

Ph.D. Thesis

**The Effects of Marital Transitions and Spousal Characteristics on
Economic Outcomes**

by

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General Introduction

This dissertation aims to expand and refine our understanding of why and how couple dynamics affect four critical economic outcomes that are directly related to inequality and stratification. These outcomes are respectively; self-employment, labour supply, household savings and income distribution. Throughout the dissertation, by couple dynamics, I conceive of two notions: First one implies being in a couple (i.e. having a partner with certain characteristics) versus being single and transitions between these two states. And the second one refers to the changes in behaviour of the spouses due to a contextual change such as an increase in the risk of couple dissolution. I consequently, analyse the implications of these two notions on each of these key economic variables.

While doing so, I ask and answer a number of important empirical questions regarding the implications of the existing theories about the couple dynamics on these outcomes. For example; does the theory of economic specialization within the family help us to understand the process of becoming self-employed? In other words, do spouses matter for the transition to self-employment? If so, do the sociological “social resources” and “trust” concepts better describe the nature of such influence? Does the standard risk-pooling behaviour of spouses have any role on becoming an entrepreneur?

The role of spousal influence on the labour market participation of women has previously been studied extensively (see Blossfeld & Drobnic 2001). Therefore, I take one step further and ask the question of what happens to women’s and men’s labour supply behaviour if the risk of divorce increases. How would then each spouse behave? Do women increase their labour supply, as the specialization hypothesis predicts, to self-insure? In fact, the specialization hypothesis predicts no effect of divorce risk on men’s labour supply. Yet, if the value of specialization declines when the risk of divorce rises, as this hypothesis predict, then men might decrease the amount of market work. Subsequently, I test whether men

behave as the Becker's specialization hypothesis predicts or on the contrary, they increase their labour supply to self-insure against the divorce risk just like women.

Increasing labour supply may not be the only channel for self-insurance for an increase in the divorce risk. For example, increasing savings can be another way of self-insurance for the negative outcomes of divorce. Consequently, to my knowledge I provide the first empirical test of the question whether spouses increase or decrease their savings when the risk of divorce increases. From the theoretical point of view the outcome is ambiguous. Spouses might increase their savings as the standard life-cycle theory predicts for precaution against an income shock, or they might dissave to maximize individual consumption rather than contributing to the pooled-income.

Finally, I attempt to describe how all these micro mechanisms would translate into macro-societal inequalities. In particular; would increasing marital instability and changing household composition affect the income inequality in general? What is the role of increasing labour supply of married women in the distribution of household income?

These questions might also illuminate underlying mechanisms of the striking changes in the trends of these economic outcomes. For example, self-employment rate; especially among women, has been increasing in the US in the last 30 years and this rise has been more than the female employment rate (Devine, 1994). Labour supply of married women has also been in rise in the post-industrial world since the 1950s and it has nearly doubled reaching around 75% of women in 2003 in the US (Blau & Kahn, 2006). Household savings has been in decline especially in the US since the 1980s, for which there is an extensive amount of research in the economics literature (Browning & Lusardi, 1996). Finally, income inequality has been on the rise again since the mid-70s and researchers mention the great U-turn in the income inequality (Nielsen & Alderson, 1997, Esping-Andersen, 2007). Although the reasons behind these trends received wide scholarly attention, their causes are not fully understood.

This dissertation might also contribute to the ongoing research about the changes in each of these economic variables by focusing particularly on the couple behaviour and decisions.

Self-Employment Behaviour

Self-employment rate has been in decline in most of the post-industrial societies since the 1970s (Blanchflower, 2000), but it was noticeably increasing in the US and UK¹. In 1975, the total self-employment rate was 7.4 % in the US and by 1996 it reached to 9.6 % (Blau et al 2002)². Furthermore, the increase in self-employment has been more drastic for women than for men: The rate of self-employed women, among all employed women increased from 4.1 % in 1975 to 7.1 % in 1996³ (Blau et. al., 2002). And there's evidence that this trend was not a simple artifact of the increase in the female labor force participation (see Bugid, 2006; Blau et al 2002).

One relevant aspect of the rising rates of female self-employment for this dissertation is that it triggered a shift in the existing research regarding the theories about the self-employment behaviour of individuals. In fact, this shift might be an extension of a broader paradigm-change occurred in stratification and labour-market research, regarding the unit of analysis in general as explained by Blossfeld and Drobnic (2001; p3-10)

In a nutshell, the only unit of analysis considered in the early literature on self-employment and entrepreneurship was the male-head (e.g. Fuchs, 1982; Evans and Leighton, 1989; Bates, 1990). Therefore, women were simply excluded from the empirical studies about the determinants of self-employment behaviour. As the similarities in the economic life

¹ Blanchflower (2000) reports declining trends for the majority of OECD countries self-employment (except a rising trend for UK and stable trend for US) since the 1976. However, he discusses that the trends shows different patterns depending on the definition of self-employment and self-employment rates. He defines self-employed as a % of non agricultural employment. UK almost doubles its self employment rate in all definitions between 1966 and 1996. Part of the contradictory figures about the self-employment trend is due to exclusion of incorporated business owners from the self-employed and counting them as wage earners of their own enterprises. This question is also addressed in this dissertation.

² As a percentage of overall employment including both incorporated and unincorporated businesses.

³ Whereas the same figure for men has increased from 10% to only 11% over the same time period and it seems to have levelled off since then both for men and women (see Blau et al 2002).

courses of men and women were mounting, the researchers turned to an individualistic approach and stratification research in general, gained a labour-market orientation (Blossfeld & Drobnic 2001). Although, labour-market oriented research governed by the economic perspective started including women in their samples (e.g. Blau, 1987; Carroll & Mosakowki, 1987), they considered the individual at the centre of the analysis. Thus, gender has become only a “status” variable (Blossfeld & Drobnic, 2001). Therefore, these studies did not explain gender differences in self-employment transitions (Budig, 2006).

Two theoretical arguments about the individual’s self-employment behaviour came out of this research: The disadvantaged-worker hypothesis and the class mobility hypothesis (Budig, 2006). The disadvantaged-worker hypothesis argued that individuals lacking adequate human capital would join the labour market via becoming self-employed when they are unable to find a wage job. Alternatively, class mobility hypothesis suggested that workers with sufficient human capital, social networks and financial resources in undesirable jobs (i.e. jobs with low pay, irregular hours) become self-employed to improve their economic situation (Budig, 2006).

However, these theories were criticized because they could only explain men’s self-employment behaviour but not women’s (e.g. Carr, 1996). The criticisms in this direction were based on two observations: First, despite the increase in female self-employment, there are still differences in self-employment rate of men and women and the gap seems to have stabilized since the mid 1990s (Arum & Muller, 2004; Blau et. al., 2002). Second, the gender-gap in the earnings of the self-employed also remained persistent over the same period (e.g. Devine 1994).

The individualistic approach not only failed to explain the gender differences in self-employment but also failed to address the earnings gap between men and women among the self-employed. Influenced by the research on the labour-market, these studies considered the individual characteristics, (mainly job-specific human capital) as the key determinants of the

productivity of the self-employed. Consequently, the gender gap in the self-employed earnings could simply be explained by the differences in these characteristics (e.g. Blau, 1987; Devine, 1994; Leung, 2006). However, this approach ignores the role of the work-family link and the interactions within the family, especially between the spouses on the labour market outcomes such as becoming self-employed (Blossfeld & Drobnic, 2001). Therefore, it left a significant portion of unexplained gender-gap both in the earnings and in the rate of the self-employed (Hundley, 2000; Budig, 2006).

On the other hand, some studies suggested that specialization in marriage might negatively affect the productivity of women and hence, could explain the earnings-gap between self-employed men and women (Boden, 1999b; Hundley, 2000). Others claimed that women's self-employment behaviour can be a result of a strategy to find a work-family life balance (Carr, 1996; Boden, 1999b; Budig, 2006). These studies point to a direction in the entrepreneurship and self-employment research where the unit of analysis increasingly becomes the family. Yet, analysis of the determinants of becoming a self-employed entails consideration of both spouses in the life-course framework in order to identify the differences between individuals in access to resources (Blossfeld & Drobnic, 2001).

Although, the studies of entrepreneurship and self-employment have been entering to the domain of the family, the role of spouses and couple interactions on the transition to become self-employed especially across the life-course has never been analysed empirically. Chapter 1 of this dissertation addresses this paucity. It also contributes to the US literature, by applying a life-course spousal effects framework, which is previously used in the other outcome variables such as labour force participation decision (e.g. Bernardi, 1999; Blossfeld & Drobnic 2001), occupational status (e.g. Bernasco, 1994, Bernasco et al., 1998) or career mobility (Verbakel & de Graaf, 2008) but almost solely in the European context.

Labour Supply Behaviour

One of the reasons why couple behaviour and coupling dynamics constituted the backbone of this research has to do with the ongoing change in the family in the affluent societies. The scholars frequently mention the following factors to have shaped the transformation of the family: The first one is increasing trends of similarity in the economic life courses of men and women due to sharp rise in women's educational attainment (Shavit & Blossfeld, 1993), coupled with the dramatic increase in female labour force participation especially among the married (Blossfeld & Hakim, 1997; Hakim, 1995; Blau & Kahn, 2006). Additionally, the changes in the family structure such as the increase in the divorce rates and non-marital childbirth (Stevenson & Wolfers, 2007) as well as the decline in the rate of co-residence in inter-generational households (White, 1994) have joined in these trends. Moreover as a by-product of higher educational attainment of women and the increasing similarity of men and women's life-courses, positive assortative mating has also been on the rise (Kalmijn, 1998, Blossfeld & Timm, 2003; Schwartz and Mare, 2003).

Perhaps among these changes, the rise in female employment after the second world-war has been the most important one in the labour markets of the post-industrial world. Especially, the labour supply of the married women has been drastically increasing nearly in all affluent countries since the 1950s (Hakim, 1995; Blossfeld & Hakim, 1997, Goldin 2006, Blau & Kahn, 2006). For instance, in the US women's labour force participation rate has almost doubled between the 1950s and 1999 (Blau et al. 2002). In fact, Goldin (2006) calls this increasing career-orientation behaviour and labour force participation of women, as a "quiet revolution", which gave "birth" to modern labour economics and theory of labour supply. Consequently, there's now almost a consensus that real wage growth and increasing wage elasticity of women have been the main driving force behind the rising trends of female employment up until 1990s (e.g. Smith & Ward; 1985; Blau & Kahn, 2006; Goldin, 2006).

If the rise in female employment is considered as one of the most important changes related to the family by the labour economists, the increasing marital instability might be the other one (perhaps more for the sociologists).

Between 1960 and 1980, divorce has more than doubled in the US (from 9 couples per thousand to 22.5 couples per thousand). Although not so spectacular, similar trends have been observed also in European countries in the last three decades (Dronkers, Kalmijn & Wagner, 2006). When the number of divorcees considered in per capita measures, both in some EU countries and in the US, the rates have stabilized at the 1980s figures or even declined slightly since then (Oppenheimer, 1997; Stevenson and Wolfers, 2007; Blau et al. 2002; Dronkers, Kalmijn & Wagner 2006). Yet, the recent evidence shows that in the US, marriages that started after the 1980s are twice as likely to end up with divorce than the ones that took place in the 1950s (Stevenson and Wolfers, 2007). In other words, the divorce-risk is much higher today than in the 1950s- 1960s in the vast majority of post industrialised countries (Blau et al. 2002, Blau & Kahn 2006; Stevenson & Wolfers; 2007). Furthermore, after extrapolation, the longer-run trends of divorce still points upwards (Stevenson and Wolfers, 2007) implying that marital instability will be persistent at least for some decades (See Figure 1 below).

(Figure 1 about here)

Divorce is usually associated with negative economic consequences, especially for women (Holden & Smock; 1991). Naturally, the stratification literature has been interested in these consequences and their effects on different outcomes. The main outcomes of interest are children's development and well-being (e.g. McLanahan & Sandefur, 1994; McLanahan 2004), poverty risk (Holden and Smock; 1991), income inequality (e.g. Karoly & Burtless 1995; Martin 2006) and fertility (e.g. Lillard and Waite, 1993).

While spousal effects on female labour force participation have been explored in the existing literature (see Bernadi 1999, Blossfeld & Drobnic 2001), how spouses' labor supply behavior would change when the risk of divorce increases is still ambiguous. If the divorce risk is more persistent and has negative economic consequences, then it is important to understand whether spouses increase their labor supply in order to protect themselves from these negative outcomes.

Indeed, many studies have tried to link the increasing rates of divorce and upwards trends of female employment empirically. Noticeably, there is a difference between the sociology and economics literature regarding the direction of causality relating these two trends. While the sociology literature focuses on the question whether increasing female labour supply affected the probability of divorce (see the literature review in South, 2001; Oppenheimer, 1997; Cook, 2006), the economics literature reverses the question and asks whether the increasing risk of divorce can explain increasing female labour supply (e.g. Green & Quester, 1982; Johnson & Skinner, 1986; Parkman 1992; Stevenson 2007).

The idea that female employment might explain the rising divorce risk stems from the Becker (1981)'s hypothesis (i.e. independence hypothesis) which assumes that the gains from marriage is derived from specialization and exchange between the spouses over domestic work and market work. Hence, an increase in women's employment implied that the gains from marriage derived by specialisation would be reduced, resulting an increase in the risk of divorce. This is also called "the independence hypothesis".

Yet, the empirical evidence for the independence hypothesis is mixed. Some studies find a positive impact of female labour supply on marital instability (see e.g. South 2001; Brines & Joyner, 1999), while the others find no significant association (Oppenheimer 1997; Hoffman & Duncan 1995), or a conditional negative association (e.g. Cook, 2006). The opponents of the independence hypothesis remind us that marital instability trends started taking-off long before the trends in female employment (Oppenheimer, 1997). Furthermore,

Becker (1981)'s specialization hypothesis predicts that as the gains in marriage from specialization decline, they would be derived from common preferences and consumption of public good (Lam 1988). One major implication of this prediction has been the rise of positive assortative mating, for which there is evidence over the same time period (see Schwartz and Mare, 2003; Blossfeld & Timm, 2003)

The economics literature analysed the relationship between trends of marital instability and female labour force participation from the opposite direction. The central question has been whether the increased divorce risk could explain the rise in female labour supply (e.g. Green, 1982; Johnson & Skinner, 1986; Parkman, 1992, Gray 1998, Stevenson, 2007). Though inconclusive, some empirical support is provided in this direction. For example in an early study, Johnson & Skinner (1986) claimed that the rise in divorce rates between 1960s to mid 1980s resulted in an increase of 2.6 percent of the overall 15 percent rise in women's labour force participation over the same time period.

Concerned with the possibility of the reverse causation, researchers often used the gradual introduction of unilateral divorce laws across different states in the US since the 1970s as the primary source of the divorce risk. Both cross-sectional and time series variation of the divorce law reforms allowed the economists to test the pooled-income hypothesis of the neoclassical theory of the household (Becker; 1981). The hypothesis predicts that female labour supply would be positively affected to the extent that divorce laws increase the risk of divorce because divorce risk reduces the value of specialization within the family. For example; while Gray (1998) found no evidence, Friedberg (1998) shows a small rise and Wolfers (2006) detects an immediate response after the introduction of law, which faded after 10-years.

In chapter two, I circumvent the reverse causation problem by taking advantage of a quasi-experimental case for the exogenous source of risk of divorce. In this chapter, I investigate the increase in labour-supply response of women and men in Ireland to the

increase in the divorce-risk due to the legalization of divorce in 1996. In this way, I test whether the predictions of Becker (1981)'s hypothesis that women increase their current labour supply because of depreciation in the value of specialization and self-insurance. Although, Becker (1981)'s hypothesis has no particular prediction of men's behaviour, I test whether an increase in the risk of divorce stimulates men to self-insure against negative economic outcomes of divorce (i.e. a loss of economies of scale, lawyer fees or legal costs) by increasing their current labour supply. Or alternatively, they may reduce their labour supply in order not to contribute as much to the pooled income.

Savings Behaviour

Labour supply might not be the only channel of self-insurance for spouses against a rise in marital instability. Another source of insurance against the divorce risk may be savings. From a theoretical point of view, the direction of the spouses' savings behaviour when there is an increase in the risk of divorce is ambiguous. Yet, it is important to understand in an era of high marital instability since it may explain, at least partially, the declining trends in the household savings especially in the US since the 1980s (Browning & Lusardi, 1996). In fact, not only in the US, but also in other OECD countries, similar declining trends in the household saving rates have been observed in the last 20 years (See Figure 2 below). Currently, household savings rates are at much lower levels in all the major economies of the EU (Except for France) after the two decades.

(Figure 2 about here)

Even though the vast majority of the research aimed at unpacking savings behaviour has been done by economists and psychologists, household saving behaviour is also important for sociologists. For example, it is one of the key determinants of the risk of poverty at

different stages of the life-cycle (i.e. old age poverty, or younger households' access to housing) or across household types (i.e. poverty risks after divorce or widowhood). Furthermore, saving behaviour, as the primary way of accumulating wealth, is directly linked to wealth inequality (Keister & Moller, 2000). It is also important for social policy and stratification. For instance, Spilerman (2000) discusses the asset building strategies of the poor⁴ as a social policy option and their relevance for stratification theory. In the same line, Quadagno (1998) defines one of the objectives of the transformations of the American welfare system towards a "capital-insurance welfare state" to be promoting savings. She argues that the declining trend in the savings rate of the American households during the 1980s and the 1990s has been one of the triggering factors of the discourse about the welfare reform and the direction it takes. Diprete (2002) explores the relevance and adequacy of the permanent income hypothesis and the role of life-cycle savings for social mobility.

However, due to the scant interest by the sociologists in savings behaviour, the standard life-cycle savings theories are dominated by the economists. The result is that current models of savings and consumption behaviour have strong assumptions about the homogeneity of household structures. What is more, those models assume a unitary utility and that the household head is the primary decision-maker whose preferences represent the preferences of all the individuals in the households. Yet, only very recently economists began to pay a special attention to the household and its decision making processes (Browning 2001; Euwals et al. 2004) by deviating from the assumption of standard homogenous household types to a richer, more heterogeneous household arrangements, as traditionally analysed by sociologists. Still, current empirical studies of life-cycle savings treat the different household structures as static states rather than transitory ones. Then they compare the savings outcome across the individuals living in different household types (e.g. Avery and Kennickel, 1991).

⁴ Spilerman (2000) considers the IDA (Individual Development Accounts) in the US as an example of such strategy. These are savings accounts targeted to empower the poor households to accumulate funding for the home purchasing.

Although Browning and Lusardi (1996) recognised that marital transitions are important life-events that should be incorporated into a life-cycle savings theorem, since then, few studies have considered their impact on savings behaviour. These studies unfortunately remain highly theoretical and their predictions are only tested on synthetic data. Chapter three in this respect provides the first empirical evidence that married couples when they face a rise in the divorce risk, actually, increase both household and individual savings.

Throughout the first three chapters of the dissertation, although I include the singles when the empirical strategy so requires, married couples have been the core group of interest. Indeed, despite the secular trends in family life, marriage remains important especially in the US. Previous research showed rather than a decline in lifetime marriage rates, we observe a delay in the marriages (Oppenheimer 1997). Life-time marriage rates in the US continue to be high (around 70%) and are consistent across all education/income levels (Lundberg & Pollak, 2007), whereas rates of non-marital childbearing and divorce have increased faster for the less- educated for both men and women (Lundberg and Pollak, 2007). Chapter four provides additional support for this observation. It shows that among the married couples in 1980 the hazard of divorce over the two decades for the bottom quintile of the income distribution is twice as higher as the top income quintiles in the US.

Intertwined effects on income inequality

These findings suggest that social selection into the stock of married couples have been influenced by the non-random distribution of the increasing marital instability over income groups. Similar pattern is also true for female labour supply. Recently, Blau and Kahn (2006) show that female labour supply is becoming more and more insensitive to own and husband's wages since the 1980s. Furthermore the drop in the elasticity of women's labour supply to husbands' wages has been exceptionally drastic for the women in the lowest education-group. One reason for the growing similarity between married men and women's

labour supply elasticity might be due to the higher divorce rates (Blau & Kahn, 2006) in particular in the bottom.

The differential evolution of these trends across the income distribution calls for an exploration of the societal level outcomes. Both the increase in the marital instability and the changing patterns of labour supply among the married might have direct consequences for the income inequality. Instead of analysing the effect of one trend on the other, chapter four outlines the joint impact of these two dynamics on income inequality.

Income inequality has also been increasing over the last three decades; a “U-turn” after a long period income compression during the post-war era (Esping-Andersen 2007, Nielsen & Alderson, 1997). A number of researchers paid attention to its causes and most of them lodged their explanations – in particular from economists- in the labour markets. More specifically; due to the rapid changes in the technology and the consequent rise in skill premia, employment deregulation and diminishing strength of trade unions have been the commonly cited causes of the rising income inequality (Juhn et al 1993; Katz & Autor, 1999; Morris & Western, 1999; Ryscavage, 1999; Kenworthy, 2005).

On the other hand, a growing number of studies question the relationship between the changing structure of the families and their labour market behaviour. An emphasis has been placed on the impact of the rise in the proportion of the single-headed families (especially single mothers) on income inequality (e.g. Karoly & Burtless, 1995; Cancian and Reed, 2001; Lee, 2005; Martin, 2006; Western et al 2008) The income differences across household types, their relative weight in the population and their proportional share in the total population income have been the factors considered to have potentially affected the income distribution (e.g. Burtless 1999; Lerman, 1996; Jantti, 1997; Martin, 2006). But these studies rarely build a link between the growing earnings disparity, much studied from a labour market perspective, and the changing household structures in the demographic perspective (Western et al. 2008). However marriage can serve as an important mechanism to distribute the

earnings inequality observed in the labour market across households. One key issue here is assortative mating for which Hyslop (2001) assigns an important role (e.g. %23) on the rising income inequality.

Chapter four describes the major mechanisms via which assortative mating, rising female employment and the increase in single –headed households all together may affect income inequality. Surprisingly the existing literature is heavily based on US data⁵. In chapter four, in addition to US data, I include Germany in the analysis and gain an opportunity to test some of the conclusions of the extant literature.

Methodological Contributions

Overall, the dissertation uses a variety of econometric techniques and methodological approaches to answer the questions raised in each chapter. To start with, chapter 1 adopts a life-course approach. This chapter uses individual career and marriage histories simultaneously to model cumulative nature of the spousal effects. As a result, it makes an important contribution to the analysis of self-employment by applying event history modelling that takes into account pre-marital histories of each spouse (i.e. prior exposure to self-employment, individual resources), which I believe has been a key missing element in most previous studies (e.g. Arum, 2004; Caputo and Dolinsky 1998; Bruce, 1999).

One of the standard methodological problems in previous research has been endogeneity. Consequently, one major contribution of this dissertation is to address this problem especially in chapters two and three. In particular, when one uses individualized-variation in the divorce risk obtained by actual divorce probabilities using panel data, we can not be sure whether these divorce probabilities are in fact affected by the very same dependent variable we observe prior to divorce. For example, if we investigate whether the time spent on housework changes when individuals anticipate divorce, we should remember that it may well

⁵ See for exceptions Maitre et al. (2003), Pasqua (2002) and Esping -Andersen (2007)

be the case that the very change in the time spent on housework affects the divorce probability. One good example of such problems is the relationship between divorce risk and labour supply for which there is a vast amount of research from both directions as I outlined previously.

There are two common econometric approaches for causal inference to resolve such endogeneity problems, one is the instrumental variable approach and the other one is a differences-in-differences approach. Instrumental variables usually bear the problems of selecting good instruments, problems related to observational data and simultaneous causality. Furthermore selection bias often remains unresolved in the instrumental variable approach. On the other hand the diff-in-diff approach has a number of advantages. Briefly, diff-and-diff estimation is useful if there is a specific intervention or treatment (often such treatment is the passage of a law). Then, the difference in the outcome variable, after and before the intervention for groups affected by it (i.e. treatment group) is compared with the same difference for groups unaffected by it (i.e. control group). Differences-in-differences estimations have been popular in economics although not so much sociologists⁶. Their growing popularity is mostly due to their simplicity and potential to overcome such endogeneity problems (Bertrand et. al., 2004).

Both chapters two and chapter three use differences-in-differences estimation techniques applied to linear probability modelling to isolate and identify the effect of an exogenous increase in the risk of divorce across control and treatment groups. As the source of increase in risk of divorce, these chapters have been innovative especially in exploiting effectively the Irish divorce law as a quasi-natural experiment. The existing literature has mainly used the implementation of unilateral divorce law in the US whose effect on divorce risk has been controversial (Gray, 1998; Wolfers, 2006)

⁶ Alison (1990) is the only paper to my knowledge that discusses (and favours) using this method in the sociological literature.

The previous research regarding the questions that Chapter four outlines also suffers from endogeneity problems. On one hand, there's a sizeable amount of research addressing the impact of household structure changes on income inequality (Karoly & Burtless, 1995; Cancian and Reed, 2001; Lee, 2005; Martin, 2006; Western et al 2008). On the other hand, recent research both from economics and from sociology suggest that it may well be that higher inequality affects the selection into marriage and thus, generates changes in the household structure (see the literature in Percheski & McLanahan, 2008) such as more monoparental households in the bottom income group in the US. Increasing income inequality also affects the assortative mating mechanisms and the selection into the sample where marital matching occurs. Hence, it might be contributing to the transmission of inequality (Fernandez et al., 2005; Greenwood, et al., 2003).

Mostly in the US research, the studies that analyse whether the changes in family structures generate more inequality use either regressions or decompositions, standardizations, shift-share analysis (Percheski & McLanahan, 2008). Simulations are used mostly in European research (e.g Pasqua 2002; Maitre et al. 2003).

Chapter four modifies the traditional decompositions and simulation techniques, in order to account for the intertwined effect of the female labour-supply and household structure changes. Decomposition analysis is applied in a dynamic way where the population sub-groups account for the both changes. Counterfactual simulations are also applied in the same spirit. They hold changes constant both stepwise and simultaneously. Our simulations also use a different benchmark than the previous studies. I use the husband's earnings quintiles to identify the exact group of the married women whose labour supply has been more influential on the household income distributions. In this way, I take into account the differential divorce rates across income quintiles rather than the overall changes in the household compositions which blur the magnitude of the effect of female employment (e.g. Pasqua, 2002).

Countries, Caveats and Conclusions

The country and data choice of this study is dictated by the empirical strategy. The dissertation uses longitudinal micro-data in all the chapters in general. In the first chapter, for the studies of self-employment United States is an important case for three reasons. First, the non agricultural self-employment rate has been increasing for a long time for both women and overall. Thus, self-employment has increasingly becoming an important phenomenon to study in the US. Second, the United States has the adequate longitudinal data that allows us to analyse the spousal effects in the life course framework (Panel Study of Income Dynamics (PSID) 1968- 1999). Third, the US provide also an appropriate country to isolate the effects of parental influences on the self-employed because the geographic mobility in the US is higher and intergenerational family ties might be weaker than for example, in Italy, Spain and other Southern European countries where the self-employment rate is traditionally higher.

Although PSID data provide us a long time span, a larger sample size could also allow adding a supplementary analysis to the first chapter by further disaggregating self-employment into skilled versus unskilled self-employment. Since the mechanisms via which spouses human capital influences the transition to self employment might vary by the type of self-employment (Budig 2006).

Chapters two and three use a unique quasi-experimental case of the Irish divorce law. Therefore these chapters use the longitudinal Living in Ireland Survey (1994-1999) primarily and the European Household Panel Data (1994-2001) for the comparison with Spain and UK and Netherlands. The choice of comparison countries are discussed and justified extensively in each chapter.

Finally, in the last chapter, I compare Germany and US for two reasons. The first one is empirical. Both countries have opposite cohort structures in terms of female employment and they both have comparable longitudinal data that allows us to exploit such differences. I

use Cross National Equivalent Files of German Socio-Economic Panel and Panel Study of Income Dynamics for Germany and the US respectively.

There are a number of methodological challenges in identifying the channels of how these micro mechanisms are translated into societal level inequalities. Chapter four, therefore, includes a section where it discusses these challenges in detail. Many of the problems we detect in the previous literature and persist in our study as well. However, it contributes to the existing debate by showing the paralysing problems of the current research in this field particularly.

Sociological explanations of marriage and marital transitions stress changes in the resources and opportunities whereas the economic perspective has emphasized the significance of individual choice under constraints. On the whole, this dissertation provides supports for both perspectives. Couple behaviour regarding self-employment, labour supply or savings exhibits a combination of both choices and constraints. In particular, the first chapter presents evidence for spouses both providing constraints and opportunities for self employment –of course depending on the gender and/ on spousal resources. While sociological explanations fits relatively well to describe the spousal influence on men’s self-employment, spousal influences on women’s self employment behaviour present a constraint rather than a resource unless the husband is not working.

The results in chapter two have also implications that both go against the specialization hypothesis and favour it. While increasing labour supply behaviour of men can not be explained by the specialization hypothesis, women’s increasing labour-supply behaviour shows that they are concerned about the decreasing value of specialization. On the hand, chapter three supports the idea that individuals are forward-looking and increase their both household and individual savings in the face of a divorce risk because they associate divorce with its negative outcomes. Finally, chapter four shows that improvements on the gender inequality and the resulting transformation around the family may actually lead to

societal level inequalities and their inheritance. However, the pace at which these transformations around the family are translated into broader inequalities can be very different across countries and over time.

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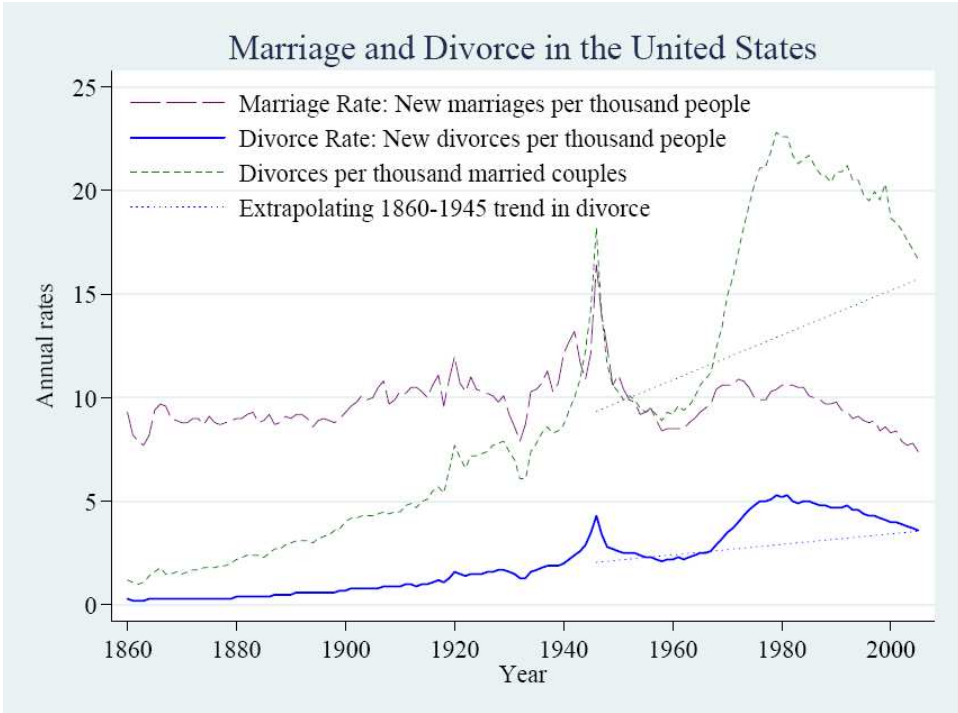
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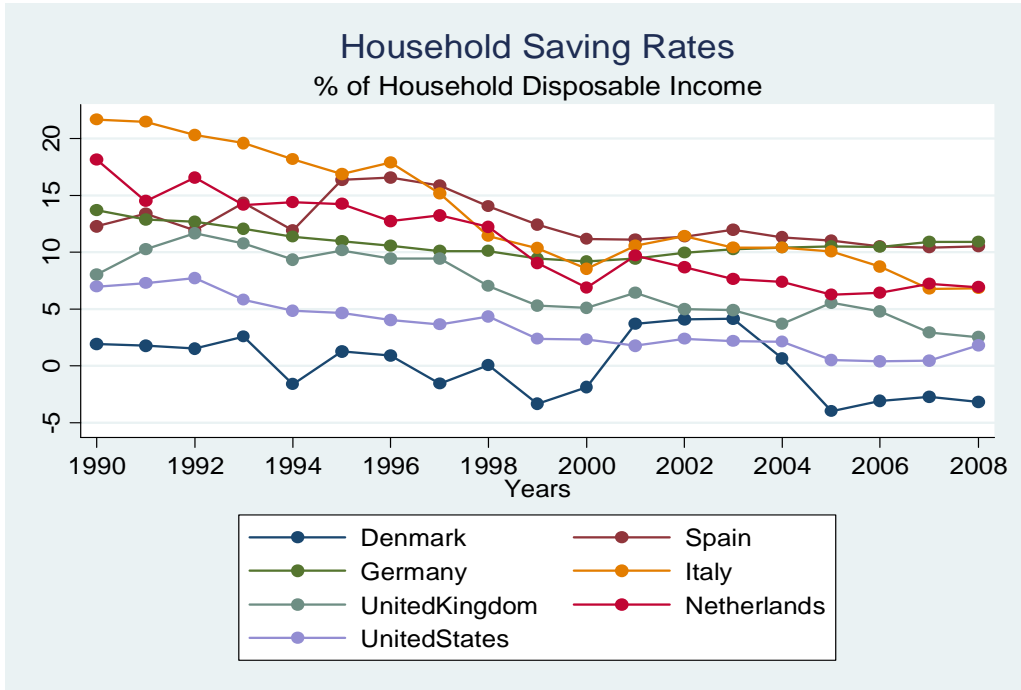
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Figure 1. The trends in Marital Instability in the US.



Source: Stevenson and Wolfers (2007).

Figure 2. Trends in Household Saving Rates



Source: Data from OECD Economic Outlook 2008.

Only the Lonely?

The Influence of Spouse on the Transition to Self-Employment

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Abstract : In this paper I investigate the role of couple-hood and spousal characteristics on the likelihood to become self-employed. Much of the previous research has treated the entrepreneur as the “lonely only” individual. Theoretical arguments have been heavily weighted towards a wide range of personality traits, motivational attributes and socio-cultural background. This paper deviates from previous studies by addressing whether being in a couple matters for the transition to self-employment. It attempts to provide a systematic analysis of the extent to which spouses affect each other’s transition to self-employment. Using PSID (1968-1999) individual and household files, I track individuals’ marriage and career history from the time that they end their education. Then, I model the first transition to self-employment dependent on the couple status, its duration and spousal resources for each spouse using an event history technique. Results suggest that the likelihood of becoming self-employed is positively and strongly associated with being in a couple for men and wives’ social resources are significantly important for their transition. On the other hand, the results supports economic specialization hypothesis for women where presence of a husband is likely to contribute her self-employment transition only if he does not work.

