

Stand together or alone? Family structure and the business cycle in Canada

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Abstract In this paper we examine the relationship between business cycle fluctuations and family formation and structure, using Canadian vital statistics and Labour Force Survey data. Similar to US studies, we find that a 1 percentage point increase in the unemployment rate of men is associated with a 13 % decline in the number of marriages formed per thousand single females each quarter. Unlike US studies, we do not find a significant relationship between unemployment rates and aggregate flows into divorce. Using stock measures of marital status and family type, we show that the importance of the business cycle varies substantially by age group. Among 25–44 year olds, there is a significant increase in single parents with children under 18 when unemployment rates rise. Among 35–54 year olds, there is a significant increase in those living alone. There is some evidence of elderly parents joining the households of 45–54 year olds and young adults (18–24) remaining with their single parents during recessions. Overall, the observed decline in marriages during recessions appears driven by a decline in remarriages rather than a decline in first marriages.

Keywords Marriage · Divorce · Family structure · Unemployment · Business cycle · Canada

JEL Classificaion E32 · J11 · J12

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1 Introduction

Family structure is continually changing. Though long-term trends in marriage and divorce appear largely driven by cultural, technological, and legal factors (Stevenson and Wolfers 2007), a growing literature has established a short-term relationship between family formation decisions and macroeconomic conditions. Why might a short-term relationship exist?

Becker's (1973, 1991) theory of marriage continues to be the principal framework used when exploring family formation decisions. In Becker's general equilibrium framework, individuals marry when marriage results in higher utility than remaining single. The gains from marriage are largely derived from specialization in market work or home production, as well as investments in marriage-specific capital. The framework, however, does not easily lend itself to making predictions for the short-run effects of business cycle fluctuations on family formation.

To structure our investigation of the business cycle and family formation, we use a search-theoretic framework in which we model marriage, divorce, and remarriage decisions in an environment where employment outcomes each period will affect the income that an individual brings to a marriage. We assume that potential match quality (a non-monetary return to marriage) does not depend on employment status or change after couples are married. In this framework, a recession will reduce the gains from marriage and result in lower marriage rates. Recessions will have ambiguous effects on divorce decisions. On one hand, an increase in job separation rates or a reduction in job finding rates may reduce the value of staying in an existing marriage, raising the incentive to divorce. On the other hand, a recession will increase unemployment rates among those in the pool for later marriages, reducing incentives to divorce and search for a new spouse. The balance of these forces will depend on several conditions, including the gap between employment and unemployment income and whether it is primarily separation rates or job finding rates driving an increase in unemployment. Finally, we should expect recessions to have the different effects on marriage decisions made at different stages of the lifecycle.

The literature has established empirical relationships consistent with the predictions derived from the search-theoretic framework. Early US evidence based on national time series data for 1871–1960 (Silver 1965) suggested marriage rates were procyclical, rising with per capita gross national product or personal disposable income. Recent US studies based on state-year vital statistics panel data—including Schaller (2012), Hellerstein and Morrill (2011), and Amato and Beattie (2011)—have found negative correlations between state unemployment rates and both flows into marriage and flows into divorce.¹ While job loss may increase the risk of divorce at the individual level (as in Doiron and Mendolia 2011; Blekesaune 2009; Charles and Stephens 2004), and Arkes and Shen (2010) have found that US national and state unemployment rates increased the risk of divorce for couples in years 6–10 of their marriage, the US results for aggregate divorce

¹ Earlier studies based on time series data found a positive correlation between the unemployment rate and divorce rates (including Kawata (2008), Huang (2003) and South (1985) for divorce rates in Japan, Taiwan and post-war US, respectively).

flows suggest that, on average, recessions make potential partners much less desirable thereby reducing the risk of divorce at the aggregate level. This is consistent with earlier work by Blau et al. (2000) who found that worse male labor markets are associated with lower marriage rates. Important for understanding the long-run implications of the marriage results, Kondo (2012) has found that higher male unemployment is associated with delayed marriage, but will not affect the probability a woman marries by age 30.

The results of this literature are important for understanding the burden carried by a nation's social safety net over the business cycle. If individuals are less likely to get married during recessions, or more likely to get divorced (and possibly become a single parent) when facing job loss, more individuals might need to rely on the social safety net. However, if in the aggregate there is a reduction in the number of divorces during recessions, there may not be an additional burden. Furthermore, those delaying marriage may choose alternative family structures (such as living with siblings or parents) to benefit from public goods within a household during recessions. The existing literature examining marriage and divorce flows does not inform us of the net effect of business cycle fluctuations on family structures.

In this study we examine the relationship between macroeconomic conditions and family structure in Canada. First, we use available vital statistics data and unemployment rates, comparable to that used in recent US studies, to examine flows into legal marriage and divorce. Despite very similar movements in the business cycle, Canadians and Americans have fairly different attitudes toward family formation. In particular, there appears to be more churning in the US marriage market (with higher flows in and out of marriage), a larger portion of the adult population divorced, and a smaller portion married than in Canada (Stevenson and Wolfers 2007). International comparisons will speak to the robustness of the estimated relationship between marriage flows and business cycle fluctuations.

