Does Marriage Lead to Specialization in Sweden? An Evaluation of Trends in Adult Earnings Before and After Marriage

by

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Abstract:

Although a positive male marriage premium has been found in many studies, the source of the premium is unclear and debated – does it result from selection or specialization? Our paper analyzes trends in earnings for married and long-term cohabiting Swedish men, women, and couples who are parents of a random sample of about 130,000 children born in 1977-87. We use panel data on parents' earnings for six years between 1985 and 1995 to analyze trends in earnings before and after marriage. To identify the causal effect of marriage on earnings we use the marriage boom in Sweden in 1989, created by the reform of the widow's pension system and fixed-effects estimation. Our results suggest that half of the male marriage premium can be explained by positive selection whereas the female marriage penalty is explained by increased specialization in home production. We also examine the effect of marriage on total family earnings and find evidence that the positive selection of men into marriage leads to the increased specialization of women. The net effect of marriage on family earnings is zero because the male marriage premium is offset by the female marriage penalty.

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1. Introduction

What is the economic impact of marriage? Becker's model of household formation in *A Treatise on the Family* (1981) argues that marriage makes spouses more productive because men can specialize in market work while women can specialize in household production. Economists have examined the effect of marriage on the earnings of men and to a limited extent, women (see Ribar 2004 for a recent review). Becker's model treats household formation and marriage as identical, however the empirical evidence point to important differences between cohabitation and marriage (Stratton 2002 and Richardson 2002). Furthermore, it is difficult to identify the causal effect of marriage because it is a choice that depends on individual characteristics and economic circumstances that are not fully observed by researchers. This paper examines the causal effect of marriage as compared to cohabitation on men's, women's, and family earnings in Sweden and finds that selection of men with greater earnings potential into marriage facilitates specialization by couples which leads to no change in family earnings for cohabiting couples who marry.

Our paper analyzes earnings for married and cohabiting Swedish men and women who have children. Sweden is interesting because it has a high prevalence of cohabitation among couples with children compared to the U.S.[1] In addition, since the 1960s the Swedish government has enacted reforms intended to promote gender equality in the labor market and in the home, making specialization less likely to occur. Sweden also enacted the cohabitation laws that provide for the division of community property in a cohabiting relationship. The social norm in Sweden is to treat cohabiting and married couples the same. A priori, we would expect to find little evidence of a causal effect of marriage on earnings. However, marriage in Sweden may lead to a greater specialization than does cohabitation because its expected duration is longer and the legal arrangements may provide for pooling of resources to a higher degree. This greater specialization is expected to result in higher

[1] Stevenson and Wolfers (2007) point out that cohabitation is difficult to study in the U.S. context because of lack of data.

male productivity in the labor market. If this is the case, we should expect wages for cohabiting women to be higher than for married women.

We use data on annual earnings between 1985 and 1995 of men and women who were both biological parents of a random sample of about 130,000 children born in Sweden in 1974-87. These parents were Swedish-born, lived in Sweden in 1990 and were either married or cohabiting. The purpose of using data on parents is to compare homogenous groups-- we want to compare long-term cohabitants to married individuals.

However, identifying the causal effect of marriage on outcomes is complicated by the selection problem. It could be that men who have higher wages or who are expecting a faster wage growth are more likely to marry. For this reason, we use a quasi-natural experiment to control for selection into marriage. In 1988, the Swedish parliament enacted a reform abolishing the widow's pension system. The reform included transitional provisions that allowed women who were born before 1945 and married by the end of 1989 to be entitled to a widow's pension if their husband died. Those already receiving a widow's pension would continue to do so as long as they lived. The implications became gradually known to Swedish public and resulted in a dramatic marriage boom in the last two months of 1989. We use the change in the widow's pension system to assess the causal effect of marriage, since marriage in the end of 1989 can be assumed to be less correlated with previous earnings than other marriages. Thus, our model allows us to compare the change in earnings for men and women who married in November and December 1989 to those of men and women who continued to cohabitate or were married earlier.

Our analysis makes several contributions to the study of the economic impact of marriage. First, we examine the effect of marriage relative to cohabitation in Sweden where we would expect to find very limited differences between the two institutional relationships. Thus, if we do find

differences between marriage and cohabitation, this will provide evidence that the institution of marriage is distinct from household formation. Second, we study the economic impact of marriage for three distinct groups: men, women, and couples. We are the first to evaluate the effect of marriage on women's earnings in Sweden. We are also the first study (that we are aware of) to examine the causal impact of marriage on a couple's earnings. Finally, we employ a quasi-natural experiment to evaluate the economic impact of marriage. Most studies of the marriage premium use fixed-effects methods that may not fully address the selection problem.

We find that married men have higher earnings than cohabiting men, that is, there is a male marriage premium also in Sweden. For women we find a marriage penalty, that is, married women have lower earnings than cohabiting women. Our results further show that half of the male marriage premium can be explained by positive selection whereas the female marriage penalty is explained by increased specialization in home production and childcare. When we examine the effect of marriage on total family earnings, we find evidence that the positive selection of men into marriage leads to the increased specialization of women that has no net effect on family earnings.

We begin the analysis by discussing theoretical perspectives and the previous literature on the earnings effects of marriage. Next we examine cohabitation and marriage in Sweden. We then discuss the data, estimation methods, and empirical results. The final section concludes.

2. Theoretical perspectives and previous studies

Becker's theory of the family argues that households are most productive when individuals specialize in a gendered division of labor: men are m ore productive in market work and women are more productive in the household. The theory treats cohabitation and marriage as interchangeable. Clearly both cohabiting and married couples can pool resources and benefit from economies of scale

in household production. Taking the theory at face-value, we would expect to find little difference in the economic impact of marriage and cohabitation. However, important differences between cohabitation and marriage arise upon closer inspection. Cherlin (2004) argues that the institution of marriage features an 'enforceable trust' which requires a public commitment. Unlike cohabitation which ends when one partner moves out, marriage requires a legal separation of property and custody rights, making it more difficult to dissolve. Thus, it could be that marriage is a signal of greater commitment. Consequently, the expected duration of a marriage is longer than that of a consensual union. All these aspects may provide for a higher degree of pooling of family resources and a greater degree of specialization within the family leading to economies of scale in household production among married couples. A traditional, gender-based division of labor would thus allow married men more than cohabiting men to specialize in market work, while married women would be more specialized in household production than cohabiting women. That this is the case also in Sweden is indicated by the fact that among employed mothers of children below age 10 the fraction working part time was 62 percent among married mothers but only 35 percent among cohabiting mothers in 1990 (Swedish Level of Living Survey 1991).[2]

Studies of the economic impact of marriage have focused almost exclusively on the male marriage premium. Fewer studies examine the effect of marriage on women or cohabiting men. The literature on the U.S. male marriage premium is vast and contradictory. Korenman and Neumark (1991) find little evidence that selection into marriage biases estimates of the marriage premium after controlling for fixed effects. In contrast, Cornwell and Rupert (1997) conclude that selection underlies much of the marriage premium using the same approach. Gray (1997) uses data for two time periods to examine the change in the male marriage premium. Like Blackburn and Korenman

[2] In 1999 (outside our study period) these differences had been reduced; 46 percent of married mothers worked part time compared to 41 percent among cohabiting mothers. We are grateful to Elin Olsson for help with these computations.