1. Introduction

Entrepreneurship⁷ is an important research phenomenon for social scientists. Economists have long placed it at the heart of economic growth and productivity (e.g. Baumol, 1968). Scholars of organizations have drawn attention to the adaptive, reproductive and destructive consequences of entrepreneurship for existing organizational routines, structure and order (e.g. Haveman & Cohen, 1994). Sociologists have seen entrepreneurship as a critical source of stratification in society, a potential threat to earnings equality and a vehicle of social mobility (e.g. Blau & Duncan, 1967; Sorensen, 1977).

Although entrepreneurship has been receiving increasing scholarly attention, much of the research has treated the entrepreneur as the “lonely only” individual (Schoonoven & Romanelli, 2001). It has typically raised strong assumptions about the exogeneity of external influences on the decision to be an entrepreneur (Carroll & Mosakowski, 1987; Thorntorn,

⁷ I use the term entrepreneurship and self employment interchangeably throughout the text. See section 3 for a brief discussion on the definition of self-employment and entrepreneurship.

1999). For the most part, major theoretical arguments have been heavily weighted towards a wide range of personality traits and motivational attributes (e.g. Brockhaus, 1980) and socio-cultural background (e.g. Aldrich & Waldinger, 1990). In most accounts, transition to self-employment is seen as a function of individual desire to master the challenges of founding a new organization and a desire to have control over one's productivity (McClelland, 1978; Zhao & Seibert, 2006).

Recent research efforts have moved away from micro-behavioural foundations. There are, of course, extensive differences among these in their formulations of how, why, when and where entrepreneurial behaviour arises. Yet, they are alike in their insistence that entrepreneurship is a process of interaction between the individual and the environment and that the situational factors foster or impede the process of entrepreneurship beyond explained by stable individual characteristics. Along these lines, socio-economic contextual units such as organization (Ruef, Aldrich & Carter, 2003), industry (Carroll & Mayer, 1986) and regions (Stuart & Sorenson, 2003) have become domains of repeated inquiry.

Recent contextual scholarship has increasingly called attention to the family as the primary social organization in which self-employment decision is shaped (Sanders & Nee, 1996; Arum, 2004). However, the role of family on the probability of moving into self-employment has been explored mostly through shedding light on the mechanisms of inter-generational socialization and transmission (e.g. Aldrich et al. 1998; Dunn & Holtz-Eakin, 2000; Hout & Rosen, 2000; Renzulli, Aldrich & Moody, 2000; Sorensen, 2007). As a result, in these studies, while the role of parental characteristics has been explicated, spouses have become "forgotten relatives".

In this paper, I turn my attention to the most micro and immediate part of the socio-economic environment and focus on marriage as the context in which the decision to become self-employed unfolds. I offer an integrative model that explains the mechanisms by which spouses affect each other's transition to self-employment as well as the direction and

magnitude of their impacts. To do so, I first test whether marriage⁸ matters for self-employment transitions. I seek to illuminate whether an individual is more likely to make a transition to self-employment when s/he is single than when s/he is married or cohabiting with a partner. Subsequently, I explore whether a spouse with a specific level of resources makes one's own transition to self-employment more likely. I probe these questions by drawing upon the Panel Study of Income Dynamics (PSID) data. I construct career and marriage histories of individuals who entered the labour market for the first time between 1968 and 1999. I adopt a discrete-time event history modelling, which suits best to explain interdependent processes of marriage and employment selection (Blossfeld & Drobnic, 2001).

This research is motivated by three observations. First and foremost, evidence from the cross-sectional data shows that the married individuals are overrepresented among the self-employed (Blanchflower & Meyer, 1994; Bruce, 1999). Yet, the relationship between being married and becoming self-employed has been essentially ignored from the causal explanations. We are far from having a clear picture of the net effect of marriage on this particular type of labour market transition. By including spouses and their influence on entrepreneurial decisions, this research helps complete the analysis of the family as a contextual unit where the opportunities for self-employment arise and are nourished.

Secondly, over the past three decades, there have been major demographic transformations around the family, which have radically altered the marriage and career dynamics of the spouses in the US. These changes might have important consequences on the distribution of resources and disadvantages relevant to self-employment transitions across households. For example, the increase in single-headed families is likely to reduce both the number and the distribution of households with required resources. Similarly, the sharp

⁸ In this study, I do not consider marriage as a legal institution. Instead, I take it as an environment in which the individual engages in social interaction with the spouse. Such interactions ultimately generate favourable or unfavourable conditions, motivation and learning for entrepreneurship. I consider marriage identical to "being part of a couple". Therefore, possible tax benefits for the married are out of the scope of this paper. Cohabitation and marriage are treated identical throughout the text.

increase in women's educational attainment (Shavit & Blossfeld, 1993), the decline in the rate of co-residence in inter-generational households (White, 1994) and the rising trend of assortative mating (Kalmijn, 1998; Blossfeld & Timm, 2003; Schwartz and Mare, 2003) might all have changed the importance, the nature and the direction of the spousal effects on the decision to become self-employed. As a consequence of these changes, the analysis of the family's role on the self-employment behaviour eventually requires a shift in the research focus from parental influences to the spousal influences.

Finally, I am also concerned over the methodological shortcomings in the few existing studies that have explored spousal influence. These studies primarily work with selected samples; examining only the married (e.g. Bruce, 1999; Parker, 2005) or the immigrant families (e.g. Borjas, 1986; Nee & Sanders, 1996) or solely women's transition and the husbands' effects on it instead of mutual influences of both partners on each other (e.g. Devine, 1994; Caputo & Dolinsky, 1998; Bruce, 1999)⁹. Furthermore, they typically use either cross-sectional samples (e.g. Nee & Sanders, 1996) or simple linear probability models that do not account for the endogeneity that emerges from individuals selecting into the self-employment and marriage simultaneously due to "assortative mating" on observables (e.g. Borjas, 1986; Renzulli et al. 2000). Finally, the absence of pre-marital history (e.g. work history) and left-truncation – due to exclusion of previous exposure to self-employment (e.g. Arum, 2004) are examples of other sampling problems that pervade in this research.

This study attempts to address these theoretical and methodological issues. It is organized as follows: In next section, I will initially introduce the background theory on how marriage might affect self-employment and then discuss the types of marriages and the spousal characteristics that are more likely to influence the decision to become self-employed. Section 3 will describe the data, sampling and modelling strategy. Section 4 will present the results. The study ends with conclusions and discussions.

⁹ See for exceptions Parker (2005) and Arum (2004).

2. Theoretical Background

Many theoretical reasons might explain why being in a couple matters for self-employment transitions. First of all, marriage can be construed as an institution that reduces risks via risk-pooling. For example, there is empirical evidence that marriage can be used to offset individual's "labour-income risks" (e.g. Hess, 2004; Chami & Hess 2005). In other words, marriage provides individuals with greater flexibility for job or career changes because they can trust their spouse's earnings potential regardless of her/him being in the labour market (Blau et al., 2002). Since self-employed individuals face such risks themselves (Brockhaus, 1980), I expect that overall the transition to self-employment is likely to be easier for the married who can share their potential income risks with a partner than for the single.

A growing number of studies claim that marriage and spouses influence an individual's labour market behaviour and more importantly, labour market outcomes in general (e.g. Bernasco, 1994; Bernasco et al., 1998; Bernardi, 1999; Blossfeld & Drobnic 2001; Verbakel & de Graaf, 2008). The studies pinpoint mechanisms other than the simple risk-pooling behaviour. The theoretical arguments usually build on the synthesis of the two competing hypotheses about the couples' labour market behaviour and labour market outcomes. First one comes from the specialization hypothesis of the standard neo-classical theory of the family (e.g. Becker, 1991) and the other one relies upon the more sociological *social capital* concept (e.g. Coleman, 1990; 1988).

The specialization hypothesis predicts that since spouses differ in their productivity levels, they can maximize a joint utility function efficiently by specialising according to their relative productivity between the market work and the domestic work. The relevant implication of this hypothesis bears on the fact that the human capital is accumulated through experience and training (usually on the job), and it is one of the main determinants of productivity. Then, the spouse who specializes on the domestic work, (or who has a comparative disadvantage in the market work) will put less effort on the market work.

Consequently s/he will accumulate less human capital and end up with poorer labour market outcomes. In a nutshell, the division of labour and specialization hypothesis predicts a negative effect of marriage on one of the spouse's labour market outcomes.

On the other hand, the sociological social capital perspective predicts a positive impact of spouses on the individual's labour market achievements. Spouses improve each other's resources through provision of additional skills, knowledge and networks¹⁰. The idea of network advantages is straightforward. For example; spouses may exert influence on their own contacts for their partners. Having a working spouse makes the individual linked with the labour market and the network of the spouse in the labour market. In addition, spouses can be direct sources of skill and knowledge transfer as well as experiential learning and motivation (Caputo & Dolinsky, 1998; Davis & Aldrich, 2000; Taniguchi, 2002; Parker, 2005). In this respect, marriage alters the learning environment substantially. Couples spend more time with each other and less time with known others such as family members. It has been shown, for instance, that spouses are the most frequently named discussion partners for important problems in general (Marsden, 1987). Through such interaction spouses provide both direct transfers of knowledge and access to new knowledge. For instance; spouses can transmit occupational experiences, assist in writing application letters and help other spouse prepare for i.e. work related exams or job interviews or simply provide information about job opportunities (Bernardi, 1999).

From the incorporation of these two views have emerged a number of studies on "coupled careers" that used event-history modelling in order to analyse closer the underlying mechanisms through which "spousal effects" operate (e.g. Bernasco, 1994; Bernasco et al., 1998; Bernardi, 1999; Blossfeld & Drobnic 2001; Verbakel & de Graaf, 2008). However, the outcome variables in these studies have been labour force participation decision (e.g.

¹⁰ The underlying assumptions and the theoretical discussion about the reasons why an individual will be sharing these resources with the spouse are mainly based on Coleman's (1990) "trust" concept and explained in detail in Bernasco (1994) and Bernasco et al., 1998.

Bernardi, 1999; Blossfeld & Drobnic 2001), occupational status (e.g. Bernasco, 1994, Bernasco et al., 1998) or career mobility (Verbakel & de Graaf, 2008).

In this study, I propose that not only these outcome variables but also the decision to become self-employed is affected by the spouses. This proposition stands on two remarks. First one is that the decision to become self-employed is often embedded in the decision to enter the labour market. If self-employment means one's taking control over his/her own productivity and, more importantly, labour supply, it is natural to think that the spousal effects that determine the labour market entry might also influence the choice of employment-type. Put differently, just as the labour force participation decision, self-employment decision is also an outcome of spousal interaction and influence (e.g. Hundley, 2000).

Secondly, the hypothesis about the self-employment as a vehicle of class mobility implies that individuals in bad jobs become self-employed when they have enough resources (i.e. human capital, social networks and financial capital) to improve their economic conditions (Budig, 2006). From this perspective the set of resources required to pursue a high occupational achievement is very similar to the set of resources needed for entrepreneurial migration and success. For this reason, for instance, the studies on immigrant self-employment state that immigrants perceive self-employment as an alternative way to achieve occupational success since their one important resource; human capital is usually undervalued by the employers in the host countries (Borjas, 1986; Nee & Sanders, 1996). If self-employment provides an alternative to occupational success and mobility, then the spousal resources that are found to be influential on the occupational-attainment or career mobility might as well encourage the self-employment decisions.

Two types of spousal resources are relevant to self-employment and that spouses can add to the individual's own resources via coupling behaviour. These are social and financial resources (Bernasco et al., 1998). Financial resources are typically wealth and earnings potential (Dunn & Holtz-Eakin, 2000; Hurst & Lusardi 2004). By social resources, the

literature refers to human capital and social capital (e.g. Nee & Sanders, 1996; Bernasco et al., 1998; Bernardi, 1999; Dunn & Holtz-Eakin, 2000; Parker, 2006).

As long as we agree on these remarks, the predictions of the two hypotheses explained above can be adapted to the self-employment behaviour: If the specialization and economic exchange hypothesis holds true, marriage would imply a negative impact for the women's likelihood of starting a business. Yet, this is conditional on the employment status of the spouse. I hypothesize that married women are less likely to start a business if their husbands specialise in the market work (i.e. working whether as a salary earner or a self-employed). In this case specialization hypothesis predicts that women will be investing less on their human capital and will have less resource for becoming self-employed. However, having a husband might affect positively wife's likelihood of starting a business if he does not work since it would increase the likelihood of wife's being the breadwinner. Verbakel and de Graaf (2008) suggest that breadwinner hypothesis might explain the higher productivity levels of the married in general. Breadwinner individuals would feel stronger financial responsibility and will invest more on their work, which in turn increases their productivity. If this is true, having a not-working spouse might actually increase the incentives to specialize on the market work. Hence, it leads to obtaining higher level of human capital which ultimately affects the likelihood of starting his/her own business.

One key question here is the type of self-employment. The predictions of economic specialisation hypothesis imply that self-employment is a means to improve career progress. Then, the spousal effects described in the hypothesis above would be referred to an entrepreneurial self-employment or starting an incorporated business. Yet, not all types of self-employment can be seen as a medium of career advancement. In fact, previous studies argued that women are more prevalent in low-skilled self-employment because they enter self-employment as a strategy to balance work and family life whereas men enter self-employment to advance in their career (e.g. Carr, 1996; Budig, 2006). Hundley (2000),

claims that the symptoms of such behaviour can be traced in self-employment earnings gap between men and women. He claims that a self-employed women's earnings decline after marriage because of the division of labour and specialisation in non-market work rather than market work.

Therefore, modelling spousal influences is complicated by the increasing heterogeneity in the professions of the self-employed in terms of their resource requirements. Yet, most previous research on self-employment has focused only on incorporated businesses and entrepreneurs (Arum 1997; Parker, 2005; Budig, 2006). On the other hand, regarding the main focus of this study, the spousal effects might operate differently for the self-employed who are indeed "labourers" and in the bottom end of occupational class distribution than for the self-employed entrepreneurs who are corporate business owners (Carr, 1996; Arum, 1997; Budig, 2006). Moreover, heterogeneity in the distribution of occupations among the self-employed might be exacerbated especially for women after the sharp rise in their labour force participation in the recent decades (Arum & Müller, 2004).

In order to account for these issues, I define two types of self-employment in this study: incorporated and unincorporated business owners. While incorporated businesses are predominantly concentrated in managerial and professional occupations that require higher skill level and resources, most unincorporated businesses in the US are prevalent among the service related occupations, construction, maintenance and natural resources (e.g. farming, fishing and forestry), which, in general do not demand higher skill levels. Section three provides details about the validity of the choice of these two categories to capture differences in self-employment types.

On the other hand, if social capital hypothesis holds true, the partner's resources and in particular labour market experience and education, should positively influence one's likelihood of becoming self-employed. If corporate businesses require higher level of resources (i.e. human capital, social and financial resources), individuals with spouses holding

such resources are more likely to start a corporate business. From this perspective, prior literature has found that the self-employment experience of the spouse increases the husband's or wife's propensity to become self-employed. For example, Parker (2005) claims self-employed partner's knowledge transfer plays an important role on the likelihood of starting incorporated business. Bruce (1999) points that self-employed husbands transfer knowledge and business experiences to the wives.

This perspective also predicts that the spouse education, which is the most commonly used measure of human capital, is a positive determinant of an individual's likelihood of becoming self-employed. Higher educated spouses may stimulate their partners for labour market participation and higher success (Verbakel & De Graaf; 2008), which may influence the likelihood of starting a business. Labour market experience and education might also expand the resources, knowledge and networks of an individual by improving his/her opportunities for self-employment transitions. In sum, social capital perspective predicts a positive impact of spousal employment and education on the individual's likelihood of becoming self-employed and that their role would be more crucial for incorporated self-employed.

In brief, in this study, I disentangle the effect of marriage and assess the relative importance of marital resources on the transition to self-employment in detail. When doing so, I test the hypothesis derived from two different perspectives: Shared spousal resources versus economic specialization hypothesis.

One important yet frequently neglected issue in analysing spousal effects is the assortative mating. Spouses can choose each other based on many characteristics. Along with age, the most common demographic factor in assortative mating has been education (Bernasco et al. 1998; Blossfeld & Timm, 2003). Unlike much of the previous work, in this study, I control for the effects of assortative mating on observable characteristics such as education as well as employment status. However, there might be unobserved characteristics

of the spouses which may actually select individuals both into self-employment and into marriage. Thus, the results of this study should be interpreted with caution.

3. Data and Methodology

Longitudinal data and longitudinal statistical models are of crucial importance to understand the dynamic interrelationships between marital partners and in particular, when modelling the interdependent nature of spousal influence. For my empirical analysis, I derive data from the United States Panel Studies of Income Dynamics (PSID), a longitudinal survey administered by the Survey Research Centre of the University of Michigan. Using PSID data, I constructed individual marriage and career histories of couples between 1968 and 1999 to model the first transition to self employment.

3.1 Data & Sample

The PSID began in 1968 with a national probability sample of about 4,800 US households representing families at all income levels. It has conducted annual re-interviews each year since¹¹. I use both the family and the individual files for survey years 1968-1999. The time-series information of the PSID permits us to keep track of socio-economic life courses of individuals at different cohorts. Since the PSID collects yearly information, these observations can be used to build and test dynamic models of career choice. In other words it is possible to estimate the likelihood of changing from one state to another over a one-year period, conditional on the respondent's being at risk of such an event.

The sample of individuals who are at such risk is constructed through a series of steps. At the outset, I defined my pool as all *individuals* between 1968 and 1999. I matched information about these individuals both from family and from individual questionnaires. Out

¹¹ Over the years, scholars have undertaken extensive studies of attrition bias in PSID (e.g. Fitzgerald, Gottschalk & Moffitt, 1998). The conclusions from these studies reveal that attrition has not seriously distorted the representativeness of the PSID and that its cross-sectional representativeness has remained more or less intact.

of this pool, I excluded individuals, a) who never become a family head or wife¹² and b) who have an attrition of more than one calendar year and this information is not recoverable c) who start immediately as self-employed at the first year of observation.

The exclusion of people who never became a head or a wife is due to lack of information on the employment history of those individuals in certain years. Because the PSID is mainly a household survey, most of the relevant information for this study has been provided only for the head or wife of the family. Thus, in order to gather all the information about the individual, the individual must be a head or wife at some point in time in the PSID data window.

By excluding people with unrecoverable attrition, I prevent the possible bias due to left truncation since we cannot be sure about whether or not such transition has ever occurred or about its exact timing. I exclude the individuals who start immediately as self-employed at their first year in the labour market because their duration is simply 0. Yet the number of such people is negligible¹³ and the results are unaffected by it.

Additionally, since I model the first transition to self-employment, I start observing these individuals right after they finish their education until the time they make the transition or until window period is over. One implication of this rule is the exclusion of all individuals who were born prior to 1949 from the pool of individuals “at risk”. Consequently, I avoid the problem of left truncation in my sample. This procedure gives us an age span of 16 years to age 50 years where the vast majority of the marital transitions and first self-employment transitions occur in an individual’s life course.¹⁴ I concentrated on the first-transition because the prior exposure to self-employment is likely to effect posterior transitions (Sorensen, 2007).

¹² Because it is a family survey, unless there’s an adult male in the household or specified differently, PSID defines him as head of the household. Therefore the sample is not a couple-sample. I include single individuals (male or female) who became a head of household at least once during the observation window.

¹³ Only 11 out of approximately 6600 individuals with continuous life histories started as self-employed in their first year in the labour market.

¹⁴ Self-employment transitions after retirement are out of this paper’s focus. For transitions to self employment at older ages, see Karoly and Zissimopoulos (2003) or Bruce, Holtz-Eakin and Quinn (2000).

Overall, my sample includes 6593 individuals. Approximately 23% (1477 individuals) of them experienced self-employment transitions and 77% (5116 individuals) of them are right-censored. The transition destinations contain both types of self-employment: Self-employment as incorporated or unincorporated businesses. The definition and the construction of these two types are explained in the next section.

Previous research documents contradictory numbers about self-employment occurrence rate over the individual's life course. For example, according to one study, in the US more than 40% of men by their early fifties have engaged in self-employment at some point in their life (Arum & Müller 2004), whereas earlier studies predict this rate to be somewhere between 20% and 30% (Lipset & Bendix 1959; in Arum & Muller 2004). In my sample among the men who reached the age 48, the rate of having at least one self-employment experience is approximately 34%.¹⁵

3.2. Measures and Methodology

3.2.1. Model Specification

I use discrete-time event history analysis; though underlying time process in my dependent variables are continuous (i.e. people realize transition at any point during the year), we can only observe the duration in grouped form (i.e. annual observations) This approach is more convenient to analyse what I perceive to be two dynamic parallel processes at the level of individual in different domains of life: marriage and career processes in this case; becoming self-employed (see Blossfeld et al., 2007). Event history technique is particularly useful to establish causality between such processes since the basic idea lies in modelling the changes in the state of one variable as a function of changes in the other, rather than the variable itself (see Blossfeld et al., 2007).

¹⁵ Due to right-censoring it is not possible to obtain the same statistics out of my sample. This is because the sample size of the men who are followed since they enter the labour market until their fifties is very small. This approximate figure is out of 171 men.

In this study, the descriptive statistics about mean age at first marriage transition and mean age at first self-employment transition may give us an idea about the temporal order. In my final sample the mean age at first marriage for men is 25.3 (st. dev. 7.3), whereas mean age at first transition to self-employment is 29.1 (st. dev. 5.4). These figures imply that on average the first self-employment transition follows a few years after the first the marital transition for men. For women, the age difference between the first marriage and the first self-employment transition is greater and the standard deviations are smaller. Their mean age for the first transition to self-employment is 30 years old (st.dev 5.8) and the mean age for the first marriage is 22.4 (st dev. 4.7).

I use the complementary log-log link to estimate the transition rate. C-log-log model can also be interpreted as the discreet time model corresponding to an underlying continuous proportional hazards model (Jenkins, 1995). In practice, both models give similar results for the estimates of the covariates as long as the hazard rate is relatively small (Jenkins, 2004). As Yamaguchi (1991: 16-17) indicates the discreet time models approximate to the continuous time models when conditional probabilities of the events at each discreet time interval are smaller than 0.10. This rate in my model is well below the 0.01 for each year. Therefore, I interpret my results as in the continuous time model. I estimate different versions of the following baseline specification:

$$p(y, x, m, r, i, j) = 1 - \exp[-\exp(\alpha_m m + \alpha_{r_i} r_i + \beta_x x + t_j)]$$

where, m denotes the dummy variable indicating whether the individual is married and r_i defines the resource i of the spouse (social and financial resources) and x represents the set of control variables employed in the literature. The sub-index j represents the set of intercepts for each of the time interval considered. Spousal resources r has a value only if the individual is in a relationship. This assumes that single individuals only rely on their own resources. The functional form that characterizes the duration dependence in our estimation is the polynomial

function of time¹⁶. The baseline hazard takes the $(t + t^2)$ form in all the estimations. This is because the probabilities for the first transition decline beyond certain age in both types of self-employment but especially unincorporated businesses. In order to account for higher number of incorporated business start-ups at relatively later ages, I tried with logarithmic baseline hazard which produced almost identical coefficients for the spousal effects that we are interested in. My specifications incorporate several time varying and time independent covariates.

While estimating the model, I pursue the following stepwise strategy. In the first set of results, I will show the baseline model where I only consider an individual's own resources such as social capital, human capital and earnings potential as well as basic environmental factors and marital status variables. In the second step, I will report the results after having added the resources of the spouse to the baseline model stepwise. With this approach, I investigate the effect of assortative mating on the self-employment transition (e.g. Bernasco et al. 1998).

3.2.2 Dependent Variables: Two Destinations to Self-Employment

I examine the first self-employment transition out of any state in the course of an individual's life. The transition can be interpreted as the propensity or the intensity to change from an origin state to a destination state. In the sample of individuals, at any given point in time, I estimate the rate of moving from other states (origin, 0) to the self-employment state (destination, 1). In the construction of the dependent variables, I pursue the following steps.

First, I built the dependent variable as a dichotomous dummy where 1 indicates the years in which the individual is self-employed and 0 if otherwise. This procedure is not so straightforward. The PSID data have evolved over time and there have been multiple changes

¹⁶ Since we examine the effects of the marriage and the spouse, the specification of the base line hazard rate serves only for control purposes and therefore it should not be interpreted substantively.

in the coding and the scope of employment status variables. Therefore, construction of a consistent employment history required a detailed analysis of both individual and family files as well as cross-checking with employment history supplemental files. Based on a number of survey questions, the self-employed in this study are those individuals, who classify themselves as primarily being an employer, working on their own account, or being self-employed (see Dennis 1996, for the validity of these definitions).

As stated earlier, I model the transition to self-employment from any state of origin. Thus, the transition can be from “salaried employment” or “not-working”. I differentiate the transitions from these categories with a control variable indicating whether individual was previously employed or not working (see Arum, 2004; Sorensen, 2006; Budig, 2006; Sorensen, 2007)¹⁷.

Self-employment is increasingly becoming a heterogeneous category. It has been growing at both ends of status distribution of occupations in recent years (Arum 1997; Budig, 2006). Furthermore, selection into high-rewarding and low-rewarding self-employment types are highly patterned by gender and education. Thus, the extent to which spousal influences play a role on the transitions might vary depending on the type of self-employment. In order to address these issues, I classified self-employment into two categories: Incorporated businesses and unincorporated businesses. Incorporated businesses are becoming more and more common. In the US over the last decades and there is an increase in the incorporation rate of the self-employed: It took off from approximately 2.5%¹⁸ in the late 1980s to 3.6% in 2003. On the other hand, the rate of unincorporated self-employment has been declining since the beginning of 1970s from 8.9% to 7.5% in 2003 (Hipple, 2004). Although the incorporation rate is increasing across all education/occupational classes, it is still highly patterned by education level, occupational status and gender. Therefore, I believe

¹⁷ Due to the focus and data period, I do not observe an alternative transition, namely, entry into retirement. The oldest person in my sample reaches the age of 50.

¹⁸ E.g. percentage of the total employment.

distinguishing self-employment according to incorporation status is useful in order to capture the heterogeneity in the self-employed induced by these variables.

(Table 1 about here)

For example, Table 1 shows the distribution of self-employed by the education categories in 2003. According to these figures, more than 42% of the unincorporated self-employed have education levels equal to high school or less than high-school. Only around 30% of the unincorporated self-employed are college graduate or holding advance degrees. These rates are reversed for the incorporated self-employed. The rate of the self employed with high school graduates or less drops to 28% among the corporate business owners. On the other hand, approximately half of the corporate business owners hold college or advance degrees.

The pattern in educational distribution of the self-employed is also reflected in the occupational distribution. Hipple (2004) finds above-average incorporation rates occurring mostly in professional/skill-requiring occupations: such as dentists (40.1 percent); veterinarians (30.9 percent); physicians and surgeons (18.3 percent) and lawyers, judges, magistrates and other judicial workers (11.5) percent. Table 2 below describes the incidence of self employment in broad occupational groups.

(Table 2 about here)

Previous studies point that there is a significant difference in the self-employment type by gender (Carr, 1996; Hundley 2000; Parker 2005; Budig, 2006). Incorporated business owners are more likely to be men since they are expected to use self-employment to advance their careers, whereas women are expected to be more present in unincorporated-business since their primary concern is flexible hours to combine family obligations with work (Carr, 1996). Figure 1 and Figure 2 show the survival rates in my sample for the transition to self-employment by gender, for incorporated business and unincorporated businesses respectively.

Figure 1 shows that men are significantly more likely to realize transition to self-employment as a corporate business than women ($\chi^2 = 97.16$, $\text{Pr} > \chi^2 = 0.0000$). However, Figure 2 shows that gender selection into unincorporated business is minor ($\chi^2 = 2.43$ and $\text{Pr} > \chi^2 = 0.1188$).

(Figure 1 and Figure 2 about here)

It might be important to note here that constructing these two types self-employment at the individual level was not straightforward. The problems of comparability overtime occurred because the relevant PSID question in the earlier waves provided information at the family level and in the later years at the individual level. Therefore, for the years when this question was referring to the family business, I turned to the employment status of both spouses and assign the ownership to one or the other spouse¹⁹. The details of the algorithm I used in this classification are presented in the appendix.

3.2.3. Explanatory and Control Variables

I have two types of independent variables; time varying variables and time constant variables. The summary statistics of these variables are presented in Table 1. The main explanatory variables in the models are *marital status* and *spousal resources*. Control variables include both individual resources and environmental factors.

Because the models aim to explore the effect of marriage, the first explanatory variable is “Married” that indicates the individual’s couple status. Married is a dichotomous dummy. It takes a value 1 if the individual is married or cohabiting with a partner in the corresponding year and 0 otherwise.

My concern is not about the legal aspects of marriage and instead, I take marriage as an environment where opportunities for self-employment arise or are dampened. For this

¹⁹ Luckily, low rates of female employment during the early waves allowed me to assign it to husbands successfully. Only about 12 cases where both spouses appeared working and the decision to assign the type of business (referring to the family business) to one of them was not easy. For robustness, I ran my estimations with and without those cases, neither the signs nor the size of the estimated coefficients changed significantly.

reason, I assume that there's no difference between cohabitants and the married in terms of spousal influence. Although cohabitation implies less stability, for the nature of the spousal influences we are interested, I do not expect a difference between the cohabitation and the marriage. Recently, Verbakel and De Graaf (2008) found that in terms of partner influence for the upward career mobility, there is no difference between legally married couples and cohabitating couples. The same logic applies for the distinction between a divorcee and a single individual. If an individual doesn't have a partner in a given year, the variable Married takes the value 0. Married is an indicator of an individual being in a couple or not.

Additionally, because the duration spent in couple might influence within-family dynamics, including e.g. the processes of decision-making and resource accumulation, I included a time dependent variable for marriage duration into my specifications. Marriage Duration is a clock variable that counts the years passed in each marriage for a given individual. Marriage duration is reset to 0 when there is a divorce or cohabitation ends and starts re-counting when the individual remarries or makes a re-entry into cohabitation. Furthermore, marriage duration variable enters in the model in quadratic form also as another measure of the accumulated stock of marriage related human capital (Wong, 1986).

Self-employment transitions can occur for a variety of other reasons. To account for these, I include two sets of controls. The first one pertains to the individual resources.

Individual resources for self-employment are two-fold: Social resources and financial resources. Education is the classic indicator of human capital endowment in the extant literature. The relationship between education and self-employment is not very straightforward. This relationship has been positive in some countries such as Germany and transition economies and curvilinear in others such as UK and Israel (Arum & Muller, 2004). Previous literature in the US has found ambiguous effect of education on the entry to self employment. While, the effect of education on starting a corporate business has been insignificant (e.g. Dunn & Holtz-Eakin, 2000), Arum (2004) finds this effect to be positive

and strong for women, and negative for men except for professional-skilled self employment. Budig (2006) reports positive effect in general and this effect did not vary by gender. In a way, this ambiguity reflects the existence of two counter arguments. On the one hand, education enhances human capital and access to the essential entrepreneurial resources such as financial capital (Evans & Jovanovic, 1989). The more educated also tends to be better informed, implying that they are more adept at assessing self-employment opportunities. On the other hand, education tends to relate positively to higher salary and consequent slack behaviour due to lack of motivation. The latter argument also contends that too much specialisation occurs at certain levels of education, which becomes an impediment for the individuals to start up their own business (Blanchflower, 2000). “Education” variable is used in two different ways. First one measures continuously the grades completed by the individual at each spell²⁰. Second, I followed Schwartz and Mare (2005)’s approach to group the individuals in comparable educational categories and hence the variable *the highest grade completed* is classified into 5 broad educational categories (<10, 10-11, 12, 13-15, 15<)

Age is a typical demographic control variable. Arum (2004) reports a positive and “surprising” relationship with age and self employment. However, in my specifications age and age-square are highly correlated with the baseline hazard (e.g. time and time-square). For this reason I exclude them in the final model²¹.

I control for individual characteristics by taking into account both parental background, prior experience in the labour market as an employee and race. I use two distinct variables to control parental background. First one is whether individual’s father was self-employed. This is a standard variable in most entrepreneurship studies and captures intergenerational inheritance effect of self-employment. Second one is the parent’s socioeconomic status. This is a categorical variable provided by the PSID survey. It has three

²⁰ Note that because the risk set constitutes individuals being followed after they end their education, this variable indeed is a time-invariant variable.

²¹ I estimated the same model specifying Age and Age-Square as the baseline hazard. See the section about the robustness checks.

categories indicating whether parents' economic status was poor, average and varying or pretty well-off when the individual was growing up. This variable also constitutes a proxy for social class.

Studies show that self-employment rates differ across ethnic groups in the US and being black often found to be negatively associated with self-employment transitions (Aldrich & Waldinger, 1990; Hout & Rosen, 2000). Furthermore race is another standard background related social capital measure in the US literature. Therefore, I incorporate a categorical dummy for whites, blacks and Hispanics to the models.

Finally, individual hourly labour earnings (ln-hourlywage) control for financial resources affecting the selection into self-employment. I take the log of the earnings in the model.

Second set of control variables are related to the environmental conditions. The macro-environment in which the individuals reside should have heterogeneous effects on self-employment transition rates. The long time span and rich data set allow us to control for time varying socio-economic spatial characteristics. To that end, I construct a variable "State SE" that shows the ratio of self-employment to total employment in each state by year. Data for this variable come from US Bureau of Economic Analysis – Regional Economic Accounts. In the US, there are significant differences across states among the self-employment rates.

Besides, I include a time-dependent covariate marking the years where there is birth event for that individual (Bevent) with the value 1 and it takes the value 0 if there's no birth event for that individual in the current year. I suspect that child birth might generate different motivations for men and women for the transitions between employment statuses. While men might have greater motivation to take control of their productivity in the event of a child birth, women might look for stability and remain in (or even make a reverse transition to) the salaried jobs. The stability motive might be even stronger for single-headed household.

Like the individual resources, spousal resources are also two-fold (i.e. social resources and financial resources), however they are measured slightly different. Human capital as a component of social resources is determined by spouse's education. I used five education categories explained earlier for the spouse education as well.

As opposed to own education, the literature predicts a positive effect of spouse education on the self employment. Spouse's education as a measure of human capital both enhances knowledge transfers between the spouses (Parker, 2005) and increases the human capital of the family if the entrepreneurship takes the form of family business and the human capital levels are lower such as the patterns observed among the immigrant families (Sanders & Nee, 1996). Spouses' education also has larger effects on one's earnings than own education for the self-employed as opposed to the salary earners (Wong, 1986).

To account for spousal social capital, I use spouse employment status. I have three categories: spouse not-working, spouse being employed and spouse being self-employed. Furthermore, I add spouse's hourly wage as a financial source that spouse provides. I believe hourly wage rate is a better indicator than individual income since it is not contaminated by labour supply decisions and reflects the real earnings potential. All these variables are lagged one year.

(Table 3 about here)

4. Results

4.1. The effect of marriage and individual resources

Table 4 and Table 5 below show the results of the C-log-log models for the transitions to self-employment that includes only individual resources and marriage. Table 4, shows the results for four different specifications regarding the transition to self-employment as corporate business, whereas Table 5 shows similar estimations for the self-employment as

unincorporated business. The results for women becoming corporate business owners should be interpreted with caution since the number of events is very small.

