Unemployment Rate and Divorce

(This is a working paper. Comments are welcome)

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October 10, 2010

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.

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 of 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 follows these couples from 2001-2007. This period is notable for the boom in the Australian economy. The study includes both married as well as cohabiting couples. I exploit the variations in the 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. A doubling of the three period lagged unemployment rate in either the male or the female partner's sector almost doubles the likelihood that the couple will separate. 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.

Section 2 briefly reviews the literature. Section 3 discusses the theory. Sections 4 and 5 describe the empirical strategy and the data 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 a 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 and thereby have influenced the divorce rate. 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

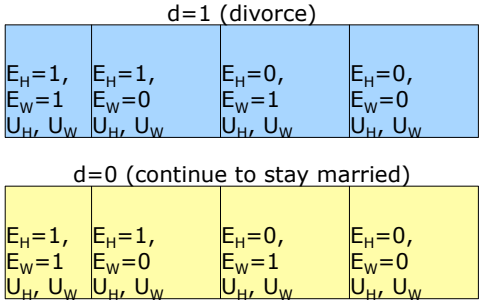
To help organize ideas, I develop a static model of divorce, which illustrates the conditions under which a rise in the unemployment rate in either one's own sector or the spouse's sector leads to a rise in the divorce probability. The model also highlights the importance of divorce costs. There are two individuals, the husband (H) and the wife (W).[1] Their utility (V)

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

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.

Figure 1: Set of events



Then, based on their expected utilities, they decide whether to stay married or to divorce.

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

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 $\ll I^{H,W}$).[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 loss 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 $i = 1$ 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, religion, number of children, industry dummies, health}. To allow for duration dependence, I control for the number of years the couple has been married/cohabiting. I also include a linear time trend, which captures factors such as divorce legislations, which have led to a reduction in the divorce costs overtime.

I assume that $\epsilon_{i,t}$, $\sim$ IN(0, σ^2_ϵ). Furthermore, conditional on the right hand side variables, the μ_i's $\sim$ IN(0, σ^2_μ) 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. Alternatively, one could also measure divorce by separations in the upcoming one period. This measure does not capture all the separated couples as in some case, the one of spouse moves away in period t+1 even as the other spouse claims to be married. In the $t+2^{th}$ round, this spouse acknowledges that he/she is no longer married. Hence, I measure divorce by the former procedure.

A couple is considered to be cohabiting or married in the de facto sense if both the hus-

band (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 were employed in the first wave of the survey divorce/separate subsequently.

B: Unemployment rate ($r_{i,t}$) construction In this paragraph, I describe the construction of an state-industry-time varying measure of unemployment rate that is representative of the job opportunities facing an individual. I start 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/sector 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

[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. I club 2006 ANZSIC categories 12, 13, and 14 and treat this as ANZSIC 1993 group 12. The ANZSIC 1993 groups 13, 14, 15, 16 and 17 are same as the ANZSIC 2006 groups 15, 16, 17, 18 and 19 respectively. The ABS cat no. 1292.0 is a publication of Australian Bureau of Statistics and provides detailed description of the old and new classification.

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 data appendix. Before proceeding further, I illustrate that this proxy performs well in capturing the movements in the unemployment rate. Figure 2 is available from the Australian Bureau of Statistics. It traces the movement of Australian unemployment rate from 1998-2007. In Figure 3 I plot the movements of the four proxies of the Australian unemployment rate. The first of these ABSrate is constructed from state level aggregate data. It is defined as the ratio of unemployed persons to labor force as measured by the sum of employed and unemployed persons. The normalized ABS rate is defined as the ratio of unemployed persons to employed persons in the year 2001. I construct two more proxies from disaggregate state-sector level analogous to the aforementioned variables but after excluding the long tern unemployed. These are denoted by rate_s and rate respectively. Note that all the four proxies mimic the movement of Australian unemployment rate (compare Figures 2 and 3). For instance, there was a rise in the Australian unemployment rate in the year 2001 and this is captured by all the four measures of unemployment rate. In Figure 4, I graph the movement of the unemployment rate proxy in each of the seventeen categories aggregated across the states from 1998-2007. The figures suggests that the various sectors have performed differently over the fourteen years. However, the unemployment rate surged in most of the sectors in the year 2001. Ideally, one would like to reconcile the fluctuations in each of the sectors with the actual performance of these sectors during this time. Due to a lack of study on each of these sectors, I focus on two sectors for which anecdotal evidence on this issue is available. The mining, manufacturing, and construction sectors have experienced steady decline in the unemployment rates due to

the boom. The agricultural sector was hit by droughts in the period 2000-2006 and plausibly this explains the fluctuations in the unemployment rate in this sector in this period. 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. For instance, 69% of all women and men who cohabit together have attained grade 12 or higher levels of education. The industry dummies constitute a time invariant measure of match quality. There are seventeen industrial categories/sectors.[8] For the purpose of estimation, I club three sectors-(a) Mining (b) Manufacturing (c) Con-

[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.

struction into one sector. Agriculture, Electricity, Gas, Water and Waste Services, Wholesale Trade and finally the Information Media and Telecommunication sectors are again clubbed together. This is to ensure that there are enough observations corresponding to each of the industrial sectors.

