UiT The Arctic University of Norway

School of Business and Economics

Power of love?

An empirical analysis of married women's bargaining power on the probability of separation in Norway

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Abstract

The detraditionalization in Norway is more marketed than in many other European countries. Women have more freedom to choose how much they want to work, what they want to study, and generally more freedom to decide how they want to live their lives. With detraditionalization, women gained more bargaining power also within the household, giving them more freedom to negotiate the equal distribution of unpaid work with their partners. However, if the man still has traditional gender norms, he will probably do not accept the women's desire for equality, which can, in turn, increase the probability of household dissolution. This thesis investigates whether higher bargaining power among women in the household is associated with a higher risk for household dissolution. More specifically, I test that when the wife's hourly wage, number of hours spent at work, education, and age are higher than her husband's, the probability of separation increases. To test my hypothesis, I use register data from Statistics Norway. I analyze the data by use of logistic regression in the analytical tool microdata.no. I find that the risk of household dissolution is negatively correlated with the income and education level in the household. However, in households where the woman has a relatively higher wage or education than the man, the risk of separation is higher than in a household where the woman is relatively less educated or earns less. I further find that working full time is associated with a higher risk of household dissolution for the woman, but not for the man. The results indicate that even in Norway, where relatively few people agree with traditional gender norms, gender conflict may still be an issue.

Keywords: *Bargaining power, separation, gender norms, marital instability, labor market, women*

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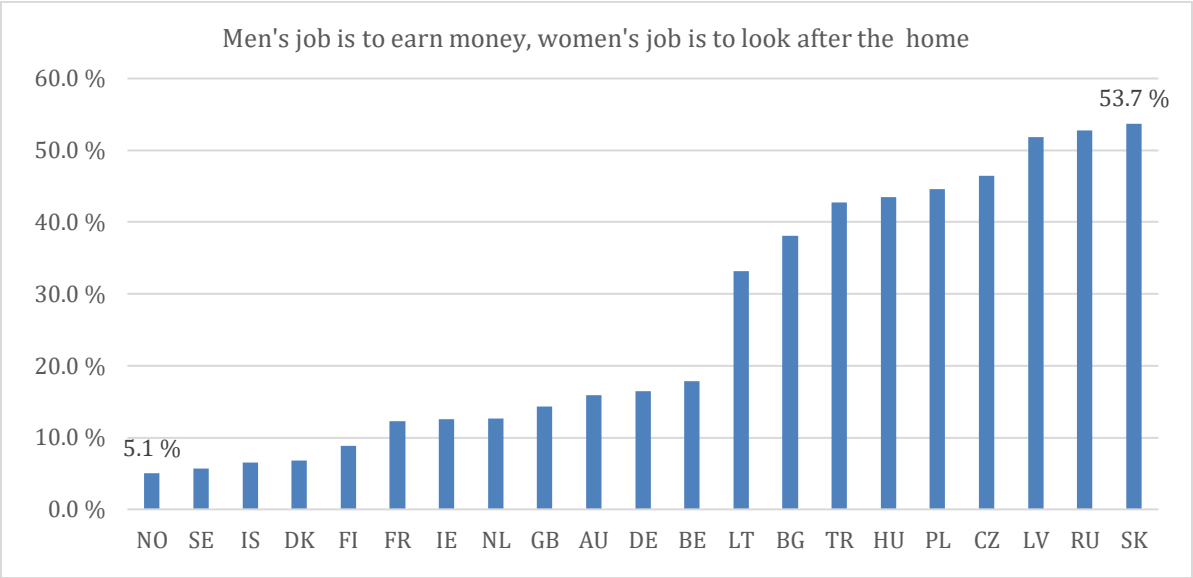
1 Introduction

Norway is a country where the detraditionalization processes are most marked (Ellingsæter, 2018). Women work almost as much as men, have a high level of education, participate in political decisions, and have generally gained more power in society. Which in itself is very good. On the other hand, we also see declining fertility rates and significant changes in marital institutions as a direct effect of the detraditionalization processes. More people choose cohabitation over marriage, and children born out of wedlock are no longer ashamed. The frequency of divorces has also increased. Countries where women have high occupational activity, such as the Nordic countries, have a higher divorce rate, lower propensity to marry, a higher proportion of cohabitants, compared with countries where gender tradition and religion are still strong (Kalmijn, 2007). In the Nordic countries, the distinction between marriage and cohabitation is more or less blurred (A. J. Cherlin, 2004). In Norway, the cohabitant's rights and obligations (parenthood, tax, inheritance, etc.) are legally regulated. They are almost equal to marriage (Ellingsæter, 2018). Despite the changes, the majority of us choose to get married anyway (A. J. Cherlin, 2004; Sobotka & Toulemon, 2008). The only difference from then until now is that those who choose to get married are more selected.

Although gender roles are not so strong in Norway, this does not apply to all other countries. The data presented in Table 1, retrieved from ISSP Research Group (ISSP, 2016), presents European counties that gave their answer to the statement: Men's job is to earn money, women's job is to look after the home. The proportion of those who answered "strongly agree" or "agree" is presented in Table 1. We can indeed see that Ellingsæter (2018) is right about detraditionalization processes in Norway. There are just 5.1% of those who responded agree with the statement. On the other hand, we can see that in Slovakia, over half of the respondents agree with the statement (53,7%). This indicates that traditional gender norms are still strong in the country and also in other countries like Russia, Latvia, Lithuania, etc.

On the other hand, with the most marked detraditionalization processes, women in Norway still earn much less than men. In 2019, women's average monthly salary per full-time was 87.6 % of men's salary. In 1998 women's monthly wages accounted for 83.6 % of men's monthly wages, increasing only four percentage points in twenty-one years (SSB, 2020).

Table 1: *The proportion of respondents agreeing with the statement: Men's job is to earn money; women's job is to look after the home, separated by country in Europe. Data from 2012 (ISSP, 2016)*



The detraditionalization processes gave the women more bargaining power in family life, and it is interesting to see if this power can explain the increased divorce rate. The objective of this study is to examine whether higher bargaining power among women in the household is associated with a higher risk for household dissolution. My research question builds on previous work by, e.g., Becker (1977,1991), Manser and Brown (1980), and Pollak (1994,1996,2005). To test my hypothesis, I use register data on married couples with small children from 2017-2018 from statistics Norway, and the estimations presented are computed using the logistic regression model.

