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**A U.S. Analysis of the
Macro- and Micro-Economics of Family Formation:
Marrying in the Great Recession and Prior Post-Industrial Recessions**

Conference Paper

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Disclaimer: This study is to inform interested parties of research and to encourage discussion. The views expressed, and any errors, are those of the author only.

Working Abstract: With restricted-use data from the U.S. Census Bureau, I conduct an analysis of the macro- and micro-economic determinants of marrying. Based on observations across a broad segment of calendar years (from 1978 to 2010), I examine the measures of the national unemployment rate for males, national recession indicators, and micro-level proxies for earning power. The analysis focuses on comparing the marrying patterns of the non-recession years of the 2000s to the distinct U.S. recession periods of the adjacent Great Recession (2008-09), the adjacent early 2000s recession (2001-2003), and the earliest observed recession period, the 1980s (1980-82). The data include time-constant demographic variables and marital, fertility, education, and earnings life histories merged from the SIPP survey and federal administrative sources.

Using ordinary logit modeling with weighted specifications, I perform regression analyses based on constructed event history data for separate models of men and women. Among both college-educated men and women, I find a marrying advantage in each period but the relation is not increasingly positive in each subsequent recession. Among college-educated women, earnings emerge as having a positive effect on marrying but the effect is not consistently positive in the subsequent recessions. Regarding college educated men, earnings are consistently observed to have a positive effect on marrying in each recession and non-recession period.

Keywords: Household economics, marriage, recession, education, earnings, earning power.

Section I. Introduction and Background

In the U.S., there has been a decline in the prevalence of marriage and an increase in the proportion of dual earner households since the mid-20th century. Over this same period, there have been deep shocks in the business cycle and structural changes affecting the historically gendered structure of the labor market (as indicated by the trend toward gender convergence in earning power). While there is much scholarly attention on how these profound shifts in the macro-economy have affected the labor market and economic status of males disproportionately, such economic changes have also presented serious challenges in new and more complex ways to families and the large segment of female workers who now act as co-heads/heads of the household.

The remarkable reorganization of the U.S. labor market and family patterns in the post-industrial era has important socio-economic implications. The interplay between work and marriage deeply affects individuals' well-being, children's outcomes, gender relations, community structure, and macro-level issues (such as federal programs, expenditures, and revenues). In this gender comparative study of the economic basis of marrying, I analyze patterns of ever marrying (entry into first marriage) across the recession and non-recession years from 1978 to 2010, which covers the Great Recession and prior three U.S. recession periods.

I provide an analysis of the relation between marrying and indicators for each specific recession (and interim non-recession period) to observe contextual period effects on marrying. Further, I analyze these effects interacted with micro-level earning power to examine whether these periods—each with distinct macro-economic conditions—have effects on the micro-economic determinants of marrying. The observation period covers

The Macro-and Micro-Economics of Family Formation

pivotal transitions in the structure of the labor market and business cycle. My focus is in examining whether there are non-linear time effects of period-specific structural shifts. I control for the national unemployment rate among males, an underlying historical (linear) time trend and personal time (age).

I consider not only that the U.S. has transitioned to a regime of more gender-equal levels of earning power and labor force participation, but also that the nation has simultaneously experienced profound male-specific as well as gender-shared economic shocks. Research on the apparent decline in marrying being concurrent to women's mass entry into the labor often takes on only one source of gendered economic change (male-specific or female-specific). In this study, I explore the interaction between gender-shared and gender-specific economic shifts.

Taking the most recent non-recession period in the data as the baseline reference (the years 2004-2007 and 2010), I make a comparison between the pattern of marrying in this period to the non-recession period at the start of the observation period (1983-1989) and the adjacent recession periods of the Great Recession (2008-2009) and the early 2000s recession (2001-2003). I then examine the changes in the relation between earning power and marrying across these periods. Examining such qualitative short-term shifts can inform our understanding of recession and period effects on recent marrying patterns thereby revealing how the economic determinants of marrying may be changing in the contemporary gender regime of the post-industrial economy.

I first analyze recession-specific period effects as an important research step that can guide future research in further disentangling indicators for general economic insecurity (e.g. stock or housing market indices). With changes in production no longer

directly linked to changes in employment, recession periods can serve as important proxies for the general context of shared economic insecurity which conventional indicators (e.g. the national unemployment rate) may not fully capture.

In the modern era of more gender-equal earning power, the benefits of the dual earner household can make entry into marriage especially more attractive (and viable) given the instability of the macro-economy. The increased security dimension of the dual earner model might be particularly appealing to someone who has experienced economic set-backs due to job loss or underemployment (as would be more likely experienced during a weak labor market). Underlying the testing of whether a recession period may affect the outcome of ever marrying, I theorize that the context of a recession may induce a generalized sense of economic insecurity irrespective of an actually experienced job loss or other personally experienced losses (I cannot test individual employment status directly because the appropriate variables are not available in the data).

Per Groshen and Potter (2003), the structural component of total employment across recessions has increased from 51 percent during the early 1980s to 79 percent in the early 21st century. The U.S. has experienced “jobless” recoveries from economic downturns since the 1990s with permanent job losses in sectors of the economy (Gordon & Baily 1993; Groshen & Potter 2003; Bernanke 2009; and Berger 2012). Further, there have been multiple sources of deep economic shocks with concurrent crises in the housing market, banking, and finance.¹ The foregoing motivates the first part of my research question: does the increasing severity of the structural component of economic

¹ For example, the effects of the Great Recession are often characterized as being particularly profound not only due to prolonged unemployment but due to the recession being simultaneous to deep housing market, banking, and financial crises (Gascon 2009).

downturns in the U.S. result in an increasingly negative or positive relation between recession period and marrying at the macro-level?

At the micro-level, the focus of this study is to examine whether the relation between women's earning power and marrying emerges as increasingly positive across the recession periods. The observed 1978-2010 timeframe involves the transition to most women serving a wage earner role in the household across education levels (Fry and Cohn 2011). In the 1970s, there was a shift in American social attitudes away from the presumptive norm that (white, middle-class) women take on the traditional housewife role.² After the 1970s, there was broad public support and a widespread expectation that women (across class and race) work in the labor market irrespective of family status as a wife and/or mother (Cherlin 1980; Spitze and Huber 1980).

In the contemporary era, a woman serving as a wage worker is less in conflict and increasingly congruent with family considerations due to various sources of socio-historical change post-WWII. For example, with advances in household technologies and the mass production of many household goods and services, a mother/wife can work in the labor market to help finance and advance (rather than compete with) domestic production (Greenwood, Seshadri, and Yorukoglu 2005). Further, during this time, birth control technology and child care outside the home is normalized and generally accessible across income levels (Coelen et al., 1977; Hofferth and Phillips 1987). These broad scale changes facilitate women's role as one that includes—for most—serving as a wage worker irrespective of parental or marital status.

² Per Juhn and Potter (2006), this shift was primarily driven by new patterns among whites since many non-white mothers and wives were already working outside their own home prior to the 1970s.

The Macro-and Micro-Economics of Family Formation

Indeed, there has been a notable increase in the prevalence of the dual earner household model with women's economic advances. The rate has doubled since the mid-20th century to about six-in-ten married women now working in the labor market to earn income for the family (Fry and Cohn 2011). Given the transition to most married households now having a female wage earner and many wives now having equal or higher earning power than the husband (Fry and Cohn 2011), it is important to more deeply examine how the modern gains to marrying may be based on the advantages of the dual earner household and women's earning power.

With the apparently persistent negative impacts of recurrent macro-economic downturns, it may be expected that both men and women would adjust to the experience and observation of the increasingly apparent insecurities of the male and/or sole breadwinner model. I test whether in the U.S. there has been an adjustment to such economic uncertainty whereas, on balance, individuals increasingly marry more so based on the gains of the dual earner model (Oppenheimer 1988, 1997) than the specialization model of household structure (Becker 1973, 1974, 1981) with each successive recession. Given women's mass entry into the labor market and a trend toward more gender-equal earning power, there is growing potential for a woman to increase and make more secure household consumption as a second earner in the household. Thus, I expect to observe in this study that a woman's earning power should have an increasingly positive relation to marrying across the observation period.

This study joins emerging empirical research that investigates the hypothesis that in the contemporary era women's earning power has a positive relation to marrying based on the gains to the dual earner model of household structure (Goldstein and Kenney

2001; Sweeney 2002; and Torr 2011). I would argue that despite the apparent trend that marrying rates have declined with women's economic advances at the macro-level, it is possible that multivariate and multi-level analyses reveal that the relation between women's earning power and marrying is positive at the micro-level. If so, then it would be important to examine alternate variables to account for the observed macro-level decline in marrying.