I also control for the duration of marriage. The average marital duration in the married (de facto) sample is around seventeen (five) years. 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. Cohabiting couples are also less likely to be Catholics or those belonging to other religions such as Islam. The base category for religion dummy variables are people with no religion. Married couples have more children relative to cohabiting couples in both the 0-14 and 15-25 age group. 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 in terms of court fees, psychological costs and costs associated with raising children. If this is true, one would see a bigger effect of unemployment rate fluctuations on the de facto couples relative to legally married couples. Figure 6 traces the movement of three period lagged unemployment rate and separation rate (separation rate*100) of the de facto couples (legally married couples). The figures suggest that separation rate tends to rise following a rise in the unemployment rate. The source of the rise in the unemployment rate seems to

the macroeconomic conditions in the year 2001. However, this figures does not control for the characteristics of the couple, hence in the following sections I examine this relationship using a random effect probit model.

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 outcome variable takes a value of 1 if the individual is fired or is out of the labor market, 0 otherwise. Panel A focusses on the females and Panel B on the males. I start with 3148 men and 3497 women, who were employed in wave 1 of the survey and follow their employment status from waves 2 -7. I focus on the sample of people who were in the age-group 19-60. 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. The composite sector of mining, manufacturing and construction is the excluded sector. I use lagged unemployment rates associated with an individual's primary sector to capture the odds of a job loss. These include 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 women and men.

Table 4 summarizes the results from a random effect probit model of one's employment status on unemployment rate in one's sector.[9] Panels A and B suggest that rising unemployment rate is associated with the loss of job. A doubling of three period lagged unemployment rate is associated with 7.48% increase in job loss probability of women over the mean unemployment rate of 13.36%. For the male sample, the partial effect is 0.001. This translates

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

into 1.45% increase in the job loss probability over the mean unemployment rate of 6.96%. The results also suggest that the positive effect of the unemployment rate on the probability of being out of job comes with a lag. A rise in the one period lagged unemployment rate is associated with a decline in the job loss probability. It is plausible that women respond to rising unemployment rate by going out of the job market to raise a family or to acquire more schooling. If longer lags (lr4-lr6) are employed, the results are not reported here, the unemployment rates are not significant for the men's sample. In the female sample, unemployment rate is insignificant if rl4 or rl5 is used. A rise in six period lagged unemployment rate decreases the odds of being unemployed.

Among other covariates (see Tables 9 and 8), good health and better schooling reduces the likelihood of being unemployed. Relative to people over forty, men in the age group if 15-14 are less likely to be unemployed. However, women in the age group 25-34 are more likely to be unemployed. This suggests that in response to rising unemployment rates women go out of job market to raise a family. The state of residence does not affect employment status of women; however, men in the states of New South Wales and Victoria are more likely to be employed relative to the base category.

To summarize, fluctuations in the unemployment rate influence women's labor market status more than that of men. Higher unemployment rates are associated with lower likelihood of being employed. 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 affect the probability of marital dissolution.

Unemployment rates and a couple's divorce probability Table 5 reports results from a random effect probit model of divorce on the unemployment rate. 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 in the spouse's sector. Hence, I include both husband's and wife's sectoral unemployment rate in the model. Panels A and B focus on the sample of cohabiting and married sample respectively. In the de facto/cohabiting (de jure/married) sample, 350 couples (1662 couples) are followed until wave seven or until they separate given that it happens by wave seven of the survey.

The mean of the dependent variable in the de facto sample is 0.129; alternatively, 40% of the couples separate between waves 2-7. For the married sample, only 8% of the couples separate between waves 2-7; the mean of the dependent variable is 0.021. The results from the cohabiting sample suggest that a rise in the wife's sectoral unemployment rate tends to increase the divorce probability. More specifically, a doubling of the wife's sectoral unemployment rate would lead to a rise in the divorce probability between 0.055 points to 0.111 points. To be more specific, a doubling of the wife's or husband's three period lagged unemployment rate leads to a almost doubling of the separation rate relative to the mean of the dependent variable. For longer lags of the female unemployment rate, the effect of unemployment rate as measured by lr4 and lr5 (lr6) on the separation rate is negative (insignificant). An increase in the husband's one (three) period lagged unemployment rate is associated with a decline (rise) in the separation probability. For longer lags, the coefficient on the husband's unemployment rate is insignificant. Overall, the results suggest that increases in the unemployment rate does not lead to a dissolution of the relationship in the immediately following period. For instance, in the case of unemployment rate facing men, initially a rise in the unemployment rate leads to a decline in the break-up probability. Similarly, a rise in the unemployment rate facing women, does not affect the odds of a break up in the immediately following period; the breakup effect is strongest three periods into the future after which it is insignificant.

The unemployment rates do not affect the divorce probability of married couples. The marginal effect of a rise in the unemployment on the divorce probability is negligible. From this point forward, I only focus on the sample of cohabiting couples.

Robustness checks on the cohabiting sample Inclusion of both the husband and the wife's sectoral unemployment rate introduces the problem of multicollinearity into the model. To alleviate this issue, in Panels A and B of Table 6, I include the unemployment rate for one spouse only. Panels A and B use the unemployment rate for wife's, husband's sectoral unemployment rate respectively. The results are similar to that found in Table 5. A doubling of the three period lagged unemployment rate is associated with a more than doubling of the probability of a break up.

The primary sector of an individual in this study 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. In 68% of the sample, the industry of employment in wave 1 matches with the modal industry of employment. The results in Panel A of Table 7 suggest that a doubling of the three period lagged unemployment rate in the wife's sector tends to increase the divorce probability by 80% above the mean level. A rise in husband's sectoral unemployment also tends to increase the divorce probability. Finally, I explore whether the unemployment rates have an effect on the divorce probability in terms of a linear probability model. The linear probability model allows time invariant omitted factors to be correlated with the right hand side variables. The sign on the coefficients is similar to that in Table 5.