1.1 Theoretical background

The most popular theoretical perspectives on the destabilizing effects of wife's labor market activity stand on work done by Becker (Gary S. Becker, 1991) and the New Home Economists' (Becker et al., 1977). The fundamental assumption of Becker's theory is that the husband is the household's main breadwinner, predicting that higher earnings for men would enhance marriage stability. However, the theory also assumes that only the husband contributes to the family income, making him an altruist who makes decisions. Hence, there exists just one single utility function of the household that should be maximized.

So, Becker's model assumes that the household can be treated as one unit, with one set of preferences, and that the aim of the household is to maximize consumption of goods and "household services." But men and women do not have preferences for what they do (market or household work); they care about a general "output." If men have a comparative advantage in market work, men will work, and women stay home. The problem is that Becker's model can't explain why so many households break up, even when there is a comparative advantage.

Manser and Brown (Manser & Brown, 1980) and Lundberg and Pollak (Lundberg & Pollak, 1996) note that men and women do not only care about "output" and that they have individual preferences that can collide; both want to do market work, for example. But if the household members can't agree on how to share the work (household and/or market), the household risk dissolving.

Now on to bargaining power. Suppose the man has all the bargaining power and prefers to do market work while the woman does household work, and the woman has minimal outside options, like in the early 1900s, for example. In that case, the household will stay intact, and the woman will do household work, even if she would prefer to do market work. In this situation, if women outside options increase, giving them more possibility to support themselves, the divorce rate will go up.

Hence, Becker's unitary model is no longer relevant today as it once was, especially in the Norwegian context where we have the high rates of female labor force participation and university admission (Lyngstad, 2004).

Manser and Brown (1980) and Lundberg and Pollak (Lundberg & Pollak, 1996) have a somewhat different view of the problem. They criticized the assumption that the household can be treated as a single unit and that the sole decision-maker is the husband. Manser and Brown (1980) argued that the household members have different utility functions and different preferences that do not always coincide. Consequently, the distribution of market and household work is an outcome of a bargaining process between spouses. Manser and Brown assumed that a cooperative bargaining model could represent this bargaining process. In this model, the outcome of the bargaining process depends on 1) the differences in preferences and 2) the relative bargaining power of the spouses. The relative bargaining

power, in turn, is determined by each spouse outside options if the household dissolves (i.e., if the spouses fail to reach an agreement).
Their bargaining model allows for different interests of husband and wives where formation and dissolution of marriages offer a beginning and an end to the family allocation.

According to Pollak (Pollak, 1994) are not only the resources controlled by each of the spouses or the total household income that matters but also the portion of resources controlled by the wife. Further, he discusses that the economic independence of the women increases her bargaining power within the household, which can give her the opportunity to negotiate, for example, a more favorable division of household labor.

Let us start with a typical cooperative bargaining model with only two members: a wife and a husband. His or her consumption of private goods depends on their individual utility function: U^w for the wife and U^h for the husband. Now, if they fail to reach an agreement, the payoff they receive can be represented by a "threat point" (S_w, S_h) – the utility they will receive in the event of divorce. Now, let us try to understand the gains from cooperative bargaining and refer to R_i as the utility individual i gets from the marriage/relationship. S_i will represent the utility i gets from being single, or if you like, alone. I use subscripts m and f when it matters instead of i and j to point out when it is valid for males or females. Each individual has a unique utility that they get from marriage, R_i, that arises from the factors like love, sex, children, and other marital public goods. As long as agreement on how to allocate resources exists, spouses will remain together. The total surplus from staying as a household can then be written:

$$R_i + R_j - S_i - S_j$$

In an event where they fail to cooperate, the best they can get then is S_i and S_j – the *treat points* in the cooperative bargaining game. Individuals are no longer satisfied with the relationship because $R < S$, hence the solution S is more preferable. So, the actual values of R_i and R_j are determined from the spouses bargaining on how the surpluses must be split. If there is no surplus from marriage, then both will want to walk away. We have then:

$$R_i + R_j - S_i - S_j < 0$$

This could also happen in a situation where one spouse has a benefit from the household ($R > S$), but the other does not ($R > S$), and that the disadvantage of the latter is so big that it outweighs the positive surplus for the other spouse.

Some important characteristics of the cooperative bargaining problem were introduced by John Nash, winner of a Nobel prize in Economics (Nash, 1950). Nash showed that cooperative bargaining would give an allocation that maximizes the product of each spouse's surplus:

$$(R_i - S_i) * (R_j - S_j)$$

subject to the household budget constraint. This solution is Pareto efficient, meaning that neither spouse can be made better off without making the other worse off. For example, if the wife's treat point increases, she gets less from marriage and will be more inclined to leave. Hence, we can conclude that the allocation of resources to each spouse increases with their treat point.

Hence, when the woman's bargaining power increases, via, for example, income or education, etc., then the risk of dissolution increases, given that her man prefers her to stay at home.

1.2 Empirical literature

There are many studies that have investigated what makes couples separate. One of them is the study done by Liat Raz-Yorovich (Raz-Yurovich, 2012). In his study, he investigated the validity of two main groups of theories: one that asserts that wife's work has a destabilizing effect on marriage and assumes asymmetry between the wife and the husband; another states that women's employment has a stabilizing effect and assumes that relations between them are symmetric. He uses large-scale longitudinal register-based data for the Jewish population in Israel. The results he got showed asymmetry in the effect of the spouses' economic characteristics on marital dissolution, meaning that the theories (such as discussed above) that assert asymmetry and power relations between the spouses can better explain the divorce rate in this group. The results also showed that when the wife earns as much as or more than her husband, the divorce risk in this group is highest. These findings were also in line with the bargaining models, which, as we have already discussed above, claim that the fraction of resources controlled by the wife reveal the bargaining power she has, and it can increase the

divorce threat-point (the utility she may receive in the event of separation (Pollak, 1994). It was also found that when the wife works long hours in the labor market, hence she is absent from home more often, the divorce risk increases. Now, it is important to notice that in a country such as Israel, the family is very important and central in a person's life. Women are expected to take the main responsibility for the household tasks and for raising the children. Hence this dualism may be stronger in Israel than in other countries.