Based on the available data, I analyze individual earning power (via the proxies of education level and earnings), distinct recession/non-recession periods, and interactions between the two as indicators of the modern macro- and micro-economic determinants of marrying. I theorize about whether the observed patterns more so support the modern perspective of household economics that contemporary marriage is increasingly a strategy pursued based on the gains to pooling resources and the social insurance of the dual earner model versus the specialization perspective that marriage is a strategy pursued based on the gains to establishing an exchange between a specialized wage worker and a specialized domestic worker in the household (traditionally, the male breadwinner/housewife model).

Section III. Theoretical Considerations

Household Economics

Prior marriage literature includes an extended study of not only the relation between marriage and the state of the macro-economy but also between marriage and individual-level economic status (Ogburn & Thomas 1922; Sander 1992; Mather &

Lavery 2010; Kondo 2012; and Schaller 2013). The body of existing empirical studies using cross-sectional and time series data finds marriage to be pro-cyclical and positively related to earning power (Ogburn & Thomas 1922; Stouffer & Spencer 1936; and Kirk 1960). Schaller (2012) finds the negative effect of unemployment on marriage to be permanent and increasing over time.

Theoretically, there is generally a consensus about the mechanisms underlying these well-known findings as they relate to the relation between economic prospects and marrying. Economic and social theorists traditionally explain that a strong labor market and higher economic status at an individual level raise the quality of a match, make more affordable the costs of marrying, and increase the economic gains to marrying. The argument is that there is a higher probability of marrying and more relationship stability with better economic times. However, initially the focus of this literature was on the positive relation between marrying and economic factors as they relate to a male's economic prospects being a condition of his desire, readiness, and likelihood of marrying.

Historically, the conventional American household of the industrial era was understood to be based on the (now) traditional model of the male as the head of the household and the sole breadwinner (i.e. wage-earner). The normative role for the female was to be the housewife producer of non-market goods and services (Parsons 1949; Ryan 2006). Per Parsons (1949),

“...the dominant mature feminine role is that of housewife or of wife and mother. Apart from the extremely important utilitarian problems of how adequate care of household and children are to be accomplished, the most important aspect of this fact is that it shields spouses from competition with each other in the occupational sphere, which along with attractiveness to women, is above all the most important single focus of feelings of self-respect on the part of American men” (p. 193).

The Macro-and Micro-Economics of Family Formation

Economic literature on household specialization, however, explicitly incorporates a model of the economic basis (rather than a social or normative basis) of the relation between marrying and both women's as well as men's earning power.

Based on a economic approach to marriage, Becker (1973, 1974, 1981) theorizes that men's earning power is positively related to marrying while women's earning power is negatively related to marrying because the gains to marrying are maximized under a sexual division of labor in marriage. Becker argues that the increasing returns to men and women investing time and accumulating human capital in one of the two domains of household production makes specialization most efficient. Given historically-based comparative advantages or endowments by gender, Becker argues the returns to specialization motivate individuals to marry in order to maintain a household where a wife specializes in non-market (non-wage) production in the home and a husband specializes in market production. Per this model, sharing the returns across each domain optimizes utility for each spouse.

Explaining the central (individual-level) motivation to marry, Becker argues that it is under a specialized division of labor that spouses can each reach a higher level of utility than the utility from remaining single. It then follows that, per this model, women's increasing earning power and labor force participation would result in a decline in the gains to marrying. Becker wrote:

“A growth in the earning power of women raises the labor force participation of married women by raising the foregone value of time spent at nonmarket activities. It also raises the relative costs of children and thereby reduces the demand for children. . . . The gain from marriage is reduced by a rise in the earnings and labor force participation of women and by a fall in fertility because a sexual division of labor becomes less advantageous” (1981, pp. 245–247, 248).

This framework is often used to explain the apparent decline in U.S. marriage rates as women have achieved higher earning power and entered the labor market en masse since the mid-20th century.

As a contrastive perspective, Oppenheimer, Kalmijn, and Lim (1997) argue that the scholarly attention on marriage trends should be focused on understanding the effects of men’s increasing economic precariousness and delayed career entry rather than changes in women’s work as explaining delays—not declines—in family formation. Since the mid-twentieth century, men have faced high peaks of unemployment, considerable underemployment, less earnings mobility, and—as compared to women—disproportionately unfavorable labor market changes due to economic restructuring (Gerson 1993; Kimmer 1998; Elsby et al 2008, 2010; and Hoynes et al. 2012). Further, since the start of the observation period of this study (1978), there has been a sharp polarization in earnings among men with a declining real value of average wages for men with less than a college degree (Katz & Autor 1998; Kopczuk, Saez, & Song 2010; and Bureau of Labor Statistics 2012).

Some scholars that analyze work patterns in the U.S. over time point to a decline in the traditional standard of a full-time, secure job, which they argue is now weaker due to lower job tenure and more flexible work arrangements (Farber 1999; Autor 2003; and Reid & Rubin 2003). Others, however, question the persistence and/or perniciousness of

The Macro-and Micro-Economics of Family Formation

any such changes in the structure of the U.S. employment relation. This school of research tends to highlight the voluntary nature of increased job mobility and employment flexibility in the U.S. (Farber 2010). Firm-to-firm transitions and contingent, part-time, or temporary work have been found in some studies to be a mechanism of gaining more secure employment, job promotions and/or wage increases (Neumark 2000; Cappelli 2001; and Heinrich & Troske 2007).³

As a departure from the literature on the changing employment relation as a cause for the decline in marriage, I focus on the state of the macro-economy and add to the emerging studies on the effects of the recent Great Recession on marrying behavior. Yet the analysis extends beyond prior studies that have generally found a negative or insignificant relation between the Great Recession and family formation (Cohn 2010 and Mather & Lavery 2010). I add to the existing literature by providing a gender comparative study that includes multi-level economic factors based on a large sample over an extended time period that covers important shifts in the socio-economic context of marrying in the U.S.

The Historical Shift in the Socio-economic Context of Marrying in the U.S.

This analysis starts with the recessions of the 1980s because the data is available starting in 1978. However, this is an appropriate period to study because it covers the era after which American women had entered the labor market “en masse,” irrespective of family status (Oppenheimer 1982 and Bureau of Labor Statistics 2008). The observed

³ Farber (2009) argues that the job tenure literature should better incorporate a gendered analysis. Hollister and Smith (2013) find that the increasing job continuity among married women and mothers has countered and, in some periods, overwhelmed the underlying negative trend in employment stability among men and never-married women.

The Macro-and Micro-Economics of Family Formation

timeframe involves a much more gender egalitarian U.S. regime of work and family—a period when for the first time in history the typical American married household is based on the dual earner model. Most mothers and most wives were working in the labor market across the three largest U.S. ethno-racial groups of whites, blacks, and Latinos by 1978 (Hayghe 1981).

Amidst the more gender egalitarian norms and arrangements of work and family, each post-industrial U.S. recession has unique contextual factors. The early 1980s (1980-1982) recession period involved a double-dip recession that included the 1980 recession and the 1981-82 recession. The first recession dip was marked by a decline in consumer credit and personal consumption while the second recession dip involved some banking panics and, subsequently, the infamous Savings and Loan crisis (Bordo and Haubrich 2012).

The early 1990s recession (1990-1991) was the first post-industrial recession dubbed a “jobless recovery” (Groshen and Potter 2003). This was accompanied by a credit crunch and a minor housing bust. Yet, after less than two years, the 1991-92 recovery had strong employment growth and the early 1990s recession was followed by the longest economic expansion of the late-20th century (Bordo and Haubrich 2010). In addition, the 1990s is a notable time period for gendered changes in work and family because it was the context of a dramatic and publically contentious welfare reform campaign, which resulted in welfare-to-work mandates to compel non-self-sufficient women with children into the labor market and an end of public assistance to children and families as a grant entitlement (Bane 1994; Loprest et al. 2000).

The early 2000s recession (2001-2003) was a more moderate economic downturn and, following the “tech boom,” the dip was initially accompanied by a somewhat tight labor market (Bordo and Haubrich 2012). Still the recession at the turn of the century was notable in the predominance of permanent job losses over temporary layoffs. Most recovery jobs were due to new jobs in different firms and industries rather than rehires. Economists point to this recovery as representing the emergent pattern of permanent restructuring in production as a result of economic shocks (Groshen and Potter 2003).