To check whether the results depend on the choice of the excluded industrial sector, I changed the base category in a series of regressions. The coefficient of the unemployment rate remains unchanged. The results remain qualitatively unchanged if I measure divorce by separations in the next period as opposed to in the upcoming two periods. Finally, I re-estimate the equation using the variation in the seventeen industrial sectors as opposed to twelve. In this regression, only four big industrial sectors were included. The remaining industries are a part of the base category. The results remain qualitatively unchanged.

Other factors that influence the separation probability include the age of the wife, and

the health of husband. Relative to wives, who are older than forty, the wives in the age group 25 to 30 are less likely to separate. Good health of husbands reduces the divorce probability. Relative to the aggregate base category of Mining, Manufacturing and Construction sector, men employed in the Transportation and Storage sector (Finance and Insurance) are less (more) likely to face a dissolution of cohabitation. Women in the Transportation and Storage sector face higher odds of a divorce relative to those in the base category. The religions dummies are never significant but they have the expected sign.

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 likely to be 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 break up 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. A rise in the male unemployment rate reduces the separation probability in the immediately following period but a rise in the three period lagged unemployment rate is associated with a rise in the separation probability.

This study takes the view that the difference between married and cohabiting couples in the response to rising unemployment rates is driven by separation costs. There is an

alternate 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.

8 Data appendix

Unemployment rate construction To arrive at a measure of unemployment rate, which varies across states and industrial sectors, I utilize the time series on aggregate labor force and unemployed persons in '000s in each of these industries for each of the six states and 2 territories: series UQ2_aug94, and UQ2_may01 available from ABS website. For time series information on the number of employed persons by state and industry, I refer to catalogue number 6291.0.55.003, again freely downloadable from ABS website. The Australian Bureau of Statistics compiles these statistics from Labour Force Surveys which are conducted each month throughout Australia as a part of its household survey program. The Labour Force Survey is targeted at the civilian population aged 15 years and over and is designed to provide estimates of employment and unemployment for the whole of Australia as well as for each state and territory. The unemployment statistics are based on a survey question that asked unemployed persons to report the industry corresponding to their last job. I do not have measures of labor force at the industrial sector level. To overcome this problem, I construct a proxy for unemployment rate, which is defined as:

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

Why are unemployment rates based on this proxy much lower than those reported by ABS? The category of unemployed persons that goes into the construction of a region's unemployment rate consists of both people who are temporarily unemployed as well as those who have been unemployed for a long time. The unemployment proxy, which I use in my study excludes the long time unemployed. To offer some evidence in favor of this

assertion, I construct a proxy for Australia's unemployment rate from disaggregated data as well as aggregate data (both are readily available from ABS, for aggregate data refer to catalogue number 6291.0.55.001).

$$\text{unemployment rate proxy}^{Australia}_{\text{from aggregate data}} = \frac{\text{unemployed persons}_{Australia}}{\text{employed persons}_{Australia,2001}}$$

Let us call the former variable ABSrate. This variable uses labor force data for various years as opposed to employment in the year 2001. Next, I construct an unemployment rate proxy based on the above formula. Lets call it normalized ABSrate. Finally, I reconstruct these variables after excluding the long time unemployed. Let us label these variables as rate_s and rate respectively. I compare the movement of the three variables between 1998 and 2007 in Figure 3. Note that all the proxies mimic the movement of Australian unemployment rate quite well (compare Figure 2 and Figure 3). All the figures capture the rise in unemployment rate in the year 2001 and the subsequent decline. This gives me confidence that the proxy measures will capture the movement of unemployment rate in the desired fashion.

Figure 2: Unemployment rate: constructed by ABS

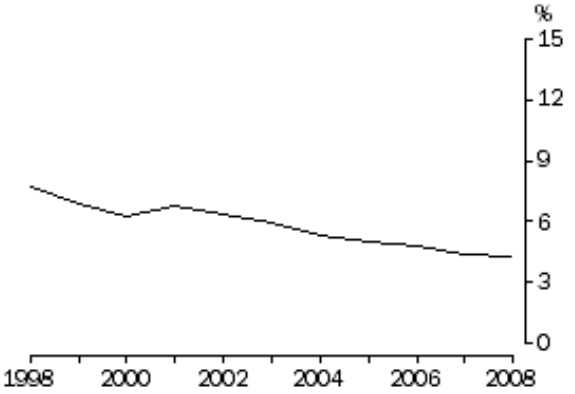


Figure 3: Unemployment rate: constructed from ABS data

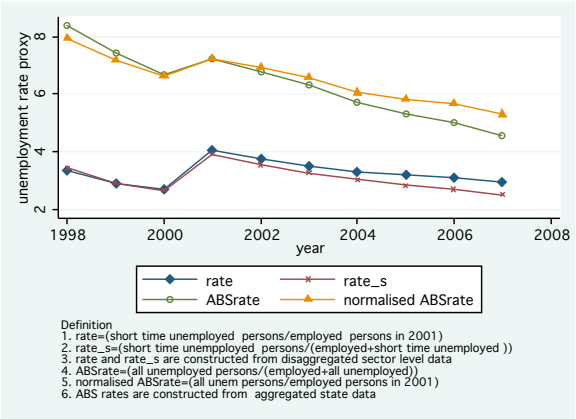


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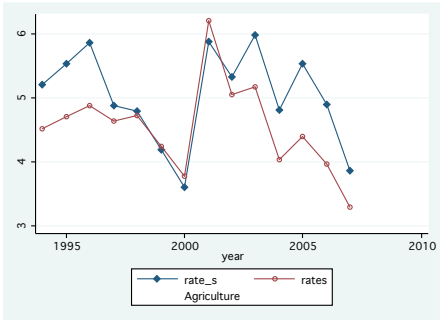
Figure 4: Movement of unemployment rates sectors 1-8