(1994), Gray reports a significant decrease in the marriage premium over time. Taken together, these studies do not reach a consensus on the size of the marriage premium or its underlying causes.

One potential explanation for these contradictory results is that fixed-effects methods are biased when estimating the marriage premium. Lundberg (2005) argues that marriage, cohabitation, and family formation respond to economic conditions and not just unobserved, fixed individual characteristics. Both Lundberg (2005) and Ribar (2004) note that fixed-effects estimates are only valid when the correlation between marriage and wages is only this individual, unobserved characteristic. When we allow for life-cycle decision-making by the family, the fixed-effects assumption is invalid.

The alternative to using fixed-effects methods to control for the endogeneity of marriage is a quasi-natural experiment or instrumental-variables approach. Ribar (2004) points out that instrumental-variables estimates of the marriage premium are limited because of a lack of valid instruments that are correlated with marriage and uncorrelated with earnings. One exception is Ginther and Zavodny (2001) who use shotgun weddings (marriage due to a pre-marital conception) as a quasi-natural experiment to identify the effect of the marriage premium. They find that men who had a 'shotgun' wedding earn about 15 percent more than never married men, while men who married without a pre-marital conception earned about 16 percent more than never married men. Their result thus suggests that at most 10 percent of the marriage premium is due to selection.

As mentioned, the possible marriage premium for women has attracted little research attention and the few studies that exist have mainly been aimed at assessing the impact of children on women's wages. Analyzing U.S. data over the years 1968-88 for white, black and Hispanic women, Waldfogel (1997) finds, however, a small positive impact of marriage on women's wages. Her fixed-effects estimates show that married women have higher wages than never married women but lower wages

than divorced women. In line with her results, Budig and England (2001) find marriage to be associated with higher earnings for women using U.S. data for the years 1982-1993. This was true also in the fixed-effects model. Divorced women, however, earned about as much as those married.

Even fewer studies have compared the married and cohabiting male wage premiums. Stratton (2002) uses U.S. data and finds that married white men earn higher wages than cohabiting white men, who in turn earn more than single men. Using fixed-effect models to control for selection she finds that the wage premium for married men is reduced by half and the premium for cohabiting men disappears completely. The higher wages for married men is primarily attributed to faster wage growth, i.e., increased market productivity, during marriage. Only the cohabiting men in long-lasting unions experience wage gains that match those of married men.

Analyzing the marriage premium for Swedish males over the period 1968-1991, Richardson (2002) finds that in 1968 married men earned about 23 percent more than never married men while cohabiting men earned about two-thirds of married men.[3] In 1991 the premium for married men had declined to 8 percent and to about half of that (4 percent) for cohabiting men. She demonstrates that the decline in the premium mainly reflects diminishing productivity differences between married and never-married men. Consequently, longer marriage duration was not associated with a higher marriage premium. Estimating a fixed-effect model to control for unobserved heterogeneity she finds a statistically significant premium of about 10 percent for married men for the whole period and one of about 5 percent for cohabiting men.

Using register data on about 35,000 young Danish men over the years 1984-2000, Datta Gupta, Smith & Stratton (2005) find a marriage premium of about 4 percent which is reduced to 2 percent after controlling for selectivity. The cohabitation wage premium is of the same size. They,

[3] The results are obtained from seemingly unrelated equations controlling for age and its square, years of schooling, work experience and its square, working conditions and number of children 0- 19 years in the household.

further, find that part of the marriage premium is in fact a 'fatherhood' premium-- men receive a wage premium during their first years as fathers.

None of the above studies examine the effect of marriage or cohabitation on the labor market outcomes of the unobserved spouse or partner. One exception is El Lahga and Moreau (2007) who find increased specialization in home production by women in German couples that transition from cohabitation to marriage. Thus, legal marriage facilitates specialization in the German context. However, El Lahga and Moreau do not examine earnings. No study, that we are aware of, examines the effect of marriage on total family earnings. We now discuss the similarities and differences between cohabitation and marriage in Sweden.

3. Cohabitation and marriage in Sweden

3.1 Trends in cohabitation and marriage in Sweden

Cohabiting unions are more common in Sweden than anywhere else in the industrialized world, although levels in Denmark now come rather close. Marriage rates have been declining since the late 1960s while cohabitation rates have been rising. At the same time, the duration of cohabitation has increased. For example, among women born in the late 1940s about half had married their partner after three years of cohabitation while this was the case for only about one-tenth of women born in the late 1960s – after five years of cohabitation about two-thirds and one-third of the respective cohorts had married (Bracher and Santow 1998).

Thus, cohabitations in Sweden are stable and relatively long-lasting unions. These unions are, however, less stable than formal marriages, and break-up rates have increased over cohorts. For example, about one-tenth of the first consensual unions for women born in the late 1940s were dissolved within three years, while this was true for about one-fourth of the first unions for women

born in the mid-1960s (Hoem B. 1995). In spite of elevated marriage rates for pregnant cohabiting women, the majority of women are not formally married at first birth but cohabiting in Sweden. Births to non-cohabiting, unmarried women are rare (less than 10 percent of all births). Sweden is probably unique in the industrialized world in having a lower median age for women at first birth than at first marriage.[4]

3.2 Legal differences between cohabitation and marriage in Sweden in 1989[5]

It is commonly believed that there are only minor differences in the legal implications of marriage and cohabitation in Sweden. There are, however, substantial differences if the union breaks up or one of the partners dies, if the couple has children together or prior to their union, or if they have savings or property. The differences are summarized in Table 1. A crucial difference between married spouses and cohabitants is that married spouses are obliged under the law to support each other according to their ability. Further, for a child of married parents, paternity is automatically attributed to the husband of the mother and the couple will have joint custody of the child. But if the parents are unmarried or cohabiting, the father has to acknowledge paternity, and they only have joint custody of the child if they both agree to that, which most couples do.

Moreover, in a consensual union there is no community property as there is in marriage. The 1988 "cohabitation-law" stipulates that if cohabitants split-up, what they have acquired for common use should be divided between them. This applies to dwellings provided they have been acquired for common use. In the event of a separation, according to the law, the partner who is most in need of the apartment/house should have it, regardless of who bought it.[6] Private property, such as stock and

[4] Both medians have been increasing, the former from 25.0 years in 1980 to 26.2 years in 1993 and to 28.4 years in 2001 and the latter from 25.6 years to 27.4 years and to 29.6 years in the same years.
[5] This Section draws on Agell (1982, 1989), Insulander-Lindh & Thunberg (1996) and Ståhlberg (2004).
[6] However, if the house/apartment was bought by one of the partners, the other one has to buy the owner off.

bank savings, is not divided. This is true also for property that was acquired before cohabitation and for property that has been acquired for private use. This is in contrast to the equal division of community property that takes place when a married couple divorce.

