Unemployment Rate and Divorce

(This is a working paper. Comments are welcome)

Susmita Roy*

University of Canterbury

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Abstract

This study investigates whether shifts in the unemployment rate affect the divorce probability of married and cohabiting couples. Compared to the match quality shocks utilized in the existing literature, unemployment rate movements are plausibly exogenous and affect individuals through both actual as well as potential loss of a job. I find that a rise in the unemployment rate in the wife's sector increases the odds of a separation among cohabiting couples but not among married couples. Moreover, for married couples the husband's leisure time is increasing in the wife's sectoral unemployment rate; however, the same is not true for cohabiting couples.

Keywords: Marital Dissolution, Unemployment rate, Australia

JEL classifications: J12, E24

*This paper was a part of my PHD dissertation. I would like to thank my supervisors for their help and support. I have also benefited from the comments of other faculty members in the Economics Department at the University of Virginia. All errors are mine. Contact information: susmita.roy@canterbury.ac.nz. Phone: +64 3 3642-033. This paper used data from HILDA survey. The Household, Income and Labour Dynamics in Australia (HILDA) Survey was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA), and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views based on these data should not be attributed to either FaHCSIA or the Melbourne Institute.

1 Introduction

A recent article in the New York Times, "Husbands, Wives and Hard Times", enquired about the impact of recessions on marital stability. Rising unemployment rates in the economy can subject marital relationships to a lot of stress. This is true of even those couples who have jobs as they are gripped with anxiety and fear. Anecdotal evidence suggests that divorce rates fell sharply during the Great Depression. More recently, following the recession and the slump in the housing market in the US, many couples are realizing that they do not have enough resources to take on life as singles.

Shifts in the unemployment rate can affect marriages in at least two ways. Firstly, it can affect the non-pecuniary component of match quality. Rising unemployment rates in one's sector may lead to a change in one's personality, say, by making one more acrimonious. This can potentially lead to a divorce. Secondly, a rise in the unemployment rate can affect marital surplus by changing the amount of expected income one would have access to within marriage relative to singlehood. Staying married enables one to have some control over spouse's income even if one were to lose his/her job. This pecuniary component of match quality depends on the husband's and the wife's job loss probabilities, which in turn depends on the unemployment rate in their respective sectors. When the unemployment rate in the spouse's sector is low, a small increase in one's sector specific unemployment rate may initially reduce the odds of a divorce. However, if the unemployment rate in the spouse's sector is high, the possibility of reaping pecuniary benefit out marriage diminishes and further increases in the unemployment rate in one's sector may increase the marriage dissolution probability. The size and the sign of the relationship between unemployment rate and divorce probability would then depend on (a) how well the unemployment rates predict one's future job losses and the subsequent probability of getting a job (b) on the relative strength of the expected income consideration vs. other aspects of match quality.

This paper uses individual level panel data from Australia to explore whether the divorce probability responds to a change in the sectoral unemployment rate in the husband's and the

wife's sector using a random effect probit model. The study includes both married as well as cohabiting couples. I exploit the variation in unemployment rate across state-industry-time in one's primary sector of employment to identify the coefficient of interest. The primary sector of employment is defined as the industry where one is employed in a majority of the survey rounds. The identifying assumption is that the unobserved components of match quality are uncorrelated with the right hand side variables including the choice of one's primary sector of employment and with the movement of the unemployment rate.

The results suggest that a rise in the unemployment rate in the wife's sector significantly increases the odds of a break up among the cohabiting couples. Shifts in the unemployment rates do not affect the sample of married couples. This plausibly highlights the importance of divorce costs, which are likely to be lower for the cohabiting couples. The study also assesses whether the relative movement of unemployment rates affect the allocation of leisure time within the household. Estimates from a fixed effect regression of one's leisure time on the spouse's sector-specific unemployment rate suggests that in the sample of married couples, where the wife's unemployment rate has no effect on divorce probabilities, the husband's leisure time is increasing in the lagged unemployment rate in the wife's sector. In the sample of cohabiting couples, wife's leisure time is found to be increasing in the male unemployment rate; however, an increase in the female unemployment rate does not translate into a higher leisure time for the husband.

Section 2 briefly reviews the literature. Section 3 discusses the theory. Sections 5 and 4 describes the data and the empirical model respectively. In section 6, I discuss the results. Section 7 concludes the paper.

2 Literature Review

There is an extensive literature on marriage and divorce. In this section, I discuss a handful of papers, which are relevant to my analysis. One set of papers is built around the idea that

the value of marital surplus can change overtime with the availability of new information about match quality. Weiss and Willis (1997) explores the role of new information about the spouse's income earning potential in predicting marital dissolution. The paper utilizes the difference between predicted and actual earnings as a measure of new information. One of the findings of the paper is that positive surprises related to husband's earnings reduces the odds of a divorce but positive surprise associated with the income of the wives increases the divorce probability. Charles and Stephens (2004) focuses on the first job displacement and the first health shock after marriage. The paper finds that for both the husband and the wife, job-displacement in the past three periods significantly augments the divorce probability. Health shocks do not affect marital dissolution. Another interesting finding of the paper is that job-displacements associated with layoffs predict future divorces but the same is not true for plant closings. Fan and Lui (2001) uses a unique source of match quality shock: husband's loyalty. The paper uses confidential data from a marriage counselling firm to construct this measure of match quality. The key independent variable is the response to the question: whether his/her spouse's extramarital affairs would adversely affect one's marital satisfaction. The results suggest that a marriage is more likely to end in a divorce if a spouse who answers yes to the aforementioned question, discovers that his/her spouse was actually cheating.

Another set of factors that influences divorce is its associated costs. The shift from mutual consent to unilateral divorce laws potentially reduced the costs associated with a divorce. Friedberg (1998) investigates the impact of this policy on divorce rates. She finds that the adoption of unilateral divorce laws led to an increase in the divorce rate. This is surprising. According to the Coase theorem, a redistribution of property rights should not affect divorce probabilities. Friedberg and Stern (2007) offers a potential explanation: asymmetric information. If husbands and wives have private information about their outside opportunities, then it can lead to inefficient bargaining and a divorce. Stevenson and Wolfers (2007) offers a summary of the factors which have potentially altered the outside options of an individual in the recent years. These include, for instance, the availability of the pill and

abortion technology, reduced wage gap between men and women and other such factors.

Finally, some papers have tried to identify factors that influence a couple's decision to cohabit vs. marriage. Rasul and Matouchek (2009) derive three alternate models of marriage and cohabitation. In one of the models, the exogenous benefit of staying together is higher under marriage relative to cohabitation. In the other two models, marriage acts as commitment device and as a signaling device respectively. Their empirical analysis is supportive of the view that marriage acts as a commitment device. In the sociology literature, there is a view that people who get married and those who choose to cohabit are different. Intra-household bargaining is relatively more important within cohabiting couples, where the partners are similar in terms of earned income. People who get married want to reap the benefits of specialization. Social roles of men and women also the influence intra-household decision-making for married couples but this is not necesarrily true for cohabiting couples (Brines et al, 1999; Bitman el al. 2003)

One of the limitations of match quality measures which have been used previously in the literature is that they are potentially endogenous. For instance, the measure proposed in Charles and Stephens (2004) is novel but one could argue that an individual can increase his hours of work in anticipation of a divorce along the lines of the result found in Johnson and Skinner (1986). This can affect an individual's job displacement probability. Health shock measures suffer from similar problems. In this paper, I exploit the state-industry-time variation in the unemployment rate, which is plausibly exogenously given to an individual. Another interesting feature about unemployment rate is that it can affect an individual through both actual as well as potential loss of a job.