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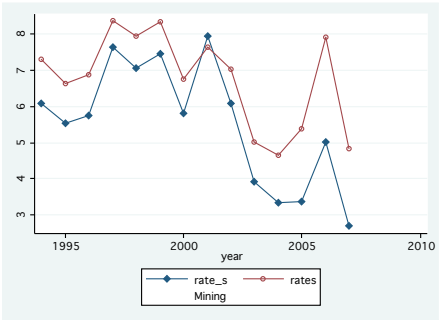

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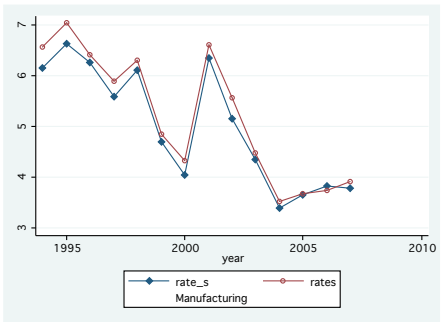

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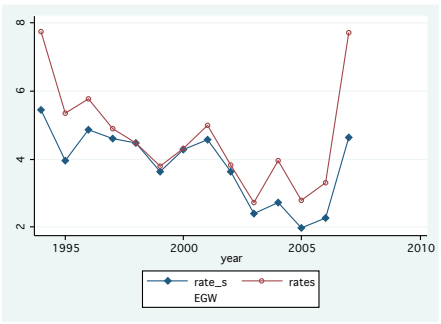

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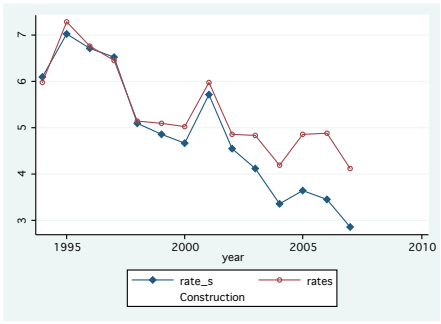

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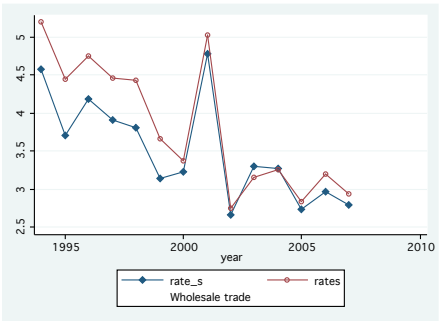

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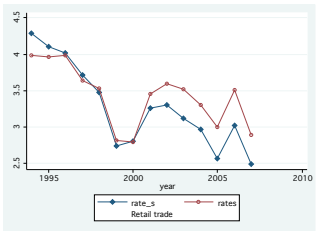

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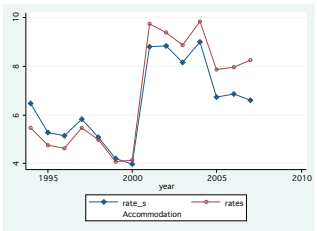

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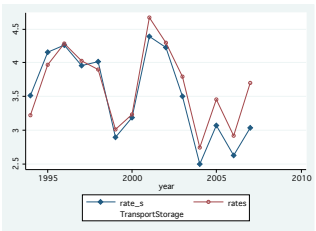

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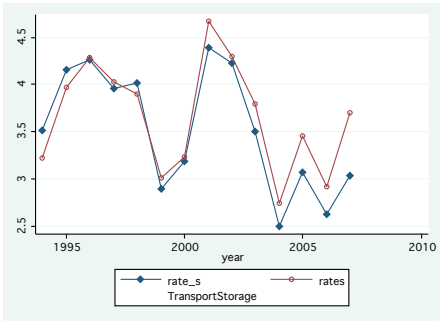
Figure 5: Movement of unemployment rates sectors 9-17



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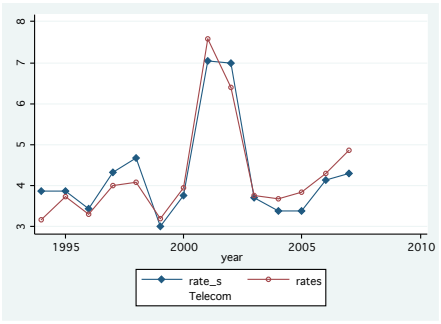

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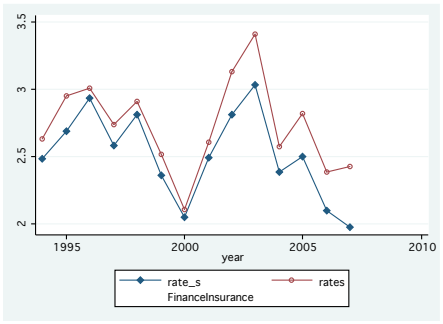

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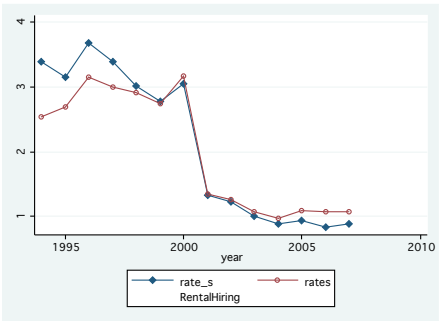

