain and Netherlands	Married women in UK, Spain and Netherlands	Married women in UK, Spain and Netherlands	Married women in UK, Spain and Netherlands and Singles in all four countries
Control variables	Education, Hh Size, time trend, Country Dummies	Education, Hh size, country dummies, time dummies	None	All	
Specification	Tobit	Linear	Linear Indiv. Fixed effects	Tobit	
N	47728	47728	60538	84108	

Note: The married sample includes all couples married before 1996 and never separated or divorced. The singles sample includes all never married individuals who do not change marital status. One asterisk indicates a 90% confidence level, two indicate 95%, and three indicate 99%. "All" controls in col. 4 include age, four educational attainment dummies, a linear time trend (a series of dummies for time), log household size (or Children dummy).

**Tale 6. Four Country Sample , Dependent Variable "Total Hours", MEN**

		1	2	3	4
Post 1996		0.556 **	-2.180 ***	1.042 ***	2.415 ***
		0.207	0.124	0.19	0.257
Treatment		3.07 ***	2.156 **	4.039 ***	5.973 ***
		0.524	1.037	0.556	0.470
Treatment*Post			1.876 ***		-1.404 ***
			0.290		0.405
Control Group	Married men in UK, Spain and Netherlands	Married men in UK, Spain and Netherlands	Married men in UK, Spain and Netherlands	Married men in UK, Spain and Netherlands	Married men in UK, Spain and Netherlands and Singles in all four countries
Control variables	None	None	All (age, education dummies, hhsiz country and time dummies)	All	
Specification	Linear	Linear Indiv. Fixed effects	Tobit	Tobit	
N	55141	55141	54910	81339	