Now, I would like to discuss the education and Norwegian work done by Lyngstad (2004). His study uses register, and census data on 54178 Norwegian first marriages started 1980-1999. He uses a discrete-time hazard model for the estimations. His study showed a strong negative effect on divorce and no particularly harmful influence of heterogamy. Both husband's and wife's higher level of educational attainment reduced the risk of divorce. Lyngstad also pointed out that it is unclear why education is so important for divorce risk in Norway contra many other countries. A similar result was also found in the other Nordic studies (Kravdal & Noack, 1989; Hoem 1997; Jalovaara, 2003). Lyngstad (2004) controlled not only for the couple's own educational attainment but also their parents and whether one of the spouses has taken further education after they become married. The results showed that spouses who had well-educated parents have a significantly higher risk of divorce than all other covariates. Further education led to an increased risk of divorce for both spouses. Nevertheless, a somewhat stronger effect was found for *her* level of education after marriage.

Another study of interest is work done by Safura Moeeni (2019). The study discusses the effect of education on labor force participation of married women with endogenous bargaining power. For the estimations and testing of fitness, he uses data from 2006 to 2013 Iranian Household Income and Expenditure Survey (HIES). In Moeeni's model, bargaining power within the household is endogenous since educational choice and matching in the marriage market influence bargaining power. The findings showed that those women who matched with a low educated husband had the lowest utility value, but they had the biggest share of a small pie, or the wife had more bargaining power. A potential explanation for why highly educated women who marry men with low education are least happy is that highly educated women feel dissatisfied with the level of conversation and/or that men with low education have traditionalist gender norms. Although this is not proven, an article by Schoen et al. (Schoen et al., 2002) suggests, after controlling for happiness, that when her educational

level is higher than his, the risk of separation increases. And the concept of happiness can potentially be explained as good conversations with a partner or the same understanding of life.

On the other hand, women with the lowest value of bargaining power (he was more educated than she was) had the highest value of utility. The results have also shown that women's labor force participation (LFP) was an inverse U-shaped function of bargaining power. When the women's bargaining power increases, she chooses to participate more in the labor force market. Nevertheless, when bargaining power exceeds a certain level, women choose to participate less in the labor market and choose home. This can be due to her high level of education and less opportunity for her in the labor market or due to the traditional view of gender responsibilities (Antecol, 2003).

1.3 Hypotheses

The overarching hypothesis of this thesis is that when a women's bargaining power is higher than her husband's bargaining power, the risk for household dissolution increases.

Based on the previous theoretical and empirical research, I use women's relative income, work time, education, and age as proxies for her relative bargaining power in the household.

The specific hypotheses of this thesis are:

The risk of separation when women:

1. Earn a higher income than their husband
2. Spend more time on market work than their husband
3. Have a higher education than their husband
4. Are older than their husband.

2 Method

2.1 Data

This thesis' analysis uses Norwegian register data from Statistics Norway (SSB). In 2018, the Norwegian Center for Research Data (NSD) and Statistics Norway (SSB) launched the online data portal and analysis tool microdata.no. This analysis tool makes the use of the register data in research less complicated. It is possible to analyze register data immediately since all the different variables contained in the register data are included in microdata.no. The variables found through the analytics tool include information on income, education, demographics, population characteristics like family size, gender, etc. The service is still under development, but as more variables are clarified, these are added to the database continuously. It is important to notice that confidentiality is secured, although the data is not anonymized. This means that the outputs you get are anonymous, and it is not possible to identify individuals. For example, noise is added to descriptive tables (+/-5), and it is not possible to make populations with fewer than 1000 individuals. The noise is visible in that the tables do not become additive. As with everything else, the analytic tool had to withstand certain limitations. Perhaps the biggest drawback is that researchers cannot use conventional statistics programs or analysis packages (like in an analytic program called R) together with microdata.no. This is due to the anonymization model to microdata.no shall ensure confidentiality throughout the analysis process. It is also not possible to familiarize yourself with the dataset you are using or check that processing and recoding have had the desired result (Ballo, 2019; NSD & SSB, 2018).

2.2 Sample

My analytic sample contains couples who were still married at the time of the census (2017). Microdata.no has information on the individual level, and it is possible to link parents to children. Information about marital status is available. However, it is not possible to identify married couples directly in the data. To obtain information on both the spouses in a household, I, therefore, identify couples via their children. The variable bank for microdata.no has key variables for mother and father, which can be connected to the child's individual data.

To ensure that the parents are married, I first constructed a dataset consisting of children aged 0-5 because this reduces the time to get divorced. I thereafter used the variable "children – code for the number of parents in the household and the parents' form of cohabitation." The

variable has seven categories, where one of the categories provides information about all children who live with both parents where the parents are also married. The variable was connected to my observation group, which gave me information about which of the parent's children lived with. Furthermore, I removed all the units that did not live with their married parents, keeping just these units that live with married parents. Now we can retrieve the information on the wife and the husband, but there is still a problem with duplicates. Because some families have several children, information on their parents is also the same for each household, which means that we have double information about the same household. To remove the duplicates, I had to go back to the variable overview and find a variable that describes the family using the age of the youngest person in the family. The variable was connected to my observation group, and after some coding (see appendix), it became possible to remove duplicates or siblings. Now each family has only one child (youngest) who lives with both mother and father, and mother and father are also married. Furthermore, information for both mother and father (who are married) was imported on their respective key variables. Information about salary, working hours, education and year of birth, marital status in 2017, and marital status in 2018.

Although the variable "child - code for the number of parents in the household and the parents' form of cohabitation" gave us information about the child living with both parents and the parents are married, it is the case that some couples still live together and are registered as married even if they are separated or have become widow/widower. To make sure we only work with couples who were still married in 2017, I had to remove those who were separated or became a widow/widower in 2017. The variables imported on the parent's key variables and then merged with my observation group contain a variable called "marital status in 2017". This variable, as expected, showed that my observation group indeed had both separated and widows/widowers. These were eventually removed from the dataset. The end result is then children who live with their married parents. Connected key variables also provide the opportunity to retrieve information about both mother(wife) and father(husband) simultaneously to the analysis area. Now it is possible to construct the dependent variable and the independent variables we need for this master thesis. It is important to notice that information retrieved is valid just for couples with small children. It is also essential to point out that it makes it difficult to analyze couples who do not have children, and thus we cannot compare our results with the results this observation group could give.

My analytic sample includes 118479 married couples, 1913 (1,6%) of whom had separated the year after (2018). This analysis does not include cohabitors because I am not able to identify cohabitors in my database (as is usual with register data). But knowing that cohabitants in Norway have almost the same legal rights as married couples, results presented in this paper may also be used for this group.