Fortin (2009) finds that, after accounting for life-cycle and cohort effects, full-time labor force participation since the 1980s peaked and then started a slight decline in the 2000s. She finds the decline to be sharper for women than for men—a finding that Fortin conjectures may imply an increase of women “opting out” of the labor force in the first decade of the new century.⁴ However, this was the first post-welfare reform recession and a recession subsequent to the dot com bubble. Given the likely gender-uneven effects of the tech “bust” and any effects specific to the new welfare context, I would argue that additional research is necessary to understand the gendered relations between changes in labor force participation across the income distribution during this time.

Proceeding to the Great Recession (2008-2009), the steep fall in home prices and rise in home foreclosures were unique in magnitude (Gascon 2009). Per Bordo and Haubrich (2012), the most recent economic downturn was the only post-WWII recession accompanied by the trifecta of a banking crisis, stock market crash, and housing bust.

⁴ It is important to note that Fortin (2009) and Blau, Ferber, and Winkler (2006) argue that women’s labor force participation is in recent times only slightly and increasing less so driven by husband’s actual income or employment prospects. Other extensions of my research (upon access to appropriate data) would be to test whether women’s marrying behavior is increasingly based on the national unemployment rate of women and women’s own employment status during a recession.

The Macro-and Micro-Economics of Family Formation

Unusually sluggish, the recovery involved an increase in economic growth but with continued high unemployment and high home foreclosure rates (Roubini 2009). Job losses continued after the official NBER-determined end of the Great Recession in 2009 until February 2010 (Goodman, Christopher & Mance 2011).

This study will explore the empirical evidence for two competing hypotheses about the relation between recession period and marrying. The classical hypothesis is that recessions have the effect of reducing the economic readiness for and economic gains of marrying (due to lower earning power). As the counter perspective, however, Shore (2009) argues there may be an increase in familistic behavior during a recession. Following more modern economic theory on marriage, it is argued that pooling resources and risk via marriage may have emerged as a coping strategy during the Great Recession. If so, the data may show that Americans are increasingly more likely to marry during the recession.

Alternatively, it may be that these two forces operate simultaneously. If so, then the effect of a recession may be ambiguous. That is, some may pursue marriage more so (as a strategy of social insurance) while others less so (due to lower economic prospects). If there is not an observed decline in marrying or if there is an increase in the likelihood of marrying during a recession, then I would argue that this at least suggests that the modern economic approach to marriage may balance or even drive more so the relation between recession period and marrying (this then would counter the classical hypothesis that there is a negative relation between recession period and marrying).

The Macro-and Micro-Economics of Family Formation

Modern Socio-economics of Marrying

In prior sociological research and in contrast to Becker, Valerie Oppenheimer (1988, 1997) theorizes that women's transition from specializing in homemaking to contributing as an earner in the household makes the marital union more appealing for both women and men. She argues that once women enter the labor market en masse the effect of women's earning power on marrying patterns should be positive. With this model, both spouses engaging in market (wage-based) work garners the central and greatest benefits to marrying—this is the basis of the comparatively higher gains of entering a dual earner marriage compared to the alternatives of staying single or, even, of establishing a sole breadwinner (married) household (Oppenheimer 1997).

Here, the essential economic advantages to marrying are achieved via the economies of scale from joining households and the increased consumption, saving, and investment made possible for each spouse via resource pooling. Oppenheimer highlights that an important gain to marrying is achieved by the increase in security that is obtained by having two rather than just one wage earner in the household.⁵ Per Oppenheimer, the dual earner model should become the predominant form of household structure because it provides less risk and more stability compared to the specialized model of household production. The strength of this theory is bolstered by the growth and now preponderance of the dual earner family structure. According to the Pew Research Center, 59 percent of married adults without a college degree and 67 percent of married adults with a college degree were in a dual earner household in 2009 (Fry and Cohn 2011).

⁵ More recent literature by economists has advanced the theory pioneered by Oppenheimer (a sociologist) on the gains to the modern dual earner household as a basis of the central economic gains to marriage (Weiss 1997; Moffitt 2000; Hess 2004; Stevenson and Wolfers 2007; and Shore 2009). Thus, I refer to this theoretical framework as the “modern” economic theory of marriage in contrast to Becker's well-known economic theory of marriage.

However, the rise of cohabitation may indicate that some of the benefits of the dual earner married household are achieved outside of marriage. Further, the decline in social stigma for this living arrangement may have resulted in lesser disadvantages for remaining single. I would argue though that the formal and relatively more durable relation of marriage is a more secure arrangement. Marrying can protect the long-term return on pooling investments more so than less stable informal relationships, including cohabitation. Thus, I conceptualize marriage to be distinct from cohabitation despite that cohabitation can mimic some of the same array of economic benefits as marrying (on a more temporary and less secure basis).⁶

Though there is emerging theory and growing empirical evidence about the positive relation between women's earning power and marrying (Goldstein and Kenney 2001; Sweeney 2002; and Torr 2011), Becker's alternative theory that focuses on the decline in marrying at the macro-level being contemporaneous (and due) to woman's rising earning power is still influential. The inverse association between women's economic advancements and the aggregate U.S. trend in marriage prevalence since the mid-twentieth century is congruent with the logic of household specialization theory. Yet because the theory is based on individual level motivation and behavior it is important to examine how the theory performs at the micro-level.

I endeavor to advance the understanding of the macro-micro link of the economics of family formation. I explore the macro- and micro-economic determinants of marrying across increasingly structural economic downturns in the U.S., which occurred amidst women's increasing earning power. Per prior research, I expect to find a

⁶ Unfortunately, I am not able to address cohabitation in the analysis due to limitations of the data.

The Macro-and Micro-Economics of Family Formation

linear time (calendar year) trend of declining entry into marriage, a quadratic age effect of entry into marriage increasing and then decreasing over the life cycle, and a negative linear relation between the national unemployment rate of males and the probability of marriage. Here, the national unemployment rate among males speaks to the theory that changes in the decline in marrying are driven by shifts in male employment.

My focus is on capturing the distinct contextual effects of each recession/non-recession period. I am interested in looking at the generalized context and social marker of the recession period as an indicator that may relate to specific ways in how individuals may respond to weak macro-economic conditions in particular periods. I use distinct recession periods as not only being recognized markers of downturns in production but also as generalized indicators of the broader economic changes during each recession, such as the market conditions across banking, finance, and housing.

As a new contribution to the literature, the focus of my research is on testing the hypothesis that as the structural component of the downturn in the business cycle becomes more dominant and concurrent contextual shocks become stronger the effect of a recession on marrying might become more salient. I test whether the direction of this change might be negative or, alternatively, emerge as positive given the potential of marriage to act as a form of social insurance. Secondly, I test the proposed hypothesis that women's earning power should become increasingly positive in relation to marrying during each consecutive recession (as women have entered the labor market en masse). I operationalize earning power with proxies for education level and earnings.

I focus on individuals of the ages 15 to 35 in order to observe the decision to marry from the initial life stage of adolescence when individuals begin to marry (legally

and by custom) and across the transition from being a youth to adulthood. Further, the period and age range examined herein are important because it is during the Great Recession that for the first time there were more U.S. adults aged 25 to 35 that were never married than ever married (Mather & Lavery 2010).

Section IV. Data

The dataset for the analysis is based on merged data from the Census Bureau's Survey of Income and Program Participation (SIPP) survey and confidential lifetime earnings data from the Social Security Administration (SSA). The public-use version of this data is the SIPP Synthetic Beta (SSB) data product.⁷ The restricted-use data I use in this study is the SIPP Gold Standard File (GSF), Version 6.0. These data are produced as a project of the U.S. Census Bureau in collaboration with the SSA and the IRS.

The merge of the survey and administrative data is based on protected identification keys (PIKs). These are anonymous person-level identification numbers assigned by the U.S. Census Bureau's Person Validation System (PVS) using person-level data such as a verified social security number and date of birth. The survey data and sample persons included are from the 1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, and 2008 SIPP panels. Because this is a study that focuses on period effects and includes the recent Great Recession (controlling for age), at each age I observe the full range of calendar years (1978 to 2010) but not the full range of birth cohorts (1943 to 1995).⁸

⁷ The U.S. Census Bureau uses a synthetic data procedure based on Rubin (1987) to make this data publicly available.

⁸ Since a person may be observed for only a partial segment of the age range, the data is unbalanced at the person level (each person has a different number of person-year observations). However, the event history data structure accommodates right censoring and only persons that have never married prior to observation or at first observation are observed (i.e. left censoring is addressed using each person's available marital life history).

The marital, education, women's fertility, and earnings data is collected across a person's life history. The data on gender, race, marriage, education, and women's fertility are from the SIPP. The SIPP life history data are mostly retrospective except for the years in which the respondent was in the SIPP panel. The unemployment rates data are from the Bureau of Labor Statistics (BLS) and the recession period indicators (by year) are guided by the official recession determinations made by the National Bureau of Economic Research (NBER).