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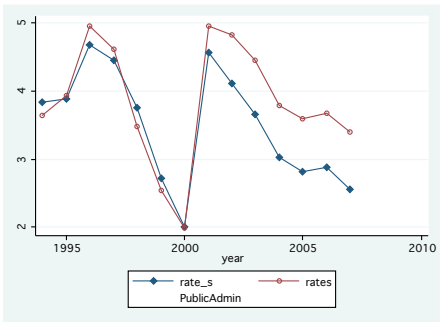

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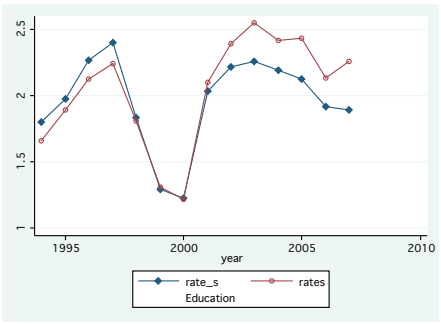

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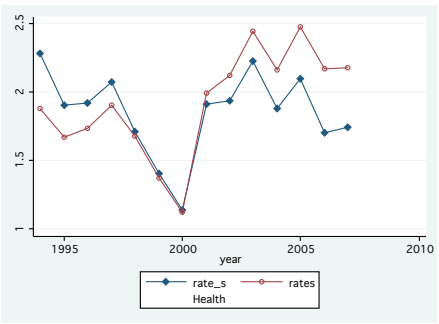

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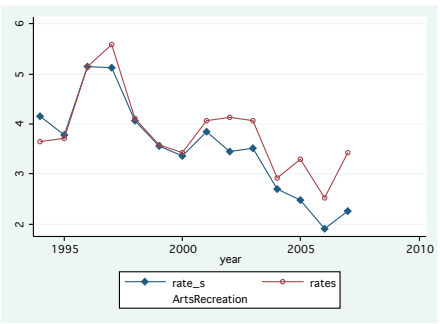

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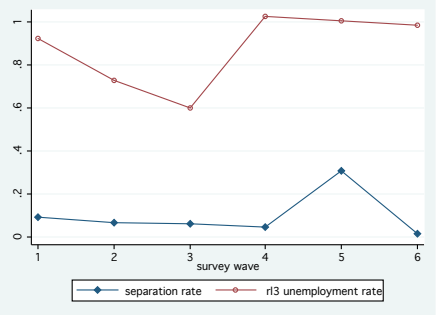
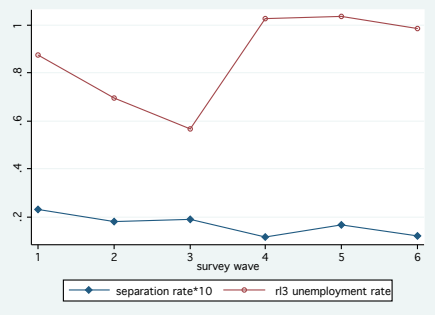
Figure 6: Unemployment rate and separation



(a) defacto couples



(b) married couples

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Table 1: Descriptive Statistics: legally married sample

Y=1 if divorced, 0 otherwise		% brokeup between rounds 2-7=8.36%			
Married Sample	sample of 1662 couples, sample size=6752	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		
Children 0-14	Count of resident children aged 0-14	1.06	1.16		
Children 15-25	Count of resident children aged 15-25	0.40	0.49		
Catholic	religion dummy	0.23	0.42		
Other Christians	religion dummy	0.24	0.43		
Other religion	religion dummy	0.13	0.33		
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/de facto couples

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		
Children 0-14	0.45	0 .85		
Children 15-25	0.03	0.20		
Catholic	0.19	0.39		
Other Christians	0.24	0.43		
Other religion	0.01	0.08		
Duration	4.91	5.10		
Wave	2.58	1.39		
NSW	0.29	0.45		
VIC	0.23	0.42		
QLD	0.21	0.41		

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] biological or adopted children ever had		
Husband	0[0.886]	2 [2.078]
Wife	0[0.874]	2 [2.067]

Table 4: Random effect probit regression of labor market status on unemployment rate

Y=1 if fired or out of labor market, 0 otherwise					
	log(rl1)	log(rl2)	log(rl3)	log(MArate)	log(MArl1)
Panel A: Female sample					
unemployment rate	-0.17*	0.14**	0.18***	-0.15	0.19**
	[0.09]	[0.06]	[0.05]	[0.11]	[0.09]
Partial Effect	-0.010	0.008	0.010	–	0.011
$\overline{y}$	0.1336	0.1336	0.1336	0.1336	0.1336
unemployment rate	3.088	2.95	2.84	3.01	2.96
Panel B: Male sample					
unemployment rate	-0.40***	0.06	0.17**	-0.36***	-0.03
	[0.12]	[0.08]	[0.08]	[0.15]	[0.13]
Partial Effect	-0.003	–	0.001	-0.003	–
$\overline{y}$	0.0696	0.0696	0.0696	0.0696	0.0696
unemployment rate	3.76	3.71	3.65	3.67	3.71

Notes: rl$k$ is k period lagged unemployment rate; MArate (MArl1) is moving average of current period rate, rl1, rl2 (rl1, rl2,rl3). The regression controls for age, education, health status, industry of employment, state of residence and survey wave. In Panel A (women's sample, 3148 women are followed from waves 2-7) the sample size is 17135. In Panel B (men's sample, 3497 men are followed from waves 2-7) the sample size is 18823. Standard error in [] p<0.01, ** p<0.05, * p<0.1

Table 5: Random effect probit regression of divorce probability on unemployment rate