(Table 4 and 5 about here)

First columns for men and women in both tables (models 1a and 1f) show the influence of individual resources on the likelihood of becoming self-employed. The subsequent models add stepwise marriage effects. It is immediately apparent that there exist striking differences by gender in the way in which individual resources affect the transition to both type of self-employment (models 1a. in Table 4 and 5).

For example, while education; as an indicator of human capital (i.e. last grade completed) positively affects men's likelihood of starting a corporate business, having the highest level of education relative to the lowest level of education is significant and positively associated with the women's transition to the unincorporated self-employment. On the other hand, being a high-school graduate as opposed to high-school drop out is more likely to increase the odds of becoming unincorporated self-employed for men.

Growing up with wealthy parents appears to be an important determinant of starting a corporation for both sexes; though for men the size of the coefficient is much bigger indicating that the economic background is a better determinant of entrepreneurship among men than women

Whereas for women, parent's background also contributes to self-employment transition in the form of unincorporated business but no such association is found for men.

Race is a categorical variable where the reference category was being white. Being black relative to being white is clearly a disadvantage for the transition to both type of self employment, a fact that's well observed in the previous literature (Nee & Sanders, 1996; Hout

& Rosen, 2000; Parker, 2005), although, this negative association seems to be absent for women when it comes to transition to self-employment in the form of a corporate business.²²

Hourly-wage can be interpreted both as a measure of financial resources and possibilities especially since it corresponds to the previous years and as the opportunity cost of quitting the job and starting a business. The signs of the coefficients for hourly wage also indicate the second interpretation more likely to be true. The relationship between hourly earnings and self-employment transition for men is negative for both types of businesses. From the significant and negative signs, we can conclude that the higher the hourly wage rate, the less likely an individual to quit an employment to start a business. An implication of this result is the earnings difference between salaried work and self employment is an important determinant for men's entry to self employment. While higher hourly wage rate discourages men, it discourages women only for entering unincorporated self-employment. This finding is consistent with the hypothesis that men mostly enter into self-employment to improve their economic conditions.

As an environmental factor, state self-employment rate is strongly and positively associated with the unincorporated business type of self-employment while the data shows no relationship with the corporate business transitions. This result is not surprising since the most of the variation in the state self-employment rate comes from the unincorporated businesses (Arum & Muller, 2004).

To sum up, the effect of individual resources shows no unexpected signs and confirms most findings in the previous literature on both types of self-employment transitions, except for two variables: the path that leads to self-employment and father being self-employed. There is a vast literature on self-employment and its inheritance from the parents (Dunn & Holtz-Eakin, 2000). Evidence is stronger for the non-US research (Sorensen, 2006). However,

²² Note that the number of events for women is lower than the men for corporate business type of transitions, which might be explaining some of weaker effects here. Being women is negatively associated with corporate business transitions on a pooled regression which might dominate the race effect.

my data shows no association between the likelihood of both type of self-employment transition and the father being self-employed. Arum (2004) finds no effect of father being self-employed for women's entry into the professional or unskilled self-employment outside the agricultural sector. Part of the father effect might be captured by parent's economic status variable which is explained above.

Another unexpected result the data exhibits is about the importance of the path to the self-employment. Not working in the prior year to the transition has a significant and positive effect for women's likelihood of starting a corporation. This result is surprising because from the resource perspective, being out of employment means a backlash in the accumulated stock of human capital, which is necessary for the incorporated self-employment. Budig (2006) found that for men; being unemployed usually has a weak but positive influence on the likelihood of becoming self-employed. Interestingly, in my estimations, when we consider only individual resources, having the year prior to the transition as "not-working", has a significant negative effect for men on corporate self-employment transitions in line with the human capital and resource hypothesis.

In general, individual resources and constraints confirm findings of the prior literature on the determinants of becoming self-employed. One interesting pattern observed from these results is, broadly speaking, the factors that affect the likelihood of starting especially a corporate business of men actually influence the likelihood of starting an incorporate business for women. These are education, race and parent's well-being. These results suggest that incorporated business for women may also be a way of advancing in the career rather than a mere way of reconciling work and family life. The confirmation of such argument becomes salient at the coefficients of the "marriage" variable.

Our concern in this first set of models was to understand whether "being married" matters for self-employment transition? The answer is "yes" for men and "no" for women. Married men are more likely to start a corporate business than single men in all specifications.

When marriage duration is controlled for, being married also positively affects likelihood of starting an unincorporated business. Yet, for women although not significant and therefore inconclusive, the coefficient of being married is negative for both types of business. This result is consistent with the economic specialization hypothesis. On the other hand, if women are more prevalent in unincorporated self-employment and the main reason of such self employment is the flexibility of work hours due to family obligations, one expects to have a positive influence of marriage on the transition to this type of self-employment. This is both because marriage would provide her the resources and it would incentive her to choose a self-employment that's less ambitious. However, we should be careful not to over-read these coefficients without looking at the channels of the spousal effects in table 6 and table 7.

On the other hand, Blossfeld et al. (2007) recommends caution about the interpretation of the coefficient for qualitative time-dependent covariates such as marriage, since it may capture other effects related to marriage. One clear example of this situation would be childbirth. Child birth can be an important determinant of the transition to self-employment especially for married women in search for flexible schedules. Consequently, when uncontrolled, its effect can be confounded with the effect of marriage since their timing usually closely follow each other in a duration setting (Blossfeld et al., 2007). The inclusion of a dummy variable indicating whether the child birth took place in a given year helps separate marriage effect from the child birth effect. The coefficient of Married variable is still significant in the specifications where the childbirth is controlled for (See, Models: 1h and 1j). This implies that there are other mechanisms for both women and men through which marriage generates a tendency for self-employment relative to single-hood than the motivations triggered by the child birth.

Marriage duration is another variable for marriage induced human capital. Marriage duration entered as a squared term to highlight its cumulative nature affecting the likelihood of self-employment (Wong 1986, Bruce 1999). The model proved a negative effect on the

self-employment transition although the size of this effect is small. The interpretation of this is that the transition to self-employment becomes increasingly unlikely as the time spent in the marriage increases.

4.1. Spousal effects

Now we go one step beyond the “marriage effect” and explain the effects of spousal resources on the individual’s hazard of being self-employed. Tables 4 and 5, below, contain models including variables related to spousal resources in addition to individual resources. There are five model specifications for each type of self-employment by gender.

(Table 6 and Table 7 about here)

The first three models add stepwise the different indicators of spousal resources for each sex (from 1a to 1c and 1f to 1h). The last two models include the spouse education as one measure of additional human capital and spouse financial resources in isolation (1d, 1e and 1i, 1j). In the first model (see columns 1a and 1f), I include to the baseline specification spouse’s employment as an indicator of spouse’s social resource (i.e. human and social capital). The reference category here is “spouse not-working”. An interesting finding here is that for both men and women having no spouse at all (being single) is negatively associated with the likelihood of starting a corporate business when compared to being married with a not-working spouse *ceteris paribus*. This relation is strong and significant. This result provides evidence for the economic specialization theory and especially the breadwinner hypothesis. For women; having a “working spouse” and “not-having spouse at all” are both negatively associated with the likelihood of becoming incorporated self-employed with respect to having a “not-working” spouse. In other words; husbands by being in the labour market as an employee, do not contribute to the wife’s likelihood of being self-employed as much as if he had been out of the labour market. Actually, when compared to the table 4 and table 5 with simple marriage effects which pointed no significant effect of having a partner on

any self-employment type, the results in model 1a of table 6 clearly indicate the conditions under which having a partner might matter for the self-employment transitions of the women: i.e. when the husband does not work.

On the other hand, a self-employed wife is positively contributing to the husband's likelihood of transition to both type of self-employment relative to a not-working wife. To the extent that employment status measures social capital, we can claim that wife's social capital contributes positively to the husband's transition to become self-employed. The same is true for women's likelihood of being an unincorporated self-employed. Husbands' being self-employed is significantly and positively affecting wives' likelihood even after the husbands' education is controlled for. This result is consistent and more directly with the sociological social capital interpretation rather than specialization explanation. This result is also consistent with previous findings of knowledge and skill transfers between the spouses (e.g. ; Bruce, 1999; Parker, 2005).

However, this effect is strikingly captured by spouse education and vanished when we include it into the model as a measure of additional human capital resources (See models 1g to 1i). For corporate business type of self-employment transitions, relative to having a spouse with the highest education level a spouse with the two year-college and high school graduated wife have a strong negative effect. The implication is that the wife having a college and above degree is positively associated with husband's self-employment transition.

When we control for spouse's hourly wage rate for both self-employment types, the effect of spouse education becomes more accentuated. Relative to the highest education level, having a spouse who is a high school graduate or 2 years college graduate is negative associated with the husband's transition to self-employment. These findings are consistent with the findings of the earlier research (Wong, 1986)

Finally, I include spouse education and spouse financial resources separately in order to distinguish the most important resource for the individual's transition to self-employment.

While for men, spouse education is still important, the exclusion of spouse employment and financial resources significantly reduced the log-likelihood worsening the overall fit of the model. Inclusion of only financial resources improved the model relatively though they turned out to be insignificant. This result suggests that risk pooling hypothesis does not hold true. Spousal financial resources in the form of hourly wage do not constitute insurance for starting a business for neither wives nor husbands.

5. Additional Specifications.

To ensure the robustness of the findings, I tried the following strategies: First, I estimated the same models with different duration specifications, specifically using Age and Age-square. Age might enter the model both in quadratic and linear form to measure the baseline rate and to be proxy for a stage in life (Blossfeld & Drobnic, 2001). Doing so did not change the results of other coefficients significantly. However, I excluded age and age-square from the final model because they were highly correlated with marriage duration.

I also estimated the models with different control variables. These variables are either correlated with the existing ones or inclusion of them did not improve the overall model (i.e. based on Wald test). These control variables are “time spent not-working”, “number of kids” “city size” and “state level GDP rate” and “household income”. Some of them are worth mentioning in detail. For example, previous literature used household income both to proxy financial resources available for the individual and to isolate the effect of marriage net of the increase in household income (e.g. Budig 2006). However, total household income is not relevant for the second purpose of this paper, which is identifying spousal resources. Because it is contaminated by the labour supply of both spouses as well as income from other sources, I preferred using hourly wage rates as the main determinant of self-employment decisions.

Time spent not-working turned out to be significant and negatively associated only with women's founding of unincorporated businesses but it was highly correlated with the baseline hazard as well as marriage duration. The inclusion of too many clock variables made the model highly collinear and hard to interpret, therefore I excluded it from the main specification.

6. Conclusions.

This paper contributes to the growing literature on the self-employment and family resources by shifting the focus from parents to marriage and spousal effects. The results suggest that in general being in a couple is an important determinant of the transition to both types of self-employment (but especially for men). Nonetheless, this is not unconditional. The hypothesis that having a partner positively affects self-employment outcome due to risk pooling and risk sharing has not been confirmed since it doesn't distinguish gender roles and sex-specific division of labour within the couple. For example, especially for women, spousal financial resources only, or having a spouse in salaried job had either negative or no effect on the wife's transition probability. This result is consistent with the prediction of specialization hypothesis. Higher wage of the husband, in a way, disincentives the wife to invest in market skills and start a business to advance a career.

My results supported the hypothesis derived from the neoclassical theory of the family based on economic specialisation for women's transition: While having an unemployed husband improves wife's likelihood of becoming an incorporated self-employed, a salary earner husband who is specialising in the market work negatively affects her transition probability.

To the extent my variables measure spousal resources; I find evidence for some of the predictions of the social capital thesis and especially for men. Spouse education as one

measure of human capital highly and positively contributes to husband's transition to both types of self-employment in general but more so to incorporated self-employment. This result persists to be robust even after other types of resources are controlled for. When only spousal employment status as a measure of social capital is considered, having a self-employed wife positively influence the husband's own likelihood of becoming one. This outcome is consistent with one prediction of social capital hypothesis that resourceful spouses positively contributes to the spousal attainment and success. Yet, this result does not hold firmly when the wife's financial resources are controlled for.

There are a few caveats of this study that requires caution and calls for further research. First one is the selection into self-employment and marriage due to unobservable characteristics. Second, sample size for women's rate of moving to incorporated self-employment has been very small. I expect to find more precise results with a larger sample. Third, separating self-employed into incorporated versus unincorporated businesses might not fully capture gendered and skilled nature of all professions. From table 1 and table 2 it can still be seen that some of the low-skill (resource) requiring occupations are incorporated and some portion of highly professional occupations are unincorporated. I expect that for most of the time period that my sample covers; incorporated self-employed category has been less heterogeneous since there has been a significant incorporation rate between 1989 and 2003 which might include different occupations into this category. But further heterogeneity of the self-employed especially among who declared to have an unincorporated business can also be problematic. This group might include some proportion of the professional-skilled self-employed as well as unskilled self-employed. Further disaggregating self-employed has not been possible due to sample size restrictions. Number of transitions for women has been relatively small therefore defining dependent variable in three categories would result even fewer cases for each type of transition.

All these limitations call for further research with improved data in understanding the mechanisms underlying the spousal influences on the likelihood of becoming self employment.