Section V. Descriptive Statistics

For the analysis, I only include native-born whites, blacks, and Latinos because my theoretical framework is focused on the U.S. socio-economic context. Never married sample persons are observed from age 15 up to first marriage or up to age 35 if never observed to have married by the end of the analytic period (year 2010). Based on the constructed event history data structure, the large person-year level sample includes 932,567 person-year observations of women and 967,914 person-year observations of men (Tables 1 and 2).⁹

By race, 78.0 percent of these observations are among whites, 14.7 percent are among blacks, and 7.3 percent are among Latinos. In the distribution by highest educational level, 24.5 percent of these observations are among those with less than a high school degree, 23.9 percent are among those with high school degree, 28.9 percent are among those with some college, and 22.7 percent are among those with a bachelor's degree or higher.

⁹ The case and full series of person-records for any respondent who died during the 15 to 35 age range of analytic observation were dropped prior to the analysis.

At the person level, the sample includes 266,482 persons of which 137,263 are women and 129,219 are men (Table 2). By race, 80.8 percent of the sample persons are white, 12.2 percent are black, and 6.9 percent are Latino. For highest educational level, 24.9 percent of the sample persons had less than a high school degree, 26.2 percent had a high school degree, 28.5 percent had some college, and 20.4 percent had a bachelor's degree or higher.

Section VI. Methods

I conduct an analysis of event history data using a discrete-time hazard model for first marriage as a single, non-repeatable event. Here, the dependent variable is a binary (0/1) for the outcome of first marriage. My approach accommodates the use of time-varying and time-constant predictors as well as right censoring (the event may not occur within the observation period). Modeling for a conditional probability, I observe individuals transition from the origin state of being never married to the state of being ever married. With the analysis over the age range of 15 to 35 years old, I specify the baseline hazard to be an age quadratic function.

For the entry variable of marrying, I code the outcome as 0 for being never married and 1 for when a person becomes married for the first time. That is, across person-year observations the event outcome variable for marrying is equal to zero for all sample person-years prior to first marriage and equal to 1 for the person-year observation when the sample person first marries. All person-year observations for the ever married sample person are omitted subsequent to the first observation of having married.

In event history analysis, there is generally a concern about dependence within the person-year observations of persons and unobserved heterogeneity between persons

(Allison 1982, 1995 and Yamaguchi 1991). For the first concern, I make adjustments for the grouped data with standard error adjustments (I use robust standard errors for clustering at the person level). Further, the use of period indicators addresses the temporal dependence of observations within persons. I also use person weights that take into account sample design. My approach is then not compatible to the tests for unobserved person-level characteristics using random intercept (random effects) or fixed effects models. I report the results based on ordinary logit models in the subsequent sections.¹⁰

In equation 1, I represent a simplified form of the equation for the ordinary logit model.¹¹ Here, β is the row vector of observed time-varying (and time-constant) regression coefficients and $\alpha(t)$ is a function of personal time (age). The conditional distribution of the outcome variable is Bernoulli with probability following a standard logistic regression model.

$$\text{logit}(\pi_{it}) = \alpha(t) + x'_{it}\beta \quad (1)$$

In this working paper, I consider the results from the reported models to be preliminary. In the first step, I use separate models by gender to regress the log odds¹² of first marriage with each recession/non-recession period and highest education level as a proxy for earning power (Tables 3 and 4). I also report the results for the person-level

¹⁰ Per Allison and Christakis (2000), problems can arise in fixed-effects logistic regression to discrete-time event history data with non-repeated events. The random intercept model is also not generally a superior approach to the ordinary logit model for discrete-time event history data with non-repeated events. Further, this alternative procedure is not permitted when using person weights. Thus, I do not apply these methods to address person-level heterogeneity.

¹¹ Here, I do not provide distinct notation for time-constant or time-invariant covariates for the sake of simplicity. Final working model with a quadratic time function for the baseline hazard is described in the subsequent text.

¹² The odds of marrying at the observed time is the ratio of the probability of marrying to the probability of not marrying at that time (given that marriage has not already occurred prior to that time).

proxies for earning power interacted with each period (Tables 5 and 6). In the second step of the analysis, I replicate the analysis with the interactions between earning power and each period using gender separate models for college educated persons with logged annual earnings as a proxy for earning power (Table 7).¹³

In the reported logit models, I use a uniform set of control variables. I regress the log odds of first marriage on the concurrent national unemployment rate of males; the age quadratic function; a linear trend for calendar year; three-category race (black, Latino, and with white as the baseline group); four-category educational levels (less than a high school degree, a high school degree, some college, and with a bachelor's degree or more as the baseline group); an in-school indicator (with not being in school as the baseline group); and, for women only, an indicator for motherhood (with not having ever had a child as the baseline group). As mentioned, the measure of the underlying event history time function is each year of progressive age. Following my prior work (Espinoza 2013), I employ the quadratic function for age.¹⁴ Prior research has also established that a quadratic in age best captures the expected diminishing increase in the probability of first marriage across age (Hernes 1972). The age quadratic is interacted with education level to accommodate that marrying behavior may follow different life course patterns for the different education groups.

I use eight-category recession/non-recession periods. There are four distinct non-recession periods (in the late-1970s, 1980s, and 1990s with the 2000s aggregated non-

¹³ Due to concern for reverse causation, I tested lagged and non-lagged variables for motherhood, being in-school, and earnings. I find consistent results and maintain the non-lagged variables due to concern for the bias that misspecified lagged variables may induce. I would continue work to best address endogeneity concerns using more advanced methods in the future.

¹⁴ I tested the performance of age indicators and linear, quadratic, and cubic spline age functions. The age quadratic and cubic spline age functions are about equivalent in fit to each other yet superior in fit to age indicators or a linear transformation. I use the quadratic function for simplicity and to follow prior work.

recession years as the reference). These are in addition to the four distinct recession periods (the early 1980s recession, early 1990s recession, early 2000s recession, and the Great Recession). I examine interaction terms between each period and micro-level proxies for earning power to test my hypothesis that the effects of earning power on marrying are conditional to period-specific effects and, more specifically, U.S. recession period.

As controls, the models I present include two time-invariant covariates (black and Latino) and six time-varying covariates (unemployment rate for males, calendar year, recession period, and being in-school). For women only (due to the available data), I include an additional time-varying covariate (motherhood). In the first step of my study, I focus on the analysis of the time-constant variable for a person's highest education level.

In the second step, I focus on the time-varying logged variable for individual-level annual earnings. In the data, the dollar unit for the earnings variable is converted from nominal dollars to 2010 real dollars using the Consumer Price Index for Urban Consumers, Research Series (CPI-U-RS). Earnings data are from IRS form W-2 and SSA self-employment records, and they include employee contributions to deferred compensation plans. I use the log of the variable for annual earnings due to the positive skewness in the distribution of that variable (zero earnings are recoded to 1).

I test both lagged and non-lagged earnings as predictors. I report the findings from the model for non-lagged earnings based on the preference to use non-lagged predictors unless the time-lag is clearly appropriate and superior. Prior research suggests careful and cautious use of lagged predictors (De Boef and Keele 2008). Under my theoretical

framework, I consider the logged earnings in the year of marriage to be an adequate indicator.

Though I test the conventional procedure, one-year lagged earnings may not be a superior option. On the one hand, I assume a person makes the decision to marry based on anticipated earning power once married. In the case of an unanticipated earnings shock in the year of marriage (e.g. an involuntary job loss), capturing this is the approach I take to test how earning power in a recession affects the likelihood of marrying. However, I would pursue comparing alternative earnings specifications (e.g. lagged non-recession year earnings, average earnings, or earnings quintiles) as well as pursuing alternative methods to better address concerns for simultaneity or reverse causation in the future.¹⁵

A lower Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) indicate better fit. Per this criterion, I report the models that provide the best fit. The AIC and BIC are reported for all models, including in the stepwise modeling for the age time functions (Tables 8 and 9).

Section VII. Findings

To discuss the results, I interpret the logit coefficients by sign and significance in order to examine the qualitative relation between covariates and marrying (i.e. a positive or negative relation) and to make qualitative comparisons of the magnitudes of selected covariates (i.e. higher or lower relations). Based on a one-unit change in the explanatory

¹⁵ I do not pursue an instrumental variables (IV) estimation because it relies on the untestable assumption that the instruments are uncorrelated with the error term of the model, which I consider to be an unsuitable alternative here. Instead, my approach is to pursue robustness checks to garner greater confidence based on establishing consistent results.

variable, a statistically significant positive (negative) sign on the coefficient implies an upward (downward) shift in the logit—an indicator of the conditional probability of marrying. Thus, a statistically significant positive (or negative) coefficient is interpreted as indicating an increase (or decrease) in the likelihood or propensity to ever marrying (relative to the baseline reference). However, for time-varying covariates, a one-unit increment shifts the logit function relative to the reference starting only from the time period when the covariate changes.