3 Theoretical Framework

To help organize ideas, I develop a static model of divorce, which illustrates the conditions under which a rise in the unemployment rate in either one's own sector or the spouse's

sector leads to a rise in the divorce probability. The model also highlights the importance of divorce costs. There are two individuals, the husband (H) and the wife (W).[1] Their utility (V) depends on a non-pecuniary component of match quality (m) and a pecuniary component, as measured by their consumption. I assume that their consumption is a function of the income that they have access to. Suppose that the utility of the husband and the wife is of the form: $V^i = U(I^i) + m$, i=$\{H, W\}$. Here I^i is the income controlled by the i^{th} partner; note that the non-pecuniary component of utility is linearly increasing in match quality and is also additively separable. The former assumption is made for simplicity but I need to make the latter assumption since match quality is not directly observable.[2] Furthermore, since the focus is on divorce probabilities, I do not model the intra-household allocation of resources. Instead, I assume that all income is equally shared within marriage.

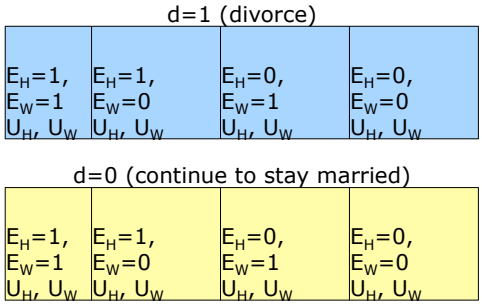
Next, I describe the timeline of events. At time 0, both of them are employed. At the beginning of period 1, they observe the unemployment rates in each other's sector. They use this information to infer the probability (q_i,i=$\{H, W\}$) that each one of them is able to keep the job. I assume that one's job loss probability is strictly increasing in u, the unemployment rate facing one's sector ($q_i = q(u_i); q' > 0$). This allows me use the $u_i's$, which are observable to measure $q_i's$ in the empirical section of the paper. Both the husband and the wife are assumed to have perfect information so that the husband's guess is same as the wife's guess.

Then, based on their expected utilities, they decide whether to stay married or to divorce. This is a joint decision in the sense that if the joint surplus of staying married falls below zero, the couple divorce. Next, the period 1 employment status, E=$\{$employed, fired$\}$=$\{1, 0\}$ of the husband and the wife is revealed and the corresponding utilities are realized. Figure 1 summarizes the set of mutually exclusive and exhaustive events which can happen, conditional on the divorce decision (d=$\{1, 0\}$). Corresponding to each of these events is the associated utility of the husband and the wife, U^H and U^W. Assume further that divorce costs k to both the husband and the wife. Let b be one's income if unemployed (k<b; b

[1] I do not model the decision to marry, and hence I assume away any selection bias.

[2] This specification implies that m=0 if divorced

Figure 1: Set of events



$\ll I^{H,W}$).[3] Let the expected utility of the husband and the wife conditional on the status of the marriage (d) be denoted by S_d^H, S_d^W respectively. For instance, the expected utility of the wife under divorce is denoted by $S_{d=1}^W$. This depends on the set of mutually, exclusive and exhaustive events summarized in Figure 1. These events are: both keep their jobs (with probability $[1-q_W]*[1-q_H]$), the husband loses his job while the wife keeps her job (with probability $[1-q_W]*[q_H]$), wife loses her job while the husband keeps his job (with probability $[q_W]*[1-q_H]$), both lose their jobs (with probability $[q_W]*[q_H]$).

$$\begin{aligned}
S_{d=0}^W &= (1-q_H)(1-q_W)U(\frac{I^W+I^H}{2}) + (1-q_W)q_H U(\frac{I^W+b}{2}) \\
&\quad +(1-q_H)q_W U(\frac{I^H+b}{2}) + q_H q_W U(b) + m + \epsilon_{dW0} \\
S_{d=1}^W &= (1-q_H)(1-q_W)U(I^W-k) + (1-q_W)q_H U(I^W-k) \\
&\quad +(1-q_H)q_W U(b-k) + q_H q_W U(b-k) + \epsilon_{dW1} \\
&= (1-q_W)U(I^W-k) + q_W U(b-k) + \epsilon_{dW1}
\end{aligned}$$

[3]The source of b could be unemployment insurance

$$
\begin{aligned}
S^H_{d=0} &= (1-q_H)(1-q_W)U(\frac{I^W+I^H}{2}) + (1-q_W)q_H U(\frac{I^W+b}{2}) \\
&\quad +(1-q_H)q_W U(\frac{I^H+b}{2}) + q_H q_W U(b) + m + \epsilon_{dH0} \\
S^H_{d=1} &= (1-q_H)(1-q_W)U(I^H-k) + (1-q_H)q_W U(I^H-k) \\
&\quad +(1-q_W)q_H U(b-k) + q_W q_H U(b-k) + \epsilon_{dH1} \\
&= (1-q_H)U(I^H-k) + q_H U(b-k) + \epsilon_{dH1}
\end{aligned}
$$

Recall that m is any factor other than income that affects marital surplus, and ϵ's are shocks corresponding to marriage and divorce, which are unobserved to the econometrician. Then, the unconditional expected utilities are:

$$
\begin{aligned}
S^W = d * S^W_{d1} + (1-d) * S^W_{d0} = d * (S^W_{d1} - S^W_{d0}) + S^W_{d0} \\
S^H = d * S^H_{d1} + (1-d) * S^H_{d0} = d * (S^H_{d1} - S^H_{d0}) + S^H_{d0}
\end{aligned}
$$

where the term within the parentheses is the benefit to an individual (the wife and the husband) of divorcing relative to staying married. The joint surplus is :

$$
\begin{aligned}
S &= d * (S^W_{d1} - S^W_{d0} + S^H_{d1} - S^H_{d0}) + S^W_{d0} + S^H_{d0} \\
&= (-1) * d * \{2(1-q_H)(1-q_w)U(\frac{I^W+I^H}{2}) + 2(1-q_W)q_H U(\frac{I^W+b}{2}) \\
&\quad +2(1-q_H)q_W U(\frac{I^H+b}{2}) + 2q_W q_H U(b) - (1-q_W)U(I^W-k) \\
&\quad -q_W U(b-k) - (1-q_H)U(I^H-k) - q_H U(b-k) \\
&\quad +2m + \epsilon_{dH1} - \epsilon_{dH0} + \epsilon_{dW1} - \epsilon_{dW1}\} + S^W_{d0} + S^H_{d0}
\end{aligned}
$$

In this structure, the term within the brace brackets (say, E) denotes the excess utility

of divorce. Hence, d=1 is optimal if E is negative.[4]

$$\begin{aligned} Pr(Divorce) &= Pr(E < 0) \\ Pr(Divorce) &= Pr(T + \epsilon < 0) = F(-T) \end{aligned}$$

where T is all terms other than ϵ and F is the cdf associated with the distribution of $\tilde{\epsilon}$=$\epsilon_{dH1} - \epsilon_{dH0} + \epsilon_{dW1} - \epsilon_{dW1}$.