Y=1 if separated in the next two rounds, 0 otherwise					
X=	log(rl1)	log(rl2)	log(rll3)	log(MArate)	log(MArl1)
Panel A (cohabiting sample)					
Wife's rate	0.052	0.316*	0.661***	-0.000	0.497**
	[0.158]	[0.173]	[0.193]	[0.253]	[0.239]
Partial effect	–	0.055	0.110	–	0.088
Husband's rate	-0.467***	-0.075	0.714***	-0.442	-0.044
	[0.173]	[0.186]	[0.219]	[0.252]	[0.242]
Partial effect	-0.079	–	0.123	–	–
$\overline{\text{unemployment rate\_W}}$	2.95	2.77	2.73	3.00	2.81
$\overline{\text{unemployment rate\_M}}$	3.73	3.65	3.66	3.77	3.68
$\overline{y}$	0.130	0.130	0.130	0.130	0.130
Panel B (Married sample)					
Wife's rate	-0.41***	-0.22	0.13	-0.42	-0.31
	[0.16]	[0.16]	[0.16]	[0.26]	[0.21]
Partial effect	-0.00	–	–	–	–
Husband's rate	0.08	0.09	0.30*	0.19	0.20
	[0.14]	[0.16]	[0.16]	[0.25]	[0.19]
Partial effect		–	0.00	–	–
$\overline{\text{unemployment rate\_W}}$	2.92	2.78	2.72	2.95	2.81
$\overline{\text{unemployment rate\_M}}$	3.61	3.51	3.51	3.62	3.54
$\overline{y}$	0.021	0.021	0.021	0.021	0.021

Notes: rl$k$ is k period lagged unemployment rate; MArate (MArl1) is moving average of current period rate, rl1, rl2 (rl1, rl2,rl3). The regression controls for age, education, health status, industry of employment, state of residence, dummy for Australian origin and survey wave. For the married sample, duration of marriage is also included. In Panel A, the excluded industrial dummy is Mining, Manufacturing and Construction. In Panel B, the included industrial dummies are Agriculture, Retail Trade, Property & Business and Education for men and RetailTrade, Property & Business, Education and Health for womem. The included state dummies are NSW, VIC, and QLD. Standard error in [] p<0.01, ** p<0.05, * p<0.1

Table 6: Robustness Checks: Unemployment rate and divorce probability

Y=1 if separated in the next two rounds, 0 otherwise					
X=	log(rl1)	log(rl2)	log(rll3)	log(MArate)	log(MArl1)
	Panel A (Including only wife's unemployment rate)				
Wife's rate	-0.093	0.293*	0.899***	-0.134	0.485**
	[0.147]	[0.163]	[0.180]	[0.239]	[0.230]
Partial Effect	–	0.053	0.155	–	0.088
	Panel B (Including only husband's unemployment rate)				
Husband's rate	-0.447***	0.037	0.986***	-0.442*	0.088
	[0.162]	[0.174]	[0.202]	[0.240]	[0.231]
Partial Effect	-0.077	–	0.173	-0.073	–
$\overline{\text{unemployment rate\_W}}$	2.95	2.77	2.73	3.00	2.81
$\overline{\text{unemployment rate\_M}}$	3.73	3.65	3.66	3.77	3.68
$\overline{y}$	0.130	0.130	0.130	0.130	0.130

Notes: rl$k$ is k period lagged unemployment rate; MArate (MArl1) is moving average of current period rate, rl1, rl2 (rl1, rl2,rl3). The unemployment rate dummy takes a value of 1 if it is above the 75th percentile in the sample. The regression controls for age, education, health status, industry of employment, state of residence and survey wave. The excluded industrial dummy is Mining, Manufacturing and Construction. The included state dummies are NSW, VIC, and QLD. Standard error in [] p<0.01, ** p<0.05, * p<0.1

Table 7: Robustness checks: Unemployment rate and divorce probability

Y=1 if separated in the next two rounds, 0 otherwise					
X=	log(rl1)	log(rl2)	log(rll3)	log(MArate)	log(MArl1)
	Panel A (using alternate definition unemployment proxy)				
Wife's rate	0.059	0.311*	0.683***	0.017	0.518**
	[0.165]	[0.178]	[0.199]	[0.260]	[0.246]
Partial Effect	–	0.055	0.116	–	0.093
Husband's rate	-0.450**	-0.004	0.714***	-0.364	0.033
	[0.179]	[0.189]	[0.220]	[0.256]	[0.246]
Partial Effect	-0.078	–	0.122	–	–
	Panel B (using alternate definition of sector of employment)				
Wife's rate	-0.13	0.07	0.392**	-0.265	0.075
	[0.16]	[0.17]	[0.186]	[0.240]	[0.224]
Partial Effect	–	–	0.062	–	–
Husband's rate	-0.116	0.203	0.852***	0.037	0.341
	[0.157]	[0.202]	[0.229]	[0.267]	[0.258]
Partial Effect	–	–	0.136	–	–
	Panel C (using fixed effect linear probability model)				
Wife's rate	0.045	0.068**	0.091***	0.080	0.15***
	[0.029]	[0.030]	[0.031]	[0.052]	[0.05]
Husband's rate	-0.045	-0.021	0.137***	-0.049	0.027
	[0.033]	[0.035]	[0.038]	[0.059]	[0.051]
$\overline{\text{unemployment rate\_W}}$	2.95	2.77	2.73	3.00	2.81
$\overline{\text{unemployment rate\_M}}$	3.73	3.65	3.66	3.77	3.68
$\overline{y}$	0.130	0.130	0.130	0.130	0.130