My central interest is to examine meaningful period-specific time effects by recession/non-recession indicators. I employ stepwise modeling to examine how adding different specifications of time indicators contribute to the fit of the model. Based on the results of the stepwise modeling, the eight category recession/non-recession aggregation of years with an age quadratic is the best fit model (Tables 8 and 9). All comparative statements in this study have undergone statistical testing and, unless otherwise noted, all comparisons are statistically significant at the 5 percent significance level. The Z test is used for the test of a single variable and the Wald test is used to jointly test more than one variable or comparisons between variables.

I first focus on describing the results for the separate models for women and then I discuss the results for the separate models for men. Looking at the preliminary model (without an interaction for earning power-period effects) for women (Table 3, Model 1), I first compare the likelihood of marrying for the baseline category to other select non-recession and recession periods. The baseline is the period of the non-recession years of the 2000s, first decade. Comparing the baseline period to the earliest non-recession period observed, there is a higher likelihood of marrying in the baseline period

(controlling for the linear trend). That is, there is a downward shift in the log odds of marrying in the earlier 1980s non-recession period. In the early recession of the 2000s (first decade), there is a downward shift but then we see an upward shift for the period of the Great Recession.

The period-specific effects are all statistically significant, and we do not see support for the hypothesis of an ever increasing negative effect of each successive recession on marrying. Instead, the likelihood of marrying in each prior recession period is relatively lower than the likelihood of marrying in the Great Recession. In addition to the other controls for this model (not shown), I display the results for the negative linear time trend and the negative effect of the national unemployment rate among males.

While there is not enough data to establish a conclusive trend, these preliminary findings do not support the hypothesis that as recessions have become increasingly structural and more complex there is an increasingly negative relation between the contextual effects of successive recession periods and the likelihood of marrying. As this pattern is not observed in the period after women have entered the labor market en masse, I am further motivated to test how this pattern holds when interacted with micro-level earning power by gender. In the subsequent sections, I first proceed to discuss the marrying patterns across the observed periods among men and then by gender-education categories

Looking at the preliminary model (without an interaction for earning power-period effects) for men (Table 4, Model 2), I first compare the likelihood of marrying among men for the baseline category to other select non-recession and recession periods. There is a higher likelihood of marrying in the baseline non-recession period than the

earlier 1980s non-recession period. Compared to the baseline period, there is a downward shift in the log odds of marrying in the early 2000s recession. As observed among women, the likelihood of marrying in the Great Recession shifts upward and this shift is statistically higher than not only the baseline period but each prior recession period. As with women, among males we see a negative linear time trend and a negative effect of the national unemployment rate on marrying.

Again, there is not enough data to establish a conclusive trend, but among men—as among women—the preliminary findings do not support the hypothesis that there is an increasingly negative relation between the contextual effects of a recession period and the likelihood of marrying. Next, I discuss these patterns adding interactions for earning power-period effects to the models with education level serving as a proxy for earning power. In addition to discussing the “college effect,” I also test the difference between the coefficients for holding a college degree or more compared to having less than a high school degree as a measure of the “college advantage” in marrying.

I analyze the results from the model with an interaction for earning power-period effects for women (Table 5, Model 3) and then for men. Firstly, I compare the likelihood of marrying among college educated women in the non-recession period of the early first decade of the 2000s to the non-recession period of the 1980s. For this comparison, women with a college degree in the more recent period have a higher likelihood of marrying than women with a college degree in the earlier period. Within the same non-recession period of the 2000s, the baseline category of college educated women have a marrying advantage when compared to women with less than a high school degree. However, the likelihood of marrying for college educated women is higher in the Great

Recession than for college educated women in the baseline period (the non-recession period of the 2000s, first decade).

Additionally, I compare the college advantage of the non-recession period of the 2000s (first decade) to the college advantage of the non-recession period of the 1980s. For this comparison, the college advantage is higher in the more recent period than the college advantage in the earlier period. Yet the college advantage in the baseline period (the non-recession period of the early first decade of the 2000s) is not statistically different than the college advantage of the Great Recession. However, the college advantage of the baseline period is lower than the college advantage of the early 2000s recession and the 1990s non-recession period. The college advantage in the Great Recession is also lower than the college advantage of the early recession period of the 2000s, first decade.

Though not conclusive, these comparisons suggest that among women there are important period-specific effects that condition the relation between having a college education and marrying as well as between the relative relation of the college advantage and marrying.¹⁶ Given the lower college advantage in the most recent recession compared to the penultimate recession, not only do we not see evidence that there is a negative relation between women's earning power and marrying but there also is a lack of evidence for the claim that there has been an ever increasing marrying disparity by education level in the U.S. The data do not reveal the emergence of (continuously) increasingly positive or (continuously) increasingly negative trends, but rather distinct contextual effects for each observed period.

¹⁶ The relative relation of the college advantage and marrying is a function of the effect of having a college education on marrying compared to the effect of having less than a high school degree and marrying.

Next, I analyze the results from the model with an interaction for earning power-period effects for men (Table 6, Model 4) In the first comparison, the likelihood of marrying among college educated men in the (non-recession) baseline period is compared to the non-recession period of the 1980s. For this comparison, men with a college degree in the more recent period have a higher likelihood of marrying than men with a college degree in the earlier period. Within the same baseline period, the baseline category of college educated men have a marrying advantage when compared to men with less than a high school degree. The likelihood of marrying for college educated men is higher in the Great Recession than college educated men in the baseline period.

In addition, I compare the college advantage of the (non-recession) baseline period to the college advantage of the non-recession period of the 1980s. For this comparison, the college advantage is higher in the more recent period than the college advantage in the earlier period. The college advantage in the baseline period is not statistically different than the college advantage of the Great Recession. However, the college advantage of the baseline period is lower than the college advantage of the early 2000s recession and the 1990s non-recession period. As was observed among women, the college advantage in the Great Recession is lower than the college advantage of the early recession period of the 2000s, first decade.

These comparisons suggest that among men, as was observed among women, there are important period-specific effects that condition the relation between having a college education and marrying as well as between the relative relation of the college advantage and marrying. Again, these preliminary results do not support the argument

that the marrying disparity by education level is necessarily continuously increasing (or decreasing) in the U.S.

In the next step, I analyze the results from the model with an interaction for earning power-period effects for college educated women (Table 7, Model 5). This model uses logged annual earnings as a proxy for earning power. Looking at the combined effects of earning power in each period, there is a positive relation between log earnings and the log odds of marrying in the baseline period as well as in the non-recession period of the 1990s. The combined effect of log earnings on marrying is not statistically different than zero in the other observed periods. Other than for the Great Recession and 1990s non-recession periods, this is due to a downward shift in the interaction effect of log earnings. In the Great Recession, change in the interaction effect of log earnings is not statistically different than zero.

Although there is not enough data to make a conclusive interpretation of the trend, the data suggest that there is a lack of support for the model of specialization that predicts a lower probability of marrying for women with higher earning power. On the other hand, in some of the periods we see a positive relation between logged earnings and the log odds of marrying, but we do not see evidence that the relation is increasing in each successive period.

When applying this model to the sample of college educated men, the interaction between log earnings and period is not found to be statistically significant in any period (model not shown). I interpret this to suggest that while there are some period-specific changes in the effect of log earnings on marrying among women the (positive) effect for men is consistent across the analytic periods. This suggests additional (preliminary)

The Macro-and Micro-Economics of Family Formation

support for the theory that the micro-level economic basis of marrying changes toward being positive among women (as it is with men) in the period after women's mass entry into the labor market. However, the results relate to my initial hypotheses in a mixed fashion since the relation between earning power and marrying is not clearly observed as increasingly positive across each successive period for the proxies of education level and earning power.

As mentioned previously, it may be that there are ambiguous effects masked within each distinct recession period. Some may marry more due to the dimension of marrying that serves as social insurance while others may be more so precluded from marrying due to a lower ability to meet some standard for economic readiness, the "marriage bar." The balance of these two effects may be different in each recession (for example, based on the severity of credit or housing market downturns). If so, then further research should focus on disentangling what may be multiple and countervailing effects operating during specific recession (and non-recession) periods.