Comparative statics analysis

A. Effect of an increase in divorce costs

$$\begin{aligned} \frac{\partial Pr(Divorce)}{\partial k} &= f * (-1) * [-(1-q_W)U'(I^W - k)(-1) - q_W U'(b-k)(-1) \\ &\quad -(1-q_H)U'(I^H - k)(-1) - q_H U'(b-k)(-1)] \\ &= -f * [(1-q_W)U'(I^W - k) - q_W U'(b-k) \\ &\quad +(1-q_H)U'(I^H - k) + q_H U'(b-k)] \end{aligned}$$

Holding all else constant, a rise in the divorce costs reduces the divorce probability

B. Effect of an increase in husband's/wife's unemployment rate

$$\begin{aligned} \frac{\partial Pr(Divorce)}{\partial q_i} &= f * (-1) * [-2(1-q_j)U(\frac{I^j + I^i}{2}) + 2(1-q_j)U(\frac{I^j + b}{2}) \\ &\quad -2q_j U(\frac{b + I^i}{2}) + 2q_j U(b) + U(I^i - k) - U(b-k)] \lessgtr 0 \end{aligned}$$

$i = H, W; j = W, H$

[4]Note that I have factored out -1.

The couple divorce if:

$$q_j > \frac{-U(\frac{I^j+I^i}{2}) + U(\frac{I^j+b}{2}) + \frac{U(I^i-k)}{2} - \frac{U(b-k)}{2})}{-U(\frac{I^i+I^j}{2}) + U(\frac{I^j+b}{2}) - U(b) + U(\frac{I^i+b}{2})} = t^*(say)$$

Thus, a rise in one's own sectoral unemployment leads to a rise (fall) in the divorce probability if the pre-existing level of unemployment rate in the spouse's sector is above (below) a threshold level (t*). Also note, that as k (divorce/separation cost) increases, the threshold, t* rises. This implies that holding all else constant, the lower is the value of k (divorce cost), the more likely it is that this condition will be satisfied. Another implication of the model is that the higher is the spouse's income I^j, the greater is the probability of divorce in response to a rise in one's sector-specific unemployment rate if the following condition is met (which implies that one's excess utility from divorce relative to staying together is higher in the event of job than in the event that one is able to keep the job):

$$\{\frac{U(b-k)}{2} - U(b)\} > \{\frac{U(I^i-k)}{2} - U(\frac{I^i+b}{2})\}$$

Testable hypothesis The above model suggests that the cohabiting couples are at a greater divorce risk since they face lower separation costs.[5] Secondly, if unemployment rates have any impact on separation probabilities, they will have a relatively bigger impact on the set of cohabiting couples.

4 Empirical Strategy

I estimate random effect probit equations of the following form. Let r^H and r^W denote the unemployment rate in the husband and the wife's sector respectively. The couple-specific

[5]I will use the terms separation and divorce interchangeably in this paper.

heterogeneity is denoted by μ_i.

$$y_{it} = \Phi(\beta_0 + \beta_1 X_{it} + \beta_{r,H} r_{H,t} + \beta_{r,W} r_{W,t} + \mu_i) + \epsilon_{it} \tag{1}$$

where $j = h, w$ and $i = 1$ to N while $t = 1$ to T

The unit of observation is my study is a couple-year (i,t; i=1 to N and t=1 to T). Any couple, i consists of two members, j=H,W. The dependent variable, y_{it} takes a value of 1 if the couple divorces in the upcoming two periods, and zero otherwise. The key parameters of interest are $\beta_{r,h}$ and $\beta_{r,w}$.

A positive and significant $\beta_{r,j}$ would suggest that holding all else constant, a rise in the unemployment rate in one's sector potentially reduces the gains from marriage and increases the odds of a divorce. A negative coefficient would suggest the converse. Finally, if the coefficient is insignificant it could be either because local unemployment rate is not a good predictor of one's job loss probability, or because the incremental benefit from divorce in response to a change in the unemployment rate falls short of the costs associated with the same.

Match quality is not observed perfectly by the econometricians. I follow the literature and assume that after controlling for the observable components of match quality, the couple specific heterogeneity(μ_i) is not correlated with the right hand side variables. The X_{it}'s in equation 1 are a vector of time-invariant and time varying controls which capture match quality. In this study X_{it}={education, race, industry dummies, health}. To allow for duration dependence, I control for the number of years the couple has been married. I also include a linear time trend, which captures factors such as divorce legislations, which have led to a reduction in divorce costs overtime.

I assume that $\epsilon_{i,t}$, $\sim$ IN(0, σ_ϵ^2). Furthermore, conditional on the right hand side variables, the μ_i's $\sim$ IN(0, σ_μ^2) and are independent of X's and $\epsilon_{i,t}$'s. This implies, for instance, that

match quality is uncorrelated with the movement of unemployment rates.

5 Data and Variables

This study uses the first seven waves of HILDA (Household Income and Labor Dynamics in Australia) dataset. The HILDA is a nationally representative panel of Australian households. The first wave of HILDA was conducted in 2001, the second wave was held in 2002 and so on. The seventh round was administered in the year 2007. My sample comprises of couples (legally married and cohabiting/ de facto) who were employed in the first round. According to the Australian Bureau of Statistics, in the year 2001 the de facto couples represented 12% of all socially married couples.

A: Divorce Australia adopted the no-fault divorce legislation in the year 1975. Couples seeking a divorce have to be separated for at least a year. In each of the HILDA survey rounds, an individual is asked to report his marital status: (a) legally married (b) de facto married (c) separated (d) divorced (e) widowed (f) not de facto and never married. A couple is considered to be divorced within the upcoming two periods in my study if they reported being married in the current survey round (t^{th} round) and if either the husband or the wife report being separated, single or divorced in the $t+1^{th}$ or $t+2^{th}$ round. The reason for this specification is that in the case of some couples in my sample, either the husband or the wife moves away (missing in the sample) in the $t+1^{th}$ round while the other spouse still claims to be married. In $t+2^{th}$ round the existing spouse reported being separated or divorced.

A couple is considered to be cohabiting or married in the de facto sense if both the husband (male partner) and the wife (female partner) acknowledge to be in such a relationship in the wave 1 of the survey. The couple is considered to be divorced subsequently, if either the male or the female partner reports reverting back to the singlehood status (i.e. reports his/her marital status to be separated, divorced or single). Approximately 8% (40%) of couples, who claimed to be married (cohabiting) and employed in the first wave of the survey

divorce subsequently.

B: Unemployment rate ($r_{i,t}$) construction In this paragraph, I describe the construction of an unemployment rate measure that is representative of the job opportunities facing an individual as well as varies across states and industries. I started by identifying the primary industry of employment for each individual. In this study, the primary sector is defined to be the industry where the person is employed in a majority of the survey rounds.[6] Next, I matched each individual with the unemployment rate in his/her sector of employment. According to the 2 digit ANZSIC (Australia New Zealand Standard Industrial Classification) 1993 codes, all the industries have been divided into seventeen categories. HILDA not only asks each individual to report his industry of employment but also uses his/her response to assign him/her the 2 digit ANZSIC 1993 codes corresponding to his/her industry.