Finally, cohabiting couples do not automatically inherit each other. Cohabiting partners may write testaments in favor of each other, but bequests are taxed.[7] Survivors from a cohabiting union have never been entitled to widows' or widowers' pension in the public supplementary pension system, but, under certain very specific circumstances, they were eligible in the general pension scheme. Thus, these legal implications should affect the incentives to marry differently for different groups. We should expect the selection into marriage and cohabitation to be non-random processes, and as a result, married and cohabiting couples should differ.[8]

4. Data and methods

4.1 Data and sample

As mentioned, an important limitation of previous studies of marriage and cohabitation is the access to sufficiently large data sets on cohabitants with accurate information on earnings and explanatory variables. We have the advantage of using administrative data on earnings in 1985, 1987, 1989, 1990, 1992 and 1995 of the biological parents of a random sample of about 130,000 children born in 1977-87 (drawn from the population registers of Statistics Sweden). All parents in our samples were born in Sweden and married or cohabiting with each other in the 1990 Census and, in addition, all those who had children born in 1985 or earlier were married or cohabiting with each other in the 1985 Census. (A consequence of the sample design is that no fathers or mothers enter the sample after 1987). Additional information was obtained from the 1985 and 1990 censuses and from Statistics Sweden

[7] The tax on (any) inheritance was abolished from January 1, 2005.
[8] Henz and Sundström (2001) show, for example, that married mothers were more highly educated and older at first birth, on average, than cohabiting mothers. The differences between the two groups have increased over time.

special multigenerational register, allowing us to create parents' marital history, number of siblings and their year of birth, as well as the number of children at home (including any number of children from previous unions and adoptive children).

Annual earnings are obtained from the tax records and include earnings before tax from employment, sickness benefits and parental-leave benefits. To obtain estimates as close as possible to those for hourly wages (not available), we restrict the analysis to earnings above SEK 100,000[9] in 1990 prices all years for fathers[10] and earnings above SEK 50,000 in 1990 prices for mothers. We use the lower earnings limit for mothers because the average earnings of the mothers in our sample is relatively low, for example, only about SEK 83,500 in 1985 (1990 prices). Our explanatory variables include educational attainment in 1990 (obtained from the educational registers of Statistics Sweden), marital duration and number of children at home. The latter variable is made time-varying through the addition of the number of younger children in the year they are born. Since we do not know when the couples began to cohabit and since most Swedes cohabit before marriage, we use age of the oldest common biological child as a proxy for union duration for both married and cohabiting parents. For those who married prior to the birth of the oldest child, union duration is equal to marriage duration.[11] In case of divorce marriage duration is set equal to zero in the year of divorce and the father or mother is dropped (censored) from the panel estimation in that year.

We present means and frequencies for our samples in 1985 and 1990 in Table 2a and 2b. Clearly, there are large differences between married fathers (mothers) and cohabiting fathers (mothers) both years. Married persons have higher earnings and higher education, they are older, have

[9] 100,000 SEK was approximately $16,667 in 1990 which is equivalent to $24,406 in 2008 dollars.
[10] This, in fact, the same earnings limit as Antelius and Björklund (2000) apply when they demonstrate (for both sexes in 1991) that this limit produces estimates on returns to education that are highly similar to those obtained using hourly earnings.
[11] Since we miss date of marriage for those who married before 1968 but know if they were married in 1985 or not, we compute marriage duration from 1968 for these couples.

more children, and their union has lasted longer. We also observe the large number of persons marrying in Nov-Dec 1989. As expected, the marriage boom contributed to make the married in 1990 more similar to those cohabiting in 1985 and, for example, reducing considerably the fraction with a university education among married mothers in 1990.

4.2 Estimation methods

Estimates of the effect of marriage on earnings may be subject to selection bias because employers and potential spouses value the same characteristics such as loyalty and dependability, or because individuals with higher earnings potential are more likely to get married. If unaddressed, both sources of selection bias would lead to an overestimate of the effect of marriage on earnings.

The standard approach in the literature to correcting for the endogeneity of marriage is the use of fixed-effects estimation. We consider fixed-effects models because they allow us to control for unobserved, individual- or family-specific factors that do not vary over time and may be correlated with the marriage decision and earnings. Formally, let y_{it} measure male, female, or family earnings, where i indexes individuals and t indexes time. Let X_{it} be characteristics that vary across individuals and time such as education or number of children, M_{it} be marital status, and D_{it} be desirability of the individual as a spouse or worker. Consider the linear model:

$$y_{it} = \beta X_{it} + \gamma M_{it} + D_{it} + \varepsilon_{it}. \qquad (1)$$

If D_{it} is positively correlated with marital status, then the estimated coefficient on M_{it} will be biased upward. For example, dependability and individual ability are likely to be positively correlated with wages and marital status, and in the data we observe that people with higher levels of education are more likely to be married.

The standard approach is to assume that D_{it} is fixed over time and ε_{it} is uncorrelated with desirability. First differencing equation (1) with respect to time and estimate the following equation will eliminate selection bias:

$$\Delta y_i = \beta \Delta X_i + \gamma \Delta M_i + \Delta \varepsilon_i . \quad (2)$$

Under our assumptions, this procedure eliminates any observed or unobserved variables that do not vary by individual. As mentioned previously, the FE assumption is most likely invalid because marriage can be a response to economic conditions or changes in incentives. Thus, the fixed-effects methodology does not correct for bias due to unobservable characteristics that are correlated with marital status but change over time. For example, fixed-effects estimates do not correct for selection into marriage that depends on wage growth. If men are selected into marriage on the basis of wage growth, then changes in Y_{it} and M_{it} are interdependent and the estimated coefficient on the marriage variable will be biased upward if high wage growth increases the likelihood of marriage. We address the short-comings in the fixed-effects methodology by using a quasi-natural experiment, the marriage boom in Sweden in 1989, to evaluate the causal effect of marriage on the earnings of men, women, and families.

4.3 The Swedish widow's pension reform and the marriage boom in 1989

In the summer of 1988 the Swedish parliament enacted a reform abolishing the widow's pension beginning in January 1990 with certain transitional provisions. Under the old system, if a woman's husband (and certain cohabiting partners) died she was entitled to a widow's pension for the rest of her life. The pension was based on the husband's retirement income. A widow who was below the general retirement age of 65 received 40 percent of his retirement income. According to the transitional provisions, after age 65 a widow would receive the difference between the widow's

pension and her own pension. This system was replaced in 1990 by a system where children of the deceased receive child pensions at most until age 18 and the surviving partner—both sexes, married or cohabiting-- receive an adjustment pension for up to 12 months.