Overall, I find tentative support to the theory that once women entered the labor market en masse women's earning power is a positive determinant of marrying, including (but not necessarily more so) during a recession period. However, the relation does not appear to be stable or ever increasing across the observed periods and further analysis would be necessary to establish a trend. Given that the changes in the labor market and household structure are recent, the analytic timeframe may cover a period of social and economic adjustment. Long-term permanent shifts in the trend may be yet to materialize.

However, it is important to especially highlight that I do not find any evidence that women's earning power has a negative relation to marrying (per specialization

The Macro-and Micro-Economics of Family Formation

theory) and that the balance of the findings suggest support for the modern perspective on household economics. The data more so reconciles with the theory that a women's earning power (and a man's earning power) makes marrying more affordable, enhances economic security, and increases the gains to marrying despite (if not necessarily due to) a recession. Further, the negative effect of the national unemployment rate among males suggests that future studies look at both conventional and supplemental male-specific and female-specific economic determinants of marrying. There may be countervailing effects of multiple gender-shared and gender-specific economic changes that more fully explain marrying patterns across time when considered jointly.

Section VIII. Limitations

The dataset used in this study provides a unique opportunity to conduct a study with a large sample across multiple recession/non-recession periods. While there are substantive benefits derived from the nature of this life history data that covers a long historical period, there are also major trade-offs. Firstly, there are a limited set of variables that are available.¹⁷ Thus, the findings should be considered with caution because a model specified with a fuller set of variables may support different conclusions. In subsequent work, I would pursue using models that allow for more than a two-level analysis, simultaneous age-period-cohort effects, and additional methods to address the concern for unobserved heterogeneity. To extend my research, I would be interested in conducting a multiple spell duration analysis with a fixed effects approach (dropping person-level effects) as an appropriate next step.

Indeed, the interpretations of the findings should be considered tentative because the analysis does not separate the three measures of time—age, period, and birth cohort. This paper takes a period analysis approach while my prior research took a birth cohort approach. My prior work (Espinoza 2013) finds dramatic shifts in the effect of earning power on marrying by U.S. generation. Studying the shift in the effects of time-varying education level and time-varying earnings on marrying across the Lucky Few generation, Baby Boomers, and Generation Xers, I find that the earning power advantage for marrying among women first emerges among Generation X women—women who are at the prime age for marrying in the first decade of the 2000s. I would argue that this prior

¹⁷ In future work, I would adjust the analytic strategy so as to include the broader array of in-panel SIPP variables that do not have life history data. This would involve adjustment of the sample and timeframe.

finding is congruent with the findings of this current study, and I do not attempt to disentangle the age-period-cohort effects here.

A study that focuses on identifying period and age effects confronts challenges in simultaneously identifying birth cohort (generation) effects. In addition to the issue of adding conceptual complexity that may be overwhelming, including within any model specification all three concepts—personal time (age), historical time (period), and generation (cohort)—can cause identification problems and severe multicollinearity (Buss 1974 and Hageaars 1990). Following other scholars, I would argue that this theoretically driven analysis should garner some confidence despite that it does not isolate each of the three time-related concepts (Rabe-Hesketh and Skrondal 2012). However, future work would involve analyzing age-period-and-cohort effects simultaneously, which I would do using more complicated analytic strategies in conjunction with qualitative methods. This study was conducted with the intention of guiding such future work.

Further, there are limits to the analysis I conduct using crude measures of earning power. My methods do not cancel concern for reverse causation or unobserved dimensions of earning power. Yet even in reality there is a lot of uncertainty, simultaneity, and asymmetrical information in the observable measures available when evaluating whether a person is economically ready to marry or in evaluating the economic readiness of a partner to marry. Much of the theory about the effect of earning power on marrying acknowledges the limits in the analysis of earning power not only in empirical analysis but also subjectively at the personal level (Oppenheimer 1988). Thus, I

would argue that using commonly available measures of earning power that are generally accepted is useful despite their lack of exactness or completeness.

In this analysis, I control for race and ethnicity but in the future I would add race-specific rates of national unemployment. A more appropriate ethno-racial analysis would be to include such auxiliary data in order to facilitate the nuances of racial disparities in the labor market. The hardest hit by the labor market decline in the Great Recession were males, blacks, Latinos, youths, and those with low education levels (Elsby et al 2010 and Farber 2011). Per Hoynes, Miller and Schaller (2012), the dramatic differences in the impacts of the business cycle affecting these specific groups has been a stable pattern across the U.S. recessions since 1978. Unemployment rates by education level (ultimately, by gender-race-education categories) would be important to include in future research.

Despite that each panel of the SIPP survey¹⁸ is a nationally representative survey and I use weights that take into account the sample design, without the application of replicate weights in the calculation of the standard errors and a fully specified model (i.e. a model without omitted variable bias), we must treat these findings as suggestive.¹⁹ Because there remains concern that possible endogeneity and selection issues may result in biased estimates, I am cautious about the conclusions that are drawn from what I consider to be preliminary findings. I do not present the results as precise quantitative estimates for the U.S. population, but rather I discuss qualitative relationships that appear to be robust across various analytic strategies and model specifications.

¹⁸ Statistics from surveys are subject to sampling and nonsampling error. For further information on the source of the data and accuracy of the estimates, including standard errors and confidence intervals, see <<http://www.census.gov/programs-surveys/sipp/tech-documentation/source-accuracy-statements.html>>.

¹⁹ Replicate weights are still in development for the data (Gold Standard File) used in this study.

The robustness of my findings suggest that the magnitude of any bias may be low and though alternative methods may lead to more precise estimates they may not necessarily reverse or counter the qualitative findings of this study. I present the conclusions in the next section as theoretical arguments made based on the suggestive findings of the study. Further data and analyses would be necessary to make the interpretations conclusive.

Section IX. Discussion and Conclusion

In this study, I examine the period-specific effects of earning power on marrying conditional to shifts in the macro-economy in the period after women's mass entry into the labor market (1978 to 2010). The objective of this study is to provide an exploratory analysis of how gender-shared and gender-specific economic shifts may drive changes in the basis of marrying and household socio-economics in the U.S. This period covers what may be a pivotal transition in the labor market and household structure, and a longer time series would be necessary to conclusively establish the permanent trend. However, I find in this study further encouragement for research that advances a new framework for understanding household socio-economics in the U.S.—one that incorporates the gains to marrying as operating more so based on the dual earner household structure (than based on specialization theory).

The results generally support the theory that the economic basis of marrying has shifted in the U.S. to one that is based on women's earning power being a positive determinant of marrying. Especially during a recession, a women's financial contribution and the greater security of a dual earner household can help make marrying more economically viable and advantageous. With women garnering a more gender-equal level

The Macro-and Micro-Economics of Family Formation

of earning power, I would argue that a couple can more likely meet an aggregate earning potential that is high (and secure) enough to make more attractive the gains of the dual earner household structure as compared to staying single (or, alternatively, entering a sole earner union).

With many of the traditional functions of marrying increasingly de-linked to being married (e.g. sexual activity and procreation), I would argue that—along with companionship—the economic gains to marrying are increasingly central to the decision to marry in the U.S. While the stigma of divorce and some of the provisions of divorce law have weakened over time in the U.S., there is still a greater protection of the investments one makes in a relationship within the context of marriage compared to in an informal relationship. I theorize that marriage may serve as an attractive and voluntary contract that allows couples to manage risk and make investments and commitments to each with greater confidence about the potential returns to such arrangements.

By observing a positive college effect among women across the observed periods (and a non-statistically significant or positive earnings effect among the college educated), I provide some empirical evidence that bolsters the theory that marriage may be increasingly serving as a strategy for achieving the gains to marrying based on the dual earner model. Rather than showing a consistent trend, however, the results across time are mixed. It may be that singlehood, including cohabitation, may be a more attractive option than the option of a specialized marital union or, even, the dual earner arrangement when a person does not meet the economic threshold for marrying. In this way, it may be that the effect of the marriage bar and increasingly viable alternative

The Macro-and Micro-Economics of Family Formation

household arrangements as a single (non-married) adult mediate the gains to marrying based on the dual earner model.

Especially when the marriage bar can be applied across gender, a recession may preclude more women as well as more men from being economically ready to marry (at the exact time when the increased security and economies of scale of marriage should be most at play). If so, the de-gendering of the economic basis of marriage may operate more so like double jeopardy during hard economic times. With potentially countervailing effects, additional data is necessary to disentangle the net effect of a recession on marrying. Further research should examine whether cohabitation and the marriage bar may help advance our understanding of the modern economic determinants of marrying and household structure across the business cycle.