I record the primary industry of a person in terms of 2 digit ANZSIC (Australia New Zealand Standard Industrial Classification) 1993 codes.[7] Next, I use the time-series on aggregate labor force and unemployed persons provided by the Australian Bureau of Statistics, to arrive at a measure of unemployment rate for each of the seventeen industrial sectors, and for each of the states and territories.

$$\text{unemployment rate proxy in, state s, sector i, year t} = \frac{\text{unemployed persons}_{s,i,t}}{\text{employed persons}_{s,i,2001}}$$

Finally, I match the set of unemployment series to individuals in the HILDA survey using the identifiers for their primary sector of employment. The construction of this variable and the data sources is described in detail in the Appendix provided at the author's webpage. In Figure 4 of the Appendix, I graph the movement of the unemployment rate proxy in each of the seventeen categories aggregated across states from 1994-2007. The figure suggests

[6] Alternatively, one could treat the primary industry to be the one, where he/she is employment in the first wave of the survey. I do this as a part of robustness check.

[7] There was a finer classification of the codes in 2006, which affected only wave 7. I used ABS cat no. 1292.0 to reclassify the wave 7 codes according to rules defined in 1993. The ABS cat no. 1292.0 is a publication of Australian Bureau of Statistics and provides detailed description of the old and new classification.

that the various sectors have performed differently over the fourteen years. In Tables 1 and 2, I report the average unemployment rate faced by the husband and the wife. The male unemployment rate is always higher than the female unemployment rate. This suggests that men and women tend to concentrate in different sectors. For instance, the construction sector, which is highly prone to business cycles but pays well is dominated by men. Women tend to concentrate in the health sector and the education sector.

C: Other controls Table 1 provides a list and description of all the right hand side variables including the aforementioned unemployment rates. The health status of an individual is a time varying covariate, which influences the likelihood of a divorce. I include indicator variables for the good health (=1, if one can do vigorous activities with ease, 0 otherwise) of the husband and wife. Table 1 suggests that around 39% of the married men and women are perfectly healthy according to this categorization. In the sample of cohabiting couples, 50% of the men and 46% of the women are in good health. Another observable component of match quality is the educational qualifications of the couple. I include indicator variables for a person's educational attainment in wave 1 of the survey (a) graduate level or higher level degree, (b) college degree or advanced diploma (c) high school certificate. The excluded category is grade 12 or lower. The descriptive statistics table suggests that in the married sample women are less likely than men (56% vs. 70%) to complete high school or attain a higher levels of education. The cohabiting partners, on the other hand, are similar in terms of educational attainment. The industry dummies constitute a time invariant measure of match quality. There are seventeen industrial categories.[8] However, I only include those sectors in the model which employ a significant section of the population. These are manufacturing sector, retail trade sector, property and business services sector, and finally health and community services sector. The remaining sectors fall within the excluded category.

[8]The industrial categories are (1) Agriculture (2) Mining (3) Manufacturing (4) Electricity Gas and Water Supply (5) Construction (6) Wholesale Trade (7) Retail Trade (8) Accommodation, Cafes and Restaurant (9) Transport and Storage (10) Communication Service (11) Finance and Insurance (12) Property and Business Services (13) Government Administration and Defense (14) Education (15) Health and Community Services (16) Cultural and Recreational Services (17) Personal and other services

Note that while the property and business sector and the retail trade sector employ a substantial number of men and women, the manufacturing sector seems to be more popular with men while a substantial number of women are employed in the health sector. I also control for the duration of marriage. The average marital duration in the married sample is around seventeen years. I do not observe this variable for cohabiting couples. Racial background of the partners can also influence marital stability. Around 44% of the married couples and 39% of the cohabiting couples are of Australian descent. The time trend captures factors common to all couples in the sample, which might have contributed to the strengthening or the weakening of marriages over the survey period. The state dummies control for time invariant factors common to all couples in a state such as divorce laws, which might affect the divorce probabilities. The states of New South Wales, Queensland and Victoria are jointly home to over 70% of the sample. The excluded states and territories are Tasmania, Western Australia, Southern Australia, Northern Territory and Australian Capital Territory.

In Table 3, I compare the married and the cohabiting couples based on other characteristics. Cohabiting couples are younger, on average. They are also less likely to have been married and have fewer children on average. This suggests that relative to married couples, the cohabiting couples are likely have better outside options and face lower divorce costs. Note, by divorce costs I referring to court fees as well as psychological costs and costs associated with raising children.

6 Results

Unemployment rate in one's primary sector and one's employment status First, I explore whether the unemployment rate in one's primary sector is a good predictor of one's labor market status. The dependent variable takes a value of one if the individual is employed, and zero if he/she is unemployed or is out of the labor force. I focus on the sample of people who were in the age-group 19-60 and were also employed in the wave 1 of the

survey. The explanatory variables in this model are the unemployment rates in one's primary sector of employment, age, health, education, state of residence and dummy variables for the sector of employment. I use measures of current as well as lagged unemployment rates associated with an individual's primary sector to capture the odds of a job loss. These include current period unemployment rate (rate), unemployment rate lagged by one period (rl1) and unemployment rate lagged by two periods (rl2), moving average of unemployment rates in the current period and the past two periods (MArate) and finally, moving average of unemployment rates lagged by one, two and three periods (MArl1). The equation is estimated separately for men and women.

Table 4 summarizes the results from a random effect probit model of unemployment rate in one's sector on one's employment status.[9] The coefficient on the unemployment rate has the expected sign.[10] Moreover, the results suggest that the unemployment rates are a better predictor of the labor market status of women relative to that of men. For women, not only is the result more robust to the inclusion of lagged unemployment rates of different order, but even the size of the coefficient is greater compared to that in the male sample. More specifically, a unit percent increase in the one period lagged unemployment rate in one's sector reduces women's employment probability by 2.67% and men's job loss probability by merely 0.1%. This disparity between the genders can partially be attributed to the differences in their social roles. Men are usually the primary bread-winners in a household and they might look for a job more desperately than women if fired. This suggests that individual heterogeneity might be relatively more important for men in explaining job-loss probabilities.

I use these results to motivate my analysis of the link between the unemployment rates and the divorce probabilities. If the unemployment rates affect one's labor market status, then they can potentially change one's relative gains from marriage and this in turn can

[9]To save space, the detailed results are reported in the author's webpage in Tables 1 and 2

[10]I exclude current unemployment rate because some people might have been interviewed just before that lost their job in the current period.

affect the probability of marital dissolution.

Unemployment rates and a couple's divorce probability As highlighted in the theory section, the change in the divorce probability in response to an increase in the husband's or the wife's sector specific unemployment rate depends on the preexisting levels of unemployment rates. Hence, one would like to estimate an equation of the form (1). However, unemployment rates are likely to be correlated across periods in a given sector and across sectors in a given period. This raises concerns about multicollinearity if both husband and wife's sector-specific unemployment rate is included in the same equation. To deal with this problem, I assume $\beta_{r,H}$ to be zero when I include $r_{W,t}$ in the model and vice versa. In other words, in this restricted model I am assuming that once the industry dummies are controlled for only one spouse's unemployment rate affects divorce probabilities.

The results are summarized in Table 5. First, I focus on the sample of cohabiting couples. The results suggest that a rise in the sector-specific unemployment rate in the wife's sector is positively associated with the divorce probability. A one percent increase in the unemployment rate raises the divorce probability in a year by 4.04%-8.23%. If husband's sector-specific unemployment rate is included in the model, assuming that $\beta_{r,W}$ =0, the results change slightly. A one percent increase in unemployment rate in the previous period is associated with a 5% decline in the divorce probability. However, a rise in the three period lagged unemployment rate in the husband's sector increases the odds of a divorce. Recall, that the unemployment rates explain women's labor market status far better than that of men. Hence, plausibly a rise in the unemployment rates give a better signal about women's job prospects and this in turn translates into higher divorce probabilities among cohabiting couples.