While the parliament's decision certainly was no secret, its significance was not immediately realized. On the contrary, it was not until the fall of 1989 that the implications of the transitional provisions gradually transpired. Importantly for our analysis, the main impact of these provisions was that all non-married women born before 1945 could gain rights to the widow's pension by marrying before the end of 1989.[12] In addition, some women who were born in 1945 or later and who had children could improve their rights to a widow's pension by marrying before 1990, but the entitlement was much more restrictive than for older women.[13] The effect of the policy change was dramatic. The propensity to marry sky-rocketed in December 1989, especially for cohabiting couples.; Figure 1 shows that the number of marriages increased from an average of 3,000 in previous Decembers to 64,000 in December, 1989 a 21-fold increase, see Figure 1.[14] It is clear from the graph that the marriage boom did not appreciably decrease marriages in the subsequent years.

Although marriage rates in November and December 1989 were particularly elevated for women over 45 (Hoem 1991, Figure 2 and 3), they were also very high for younger women, who would not financially benefit from marrying. We can interpret the latter change as a "bandwagon" effect--couples who held more or less vague plans of marrying in the future, stopped putting it off and married because so many other couples were doing so. Alternatively, they may have found it too time consuming to find out whether the woman would be eligible for a widow's pension and simpler to just to marry. In line with this interpretation, there was abundant misreporting and confusion in the media

[12] The transitional provisions for women born in 1945 or later were more restrictive and more complicated.
[13] For women born in 1945 or later who married before 1990 the widow's pension is based on the husband's accumulated retirement income at the end of 1989. Essentially, in order to have an impact on any widow's pension, the husband had to have earned a sizeable income for at least ten years before 1990.
[14] For further analyses of the marriage boom, see Hoem (1991) and Andersson (1998, 2003).

over who would benefit from marrying and who would not. For example, the Swedish newspaper *Västerbotten-kuriren* on November 12, 1989 wrote that women born **after** 1945 who have children with their cohabitant must marry before the turn of the year to be entitled to a widow's pension after their husband. This information was clearly at odds with the Widow's Pension Reform. Still another interpretation of the "bandwagon" effect is that the marriage boom made it less expensive to marry since it became acceptable to marry without having a costly reception. In fact, the most common answer among cohabiting women to the question why they were not planning to marry was that they could not afford the wedding they wished to have (Hoem B 1995). Although many couples who were ineligible for the widow's pension married in December, 1989, Figure 1 shows no corresponding decrease in marriages in the early 1990s. This dramatic response to the change in the Widow's Pension System constitutes a quasi-natural experiment that will enable us to examine the causal effect of marriage on individual and family earnings.

The validity of using the marriage boom as a random source of variation in marital status depends on the assumption that the marriage boom is uncorrelated with an individual's earnings prior to marriage. The marriage boom thus created an exogenous change in both the timing and the number of marriages. To the extent that marriage makes men more productive and facilitates specialization by women in home production we should see the same estimated effect of marriage regardless of when the marriage occurred (before or during the marriage boom). However, if the marriage boom in 1989 caused an exogenous change in the propensity to marry and marriage has no causal impact, then the marriage premium should be lower or zero for those who married during the boom.

We examine our hypotheses by estimating cross-sectional regressions that include separate marital status indicator variables for the two types of marriages:

$$y_{it} = \beta X_{it} + \gamma M_{it} + \delta MBOOM_{it} + D_{it} + \varepsilon_{it}. \quad (3)$$

where $MBOOM_{it}$ is an indicator for those who married in response to the change in the Swedish Widow's Pension and the remaining variables are defined as before. We can evaluate the impact of the quasi-natural experiment by comparing the effect of marriage on earnings of the two types of marriages, those who marry before the pension reform and those marrying as a consequence of the change in the Swedish widow's pension with those who could have married but remain as cohabitants. The fact that some couples married because they had a financial incentive to do so and some other couples married because they *believed* they had such a financial incentive or because they were carried away by the marriage of others does not matter for our purpose as long as it creates an exogenous change in the marriage rate.

Next, we evaluate the effect of the two types of marriage on earnings after controlling for unobserved, individual fixed effects as in equation (2). We hypothesize that if selection plays a role, then the estimated coefficients on marriage should be lower for those who responded to the Widow's Pension Reform in both the cross-sectional and fixed-effects estimates.

Although using the quasi-natural experiment approach has several advantages relative to standard fixed-effects models, it also has some limitations. Choice of treatment and control groups affect the reliability of the estimates. Many women who married during the marriage boom were pregnant, some were older and often had children from previous unions (Hoem 1991). Thus, the causal impact of marriage derived from these estimates may not generalize to the population of Sweden as a whole. However, it is important to note that any response to a policy promoting marriage will induce a select group to change its behavior. Thus, if there is a positive impact of marriage in

response to the change in the widow's pension, this would provide strong evidence of the causal effect of marriage.

5. Estimation Results

5.1 Cross-section estimates

We start by estimating cross-section regressions for fathers in 1985 and find that married fathers earn about four percent more than cohabiting fathers (Table 3a, Model 1). Even though marriage and cohabitation are quite similar in Sweden, legal marriage is associated with higher earnings. The estimates in Model 2 suggest that a small part of the marriage premium can be attributed to the longer duration of marital unions. But it is, in fact, the duration of marriage, and not union duration as such, that contributes to the marriage premium (Model 3). The number of children is negatively related to earnings (Model 3). Turning to the cross-section regressions for mothers in 1985, we see that the coefficient for married is negative and ranges between two to three percent in all three models (Table 3b). Marriage duration increases earnings (Models 2 and 3) and each child reduces earnings by five percent (Model 3). The increase in earnings associated with longer marriage duration is smaller for mothers than for fathers and union duration is negative and significant. As for fathers, the number of children is negatively related to earnings.

Table 3c compares the earnings of married and cohabiting families in 1985. Marriage is associated with a two percent decrease in earnings (Model 2) compared with cohabitation, but half of this marriage penalty is explained by the number of children (Model 3). Married families have more children. Thus in the cross-sectional estimates the female marriage penalty more than offsets the male marriage premium giving rise to a family marriage penalty.

Next, we estimate cross-section regressions for fathers, mothers, and couples in 1990 controlling for the marriages prior to and during the marriage boom of 1989. We see that fathers who married before the marriage boom receive a significantly larger marriage premium than those who got married during the boom (Table 4a Model 1), but when union duration and marriage duration (Model 2) and the number of children (Model 3) are taken into account the difference shrinks but remains significant. It is interesting to see that the fathers who married during boom indeed had significantly higher earnings than those who remained cohabiting (the reference group). As before, longer marriage duration is associated with higher earnings whereas the number of children is negatively related to earnings (Model 3).

Turning to the cross-section estimates for mothers in 1990 in Table 4b, we see, in contrast to the findings for fathers, that both groups of married mothers had lower earnings than the cohabiting mothers. (This is true also if we use the same earnings limit of SEK 100,000 as for fathers). In addition, mothers who married during the boom had lower earnings than those who had married before then (equality of the coefficients was rejected by an F-test at the 1 %-level). When we control for union and marriage duration and number of children, the marriage penalty for women who married before the boom is entirely explained by the number of children at home. The results in Tables 3b and 4b suggest that women specialize in home production and childcare after marriage, whereas the estimates in Tables 3a and 4a suggest that marriage and marriage duration increase men's earnings, more so for men who married prior to the 1989 marriage boom.