From the perspective that the U.S. is still under-going adjustment to women's mass entry into the labor market, any permanent adjustments in marrying patterns across time and by education level is still to be established. Though limited, this empirical study across an extended timeframe and based on a large sample is useful as a guide for those who take on contemporary research into modern household, family, and work arrangements (as temporary and/or permanent social change may still be in process).

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The Macro-and Micro-Economics of Family Formation

Table 1. Distributions of Variables (Event History Data Structure), Person-Year Level Observations

	Women		Men		Total	
	NT	% (NT)	NT	% (NT)	NT	% (NT)
Analytic Sample	932,567	100	967,914	100	1,900,481	100
Distributions of Categorical Variables	Frequency	Percent	Frequency	Percent	Frequency	Percent
<i>Marital Status</i>						
Ever Married	87,617	9.4	75,794	7.8	163,411	8.6
Never Married	844,950	90.6	892,120	92.2	1,737,070	91.4
<i>U.S. Recession</i>						
No Recession	675,363	72.4	698,088	72.1	1,373,451	72.3
Early 1980s: 1980 - 1982	113,997	12.2	120,346	12.4	234,343	12.3
Early 1990s: 1990 - 1991	68,960	7.4	72,602	7.5	141,562	7.4
Early 2000s: 2001 - 2002	54,683	5.9	56,057	5.8	110,740	5.8
Great Recession: 2008 - 2009	19,564	2.1	20,821	2.2	40,385	2.1
<i>Highest Education Level</i>						
Less Than High School	224,739	24.1	241,043	24.9	465,782	24.5
High School	208,351	22.3	246,547	25.5	454,898	23.9
Some College	278,915	29.9	269,441	27.8	548,356	28.9
Bachelor's Degree or Higher	220,562	23.7	210,883	21.8	431,445	22.7
<i>Race</i>						
White	700,251	75.1	781,256	80.7	1,481,507	78.0
Black	161,429	17.3	118,746	12.3	280,175	14.7
Latino	70,887	7.6	67,912	7.0	138,799	7.3
<i>Motherhood</i>						
Ever Given Birth	153,040	16.4	n/a	n/a	n/a	n/a
Never Given Birth	779,527	83.6	n/a	n/a	n/a	n/a
<i>School Status</i>						
In-School	460,764	49.4	443,468	45.8	904,232	47.6
Not-in-School	471,803	50.6	524,446	54.2	996,249	52.4
<i>Summary of Continuous Variables</i>	Women	Men	Total			
Mean Age	22	23	22			
Mean National Unemployment Rate, Males	6.4	6.4	6.4			
Mean Earnings	\$ 12,624	\$ 17,727	\$ 15,223			

Data sources: U.S. Census Bureau, Survey of Income and Program Participation (SIPP) 1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, 2008 panels and SSA earnings data - Gold Standard File (GSF), Version 6.0
NT: Person-year level observations (unweighted)

The Macro-and Micro-Economics of Family Formation

Table 2. Distributions of Variables (Event History Data Structure), Person Level Observations

	Women		Men		Total	
	N	% (N)	N	% (N)	N	% (N)
Analytic Sample	137,263	100	129,219	100	266,482	100
Distributions of Categorical Variables		Percent		Percent		Percent
<i>Marital Status</i> (at Last Observation)						
Ever Married	87,617	63.8	75,794	58.7	163,411	61.3
Never Married	49,646	36.2	53,425	41.3	103,071	38.7
<i>Highest Education Level</i>						
Less Than High School	32,529	23.7	33,955	26.3	66,484	24.9
High School	36,106	26.3	33,626	26.0	69,732	26.2
Some College	40,999	29.9	34,974	27.1	75,973	28.5
Bachelor's Degree or Higher	27,629	20.1	26,664	20.6	54,293	20.4
<i>Race</i>						
White	108,954	79.4	106,447	82.4	215,401	80.8
Black	18,609	13.6	14,033	10.9	32,642	12.2
Latino	9,700	7.1	8,739	6.8	18,439	6.9

Data sources: U.S. Census Bureau, Survey of Income and Program Participation (SIPP) 1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, 2008 panels and SSA earnings data - Gold Standard File (GSF), Version 6.0

N: Person level observations (unweighted)

The Macro-and Micro-Economics of Family Formation

Table 3. Ordinary Logit Specifications on Marrying - Dependent Variable: First Entry into Marriage (Binary 0/1), Women

		Women						NT	932,567
		Model 1						aic	133120
	coefficient/(standard error)							bic	133366
Selected Coefficients									
Year (linear trend)		-0.093***							
		(0.00)							
National Unemployment Rate, Males		-0.037***							
		(0.00)							
Less than High School		-1.153***							
		(0.02)							
		1980s		1990s		2000s			
		Early Recession	No Recession	Early Recession	No Recession	Early Recession	No Recession	Great Recession	
Recession		-1.410***	-1.177***	-0.860***	-0.700***	-0.234***	(Baseline)	0.231***	
		(0.09)	(0.08)	(0.06)	(0.05)	(0.04)		(0.06)	
Difference-in-Difference Analysis (Wald Tests)									
Earlier Recessions									
Versus Great Recession									
		-1.641***		-1.091***		-0.465***		n/a	
Prob > chi2 =									
		0.000		0.000		0.000		(Reference)	

Legend: * p<0.05; ** p<0.01; *** p<0.001

Control variables (not shown): age quadratic, race/ethnicity (baseline: white), motherhood (baseline: never), and school status (baseline: out-of-school)

Omitted categories (not shown): 1978-1979 non-recession period, high school degree, some college (age quadratic interacted with education levels)

Mean centering for continuous variables: year, age, and unemployment rate

Data sources: U.S. Census Bureau, Survey of Income and Program Participation (SIPP) 1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, 2008 panels and SSA earnings data - Gold Standard File (GSF), Version 6.0

NT: Person year observations (unweighted). Weighted specifications

Table 4. Ordinary Logit Specifications on Marrying - Dependent Variable: First Entry into Marriage (Binary 0/1), Men

		Men					NT	967,914
		Model 2					aic	133486
		coefficient/(standard error)					bic	133721
Selected Coefficients								
Year (linear trend)		-0.109***						
		(0.00)						
National Unemployment Rate, Males		-0.066***						
		(0.01)						
Less than High School		-1.011***						
		(0.02)						
		1980s		1990s		2000s		
		Early Recession	No Recession	Early Recession	No Recession	Early Recession	No Recession	Great Recession
Recession		-1.872***	-1.549***	-1.140***	-0.888***	-0.293***	(Baseline)	0.529***
		(0.10)	(0.08)	(0.07)	(0.05)	(0.04)		(0.06)
Difference-in-Difference Analysis (Wald Tests)								
Earlier Recessions								
Versus Great Recession		-2.400***		-1.669***		-0.822***		n/a
Prob > chi2 =		0.000		0.000		0.000		(Reference)

Legend: * p<0.05; ** p<0.01; *** p<0.001

Control variables (not shown): age quadratic, race/ethnicity (baseline: white), and school status (baseline: out-of-school)

Omitted categories (not shown): 1978-1979 non-recession period, high school degree, some college (age quadratic interacted with education levels)

Mean centering for continuous variables: year, age, and unemployment rate

Data sources: U.S. Census Bureau, Survey of Income and Program Participation (SIPP) 1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, 2008 panels and SSA earnings data - Gold Standard File (GSF), Version 6.0

NT: Person year observations (unweighted). Weighted specifications

The Macro-and Micro-Economics of Family Formation

Table 5. Ordinary Logit Specifications on Marrying with Period-Education Interactions - Dependent Variable: First Entry into Marriage (Binary 0/1), Women

	Women					NT	932,567
	Model 3					aic	132590
	coefficient/(standard error)					bic	133083
Selected Coefficients							
Year (linear trend)	-0.092***						
	(0.00)						
National Unemployment Rate, Males	-0.036***						
	(0.01)						
	1980s		1990s		2000s		
	Early Recession	No Recession	Early Recession	No Recession	Early Recession	No Recession	Great Recession
Less than High School Degree	-3.221***	-2.872***	-2.792***	-2.722***	-2.771***	-1.561***	-1.480**
	(0.11)	(0.09)	(0.10)	(0.07)	(0.10)	(0.07)	(0.11)
College Degree or More	-2.105***	-1.703***	-1.263***	-0.874***	-0.172**	(Baseline)	0.250***
	(0.10)	(0.09)	(0.08)	(0.06)	(0.06)		(0.10)
Difference-in-Difference Analysis (Wald Tests)							
College Advantage (LTHS versus BA or More)	1.116***	1.168***	1.530***	1.847***	2.599***	1.561***	1.729***
Prob > chi2 =	0.000	0.000	0.000	0.000	0.000	(Baseline)	0.000
Earlier College Advantage versus Baseline College Advantage	-.445***	-.393***	-.032	0.286***	1.037***	n/a	0.168
Prob > chi2 =	0.000	0.000	0.742	0.000	0.000	(Reference)	0.250
College Advantage of Earlier Recessions Versus Great Recession	-0.613***		-0.199		0.870***		n/a
Prob > chi2 =	0.000		0.182		0.000		(Reference)