2.3 Variables

The dependent variable is the log-odds of a divorce in the year 2018. It is coded one if the couple got separated in 2018 and zero otherwise. These outcomes depend on different explanatory variables, which are wife's and husband's hourly wage, weekly hours spent at work, education, and age.

Below, I describe the main explanatory variables in the model. To test if households, where the woman has relatively more bargaining power than the man separates. I create variables that take the value one if the woman has or does relatively more than the man (see details below).

2.3.1 The Log of the Hourly wage

In this study, I use the hourly wage as an indication of bargaining power via income. Pollak (Pollak, 2005) argued that it is the wage rates, not earnings, that determine bargaining power between the spouses. This means that if a wife who does not work for pay while she is married or in a relationship might do so following divorce or separation, and her bargaining power would be linked to her wage rate, not her earnings while married. Further, Pollak claims that when a spouse's earnings are high because she or he decides to allocate extra hours to market work and thus less time to leisure and to household production, the spouse does not have more bargaining power. However, if his or her earnings are high because of a high wage rate, bargaining power increases. On the other hand, Pollak (1994) claims that the spouse who has more control over recourses within the household also has more bargaining power. From a microeconomic perspective, control over resources can be interpreted as earnings. It may be noted that there is disagreement in the literature concerning whether it is the wage rate or total earnings that provide bargaining power in a household. Basu (Basu, 2006) argues that earnings are a better measure of bargaining power than the wage rate. His motivation is that real income is in part driven by the number of working hours and that this

choice reflects the balance of power in the household. There exist empirical evidence supporting Basu's model (Koolwal & Ray, 2002; Maitra & Ray, 2005; Lancaster et al., 2008).

In spite of the empirical support for the Basu (2016) model, I use the wage rate as an indicator of bargaining power in this study. My main motivation for doing so is that a high wage rate indicates high social status. To control for the choice of hours devoted to market work, I also control for work hours (see below).

The wage rate variable was created as follows.

The logs of the wife's and husband's hourly wage are computed separately by taking the log of the wife's and husband's hourly wage, which in turn were computed by first taking the annual wage and dividing it by the number of months in which they were working as salaried employees. In my case, we are looking at the divorce the year after (2017-2018); hence we are dividing by 12 to compute a monthly salary. Furthermore, to compute the weekly salary, I divide the monthly salary by 4.36 (based on the assumption that an average month has 30.5 days, hence by dividing 30.5 by 7 (the week has seven days), we get 4.36). Finally, by dividing the weekly salary by the number of working hours per week, we get the hourly wage.

2.3.2 Number of Work Hours per Week

To test if time spent doing market work affects the probability to separate, I use three indicators' variables: 1) A dummy taking the value one if the woman works full time, 2) A dummy taking the value one if the man works full time, and 3) A dummy taking the value one if the woman works more than the man.

In a study done by Liat Raz – Yorovich (Raz-Yurovich, 2012), he found that when the wife works long hours in the labor market, hence she is absent from the home more often, the risk of divorce increases. The standard full-time workweek in Norway is 37.5 hours. To avoid treating people who work in a sector with lower standard work hours as part-time workers, I define full-time as working 35 hours per week or more.

The dummy variable taking the value one if the woman works more than the man includes all women who work more than their husband, no matter how many hours he or she works. Note that this variable takes the value one even if neither spouse works full time.

2.3.3 Highest Educational Degree

Following Moeeni (Moeeni, 2019), which claims that education affects women's inta-household bargaining power, I use the highest education degree for each spouse as an indication for bargaining power via income.

I use three indicator variables to test if bargaining power via education affects the probability to separate: Two dummy variables which take the value one if the woman and man have a university education, respectively, and one dummy variable taking the value one if the wife has a higher education than the husband.

To know what education can be considered as high or low, I recoded spouse's educational variable into two categories (levels): high educational level and low educational level (see appendix). Education is grouped to the Norwegian standard for education grouping (NUS)(SSB, 2019). NUS is a six-digit education code, where the 1st digit indicates the level of education. The level division intends to give the best possible picture of the structure of the Norwegian education system. The first digit shows the level of the education system for the highest level of education achieved for that person. If the first digit is 6, 7, or 8, the individual has a high level of education or education at the university level. If the first digit is 0, then a person does not have any education or has just a preschool education. All those who have 1, 2, 3, 4, 5, and 0 as the first digit are included in the low-level section. Hence, the variable univer_hlevel_(wife or husband) includes all those who have 6, 7, and 8 as the first digit.

The dummy variable taking the value one if the wife has a higher education than the husband includes all women whose education is higher than the husbands no matter what her level of education is (low or high).

2.3.4 Age and Age Difference

I include age both as a control variable and as an indicator of bargaining power (being the elderly one).

There exist several reasons to expect a negative effect of age on marital dissolution (South & Spitze, 1986). Younger people or today's more modern generation have probably more relaxed attitudes towards divorce than older people. Older people may also have fewer opportunities in the marriage market than younger people. But also, the younger generation

may have less knowledge about their spouses than older couples, and they may have less experience in handling difficulties. Another factor is that the younger generation invests less in ‘marriage-specific investments’ (like, for example, common children, houses, etc.). Becker et al. (1977) has also discussed that a large age difference may be destabilizing for the marriage. Since we do not have information about the duration of marriage or age of marriage in my data, including the age variable can indicate the effect of the existing duration of the marriage.

Another important variable in the literature is the age difference. By including this variable, though, it is not possible to include the age of both wife and husband in the same analysis. This is because we get a problem with multicollinearity. Multicollinearity can disturb any regression model when working with more than one predictor. When, for example, two predictor variables overlap so much in what they measure, their effects become indistinguishable (Grace-Martin, 2019).

The age difference is constructed as a dummy variable, coded one if the wife is older than the husband, and zero otherwise.

I summarize the variables used in the analyses in table 2 below.