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Appendix

The following algorithm shows the way in which the type of self-employment is assigned for each year for the observations when the dependent variable took the value one. Up until 1983, the question about the type of business for a self-employed wife did not exist. But instead for those years, there was a question about whether family owned a business or not. And then it followed a direct question “whether this business was incorporated or unincorporated?” So, I matched the responses with the individual employment status of both wife and head. For example: in cases where head was an employee and wife appeared self-employed, I assigned this business to wife. For the later waves this information was provided by PSID directly at the individual level. In the following algorithm the variable “corp” indicates whether the business was a corporation.

```
*1969
replace corp=1 if ER30022==1 & V640==3 & (V1383==1 | V1383==3) & year==1969
*1970
replace corp=1 if ER30045==1 & V1279==3 & (V2095==1 | V2095==3) & year==1970
*1971
replace corp=1 if ER30069==1 & V1984==3 & (V2696==1|V2696==3) & year==1971
*1972
replace corp=1 if ER30093==1 & V2582==3 & (V3208==1 | V3208==3) & year==1972
*1973
replace corp=1 if ER30119==1 & V3115==3 & (V3627==1| V3627==3) & year==1973
*1974
replace corp=1 if ER30140==1 & V3530==3 & (V4067==1| V4067==3) & year==1974
*1975
replace corp=1 if ER30162==1 & ((V3968==3 & (V3972==1| V3976==1))|V4613==1) & year==1975
*1976
replace corp=1 if ER30190==1 & V4459!=31 & (V4472==1| V4475==1) & year==1976
replace corp=2 if ER30190==2 & V4842!=31 & (V4855==1| V4858==1) & year==1976
*1977
replace corp=1 if ER30219==1 & V5374!=31 & (V6077==1|V6077==3) & year==1977
*1978
replace corp=1 if ER30248==1 & V5873!=31 & (V6681==1|V6681==3) & year==1978
*1979
replace corp=1 if ER30285==1 & V6497!=31 & (V7278==1|V7278==3) & year==1979
replace corp=1 if ER30285==2 & V6596!=31 & (V7278==1|V7278==3) & year==1979
*1980
replace corp=1 if ER30285==1 & V6497!=31 & (V7970==1|V7970==3) & year==1980
replace corp=1 if ER30285==2 & V6596!=31 & (V7970==1|V7970==3) & year==1980
*1981
replace corp=1 if (ER30345==1|ER30345==2) & (V8609==1|V8609==3) & year==1981
*1982
replace corp=1 if (ER30375==1|ER30375==2) & (V9289==1|V9289==3) & year==1982
*1983
replace corp=1 if (ER30401==10|ER30401==20|ER30401==22) & (V10875==1|V10875==3) & year==1983
*1984
replace corp=1 if (ER30431==10) & (V11890==1|V11890==3) & (V11892==1|V11892==3) & year==1984
replace corp=1 if (ER30431==20|ER30431==22) & (V11890==2|V11890==3) & (V11892==1|V11892==3) & year==1984
*1985
replace corp=1 if (ER30465==10 & (V11641==2 | V11641==3)) | ((ER30465==20|ER30465==22)&(V12004==2|V12004==3)) & year==1985
replace corp=1 if ER30465==10 & (V13401==1 | V13401==3) & (V13403==1|V13403==3) & year==1985
replace corp=1 if (ER30465==20 |ER30465==22) & (V13401==2 | V13401==3) & (V13403==1|V13403==3) & year==1985
*1986
replace corp=1 if (ER30500==10 & (V13050==2 | V13050==3)) | ((ER30500==20|ER30500==22)&(V13229==2|V13229==3)) & year==1986
replace corp=1 if ER30500==10 & (V14498==1 | V14498==3) & (V14500==1|V14500==3) & year==1986
replace corp=1 if (ER30500==20 |ER30500==22) & (V14498==2 | V14498==3) & (V14500==1|V14500==3) & year==1986
*1987
replace corp=1 if (ER30537==10 & (V14150==2 | V14150==3)) | ((ER30537==20|ER30537==22)&(V14325==2|V14325==3)) & year==1987
replace corp=1 if ER30537==10 & (V15766==1 | V15766==3) & (V15768==1|V15768==3) & year==1987
replace corp=1 if (ER30537==20 |ER30537==22) & (V15766==2 | V15766==3) & (V15768==1|V15768==3) & year==1987
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*1988
replace corp=1 if (ER30572==10 & (V15158==2 |V15326==2)) | ((ER30572==20|ER30572==22)&(V15460==2|V15628==2))& year==1988
replace corp=1 if ER30572==10 & (V17301==1 |V17301==3) & (V17303==1|V17303==3)& year==1988
replace corp=1 if (ER30572==20 |ER30572==22) & (V17301==2 |V17301==3) & (V17303==1|V17303==3)& year==1988
*1989
replace corp=1 if (ER30608==10 &(V16659==2 |V16841==2)) | ((ER30608==20|ER30608==22)&(V16978==2|V17160==2))& year==1989
replace corp=1 if ER30608==10 & (V18705==1 |V18705==3) & (V18707==1|V18707==3)& year==1989
replace corp=1 if (ER30608==20 |ER30608==22) & (V18705==2 |V18705==3) & (V18707==1|V18707==3)& year==1989
*1990
replace corp=1 if (ER30644==10 &(V18097==2 |V18265==2)) | ((ER30644==20|ER30644==22)&(V18399==2|V18567==2))& year==1990
replace corp=1 if ER30644==10 & (V20005==1 |V20005==3) & (V20007==1|V20007==3)& year==1990
replace corp=1 if (ER30644==20 |ER30644==22) & (V20005==2 |V20005==3) & (V20007==1|V20007==3)& year==1990
*1991
replace corp=1 if (ER30691==10 &(V19397==2 |V19565==2)) | ((ER30691==20|ER30691==22)&(V19699==2|V19867==2))& year==1991
replace corp=1 if ER30691==10 & (V21305==1 |V21305==3) & (V21307==1|V21307==3)& year==1991
replace corp=1 if (ER30691==20 |ER30691==22) & (V21305==2 |V21305==3) & (V21307==1|V21307==3)& year==1991
*1992
replace corp=1 if (ER30735==10 &(V20697==2 |V20865==2)) | ((ER30735==20|ER30735==22)&(V20999==2|V21167==2))& year==1992
*1993
replace corp=1 if (ER30808==10 &(V22452==2 |V22653==2)) | ((ER30808==20|ER30808==22)&(V22805==2|V23006==2))& year==1993
*1994
replace corp=1 if (ER33103==10 &(ER2077==2 |ER2344==2)) | ((ER33103==20|ER33103==22)&(ER2838==2|ER2571==2)) & year==1994
*1995
replace corp=1 if (ER33203==10 &(ER5076==2 |ER5343==2)) | ((ER33203==20|ER33203==22)&(ER5570==2|ER5837==2))& year==1995
*1996
replace corp=1 if (ER33303==10 &(ER7172==2 |ER7439==2)) | ((ER33303==20|ER33303==22)&(ER7666==2|ER7933==2))& year==1996
*1997
replace corp=1 if (ER33403==10 &(ER10087==2 |ER10355==2)) | ((ER33403==20|ER33403==22)&(ER10569==2|ER10837==2))& year==1997
*1998
replace corp=1 if (ER33503==10 &(ER13496==2 |ER13211==2)) | ((ER33503==20|ER33503==22)&(ER13723==2|ER14008==2))& year==1998

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Table 1. Distribution of the Self-employed by Education and gender (2003). Percentages.

	Unincorporated Self-employed			Incorporated Self-employed		
	Total	Men	Women	Total	Men	Women
Less than High School	10,6	12,7	7,3	4,9	5,1	4,4
High School graduates	31,4	32,4	29,7	23,1	23,0	23,1
Some college	18,3	17,7	19,2	18,3	17,6	20,2
Associate degree	8,5	7,1	10,8	7,4	7	8,6
College graduates	18,9	17,9	20,5	28,4	28,5	28,2
Advanced Degree	12,3	12,2	12,5	17,9	18,8	15,5
Total	100	100	100	100	100	100

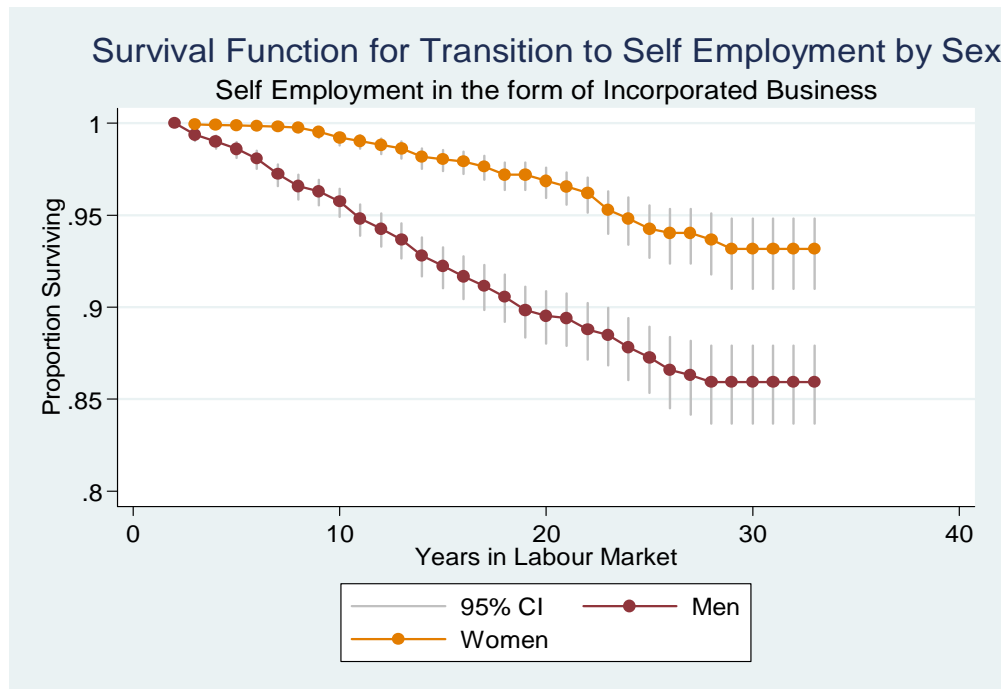
Source: Author's recalculations of the table 3 of Hipple (2004) which uses Current Population Survey (CPS) 2003

Table 2. Distribution of the Self-Employed by Gender and Occupation.

Occupation	Unincorporated Business			Incorporated Business		
	Total	Men	Women	Total	Men	Women
Management, professional and related occupations	8,7	11,3	6,2	5,9	8,8	2,8
Service occupations	7,7	5,9	9	1,1	1,5	0,9
Sales and Office Occupations	5,5	7,2	4,5	3,5	5,8	2,3
Natural Resources (e.g. Farming, Fishing) construction, maintenance	12,6	12,7	11	3,3	3,3	2,2
Production, transportation and material moving occupations	3,8	4	3,3	1,2	1,4	0,6

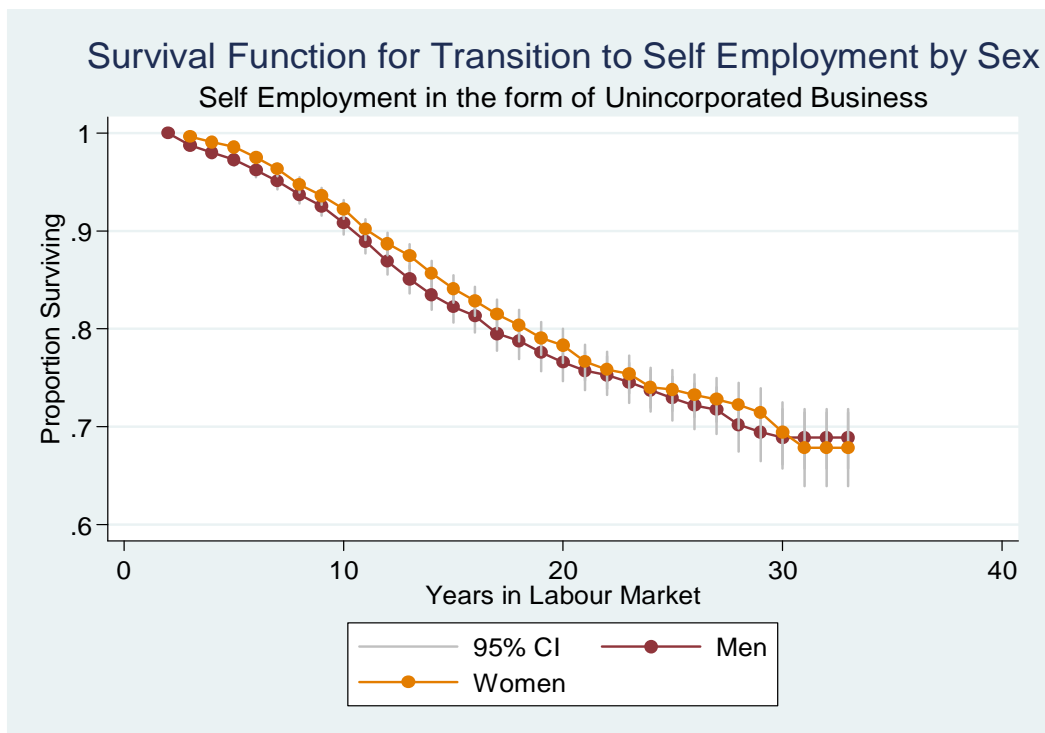
Source: Recalculations from Table 7of Hipple (2004) which is derived from CPS (2003).

Figure 1. Survival Function for the first transition to self employment- Incorporated Business by gender.



Source: PSID 1968-1999, own calculation.

Figure 2- Survival Function for men and women first transition to unincorporated self employment.



Source: PSID 1968-1999, own calculation.

Table 3. Descriptive Statistics of the Main Variables

Variable	MEN					WOMEN				
	N	Mean	Std. Dev.	Min	Max	N	Mean	Std. Dev.	Min	Max
Self-Emp- Corporation	44896	0,006	0,07	0	1	51670	0,002	0,04	0	1
Self-Emp- Unincorporated Bus.	44896	0,012	0,11	0	1	51670	0,01	0,11	0	1
Time	44896	9,76	6,83	1	32	51670	9,84	6,80	1	32
Time2	44896	141,85	177,24	1	1024	51670	143,17	175,87	1	1024
Race-Black	44821	0,31	0,46	0	1	51351	0,38	0,49	0	1
Race-Hispanic	44821	0,03	0,18	0	1	51351	0,03	0,17	0	1
Marriage Duration	44896	5,44	6,39	0	32	51670	4,65	6,09	0	32
Married(lagged)	40929	0,66	0,47	0	1	48148	0,59	0,49	0	1
Education-2	44853	0,12	0,33	0	1	51651	0,13	0,34	0	1
Education-3	44853	0,48	0,50	0	1	51651	0,49	0,50	0	1
Education-4	44853	0,19	0,39	0	1	51651	0,20	0,40	0	1
Education-5	44853	0,16	0,37	0	1	51651	0,13	0,34	0	1
Previous year not-working	44896	0,20	0,40	0	1	51670	0,41	0,49	0	1
Years of Not working	44896	0,30	1,18	0	31	51670	1,52	3,30	0	31
Ln_hourly wage (lagged)	40500	2,15	0,80	0	10,46	47385	1,77	0,87	0	11,15
Parents' SES-Average-Vary	44008	0,44	0,50	0	1	51524	0,40	0,49	0	1
Parents' SES-Well-off	44008	0,29	0,45	0	1	51524	0,26	0,44	0	1
Father Self-employed	43869	0,03	0,16	0	1	50306	0,02	0,15	0	1
State Self Emp. Rate	44491	0,15	0,03	0,02	0,30	51334	0,15	0,03	0,02	0,30
Spouse Not working	37971	0,26	0,44	0	1	46474	0,04	0,19	0	1
Spouse Employed	37971	0,36	0,48	0	1	46474	0,49	0,50	0	1
Spouse Self-employed	37971	0,03	0,16	0	1	46474	0,04	0,21	0	1
Ln_hourly wage of Spouse (lagged)	33420	1,11	1,10	0	7,97	44588	1,22	1,26	0	10,12
_lag Spouse_edu~1	40033	0,03	0,17	0	1	46860	0,03	0,16	0	1
_lag Spouse_edu~2	40033	0,07	0,26	0	1	46860	0,05	0,22	0	1
_lag Spouse_edu~3	40033	0,32	0,47	0	1	46860	0,27	0,44	0	1
_lag Spouse_edu~4	40033	0,14	0,35	0	1	46860	0,13	0,34	0	1
_lag Spouse_edu~5	40033	0,09	0,29	0	1	46860	0,10	0,31	0	1

Note: Omitted categories of the dummy variables are not reported here.

Table 4. Determinants of Hazards of Transition to Self Employment-Corporate Business(C-log-log Estimates)
Individual's Own Resources and Marriage Effect

	WOMEN					MEN				
	model1a	model1b	Model1c	model1d	model1e	model1f	model1g	model1h	model1i	model1j
Time	0.333***	0.306***	0.305***	0.305***	0.304***	0.168***	0.110**	0.109**	0.113**	0.111**
	(0.067)	(0.074)	(0.074)	(0.075)	(0.074)	(0.050)	(0.050)	(0.051)	(0.051)	(0.052)
time2	-0.008***	-0.007***	-0.007***	-0.007***	-0.007***	-0.006***	-0.004**	-0.004**	-0.004*	-0.004*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Black	-0.412	-0.416	-0.415	-0.431	-0.431	-0.879***	-0.847***	-0.847***	-0.844***	-0.844***
	(0.294)	(0.305)	(0.305)	(0.301)	(0.301)	(0.229)	(0.230)	(0.229)	(0.230)	(0.230)
Hispanic	0.064	0.064	0.066	0.053	0.055	0.088	0.108	0.111	0.109	0.112
	(0.729)	(0.728)	(0.728)	(0.723)	(0.723)	(0.406)	(0.408)	(0.408)	(0.409)	(0.409)
Education_2	0.476	0.479	0.480	0.490	0.491	0.745	0.728	0.723	0.726	0.721
	(0.798)	(0.797)	(0.797)	(0.793)	(0.793)	(0.557)	(0.559)	(0.560)	(0.559)	(0.560)
Education_3	0.343	0.354	0.354	0.367	0.368	0.502	0.544	0.541	0.540	0.538
	(0.762)	(0.761)	(0.761)	(0.757)	(0.757)	(0.541)	(0.541)	(0.542)	(0.541)	(0.541)
Education_4	0.800	0.813	0.814	0.839	0.840	1.191**	1.229**	1.221**	1.222**	1.215**
	(0.778)	(0.779)	(0.779)	(0.776)	(0.776)	(0.556)	(0.556)	(0.557)	(0.557)	(0.557)
Education_5	1.093	1.108	1.108	1.151	1.152	1.586***	1.621***	1.613***	1.613***	1.605***
	(0.798)	(0.797)	(0.797)	(0.794)	(0.794)	(0.570)	(0.571)	(0.572)	(0.571)	(0.571)
Trans. from not-work	0.633**	0.658**	0.658**	0.661**	0.661**	-0.664**	-0.322	-0.324	-0.323	-0.325
	(0.289)	(0.289)	(0.289)	(0.289)	(0.289)	(0.311)	(0.296)	(0.296)	(0.296)	(0.296)
Ln-lagged(hourly wage)	0.121	0.125	0.125	0.121	0.120	-0.526***	-0.526***	-0.526***	-0.527***	-0.527***
	(0.118)	(0.116)	(0.116)	(0.115)	(0.115)	(0.148)	(0.150)	(0.150)	(0.150)	(0.150)
Parents SES-Average-Varying	0.188	0.189	0.189	0.191	0.191	0.431*	0.439*	0.440*	0.440*	0.441*
	(0.334)	(0.334)	(0.334)	(0.335)	(0.334)	(0.233)	(0.233)	(0.233)	(0.233)	(0.233)
Parents SES- Well Off	0.576*	0.575*	0.575*	0.570*	0.570*	0.838***	0.824***	0.824***	0.825***	0.825***
	(0.326)	(0.327)	(0.327)	(0.327)	(0.327)	(0.233)	(0.233)	(0.233)	(0.233)	(0.233)
Father Self-Employed	0.656	0.660	0.660	0.672	0.672	0.046	0.037	0.034	0.036	0.034
	(0.504)	(0.506)	(0.506)	(0.505)	(0.505)	(0.362)	(0.364)	(0.364)	(0.364)	(0.365)
State Self-Emp. Rate	1.442	1.449	1.448	1.560	1.560	-0.442	-0.569	-0.571	-0.560	-0.563
	(4.362)	(4.378)	(4.375)	(4.383)	(4.379)	(2.357)	(2.380)	(2.381)	(2.383)	(2.383)
lag(Married)		-0.018	-0.017	0.151	0.154		0.409**	0.426**	0.393**	0.411**
		(0.276)	(0.276)	(0.301)	(0.300)		(0.189)	(0.191)	(0.197)	(0.199)
Birth Event			-0.017		-0.050			-0.110		-0.107
			(0.469)		(0.469)			(0.241)		(0.241)
Marriage Duration-Sq				-0.001	-0.001				0.000	0.000
				(0.001)	(0.001)				(0.001)	(0.001)
Constant	-10.41***	-10.22***	-10.22***	-10.35***	-10.34***	-6.082***	-6.069***	-6.049***	-6.062***	-6.043***
	(1.091)	(1.090)	(1.103)	(1.098)	(1.110)	(0.710)	(0.702)	(0.704)	(0.703)	(0.705)
Ll	-527.298	-526.515	-526.503	-525.864	-525.848	-1248.096	-1233.221	-1232.717	-1233.181	-1232.683
chi2	80.845***	71.639***	71.547***	71.450***	71.379***	107.317***	102.520***	103.534***	103.244***	104.100***
Bic	1215.624	1223.804	1234.443	1233.176	1243.805	2654.916	2634.753	2644.225	2645.192	2654.673
N	45946	43192	43164	43192	43164	39404	37028	36941	37028	36941
# of Events	76	76	76	76	76	210	210	210	210	210

*: p <0.1, **: p <0.05, *** : p<0.01. Robust standard errors are in parentheses.

Table 5. Determinants of Hazards of Transition to SE-Unincorporated Business (C-log-log Estimates)

Individual's Own Resources and Marriage Effect

	WOMEN					MEN				
	model1a	model1b	Model1c	model1d	model1e	model1f	model1g	model1h	model1i	model1j
Time	0.283***	0.237***	0.238***	0.238***	0.238***	0.295***	0.244***	0.243***	0.234***	0.233***
	(0.029)	(0.031)	(0.031)	(0.032)	(0.032)	(0.037)	(0.038)	(0.038)	(0.038)	(0.038)
Time2	-0.009***	-0.008***	-0.008***	-0.007***	-0.007***	-0.010***	-0.008***	-0.008***	-0.007***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Black	-0.665***	-0.662***	-0.660***	-0.681***	-0.679***	-0.766***	-0.759***	-0.758***	-0.768***	-0.767***
	(0.106)	(0.110)	(0.110)	(0.111)	(0.111)	(0.122)	(0.122)	(0.122)	(0.123)	(0.123)
Hispanic	-0.209	-0.207	-0.200	-0.210	-0.203	-0.744**	-0.733**	-0.732**	-0.731**	-0.731**
	(0.274)	(0.273)	(0.274)	(0.270)	(0.270)	(0.351)	(0.351)	(0.351)	(0.350)	(0.350)
Education_2	-0.061	-0.057	-0.054	-0.041	-0.037	0.403*	0.405*	0.400*	0.412*	0.407*
	(0.228)	(0.228)	(0.228)	(0.227)	(0.228)	(0.215)	(0.216)	(0.216)	(0.217)	(0.218)
Education_3	0.064	0.079	0.083	0.099	0.104	0.028	0.056	0.053	0.077	0.074
	(0.210)	(0.210)	(0.210)	(0.209)	(0.210)	(0.204)	(0.205)	(0.205)	(0.206)	(0.206)
Education_4	0.118	0.134	0.128	0.170	0.166	0.172	0.199	0.191	0.232	0.224
	(0.228)	(0.229)	(0.229)	(0.228)	(0.228)	(0.225)	(0.225)	(0.225)	(0.227)	(0.227)
Education_5	0.524**	0.539**	0.546**	0.591**	0.599**	0.315	0.343	0.336	0.382	0.375
	(0.234)	(0.235)	(0.236)	(0.234)	(0.235)	(0.232)	(0.233)	(0.233)	(0.234)	(0.234)
Trans. from not-work	0.154	0.210	0.213	0.223	0.226	-0.184	-0.008	-0.009	-0.011	-0.012
	(0.140)	(0.139)	(0.139)	(0.139)	(0.139)	(0.167)	(0.161)	(0.161)	(0.161)	(0.161)
In-lagged(hourly wage)	-0.377***	-0.362***	-0.365***	-0.362***	-0.367***	-0.801***	-0.797***	-0.799***	-0.790***	-0.792***
	(0.098)	(0.098)	(0.098)	(0.097)	(0.098)	(0.084)	(0.084)	(0.085)	(0.086)	(0.086)
Parents SES-Average-Varying	0.007	0.009	0.005	0.015	0.011	-0.072	-0.065	-0.062	-0.065	-0.061
	(0.111)	(0.111)	(0.111)	(0.110)	(0.111)	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)
Parents SES- Well Off	0.199*	0.198*	0.199*	0.199*	0.199*	-0.043	-0.049	-0.049	-0.053	-0.053
	(0.116)	(0.116)	(0.116)	(0.116)	(0.116)	(0.127)	(0.127)	(0.127)	(0.127)	(0.127)
Father Self-Employed	-0.037	-0.035	-0.031	-0.028	-0.025	0.237	0.238	0.236	0.242	0.240
	(0.272)	(0.272)	(0.272)	(0.270)	(0.270)	(0.264)	(0.263)	(0.263)	(0.263)	(0.263)
State Self-Emp. Rate	5.368***	5.391***	5.437***	5.441***	5.488***	3.868***	3.840***	3.832***	3.780***	3.774***
	(1.423)	(1.424)	(1.426)	(1.413)	(1.416)	(1.453)	(1.459)	(1.459)	(1.456)	(1.456)
lag(Married)		-0.003	0.002	0.159	0.169		0.142	0.146	0.232*	0.238*
		(0.101)	(0.101)	(0.110)	(0.110)		(0.121)	(0.122)	(0.124)	(0.126)
Birth Event			-0.182		-0.212			0.006		-0.017
			(0.160)		(0.160)			(0.157)		(0.157)
Marriage Duration-Square				-0.002***	-0.002***				-0.001**	-0.001**
				(0.001)	(0.001)				(0.001)	(0.001)
Constant	-6.306***	-6.079***	-6.070***	-6.210***	-6.198***	-4.856***	-4.681***	-4.670***	-4.718***	-4.704***
	(0.389)	(0.387)	(0.390)	(0.389)	(0.392)	(0.356)	(0.353)	(0.353)	(0.355)	(0.355)
LI	-2823.702	-2811.510	-2805.174	-2806.174	-2799.680	-2518.928	-2498.144	-2496.825	-2495.783	-2494.474
chi2	233.608***	190.684***	193.534***	196.264***	198.927***	206.296***	183.482***	184.401***	189.752***	191.105***
Bic	5808.432	5793.794	5791.786	5793.796	5791.470	5196.580	5164.599	5172.441	5170.396	5178.256
N	45946	43192	43164	43192	43164	39404	37028	36941	37028	36941
# of Events	544	544	543	544	543	493	492	492	492	492

*, p <0.1, **, p <0.05, *** : p<0.01. Robust standard errors are in parentheses.

Table 6: Determinants of Hazards of Transition to S.Emp.-Corporate Business (C-log-log Estimates) Spouse Resources

	WOMEN					MEN				
	modela	Modelb	modelc	modeld	modele	modelf	modelg	modelh	modeli	modelj
Time	0.314*** (0.078)	0.310*** (0.078)	0.355*** (0.082)	0.309*** (0.077)	0.364*** (0.081)	0.075 (0.054)	0.068 (0.054)	0.012 (0.059)	0.086 (0.053)	0.036 (0.058)
Time2	-0.007*** (0.003)	-0.007*** (0.003)	-0.008*** (0.003)	-0.007*** (0.003)	-0.009*** (0.003)	-0.003* (0.002)	-0.003 (0.002)	-0.001 (0.002)	-0.004** (0.002)	-0.002 (0.002)
Marriage Duration-Square	-0.032 (0.025)	-0.035 (0.025)	-0.091** (0.041)	-0.031 (0.025)	-0.095** (0.043)	0.008 (0.024)	0.015 (0.024)	-0.001 (0.029)	0.029 (0.024)	-0.007 (0.027)
Black	-0.393 (0.318)	-0.410 (0.319)	-0.342 (0.346)	-0.478 (0.308)	-0.336 (0.342)	-0.718*** (0.236)	-0.702*** (0.236)	-0.712** (0.278)	-0.776*** (0.234)	-0.804*** (0.277)
Hispanic	0.134 (0.721)	0.196 (0.717)	-0.397 (0.979)	0.113 (0.727)	-0.412 (0.987)	0.289 (0.402)	0.279 (0.401)	0.086 (0.569)	0.216 (0.406)	-0.094 (0.583)
Education_2	0.516 (0.792)	0.444 (0.795)	0.413 (0.781)	0.384 (0.799)	0.448 (0.784)	0.778 (0.638)	0.765 (0.653)	0.607 (0.778)	0.870 (0.642)	0.396 (0.648)
Education_3	0.278 (0.766)	0.129 (0.763)	-0.230 (0.757)	0.121 (0.759)	-0.140 (0.745)	0.669 (0.610)	0.620 (0.616)	0.361 (0.733)	0.686 (0.612)	0.135 (0.617)
Education_4	0.773 (0.788)	0.515 (0.793)	0.427 (0.795)	0.493 (0.785)	0.641 (0.769)	1.380** (0.625)	1.229* (0.635)	1.038 (0.748)	1.235* (0.631)	0.825 (0.632)
Education_5	1.031 (0.798)	0.841 (0.805)	0.557 (0.807)	0.822 (0.806)	0.701 (0.796)	1.756*** (0.638)	1.397** (0.653)	1.178 (0.772)	1.413** (0.648)	1.106* (0.648)
Trans. from not-work	0.591** (0.284)	0.575** (0.288)	0.497 (0.392)	0.620** (0.294)	0.543 (0.392)	-0.482 (0.317)	-0.532* (0.317)	-1.032** (0.413)	-0.409 (0.305)	-0.850** (0.395)
In-lagged(hourly wage)	0.105 (0.104)	0.092 (0.106)	0.081 (0.190)	0.121 (0.117)	0.088 (0.189)	-0.569*** (0.154)	-0.608*** (0.148)	-0.581*** (0.191)	-0.600*** (0.148)	-0.484** (0.206)
Parents SES-Average-Varying	0.310 (0.348)	0.253 (0.346)	0.404 (0.404)	0.204 (0.339)	0.477 (0.401)	0.477** (0.243)	0.476* (0.244)	0.579* (0.298)	0.395* (0.235)	0.476* (0.287)
Parents SES- Well Off	0.670* (0.343)	0.634* (0.340)	0.837** (0.393)	0.597* (0.332)	0.868** (0.390)	0.821*** (0.242)	0.811*** (0.245)	0.815*** (0.297)	0.743*** (0.236)	0.769*** (0.285)
Father Self-Employed	0.708 (0.503)	0.662 (0.499)	0.624 (0.584)	0.646 (0.498)	0.681 (0.602)	0.161 (0.363)	0.195 (0.366)	0.048 (0.465)	0.089 (0.371)	-0.069 (0.464)
State Self-Emp. Rate	1.055 (4.457)	1.050 (4.483)	3.259 (4.077)	1.350 (4.439)	2.770 (4.061)	-2.593 (2.550)	-2.291 (2.561)	-3.576 (3.121)	-1.550 (2.453)	-2.558 (2.947)
SPOUSE SOCIAL RESOURCES										
<i>Spouse Employment Status (Ref. Cat: Spouse Not Working)</i>										
_ No spouse	-0.881* (0.517)	-0.927 (0.598)	-0.986 (0.718)	-0.285 (0.464)	-0.361 (0.346)	-0.445* (0.253)	-0.933*** (0.308)	-0.937** (0.443)	-0.828*** (0.285)	-0.394 (0.303)
_ Spouse Salary Earner	-0.985* (0.522)	-1.066** (0.526)	-1.270** (0.594)			0.118 (0.173)	0.048 (0.175)	0.012 (0.234)		
_ Spouse Self-Employed	0.650 (0.530)	0.563 (0.532)	0.135 (0.663)			0.611* (0.345)	0.473 (0.357)	0.450 (0.495)		
<i>Spouse Education (Ref. Cat: Highest Education)</i>										
_lag Spouse Edu-1							-0.672 (0.545)	-0.737 (0.731)	-0.841 (0.545)	
_lag Spouse Edu-2		-0.139 (0.684)	-0.072 (0.865)	-0.168 (0.670)			-0.825** (0.391)	-0.999* (0.570)	-0.958** (0.386)	
_lag Spouse Edu-3		-0.108 (0.415)	0.025 (0.518)	-0.247 (0.407)			-0.655*** (0.233)	-0.513* (0.295)	-0.645*** (0.227)	
_lag Spouse Edu-4		0.567 (0.366)	0.862* (0.487)	0.560 (0.365)			-0.389 (0.238)	-0.239 (0.283)	-0.317 (0.228)	
SPOUSE FINANCIAL RESOURCES										
Spouse In-lagged(hourly wage)			0.201 (0.145)		0.131 (0.173)			0.063 (0.137)		0.156 (0.126)
Constant	-9.330*** (1.185)	-9.974*** (1.080)	-9.560*** (1.381)	-10.04*** (1.098)	-10.71*** (1.153)	-5.202*** (0.823)	-4.494*** (0.851)	-4.944*** (0.919)	-4.787*** (0.828)	-5.177*** (0.807)
LI	-498.710	-494.308	-386.194	-513.696	-395.670	-1130.538	-1121.075	-828.054	-1179.831	-880.832
chi2	118.714***	122.636***	99.762***	72.839***	72.525***	102.770***	115.828***	94.430***	114.099***	78.547***
Bic	1199.686	1222.096	1014.071	1239.835	981.289	2459.238	2481.900	1900.396	2579.763	1946.030
N	42008	40648	36605	41035	38283	33845	33653	26336	35633	28073
# of Events	76	76	66	76	66	196	196	148	201	148

*, p <0.1, **, p <0.05, *** : p<0.01. Robust standard errors are in parentheses.

Table 7: Determinants of Hazards of Transition to S.E.- **Unincorporated Business** (C-log-log Estimates) Spouse Resources

	WOMEN					MEN				
	modela	modelb	Modelc	modeld	modele	modelf	modelg	modelh	modeli	modelj
Time	0.244*** (0.032)	0.244*** (0.033)	0.246*** (0.034)	0.248*** (0.032)	0.254*** (0.034)	0.235*** (0.040)	0.235*** (0.040)	0.271*** (0.049)	0.241*** (0.038)	0.281*** (0.048)
time2	-0.007*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)	-0.007*** (0.002)	-0.007*** (0.002)	-0.008*** (0.002)	-0.007*** (0.001)	-0.009*** (0.002)
Marriage Duration-Sq.	-0.046*** (0.011)	-0.046*** (0.011)	-0.050*** (0.014)	-0.044*** (0.011)	-0.045*** (0.014)	-0.041*** (0.013)	-0.044*** (0.013)	-0.057*** (0.018)	-0.034*** (0.013)	-0.051*** (0.017)
Black	-0.666*** (0.112)	-0.672*** (0.113)	-0.677*** (0.119)	-0.691*** (0.112)	-0.694*** (0.119)	-0.806*** (0.131)	-0.794*** (0.131)	-0.848*** (0.151)	-0.804*** (0.127)	-0.812*** (0.145)
Hispanic	-0.194 (0.272)	-0.171 (0.276)	-0.259 (0.299)	-0.197 (0.275)	-0.272 (0.296)	-0.926** (0.398)	-0.917** (0.404)	-0.874* (0.482)	-0.705** (0.355)	-0.751* (0.429)
Education_2	-0.084 (0.228)	-0.106 (0.231)	-0.063 (0.239)	-0.070 (0.229)	-0.045 (0.236)	0.253 (0.222)	0.260 (0.222)	0.033 (0.262)	0.370* (0.216)	0.072 (0.257)
Education_3	0.076 (0.209)	0.043 (0.213)	0.043 (0.221)	0.060 (0.212)	0.067 (0.217)	-0.041 (0.207)	-0.019 (0.208)	-0.229 (0.246)	0.028 (0.205)	-0.186 (0.240)
Education_4	0.122 (0.229)	0.087 (0.236)	0.159 (0.246)	0.123 (0.236)	0.180 (0.237)	0.132 (0.227)	0.170 (0.229)	0.118 (0.264)	0.206 (0.227)	0.132 (0.259)
Education_5	0.564** (0.236)	0.551** (0.253)	0.604** (0.264)	0.577** (0.252)	0.607** (0.244)	0.257 (0.235)	0.262 (0.249)	0.088 (0.286)	0.315 (0.246)	0.215 (0.272)
Trans. from not-work	0.229 (0.139)	0.225 (0.141)	0.167 (0.147)	0.226 (0.140)	0.164 (0.146)	-0.038 (0.170)	-0.046 (0.170)	-0.140 (0.195)	-0.023 (0.164)	-0.098 (0.189)
In-lagged(hourly wage)	-0.375*** (0.097)	-0.377*** (0.098)	-0.477*** (0.092)	-0.373*** (0.098)	-0.478*** (0.092)	-0.823*** (0.088)	-0.819*** (0.089)	-0.863*** (0.111)	-0.824*** (0.086)	-0.850*** (0.109)
Parents SES-Average-Varying	0.022 (0.111)	0.026 (0.112)	0.057 (0.121)	0.020 (0.111)	0.062 (0.121)	-0.092 (0.128)	-0.085 (0.128)	-0.145 (0.151)	-0.043 (0.124)	-0.130 (0.145)
Parents SES- Well Off	0.193* (0.117)	0.198* (0.118)	0.232* (0.126)	0.210* (0.117)	0.233* (0.125)	-0.101 (0.133)	-0.092 (0.133)	-0.067 (0.153)	-0.057 (0.131)	-0.078 (0.148)
Father Self-Employed	-0.010 (0.270)	-0.022 (0.270)	0.071 (0.271)	-0.030 (0.270)	0.080 (0.272)	0.125 (0.289)	0.131 (0.290)	0.106 (0.350)	0.202 (0.272)	0.216 (0.321)
State Self-Emp. Rate	5.167*** (1.424)	5.158*** (1.425)	5.895*** (1.502)	5.282*** (1.417)	5.940*** (1.508)	3.295** (1.515)	3.257** (1.515)	2.371 (1.814)	3.580** (1.469)	2.592 (1.764)
SPOUSE SOCIAL RESOURCES										
<i>Spouse Employment Status (Ref. Cat: Spouse Not Working)</i>										
_ No spouse	-0.180 (0.261)	-0.103 (0.314)	-0.263 (0.341)	-0.331* (0.190)	-0.293* (0.157)	-0.464*** (0.160)	-0.605*** (0.227)	-0.489* (0.288)	-0.549*** (0.206)	-0.267 (0.192)
_ Spouse Salary Earner	0.187 (0.249)	0.240 (0.258)	-0.011 (0.271)			-0.040 (0.119)	-0.029 (0.121)	0.136 (0.176)		
_ Spouse Self-Employed	0.454 (0.291)	0.505* (0.301)	0.425 (0.331)			0.412* (0.243)	0.398 (0.245)	0.394 (0.353)		
<i>Spouse Education (Ref. Cat: Highest Education)</i>										
_lag Spouse Edu~1		-0.024 (0.314)	0.087 (0.341)	0.005 (0.304)			-0.198 (0.332)	-0.287 (0.436)	-0.214 (0.306)	
_lag Spouse Edu~2		0.082 (0.245)	0.065 (0.276)	0.080 (0.240)			0.017 (0.240)	-0.045 (0.290)	-0.021 (0.227)	
_lag Spouse Edu~3		0.030 (0.166)	0.087 (0.190)	0.031 (0.164)			-0.114 (0.187)	-0.241 (0.215)	-0.155 (0.180)	
_lag Spouse Edu~4		0.095 (0.171)	0.104 (0.193)	0.098 (0.170)			-0.312 (0.204)	-0.519** (0.238)	-0.291 (0.196)	
SPOUSE FINANCIAL RESOURCES										
Spouse ln-l-hourly wage			0.037 (0.062)		0.030 (0.060)			0.051 (0.105)		0.057 (0.092)
Constant	-5.992*** (0.444)	-6.135*** (0.398)	-5.890*** (0.537)	-6.197*** (0.396)	-6.203*** (0.416)	-3.975*** (0.384)	-3.859*** (0.440)	-4.180*** (0.442)	-4.066*** (0.417)	-4.361*** (0.427)
LI	-2750.053	-2742.125	-2403.761	-2770.738	-2414.168	-2262.914	-2258.288	-1659.983	-2401.277	-1771.828
chi2	204.442***	203.486***	210.923***	196.119***	205.810***	193.691***	199.435***	151.704***	206.348***	147.918***
Bic	5702.372	5728.957	5060.317	5765.118	5018.285	4723.990	4756.325	3564.254	5022.656	3728.022
N	42008	41748	37537	42174	38283	33845	33653	26336	35633	28073
# of Events	535	534	468	539	468	448	448	326	476	346

*: p <0.1, **: p <0.05, *** : p<0.01. Robust standard errors are in parentheses.

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 I take advantage of the legalization of divorce in Ireland in 1996 for a better exogenous source of divorce risk. Then, I follow the labour supply behaviour of individuals who were married before the law passed. I use difference-in-differences approach where I use as comparison groups either married individuals in other European countries (who are not affected by the law) or married Irish people who did not affected by the increase in the risk of divorce caused by the law (for example very religious individuals).

Note: The section 2.1 of this chapter and that of the next “savings” chapter describe the Irish divorce law and hence, they are the same. The readers might skip that section in the next chapter.

1. Introduction

In this paper; I address the impact of an increase in the divorce risk on the labour supply behaviour of men and women. The introduction of unilateral divorce law over the last 30 decades across different states of the US has been frequently used in the previous literature to account for exogenous increase in the risk of divorce. In this paper I propose that legalization of divorce in Ireland in 1996 constitutes a better exogenous source of divorce risk. Then, I follow the labour supply behaviour of individuals who were married before the law passed. I use difference-in differences approach where I use as comparison groups either married individuals in other European countries (who are not affected by the law) or married Irish people who did not affected by the increase in the risk of divorce caused by the law (for example very religious individuals).

The real wage growth has usually been named as the main driving force of the increase in labour supply of married women in the post-war US and post industrial countries (e.g. Smith & Ward; 1985; Blau & Kahn, 2006). Nevertheless, some researchers point that especially in the second half of the 1970s (Peters, 1986; Johnson & Skinner, 1986; Parkman, 1992) and after the 1990s (Papps; 2006) female labour force participation in the US did not respond to the fluctuations in the real wage growth. Female employment rate continued increasing in the late 1970s and early 1980s although the real wage growth slowed-down and finally stagnated starting from 1990s when actually the real wages grew at a very high rate. They 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 (See figure 1 below). It is claimed that part of the increase in the labour supply of married women could be a reaction to changes in the risk of divorce in these periods (Papps, 2006).

(Figure 1 about here)

The studies that focused on the empirical relationship between risk of divorce and labour supply behaviour can be grouped into two by their identification strategies (Papps 2006). First group of studies derived the divorce risk from the actual individual data. Some of these studies used predicted future divorce probabilities to account for individual specific divorce risks (i.e.using either linear probability models or hazard rates) (e.g. Greene & Quester; 1982, Johnson & Skinner, 1986; Gray, 1995; Montalto & Gerner, 1998; Sen, 2000; Papps 2006). However, central preoccupation in these studies has been the endogeneity problem between the variables of labour supply and the divorce risk. Deriving divorce probabilities from the individual data ignores the reverse causation possibility. It could well be the increase in female labour supply that causes a higher probability of divorce and so that women, who are employed, might be overrepresented in the divorced sample. Although some studies applied various techniques to evade such endogeneity (e.g. Johnson & Skinner, 1986; Sen, 2000), often their remedies suffered from data limitations: such as cross-sectional research design (e.g