Unemployment rates do not seem to affect the sample of legally married couples. Even though the coefficient on the three period lagged unemployment rate is significant for the sample of wives, the partial effect of the variable is negligible. In Table 3, I compare the

characteristics of cohabiting and married couples. Cohabiting couples are around 10 years younger than the married couples. They also have fewer children than the married couples.This plausibly highlights the importance of separation costs in explaining the odds of a divorce. Another factor, which plausibly influences the decision is the clarity of the signal. Charles and Stephens (2004), for instance, finds that layoffs affect divorce probability but not plant closings. The closure of plants affects both good as well as bad workers and this might dilute the signal about the spouse's income earning potential. Analogously, job losses during periods of high unemployment rates may not convey a clear signal about the spouse's type. This combined with the higher separation costs due to the presence of children plausibly discourages legally married couples from seeking a divorce.

Among other covariates, better health of the husband significantly reduces the odds of a divorce particularly for cohabiting couples (Tables 9, 10). To the extent, that the health of a person informs us about his/her income earning potential, the result suggests that a husband's income earning potential is an important determinant of divorce probabilities. Compared to wives, who have less than 12 years of schooling, wives with a college degree are less likely face cohabitational dissolution. Education is an important predictor of one's income earning potential and plausibly the couples use it to infer about match quality. The results on the sample of married couples suggest that better health of the wife increases the odds of a divorce; husband's with a college degree are less likely to face divorce.[11] However, the partial effects corresponding to these variables is negligible and so I do not discuss the results on the married sample in the rest of the paper. Compared to the excluded industrial sectors, women in the retail trade sector are at a lower risk from divorce.

Robustness checks on the cohabiting sample In Panel A and Panel B of Table 6, I include measures of both husband and wife's sector specific unemployment rate. For one spouse, I include a dichotomous indicator, which takes a value of 1 if the corresponding un-

[11]Other papers in the literature have also found that the impact of husband's and wife's income shocks on the divorce probability is asymmetrical. for instance, Weiss and Willis (1997)

employment rate is greater than the seventy fifth percentile value across all the sectors and survey rounds. For the other spouse, I include the continuous measure of the unemployment rate. This reduces the collinearity between the two variables. The results are qualitatively unchanged. In fact, in Panel A and Panel B, the results are almost unchanged even quantitatively. Next, in Panel C of Table 6 I include the continuous measure of unemployment rate facing the husband and the wife's sector. Overall the coefficient estimates convey the same story. This gives me confidence that the results are not solely driven by multicollinearity.

As another test of robustness of the results, I use a different set of industrial dummies as the excluded category. For husbands, I include Manufacturing, Construction, Retail Trade and Property & Business sectors dummies in the model. All other sectors fall under the excluded category. For the wives, I include Health, Education, Retail Trade and Property & Business sectors dummies in the model. These are the industries that are most popular with men and women respectively. Recall that since the excluded category is a group of small industries (as opposed to one industry), changing the set of included industrial dummies can change the coefficient on the unemployment rate. The results summarized in Panel A of Table 7 show that the overall story is unchanged.

Next, I use a different definition of primary sector. Recall that the primary sector of an individual is defined as the sector where the individual is employed in a majority of the rounds. Since an individual can potentially choose his sector of employment, I check whether the results are robust to a slightly different definition. Under the new definition, the primary sector is the industry where one was employed during the first wave of the survey. The results reported in Panel B seem to mimic those found earlier.

Allocation of leisure time and unemployment rates Finally, I investigate whether unemployment rates affect the allocation of leisure time within the household. I want to see whether the would-be separated couples and non-separated couples respond differently to a change in the unemployment rates. I start from wave 1 and follow the couples until

the period when they separate. Figure 2 graphs the relative leisure ratio of the wife to the husband in the married and the cohabiting sample respectively. The figures suggest that there is hardly any gap in the leisure time available to men and women. I look at the impact of spouse's sector-specific unemployment rate on one's leisure time.

Table 8 reports a subset of the findings, where the results are significant. The sample of would-be separated and non-separated couples are denoted by S and N respectively. In the upper (lower) panel, I report results for the married (cohabiting) sample. In the sample of married couples, changes in husband's unemployment rates do not produce any significant changes in wife's leisure time. Variations in wife's sector specific unemployment rate lead to different responses among the would-be separated and non-separated couples. An increase in spouse's unemployment rates does not affect husband's leisure time in the sample of separated couples. However, a one percent increase in one period lagged unemployment rate in the wife's sector increases husband's weekly leisure time by around 2.91 hours in the sample of non-separated couples.

In the sample of cohabiting couples, a change in the unemployment rate facing the wife does not affect does affect husband's leisure time significantly. However, an increase in husband's unemployment rate is associated with a rise in wife's leisure time in both the separated and non-separated samples. It is interesting to note that in the sample of cohabiting couples, (Table 5) increases in one period lagged unemployment rate in the husband's sector is associated with a fall in divorce probability and also with a 0.05% (around 4.9 hours) increase in wives' leisure time (Table 8).

7 Conclusion

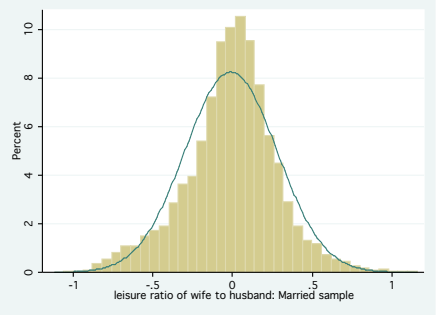
The literature on divorce has used the difference between predicted and actual income, job displacements, and physical disability to measure match quality shocks. This paper explores whether variations in unemployment rates affect marital and cohabitation dissolution using

individual level panel data from Australia. Unemployment rates are plausibly exogenous and affect people through actual as well as potential loss of a job. I include both married and cohabiting couples in my study. The costs of separation are much higher for the former group. The descriptive statistics, for instance, reveal that the median number of children for married and cohabiting couples is two and zero respectively.

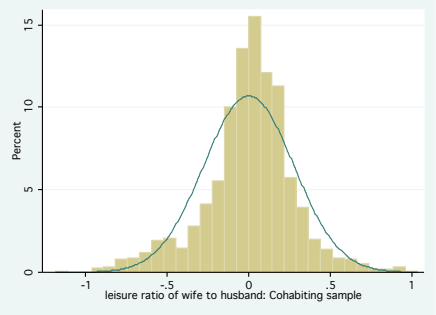
This study develops a model, which predicts that cohabiting couples are more likely to divorce in the face of rising unemployment rates, due to lower costs of separation. The results provided in this paper are supportive of this hypothesis. I find that high female unemployment rates significantly augment the odds of a divorce in the sample of cohabiting couples, but have no effect in the sample of married couples. There is no clear pattern about the relationship between male unemployment rate and divorce. This is plausibly due to the fact that unemployment rates predict women's labor market status better compared to that of men. I also assess whether variations in unemployment rates affect the allocation of leisure time within the household. Estimates from fixed effect regression of one's leisure time on spouse's sector-specific unemployment rates suggest that in the sample of married couples, husband's leisure time is increasing in the unemployment rate faced by the wife. In this sample, an increase in the wife's sector specific unemployment rate did not affect martial dissolution probability. In the sample of cohabiting couples, where divorce probability was found to be increasing in the unemployment rate in the wife's sector, a rise in wife's unemployment rate does not translate into higher leisure time for the husband.