Legend: * p<0.05; ** p<0.01; *** p<0.001

Control variables (not shown): age quadratic, race/ethnicity (baseline: white), motherhood (baseline: never), and school status (baseline: out-of-school)

Omitted categories (not shown): 1978-1979 non-recession period, high school degree, some college (age quadratic interacted with education levels)

Mean centering for continuous variables: year, age, and unemployment rate

Data sources: U.S. Census Bureau, Survey of Income and Program Participation (SIPP) 1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, 2008 panels and SSA earnings data - Gold Standard File (GSF), Version 6.0

NT: Person year observations (unweighted). Weighted specifications

The Macro-and Micro-Economics of Family Formation

Table 6. Ordinary Logit Specifications on Marrying with Period-Education Interactions - Dependent Variable: First Entry into Marriage (Binary 0/1), Men

	Men					NT	967,914
	Model 4					aic	133260
	coefficient/(standard error)					bic	133743
Selected Coefficients							
Year (linear trend)	-0.108*** (0.00)						
National Unemployment Rate, Males	-0.066*** (0.00)						
	1980s		1990s		2000s		
	Early Recession	No Recession	Early Recession	No Recession	Early Recession	No Recession	Great Recession
Less than High School Degree	-3.055*** (0.12)	-2.836*** (0.10)	-2.557*** (0.10)	-2.685*** (0.08)	-2.389*** (0.10)	-1.337*** (0.07)	-1.000*** (0.10)
College Degree or More	-2.244*** (0.11)	-1.788*** (0.09)	-1.397*** (0.09)	-1.013*** (0.07)	-0.204*** (0.07)	(Baseline)	0.559*** (0.11)
Difference-in-Difference Analysis (Wald Tests)							
College Advantage (BA or More versus LTHS)	.811***	1.048***	1.160***	1.672***	2.185***	1.337***	1.559***
Prob > chi2 =	0.000	0.660	0.000	0.000	0.000	(Baseline)	0.000
Earlier College Advantage versus Baseline College Advantage	-.526***	-.288***	-0.177	0.335***	0.848***	n/a	0.222
Prob > chi2 =	0.000	0.000	0.070	0.000	0.000	(Reference)	0.121
College Advantage of Earlier Recessions Versus Great Recession	-0.748***		-0.399**		0.626***		n/a
Prob > chi2 =	0.000		0.006		0.000		(Reference)

Legend: * p<0.05; ** p<0.01; *** p<0.001

Control variables (not shown): age quadratic, race/ethnicity (baseline: white), and school status (baseline: out-of-school)

Omitted categories (not shown): 1978-1979 non-recession period, high school degree, some college (age quadratic interacted with education levels)

Mean centering for continuous variables: year, age, and unemployment rate

Data sources: U.S. Census Bureau, Survey of Income and Program Participation (SIPP) 1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, 2008 panels and SSA earnings data - Gold Standard File (GSF), Version 6.0

NT: Person year observations (unweighted). Weighted specifications

Table 7. Ordinary Logit Specifications on Marrying with Period-Earnings Interactions - Dependent Variable: First Entry into Marriage (Binary 0/1), Women

College Educated Women						NT	220,562
	Model 5					aic	33625
Selected Coefficients	coefficient/(standard error)					bic	34027
Year (linear trend)	-0.067***						
	(0.01)						
National Unemployment Rate, Males	-0.054***						
	(0.01)						
Log Earnings ("Main" Effect)	0.105**						
	(0.04)						
	1980s		1990s		2000s		
	Early Recession	No Recession	Early Recession	No Recession	Early Recession	No Recession	Great Recession
Log Earnings ("Interaction" Effect)	-0.112**	-0.089*	-0.110*	-0.063	-0.127*	(Baseline)	0.002
	(0.04)	(0.04)	(0.05)	(0.04)	(0.05)		(0.08)
Wald Tests							
Log Earnings ("Combined" Effect)	-0.007	.0167	-.005	.042**	-.022	.105**	0.107
Prob > chi2 =	0.655	0.136	0.815	0.002	0.451	0.010	0.139

Legend: * p<0.05; ** p<0.01; *** p<0.001

Control variables (not shown): age quadratic, race/ethnicity (baseline: white), motherhood (baseline: never), and school status (baseline: out-of-school)

Omitted categories (not shown): 1978-1979 non-recession period

Mean centering for continuous variables: year, age, and unemployment rate

Data sources: U.S. Census Bureau, Survey of Income and Program Participation (SIPP) 1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, 2008 panels and SSA earnings data - Gold Standard File (GSF), Version 6.0

NT: Person year observations (unweighted). Weighted specifications

The Macro-and Micro-Economics of Family Formation

Table 8. Ordinary Logit Specifications on Marrying - Stepwise Modeling for Age Specifications, Women

Model 6	coefficient/(standard error)		
	(a)	(b)	c)
Age 16	-2.657*** (0.046)		
Age 17	-1.954*** (0.033)		
Age 18	-0.950*** (0.023)		
Age 19	-0.592*** (0.021)		
Age 20	-0.360*** (0.020)		
Age 21	-0.204*** (0.020)		
Age 23	0.089*** (0.020)		
Age 24	0.164*** (0.020)		
Age 25	0.204*** (0.020)		
Age 26	0.233*** (0.021)		
Age 27	0.275*** (0.022)		
Age 28	0.342*** (0.022)		
Age 29	0.364*** (0.022)		
Age 30	0.399*** (0.023)		
Age 31	0.374*** (0.024)		
Age 32	0.259*** (0.025)		
Age 33	0.263*** (0.026)		
Age 34	0.427*** (0.026)		
Age 35	0.434*** (0.026)		
Age (linear trend)		0.105*** (0.001)	0.187*** (0.001)
Age*Age (squared term)			-0.014*** (0.000)
NT	932,567	932,567	932,567
aic	166590	171990	168212
bic	166824	172014	168248
Pseudo R ²	0.0564	0.0493	0.0702

Legend: * p<0.05; ** p<0.01; *** p<0.001

Omitted categories (not shown): Age 15 (dropped) and Age 22 (baseline)

Mean centering for continuous variables: age

Data sources: U.S. Census Bureau, Survey of Income and Program Participation (SIPP) 1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, 2008 panels and SSA earnings data - Gold Standard File (GSF), Version 6.0

NT: Person year observations (unweighted). Weighted specifications

The Macro-and Micro-Economics of Family Formation

Table 9. Ordinary Logit Specifications on Marrying - Stepwise Modeling: Year Specifications, Women
Dependent Variable: Entry into Marriage (Binary 0/1)

	Model 7			
	coefficient/(standard error)			
	(i)	(ii)	(iii)	(iv)
Age	0.210*** (0.00)	0.218*** (0.00)	0.210*** (0.00)	0.218*** (0.00)
Age*Age	-0.015*** (0.00)	-0.018*** (0.00)	-0.016*** (0.00)	-0.018*** (0.00)
Year (linear trend)	-0.129*** (0.00)	-0.089*** (0.00)	-0.134*** (0.00)	-0.111*** (0.00)
National Unemployment Rate, Males			-0.366*** (0.00)	-0.050*** (0.006)
1980s, Early Recession		-1.222*** (0.09)		-1.651*** (0.09)
1980s, No Recession		-1.048*** (0.08)		-1.418*** (0.08)
1990s, Early Recession		-0.738*** (0.05)		-1.034*** (0.06)
1990s, No Recession		-0.569*** (0.04)		-0.782*** (0.05)
2000s, Early Recession		-0.128*** (0.03)		-0.208*** (0.04)
Great Recession		0.097 (0.05)		0.284*** (0.06)
NT	932,567	932,567	932,567	932,567
aic	150248	139875	144915	139842
bic	150295	140005	144973	139983

Legend: * p<0.05; ** p<0.01; *** p<0.001

Omitted categories (not shown): 1978-1979 non-recession period

Mean centering for continuous variables: age

Data sources: U.S. Census Bureau, Survey of Income and Program Participation (SIPP) 1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, 2008 panels and SSA earnings data - Gold Standard File (GSF), Version 6.0

NT: Person year observations (unweighted). Weighted specifications