Notes: rl$k$ is k period lagged unemployment rate; MArate (MArl1) is moving average of current period rate, rl1, rl2 (rl1, rl2,rl3). In 30% of the cases, the the wave 1 industry of employment diverges from the modal industry of employment. In Panel A, the regression controls for age, education, health status, industry of employment, state of residence and a time trend. The excluded industrial dummy is Mining, Manufacturing and Construction. The included state dummies are NSW, VIC, and QLD. In Panel B, the other controls are health indicators and a time trend. Standard error in [] *** p<0.01, ** p<0.05, * p<0.1

Table 8: Unemployment rate and employment status: Female sample

Y=1 if fired or out of labor market, 0 otherwise					
X=	log(rl1)	log(rl2)	log(rll3)	log(MArate)	log(MArl1)
unemployment rate	-0.17*	0.14**	0.18***	-0.15	0.19**
	[0.09]	[0.06]	[0.05]	[0.11]	[0.09]
Partial Effect	-0.010	0.008	0.010	–	0.011
Individual Characteristics					
good health dummy	-0.13***	-0.13***	-0.12***	-0.13***	-0.12***
	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]
>= 19&*age* <= 24	-0.06	-0.06	-0.04	-0.07	-0.07
	[0.12]	[0.12]	[0.12]	[0.12]	[0.12]
>= 25&*age* <= 30	0.24***	0.23***	0.25***	0.23***	0.23***
	[0.08]	[0.08]	[0.08]	[0.08]	[0.08]
>= 31&*age* <= 34	0.32***	0.33***	0.33***	0.32***	0.32***
	[0.08]	[0.08]	[0.08]	[0.08]	[0.08]
>= 35&*age* <= 40	0.06	0.06	0.07	0.06	0.06
	[0.07]	[0.07]	[0.07]	[0.07]	[0.07]
graduate or higher	-0.23**	-0.22*	-0.22*	-0.23**	-0.22*
	[0.11]	[0.12]	[0.12]	[0.11]	[0.12]
college educated	-0.29***	-0.29***	-0.29***	-0.29***	-0.29***
	[0.09]	[0.09]	[0.09]	[0.09]	[0.09]
high school educated	-0.04	-0.04	-0.04	-0.04	-0.04
	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]
State dummies					
New South Wales	-0.25***	-0.22**	-0.21**	-0.25***	-0.22**
	[0.09]	[0.09]	[0.09]	[0.09]	[0.09]
Victoria	-0.22**	-0.20**	-0.18**	-0.22**	-0.19**
	[0.09]	[0.09]	[0.09]	[0.09]	[0.09]
Queensland	-0.06	-0.11	-0.11	-0.06	-0.12
	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]
Constant	-1.30***	-1.77***	-1.85***	-1.32***	-1.86***
	[0.20]	[0.17]	[0.16]	[0.22]	[0.20]
logsigma2	0.68***	0.68***	0.68***	0.68***	0.68***
	[0.06]	[0.06]	[0.06]	[0.06]	[0.06]
Observations	17135	17135	17135	17135	17135
Number of individuals	3307	3307	3307	3307	3307

Standard errors in []; *** p<0.01, ** p<0.05, * p<0.1

Table 9: Unemployment rate and employment status: Male sample

Y=1 if fired or out of labor market, 0 otherwise					
X=	log(rl1)	log(rl2)	log(rll3)	log(MArate)	log(MArl1)
unemployment rate	-0.40***	0.06	0.17**	-0.36***	-0.03
	[0.10]	[0.07]	[0.07]	[0.12]	[0.11]
Partial Effect	-0.003	–	0.001	-0.003	–
Individual Characteristics					
good health dummy	-0.27***	-0.28***	-0.28***	-0.27***	-0.28***
	[0.06]	[0.06]	[0.06]	[0.06]	[0.06]
>= 19&*age* <= 24	0.07	0.00	0.01	0.05	0.01
	[0.15]	[0.14]	[0.14]	[0.15]	[0.14]
>= 25&*age* <= 30	-0.24**	-0.28**	-0.27**	-0.25**	-0.28**
	[0.11]	[0.11]	[0.11]	[0.11]	[0.11]
>= 31&*age* <= 34	-0.30***	-0.31***	-0.31***	-0.31***	-0.32***
	[0.11]	[0.11]	[0.11]	[0.11]	[0.11]
>= 35&*age* <= 40	-0.25***	-0.26***	-0.25***	-0.25***	-0.26***
	[0.09]	[0.09]	[0.09]	[0.09]	[0.09]
graduate or higher	-0.79***	-0.77***	-0.77***	-0.79***	-0.77***
	[0.17]	[0.16]	[0.17]	[0.17]	[0.16]
college educated	-0.23**	-0.22*	-0.22*	-0.22**	-0.22*
	[0.11]	[0.11]	[0.11]	[0.11]	[0.11]
high school educated	-0.21**	-0.21**	-0.21**	-0.21**	-0.21**
	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]
State dummies					
New South Wales	0.04	0.09	0.11	0.03	0.07
	[0.10]	[0.10]	[0.10]	[0.11]	[0.11]
Victoria	-0.06	-0.03	-0.02	-0.06	-0.04
	[0.11]	[0.11]	[0.11]	[0.11]	[0.11]
Queensland	0.06	0.00	-0.01	0.04	0.01
	[0.12]	[0.11]	[0.11]	[0.12]	[0.11]
Constant	-2.00***	-2.70***	-2.88***	-2.05***	-2.54***
	[0.20]	[0.18]	[0.18]	[0.23]	[0.23]
logsigma2	0.91***	0.91***	0.91***	0.91***	0.91***
	[0.07]	[0.07]	[0.07]	[0.07]	[0.07]
Observations	18823	18823	18823	18823	18823
Number of individuals	3695	3695	3695	3695	3695