This study assumes that the difference between married and cohabiting couples is that the former group faces much higher separation costs. There is a view in economics as well as in the sociology literature that suggests that married couples are more committed. The empirical results of this study could partly be driven by this factor as well.

Figure 2: Distribution of leisure time



(a) married sample



(b) cohabiting sample

Table 1: Descriptive Statistics: legally married sample

Y=1 if divorced, 0 otherwise		% brokeup between rounds 2-7=8.36%			
Married Sample	sample of 1641 couples, sample size=6657	Mean	Std. Dev.	Mean	Std. Dev.
X	Description	Husband characteristics		Wife characteristics	
ln(rate)	log(current unemployment rate)	1.16	0.55	0.99	0.52
ln(rl1)	log(1 period lagged unenmplyment rate)	1.12	0.55	0.90	0.57
ln(rl2)	log(2 period lagged unenmplyment rate)	1.10	0.54	0.85	0.57
ln(rl3)	log(3 period lagged unenmplyment rate)	1.12	0.54	0.83	0.57
ln(MArate)	log(Moving average of current, lag 1, lag 2 rate)	1.16	0.49	0.94	0.50
ln(MArl1)	log(Moving average of lag 1, lag 2, lag3 rate)	1.14	0.49	0.89	0.51
Health dummy	1 if one can do vigorous activities with ease	0.39	0.49	0.38	0.49
Graduate	Had graduate degree in wave 1	0.14	0.35	0.13	0.34
College	Had College degree in wave 1	0.24	0.43	0.28	0.45
High school certificate	Held school certificate in wave 1	0.33	0.47	0.16	0.37
Health sector	Belongs to health sector	0.05	0.22	0.23	0.42
Manufacturing	Belongs to manufacturing sector	0.13	0.34	0.05	0.22
Property & Business	Belongs to property and business sector	0.11	0.31	0.10	0.30
Retail sector	Belongs to retail trade sector	0.09	0.28	0.11	0.32
Australian	Couple's parents are Australian	0.44	0.50		
Duration	time since married	17.41	10.11		
Wave	Time trend	2.82	1.43		
NSW	New South Wales dummy	0.29	0.45		
VIC	Victoria	0.27	0.44		
QLD	Queensland	0.19	0.39		

Table 2: Descriptive Statistics: cohabiting sample

Y=1 if divorced, 0 otherwise		% brokeup between rounds 2-7=40%		
sample of 350 cohabiting couples, sample size=1136	Mean	Std. Dev.	Mean	Std. Dev.
X	husband characteristics		wife characteristics	
ln(rate)	1.18	0.61	1.00	0.60
ln(rl1)	1.15	0.58	0.88	0.61
ln(rl2)	1.14	0.55	0.83	0.58
ln(rl3)	1.16	0.53	0.83	0.57
ln(MArate)	1.18	0.52	0.94	0.54
ln(MArl1)	1.17	0.50	0.88	0.53
Health dummy	0.50	0.50	0.46	0.50
Graduate	0.11	0.31	0.16	0.37
College	0.27	0.45	0.36	0.48
High school certificate	0.30	0.46	0.17	0.38
Health sector	0.04	0.20	0.21	0.41
Manufacturing	0.15	0.36	0.05	0.22
Property & Business	0.15	0.35	0.14	0.35
Retail sector	0.07	0.26	0.11	0.32
Australian	0.39	0.49		
Wave	2.58	1.39		
NSW	0.29	0.45		
VIC	0.23	0.42		
QLD	0.21	0.41		

Notes: For cohabiting couples I do not observe the length of the relationship

Table 3: Comparing characteristics of married and cohabiting couples

X	Cohabiting sample	Married sample
Ever married	5.14%	12.58 %
Husband's median age	35	45
Wife's median age	32	43
Median [Mean] children ever had (biological or adopted)		
Husband	0[2.078]	2 [2.067]
Wife	0 [0.886]	2 [0.874]

Table 4: Unemployment rate and employment status

Male sample						
X=unemployment rate	log(rate)	log(rl1)	log(rl2)	log(rl3)	log(MArate)	log(MArl1)
Coefficient	0.54***	-0.13**	-0.14**	0.00	0.12	-0.15**
Std. error	[0.07]	[0.06]	[0.06]	[0.06]	[0.08]	[0.07]
Partial effect at average	0.004	-0.001	-0.001			-0.002
SER	94.27%	94.27%	94.27%	94.27%	94.27%	94.27%
PER	99.6%	99.6%	99.6%	99.6%	99.6%	99.6%
Observations	22890	22890	22890	22890	22890	22890
Female sample						
X=unemployment rate	log(rate)	log(rl1)	log(rl2)	log(rl3)	log(MArate)	log(MArl1)
Coefficient	0.27***	-0.50***	-0.37***	-0.15***	-0.37***	-0.53***
Std. error	[0.06]	[0.05]	[0.04]	[0.04]	[0.06]	[0.06]
Partial effect at average	0.015	-0.026	-0.020	-0.008	-0.020	-0.029
SER	88.96%	88.96%	88.96%	88.96%	88.96%	88.96%
PER	97.6%	97.6%	97.6%	97.6%	97.6%	97.6%
Observations	20751	20751	20751	20751	20751	20751
Model	R. E. Probit	R. E. Probit	R. E. Probit	R. E. Probit	R. E. Probit	R. E. Probit

Notes: Y=1 if employed, 0 otherwise. The sample comprises of people in age group 19-66 and who were also employed in wave 1.

SER is sample employment rate; PER is the predicted employment rate.

The detailed results are reported in Tables 1 and 2 in author's webpage

Table 5: Unemployment rate and divorce probability

X=	log(rl1)	log(rl2)	log(rll3)	log(MArate)	log(MArl1)
Wife's unemployment rate	**Panel A** (cohabiting sample)				
Coefficient	0.06	0.20*	0.42***	0.12	0.25**
Std. error	[0.10]	[0.11]	[0.11]	[0.13]	[0.13]
Partial effect at average		4.04%	8.23%		5.03%
Predicted divorce probability		11.8	11.56		11.79
Husband's unemployment rate	**Panel B** (cohabiting sample)				
Coefficient	-0.26**	0.02	0.38***	-0.20	-0.01
Std. error	[0.12]	[0.12]	[0.13]	[0.15]	[0.15]
Partial effect at average	-5.21%		7.44%		
Predicted divorce probability	11.73%		11.67%		
X=	log(ratel1)	log(rl2)	log(rll3)	log(MArate)	log(MArl1)
Wife's unemployment rate	**Panel C** (married sample)				
Coefficient	-0.28**	-0.05	0.31*	-0.11	-0.04
Std. error	[0.13]	[0.16]	[0.16]	[0.22]	[0.19]
Partial effect at average	0.001%		0.001%		
Predicted divorce probability	0.001%		0.002%		
Husband's unemployment rate	**Panel D** (married sample)				
Coefficient	-0.08	-0.07	0.21	-0.01	0.02
Std. error	[0.14]	[0.15]	[0.15]	[0.20]	[0.20]

Notes: rl$k$ is k period lagged unemployment rate; MArate (MArl1) is moving average of current period rate, rl1, rl2 (rl1, rl2,rl3)

The detailed results are reported in Tables 3-6 in author's webpage.