Table 4c examines the impact of both types of marriage on family earnings in 1990. In contrast to the 1985 estimates, we find that marriages that occurred prior to 1989 had a positive and significant effect on family earnings (Models 1 and 3). Much of the impact can be explained by

marriage duration. Marriages that occurred during the 1989 boom significantly decreased family earnings (Models 2 and 3) with much of the decrease being explained by the number of children.

In the proceeding tables, we observe significant differences in the economic impact of marriage in 1990. Men receive a small marriage premium in both types of marriage, although it is larger in marriages prior to the boom. Women who marry in 1989 experience a two percent marriage penalty. Taken together couples who married prior to 1989 receive a small marriage premium of approximately one percent and those who married during the boom face a small penalty. However, these estimates may still be biased by unobserved heterogeneity. We now consider the fixed-effects estimates.

5.2 Fixed-effects estimates

Estimating fixed-effect models should control for any time-invariant selectivity under the assumption that those who marry in 1985-1995, and who identify the marriage coefficient, are representative of the effect of marriage on earnings. Thus, if the marriage premiums observed in the cross-section analyses are due to selection into marriage based on productivity-related characteristics we should expect to find a smaller or even non-significant coefficient for married persons in the fixed-effects models. This is, indeed, what we find: for fathers who did not marry during the marriage boom we find a positive and significant marriage premium (Table 5a, Model 1) which is about half of that found in the cross-section analysis (Table 3a and 4a Model 1). For fathers who married during the boom we also find a marriage premium but only about half of that for fathers who married at some other time in all three models. Controlling for the change in duration of the union and the marriage as well as the change in the number of children (Model 3) the magnitude of the premium decreases somewhat (Table 5a Model 3) and is quite similar to the cross-sectional estimates in Table 4a. As is

clear from Model 3, part of the premium can be attributed to the positive and significant impact of an increase in the number of children at home, which is very much in line with the findings for Denmark by Datta Gupta et al (2005). In contrast to the cross-sectional estimates where longer marriage duration was associated with higher earnings, we find that changes in marriage duration have a negative and significant effect on earnings after controlling for unobserved individual effects. The estimates in Table 5a suggest that half of the male marriage premium is due to selection: those men who married prior to 1989 had twice the marriage premium of those who married during the boom, yet marriage has a significant, causal impact on men's earnings in Sweden.

When we control for unobserved characteristics for mothers, the marriage penalty doubles for mothers who married prior to 1989 and falls for those who married during the boom when compared with the cross-sectional estimates. Marriage duration increases earnings somewhat whereas the increase in the number of children decreases earnings. When we control for all variables in Model 3, we cannot reject the null hypothesis that the effect of marriage is the same for marriages prior to and during the marriage boom. This indicates that much of the marriage penalty is associated with increased numbers of children at home. Married women who have additional children are more likely to specialize in home production and childcare. Marriage, regardless of when it happens, has a causal effect on the marriage penalty that results from specialization by women in household production.

Table 5c reports fixed-effects estimates of the impact of marriage on family earnings where we only include couples in which the fathers earned more than SEK 100,000 (in 1990 prices) and there is no earnings limit imposed on women. Models 1 and 2 show that marriages prior to 1989 have a negative and significant impact on total family earnings, reducing them by approximately 1 percent. The marriage penalty for 1989 marriages is half the size of more selected marriages and only significant in Model 1. Model 3 shows that the negative effect of marriage is actually the impact of

additional children on family earnings, which can be attributed to the lower earnings of mothers after a birth since for fathers we found a child premium (Table 5a). In results not reported we included an interaction term between marriage and number of children that was positive and significant, indicating that children have a less negative impact on family earnings of the married. Taken together, the results in Tables 5a – 5c indicate that upon marriage, women reduce hours of work significantly, especially if they have more children, leading to a marriage penalty for women that entirely offsets the male marriage premium. The net effect of marriage on family income does not change after controlling for the marriage boom and unobserved heterogeneity.

5.3 Earnings Growth

We now examine earnings growth in order to evaluate whether selection or specialization occurred prior to marriage. Table 6a shows that the growth in earnings among fathers who married in 1989 was slightly higher than among those who remained cohabiting. But earnings growth was twice as high for fathers who married earlier in the period 1985-1990.[15] This finding thus lends further support to our interpretation that the male marriage premium mainly originates from selection on pre-marriage earnings.

We also see that mothers who married before the boom experienced a more negative earnings trend in 1985-1990 than those who remained cohabiting (Table 6b Model 1), and this trend was more negative than for mothers who married during the marriage boom.[16] When we control for the change in the number of children (Model 3), the marriage penalty for both types of marriages is cut in half.

[15] If the fathers who married during the boom are dropped from the estimations in Table 6a, the estimates increase in magnitude as could be expected.
[16] If the mothers who married during the boom are dropped from the estimations in Table 6b, the estimates increase in magnitude, i.e., becomes more negative, as could be expected.

Taken together the results for mothers suggest that the cohabitants who married in the end of 1989 were less specialized than those who married before then.

Table 6c examines the effect of marriage on family earnings between 1985 – 90. Unlike the results in Table 5c, couples who married prior to 1989 receive a small marriage premium that increases with marriage duration (Model 3). However, there is no effect of marriage on family earnings for those who married during the boom once we control for the increase in the number of children. These estimates indicate that couples who married before the boom were more highly selected; the men had higher earnings growth and the women were more likely to specialize in household production.

6. Conclusions

We began this analysis expecting to find little evidence of a causal effect of marriage on men's, women's, and family earnings in Sweden. We used a quasi-natural experiment, the increase in marriages in 1989 in response to the widow's pension reform along with fixed-effects methods to identify the causal impact of marriage. For men, we find a small, statistically significant marriage premium that increases with marriage duration. Our fixed-effects estimates are similar to the cross-sectional findings. Men who married prior to the marriage boom have a marriage premium that is twice the size of those who married during the 1989 boom. These results indicate that half of the male marriage premium is due to selection. Women in Sweden experience a marriage penalty regardless of when they married. Half of the marriage penalty can be explained by children. These results indicate that marriage promotes specialization in home production and child care by women and in market work by men.

Our results for couples are somewhat mixed. In the cross-sectional estimates couples who married prior to the boom receive a marriage premium that increases with marriage and union duration but decreases with additional children. Those who married during 1989 receive a marriage penalty. Once we control for unobserved heterogeneity, we find no significant effect of marriage on family earnings. However, marriage duration increases earnings while having more children decreases earnings.

Our empirical results show that the institution of marriage and selection into marriage are intertwined. Selection of high-earning men into marriage facilitates increased specialization by women leading to a marriage penalty for them. For marginal marriages brought about by the widow's pension reform, we still find evidence of a marriage premium for men that is half the size of that for those who married before the boom. Interestingly, regardless of when the marriage occurred we see women specializing in home production especially if they have additional children. The net causal effect of marriage on family earnings is negative or zero depending on the specification: the male marriage premium and the female marriage penalty offset one another.