Standard errors in []; *** p<0.01, ** p<0.05, * p<0.1

Table 10: Unemployment rate and divorce:cohabiting sample

Sectoral unemployment rate					
Wife's rate	0.052	0.316*	0.661***	-0.000	0.497**
	[0.158]	[0.173]	[0.193]	[0.253]	[0.239]
Partial effect	–	0.055	0.110	–	0.088
Husband's rate	-0.467***	-0.075	0.714***	-0.442	-0.044
	[0.173]	[0.186]	[0.219]	[0.252]	[0.242]
Partial effect	-0.079	–	0.123	–	–
Wife's Characteristics					
>= 19&*age* <= 24	-0.058	-0.036	0.01	-0.062	-0.028
	[0.281]	[0.280]	[0.283]	[0.281]	[0.280]
>= 25&*age* <= 30	-0.572**	-0.574**	-0.610**	-0.563**	-0.579**
	[0.234]	[0.233]	[0.237]	[0.234]	[0.233]
>= 31&*age* <= 34	-0.216	-0.205	-0.156	-0.21	-0.209
	[0.229]	[0.228]	[0.233]	[0.228]	[0.229]
>= 35&*age* <= 40	0.278	0.271	0.291	0.274	0.271
	[0.176]	[0.176]	[0.179]	[0.176]	[0.176]
health dummy	-0.032	-0.028	-0.06	-0.022	-0.026
	[0.109]	[0.109]	[0.112]	[0.109]	[0.109]
graduate or higher	-0.104	-0.089	-0.121	-0.103	-0.077
	[0.195]	[0.194]	[0.198]	[0.195]	[0.194]
college educated	-0.218	-0.194	-0.196	-0.218	-0.182
	[0.146]	[0.146]	[0.150]	[0.146]	[0.146]
high school educated	0.042	0.052	0.084	0.05	0.053
	[0.150]	[0.151]	[0.154]	[0.150]	[0.151]
Husband's Characteristics					
>= 19&*age* <= 24	0.107	0.077	-0.005	0.117	0.063
	[0.298]	[0.298]	[0.301]	[0.298]	[0.298]
>= 25&*age* <= 30	0.041	0.02	-0.001	0.03	0.016
	[0.228]	[0.227]	[0.230]	[0.228]	[0.227]
>= 31&*age* <= 34	-0.022	-0.011	-0.049	-0.017	-0.002
	[0.209]	[0.209]	[0.212]	[0.209]	[0.208]
>= 35&*age* <= 40	-0.235	-0.23	-0.302*	-0.229	-0.242
	[0.176]	[0.176]	[0.181]	[0.175]	[0.176]
health dummy	-0.283**	-0.296***	-0.329***	-0.290***	-0.291***
	[0.111]	[0.111]	[0.114]	[0.110]	[0.111]
graduate or higher	-0.264	-0.216	-0.187	-0.276	-0.221
	[0.245]	[0.245]	[0.252]	[0.245]	[0.245]
college educated	-0.166	-0.152	-0.129	-0.168	-0.144
	[0.164]	[0.164]	[0.168]	[0.164]	[0.164]
high school educated	-0.03	-0.044	-0.077	-0.032	-0.046
	[0.137]	[0.137]	[0.142]	[0.137]	[0.137]
Other couple characteristics					
Australian couple	-0.201*	-0.187	-0.221*	-0.194	-0.186
	[0.121]	[0.121]	[0.124]	[0.121]	[0.121]
New South Wales	0.037	0.173	0.533***	0.03	0.229
	[0.151]	[0.154]	[0.166]	[0.157]	[0.163]
Victoria	-0.003	0.133	0.413**	0.007	0.166
	[0.168]	[0.169]	[0.176]	[0.169]	[0.174]
Queensland	0.345**	0.268	0.202	0.346**	0.25
	[0.166]	[0.164]	[0.167]	[0.168]	[0.165]
Number of children aged 0-14	-0.065	-0.07	-0.078	-0.067	-0.074
	[0.071]	[0.071]	[0.072]	[0.071]	[0.071]
Number of children aged 15-25	0.204	0.177	0.115	0.204	0.167
	[0.147]	[0.146]	[0.152]	[0.147]	[0.147]
Catholic	-0.026	-0.015	0.012	-0.038	-0.002
	[0.159]	[0.158]	[0.162]	[0.160]	[0.159]
Other religion	0.148	0.147	0.164	0.143	0.154
	[0.162]	[0.162]	[0.165]	[0.161]	[0.162]
Other Christians	0.065	0.052	0.081	0.064	0.054
	[0.147]	[0.147]	[0.151]	[0.146]	[0.147]
Duration	-0.016	-0.016	-0.017	-0.016	-0.015
	[0.013]	[0.013]	[0.013]	[0.013]	[0.013]
survey wave	0.088**	0.043	0.021	0.076*	0.034
	[0.041]	[0.043]	[0.040]	[0.040]	[0.044]
Constant	-0.217	-1.169**	-3.017***	-0.121	-1.516***
	[0.445]	[0.456]	[0.512]	[0.587]	[0.561]
logsigma2	-13.876	-13.614	-11.593	-13.923	-13.584
	[207.908]	[199.439]	[17.909]	[209.956]	[31.768]
Observations	1136	1136	1136	1136	1136
Number of coupleid	350	350	350	350	350

Standard errors in brackets; *** p<0.01, ** p<0.05, * p<0.1