The annual divorce rate in cohabiting (married) sample is 11% (1.81%)

Table 6: Robustness Check: including both husband and wife's unemployment rate

Cohabiting sample	[2]	[3]	[4]	[5]	[6]
X	log(rl1)	log(rl2)	log(rl3)	log(MArate)	log(MArl1)
Panel A					
Wife's unemployment rate	0.06	0.21*	0.42***	0.12	0.26**
	[0.10]	[0.11]	[0.11]	[0.13]	[0.13]
Husband's high unemployment dummy	0.13	0.14	0.14	0.13	0.14
	[0.13]	[0.13]	[0.13]	[0.13]	[0.13]
Panel B					
Husband's unemployment rate	-0.28**	0.01	0.38***	-0.21	-0.02
	[0.12]	[0.12]	[0.13]	[0.15]	[0.15]
Wife's high unemployment rate dummy	0.18	0.16	0.16	0.18	0.16
	[0.14]	[0.14]	[0.14]	[0.14]	[0.14]
Panel C					
Wife's unemployment rate	0.11	0.21*	0.37***	0.14	0.30**
	[0.11]	[0.11]	[0.12]	[0.13]	[0.12]
Husband's unemployment rate	-0.29**	-0.03	0.29**	-0.22	-0.05
	[0.12]	[0.13]	[0.14]	[0.15]	[0.15]
Observations	1136	1136	1136	1136	1136
Number of couples	350	350	350	350	350

Notes: High unemployment is defined as a rate, which is greater than 75th percentile rate
Panel A uses dummy (continuous) variable for husband's (wife's) unemployment rate
Panel B uses dummy (continuous) variable for wife's (husband's) unemployment rate
Panel C uses continuous variables for husband's and wife's unemployment rate

Table 7: Unemployment rate and divorce probability

	log(rl1)	log(rl2)	log(rl3)	log(MArate)	log(MArl1)
Panel A: Different industrial dummies for men and women					
Wife's rate	0.09	0.28**	0.62**	0.20	0.42***
Std error	[0.12]	[0.13]	[0.28]	[0.16]	[0.16]
PAE		5.60%	11.79%		8.23%
β_r^H =0*					
Husband's rate	-0.31***	-0.05	0.29**	-0.27*	-0.08
Std error	[0.12]	[0.12]	[0.13]	[0.15]	[0.14]
PAE	6.10%		5.75%	5.24%	
β_r^W =0*					
Panel B: Alternate definition of primary sector					
Wife's rate	0.07	0.21**	0.42***	0.12	0.26**
Std error	[0.10]	[0.10]	[0.11]	[0.11]	[0.12]
PAE		4.19%	8.21%		5.10%
β_r^H =0*					
Husband's rate	-0.28***	-0.06	0.23*	-0.24*	-0.1
Std error	[0.10]	[0.11]	[0.12]	[0.12]	[0.13]
PAE	5.56%		4.50%	4.71%	

Notes: PAE is partial effect at the average; PDP is predicted divorce probability. Panel A uses Construction Sector, Manufacturing Sector, Property and Business Sector, and Retail Trade Sector for men and Education Sector, Health Sector, Property and Business Sector, and Retail Trade Sector for women. In Panel B, the industrial dummies included in the model are Manufacturing Sector, Property and Business Sector,Health Sector, and Retail Trade Sector; $\beta_r^{\text{W or H}}$ =0 by assumption.

Table 8: Fixed effect regression of leisure time on unemployment rates

	S	N	S	N	S	N	S	N
Married sample								
Y=ln(husband's leisure)	log(wiferl1)	log(wiferl1)	log(wiferl2)	log(wiferl2)	log(wiferl3)	log(wiferl3)	log(wifeMArl1)	log(wifeMArl1)
unemployment rate	0.01	0.03***	0.00	-0.01	0.06	0.00	0.10	0.02*
	[0.03]	[0.01]	[0.04]	[0.01]	[0.04]	[0.01]	[0.08]	[0.01]
husband's health dummy	-0.01	-0.02***	-0.01	-0.03***	-0.02	-0.03***	-0.02	-0.03***
	[0.03]	[0.01]	[0.03]	[0.01]	[0.03]	[0.01]	[0.03]	[0.01]
wife's health dummy	-0.02	-0.01**	-0.02	-0.01**	-0.02	-0.01**	-0.02	-0.01**
	[0.03]	[0.01]	[0.03]	[0.01]	[0.03]	[0.01]	[0.03]	[0.01]
time trend	-0.01	0.00***	0	0.01***	-0.01	0.01***	-0.01	0.00***
	[0.01]	[0.00]	[0.01]	[0.00]	[0.01]	[0.00]	[0.01]	[0.00]
constant	4.54***	4.54***	4.54***	4.57***	4.50***	4.57***	4.48***	4.55***
	[0.04]	[0.01]	[0.04]	[0.01]	[0.04]	[0.01]	[0.06]	[0.01]
Observations	335	7267	335	7267	335	7267	335	7267
R-squared	0.006	0.014	0.005	0.01	0.016	0.01	0.014	0.01
Cohabiting sample								
Y=log(wife's leisure)	log(husrl1)	log(husrl1)	log(husrl2)	log(husrl2)	log(husrl3)	log(husrl3)	log(husMArl1)	log(husMArl1)
unemployment rate	0.04	0.05**	0.05	0.01	0.09*	-0.02	0.14**	0.04
	[0.04]	[0.03]	[0.04]	[0.03]	[0.04]	[0.03]	[0.06]	[0.04]
husband's health dummy	-0.07**	-0.04**	-0.07**	-0.04**	-0.07**	-0.04*	-0.07**	-0.04**
	[0.04]	[0.02]	[0.04]	[0.02]	[0.03]	[0.02]	[0.03]	[0.02]
wife's health dummy	0	-0.06***	0	-0.06***	0	-0.06***	0	-0.06***
	[0.04]	[0.02]	[0.04]	[0.02]	[0.04]	[0.02]	[0.04]	[0.02]
time trend	-0.01	-0.03***	-0.01	-0.03***	-0.01	-0.03***	-0.01	-0.03***
	[0.01]	[0.00]	[0.01]	[0.00]	[0.01]	[0.00]	[0.01]	[0.00]
constant	4.61***	4.68***	4.61***	4.73***	4.57***	4.76***	4.50***	4.70***
	[0.05]	[0.04]	[0.05]	[0.04]	[0.06]	[0.04]	[0.07]	[0.05]
Observations	397	777	397	777	397	777	397	777
R-squared	0.027	0.085	0.028	0.078	0.036	0.079	0.045	0.079

Notes: (1) S=sample of would-be separated couples;N=sample of non-separated couples;

(2) The average leisure time in hours per week of husband (wife) is 93.73 and 97.88 (103.76 and 102.63) in S, N sample respectively.