Despite cohabitation being the social norm, a legal environment that treats cohabiting and married couples very similarly, and theoretical models that posit little difference between marriage and cohabitation, we find that marriage has a significant and causal impact on male and female wages in Sweden. Half of the male marriage premium is due to selection. Nevertheless, married men earn more than cohabiting men. The institution of marriage provides for increased specialization in household production for women regardless of how they entered the marriage. Marriage provides an 'enforceable trust'—a longer lasting commitment that enables women to specialize in household production more than their cohabiting counterparts. The net causal effect of marriage on family earnings is zero because the male marriage premium is offset by the female marriage penalty.

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Table 1: Differences in Legal Arrangement of Marriage and Cohabitation in Sweden

Legal Arrangement:	Marriage:	Cohabitation:
Obligation to Support Spouse	• **Yes: Spouses obligated to support one another**	• **No: Partners not obligated to support one another**
Paternity	• **Husband of mother is granted paternity**	• **Biological father must legally recognize child**
Custody	• **Joint Custody**	• **Requires agreement by parents**
Taxation	• **Property Income and Wealth Taxed Jointly**	• **Property Income and Wealth Taxed Jointly if share children < 18 years**
Community Property	• **Yes**	• **No**
Inheritance	• **Spouses automatically inherit**	• **Written testament required for inheritance**
Dissolution Costs	• **Dissolution requires legal costs**	• **Limited or no legal costs**

Table 2a. Means and frequencies for the male samples[a] for 1985 and 1990 by marital status.

	Fathers 1985			Fathers 1990		
	Married	Cohabiting	All	Married	Cohabiting	All
Log earnings[b]	7.15 (.301)	7.03 (.229)	7.12 (.290)	7.61 (.325)	7.50 (.274)	7.60 (.321)
Age	35.5	32.6	34.9	39.1	36.6	38.8
Compulsory education + ≤ 1 year educ.	0.281	0.348	0.296	0.274	0.346	0.283
Upper secondary education ≤ 2 years	0.221	0.332	0.245	0.256	0.349	0.267
Upper secondary education ≤ 3 years[c]	0.282	0.216	0.267	0.271	0.203	0.263
University education ≥ 3 years	0.199	0.092	0.175	0.183	0.090	0.172
# children at home	2.26	1.81	2.16	2.40	2.14	2.37
Union duration, years[d]	9.95	5.51	8.95	13.17	9.20	12.69
Marriage duration, years[e]	9.07	0	7.03	11.42	0	10.04
Married before Nov-Dec 1989				.907		
Married Nov-Dec 1989				.085		
# of observations	71,339	20,644	91,983	105,646	14,468	120,114

[a] The samples used in the cross-section analysis [b] In nominal SEK. [c] Includes those with short post-secondary education.[d] Union duration is approximated by age of oldest child or, if married prior to the birth of that child by marriage duration [e].Marriage duration is # years since marriage or, if year of marriage is missing, and we know from the Census that they were married in 1985, 1985-1968 = 17 years, as we miss date of marriage for those who married before 1968.[f] The percentage married in 1989 differs from that in 1990 since some couples married in 1990 and some divorced. [g] Refers to the child in the random sample, see Section 4.1.

Table 2b. Means and frequencies for the female samples[a] for 1985 and 1990 by marital status.

	Mothers 1985			Mothers 1990		
	Married	Cohabiting	All	Married	Cohabiting	All
Log earnings[b]	6.84 (.329)	6.80 (.290)	6.83 (.321)	7.03 (.355)	6.98 (.325)	7.02 (.351)
Age	33.0	29.9	32.2	36.6	34.0	36.3
Compulsory education + ≤ 1 year educ.	0.174	0.235	0.189	0.193	0.253	0.201
Upper secondary education ≤ 2 years	0.337	0.455	0.366	0.372	0.459	0.383
Upper secondary education ≤ 3 years[c]	0.296	0.219	0.278	0.272	0.203	0.267
University education ≥ 3 years	0.184	0.085	0.160	0.151	0.080	0.142
# children at home	2.16	1.72	2.05	2.35	2.02	2.32
Union duration, years [d]	9.65	5.16	8.57	13.17	9.15	12.67
Marriage duration, years[e]	8.83	0	7.16	11.44	0	10.00
Married before Nov-Dec 1989				.908		
Married Nov-Dec 1989				.084		
# of observations	58,899	18,646	77,545	98,801	14,142	112,943

[a] The samples used in the cross-section analysis [b] In nominal SEK. [c] Includes those with short post-secondary education.[d] Union duration is approximated by age of oldest child or, if married prior to the birth of that child by marriage duration [e].Marriage duration is # years since marriage or, if year of marriage is missing, and we know from the Census that they were married in 1985, 1985-1968 = 17 years, as we miss date of marriage for those who married before 1968.

Table 3a. Cross-section regressions on fathers' earnings in 1985. Dependent variable: log annual earnings in 1985. N=91,983

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Married	0.043**	0.006*	0.008**
	(.002)	(.003)	(.003)
Education dummies	Yes	Yes	Yes
Age and its square	Yes	Yes	Yes
Union duration, years		-0.001**	-0.000
		(.0004)	(.000)
Marriage duration, years		0.005**	0.005**
		(.0004)	(.0004)
# Children at home in 1985			-0.009**
			(.001)
Adj R-sq.	.2362	.2392	.2398

Note: Only fathers who earned more in 1985 than SEK 100,000 in 1990 prices, had children at home and positive union duration are included. Average earnings for all fathers with non-zero earnings in 1985 was SEK 220,200 in 1990 prices. Robust standard errors in parentheses. *significant at 5%; ** significant at 1%

Table 3b. Cross-section regressions on mothers' earnings in 1985. Dependent variable: log annual earnings in 1985. N=77,545.

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Married	-0.029**	-0.029**	-0.021**
	(.002)	(.004)	(.004)
Education dummies	Yes	Yes	Yes
Age and its square	Yes	Yes	Yes
Union duration, years		-0.007**	-0.003**
		(.001)	(.001)
Marriage duration, years		0.003**	0.002**
		(.0004)	(.0004)
# Children at home in 1985			-0.049**
			(.002)
Adj R-sq.	.1740	.1771	.1878

Note: Only mothers who earned more than SEK 50,000 in 1990 prices, had children at home and positive union duration are included. Average earnings for all mothers with non-zero earnings was SEK 83,500 (in 1990 prices). Robust standard errors in parentheses. *significant at 5%; ** significant at 1%

Table 3c . Cross-section regressions on family earnings in 1985.
Dependent variable: log annual family earnings in 1985. N=91,983.