Table 2: *Descriptions of the variables*

Variables	**Description**
Dependent variable	
Separated / Not separated	0 if still married the year after
	1 if separated the year after
Explanatory variables	
Hourly wage, husband	The husband's average income in 2017 on the average working hours in 2017
Hourly wage, wife	The wife's average income in 2017 on the average working hours in 2017
Wife's hourly wage > husband's hourly wage	The wife's average hourly wage in 2017 exceeds the husbands' average hourly wage in 2017
Weekly working hours, husband	The husband's working hours per week in 2017
Weekly working hours, wife	The wife's working hours per week in 2017
Wife's hours > husbands' hours	The wife's working hours per week in 2017 exceeds the husbands' working hours per week in 2017
Wife's education – high level	The wife's level of education is bachelor's degree or higher in 2017
Husband's education – high level	The husband's level of education is bachelor's degree or higher in 2017
Wife's education > husbands education	The wife's level of education exceeds the husband's level of education in 2017

2.4 Econometric approach

2.4.1 Econometric specification

The equation/model that I would like to estimate is represented by equation below:

$$\begin{aligned}\Pr(separated_{i,2018}) = \alpha &+ \beta_1 W^f_{i,2017} + \beta_2 W^m_{i,2017} + \beta_3 HigherW^f_{i,2017} \\ &+ \beta_4 FT^f_{i,2017} + \beta_5 FT^m_{i,2017} + \beta_6 HigherT^f_{i,2017} \\ &+ \beta_7 Univ^f_{i,2017} + \beta_8 Univ^m_{i,2017} + \beta_9 HigherEduc^f_{i,2017} \\ &+ \beta_{10} Age^f_{i,2017} + \beta_{11} HigherAge^f_{i,2017} + \epsilon_i\end{aligned}$$

Here α is an intercept, $W^f_{i,2017}$ and $W^m_{i,2017}$ stands for an hourly wage for the wife (female) and for the husband (male), respectively. $HigherW^f_{i,2017}$ stands for wife's hourly wage that exceeds the husband's hourly wage. $FT^f_{i,2017}$ and $FT^m_{i,2017}$ denotes that the wife and the husband work full-time, respectively. $HigherT^f_{i,2017}$ stands for the wife's working hours that exceed the husbands working hours. $Univ^f_{i,2017}$ and $Univ^m_{i,2017}$ is the wife's and the husband's high level of education (university), respectively. The wife has a higher level of education than the husband is denoted by $HigherEduc^f_{i,2017}$. The wife's age is denoted by $Age^f_{i,2017}$. Finally, $HigherAge^f_{i,2017}$ stands for age difference when the wife is older than the husband.

2.4.2 The Logistic Regression Model

Since the intention is to examine the choice behavior of the individual, the logit and probit models are the appropriate models to choose. The probit model and the logit model are two nonlinear models for binary choice where choice probabilities remain between zero and one (Hill, Griffiths, & Lim, 2018). Let $(y_i, \boldsymbol{x_i}), i = 1, \ldots, n$ be observations with binary response $y_i \in \{0,1\}$ on a covariate vector $\boldsymbol{x}_i$. A nonlinear S-shaped "sigmoid" curve is used in those models to keep the choice probability $p(y_i)$ within the interval (0,1) (please see (Hill et al., 2018, p. 686) for the figure that shows S-shaped "sigmoid" curve). Assume now, for example, that $\beta_2 > 0$, then, as an explanatory variable x_i increases, $\beta_1 + \beta_2 x_i$ increases, and the probability curve growths rapidly, but then the probability curve begins to increase at a

decreasing rate, keeping the probability less than one no matter how large the explanatory variable, x, becomes. The same principle also applies the other way, the probability approaches but never reaches zero. The change in probability, $dp(y_i)/dx_i$, is the slope of the probability curve, given a unit change in the explanatory variable, x_i. In other words, it is the marginal effect with the slope that is not constant (such as in the linear probability model). The probit and logit models, in binary choice cases, provide very similar inferences. Logit, however, is the most used model (NSD & SSB, 2020; Tutz, 2011), and it is also the model I use in this thesis.

The *logit model* has the form

$$\pi(\boldsymbol{x}_i) = F(\beta_0 + \boldsymbol{x}_i^T \beta) \tag{4.1}$$

here F denotes the logistic distribution function $F(\eta) = \exp(\eta)\,/(1 + \exp(\eta))$, and $\eta_i = \beta_0 + \boldsymbol{x}_i^T \beta$.

y_i is the outcome if individual i chooses alternative $y_i = 1$. The logit model, is then defined as:

$$ln\left\{\frac{\Pr(y=1)|\boldsymbol{x}}{\Pr(y=0)|\boldsymbol{x}}\right\} = \ln \Omega(\mathrm{x}) = \beta_0 + \beta_1 x_{i1} + \cdots + \beta_K x_{iK} = \boldsymbol{x}_i'\boldsymbol{\beta} \tag{4.2}$$

Where $\ln \Omega(\mathrm{x}) = \frac{\Pr(y=1|x)}{\Pr(y=0|x)} = \frac{\Pr(y=1|x)}{1-\Pr(y=1|x)}$

The equation (4.2) is the log-odds that the alternative $y = 1$ is chosen compared to the alternative $y = 0$. Further, the model assuming p explanatory variables, $\boldsymbol{x}_i = (x_{i1} = 1, x_{i2}, \ldots, x_{iK})$. The p-dimensional vector, $\boldsymbol{\beta}$, holds the parameters referring to the effects on x_i for choosing the alternative $y = 1$. Pr $(y = 1|\boldsymbol{x})$ is the probability that individual i choose alternative $y = 1$. These probabilities are defined as:

$$\Pr(y = 1|\boldsymbol{x}) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_1 + \cdots \beta_K x_{iK})}} \tag{4.3}$$

A more generally useful form of (4.3) is:

$$\Pr(y = 1|\boldsymbol{x}) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_1 + \cdots \beta_K x_{iK})}}$$
$$= \frac{\exp(\beta_0 + \beta_1 x_1 + \cdots \beta_K x_{iK})}{1 + \exp(\beta_0 + \beta_1 x_1 + \cdots \beta_K x_{iK})} \quad (4.4)$$

Then the probabilities $y = 0$ can be defined as:

$$\Pr(y = 0|\boldsymbol{x}) = \frac{1}{1 + \exp(\beta_0 + \beta_1 x_1 + \cdots \beta_K x_{iK})} \quad (4.5)$$

(Hill et al., 2018; Long & Freese, 2014)

Since this thesis investigates whether the probability of separation is affected by a change in the explanatory variables, the marginal effects will be calculated for interpretation. A marginal effect shows the change in the probability of an outcome for a change in one of the explanatory variables. The critical notion here is that one variable is changing while the other variable is not (Long & Freese, 2014). The average marginal effect (AME) is given by:

$$AME = \frac{1}{n}\sum_{i=1}^{n} \beta_{x_1} f(\beta x_i) \quad (4.6)$$

Here β_{x_1} denotes the log-odds ratios for variable x_1. βx_i is the linear combination of values on variable x and their estimated coefficients β, or we can also call it the value of the logit for the i-th observation. The *pdf* (probability density function) of the logistic distribution regarding βx_i is $f(\beta x_i)$. Hence, the average marginal effect (AME) states the average effect of x_1 on $\Pr(y = 1)$. This is done by taking the logistic *pdf* at each observation's estimated logit, multiplying this by the coefficient for x_1, and then averaging the product over all observations (Mood, 2010).