Johnson & Skinner, 1986; Gray, 1995) or a few years of panel data that ignored the cumulative nature human capital over the marriage duration (Papps 2006) or lack of marital histories (e.g. Montalto & Gerner, 1998).

The concern about endogeneity problem, led a number of researchers look for an exogenous source of the divorce risk. One popular solution has been using the change in the risk of divorce that is triggered by the gradual introduction of the unilateral divorce law in the US. Then, the resulting variation in the divorce rates across the states and over time has been used in estimating the labour supply response of the women (e.g Peters, 1986; Parkman 1992; Gray 1998). Yet, the extent to which introduction of unilateral divorce law affected the divorce rate has been debated by both economists (Freidberg, 1998; Gray 1998; Wolfers, 2006) and sociologists (Nakonezny et al., 1995; Glenn, 1999; Rogers et al.1999). Some earlier researchers believed that introduction of unilateral law did not affect divorce rates (Peters, 1986; Parkman, 1992; Peters 1992, Gray 1998). However, recent evidence shows unilateral divorce rates had a positive impact on divorce rates though it has been small, immediate and not lasting more than 10 years (e.g. Friedberg, 1998; Wolfers, 2006).

Rather than controversial impact of unilateral divorce-law on the divorce risk in the US, I propose that legalization of divorce in Ireland provides a better experiment for the exogenously-increased divorce risk. My claim is based on two observations: First, the outcome of the referendum about the legalization of divorce in Ireland was not anticipated. The previous attempt to legalise divorce has been unsuccessful²³ and in 1995 the law passed by a slim margin. Second, I claim that legalization of divorce has unarguably increased the risk of divorce in Ireland (See the next section for the discussion). As a result, benefiting from Irish quasi-experiment case, in this paper I estimate the labour supply response of the individuals to the increase in marital instability.

²³ In 1986, a referendum to remove the ban on divorce was defeated. The "Yes" vote was only 36.5%.

Why should an increase in the risk of divorce trigger changes in the labor supply behavior? The explanation can be directly deduced from Becker's (1981) standard economic specialization theory of the family. According to this theory, a rise in divorce risk may affect the returns to specialization within the marriage, which in turn, alters the returns to market work relative to domestic work (Stevenson, 2007). 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. The underlying mechanism is straightforward. 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. This can 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).

In other words, the higher the probability of a forthcoming divorce, the higher the expected value of current, marketable human capital (Johnson & Skinner, 1986). As a consequence married individuals (especially women) might increase their labor supply and invest on market skills to self-insure against a possible divorce (Peters, 1986).

While the implication for women's labour supply is explicated, how would men's labour supply behaviour is affected by an increase in the divorce risk is not so clear. If divorce risk decreases the value of specialization and increases the value of current human capital and labour market experience, then we should not observe any changes in the current labour supply of married men.

On the other hand, divorce might mean negative economic outcomes also for men. Divorce implies increase in costs for men due to deviation from economies of scale or expensive legal process...etc. Therefore, in the anticipation of divorce men might also increase their labour supply in order to self-insure to upcoming divorce. In sum, 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.

I use Differences-in-Differences estimation, in order to isolate the effect of changes in the risk of divorce on labor supply behavior. Diff-and-diff estimation is useful once a specific intervention or treatment (often such treatment is the passage of a law) is identified. Then, the difference in outcome variable, after and before the intervention for groups affected by it (i.e. treatment group) is compared with the same difference for groups unaffected by it (i.e. control group). Bertrand et al (2002) argue that Diff-in-Diff estimations became popular in economics literature in estimating casual relationships because they are both simple and potentially powerful "to circumvent many of the endogeneity problems that typically arise when making comparisons between heterogeneous individuals" (p.249).

The paper is organised as follows. Section two outlines the data and methodology. While doing this, the first part gives information about the Irish divorce reform and discusses the nature of experiment. Then, I discuss control and treatment groups, sample and econometric specification consecutively. Section three presents results of the estimation for two different control groups. Finally, in Section five, paper ends with conclusions.

2. Data and Methodology

2.1 The Irish divorce law and the risk of marital dissolution

I 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.²⁴ 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 slim margin.²⁵ The removal of the ban was subsequently incorporated in the Constitution in June 1996, and the new divorce law became effective in February 1997.

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. The Irish courts were granted a great deal of discretion regarding the economic consequences of divorce for the spouses. The law states the factors to be taken into consideration, including the contributions made by the two spouses (both pecuniary and non-pecuniary), but there is no explicit policy of equal division of assets.²⁶

The legalization of divorce was followed by a rapid increase in the number of divorce applications filed as well as the number of divorces granted over the following years. Figure 2 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. My 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%.²⁷ 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.

²⁴ Judicial separation was possible since 1989.

²⁵ We take this as an indication that there were no clear expectations about the outcome of the referendum. In that sense, the legalization of divorce was not anticipated.

²⁶ The law does mention the responsibility of both (ex-) spouses to maintain one another, even after the divorce. The calculation of actual maintenance payments is up for the courts to decide, and it should be based on the financial resources and needs of the spouses (Boele-Woelki, 2003).

²⁷ The increase was from 3.45 to 4.33% for the ever-married adult population (also statistically significant).

2.2 Finding a control group

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

My 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.²⁸ 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).²⁹ I 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.

²⁸ 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).

²⁹ 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.

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

It is of course hard to claim that religious families in Ireland were completely unaffected by the legalization of divorce.³⁰ Thus, I 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 in particular in terms of female employment to Ireland during the period appear to be the UK, Netherlands and Spain. Figure 2 and 3 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. Although starting levels were different, both Spain and Ireland experienced around 15 points increase in the female employment rate while the Netherlands around 12 points and UK around 5 points.

³⁰ In that sense, my estimates when using religious families as a control group can be seen as lower bounds on the effect of interest.

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, I provide additional evidence that labor supply behavior displayed similar trends in the three countries in the years before the Irish reform.

2.3 Econometric specification, data and sample

More formally; I 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 and logit models are estimated). T is an indicator for individuals belonging in 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, spouse income and household size.

The coefficient β_1 measures the average difference in labor supply behavior between the treatment and the control group, while β_2 captures the overall change in labor supply behavior after the reform. The key parameter is β_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), I exclude couples whose marriages took place in 1996 or later. In order to avoid selection due to separation or divorce, I exclude all individuals that are observed getting separated or divorced at any point during the survey. Thus my sample is in practice composed only of “stable marriages that started before 1996”. I include individuals of all ages up to 65, in order to exclude retired individuals. I also 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 I 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.

2.4. Measures of Labor Supply Behavior

I have five dependent variables measuring the labour supply behaviour for the Irish sample. Three of them are binary and two of them are continuous variables. All of the dependent variables are at the individual level. Binary dependent variables are: “work”, “employed” and “second job”. “Work” indicates whether individual reports his/her main activity as “currently working at least 15 hours a week or not”. “Employed” is similar to “work” but additionally it includes the cases where individual is employed although temporarily not working due to sickness leave, maternity leave...etc. Finally, “Second job” takes the value 1 if the individual has a second job other than the main job. This question is asked only to individuals with a first job. Continuous dependent variables are “Hours” and “Hours 2nd Job”, which measure the hours the individual spends in the current and second job respectively. Both of these continuous variables enter the model in the logarithmic form. Only two of these dependent variables are comparable and available on the four-country sample: “Work” and “Hours”.

Descriptive statistics for the labour supply variables for both pre- and post-reform period in the Irish sample are shown in Table 2a and 2b for women and for men respectively.

The proportion of women who are employed vary across religiosity. The non-religious men's work/employment behaviour after the pre-reform period is especially striking. The average proportion of employed non-religious men increased around 16 % after the reform period, while the proportion of religious men stayed at the same levels as in the pre-reform period. Despite level differences and short pre-reform period, initial trends of religious and non-religious groups, in most dependent variables do not appear strikingly vary in the different directions.

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 at least 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. On the other hand, religious men are more likely to be at currently work than non-religious men and more likely to have a second job. In 1995, 34% of religious women reported being currently working as a main activity, compared with 42% of non-religious ones. Among religious men; around 76% of them reported working in 1995 as opposed to 66% non-religious ones. The proportion of working women in pre-reform period was stable for both the control and treatment group, while the proportion of men was increasing slightly.

Besides, non-religious women and men are younger than religious ones (by about 9 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 main activity being work and their number of hours spent at work increased for both treatment and control groups after 1996. While these figures stayed stable for religious men, they exhibited a slight increase for non-religious men.

Since the Irish experiment is a strong one, unless there are striking individual differences, including additional control variables may be redundant given the nature of the diff-in-diff estimations. Therefore, other than the mentioned variables, I tried a specification with real wage. 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 Irish divorce case probably did not affect wages directly. I exclude this control from the final specification. However, I use individual fixed effects to control for unobserved 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 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 I controlled for wages, the results did not change. Yet, it might informative to look at occupational class in both groups. Figure 5a and 5b show the distribution of men and women in both control and treatment groups among the 6 different occupational classes in the pre-reform period. Both samples have very similar occupational class distributions in general. The differences are minor. For example while the percentage of semi-skilled manual worker women appears to be slightly higher in the

non-religious group, I found close to a zero correlation between religiosity and belonging a particular occupational class (0.005, $p > 0.000$) in Ireland before the reform.

Figure 5 about here.

3.1.2 Results

The regression results for men and women are reported in Tables 3.a and 3.b respectively. Table 3.c reports the results for the first three binary dependent for probit specification and marginal effects. In Tables 3a and 3bs, the results for binary dependent variables are reported for a logit specification and for the continuous dependent variables OLS estimations were used. For every dependent variable; model 1 and model 2 report standard logit and random effects model, consecutively while model 3 includes individual fixed- effects. All the models are significant at the 99% level.

Higher education level is associated with a higher probability to work for both men and women in general. While women living in larger households are less likely to work, no such association is found for men. Overall except for having second job, in all models treatment group significantly behave different in terms of labor supply than the control group and both for men and for women. After 1996, all women increased their labor supply in general. However, non-religious women increased their labor supply significantly more than religious ones. For example, women in the treatment group are more likely to be employed after the reform than the control group, by about 7 percentage points³¹. They are also more likely to report their main activity to be working at least 15 hours after the reform, again by about 7%. Finally, they spend at average, approximately 3.5 hours more working in the main job weekly than the religious women after the reform.

³¹ These percentage point figures are marginal effects and are only calculated for model 2s for each dependent variable. Since marginal effects can not be calculated for the individual fixed effects model on the binary dependent variables, I reported the logit coefficients for model 3. Although the size of the coefficients in the logit estimations for men might seem bigger, women have bigger marginal effects on the treat*post1997 interaction.

Notice that among the men, the treated group (non-religious men) is significantly more likely to be currently at work or employed than the control group, by about 6 percentage points. They also spend more hours in the main work, by about 5 hours more on average in a week. However, there is no significant change in their likelihood of having a second job and moreover, they spend less hours in the second job by about 2 percentage point after the reform.

In sum, looking at the marginal effects of the logit estimation results, we see that married women labor supply response to the rise in divorce risk in Ireland has been slightly more than the men. Yet, men also increased their labor supply with the rise in divorce risk a finding that is consistent with the hypothesis of self-insurance against the negative economic outcomes of divorce.

3.2 Spain, Netherlands and the UK as control groups

3.2.1 Descriptives

Tables 7a and 7b show some summary statistics by men and women respective, for the three-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 increasing in all countries, although the increase was particularly steeper in Netherlands. In terms of weekly hours, female labor supply has been highest again in the UK, although it has been clearly increasing for all countries.

The age profile is similar in the all four countries, while spouse income levels (when converted in euros) were similar in the UK, Netherlands and Ireland but significantly lower in Spain. Household size was highest in Ireland and Spain follows closely. UK and Netherlands are very similar in terms of average household size. After 1997, in all countries the proportion

of women working and the average hours of work have increased, although slightly more in Spain.

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, has decreased a little in Ireland, while it increased somewhat in other countries.

Average age of men does not differ among these countries and spouse income levels are significantly lower in Spain than in other countries (i.e. Euro equivalents). 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 three-country sample are reported in table 8.³² Model 1 shows the logistic model without control variable and model 2 reports the fixed effects and includes controls. The control variables show similar patterns as in the Irish sample. Though very small, a higher spouse income is associated with a lower likelihood of being currently working for women, but not for men. The household size where they live in is strongly and negatively associated with both measures of labor supply for women. This result is not unexpected since it implies more domestic work obligations. Similarly, unemployment rate is also negatively associated with both female and male employment and labor supply.

After 1997, the likelihood that women will be working in Ireland increased, relative to the UK, Netherlands and Spain, and this effect was significant. Though, not as much as women, the likelihood having the main activity working at least 15 hours has increased also for

³² All specifications include individual-country fixed effects.

men once control variables and fixed effects included for Irish men compared to the men in other countries. Thus, I conclude that labor supply behavior of both men and women is positively affected by the increase in divorce risk in Ireland after 1996-97, relative to the control countries.³³

3.3 Singles as a Control Group

Since single individuals are also unaffected by the divorce risk and at the same time they are exposed to the identical economic conditions as the married individuals, it may be possible to use them as a control group. In this case the treatment group becomes individuals who are married before the 1996. Then, we expect that married individuals would increase their labor supply significantly more than the single individuals after the reform.

However, there are two potential problems using singles as a control group. One is theoretical. It may be hard to claim that singles are unaffected by the increasing divorce risk in the Irish society since the patterns of selection into marriage changes under the new divorce law. Therefore singles might increase their labor supply just as the married after the divorce law for a number of related reasons. They might invest in market work to be attractive in the marriage market. Alternatively they might experience a decline in the value of future marriage, thus want to insure themselves against a possibility of an unstable marriage.

Second potential problem is related to the sample size. Table 9 shows the descriptive statistics of the singles pre and post reform period. The number of adult individuals who are single (i.e. never married, separated or widowed) both before and after the reform (i.e. no change in the marital status during the panel years), are very small in our sample: around % 4 of the sample both for men and for women. Furthermore they are at average 13-14 years

³³ 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.

younger. The descriptive information overall shows that singles are indeed a very different group than the married which imply the selection into marriage can be an important issue here.

Table 10 shows the results for the labor supply estimations where treatment group is married individuals and the singles are the control group. I report here two of the dependent variables: being employed and weekly log hours of work. The coefficients of the “treatment” and “post” and the interaction of them are all insignificant. This means married individuals are not significantly more employed after the reform period when compared to single individuals. However, it is hard to reach this conclusion because this result might be due totally due to small sample size and the selection into marriage.

4. Conclusions

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

I claim that the reason for this increase in the labor supply of Irish married individuals is the legalization of divorce that took place in 1996, which increased the risk of marital breakup, especially for non-religious families. The results for women are consistent with the previous findings for the US, that women increase labor supply when there’s an increase in the divorce risk. This outcome is consistent with the interpretation of the specialization hypothesis regarding the divorce risk. Non-religious women might have increased their labor supply in Ireland because current value of human capital increased when they perceived a higher risk of divorce while the value of specialization decreases.

Additionally, I observe an increase in the labor supply of men after the introduction of divorce law in Ireland. And non-religious men have increased their labor supply significantly more than the religious one. Again Irish men after the divorce law increased their labor supply more than the men in other countries. Economic specialization hypothesis suggest no role to the rising divorce risk on the labor supply of men. Therefore, this result implies that men also try to self-insure themselves against divorce. Men might also experience a negative income shock due to certain consequences of divorce such as; forgone economies of scale and costly lawyer fees...etc.

I estimate that an increase in the risk of marital separation of about 40% led to a significant rise in the proportion of married women and women reporting to work or to be employed (of 26-30% for women 22%-25% for men. 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.

Some caveats of this analysis are worth mentioning. First, I 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. And second, 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.

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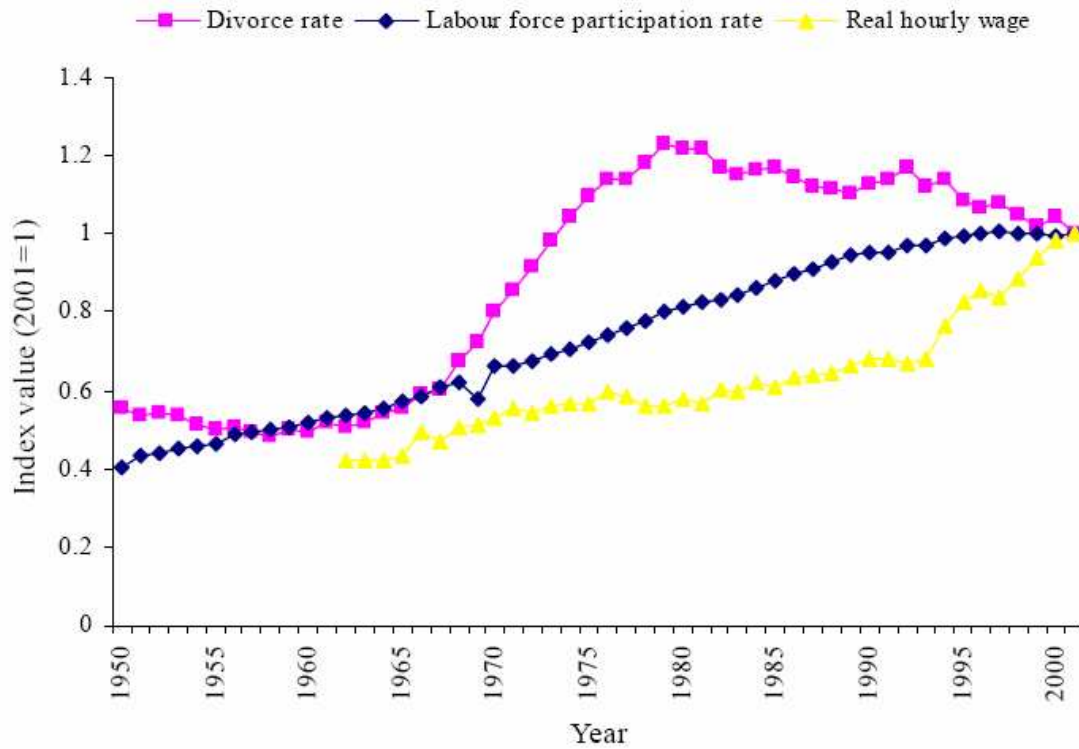
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Figure 1. Trends in labour force Participation, divorce and wages among married.

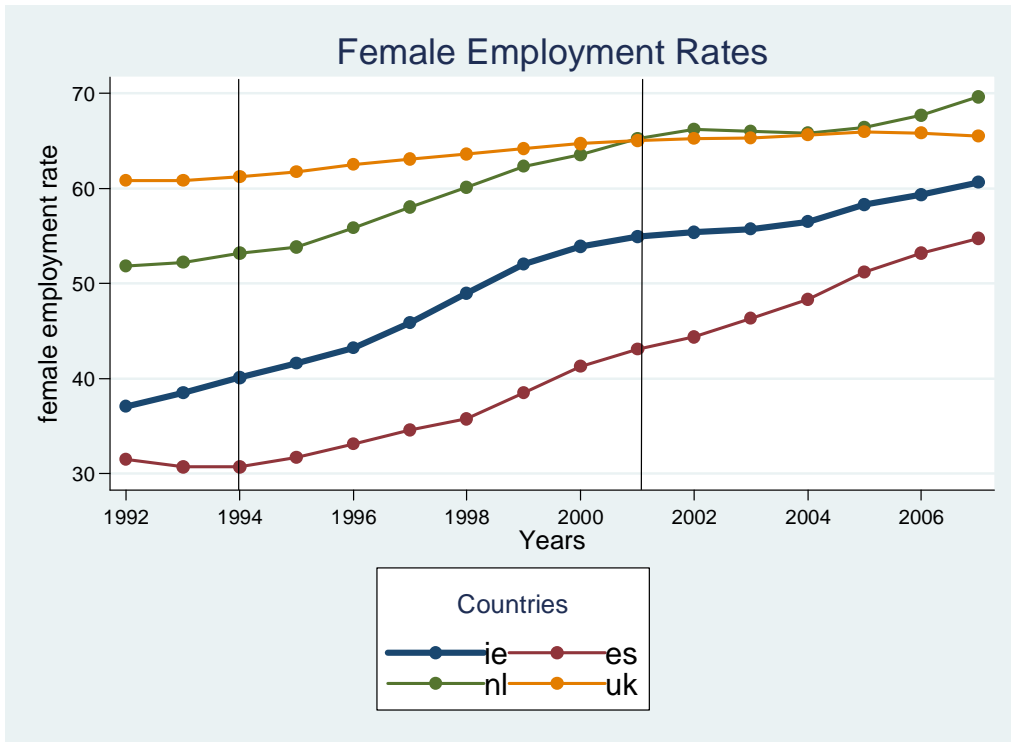


Source: Papps (2006) The graph is used with the permission of the author. The pink line shows the number of divorces per 1000 married women, the dark-blue line shows the labour force participation rate of women and the yellow line indicates the real hourly wage for employed married women.

Figure 2. Annual Number of Divorces, Ireland 1996-2004

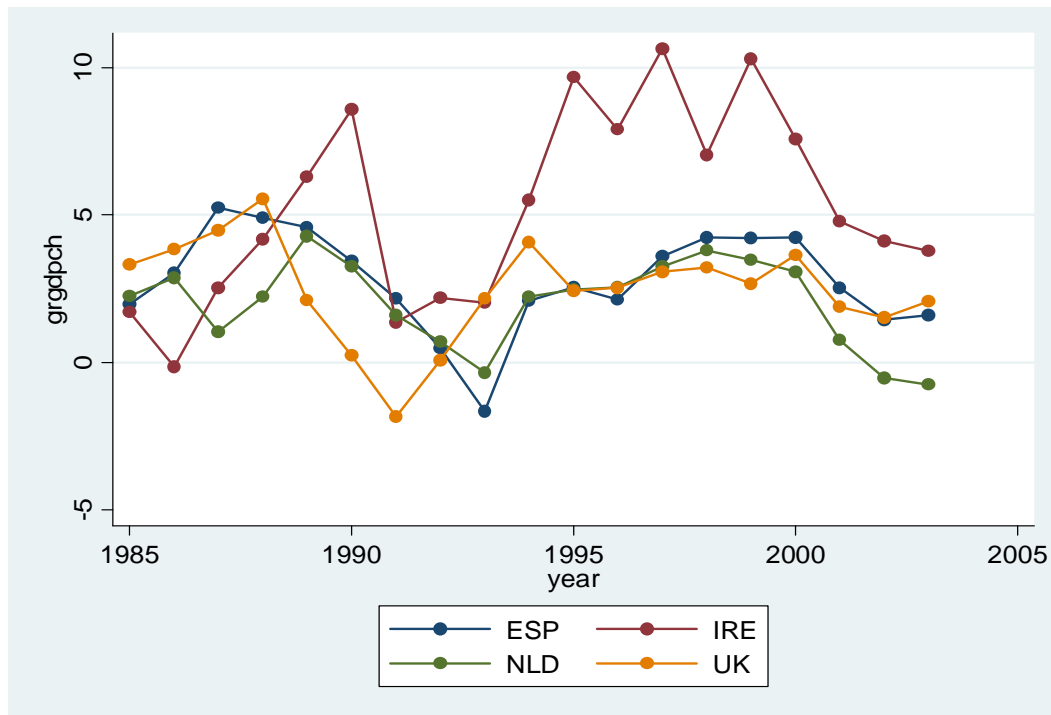


Figure 3. Female Employment Rates, Ireland, Spain, Netherlands and UK (1991-2001)



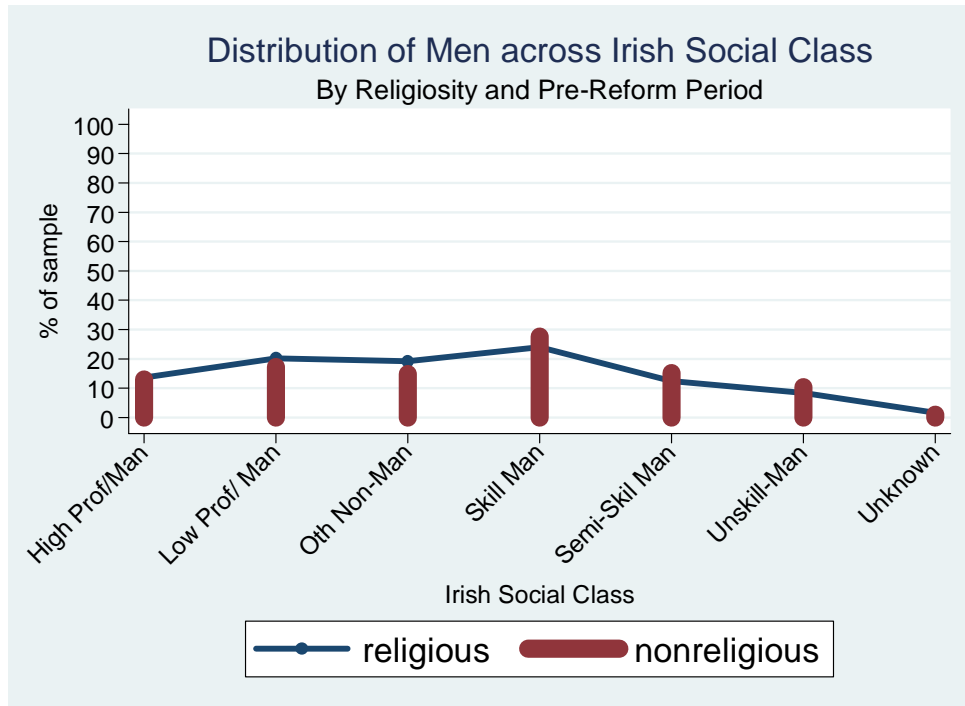
Source: EUROSTAT. “The female employment rate is calculated by dividing the number of women aged 15 to 64 in employment by the total female population of the same age group. The indicator is based on the EU Labour Force Survey. The survey covers the entire population living in private households and 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.” Eurostat.

Figure 4. Growth rate of real GDP per capita, Ireland, Spain, Netherlands and UK (1985-2004)



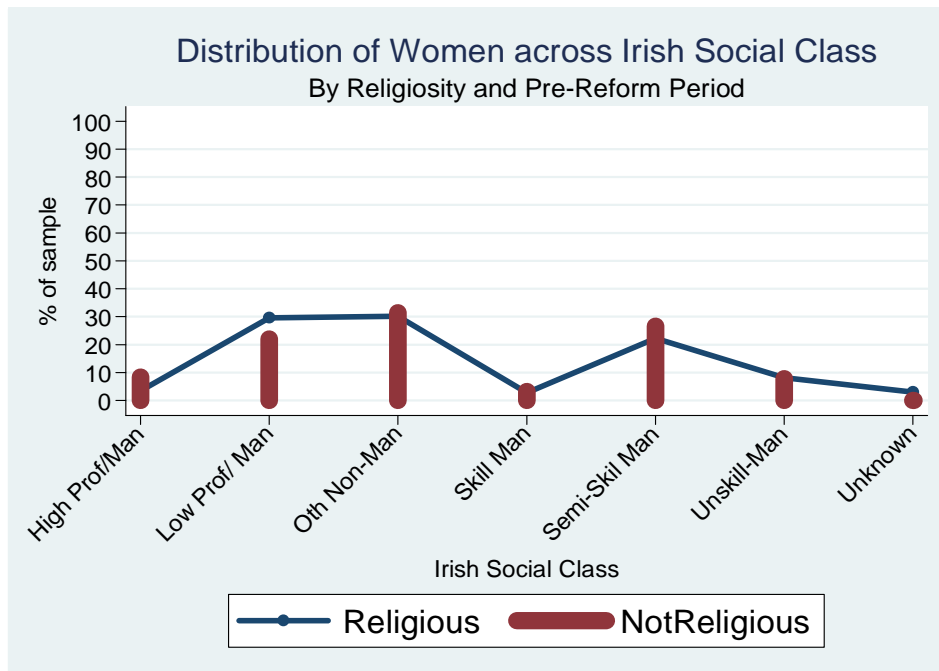
Source: Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006.

Figure 5.a. Distribution of Occupations in both Religious and Non-religious Samples (Pre-Reform Period- Men)



Note: The sum of percentages in each occupational class adds up to 100 for both control and treatment groups.

Figure 5.b. Distribution of Occupations in both Religious and Non-religious Samples (Pre-Reform Period- Women)



Note: The sum of percentages in each occupational class adds up to 100 for both control and treatment groups.

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.

Table 2.a. Irish Sample Religious versus Non-Religious: Women

	Religious			Non-Religious		
	1994	1995	Post-97	1994	1995	Post-97
Work	0,34	0,34	0,40	0,40	0,41	0,54
Hours	1,23	1,22	1,40	1,48	1,52	1,94
Hours2nd Job	0,02	0,03	0,03	0,03	0,04	0,03
Second Job	0,01	0,01	0,01	0,01	0,02	0,01
Employed	0,35	0,35	0,41	0,42	0,43	0,56
Age	41,87	42,73	44,05	32,74	32,84	34,08
Education	5,42	5,44	5,79	5,89	5,88	6,40
Hhold size	1,41	1,37	1,31	1,41	1,38	1,34
Unemp. Rate	0,15	0,12	0,05	0,15	0,12	0,05
N	2474	1956	5508	1781	1640	5470

Table 2.b. Irish Sample Religious versus Non-Religious: Men

	Religious			Non-Religious		
	1994	1995	Post-97	1994	1995	Post-97
Work	0,75	0,76	0,76	0,64	0,66	0,76
Lnhours	2,88	2,89	2,88	2,44	2,48	2,86
Hours2nd Job	0,15	0,18	0,24	0,09	0,10	0,13
Second Job	0,05	0,06	0,08	0,03	0,04	0,05
Employed	0,75	0,77	0,76	0,65	0,66	0,76
Age	42,05	42,69	43,82	33,39	33,48	34,79
Education	5,03	5,09	5,51	5,64	5,66	6,02
HH. Size	1,40	1,38	1,32	1,39	1,37	1,34
Unemp Rate	0,15	0,12	0,05	0,15	0,12	0,05
N	2086	1652	4528	2160	2000	6316

Table 3.a. Regression Results Irish Sample- WOMEN (Five Dependent variables)

	Employed			Currently Work			Second Job			Hours in the Main job			Hours in Second Job		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Unemp. Rate	-4.936 (1.544)***	-4.722 (1.565)***	-9.349 (8.978)	-5.060 (1.546)***	-4.855 (1.566)***	-9.019 (8.648)	-9.270 (6.689)	-9.238 (6.691)	-39.118 (29.831)	-3.069 (1.037)***	-2.850 (1.022)***	-1.402 (2.075)	-0.254 (0.183)	-0.253 (0.183)	-0.187 (0.496)
Age	-0.661 (0.119)***	-0.512 (0.122)***	-3.113 (0.461)***	-0.608 (0.119)***	-0.456 (0.123)***	-2.826 (0.443)***	-0.601 (0.537)	-0.568 (0.542)	-1.610 (2.089)	-0.269 (0.076)***	-0.136 (0.076)*	-0.729 (0.111)***	-0.006 (0.013)	-0.005 (0.014)	-0.011 (0.026)
Age2	0.017 (0.003)***	0.015 (0.003)***	0.077 (0.010)***	0.016 (0.003)***	0.014 (0.003)***	0.072 (0.010)***	0.015 (0.013)	0.015 (0.013)	0.036 (0.045)	0.006 (0.002)***	0.004 (0.002)**	0.018 (0.002)***	0.000 (0.000)	0.000 (0.000)	0.000 (0.001)
Age3	-0.000 (0.000)***	-0.000 (0.000)***	-0.001 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)***	-0.001 (0.000)***	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Education	0.275 (0.009)***	0.262 (0.010)***	0.164 (0.057)***	0.270 (0.009)***	0.257 (0.010)***	0.164 (0.056)***	0.257 (0.040)***	0.253 (0.040)***	-0.242 (0.211)	0.190 (0.006)***	0.175 (0.006)***	0.043 (0.013)***	0.006 (0.001)***	0.006 (0.001)***	-0.005 (0.003)
Post	-0.096 (0.140)	-0.097 (0.142)	0.136 (0.260)	-0.131 (0.141)	-0.133 (0.143)	-0.039 (0.252)	-0.376 (0.617)	-0.375 (0.618)	-0.559 (0.863)	-0.080 (0.094)	-0.085 (0.093)	-0.005 (0.061)	-0.011 (0.017)	-0.011 (0.017)	-0.002 (0.015)
HH Size		-1.136 (0.071)***	-1.647 (0.365)***		-1.106 (0.070)***	-1.594 (0.345)***	0.007 (0.347)	-0.011 (0.348)			-0.766 (0.044)***	-0.403 (0.083)***		-0.004 (0.008)	0.021 (0.020)
Treatment(2)	0.144 (0.073)**	0.077 (0.074)		0.133 (0.073)*	0.066 (0.075)			-0.214 (0.293)	0.538 (1.228)	0.087 (0.049)*	0.043 (0.049)	0.000 (0.000)	-0.001 (0.009)	-0.001 (0.009)	0.000 (0.000)
Treat*post1997	0.243 (0.095)**	0.292 (0.096)***	0.411 (0.200)**	0.281 (0.095)***	0.330 (0.096)***	0.505 (0.195)***	0.176 (0.417)	0.185 (0.417)	0.554 (0.764)	0.189 (0.064)***	0.219 (0.063)***	0.175 (0.048)***	0.002 (0.011)	0.002 (0.011)	-0.011 (0.012)
Constant	7.317 (1.686)***	6.169 (1.734)***		6.287 (1.690)***	5.057 (1.741)***		2.628 (7.539)	2.330 (7.589)		4.525 (1.110)***	3.351 (1.096)***	11.046 (2.353)***	0.086 (0.196)	0.081 (0.196)	0.101 (0.563)
Observations	10210	10210	2547	10210	10210	2709	10210	10210	544	10210	10210	10210	10210	10210	10210
R-squared										0.16	0.19	0.03	0.01	0.01	0.00
Number of Individuals			555			600			101			3352			3352

Standard errors in parentheses

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

Table 3.b. Regression Results Irish Sample- MEN (Five Dependent variables)

	Employed			Currently Work			Has Second Job			Lnhours in the Main job			Lnhours in Second Job		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Unemp. Rate	-3.131 (1.976)	-3.128 (1.976)	-1.044 (11.831)	-2.908 (1.942)	-2.901 (1.942)	-0.260 (11.111)	-1.569 (2.853)	-1.709 (2.855)	-8.139 (15.638)	-0.742 (0.994)	-0.748 (0.995)	0.653 (2.025)	-0.198 (0.500)	-0.217 (0.500)	-0.409 (1.072)