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Married	-0.0003	-0.022**	-0.011**
	(.002)	(.003)	(.004)
Education dummies for both	Yes	Yes	Yes
Age and its square for both	Yes	Yes	Yes
Union duration, years		-0.009**	-0.004**
		(.0004)	(.0004)
Marriage duration, years		0.006**	0.005**
		(.0004)	(.0004)
# Children at home in 1985			-0.060**
			(.001)
Adj R-sq.	.2682	.2722	.2934

Note: Only couples in which the father earned more than SEK 50,000 in 1990 prices, who had children at home and positive union duration are included. Robust standard errors in parentheses. *significant at 5%; ** significant at 1%

Table 4a. Cross-section regressions on fathers' earnings in 1990. Dependent variable: log annual earnings in 1990. N=120,127

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Age and age squared	Yes	Yes	Yes
Education dummies	Yes	Yes	Yes
Married			-
Of which:			
married before Nov-Dec 1989	0.054** (.002)	0.009** (.003)	0.015** (.003)
married Nov-Dec 1989	0.014** (.003)	0.008* (.002)	0.010** (.003)
Union duration, years [a]		-0.001* (.0003)	0.000 (.000)
Marriage duration, years [b]		0.004** (.0003)	0.004** (.0003)
# Children at home			-0.019** (.001)
Adj R-sq.	.2336	.2361	.2384

Note: Only fathers who earned more than nominal SEK 100,000 in 1990 are included. Average earnings for all fathers with non-zero earnings was SEK 200,000. Robust standard errors in parentheses. *significant at 5%; ** significant at 1%

[a] Union duration is approximated by age of oldest child or, if married prior to the birth of that child by marriage duration.[b].Marriage duration is # years since marriage or, if year of marriage is missing, and we know from the Census that they were married in 1985, 1985-1968 = 17 years, as we miss date of marriage for those who married before 1968.

Equality betw marriage coeff rejected at p<.01 for Model 1-3.

Table 4b. Cross-section regressions on mothers' earnings in 1990. Dependent variable: log annual earnings in 1990. N=112,943

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Age and age squared	Yes	Yes	Yes
Education dummies	Yes	Yes	Yes
Married			
Of which:			
Married before Nov-Dec 1989	-0.015**	-0.013**	0.001
	(.003)	(.004)	(.004)
Married Nov-Dec 1989	-0.030**	-0.029**	-0.024**
	(.004)	(.003)	(.004)
Union duration, years [a]		0.003**	0.006**
		(.0004)	(.0004)
Marriage duration, years [b]		-0.001**	-0.002**
		(.0004)	(.0004)
# Children at home			-0.056**
			(.001)
Adj R-sq.	.1994	.2002	.2154

Note: Only mothers who earned more than SEK 50,000 in 1990 are included. Average earnings for all mothers with non-zero earnings was SEK 109,000. Robust standard errors in parentheses. *significant at 5%; ** significant at 1%

[a] Union duration is approximated by age of oldest child or, if married prior to the birth of that child by marriage duration.[b].Marriage duration is # years since marriage or, if year of marriage is missing, and we know from the Census that they were married in 1985, 1985-1968 = 17 years, as we miss date of marriage for those who married before 1968.

Equality between marriage coefficients rejected at p<.01 for Model 1-3.

Table 4c. Cross-section regressions on family earnings in 1990.
Dependent variable: log annual family earnings in 1990. N=120,114

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Age and age squared for both mums and dads	Yes	Yes	Yes
Education dummies for both	Yes	Yes	Yes
Married of which:			
married before Nov-Dec 1989	0.021**	-0.006	0.009**
	(.002)	(.003)	(.003)
married Nov-Dec 1989	-0.005	-0.009**	-0.003**
	(.003)	(.003)	(.003)
Union duration, years [a]		-0.001	0.002**
		(.0003)	(.0003)
Marriage duration, years [b]		0.003**	0.002**
		(.0003)	(.0003)
# Children at home			-0.054**
			(.001)
Adj R-sq.	.2877	.2885	.3086

Note: Only couples in which the father earned more than SEK 100,000 in 1990 are included. Robust standard errors in parentheses. *significant at 5%; ** significant at 1%

[a] Union duration is approximated by age of oldest child or, if married prior to the birth of that child by marriage duration.[b].Marriage duration is # years since marriage or, if year of marriage is missing, and we know from the Census that they were married in 1985, 1985-1968 = 17 years, as we miss date of marriage for those who married before 1968.

Equality between marriage coefficients rejected at p<.01 for Model 1 and 3 but cannot be rejected for Model 2.

Table 5a. Fixed effects estimates on change in fathers' log earnings in 1985-95.

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Married but not Nov-Dec 1989	0.025**	0.025**	0.020**
	(.002)	(.002)	(.002)
Married Nov-Dec 1989	0.013**	0.012**	0.009**
	(.002)	(.002)	(.002)
Union duration, years		-0.001	-0.002*
		(.001)	(.001)
Marriage duration, years		-0.002**	-0.001**
		(.0003)	(.0003)
#Children at home			0.011**
			(.001)
Year dummies	Yes	Yes	Yes
# observations	638,747	638,747	638,747
# individuals	128,319	128,319	128,319
R-square within	.2565	.2566	.2576

Note: Earnings are measured in fixed 1990 prices. Only fathers who earned more than SEK 100,000 (in 1990 prices) in any year are included. Robust standard errors in parentheses. *significant at 5%; ** significant at 1%
Equality between marriage coefficients rejected at p<.01 for Model 1-3.

Table 5b. Fixed effects estimates on change in mothers' log earnings in 1985-95.

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Married but not Nov-Dec 1989	-0.037**	-0.037**	-0.018**
	(.003)	(.003)	(.003)
Married Nov-Dec 1989	-0.026**	-0.021**	-0.014**
	(.004)	(.004)	(.004)
Union duration, years		-0.006**	-0.001
		(.001)	(.001)
Marriage duration, years		0.004**	0.003**
		(.0004)	(.0004)
# Children at home			-0.036**
			(.001)
Year dummies	Yes	Yes	Yes
# observations	613,430	613,430	613,430
# individuals	127,010	127,010	127,010
R-square within	.2768	.2771	.2829

Note: Earnings are measured in fixed 1990 prices. Only mothers who earned more than SEK 50,000 (in 1990 prices) in any year are included. Robust standard errors in parentheses.*significant at 5%; ** significant at 1%
Equality between marriage coefficients rejected at p<.05 for Model 1, at p<.01 for Model 2 but could not be rejected for Model 3.