When AME is bigger than zero, an increase in an explanatory variable, x, increases the probability of choosing one of the alternatives (1,0). When AME is less than zero, then an

increase in explanatory variable decreases the likelihood of choosing one alternative (Hill et al., 2018; Long & Freese, 2014; Mood, 2010).

3 Results

3.1 Descriptive statistics

Table 3: *Means and standard deviations of the economic variables (N = 118,474)*

Variable	Mean (%)	SD
Wife's hourly wage	214	196
Husband's hourly wage	306	233
Wife's hourly wage is higher than her husband's	0.27	0.45
Wife works full-time	0.47	0.50
Husband works full-time	0.73	0.44
Wife works more than husband (hours)	0.10	0.30
Higher education (wife)	0.60	0.49
Higher education (husband)	0.46	0.50
Wife has higher education than husband	0.47	0.50
Age difference (Wife is older than husband)	0.15	0.35

Note: For binary variables the mean represents the percentage of these receiving the value of one

The descriptive statistics show that married women, on average, have much lower hourly wages than their husbands. Her average hourly wage is 214 NOK, while his average hourly wage is 306 NOK. It is important to point out that those with zero income were also included in the analysis. The proportion of women who have a higher hourly wage than their husbands is 27%. The husband dominates when it comes to working full-time. The proportion of men (husband) who work full-time is 73%, while it is only 47% for women (wife). Nor is there such a large proportion of women who works more than their husband (10%). On the other hand, there is a larger proportion of women (60%) than men (46%) who have higher education at the university level. 47% of women have a higher education than their husbands.

Again, the variable addresses both the low and high levels of education of the woman. Meaning that it does not matter in which category her level of education lies, as long as it is higher than her husband's. Finally, in this observation group, 15% of women are older than their husbands.

3.2 Econometric analysis

To test the hypothesis that a relatively high bargaining power among women increases the risk of household dissolution, I run a logit regression. The logit model, equation (4.2), gives the log-odds estimated. The log-odds estimates are presented in the appendix. However, the changes in log-odds are not substantively meaningful to the most audience (the slope of the graph of the logit changes as probability moves from 0 to 1. Thus, the change in the probability that $y = 1$ caused by a one-unit increase in an independent variable and holding the other independent variables constant will vary as we move from $y = 0$ to $y = 1$) (Long & Freese, 2014; Studenmund, 2011). Hence, the average marginal effects are used for interpretation.

The average marginal effects for all the explanatory variables are presented in table 4:

Table 4: *Estimated average marginal effects of economic characteristics on separation*

Variable	Margin
Log of wife's hourly wage	-0.00016
	(0.00021)
Log of husband's hourly wage	-0.0007***
	(0.00026)
Wife's hourly wage is higher than her husband's	0.00304***
	(0.00104)
Wife works full time	0.00192**
	(0.00092)
Husband works full time	-0.00106
	(0.00128)
Wife works more than husband (hours)	0.00119
	(0.00151)
High-level education - wife	-0.00843***
	(0.00096)

High-level education - husband	-0.0055*** (0.00095)
Wife has higher education than husband	0.0032*** (0.00087)
Wife's age	0.00294** (0.0014)
Wife's age squared	-0.03721** (0.01641)
Age differences	0.00315*** (0.00102)
Number of observations	118 474
Log likelihood	- 9609.52
LR chi2(13)	362.047
Prob > chi2	0
Pseudo R2	0.01849

Note: *Significant at 10%, **Significant at 5%, ***Significant at 1%.
Standard deviation in parenthesis

The results presented in table 4 show that when the wife's hourly wage increases, the probability of being separated decreases. Although the marginal effect shows a stabilizing effect on separation, it also shows that the variable is not significant. This means that her hourly wage does not affect the dependent variable or the likelihood of separation. On the other hand, the husband's hourly wage, which is also negative and has a stabilizing effect on the relationship, is significant. This telling us that when the husband's hourly wage increases, it contributes positively to the marriage and does explain the separation rate.

However, the results show that couples in which the wife's hourly wage *exceeds* her husband's hourly wage have a higher probability of separation. The marginal effect is positive and significant. The result confirms the first hypothesis and is in line with Pollak's (2005) theory, which states that couples in which the wife's hourly wage exceeds her husband's hourly wage have a higher probability of separation.

Further, the results show that when the wife works full-time, the marginal effect on separation is positive and significant. The marginal effect of the husband's full-time, on the other hand, is negative and not significant. Finally, when the wife's working hours exceed the husband's working hours, the marginal effect is positive but not significant. The results are in line with

Yurovich's (Raz-Yurovich, 2012) findings confirming that when the wife is more absent from home, the separation risk increases. On the other hand, the results do not confirm my second hypothesis, stating that it doesn't really matter if she works more than he does.

The marginal effects of education on the probability of separation are negative and significant for both spouses. The effect of the wife's higher education is substantially larger than for the husband, and it is almost twice as great. However, when her level of education exceeds his level of education, the effect becomes positive and significant. Again, the results are in line with Yurovich's (2012) findings confirming that when the wife's level of education is high, the better it is for the marriage. The result is also in line with Becker et al. (1977) claim that individuals with a high level of education will have higher gains from marriage, and therefore lower gains from divorce (Gary S Becker et al., 1977, p. 1146). The positive and significant effect of the wife's level of education that exceeds the husband's level of education confirms my third hypothesis. The result is also in line with Moeeni's (2019) study, suggesting that her bargaining power increases when she is more educated than he is.