Age	-0.178 (0.162)	-0.177 (0.163)	-0.607 (0.706)	-0.208 (0.160)	-0.205 (0.161)	-1.073 (0.639)*	-0.091 (0.306)	-0.160 (0.306)	-1.774 (1.000)*	-0.356 (0.087)***	-0.359 (0.087)***	-0.232 (0.120)*	-0.016 (0.044)	-0.026 (0.044)	-0.123 (0.064)*
Age2	0.007 (0.004)**	0.007 (0.004)**	0.034 (0.015)**	0.008 (0.004)**	0.008 (0.004)**	0.043 (0.013)***	0.005 (0.007)	0.006 (0.007)	0.042 (0.021)**	0.010 (0.002)***	0.010 (0.002)***	0.009 (0.002)***	0.001 (0.001)	0.001 (0.001)	0.003 (0.001)**
Age3	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)**	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)***
Education	0.204 (0.011)***	0.204 (0.011)***	0.097 (0.070)	0.196 (0.011)***	0.196 (0.011)***	0.036 (0.065)	0.076 (0.014)***	0.080 (0.014)***	0.044 (0.079)	0.086 (0.005)***	0.087 (0.005)***	0.025 (0.012)**	0.009 (0.003)***	0.010 (0.003)***	0.001 (0.006)
Post	-0.248 (0.182)	-0.248 (0.182)	-0.238 (0.357)	-0.215 (0.179)	-0.216 (0.179)	-0.167 (0.335)	0.258 (0.261)	0.261 (0.261)	0.448 (0.455)	-0.071 (0.092)	-0.070 (0.092)	-0.010 (0.061)	0.071 (0.046)	0.071 (0.046)	0.052 (0.032)
HH Size		-0.006 (0.079)	-0.276 (0.461)		-0.016 (0.078)	-0.470 (0.443)		0.307 (0.128)**			0.016 (0.042)	-0.165 (0.081)**		0.052 (0.021)**	-0.044 (0.043)
Treatment(2)	-0.818 (0.086)***	-0.819 (0.087)***		-0.761 (0.085)***	-0.762 (0.085)***		-0.549 (0.147)***	-0.533 (0.147)***	-0.323 (0.717)	-0.449 (0.045)***	-0.448 (0.045)***	0.000 (0.000)	-0.081 (0.022)***	-0.078 (0.022)***	0.000 (0.000)
Treat*post1997	0.559 (0.116)***	0.560 (0.116)***	0.776 (0.271)***	0.512 (0.114)***	0.513 (0.114)***	0.641 (0.255)**	-0.138 (0.183)	-0.150 (0.183)	-0.328 (0.350)	0.311 (0.059)***	0.311 (0.059)***	0.178 (0.046)***	-0.060 (0.029)**	-0.062 (0.029)**	-0.044 (0.024)*
Constant	2.472 (2.409)	2.460 (2.414)		2.842 (2.377)	2.813 (2.382)		-3.253 (4.578)	-2.470 (4.577)		7.189 (1.292)***	7.226 (1.296)***	3.736 (2.493)	0.139 (0.649)	0.255 (0.651)	1.843 (1.319)
Observations	9529	9529	2604	9529	9529	2774	9529	9529	809		9529	9529	9529	9529	9529
R-squared											0.13	0.05	0.01	0.01	0.01
Number of individuals			662			704			185			3190			3190

Standard errors in parentheses

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

Table 3.c. Results for the binary dependent variables Irish Sample (Marginal Effects)

MEN	Work	Employed	Second Job
Post 1997	-.028 (.023)	-.031 (.022)	.261 (.014)
Treatment	-.104 *** (.011)	-.107 *** (.011)	-.532 *** (.007)
Treatment*Post 1997	.062 *** (.013)	.064 *** (.012)	-.150 (.009)
WOMEN			
Post 1997	-.029 (.031)	-.021 (.032)	-.002 (.005)
Treatment	.014 (.016)	.017 (.016)	-.000 (.002)
Treatment*Post 1997	.074 *** (.022)	.067 *** (.022)	-.001 (.003)

Note: The coefficients reported are for Probit model and are of Marginal Effects. One asterisk indicates significance at the 90% level, two indicate 95% significance and three asterisks indicate 99% significance. All models are significant at the 99% level and standard errors are in parenthesis.

Table 7 –a) Summary Statistics, four country sample -only MEN

	Netherlands			Ireland			Spain			UK		
	1994	1995	Post	1994	1995	Post	1994	1995	Post	1994	1995	Post
Work	0,814	0,825	0,853	0,790	0,802	0,832	0,739	0,744	0,783	0,791	0,796	0,852
Ln-hours	3,064	3,089	3,118	3,052	3,030	3,171	2,800	2,833	2,967	3,035	3,062	3,071
Age	44,38	44,43	47,23	45,74	45,62	48,19	46,06	45,78	47,81	44,29	44,58	47,53
HH size	1,162	1,160	1,178	1,429	1,419	1,412	1,321	1,315	1,324	1,140	1,135	1,155
Wife's Earnings	17125,45	18149,65	15116,29	10999,62	8434,99	10886,40	360796,20	379116,60	511645,90	4547,63	4868,71	5792,21
N	2347	2424	7568	2306	1965	3971	4313	3760	9281	1762	1657	5099

Table 7 -b) Summary Statistics, four country sample - WOMEN

	Netherlands			Ireland			Spain			UK		
	1994	1995	Post	1994	1995	Post	1994	1995	Post	1994	1995	Post
Work	0.37	0.40	0.45	0.32	0.34	0.42	0.27	0.29	0.33	0.58	0.59	0.61
Ln_hours	1.48	1.56	1.71	1.23	1.27	1.49	1.01	1.09	1.16	2.13	2.18	2.14
Age	42.86	42.80	45.60	44.32	44.34	47.21	44.53	44.25	46.43	42.89	43.13	46.16
HH.Size	1.14	1.14	1.15	1.41	1.40	1.39	1.30	1.30	1.31	1.13	1.12	1.14
Husband's Earnings	61479.54	60926.63	60164.97	43548.8	42343.57	40557.01	1,388,900	1,483,744	1,951,947	10627.09	11757.18	13675.68
N	2451	2373	7618	2328	1984	3999	4339	3777	9316	1761	1656	5104

Table 8. Four-Country Sample Regression Results

	WOMEN				MEN			
	Work		Log Hours of Work		Work		Log Hours of Work	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Age	-0.380*** [0.054]	-1.802*** [0.197]	-0.037 [0.036]	-0.309*** [0.047]	0.036 [0.082]	-1.476*** [0.271]	-0.487*** [0.039]	-0.425*** [0.050]
Age-square	0.012*** [0.001]	0.054*** [0.005]	0.002*** [0.001]	0.010*** [0.001]	0.004** [0.002]	0.047*** [0.006]	0.014*** [0.001]	0.013*** [0.001]
Age-cube	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]
Ireland	-0.214*** [0.041]		-0.270*** [0.029]		0.007 [0.057]		0.072*** [0.026]	
Post-97	0.276*** [0.024]	-0.160 [0.115]	0.143*** [0.017]	-0.082*** [0.028]	0.426*** [0.033]	0.130 [0.151]	0.138*** [0.015]	-0.024 [0.027]
Ireland* Post	0.192*** [0.052]	0.324*** [0.124]	0.147*** [0.037]	0.118*** [0.029]	0.017 [0.074]	0.739*** [0.156]	0.054 [0.034]	0.173*** [0.028]
Spouse Inc.		-0.000 [0.000]		-0.000** [0.000]		-0.000 [0.000]		-0.000 [0.000]
Unemp. Rate		-7.658*** [1.872]		-1.877*** [0.431]		-6.606*** [2.460]		-1.756*** [0.412]
HH. Size		-2.666*** [0.190]		-0.662*** [0.043]		-0.150 [0.225]		-0.015 [0.041]
Constant	3.792*** [0.754]		1.609*** [0.511]	4.992*** [0.729]	-0.396 [1.220]		8.816*** [0.573]	8.114*** [0.807]
N	43728	11754	44251	39328	39897	8241	40296	39218
chi2	5838.088***	822.847***			8774.898***	1297.529***		
Rsquared			0.131	0.029			0.245	0.068

Note: Model 1 includes only the post-treatment interaction effect and the dummy for the years after reform without controls. Model 2 includes all the controls and fixed effects, standard errors are clustered at the country-individual level. For the dependent variable “working or not” logistic regression and for the continuous dependent variable OLS estimation techniques are used. One asterisk indicates significance at the 90% level, two indicate 95% significance and three asterisks indicate 99% significance. Netherlands is the reference category and coefficient for Spain and UK are not reported here.

Table 9. Descriptive statistics for Singles in per and post reform period.

MEN		PRE REFORM				POST REFORM				
Variable	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Employed	254	0,8	0,4	0	1	350	0,9	0,2	0	1
Lnhours	254	3,1	1,4	0	4,4	350	3,6	0,9	0	4,4
Post	254	0	0	0	0	350	1	0	1	1
Treatment	254	0	0	0	0	350	0	0	0	0
Treat *post	254	0	0	0	0	350	0	0	0	0
Hh Size	254	0,9	0,4	0,7	2,2	350	1,1	0,4	0,7	1,9
Unemp Rate	254	0,1	0,0	0,1	0,1	350	0,0	0,0	0,0	0,1
Age	254	32,2	9,7	22	65	350	34,5	7,6	24	65
age2	254	1128,8	822,8	484	4225	350	1246,9	625,4	576	4225
age3	254	44096,0	56140,6	10648	274625	350	47689,6	40841,9	13824	274625
Educllev	254	6,1	2,5	1	11	350	6,8	2,5	1	11
WOMEN		PRE REFORM				POST REFORM				
Variable	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Employed	256	0,7	0,5	0	1	378	0,7	0,4	0	1
Lnhours	256	2,6	1,6	0	3,8	378	2,6	1,6	0	4,4
Post	256	0	0	0	0	378	1	0	1	1
Treatment	256	0	0	0	0	378	0	0	0	0
Treat*post	256	0	0	0	0	378	0	0	0	0
HHsize	256	1,0	0,3	0,7	2,1	378	1,1	0,3	0,7	1,9
Unem Rate	256	0,1	0,0	0,1	0,1	378	0,0	0,0	0,0	0,1
Age	256	33,6	11,5	20	64	378	32,6	7,6	21	63
age2	256	1257,1	973,1	400	4096	378	1121,8	607,4	441	3969
age3	256	53097,0	66436,1	8000	262144	378	41159,6	38744,5	9261	250047
Educ level	256	6,4	2,7	1	11	378	7,5	2,2	1	11

Table 10. Using singles as control group

	Log Hours		Employed	
	women	men	women	men
post	0.449 (0.548)	0.146 (0.500)	1.293 (0.847)	0.135 (0.781)
treatment	0.142 (0.493)	0.022 (0.441)	0.592 (0.777)	-0.281 (0.752)
treatpost1	-0.372 (0.544)	-0.078 (0.497)	-1.287 (0.829)	-0.080 (0.769)
hhsize	-0.420 *** (0.082)	-0.169 ** (0.080)	0.006 (0.078)	-1.188 *** (0.070)
urate	-1.722 (2.049)	0.919 (1.992)	-2.769 (1.956)	-4.352 *** (1.547)
age	-0.719 *** (0.108)	-0.207 * (0.118)	-0.131 (0.161)	-0.506 *** (0.119)
age2	0.018 *** (0.002)	0.009 *** (0.002)	0.006 * (0.004)	0.015 *** (0.003)
age3	-0.000 *** (0.000)	-0.000 *** (0.000)	-0.000 *** (0.000)	-0.000 *** (0.000)
educlev	0.045 *** (0.013)	0.023 ** (0.012)	0.206 *** (0.011)	0.261 *** (0.009)
Constant	10.954 *** (2.343)	2.988 (2.465)	0.485 (2.513)	6.460 *** (1.845)
ll			-4024.435	-5831.122
chi2			1242.589 ***	2344.062 ***
bic	23426.596	20488.565	8140.759	11754.835
N	10499.000	9787.000	9787.000	10499.000
F	6,34 ***	6,27 ***		

In the first two columns individual fixed effects are used. One asterisk indicates significance at the 90% level, two indicate 95% significance and three asterisks indicate 99% significance

The Risk of Divorce and Household Saving Behavior*

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Abstract: We address the impact of an increase in the risk of divorce on the saving behaviour of married couples. From a theoretical perspective, the expected sign of the effect is ambiguous. We take advantage of the legalization of divorce in Ireland in 1996 as an exogenous increase in the likelihood of marital dissolution. We analyze the saving behaviour over time of couples who were married before the law was passed. We propose a difference-in-differences approach where we use as comparison groups either married couples in other European countries (not affected by the law change), or Irish families who did not experience a significant increase in the expected risk of divorce (such as very religious families). Our results suggest that the increase in the risk of divorce brought about by the law was followed by an increase in the propensity to save of married couples, consistent with a rise in precautionary savings interpretation. An increase in the risk of marital dissolution of about 40 percent led to a 10 to 15 percent rise in the proportion of households reporting positive savings.

* The authors contributed equally and are listed alphabetically. This paper builds on preliminary analyses carried out during the visit of the second author to the European Centre for Analysis in the Social Sciences (ECASS) at the Institute for Social and Economic Research, University of Essex. A preliminary version of this paper was presented at the JESS (Joint Empirical Seminar Series) of ISER center at the University of Essex, at the DemoSoc Seminar of Sociology group in the Department of Political and Social Sciences and at the Applied Lunch Seminars of the Department of Economics at Universitat Pompeu Fabra. The authors are grateful to the participants of all presentations for their helpful comments and criticisms.

1. Introduction

This paper aims to test empirically the effect of an increase in the risk of marital instability on the saving behavior of married individuals. Previous theoretical studies have not been able to unambiguously sign this effect, due to conflicting channels at work. We use the legalization of divorce in Ireland in 1996 as an exogenous shock to the risk of divorce perceived by individuals. We propose several comparison groups (unaffected by the law change) that allow us to use a difference-in-differences approach. Our findings suggest that the legalization of divorce led to an increase in the propensity to save by married individuals (especially females), which is consistent with individuals rising their precautionary savings as a response to the increase in the probability of a negative income shock.

Previous studies have looked into changes in the economic behavior of households as a response to a higher risk of divorce. The most common outcome of interest has been the labor supply behavior of the households, especially the female spouse (Johnson and Skinner 1986, Parkman 1992, Papps 2006, Stevenson 2008). Other outcomes that have received some attention in the literature are the degree of specialization within the marriage (Lundberg and Rose 1999), the division of labor between the spouses (Lommerund 1989), and the investment in marriage-specific capital (Stevenson 2007). The findings suggest that an increase in the risk of divorce may lead to increases in labor supply (especially among women) and a decline in marriage-specific investments.

A popular empirical strategy in the most recent studies is to exploit the variation across US states in the introduction of unilateral divorce legislation. However, recent

studies suggest that the effect of unilateral legislation on divorce rates may have been limited in the long term (Wolfers 2006), which raises the question of how much unilateral divorce effectively affected the perceived risk of marital separation. Our view is that the legalization of divorce in Ireland provides a stronger source of variation.

The determinants of the saving behavior of individuals and households has long been the subject of study by economists, but we are still far from reaching full understanding of the factors that drive consumption and saving decisions.³⁴ The standard stylized models of saving do not account explicitly for life-changing events such as marriage and divorce, which have potentially relevant and long-lasting implications on income and consumption. This is regrettable given that one of the most striking demographic changes in Western countries over the past few decades has been the steady increase in marital instability, which may well have had a significant impact on saving rates.

Some recent theoretical work has made an attempt to introduce marriage and divorce explicitly in a model of savings,³⁵ stressing different channels through which marital transitions can affect consumption and savings. None of them, however, provide an unambiguous prediction regarding the effect of increasing marital instability on the saving behaviour of married couples.

Divorce is generally viewed as a costly event (lawyer fees, etc). Moreover, the economies of scale associated with marriage would be lost upon marital dissolution. Therefore, an increase in the perceived risk of divorce would be viewed by the married individual as an increase in the probability of experiencing a negative shock, which is

³⁴ An example is the lack of consensus in the literature regarding the source of the drastic fall in saving rates in the US in the 1980's (Browning & Lusardi, 1996).

³⁵ Cubbedu & Ríos-Rull (1997), Lupton and Smith (2003), Browning, Chiappori & Weiss (2004), Guner & Knowles (2004), Aura (2007).

expected to lead to an increase in precautionary savings, similar to the effect of an increase in labor income risk (Cubbedu & Ríos-Rull, 1997).

However, a divorce implies that the common assets of the couple must be split between the partners. Uncertainty regarding the sharing rule (i.e. how much of the couple's joint savings each partner will get to keep) implies that an increase in the risk of divorce makes saving while married more risky, thus creating incentives to increase current consumption.³⁶

There are additional channels that can also lead to a negative relationship between the risk of marital instability and savings, for instance if divorce involves fees that reduce the net worth and thus the return to saving of the couple, or if divorce is potentially followed by remarriage, which implies that individual assets will have to be shared with the new partner (Cubbedu & Ríos-Rull, 1997).

Overall, the expected effect of an increase in the risk of divorce on the saving behaviour of the spouses is ambiguous, thus the need for empirical work to test which of the channels dominates in practice. To our knowledge, we provide the first empirical test for the effect of the increase in the risk of marital instability on the saving behavior of married couples. In order to do so, we take advantage of an exogenous increase in the risk of marital dissolution generated by the recent legalization of divorce in Ireland, and follow a difference-in-differences approach to identify its effect on households' propensity to save.

The remainder of the paper is organized as follows. Section 2 introduces the data and the methodology. First we provide support for our identifying assumption that the Irish divorce law of 1996 led to an increase in the perceived risk of marital dissolution.

³⁶ Aura's model (Aura, 2007) focuses on the effects of different aspects of the divorce legislation on the spouses' incentives to save.

We then propose two alternative control groups and provide some support for the claim that, while they were subject to similar economic conditions, they did not experience an increase in the perceived risk of divorce as a result of the law change. Next we introduce the econometric specification and we discuss the measures of saving behaviour available in the data. Section 3 discusses the results when using the two alternative control groups, and section 4 concludes.

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.³⁷ 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 slim margin.³⁸ The removal of the ban was subsequently incorporated in the Constitution in June 1996, and the new divorce law became effective in February 1997.

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. The Irish courts were granted a great deal of discretion regarding the economic consequences of divorce for the spouses. The law states the factors to be taken into consideration, including the contributions made

³⁷ Judicial separation was possible since 1989.

³⁸ We take this as an indication that there were no clear expectations about the outcome of the referendum. In that sense, the legalization of divorce was not anticipated.

by the two spouses (both pecuniary and non-pecuniary), but there is no explicit policy of equal division of assets.³⁹

The legalization of divorce was followed by a rapid increase in 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%.⁴⁰ 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 Finding a control group

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

³⁹ The law does mention the responsibility of both (ex-) spouses to maintain one another, even after the divorce. The calculation of actual maintenance payments is up for the courts to decide, and it should be based on the financial resources and needs of the spouses (Boele-Woelki, 2003).

⁴⁰ 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.⁴¹ 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).⁴² We conclude that it is plausible to claim that legalizing divorce affected non-religious families differentially, increasing their risk of marital breakup, relative to religious ones.

The additional identifying assumption required is that the saving behavior of religious and non-religious families 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

⁴¹ 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. Our 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).

⁴² 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.

showing that the trends were similar for both groups in the years preceding the legalization of divorce.

It is of course hard to claim that religious families in Ireland were completely unaffected by the legalization of divorce.⁴³ 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 families 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 two EU-15 countries with more similar economic conditions to Ireland during the period appear to be the UK and Spain. Figures 2 and 3 display unemployment rates and real GDP per capita growth rates between 1990 and 2001 in the three 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 and the UK. As for unemployment rates, they increased in the three countries until 1993-94, falling steadily since then, with the levels much higher in Spain than in Ireland or the UK.

Figure 4 also shows that private sector savings as a percentage of GDP reached similar levels in the three countries in the mid-1990's (17-20% in 1994), falling slowly between 1995 and 1999.

Although there are some differences in macroeconomic performance across the three countries, we feel the trends are similar enough to allow for the use of Spain and the

⁴³ In that sense, our estimates when using religious families as a control group can be seen as lower bounds on the effect of interest.

UK as alternative control groups. Again, in section 3.2 we provide additional evidence that household saving behavior displayed similar trends in the three countries in the years before the Irish reform.

2.3 Econometric specification, data and sample

We estimate different versions of the following baseline specification:

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

Where S is a measure of the saving behavior (see next subsection for the specific variables used) of an individual (or household) i in group j (treated or control) and year t . The function F will depend on the specification (linear, probit and logit models are estimated). T is an indicator for individuals belonging in the treatment group (either non-religious Irish couples or all Irish couples, depending on which control group we use), while $Post$ takes value 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 thought to affect savings, such as age, income and household size.⁴⁴

The coefficient β_1 measures the average difference in saving behavior between the treated and the control group, while β_2 captures the overall change in saving behavior after the reform. The key parameter is β_3 , which indicates the change in the saving 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 three-country

⁴⁴ We allow for clustering of the residuals at the level of “post” and treatment group in order to account for possible correlation, following Bertrand et al. (2004).

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 potential selection into marriage effects (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, whose saving behavior is expected to be different. We also 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. The sample size is about 2,800 married couples in the Irish sample.

2.4 Saving measures

The literature has typically measured savings either as current income minus consumption, or as changes in wealth holdings over time. Both measures are deemed to be very noisy as well as subject to substantial measurement error. Our data sources, however, lack good measures of either consumption or wealth. They do, however, include a range of indicators of saving behavior, both at the household and the individual level. We thus use a set of binary variables that we think capture the propensity to save of

households and individuals, but we cannot attempt to construct continuous measures of saving rates.

Appendix 1 reports the exact definition of all the variables used to construct our saving indicators. The household-level variables include two alternative measures of whether a household saves a positive fraction of their income. One is derived from the answers to whether the household is “able to save” (“Save”), while the other is derived from a more detailed question that asks whether, considering the household’s income and expenses, at the end of the month there is money left that the household members can save (“Save2”).

A third binary indicator takes value 1 if the household reports significant savings (more than 1,000 pounds a year) derived from do-it-yourself repairs or other home production activities (“DIY savings”). Finally, a fourth household-level saving indicator measures negative savings by indicating households that are currently repaying debt (other than mortgage payments or credit card debt) (“Debt”). These two additional indicators thus provide more detailed information on the saving behavior of the household, which may save by reducing the consumption of goods or services in the market (by producing them at home), or dis-save by incurring in debt.

Descriptive statistics for the household-level measures of savings are shown in table 2. The two binary indicators of positive household savings show significant differences in levels, suggesting the phrasing of the question may have an effect on reporting. For instance, in 1995, 51% of non-religious households report being “able to save”, but only 33% report that there is usually money left at the end of the month that household members can save.

At the individual level, we use a binary indicator constructed from a question that asks whether an individual's savings, in the bank or other financial institutions, have increased over the previous 12 months ("Savings increase"). This variable is closer to the standard definition of savings and is phrased more precisely. Summary statistics for this variable can be found in table 3. Before 1996, about 21% of all individuals in the sample reported an increase in their savings over the previous year.

3. Results

3.1 Religious families as control group

3.1.1 Descriptives

Table 2 shows some descriptive statistics for the Irish household sample, separately for religious and non-religious households, and for the pre and post-reform years. Religious households are defined as those where both partners report going to church at least once a week in all interviews, thus the religiosity indicator is time-invariant for a given family.

Note that non-religious families are less likely to save and more likely to be in debt than religious ones. In 1995, 59% of religious families reported positive savings, compared with 51% of non-religious ones. Pre-reform, the proportion of households that reported being able to save was increasing for both the control and treatment group, while the proportion in debt was falling.

Note also that non-religious households are younger than religious ones (by about 5 years on average), have slightly lower income, and slightly smaller household size (due to slightly smaller number of children). Thus it will be important to control for these factors. After 1996, the proportion of households that reported positive savings increased

for both treatment and control groups, while DIY savings fell, and the proportion in debt surged back up.

The descriptives for the individual sample are reported in table 3. The proportion of all individuals that reported an increase in their savings over the previous year was between 20 and 21 percent before the reform in both groups. Again, treated individuals are younger, have lower income and smaller household sizes than the control group. After 1996, the proportion reporting that their savings were increasing rose for both groups.

3.1.2 Results

The regression results for the household sample are reported in tables 4 and 5, while table 6 shows the results for the individual sample. Table 4 focuses on the binary dependent variable “Save”. Results are reported for a Probit specification as well as for a linear probability model that includes household fixed effects.

Higher household income is associated with a higher propensity to save, while larger households are less likely to save. Age shows a positive association with saving activity, although significance levels are low. Notice that the treated group (non-religious households) is significantly less likely to save than the control group. After 1996, all households increased their propensity to save. However, non-religious families increased their propensity to save significantly more than religious ones, by about 4 to 6 percentage points.

Table 5 reports the coefficients on the interaction term between “Post” and “Treated” for the other three household-level dependent variables. The results go in the same direction as those in table 4. The second indicator of a household’s propensity to

save increased by 5 to 7 percentage points more for treated relative to control families after divorce was legalized, and the estimated effect is strongly significant in both specifications. The size of the effect is similar for the indicator of “do-it-yourself” related savings. Finally, we also find that non-religious families were significantly less likely to be in debt after the reform, relative to religious ones, by 5 to 10 percentage points.

Table 6 reports the results for the individual measure of saving behavior. We report the results for a specification that includes both men and women, as well as separate specifications for husbands versus wives. The control variables show the same patterns as in the household-level specifications. Note that age is significant only in the specification for males. Females are significantly less likely to report increases in their savings than men. Individuals in non-religious households are less likely to report increases in their savings, especially men. The overall propensity to save increased significantly after 1997.

Non-religious individuals were significantly more likely to report increases in their savings after 1997, relative to religious ones, by about 1.6 percentage points. This effect was particularly pronounced among women (2.1 versus 0.9 for men).