Table 5c. Fixed effects estimates on change in family log earnings in 1985-95. (Fathers' earnings limit)

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Married but not Nov-Dec 1989	-0.009**	-0.008**	0.002
	(.002)	(.002)	(.002)
Married Nov-Dec 1989	-0.005*	-0.003	0.001
	(.003)	(.003)	(.003)
Union duration, years		-0.006**	-0.003**
		(.001)	(.001)
Marriage duration, years		0.002**	0.001**
		(.0003)	(.0003)
#Children at home			-0.019**
			(.001)
Year dummies	Yes	Yes	Yes
# observations	637,727	637,727	637,727
# couples	128,317	128,317	128,317
R-square within	.3079	.3081	.3106

Note: Earnings are measured in fixed 1990 prices. Only couples in which the fathers earned more than SEK 100,000 (in 1990 prices) any year are included. Robust standard errors in parentheses. *significant at 5%; ** significant at 1%.
Equality between the two marriage coefficients could not be rejected for Model 1-3

Table 6a. Fixed effects estimates on change in fathers' log earnings in 1985-90

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Married before Nov-Dec 1989	0.017**	0.017**	0.014**
	(.002)	(.002)	(.002)
Married Nov-Dec 1989	0.008**	0.008**	0.007**
	(.002)	(.002)	(.002)
Union duration, years		0.0001	-0.001
		(.001)	(.001)
Marriage duration, years		-0.0004	-0.0001
		(.0004)	(.0004)
# Children at home			0.007**
			(.0005)
Year dummies	Yes	Yes	Yes
# observations	437,806	437,806	437,806
# individuals	126,827	126,827	126,827
R-square within	.4117	.4117	.4121

Note: Earnings are measured in fixed 1990 prices. Only fathers who earned more than SEK 100,000 (in 1990 prices) any year are included. Robust standard errors in parentheses. *significant at 5%; ** significant at 1%. **Eq betw marr coeff rejected at 1 % for Model 1-3**

Table 6b. Fixed effects estimates on change in mothers' log earnings in 1985-90.

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Married before Nov-Dec 1989	-0.050**	-0.050**	-0.023**
	(.003)	(.003)	(.003)
Married Nov-Dec 1989	-0.033**	-0.022**	-0.013**
	(.004)	(.004)	(.004)
Union duration, years		-0.010**	-0.000
		(.001)	(.001)
Marriage duration, years		0.008**	0.005**
		(.001)	(.001)
# Children at home			-0.045**
			(.001)
Year dummies	Yes	Yes	Yes
# observations	403,546	403,546	403,546
# individuals	123,208	123,208	123,208
R-square within	.2973	.2982	.3213

Note: Earnings are measured in fixed 1990 prices. Only mothers who earned more than SEK 50,000 (in 1990 prices) any year are included. Robust standard errors in parentheses. *significant at 5%; ** significant at 1%.
Equality between marriage coefficients rejected at 1 % for Model 1-2, at 5 % for Model 3

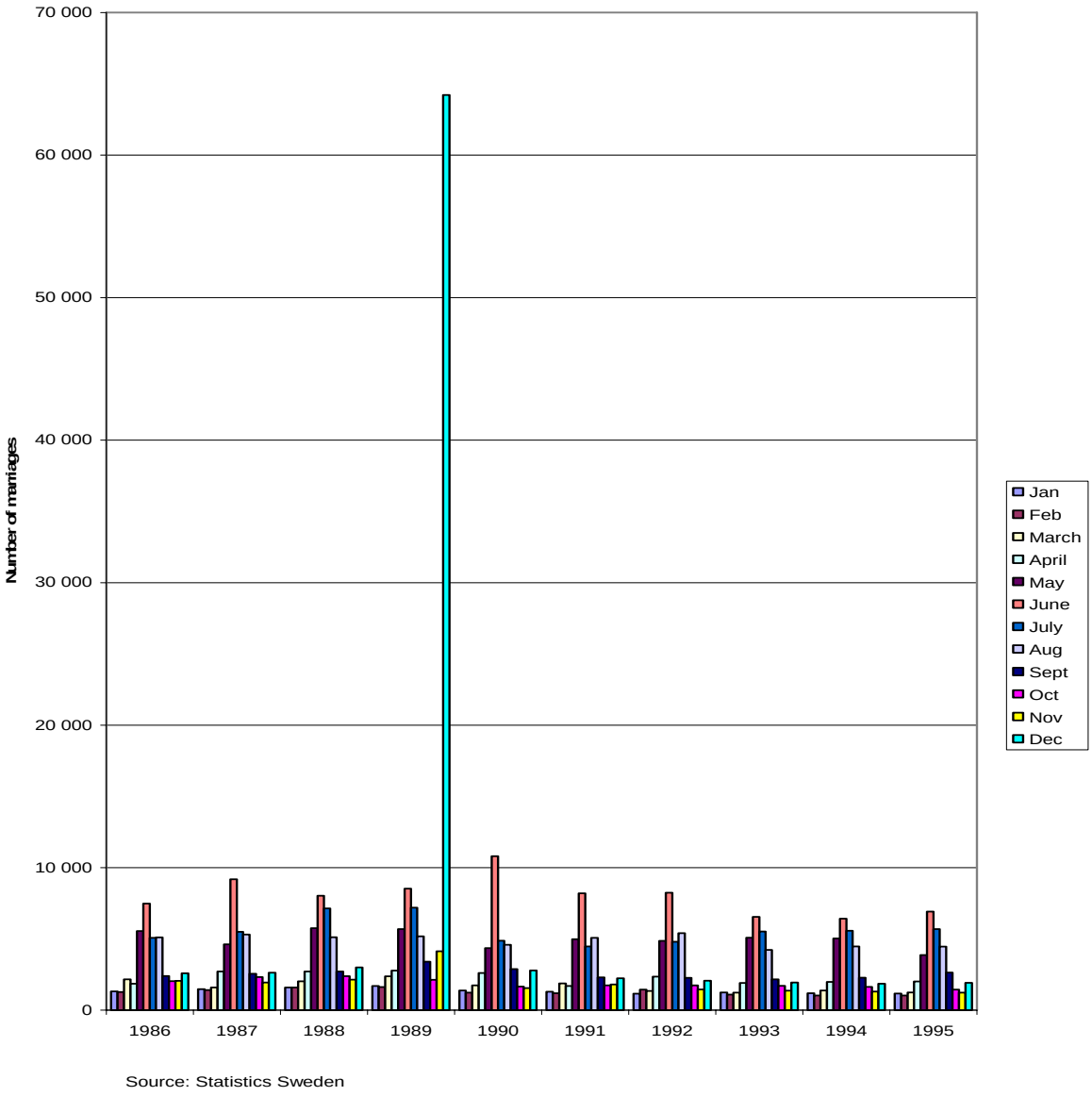
Table 6c. Fixed effects estimates on change in family log earnings in 1985-90

	Model 1	Model 2	Model 3
Constant	Yes	Yes	Yes
Married before Nov-Dec 1989	-0.008**	-0.008**	0.004*
	(.002)	(.002)	(.002)
Married Nov-Dec 1989	-0.007**	-0.003**	0.001
	(.002)	(.002)	(.003)
Union duration, years		-0.006**	-0.001
		(.001)	(.001)
Marriage duration, years		0.003**	0.001**
		(.0004)	(.0004)
# Children at home			-0.030**
			(.0006)
Year dummies	Yes	Yes	Yes
# observations	437,803	437,803	437,803
# individuals	126,827	126,827	126,827
R-square within	.4160	.4162	.4222

Note: Earnings are measured in fixed 1990 prices. Only couples in which the father earned more than SEK 100,000 (in 1990 prices) any year are included. Robust standard errors in parentheses.*significant at 5%; ** significant at 1%.

Equality between marriage coefficients cannot be rejected for Model 1-3

Figure 1. Marriages in Sweden per month 1986-1995



Source: Statistics Sweden