(3) rl$k$ is k period lagged unemployment rate; MArate (MArl1) is moving average of current period rate, rl1, rl2 (rl1, rl2,rl3)

Table 9: Female unemployment rate and break-up probability:cohabiting sample

Y=divorce rate	log(rl1)	log(rl2)	log(rl3)	log(MArate)	log(MArl1)
unemployment rate	0.06	0.23**	0.44***	0.13	0.27**
	[0.11]	[0.11]	[0.12]	[0.13]	[0.13]
Husband's characteristics					
health dummy	-0.27***	-0.27***	-0.26***	-0.27***	-0.26***
	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]
graduate or higher	-0.08	-0.03	0.01	-0.07	-0.03
	[0.20]	[0.20]	[0.20]	[0.20]	[0.20]
college educated	-0.13	-0.12	-0.12	-0.13	-0.12
	[0.14]	[0.14]	[0.14]	[0.14]	[0.14]
high school educated	0	0	-0.01	0	0
	[0.12]	[0.13]	[0.13]	[0.12]	[0.13]
Health	0.05	0.04	0.03	0.09	0.04
	[0.26]	[0.26]	[0.26]	[0.26]	[0.26]
Manufacturing	-0.19	-0.18	-0.16	-0.19	-0.17
	[0.15]	[0.15]	[0.15]	[0.15]	[0.15]
Property&Business	0.09	0.1	0.1	0.09	0.1
	[0.15]	[0.15]	[0.16]	[0.15]	[0.15]
Retail Trade	-0.05	-0.04	-0.03	-0.05	-0.04
	[0.19]	[0.19]	[0.20]	[0.19]	[0.19]
Wife's characteristics					
health dummy	-0.07	-0.07	-0.07	-0.07	-0.06
	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]
graduate or higher	-0.18	-0.14	-0.08	-0.16	-0.12
	[0.17]	[0.17]	[0.17]	[0.17]	[0.17]
college educated	-0.30**	-0.28**	-0.25*	-0.28**	-0.27**
	[0.13]	[0.13]	[0.13]	[0.13]	[0.13]
high school educated	0.06	0.07	0.09	0.07	0.08
	[0.14]	[0.14]	[0.14]	[0.14]	[0.14]
Health	-0.2	-0.11	0	-0.17	-0.08
	[0.15]	[0.15]	[0.15]	[0.15]	[0.15]
Manufacturing	-0.2	-0.28	-0.4	-0.22	-0.29
	[0.24]	[0.25]	[0.25]	[0.24]	[0.25]
Property&Business	-0.19	-0.14	-0.11	-0.14	-0.11
	[0.18]	[0.17]	[0.17]	[0.19]	[0.17]
Retail Trade	-0.35**	-0.36**	-0.39**	-0.35**	-0.36**
	[0.17]	[0.18]	[0.18]	[0.18]	[0.18]
Other Controls					
australian couple	-0.23**	-0.25**	-0.28**	-0.24**	-0.26**
	[0.11]	[0.11]	[0.11]	[0.11]	[0.11]
survey wave	0.03	0.02	0.03	0.04	0.03
	[0.04]	[0.04]	[0.03]	[0.04]	[0.04]
New South Wales	0.1	0.13	0.21	0.1	0.14
	[0.13]	[0.13]	[0.14]	[0.13]	[0.13]
Victoria	0.03	0.05	0.09	0.03	0.06
	[0.15]	[0.15]	[0.15]	[0.15]	[0.15]
Queensland	0.18	0.16	0.15	0.16	0.16
	[0.15]	[0.15]	[0.15]	[0.15]	[0.15]
Constant	-0.83***	-0.98***	-1.27***	-0.92***	-1.07***
	[0.21]	[0.21]	[0.22]	[0.24]	[0.23]
$\ln(\sigma_u^2)$	-13.32	-11.89	-12.26	-13.34	-11.95
	[27.54]	[22.09]	[30.77]	[27.81]	[22.28]
Observations	1136	1136	1136	1134	1136
Number of coupleid	350	350	350	350	350

Notes: The estimates are from a random effect probit model on the cohabiting sample. Standard error in []

Table 10: Male unemployment rate and break-up probability:cohabiting sample

Y=divorce rate	log(rl1)	log(rl2)	log(rl3)	log(MArate)	log(MArl1)
	lhusrl1	lhusrl2	lhusrl3	lhusmarate	lhusmarl1
unempoyment rate	-0.25**	0.04	0.40***	-0.18	0.03
	[0.12]	[0.12]	[0.13]	[0.15]	[0.15]
Husband's characteristics					
health dummy	-0.27***	-0.27***	-0.27***	-0.28***	-0.27***
	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]
graduate or higher	-0.2	-0.08	0.06	-0.16	-0.09
	[0.20]	[0.20]	[0.20]	[0.20]	[0.20]
college educated	-0.17	-0.13	-0.09	-0.16	-0.13
	[0.14]	[0.14]	[0.14]	[0.14]	[0.14]
high school educated	0.01	0	-0.01	0.01	0
	[0.12]	[0.12]	[0.13]	[0.12]	[0.12]
Health	-0.12	0.09	0.37	-0.06	0.08
	[0.27]	[0.27]	[0.28]	[0.28]	[0.28]
Manufacturing	-0.14	-0.21	-0.31*	-0.16	-0.2
	[0.15]	[0.16]	[0.16]	[0.15]	[0.16]
Property&Business	-0.1	0.11	0.26	-0.06	0.1
	[0.18]	[0.17]	[0.17]	[0.20]	[0.17]
Retail Trade	-0.1	-0.04	0.02	-0.09	-0.04
	[0.19]	[0.19]	[0.20]	[0.20]	[0.20]
Wife's characteristics					
health dummy	-0.08	-0.08	-0.09	-0.07	-0.07
	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]
graduate or higher	-0.2	-0.2	-0.22	-0.2	-0.2
	[0.17]	[0.17]	[0.17]	[0.17]	[0.17]
college educated	-0.30**	-0.31**	-0.34**	-0.30**	-0.31**
	[0.13]	[0.13]	[0.13]	[0.13]	[0.13]
high school educated	0.08	0.05	0.03	0.08	0.05
	[0.14]	[0.14]	[0.14]	[0.14]	[0.14]
Health	-0.21	-0.24*	-0.26*	-0.22*	-0.23*
	[0.13]	[0.13]	[0.14]	[0.13]	[0.13]
Manufacturing	-0.19	-0.17	-0.19	-0.18	-0.17
	[0.24]	[0.24]	[0.24]	[0.24]	[0.24]
Property&Business	-0.26	-0.22	-0.2	-0.24	-0.22
	[0.17]	[0.17]	[0.17]	[0.17]	[0.17]
Retail Trade	-0.35**	-0.35**	-0.37**	-0.35**	-0.35**
	[0.18]	[0.18]	[0.18]	[0.18]	[0.18]
Other controls					
australian couple	-0.22**	-0.23**	-0.24**	-0.22**	-0.23**
	[0.11]	[0.11]	[0.11]	[0.11]	[0.11]
survey wave	0.04	0.04	0.03	0.03	0.04
	[0.03]	[0.04]	[0.04]	[0.04]	[0.04]
New South Wales	0.04	0.1	0.21	0.05	0.1
	[0.13]	[0.14]	[0.14]	[0.14]	[0.14]
Victoria	-0.02	0.04	0.12	0	0.03
	[0.15]	[0.15]	[0.15]	[0.15]	[0.15]
Queensland	0.22	0.19	0.16	0.21	0.19
	[0.15]	[0.15]	[0.15]	[0.15]	[0.15]
Constant	-0.44*	-0.81***	-1.28***	-0.51*	-0.79***
	[0.23]	[0.23]	[0.25]	[0.27]	[0.26]
	-13.85	-13.33	-11.98	-12.93	-13.34
	[220.28]	[38.00]	[17.31]	[21.14]	[38.25]
Observations	1136	1136	1136	1136	1136
Number of coupleid	350	350	350	350	350

Notes: The estimates are from a random effect probit model on the cohabiting sample. Standard error in []

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