In sum, we find that married households in Ireland were more likely to save a positive fraction of their income after 1997, and this increase was significantly higher among non-religious families. Non-religious households were more likely to increase their consumption of household-produced goods and services after 1997, and they were less likely to incur in debt, relative to religious households. Also, individuals were significantly more likely to report that their savings had increased over the previous year after 1997, and this increase was higher for non-religious individuals, especially women.

The results suggest that non-religious married households in Ireland became more likely to save relative to religious ones after 1996-97, the time when divorce was legalized.

3.2 Spain and the UK as control groups

3.2.1 Descriptives

Table 7 shows some summary statistics for the three-country sample, separately for Ireland, Spain and the UK and for the pre and post-reform periods. Pre-1996, saving rates were much higher in the UK than in Ireland or Spain (68% compared with 36-39% in 1995). Before the reform, saving rates were increasing both in Ireland and in Spain, although the increase was steeper in Spain. The proportion of households in debt before the reform was highest in Ireland, followed by Spain and the UK. This proportion was falling in all three countries.⁴⁵

The age profile is similar in the three countries, while income levels (expressed in euros) were similar in the UK and Ireland but significantly lower in Spain. Household size was highest in Ireland. After 1997, the propensity to save increased in all three countries, while there was a rebound in debt in both Ireland and Spain, but not in the UK.

3.2.2 Results

The regression results for the three-country sample are reported in table 8.⁴⁶ The control variables show similar patterns as in the Irish sample. Higher income is associated with a higher propensity to save, larger households are more likely to be in debt, and debt falls with age.

⁴⁵ Now “debt” is an indicator for individuals reporting that repaying debt is a burden on the household (see Appendix).

⁴⁶ All specifications include country fixed effects.

After 1997, the propensity to save increased in Ireland by about 3 percentage points, relative to the UK and Spain, and this effect was significant. The likelihood of being in debt fell by 1 percentage point in Ireland relative to the other two countries, but this effect was not statistically different from zero. Thus, the propensity to save by married couples increased significantly in Ireland after 1996-97, relative to the control countries.⁴⁷

3.3 Robustness checks

We have estimated a number of alternative specifications as robustness checks. Table 9 shows the coefficients on the main variables of interest for some of the variations listed below, on top of the two baseline specifications reported in table 4, for the dependent variable “Save” and the Irish sample.

All regressions have been estimated using a probit, a logit and a linear probability model, with no significant differences. Moreover, we estimate specifications with and without individual fixed effects. The inclusion of the individual fixed effects affects the coefficients of interest surprisingly little, and typically does not alter the significance level. For instance, the LPM without fixed effects coefficient in the first column of table 9 estimates a significant effect of 4.2 points, compared with 6 in the fixed effects specification (shown in table 4).

We have also explored some variations in the sample selection and the control variables included. For instance, we have selected the sample based on the age of the

⁴⁷ 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.

husband or on the age of the wife, and have included as a control the age of the husband, the age of the wife or both at once. These variations made little difference in the results. For instance, the second column in table 9 shows the results when using the age of the wife both to select the sample and as a control, instead of the husband's. We also tried including additional control variables such as education level of husband or wife, and used linear and quadratic time trends instead of controlling for the aggregate unemployment rate, which barely affected the main coefficients. Column 3 shows the specification without the unemployment rate but with both a linear and a quadratic time trend.

Perhaps more relevant were the specifications that used alternative definitions of religiosity. Our main definition of "untreated" household included couples where both husband and wife report going to church at least once a week in all interviews (50% of the sample). A more strict definition would include couples where both report going to church more than once a week, but that would account for less than 1% of the sample. A less strict definition would include couples where both report going to church at least once a month (62% of the sample). Using this less strict definition barely alters the magnitude of the estimated effect (see column 4). Alternatively, we could relax the requirement that both partners report going to church once a week in every single interview. We tried several variations and the results changed very little and went in the expected direction.

We also experimented with different clustering strategies, allowing the residuals to be correlated for each individual household over time, or for all households in a given year, as well as not allowing for clustering. The coefficients of interest remained significant (see columns 5, 6 and 7).

The main specification excludes couples who end up divorcing or separating by 2001. When we estimate specifications that include the separating couples, the effect typically gets stronger; indicating that those households adjust their saving behavior (while still married) more than the couples who do not break up, as would be expected (see column 8). However, we observe few separations in the data, which may explain why the size of the coefficient only changes slightly.

The baseline results drop years 1996 and 1997 from the sample, but we also try including them (1996 as pre and 1997 as post, since no divorces took place before 1997). This weakens the estimated effects somewhat, but they remain mostly significant (see column 9).

Finally, when using families in other countries as comparison groups, we explored using only Spain and only the UK as control countries.⁴⁸ The estimated effect was smaller and less significant when using only the UK as a control country.

4. Conclusions

We have shown that, between 1994-95 and 1998-2001, the propensity to save increased significantly among married couples in Ireland. This increase was significantly higher among non-religious households, compared with religious ones. It was also more pronounced among women than men. The increase in saving rates in Ireland was significantly higher than in other European countries over the same period.

One possible reason for this increase in the propensity to save of Irish married individuals is the legalization of divorce that took place in 1996, which increased the risk of marital breakup, especially for non-religious families. These results are consistent with

⁴⁸ We also explored using all other EU15 countries as controls.

married individuals increasing their precautionary savings in anticipation of a potential divorce.

We estimate that an increase in the risk of marital separation of about 40% led to a significant rise in the proportion of married households reporting positive savings (of 7-10% or 14-18%, depending on the saving indicator used). Married couples were 11 to 16% more likely to save by consuming household-produced goods or services, were 14 to 25% less likely to be in debt, and were about 9% more likely to report that their overall savings had increased over the previous year.

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. Previous studies have suggested that one channel of adjustment is likely to be labor supply, and we provide evidence that saving behavior may also adjust significantly.

Some caveats of our analysis are worth mentioning. First, we are only able to use binary indicators of saving activity, thus cannot draw conclusions about changes in the saving rate as a proportion of household income. Second, 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. And third, 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. Although we have performed a number of robustness checks, these caveats suggest that the results should be interpreted with caution, and further studies are required to confirm their robustness.

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Appendix. Variable Definition

A. Living in Ireland Survey

1) ZH29 Debt (Household File)

Do you or anyone in your household *currently* have to repay debts from hire purchases or any other loans, apart from any mortgage or loan connected with the house and apart from outstanding credit card debts?

Yes 1
No 2
Missing.....9

2) ZH28_37 Save (Household File)

Here is a list of things which a person might have or be able to do. [Int. Show Card HB]
Could you tell me which of the things listed you have or can avail of?

- Able to save?

Yes..... 1
No..... 2

3) ZH37 Save2 (Household File)

When you consider your household's usual income on the one hand and its expenses on the other would you say that there is usually some money left which household members can save?

Yes 1
No (or very little).....2

4) Z2J64 Savings increase (Individual File)

I would like you to consider, in general, all the savings you have (both in your own name and jointly with other household members) in the Bank, Building Society, Post Office, Credit Union, Savings Bank or in Savings Certificates, Savings Bonds or Prize Bonds. How does your TOTAL balance in all these savings today compare with what it was 12 months ago? Would you say, in general, that it ... [Waves 2-8 only]

Increased a Lot1
Increased a Little.....2
Remained the Same.....3
Fell a Little.....4
Fell a Lot5
Missing9

5) (ZH46_1+ ZH46_2+ ZH46_3) DIY savings (Household File)

Would you say that any of the following results in a *significant* saving (of say IR£1,000 or more each year) in your household's expenditure ...

ZH46_1 ... Consuming food you produce on your own farm or garden Yes/ No

ZH46_2 ... Consuming goods from your business (other than farming) Yes/ No

ZH46_3 ... Saving money by carrying out any form of home production, repairs, maintenance, all forms of DIY etc. Yes/No

B. European Community Household Panel

1) HF001 Debt (Household file)

(Repay Debts Other than Mortgage)

Does anybody in the household presently have to repay debts from hire purchase or loans, etc., not connected with the house? To what extent is this a burden on the household?

- Yes, repayment a heavy burden.....1
- Yes, repayment somewhat a burden.....2
- Yes, repayment not a problem.....3
- Yes, repayment, but whether a burden or not is unknown.....4
- No, does not have to repay.....5

2) HF013 Save (Household file)

Is there normally some money left to save (considering household's income and expenses)

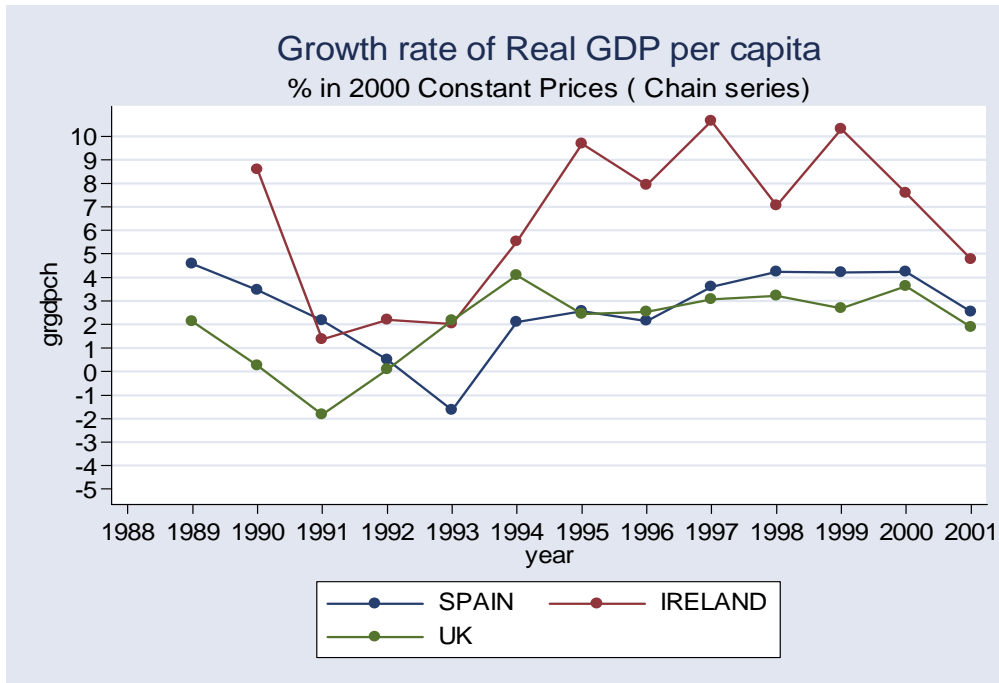
- Yes.....1
- No or very little.....2

Figure 1. Annual number of divorces, Ireland 1996-2004



Note: The number of divorces was zero before 1997.

Figure 2. Growth rate of real GDP per capita, Ireland, Spain and UK, 1990-2001



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. Unemployment rates, Ireland, Spain and UK, 1990-2001

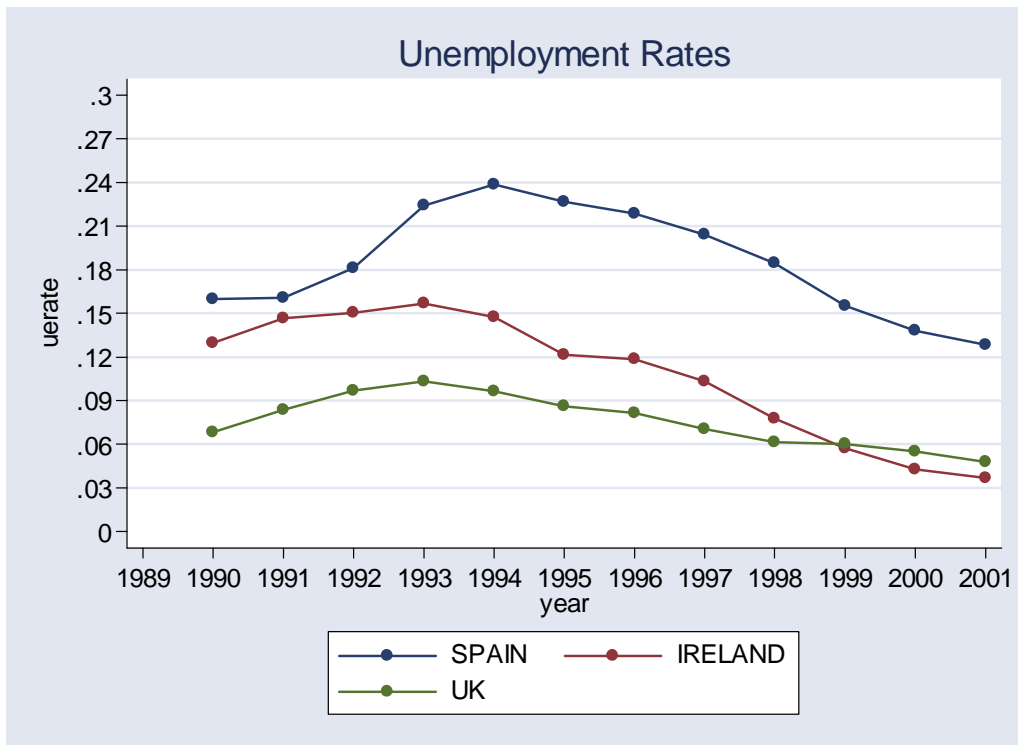
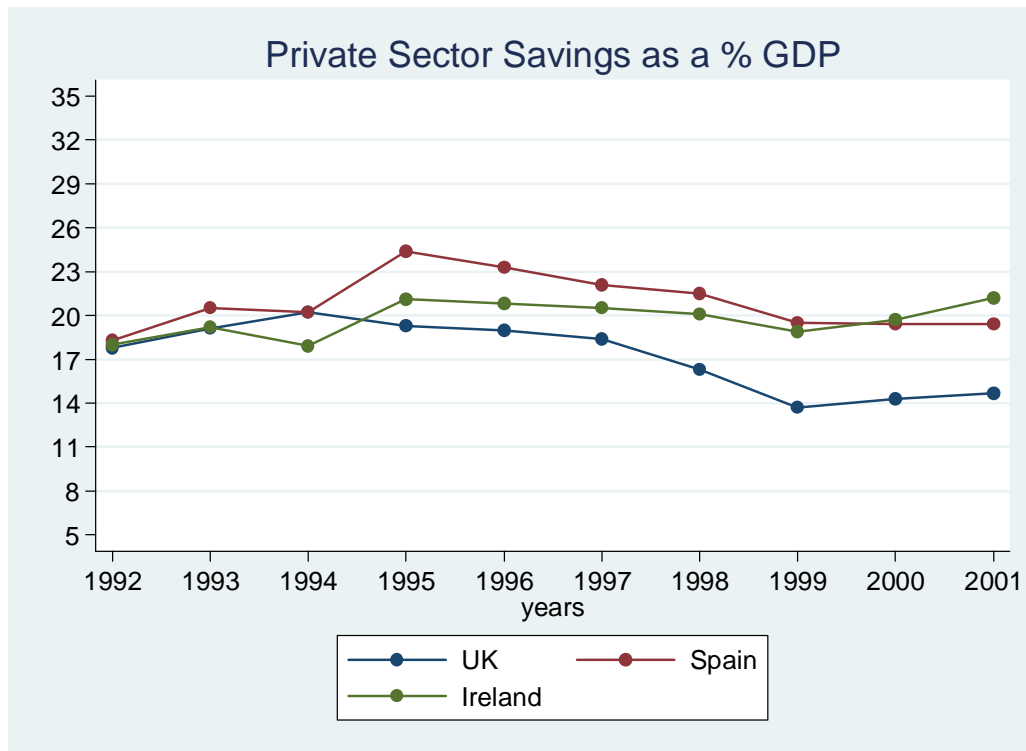


Figure 4. Private Sector Savings, Ireland, Spain and UK, 1992-2001



Source: European Commission Report (2000) "European Economy: Broad Economic Policy Guidelines-Convergence Report for Single Currency" Statistical Annex. p 376.

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.

Table 2. Summary statistics, Irish sample, household-level variables

	Religious			Nonreligious		
	1994	1995	Post (1998-2001)	1994	1995	Post (1998-2001)
Save	0,5426	0,5908	0,7397	0,4856	0,5079	0,7126
Save2	0,2934	0,3842	0,4554	0,2892	0,3347	0,4870
DIY savings	0,4871	0,4875	0,2560	0,4578	0,4297	0,2671
Debt	0,3553	0,3119	0,3588	0,4847	0,3980	0,4181
Age of husband	48,30	48,58	50,70	42,60	42,57	46,02
Hh income (pounds per week)	399,67	440,29	600,45	377,11	393,11	600,53
Hh size	4,58	4,53	4,29	4,37	4,34	4,38
N	1244	997	2578	1079	1010	2770

Table 3. Summary statistics, Irish sample, individual-level variables

	Religious		Nonreligious	
	Pre	Post	Pre	Post
Savings increase	0,2026	0,2832	0,2114	0,3060
Age	47,87	50,23	41,75	45,35
Hh income (pounds per week)	437,53	594,58	392,49	598,06
Hh size	4,49	4,22	4,33	4,36
N	2073	5466	2039	5683

Table 4. Regression results, Irish household sample, dependent variable “Save”

	Probit		LPM, hh. fixed effects	
Post-1997	0,044	(0,023) *	0,045	(0,025) *
Treated	-0,087	(0,003) ***		
Treat*Post	0,044	(0,002) **	0,060	(0,019) ***
L. hh. Income	0,312	(0,014) ***	0,108	(0,014) ***
L. hh. Size	-0,376	(0,018) ***	-0,205	(0,036) ***
U. rate	-0,297	(0,236)	-0,369	(0,439)
Age of husband	0,062	(0,043)	-0,037	(0,047)
Age sq.	-0,001	(0,001)	0,001	(0,001)
Age cubed	0,000	(0,000)	0,000	(0,000)

Note: The number of observations is 9,672. The sample includes all couples married before 1996 and never separated or divorced. Marginal effects reported in the Probit specification. One asterisk indicates a 90% confidence level, two indicate 95%, and three indicate 99%. The standard errors in the Probit specification are adjusted for clustering at the level of “Post-1997” and “Treated”.

Table 5. Regression results, Irish household sample, 3 dependent variables

Dep. Var.	Probit		LPM, hh. fixed effects	
Save2	0,0693	(0,0013) ***	0,0529	(0,0198) ***
DIY savings	0,0468	(0,0034) ***	0,0676	(0,0211) ***
Debt	-0,0545	(0,0009) ***	-0,1000	(0,0212) ***

Note: The coefficients reported correspond to the interaction between “post-1997” and “treated” (nonreligious). The number of observations is 9,672. The sample includes all couples married before 1996 and never separated or divorced. Marginal effects reported in the Probit specification. Controls included are the separate dummies for “post-1997” and “treated”, log household income, log household size, unemployment rate, age of the husband, age squared and age cubed. One asterisk indicates a 90% confidence level, two indicate 95%, and three indicate 99%. The standard errors in the Probit specifications are adjusted for clustering at the level of “Post-1997” and “Treated”.

Table 6. Probit results, Irish individual sample, dependent variable “Savings increase”

	All			Husbands			Wives		
Post-1997	0,094	(0,006)	***	0,099	(0,015)	***	0,091	(0,002)	***
Treated	-0,011	(0,007)		-0,014	(0,007)	**	-0,007	(0,009)	
Treat*Post	0,016	(0,005)	***	0,009	(0,004)	**	0,021	(0,005)	***
L. hh inc.	0,179	(0,009)	***	0,198	(0,021)	***	0,160	(0,005)	***
L. hh size	-0,193	(0,019)	***	-0,190	(0,020)	***	-0,202	(0,022)	***
U. rate	0,982	(0,144)	***	1,274	(0,366)	***	0,721	(0,043)	***
Female	-0,040	(0,010)	***						
Age	0,029	(0,041)		0,079	(0,030)	***	-0,002	(0,048)	
Age2	-0,001	(0,001)		-0,002	(0,001)	**	0,000	(0,001)	
Age3	0,000	(0,000)		0,000	(0,000)	**	0,000	(0,000)	

Note: The number of observations is 15,503. The sample includes all couples married before 1996. Marginal effects reported. One asterisk indicates a 90% confidence level, two indicate 95%, and three indicate 99%. Standard errors have been clustered at the treated and post-1997 level.

Table 7. Summary statistics, three-country sample

	Ireland			Spain			UK		
	1994	1995	Post	1994	1995	Post	1994	1995	Post
Save	0,3219	0,3635	0,4758	0,2496	0,3911	0,4700	0,6805	0,6752	0,7235
Debt	0,3302	0,2621	0,2795	0,2514	0,2357	0,2429		0,1454	0,1216
Age	45,61	45,45	48,19	46,07	45,76	47,86	44,61	44,77	47,60
Hh income (euros)	24290	25438	34914	15996	16381	21018	24562	24846	39998
Hh size	4,50	4,45	4,38	3,96	3,95	3,95	3,32	3,31	3,38
N	2038	1920	3974	4118	3669	9260	1659	1561	5223

Table 8. Regression results, three-country sample

	Save			Debt	
Post-1997	-0,062	(0,010)	***	0,006	(0,010)
Ireland*Post	0,029	(0,011)	***	-0,011	(0,010)
Log hh income	0,056	(0,006)	***	0,010	(0,005) *
Log hh size	-0,018	(0,018)		0,045	(0,017) ***
Unemp. Rate	-1,382	(0,201)	***	-0,329	(0,203)
Age of husband	0,007	(0,021)		-0,038	(0,020) *
Age sq.	0,000	(0,000)		0,001	(0,000) *
Age cubed	0,000	(0,000)	*	0,000	(0,000) **

Note: Reported results are from LPM specifications with household fixed effects. The number of observations is 39,898 and 39,623, respectively. The sample includes all couples married before 1996 and never separated or divorced in Spain, the UK and Ireland. One asterisk indicates a 90% confidence level, two indicate 95%, and three indicate 99%.

Table 9. Robustness checks, dependent variable “Save”, Irish household sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	LPM, no f-e	Female age	Time trend	Less strict religiosity	Clustering by hh	Clustering by year	No clustering	With separating couples	With 1996 and 1997
Post	0,046 (0,028)	0,038 ** (0,016)	0,029 (0,022)	0,049 * (0,026)	0,044 (0,028)	0,044 *** (0,014)	0,044 (0,033)	0,044 (0,027)	0,070 *** (0,013)
Treated	-0,081 *** (0,014)	-0,086 *** (0,002)	-0,087 *** (0,003)	-0,092 *** (0,014)	-0,087 *** (0,017)	-0,087 *** (0,008)	-0,087 *** (0,015)	-0,091 *** (0,002)	-0,082 *** (0,001)
Treat*Post	0,042 ** (0,018)	0,043 *** (0,002)	0,044 *** (0,002)	0,046 *** (0,013)	0,044 ** (0,021)	0,044 *** (0,011)	0,044 ** (0,020)	0,050 *** (0,002)	0,030 *** (0,008)
N	9672	10338	9672	9672	9672	9672	9672	9794	12830

Note: The sample includes all couples married before 1996 and never separated or divorced (except in column 8). Marginal effects reported in the Probit specifications (all but column 1). One asterisk indicates a 90% confidence level, two indicate 95%, and three indicate 99%. The standard errors in the Probit specifications are adjusted for clustering at the level of “Post-1997” and “Treated” (except in columns 5, 6 and 7).

Female Employment and Household Income Distributions

A comparison of Germany and the US

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(April 2008)

Abstract: In this paper with an essentially descriptive strategy, we aimed at identifying how the distribution of female work income influences the overall household income distribution. We focus on long trends (1980-2003) in two countries, Germany and the US, basing ourselves on the GSOEP and PSID panels. Our data analyses are limited to households with heads older than 25 and younger than 60 in order to limit the potentially contaminating effects of education and retirement, respectively. Consequently, we provide several descriptive trends in a number of key areas that are likely to play important roles in explaining rising inequality in both countries.

1. Introduction

As Goldin (2006) puts it, the ongoing transformation of women's roles is genuinely revolutionary. This is certainly the case when we look at women's life course – which is becoming more masculine – and when we examine women's position in society – far greater autonomy. But it is also revolutionary in terms of its second-order consequences. Low fertility, marital instability, the rise of 'atypical' households and new family formation practices can all be traced to altered preferences (and tensions) associated with women's embrace of novel identities and priorities.

The existing literature has paid much attention to the gender equalization aspects of the revolution, but research on its broader societal effects has been scarce. The impact of rising gender equality on societal-level inequality is empirically ambiguous. If

we consider women's lifetime employment profile, earnings and intensity of labor supply as the core constituents of women's economic independence, more gender equality may produce more societal inequality if, as is the norm, female career commitments are considerably stronger among the highly educated.

Ours is an epoch of sharply changing income distributions. US commentators speak of a 'great u-turn': after decades of income compression, we now register major reversals; in some cases, like the UK and the US, the surge in inequality has been quite dramatic (a 20+ percent rise in the Gini of market incomes); with only one or two exceptions, all OECD countries have experienced widening income differentials over the past decades (D'Ercole and Foerster, 2005). Unsurprisingly, economists and sociologists have dedicated substantial attention to the phenomenon. Most of the burgeoning literature traces it to changes in the labor market, particularly to rising skills premia, eroding trade union power, employment de-regulation, and unemployment (Juhn et.al., 1993; Katz and Autor, 1999; Morris and Western, 1999; Ryscavage, 1999; Kenworthy, 2005).

There exists also a small – but growing – literature that traces changes in the income distribution to family demographics and female labor supply. The proliferation of single person households and lone mother families in particular may have substantial effects. Karoly and Burtless (1995) suggest that the rise of female-headed households explains about half of the total increase in the US Gini during the 1970s and 1980s. Changing patterns of marital selection can also have major effects. If assortative mating intensifies, inequalities will be accentuated. A polarizing trend may ensue if unemployment tends to come in couples – as is very much the case (Gregg and Wadsworth, 2001) – and if, at the top, we find couples with two high-income earners. To illustrate, a two-career couple may potentially supply 80 or perhaps even 100 hours a week; the single-earner household half that; and the lone mother, realistically far less.

There is evidence that such asymmetries are widening (Karoly and Burtless, 1995; Juhn and Murphy, 1997; Aaronson, 2002). Smeeding (2004) shows that couples in the top quintile work roughly 2-3 times as many annual hours as do those in the lowest. Hyslop (2001) estimates that assortative mating accounts for 23 percent of the rise in US (couple-) household income inequality.

The revolutionary change in women's roles may, accordingly, be a mixed blessing if either directly or indirectly it produces greater household inequality. A surge in inequality will influence not only the distribution of living standards today but also the opportunity structure for subsequent generations. The more unequal is family income, the greater the inequalities in parental investment in their children. On this backdrop it is evidently of some importance to identify more precisely how changes in women's economic behavior affect the income distribution.

There are surprisingly few studies that have broached this question systematically and the existing literature is mostly based on US data.⁴⁹ Most research has – logically – focused on the impact of women's earnings on the household income distribution. It has been almost exclusively restricted to couple households and due to rather severe methodological problems, the results cannot easily be generalized and nor do they appear especially robust (Percheski & McLanahan 2008).

2. How may women influence the income distribution?

If we focus on the distribution of *household* income, there are 5 major factors that can dictate how female employment influences inequalities.

Firstly, the effect depends on the distribution of women across household types, in particular with regard to couple units relative to single person (and lone mother)

⁴⁹ For a European focus, see Maitre et.al. (2003) and Esping-Andersen (2007).

units. As noted, US research finds that the rise in single mother families has contributed significantly to inequality. The distribution of women across household types is patterned by a set of demographic factors, age, race and education in particular. For instance, single parenthood rates in the US are approximately three times higher among black than white (Ellwood and Jencks, 2004) Of course, the actual effect will depend on the kinds of social selection mechanisms at play: in some countries (like the UK and the US) lone motherhood is associated with low education and high poverty risks. This is far less the case in Scandinavia, in part because most lone mothers work and in part because of generous welfare state support. It is also less the case in Southern Europe where divorce and separation is very much a higher social status affair. Yet, if we include also cohabitating couples in the analysis, the impact of changing family structure appears weaker (Martin 2006).

Secondly, if we restrict ourselves to couple households the effect will depend on *which* women increase their labor supply and earnings most. If most of the increase is concentrated among higher educated women, or among women married to high-earning men, the impact is likely to be inegalitarian. But if we see a major increase in single mother employment, the effect should be equalizing (Western et. al. 2008).

Women's contribution to total household income is rising across-the-board. Estimating from the ECHP data, their relative contribution has risen by a full 5 percentage points in the 1990s in France, the Netherlands, and Spain. Most Dutch women work part-time while the norm is full-time in Spain. In turn, the Spanish activity rate remains fairly low. The upshot is that the female share of total household income is, in both cases, about 25 percent on average. To put this into perspective, Danish women approach parity (42 percent) on average because almost all women work and because full-time jobs are the norm.

For Germany and the US alike, there has been a clear rise in women's share of total household income over the past two decades. In Figures 1 and 2 we present the trend for coupled households by husbands' earnings quintile. In the US, the increase has been in the order of 50 percent across the quintiles and, with the exception of the very top and bottom, wives' contribution now hovers around 30% of total. This is somewhat greater than in most EU countries, but is also considerably lower than the Scandinavian share. The role of wives' income has been especially marked in the lowest quintile of male earnings where their share now exceeds 60 percent of the total. This, in turn, is probably a mirror image of the deteriorating position of low skilled males in the US labor market (Juhn and Murphy, 1997).

Turning to Figure 2, we see that the German trend is roughly similar although weaker. In the middle ranges of men's earnings, German wives' contribution has increased from about 15 to 20 percent of total. As in the US, wives of low income men have experienced the most dramatic increase and contribute now almost 60 percent of the total. In both countries, but somewhat more accentuated in Germany, women married to top male earners contribute rather little to household income.

The pertinent issue has to do with the dispersion. Female employment growth has generally been strongest among more skilled, high-wage women while the less educated are more likely to be housewives, to interrupt around births, or to be unemployed. If the intensity of women's labor supply is biased towards the top of the *male partner* earnings distribution, it will almost automatically imply more inequality. Basically, equalization is most likely to occur when female labor supply (and earnings) grows faster at the bottom than at the top. Figures 1 and 2 measure wives' relative earnings contribution and not the trend in labor supply or earnings. Yet, the data suggest that the intensity of women's labor supply is probably lower at the very top than in the

middle quintiles of husbands' earnings. In any case, the issue will be explored in more detail below.

This leads us to the *third* factor, namely the female and male wage distribution. The gender wage gap has been narrowing in tandem with the rise in women's employment, fewer children, and shorter birth interruptions (Blau and Kahn, 2002; Waldfogel and Mayer, 1999). But it has been narrowing at differential rates. In the Nordic countries, for example, the gap has been stable among high skilled women and has continued to close among the less skilled. This, conditional on male partner earnings, should favor an equalizing trend. In the US, in contrast, the opposite occurred in the 1990s. And if, as in the US, less skilled male earnings are eroding, the effect will be compounded – in particular where marital homogamy is the norm.

Partner selection is, in a sense, key. Marital homogamy patterns do differ across nations with regard to education (Blossfeld and Timm, 2003; Schwartz and Mare 2005). Typically, there is greater homogamy at the top and the bottom of the social pyramid. Figure 3 provides an illustration of the degree to which partners' labor supply and annual work income is correlated in Germany and the US over time. The labor supply correlations are overall far smaller, and now the nation-pattern is basically the opposite. The stronger correlations in low participation country Germany suggest that higher earning women are most likely to be found in couples where also the male has high earnings. This result in fact is consistent with what Smith (2005) finds for Spain. While much of the variation in the correlations seems to be noise, we still can see some trends. For example, earnings correlations since the late 1990s is in decline in US after a long period of average 0.23 while Germany shows a climb-up during the same time period although levels are still small around 0.1. Germany represents, in a sense, the classical Parsonian family model where women's labor supply declines the more the male earns