Finally, the results show a positive and significant marginal effect of the wife's age on the probability of separation. From the second-order term, which is negative and significant, we can conclude that the effect decreases with age. The marginal effect of age difference on the probability of separation is also positive and significant. The result confirms my fourth hypothesis indicating that being "the older one" gives one more bargaining power. The result is also in line with homogamy literature (see, e.g., (Gentleman & Park, 1994)), and in line with Becker et al. (1977), who has discussed that large age differences may be destabilizing for the marriage.

4 Discussion

Well, is it the power of love or love of the power? It seems like it all started when women began to participate in the labor market and take higher educations, gaining more power in decision-making in all directions. With detraditionalization, several important questions appear on the surface. One of the questions is addressed in this master's thesis: Can the woman's bargaining power in a marriage provoke separation? Since the frequency of separation between married couples and also between cohabitants has increased, it is natural to seek an explanation for why this happens.

In this master thesis, I used the hourly wage, work time, educational level, and age as the measure of women's bargaining power. My results confirmed three of my hypotheses, i.e., that when the wife's hourly wage, educational level, and age are higher than her husband's, the probability of household dissolution increases. My results do not support the hypothesis that when the wife's working hours exceed the husband's working hours, the probability of separation increases.

Below, I provide a possible explanation of the null result for bargaining power via relative work hours.

My observation group is couples with young children, and following the sociologists, there are strong norms against divorce when couples have children (Thornton, 1977). The effect of children is especially strong when there are young children in the household (Waite & Lillard, 1991; White, 1990). Young children demand more money, effort, and time than older children (A. Cherlin, 1979). Another study argues that the gender division of labor in the household is more specialized when children are small (Waite & Lillard, 1991). It is also essential to notice that it is women's, rather than men's daily life, that is most affected according to whether or not they have small children (Craig & Mullan, 2010). Hence time allocation between spouses when they have small children may differ from the time allocation when they do not have children or have older children. The results presented are valid just for the couples with small children, and following sociologists, they confirm that couple's time allocation, when having small children, do not affect the separation rate in the same way. However, my results show a positive and significant effect of the wife's relative work hours on the probability of

separation, which can indicate that she has too little time for household work (conflict over who does what and how much), and in turn, increase the probability of household dissolution.

Even though detraditionalization and "normal" gender norms are most marked in Norway, the results suggest that there still exists a struggle for power within the household and that traditional gender norms still live quietly within the household. There is still a larger proportion of women than men who work part-time and earn the least. And although women also hold high positions in male-dominated occupations, there are not many of them (SSB, 2021). The possible explanation can be that there is still less opportunity for women in the labor market, or it can be due to the traditional view of gender responsibilities, also in Norway.

4.1 Future research/limitations

If I am to go further with this, it would have been interesting to include more information about social norms and estimate interaction effects.

Although the model in this thesis is very simple, the implications are important. In Norway, only 5.1% agree with traditional norms; however, my analyses suggest that gender conflict is still an issue. This is perhaps not completely surprising, but as Levine et al. (Levine et al., 2010) said, "Sometimes, what is obvious is only obvious when pointed out."

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Appendix

Appendix A: Categorization of education levels. The first digit classification (NUS) in parenthesis.

Levels	Education degree
High	a. University and college education, short (6) - Anyone who has completed a degree of a duration of up to 4 years - Anyone who has completed 120 credits or more in the university and college system, but who has not completed a degree - All who have completed a university and college education of a duration of up to four years up to and including the academic year 1997/98
	b. University and college education, long (7,8) - Anyone who has completed a university and college education of more than four years. - Anyone who has completed a research education/doctoral degree regardless of period.
Low	a. No education or preschool education (0)
	b. Primary school level (1,2) - Anyone who has completed and passed an elementary school education. Today, everyone who completes an elementary school education in Norway passes regardless of the results
	c. High school level (3,4) - Everyone who has completed upper secondary education, regardless of the length of the education up to and including the school year 1974/75 -Everyone who has completed upper secondary education up to and including the school year 1974/75 - All those who have completed and passed a higher education of a duration of three years or more from the school year 1995/96, i.e., mainly upper secondary course II / Vg3 education, or passed a journeyman's examination

d. Vocational school level (5)
- All those who have completed educations based on upper secondary school, but who are not approved as university and college education

Appendix B: The log-odds.

```
children» logit separate18 wife_hourly_wagelog husband_hourly_wagelog wife_hwage_higher wife_fulltime husband_fulltime
wife_worktime_higher univer_hlevel_wife univer_hlevel_husband wife_educ_higher age_wife age2_wife age_diference , mfx(dydx )
```

Antall iter: 9
Log sans: -9609.52
Antall obs: 118474
LR chi2(13): 362.047
Prob > chi2: 0
Pseudo R2: 0.01849

separate18	Coef.	Std.feil	z	P>|z|	[95% Konf.	intervall]
wife_hourly_wagelog	-0.0101	0.01371	-0.7366	0.46136	-0.03698	0.01677
husband_hourly_wagelog	-0.04437	0.01647	-2.69375	0.00706	-0.07665	-0.01208
wife_hwage_higher	0.19241	0.06557	2.93419	0.00334	0.06388	0.32093
wife_fulltime	0.12164	0.0584	2.08265	0.03728	0.00716	0.23612
husband_fulltime	-0.06714	0.08089	-0.83006	0.4065	-0.22569	0.0914
wife_worktime_higher	0.07572	0.09534	0.79423	0.42706	-0.11115	0.2626
univer_hlevel_wife	-0.53278	0.05978	-8.91131	0	-0.64996	-0.4156
univer_hlevel_husband	-0.34739	0.05989	-5.80008	0	-0.46478	-0.23
wife_educ_higher	0.20216	0.0551	3.66862	0.00024	0.09415	0.31016
age_wife	0.186	0.08857	2.09996	0.03573	0.0124	0.3596
age2_wife	-2.35	1.03542	-2.26959	0.02323	-4.37939	-0.3206
age_diference	0.19898	0.06428	3.09549	0.00196	0.07299	0.32496
Konst	3.69606	3.00893	1.22836	0.21931	-2.20134	9.59347