especially during the 1980s. In fact, as we show below, the share of dual earners in the top quintile of male earnings is, in Germany, exceptionally low (and declining).

The *fourth* factor that can influence the connection between female employment and inequality is closely related to the former, namely how different kinds of households fare across the business cycle. This factor has, surprisingly, not been given much attention. Yet, when we examine year-by-year changes in female employment it is noticeable how women in general, and less educated women in particular, are vulnerable to economic slowdowns. In a previous study, Esping-Andersen (2007) conducted year-by-year variance decompositions of changes in household inequality and the results suggest that the impact of women's earnings on total household income distribution tends to be more inegalitarian in recession years. One way to interpret this is that women coupled to low wage men are disproportionately vulnerable to unemployment (first fired, last hired). Once again we see the repercussions of assortative partnership. It is of course very likely that marital selection and inequality are endogenously determined, thus mutually reinforcing each other. Fernandez, Guner and Knowles (2005) make this assumption explicit, arguing that marital sorting is a function of the distribution of skill premia (which are highly correlated (.80) with the GINI coefficient).

The *fifth* factor is partnership formation in the broader sense. On one hand, as already discussed, marital selection in terms of human capital attributes can have substantial effects. On the other hand, there are no doubt selection mechanisms behind the dynamics of coupling and uncoupling. Those who remain single, or become so, are not necessarily similar in composition to those who form couples. The overall effect of partnering is difficult to predict. We would expect that single-hood is more predominant among women seriously dedicated to careers. As mentioned, divorce and lone motherhood is in some countries an upper class affair; in others possible biased towards

the bottom. In any case, the methodological consequences of selective partnering behavior can be serious for any study of this kind.

3. Methodological Challenges

The standard approach is to estimate how over-time changes in the household income distribution are connected to concurrent changes in female labor supply and earnings. Estimation is typically done via variance decomposition or via simulations. Lam (1997) and Western et al. (2008) pursue the former strategy while Maitre et.al. (2003) and Pasqua (2001) are examples of the latter. The studies that used decompositions usually focused on a measure of dispersion such as coefficient of variation, Gini coefficients or the total variance. The decomposition approach is usually motivated by a focus on population shifts across family structures or shifts in earnings sources by gender, as in Karoly and Burtless (1995).⁵⁰ Simulations test counterfactuals: what would the income distribution look like had there been no change in women's labor supply? They can also be applied to cross-sections. Pasqua (2001), for example, simulates what the Spanish income distribution would look like with Danish female employment levels (it would be 15 percent less unequal).

If, as is the preferred approach by most, we estimate the female effect over time we will face some serious pitfalls. The first problem has to do with the unit of analysis – couple households. If we sample all couple households at t and subsequently at $t+1$ we are in fact not studying the same households. Many who at t were singles (and thus excluded from the sample) become coupled and many who were coupled at t become single at $t+1$. Many will, in addition have gone into retirement or died. It is accordingly crucial that we control for differential couple survival over the period we investigate.

⁵⁰ See Martin (2006) for a literature review.

For Germany and the US we first estimated a duration function of marriages for the population of couples in the first year (1980) until 2003. A major problem here, of course, is left-censoring since our sample includes people who were married prior to 1980. In any case, marital stability appears far greater in Germany than in the US – as one would expect. In Germany, almost 90 percent of the original 1980-couples remained intact by 2003, compared to less than 80 percent in the US.

The second problem is that entries to and exits from couple-hood are unlikely to be randomly distributed. If marital break-ups correlate with education or social status, then we face a possibly severe selection problem that, worse, is likely to compound for every $t+$ we include in our study. To address this problem we ran Kaplan-Meier survival estimates for each of the 5 male-earning quintiles. See Figures 3 and 4.

Both countries exhibit a fairly similar pattern, namely that marital breakups are far more likely to occur in the lowest quintile, and that higher income couples tend to be more stable. In Germany, however, the social differences are relatively undramatic (a 5-percentage point gap between the top and bottom) while the gap is huge in the US (a 15+ percentage point gap). Underlying social selection is therefore a much larger problem in the latter case and needs to be addressed directly in any serious study of how women's earnings affect societal inequalities.⁵¹

A third source of identification error lies in the simple realities of the human life course – decisive transitions are very age dependent. To exemplify, our study truncates the sample to the population over age 25 so as to exclude students and the early part of the adult life course. But doing so introduces bias because our population will have

⁵¹ Logrank tests of homogeneity and for equality of survivor functions show, for the US that we must reject the null hypothesis that there are no differences across the quintiles ($\chi^2(4) = 263.21$ ($\text{pr} > \chi^2 = 0.0000$)). For Germany, similar tests suggest that the null hypothesis cannot be rejected ($\chi^2(4) = 13.23$ and $\text{pr} > \chi^2 = 0.0102$). In other words, selection is a serious issue for the US but probably not for Germany.

greater probabilities of becoming un-coupled than of coupling (couple formation is more frequent in early adulthood; separations are more frequent later on).

These kinds of problems directly affect our abilities to generalize to the real population. Take Hyslop's (2001) study of the effects of marital homogamy. His population is restricted to stable couples where both continuously work. This means that he is compelled to shorten the time-span of the study drastically. His conclusions, moreover, will pertain only to the increasingly exotic sub-population of stable two-earner couples. Pencavel (2006) offers an intriguing solution to the life course dynamics problem. Organizing the data by years since completed education he can distinguish between ageing and period effects.

In the present version of this paper we do not overcome these problems. The analyses that follow are limited to couple households in line with the standard approach in the literature. We concentrate on two countries, Germany and the United States for which we have high-quality panel data over more than two decades. The comparison is partly motivated by the lack of research on Europe, and partly by the sharp contrasts in terms of known nation-characteristics. Germany represents pretty much the typical Continental European profile with moderate levels of overall female participation. Germany also exhibits a rather traditional – and less masculinized – female life course with typically long work interruptions around birth. As Figure 3 suggested, women partnered to high-income men have comparably low (and falling) employment rates. Due to a rather hostile environment in terms of reconciling motherhood and careers, the incidence of childless women is exceptionally high – in particular among highly educated women. The rate of part-time employment among German women is rather high. Germany has experienced a rise in the Gini during the 1990s that is quite sharp, but starting from a rather low initial level. The GSOEP panel data, beginning in 1984, affords us a 20-year span that permits us to identify also cohort-specific effects.

And the US is included not only because it has already been examined quite extensively in previous research, but also for its unique features. Women's employment has grown substantially over the past decades, almost reaching Scandinavian levels. Besides, the US is the prototype of surging income inequality, of marital instability, and of lone motherhood. Using the PSID files allows us also to analyze across several decades and this permits us, like for Germany, to isolate cohort-specific effects.

Dual earner couples have, as a result of rising female employment, risen everywhere, but the patterns are uneven. In the US, the main jump occurred in the 1980s (from 54% in 1980 to 68% in 1990, leveling off at 70% in the 1990s). And Germany exhibits a counter-trend: starting at 40% in 1984 it dropped to 33-35% in the latter part of the 1990s and recuperated to 39% in 2001-2003.

Marital homogamy (including both cohabiting and married couples) can contribute importantly to income inequality if high earnings and labor supply is positively related with education in dual earner families. Trends in marital selection differ importantly between the countries: In Germany, the share of hypogamous couples has risen while homogamy has seen a slight decline (declining from 53% in 1984 to 49% in 2002). In the US, in contrast, we see a marked increase in homogamy (from 49% in 1980 to 56% in 2001 – with an all-time high of 59% in 1997-99).

In the following we explore how women's employment in these three contexts has affected household inequality. We focus exclusively on working age couples in the age range 25-60, and include only earnings from paid work. I.e., our study excludes household income from transfers.

We begin descriptively, presenting key data on trends in women's economic role and couple status, all differentiated by the earnings quintile of husbands. We then turn to a more analytical approach and use both simulation and variance decomposition

techniques in order to assess how women's revolution has affected the overall income distribution.

4. Data and Sample

The US and German data come from the 1983-2003 waves of GSOEP (German Socioeconomic Panel) and the 1980-2003 waves of the PSID (Panel Study of Income Dynamics). After 1997, the PSID shifted from annual to biennial data collection. Therefore, from 1997 onwards, we have only years 1999, 2001 and 2003. Nevertheless, since our analyses involve cross section of the years rather than time series for PSID, the two-years gap on our period of study do not constitute any problem.

We utilize the original panel data rather than the Cross National Equivalent Files in order to achieve more precision, in particular with regard to the education variables used to identify marital selection. To define educational matching among the spouses we follow the approach of Schwartz and Mare (2005) which groups individuals into 5 broad categories (for the US less than 10 years, 10-11, 12, 13-15, and 15+ years of study).

Our inequality measure (GINI) is calculated on household net work income. The income components are virtually the same in both databases.

4. 1. Trends in Marital Selection

As previously noted, there are striking nation differences in the patterns of educational matching. The traditional model of male 'supremacy' (hypergamy) is declining in the US, now representing less than a quarter of all couples. Hypogamy has remained fairly stable. In Germany, however, the overall rate of hypergamy is stable, representing about 35 percent of couples, homogamy has experienced a small decline, and hypogamy has

gained ground. The key issue for our study is of course the variation in marital sorting across households.

In Germany, hypogamy has risen across almost all households, but most in couples where the husband's earnings fall in the lower quintiles. This surely reflects the seminal rise in women's educational attainment combined with the continued prevalence of vocational training among men. Except perhaps for the top quintile where homogamy has risen, there is no clear trend towards more homogamy in Germany. In the US, hypergamy is basically trendless except perhaps for the middle quintile households. The much-debated trend towards homogamy in the US is, however, quite limited to top-income households. See Figures 5 and 6.

4.2. Trends in Couples' Labor Supply and Earnings Status

The impact of wives' employment on the income distribution depends on the combination of wages and labor supply. Families that depend solely on a male breadwinner are in rapid decline in tandem with the disappearance of the housewife. The share of zero-earnings wives has fallen below 20 percent in American couple households and to about 20-25 percent in Germany. The key issue is of course where in the male income distribution these zero-earner women are concentrated. In Germany they are primarily found in the lowest male quintile which – all else equal – should widen the income gap between the bottom and the rest. In the US the profile is more nuanced since we find the largest concentration of zero-earner women at the top and the bottom. This, one would expect, would also promote a widening gap between the bottom and the rest.

Indeed, such potential polarization is also brought out if we examine households where there is only one earner more generally, be it the male or female. In Germany, single earner households have declined from about half to around 40 percent of all, but

there is one exception, namely the lowest male quintile, where it remains stable around 45 percent. The US trend is rather similar, but volume-wise the nation differences are substantial. Here also, the rate of single earner couples has remained stable around 40 percent, but all the middle-quintiles have seen a drastic decline, hovering now below 20 percent of all couple households. Here again we would therefore anticipate more polarization in the US than in Germany.

But we obviously also need to examine the intensity of female labor supply. In Figure 7 and 8 we present trends in dual earner based couples and in the rate of part-time employment among the wives. It is first of all evident that dual earner-ship is far more prevalent in the US than in Germany across all households. Both countries present essentially a bi-modal picture, but at different levels. In the US, dual earning is the norm (80%) in all couples except in the bottom quintile (less than 50%). In Germany, it is still less of a norm with all but the lowest quintile hovering around 60 percent (and only about 30 percent in the bottom male quintile).

The distance between the bottom and the rest will also depend very much on employment intensity. The prevalence of part-time employment should be key to the overall effect. See Figures 9 and 10. If we ignore the drop in part-time rates in Germany 2004-2005 (which is probably due to changes in definition), the German and US trends are basically moving in opposite directions. American women are increasingly committed to full-time jobs and German women, when employed, increasingly favour the part-time option. Interestingly, the pattern is fairly identical in the two cases. Women married to high income men are more likely to be part-timers while those married with low-wage men are more likely to be full-timers. This certainly suggests the presence of compensatory strategies. It is, once again, in terms of volume that the two countries differ. In all but the top quintile, the vast majority of wives (65-70 percent) are full-timers; In Germany the distribution is closer to half-half. The

substantially higher rate of full-time employment within the bottom quintile, especially in Germany, should – all else equal – produce an equalizing effect in terms of the overall household income distribution.

5. Estimating the Female Employment Effect

5.1. Simulations

As discussed earlier, we can use simulation techniques to identify the impact of women's employment on household Ginis. Basically we construct a counterfactual of what would the overall income distribution in $t+$ have looked like had there been no change in *quintile-specific* female employment or, alternatively, what would inequality have looked like had women in the bottom quintile behaved like women at the top. While doing this, we hold constant also the rate of single versus dual earners in each income quintile.

The first row in Table 2 shows the *actual_trend* in the Gini coefficient among couple households. For both countries, the simulations suggest that female labor supply in the top (male) quintiles, but especially in the 5th, is decisive for inequality. Had it not risen over the two decades, the Gini in 2003/05 would have been about 7 percent lower in both countries.

Can changes in female employment at the bottom offset the inegalitarian impulse from the top? To answer this question we perform three simulations. In row 4 we hold constant the labor supply of bottom-quintile women, but this hardly alters the level of inequality at all. But if, as rows 5 and 6 suggest, bottom-quintile US women had experienced a rise in labor supply identical to the 5th and 4th quintile, respectively, this would have produced a non-trivial reduction in inequality (3 percent in the former case; 2 percent in the latter). If this had in fact occurred, it would basically have offset the

inegalitarian thrust that comes from the 4th quintile women, but clearly not that which comes from the 5th quintile.

The German simulations convey a rather similar story, but with one exception: had bottom-quintile women behaved like the 4th quintile women, this would have produced a noticeable (2.5 percent) reduction in inequality.

Since we only hold labor supply constant and the rates of single headed households, this simulation framework is too simplistic to fully answer the questions we pose. The obvious next steps would be while holding constant key demographic variables, taking also selective patterns of couple formation and stability. The alternative approach is to use variance decomposition techniques, as we do in the following section.

5.2. Decomposition

We adopt the variance decomposition approach initially developed by Jenkins (1995). Seeking to identify the impact of household demographics, quite similarly to our study, the method has also been used on comparative data (Pasqua, 2002). To overcome the limits of a Gini-based decomposition, Generalized Entropy measures, like the Theil or the mean logarithmic deviation, are preferred. This is for two reasons. One, the Gini cannot be decomposed into population sub-groups. Two, generalized entropy indices are to be preferred if we require sensitivity to the tail ends of the income distribution. Since our primary aim is to decompose inequality by specific demographic groups and by source of income, we utilize the I_2 index, which represents half of the squared coefficient of variation. Another reason why we use this index is that it permits computation when there are zero or negative values in the income variables. Our data on household labor income include zero values within no-earner households.

The values of this index can be interpreted similarly to the Gini and other inequality measures: the higher the value, the greater the level of inequality. See Appendix 1 for a technical explanation.

Table 3 focuses on the impact of women's employment status within the couple. We differentiate between three family types: the conventional male breadwinner, dual earner couples, and a residual category (other) which includes no-earner and female breadwinner households. As in our previous analyses, we include only couple households.

Our analyses are static in the sense that we undertake decomposition for the first and last year in our data. We can of course identify some dynamics by comparing the I_2 coefficients across the years.

Beginning with the descriptive information, we confirm once again the overall decline of the male breadwinner model and the rising importance of dual earners. This trend has clearly been strongest in the US where dual earner couples are now the norm. There are ambiguities related to the 'other' category since it includes both female breadwinner and no-work households. We note, nonetheless, that this type has grown considerably in Germany. In terms of their share of total income it comes as no surprise that dual earners command a disproportional large part of the total cake – and vice versa for the 'other' group.

Moving to the decomposition results it is evident that within-group inequality accounts for almost all overall inequality. In terms of dynamics, however, Germany and the US seem to be moving in opposite directions. In the former case, between-group inequality has gained in importance; in the US, it has virtually disappeared. This is what one would expect. In the US, the dual earner status has clearly become the norm across all income quintiles and if there is less and less asymmetry in household type across the income distribution we would naturally expect that the lion's share of inequality derives

from earnings differentials within the groups. In contrast, the data suggest that there is more selection in terms of earnings potential behind the household groupings.

5.3. Age Cohort and Period Effects

One important difference between Germany and the US is the dual earner rates across the cohorts. Figure 11 shows the cohort differences in the rate of dual earner households for each age. Although in both countries overall younger generations have higher rates of dual earners, the youngest cohort in Germany has reached to 50% dual earner rates approximately 10 years earlier. And the trend looks stable there. Whereas in the US progressively younger cohorts have much higher dual earner rates and the rates are around 80% significantly much higher than Germany. Figure 12 shows how cohort specific Gini coefficients evolve over the age groups. It can be clearly seen that in Germany, the youngest cohort has the highest Gini coefficient. The striking differences in income inequality between the cohorts especially regarding the slopes suggest that pace at which these inequalities are spread over the life course is very different both countries. The youngest cohort having almost a flat trend over the ages might imply a common earnings destiny for the members of that cohort.

6. Conclusions and Discussion

This study does not aim to overcome the problems of the existing research. Rather it aims to point the potential problems of the current research descriptively. For example the decomposition analysis we present here is static in nature. The next step would obviously incorporating marital selections in the analysis of decompositions in a dynamic way. Two alternative solutions can be suggested for the future research – and

as far as we know hitherto untested -- solutions. The first is to actively model the selection effects of entry and exit moves into and out of couple-hood. If, as one would suspect, there is selection bias related to socioeconomic status we can, within a non-linear estimation framework, identify the relative impact of exits and entries.

The second – and rather more compelling – solution implies a redefinition of the basic question in a manner that is more faithful to the real world. Rather than limiting ourselves to a sub-sample of couples, we should start with the entire population of households at point t . We then trace the over-time changes in household income distribution and estimate how much of that change is due to shifts in women's labor supply, to changes in household composition (single person, lone parent, couples), to exits and entries into couple-hood (basically two dummies) and, preferably, also to behavioral characteristics of households in order to capture selection effects. The latter could be done in a manner akin to the Heckman correction method, namely to include in our estimations the residuals from regressions that predict, say, divorce.

Appendix

We used a *Stata* “a-do file” produced by Jenkins to decompose the I_2 index of inequality.⁵² The index is decomposed additively.

The general formula for the Generalised Entropy class of measures is:

$$GE(\theta) = \frac{1}{\theta^2 - \theta} \left[\frac{1}{n} \sum_{i=1}^n \left[\frac{y_i}{y^*} \right]^\theta - 1 \right]$$

With n =population; y_i =household income in our case i ; y^* =average income and θ =discretionary parameter. With $\theta=0$ and $\theta=1$ the equation is solved by taking the limit of $GE(\theta)$ for theta that tends to zero and for theta that tends to one . With theta that tends to zero, we obtain the *Mean Log Deviation*:

$$GE(0) = \sum_{i=1}^n \frac{1}{n} \left[\log \left(\frac{y^*}{y_i} \right) \right]$$

If theta tends to 1, we obtain the following Theil index:

$$GE(1) = \sum_{i=1}^n \frac{1}{n} \left(\frac{y_i}{y^*} \right) \left[\log \left(\frac{y_i}{y^*} \right) \right]$$

If the theta is equal to 2, and we substitute 2 with the theta in the formula we obtain half the squared coefficient of variation.

$$GE(2) = \frac{1}{2} \left[\frac{1}{n} \sum_{i=1}^n \left[\frac{y_i}{y^*} \right]^2 - 1 \right]$$

⁵² Stephen P. Jenkins, (1999). "INEQDECO: Stata module to calculate inequality indices with decomposition by subgroup," *Statistical Software Components S366002*, Boston College Department of Economics, revised 04 Sep 2006.

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Figure 1. Wives' share of Household Income by Men's quintile. United States

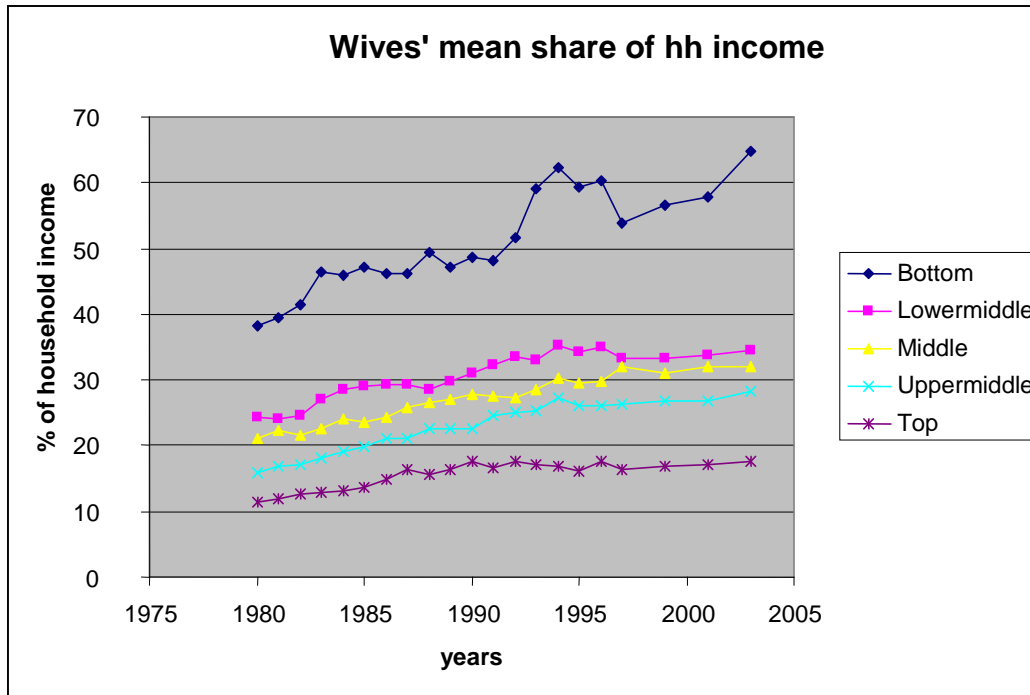


Figure 2. Wives' share of Household Income by Men's quintile. Germany

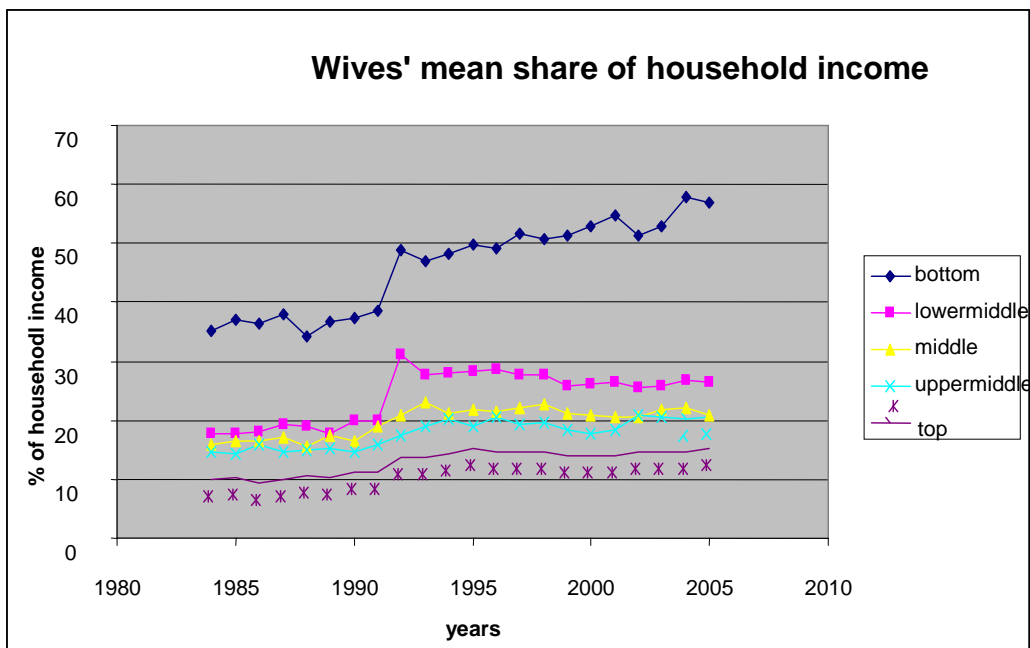


Figure 3. Correlation coefficients of couples' earnings and labour supply over time.

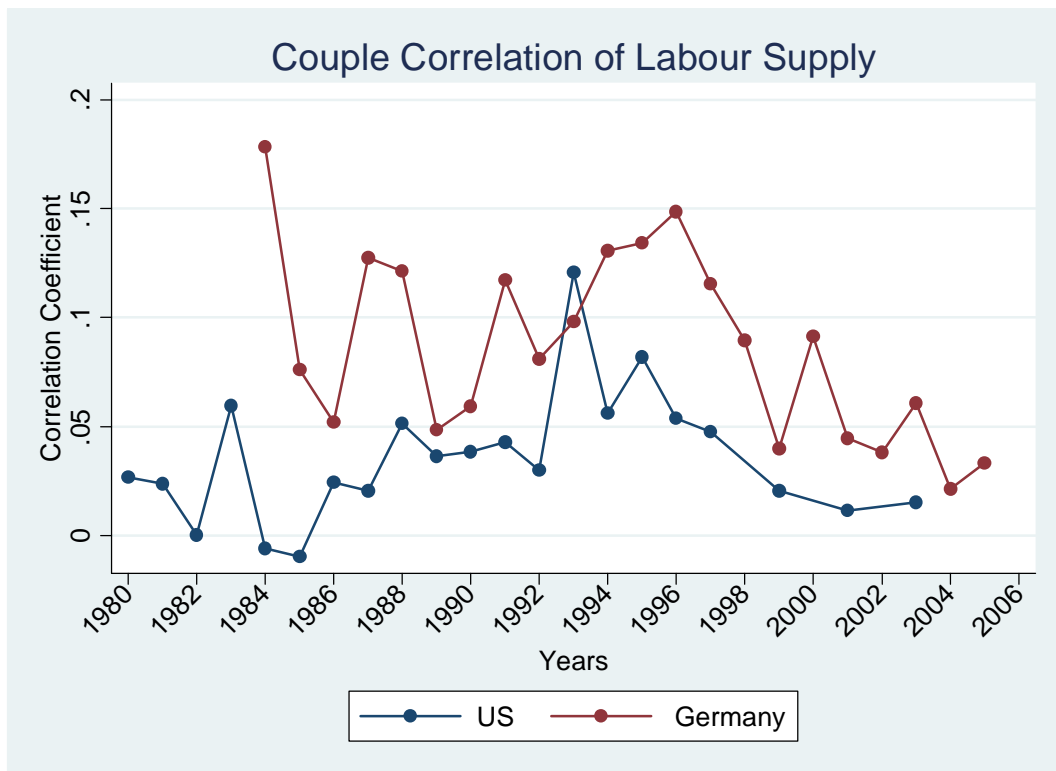
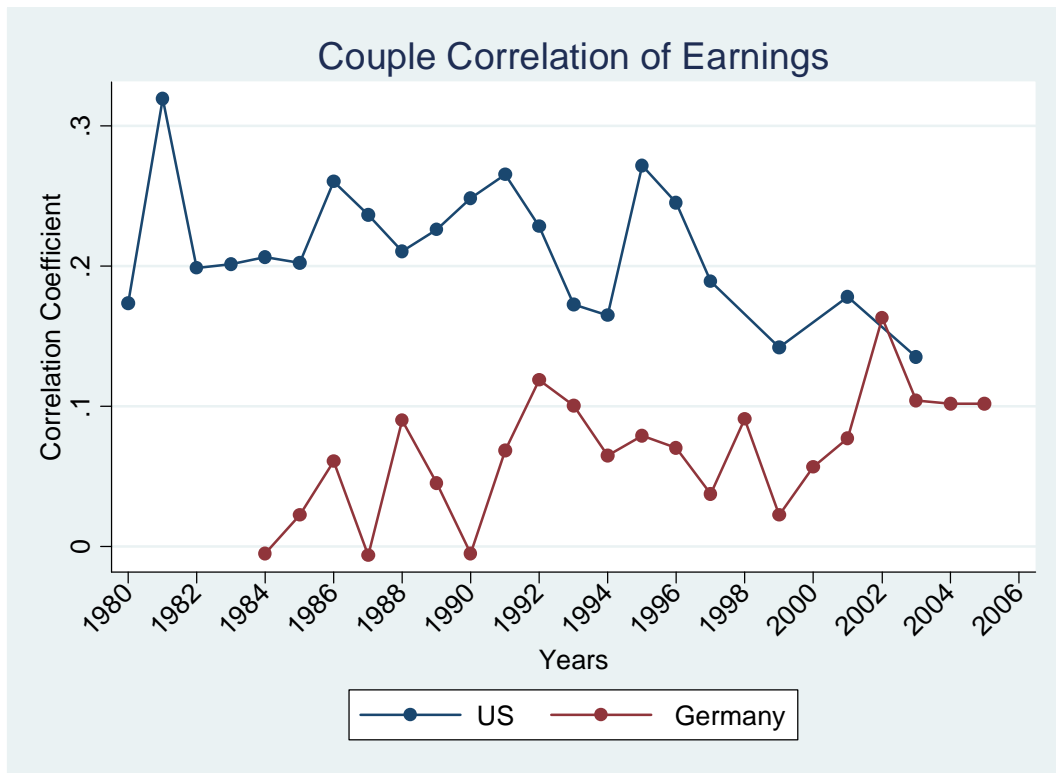


Figure 4. Marital Survival Rates. Germany

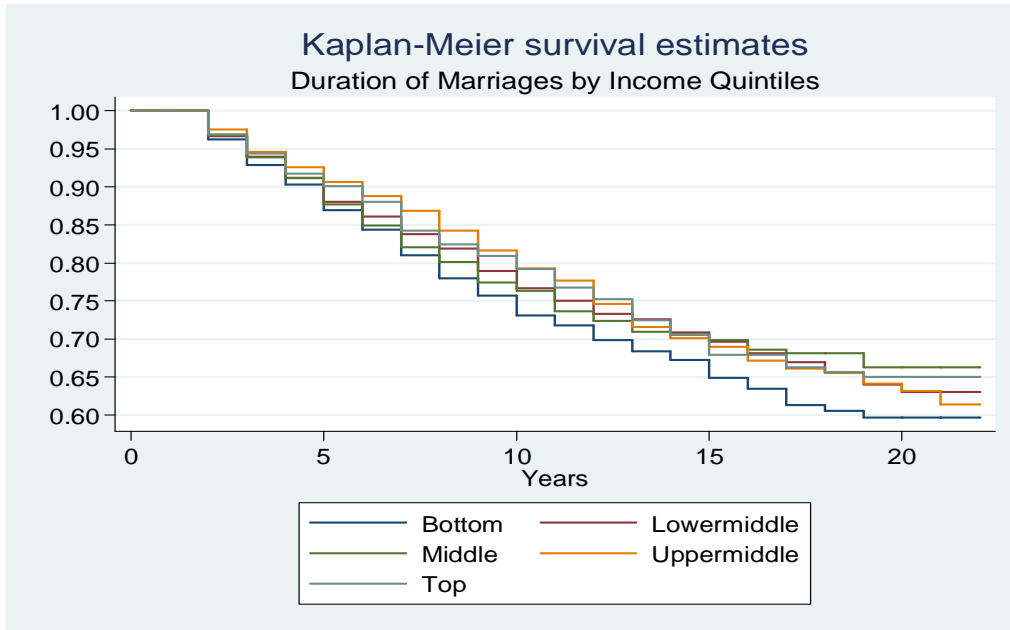


Figure 4. Marital Survival Rates. US

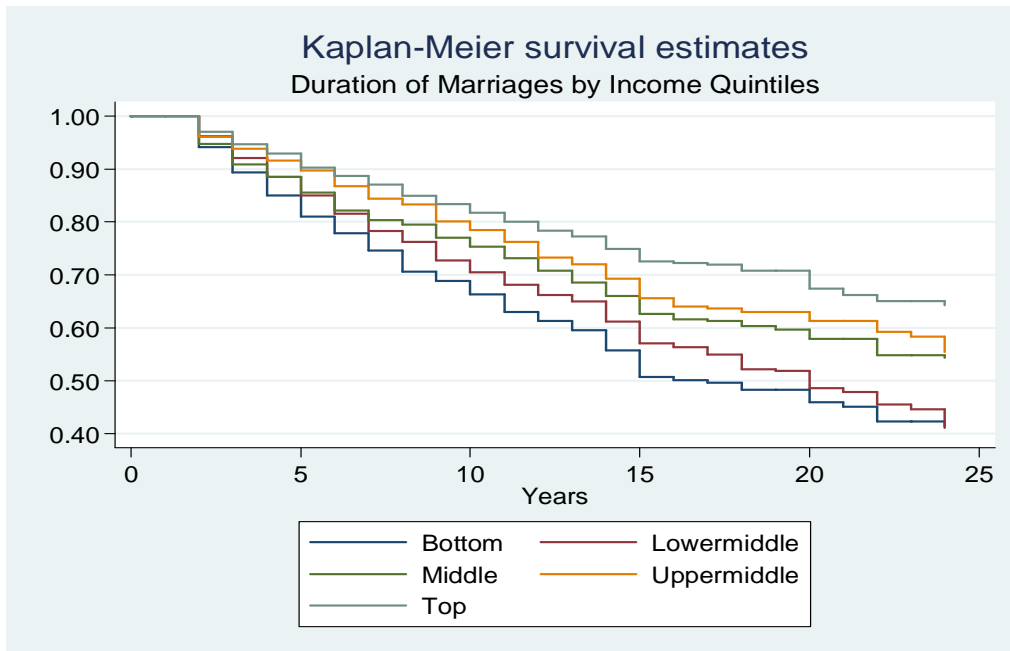


Figure 5. Hypogamy and homogamy in Germany

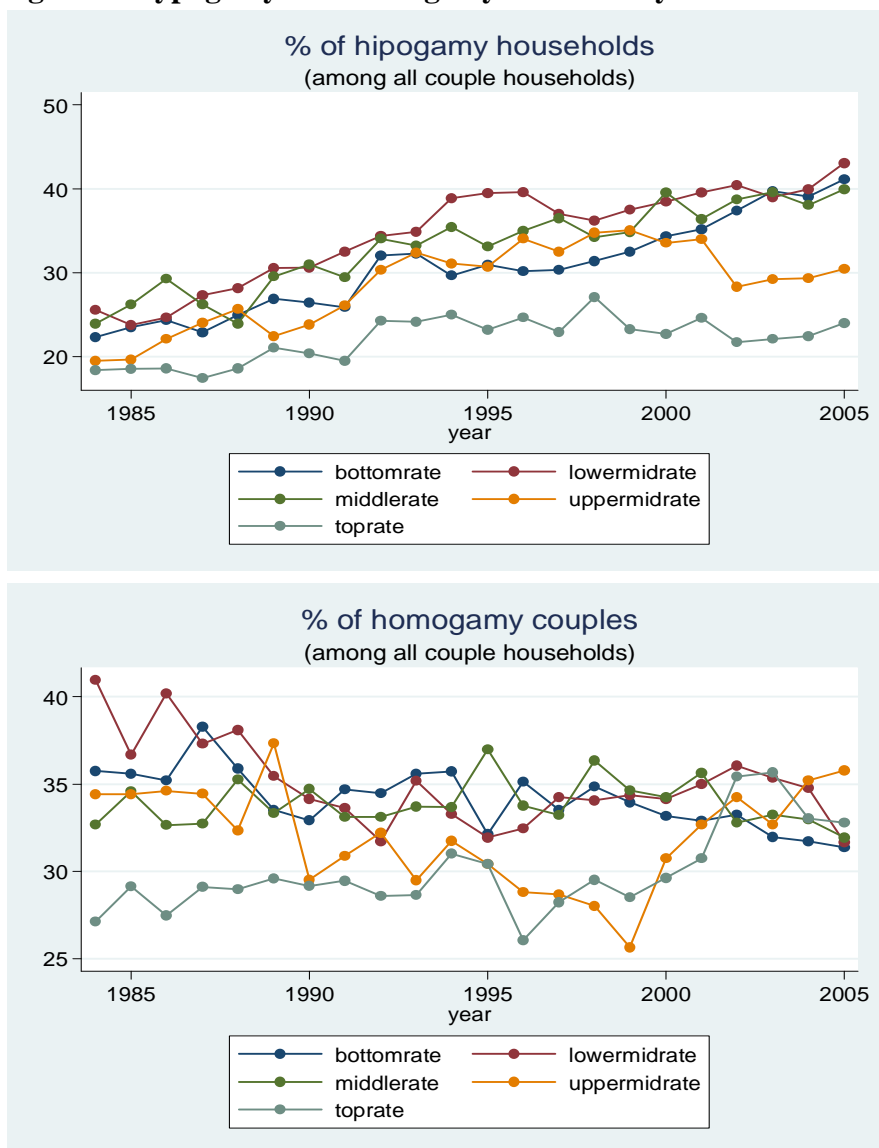


Figure 6. Hypogamy and Homogamy in the US.

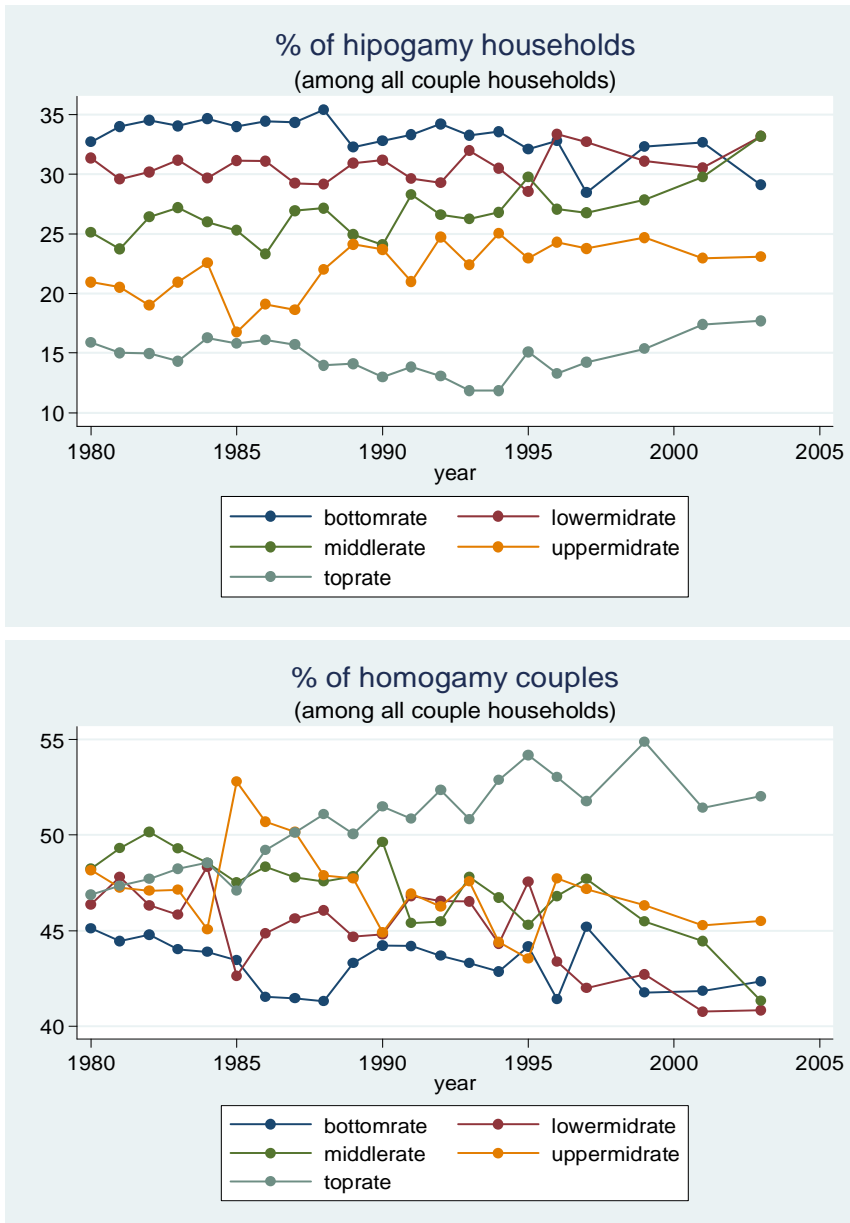


Figure 7. Percent Dual Earner Couples in Germany

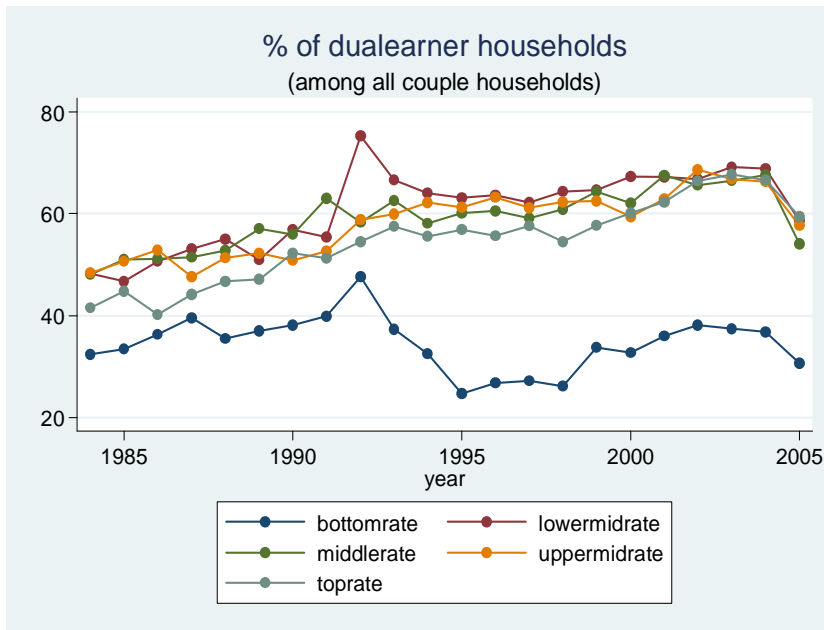


Figure 8. Percent Dual Earner Couples in the US

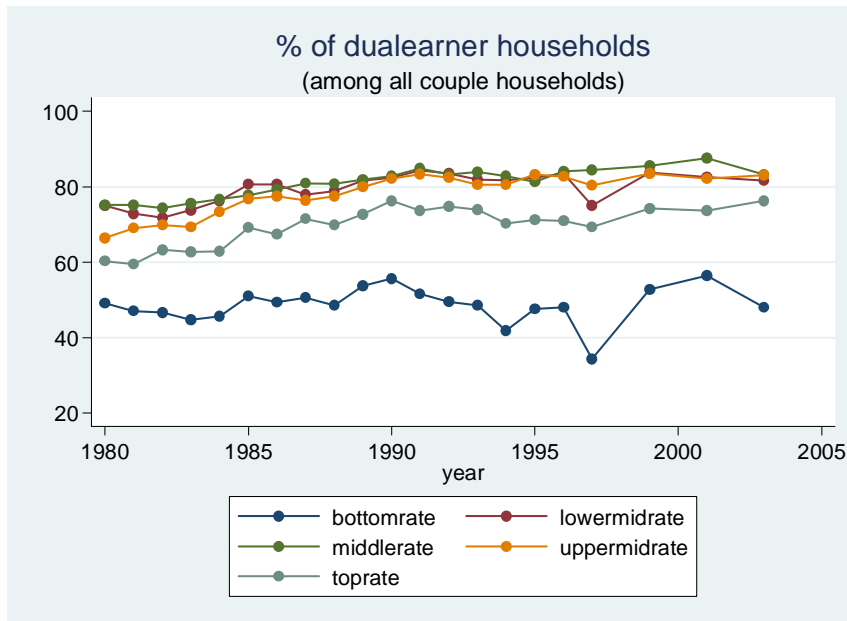


Figure 9. Incidence of Wife being part-time. Germany

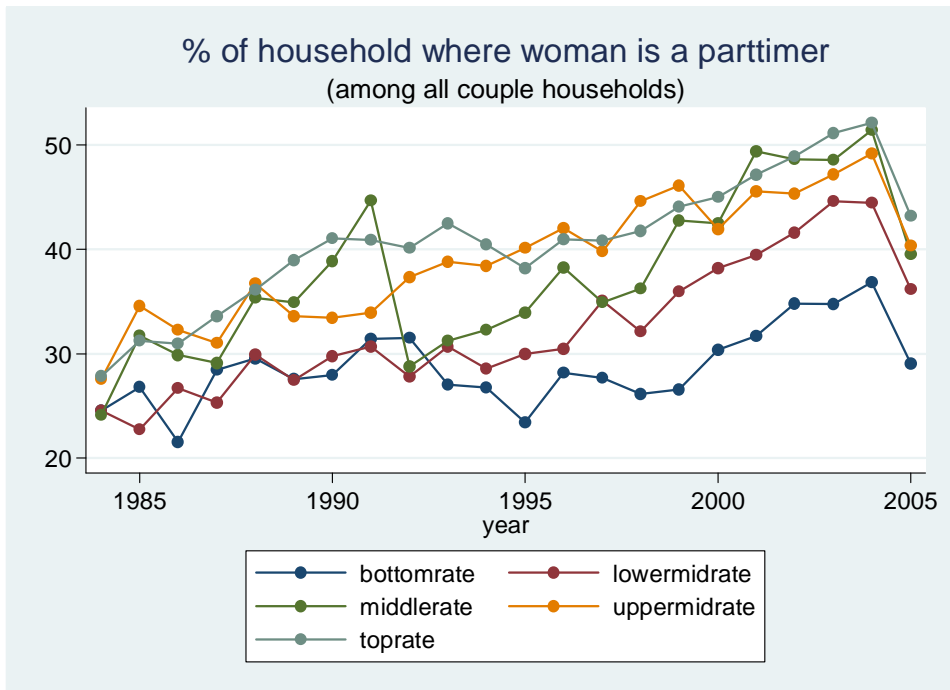


Figure 10. Incidence of Wife being part-time. US

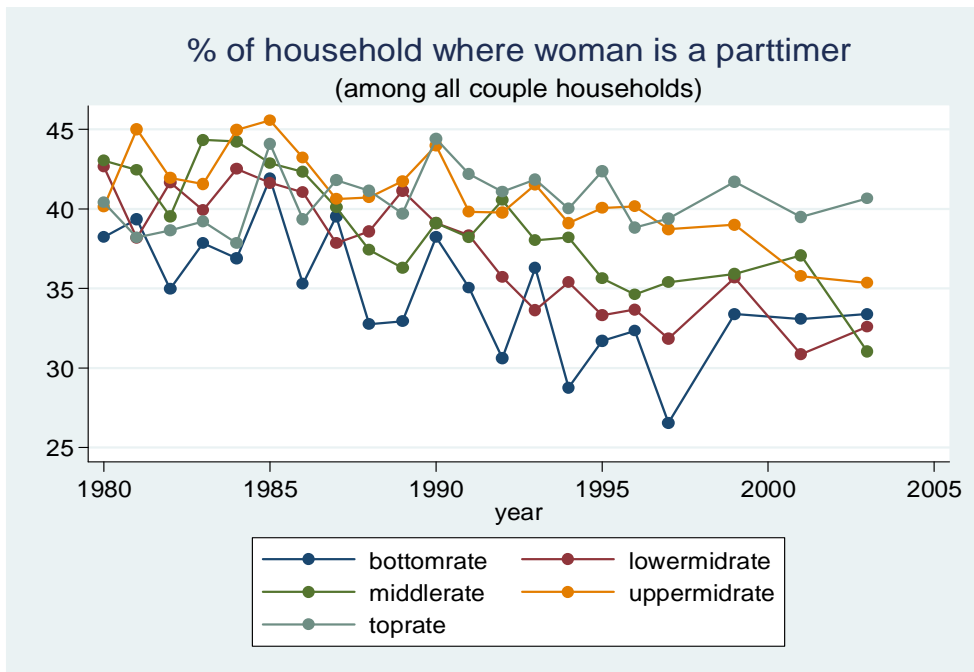
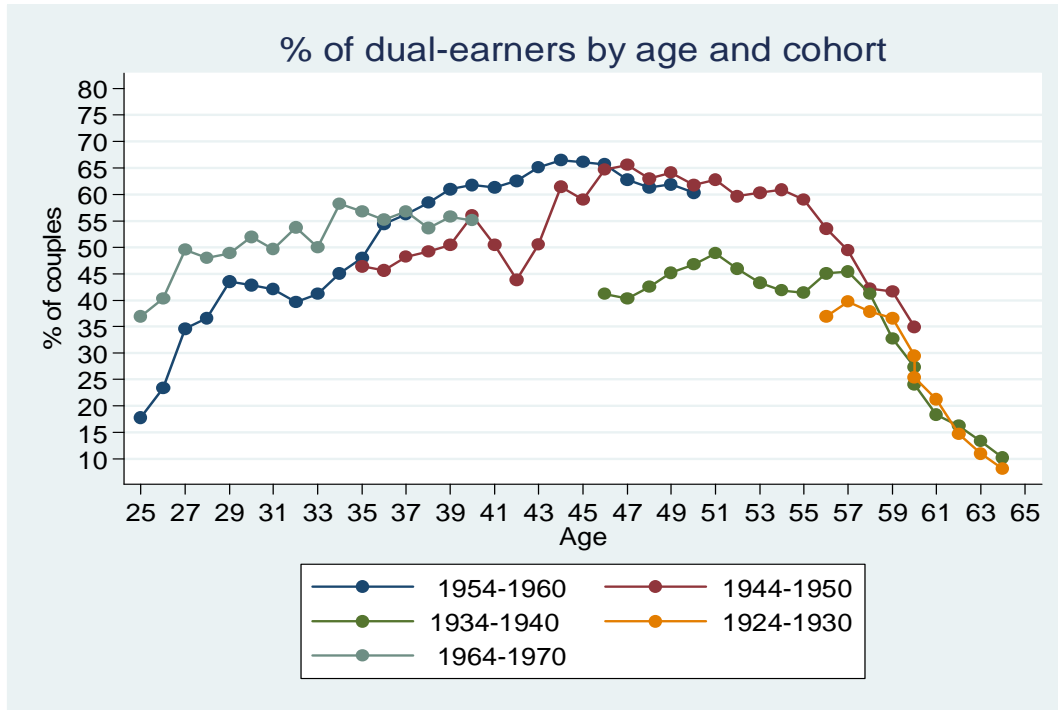


Figure 11 – Age -Cohort profiles of dual Earners in Germany and the US.

Germany



The United States

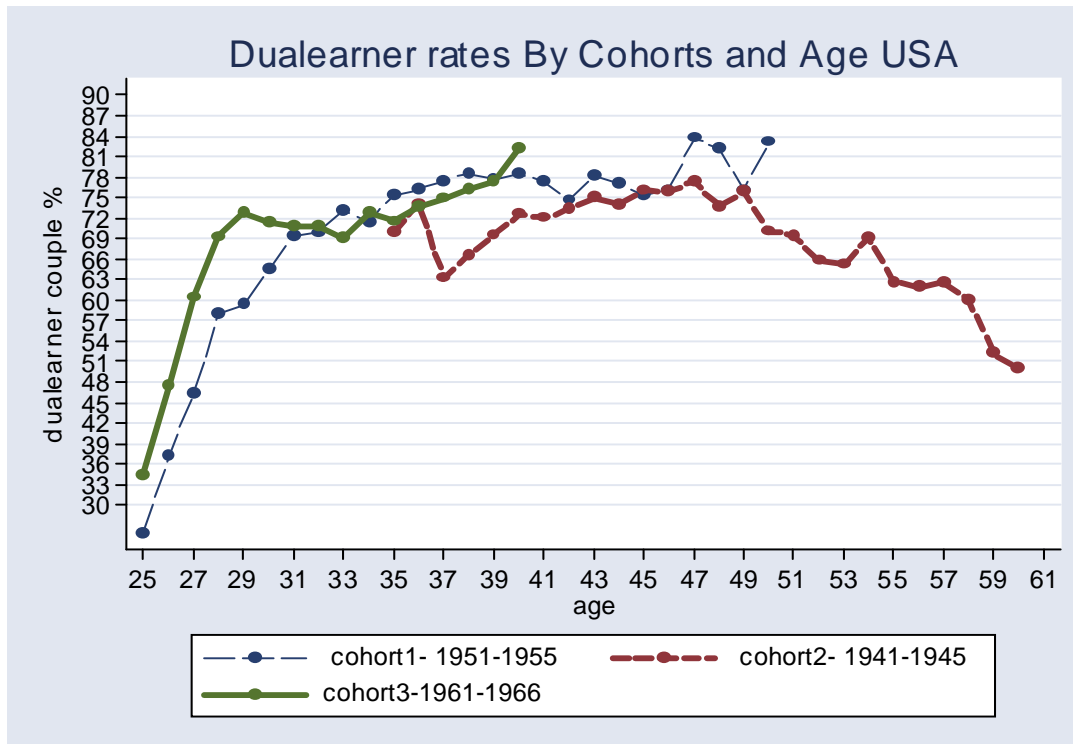


Figure 12. Evolution of Gini coefficient by age and cohort.

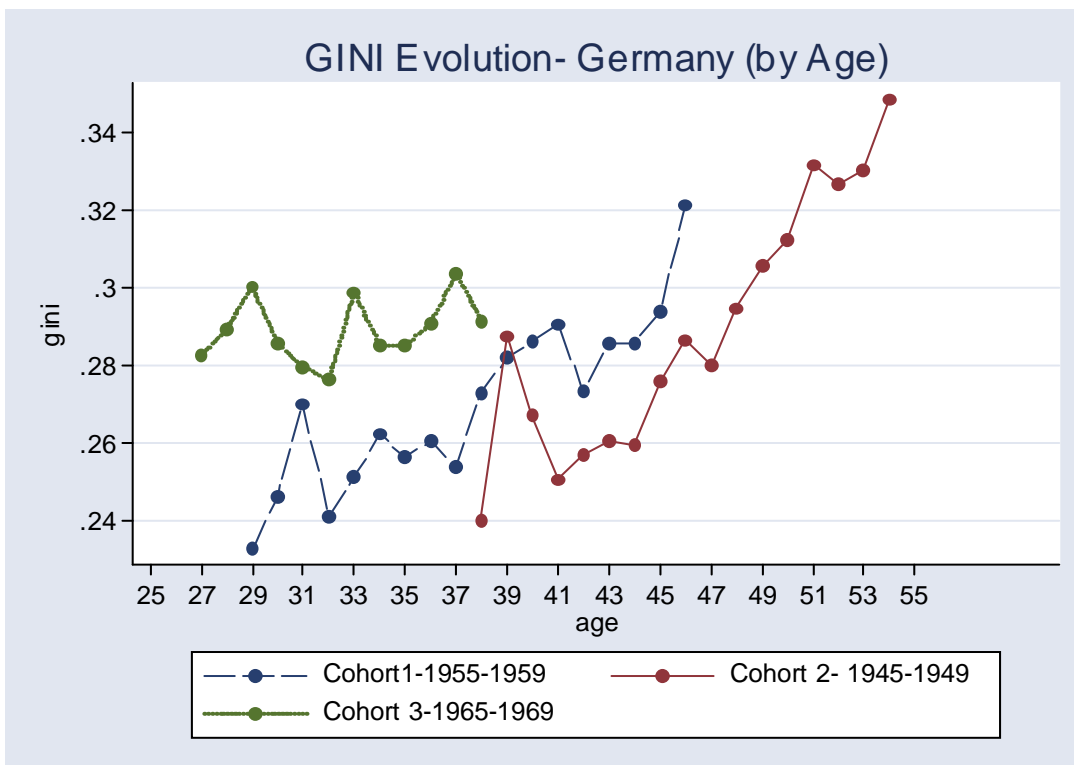
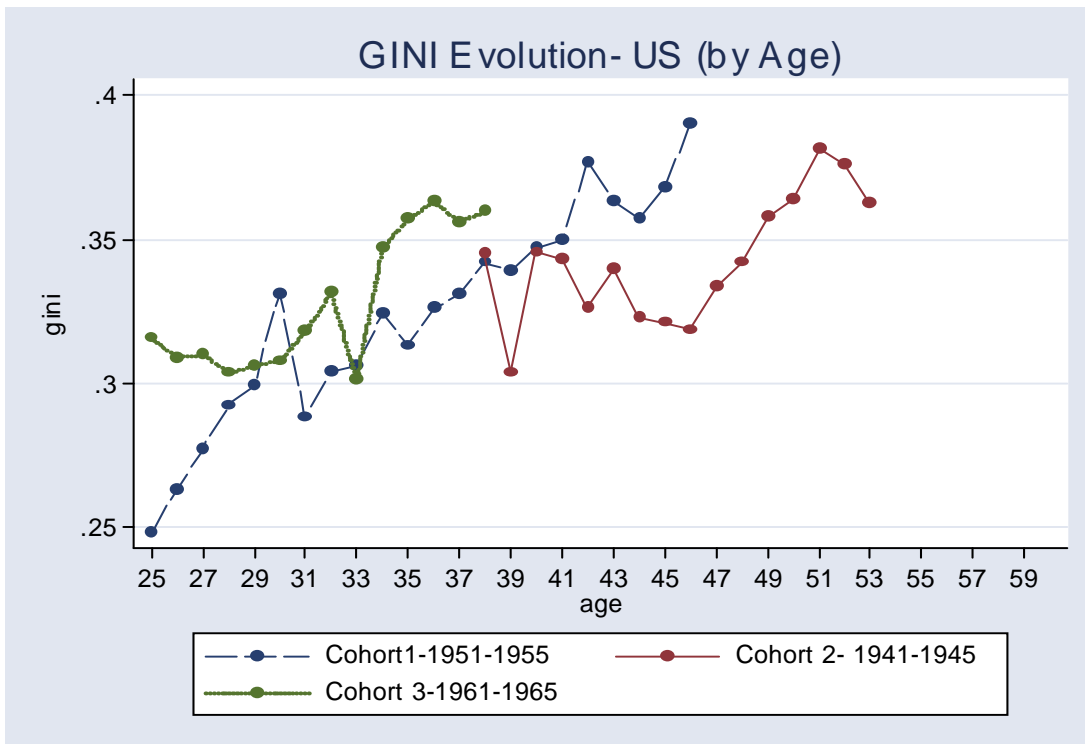


Table.1. Simulations for Couple Households. Counterfactual Labor Supply Scenarios for Germany and the US.

	United States					Germany				
	1980	2003 (unadj.)	2003 (adj.)	% Change	Diff.	1984	2005 (unadj.)	2005 (adj.)	% Change	Diff.
Initial GINI Coefficient	0,321	0,402	0,402	25,23%	0,00%	0,290	0,371	0,370	27,93%	-0,27%
Holding Constant Labour Supply of Women in the 4th Quintile	0,321	0,402	0,400	25,23%	-0,50%	0,290	0,386	0,386	33,10%	0,00%
Holding Constant Labour Supply of Women in the Top (5 th) Quintile	0,321	0,372	0,378	15,89%	1,61%	0,290	0,351	0,351	21,03%	0,09%
Holding Constant Labour Supply of Women in the Bottom Quintile	0,321	0,401	0,396	24,92%	-1,35%	0,290	0,370	0,369	27,59%	-0,27%
Women in the Bottom Quintile Behave Like the Ones in the Top	0,370	0,391	0,389	5,68%	-0,41%	0,290	0,362	0,364	24,83%	0,55%
Women in the Bottom Quintile Behave Like the Ones in the 4 th	0,370	0,391	0,389	5,68%	-0,40%	0,290	0,361	0,364	24,48%	0,83%

Table 3. Decompositions of Inequality by type of household

		Germany		US	
		1984	2005	1980	2003
Inequality Overall	<i>GINI</i>	0.290	0.370	0.321	0,401
	<i>I₂</i>	0.194	0.284	0,189	0,943
Dual Earner		0,113	0.192	0.127	0.551
Male Breadwinner		0,217	0.24	0.248	0.653
Other households (1)		0,356	0.458	0.831	0.956
<u>Population Share</u>					
Dual Earner		41,0%	46,1%	64,9%	74,1%
Male breadwinner		39,2%	24,5%	29,1%	16,5%
Other households		19,6%	29,3%	5,8%	9,2%
<u>Income Share</u>					
Dual-earner		49,6%	58,6%	71,7%	80,7%
Male breadwinner		35,9%	22,1%	27,0%	16,3%
Other household		14,4%	19,2%	1,1%	2,9%
Within group Inequality		0.177	0.249	0.165	0.919
As % of total I₂		91	88	87	97
Between group Inequality		0.017	0.035	0.023	0.024
As % of total I₂		9	12	13	3

1) Includes households with female breadwinner and households with no earners