Appendix C (microdata.no syntax)

```
create-dataset children

/// Retrieves information about children age 0-5 and removes siblings
/// Also, here children live with their married parents (foreldrekode == 1)


import fdb4/BEFOLKNING_STATUSKODE 2018-01-01 as status
import fdb4/BEFOLKNING_KJOENN as kjønn
import fdb4/BEFOLKNING_FAR_FNR as far_nr
import fdb4/BEFOLKNING_MOR_FNR as mor_nr
import fdb4/BEFOLKNING_YNGST_I_REGSTAT_FAMNR 2017-01-01 as yngst
import fdb4/BEFOLKNING_FORELDREKODE 2017-01-01 as foreldrekode
import fdb4/BEFOLKNING_FOEDSELS_AAR_MND as birthyear
generate får = int(birthyear/100)
generate alder = 2017 - int(birthyear /100)
keep if status == '1' & alder >= 0 & alder <= 5 & foreldrekode == '1'
histogram får, discrete
histogram alder, discrete
histogram yngst, discrete
summarize får alder yngst
tabulate alder yngst, missing
generate eryngst = 0
replace eryngst = 1 if sysmiss(yngst) | alder == yngst + 1
tabulate eryngst
tabulate alder yngst if eryngst, missing
keep if eryngst


///Retrieves information about mother (wife)
/// and merges with child's data through the mother's key variable


create-dataset mor_data
import fdb4/BEFOLKNING_FOEDSELS_AAR_MND as birthyear
generate age_wife = 2017 - int(birthyear /100)
import fdb4/NUDB_BU 2017-01-01 as educ_mor
import fdb4/REGSYS_ARB_ARBEIDSTID 2017-11-16 as arbtid_mor
import fdb4/INNTEKT_WLONN 2017-01-01 as lønn_mor
import fdb4/SIVSTANDFDT_SIVSTAND 2017-01-01 as sivstand17_mor
import fdb4/SIVSTANDFDT_SIVSTAND 2018-01-01 as sivstand18_mor
merge age_wife educ_mor arbtid_mor lønn_mor sivstand17_mor sivstand18_mor into
children on mor_nr
```

```
/// Retrieves information about father (husband)
/// and merges with child's data through the father's key variable


use children
create-dataset far_data
import fdb4/BEFOLKNING_FOEDSELS_AAR_MND as birthyear
generate age_husband = 2017 - int(birthyear /100)
import fdb4/NUDB_BU 2017-01-01 as educ_far
import fdb4/REGSYS_ARB_ARBEIDSTID 2017-11-16 as arbtid_far
import fdb4/INNTEKT_WLONN 2017-01-01 as lønn_far
import fdb4/SIVSTANDFDT_SIVSTAND 2017-01-01 as sivstand17_far
import fdb4/SIVSTANDFDT_SIVSTAND 2018-01-01 as sivstand18_far
merge age_husband educ_far arbtid_far lønn_far sivstand17_far sivstand18_far into children
on far_nr


/// Removes those who live together but are separated or have become a widow/widower year
2017
/// Retains only those who are actually married in the year 2017
/// Removes those who have no information


use children
tabulate sivstand17_far
tabulate sivstand17_mor
keep if sivstand17_mor == '2' & sivstand17_far == '2'
drop if sysmiss(sivstand18_far )
drop if sysmiss(sivstand18_mor )


/// Dependent variable


generate separate18 = 0
replace separate18 = 1 if sivstand18_far == '5' & sivstand18_mor == '5'
tabulate separate18


///Re-codes for the educational levels (high and low)
/// Missing are included in a low-level of education (Do not have any)

generate husband_educ = substr(educ_far, 1,3)
generate wife_educ = substr(educ_mor, 1,3)
destring husband_educ , force
destring wife_educ , force
tabulate husband_educ
```

```
recode husband_educ (99/199 = 1) (201/299 = 2) (301/399 = 3) (401/499 = 4) (501/599 = 5)
(601/699 = 6) (701/799 = 7) (811/899 = 8) (missing = 1)
tabulate wife_educ
recode wife_educ (99/199 = 1) (201/299 = 2) (301/399 = 3) (401/499 = 4) (501/599 = 5)
(601/699 = 6) (701/799 = 7) (811/899 = 8) (missing = 1)
tabulate wife_educ

/// Dummy-variable for high-level of education (wife and husband)

generate univer_hlevel_husband = 0
replace univer_hlevel_husband = 1 if husband_educ >= 6 & husband_educ <=8
tabulate univer_hlevel_husband
generate univer_hlevel_wife = 0
replace univer_hlevel_wife = 1 if wife_educ >= 6 & wife_educ <=8

///Dummy-variable wife's education is higher than husband's

generate wife_educ_higher = 0
replace wife_educ_higher = 1 if educ_mor > educ_far

///Hourly wage mothers/father in 2017
///Those with zero hourly wage are also included

generate wife_hourly_wage = (lønn_mor/12/4.36)/ arbtid_mor
replace wife_hourly_wage = 0 if sysmiss(wife_hourly_wage )
generate husband_hourly_wage = (lønn_far/12/4.36)/ arbtid_far
replace husband_hourly_wage = 0 if sysmiss(husband_hourly_wage )
summarize husband_hourly_wage wife_hourly_wage

///Log of hourly wage wife/husband

generate wife_hourly_wagelog = log(wife_hourly_wage )
replace wife_hourly_wagelog = 0 if wife_hourly_wage == 0
generate husband_hourly_wagelog = log(husband_hourly_wage )
replace husband_hourly_wagelog = 0 if husband_hourly_wage == 0

///Dummy-variable wife's hourly wage is higher than husband's

generate wife_hwage_higher = 0
replace wife_hwage_higher = 1 if wife_hourly_wagelog > husband_hourly_wagelog

/// Dummy-variable fulltime wife/husband

generate wife_fulltime = 0
replace wife_fulltime = 1 if arbtid_mor >= 35
generate husband_fulltime = 0
replace husband_fulltime = 1 if arbtid_far >= 35
```

/// Dummy-variable wife works more hours than the husband

```
generate wife_worktime_higher = 0
replace wife_worktime_higher = 1 if arbtid_mor > arbtid_far
tabulate wife_worktime_higher
```

/// Controll variable age2 and age-differnce. Age-difference variable is a dummy variable

```
generate age2_wife = sqrt(age_wife )
generate age_diference = 0
replace age_diference = 1 if age_wife > age_husband
```

/// LOGIT

```
logit separate18 wife_hourly_wagelog husband_hourly_wagelog wife_hwage_higher
wife_fulltime husband_fulltime wife_worktime_higher univer_hlevel_wife
univer_hlevel_husband wife_educ_higher age_wife age2_wife age_diference , mfx(dydx )
```