Second, to add to our understanding of family formation we examine the relationship between male unemployment rates and the portion of individuals that are married (or common-law) or divorced (or separated) using a province-month-age group panel data set constructed from Canada's Labour Force Survey (LFS), 1976–2011. There are several advantages to using the LFS data over the vital statistics data. First, the LFS's sample design allows us to obtain reliable high frequency estimates of unemployment rates and the stock of individuals married and divorced, allowing us to examine relatively short-term business cycle fluctuations and their effects on family structure. Second, since 1999, the LFS allows us to differentiate between legal marriages and common-law unions (not accounted for in studies based on marriage flows). As Stevenson and Wolfers (2007) point out, individuals are increasingly forming households without entering legal marriages. We are interested in accounting for this in our analysis. We are also able to differentiate between divorces and separations since 1999. As with common-law unions, flow data is limited to capturing entry to legal divorces and we would like to capture the more general effect of the business cycle on marriage dissolution (noting that the cost of legal divorce may be prohibitive during recessions and there may be important lags between the dissolution of a marriage and legal divorce). Finally, we are able to investigate how the family structure choices of individuals vary by age group (which our available vital

statistics data does not permit). This simply recognizes that the family structure choices of younger individuals (who are typically considering entry to a first marriage or have only recently been married) may be very different from older individuals (who are often facing choices about divorce or remarriage).

Third, we are interested in understanding what alternative types of families individuals are forming if getting married is less likely during downturns. To this end, we examine the relationship between male unemployment rates and the portion of individuals belonging to different family types—including living alone, being single parents, or other families types such as adults living with parents or siblings.

Overall, this study contributes a more complete picture describing how family structure changes over the business cycle. This provides us with a better understanding of how individuals manage and cope with recessionary periods. This study also contributes to a growing literature on the effects of business cycles on non-economic outcomes (including Miller et al. 2009; Ruhm 2000; Dehejia and Lleras-Muney 2004; Ariizumi and Schirle 2012).

The results of our study suggest that business cycle fluctuations have a strong and significant effect on marriage flows. However, in contrast to US studies, there is not a significant relationship between the business cycle and divorce flows. The results based on stock measures indicate that increases in men's unemployment rates are associated with a decline in the stock of married individuals, an increase in divorced individuals, and no change in the stock of individuals that have never married. The relationship between the stock of individuals in different family types and the business cycle depends on the age group studied. For example, in response to increases in unemployment rates there are significant increases in the portion of single parents (with children under age 18) among 25–44 year olds, but not among those aged 45–64. Also, while there is no effect on the portion of 25–34 year olds living alone, there is a significant positive effect on the portion of 35–54 year olds living alone. Overall, the results suggest the decline in marriages formed during a recession is largely driven by a decline in remarriages rather than first marriages.

The remainder of this paper is organized as follows. In the next section we present a simple model of the marriage market that allows for unemployment among its participants. In Sect. 3 we describe the data and variables used in this study. In Sect. 4 we describe Canada's marriage market and unemployment rates since 1976. In Sect. 5 we present the methodology used to estimate the effect of unemployment on family formation and family structure, outlining the fixed effects models used in the analyses. We then present our results. Finally, we offer some concluding remarks.

2 Theoretical framework

In this section we outline a simple model of the marriage market in which employed and unemployed individuals make marriage, divorce, and remarriage decisions.² An

² A more detailed exposition of the model is available from the authors upon request and is available at http://www.tammyschirle.org/research/recession_marriage.html until at least March 2015. Some parts of

equal number of men and women live for two periods. At the beginning of the first period, a portion u_1 are unemployed and will receive income Y_1^U . Employed individuals will receive income Y_1^E , that is larger than Y_1^U . Each person then randomly meets a person of the opposite sex, and the quality of the potential match is θ (which has a symmetric distribution $G(\theta)$ with zero mean). Employment status and match quality are fully observable. If a marriage is formed, the couple will have children (with production cost c), and children offer second period utility q^* if the couple stays married or $q^0 < q^*$ if the couple gets divorced. All goods in the household are public and enjoyed equally by both partners, and match quality does not change over time.

At the end of the first period, unemployed individuals may find a job (at an exogenous rate f) and employed individuals may be separated from their job (at an exogenous rate s). The unemployment rate for the second period is then $u_2 = s + (I - s - f)u_1$. Married individuals then decide whether to divorce. For simplicity, we allow for unilateral divorce decisions.

At the beginning of the second period, random matches are made. The potential match quality follows the distribution $G(\theta)$ and does not depend on past outcomes or income for the second period (Y_2^E or Y_2^U). Unattached individuals that are matched decide whether to marry or remain single. Everyone dies at the end of the second period. The model is solved backwards; in what follows we have outlined the main components of key decisions.

In the second period, marriage decisions are quite simple. An unattached individual with employment status j ($j = E, U$) will marry a person with employment status k ($k = E, U$) if the utility value of marrying this person ($Y_2^j + Y_2^k + \theta + q^0$) is greater than the utility value of remaining single ($Y_2^j + q^0$). In other words, the unattached individual will want to form a marriage if the match quality is sufficiently high ($\theta \geq -Y_2^k$).

At the end of the first period, the expected second period utility of a divorced individual with employment status j is

$$V_2^j = m\pi\gamma^E(Y_2^j + Y_2^E + \beta^E) + m(1 - \pi)\gamma^U(Y_2^j + Y_2^U + \beta^U) + pY_2^j + q^0 \quad (1)$$

where m represents the probability of meeting another unattached person, π is the probability an unattached person is employed, γ^k is the probability of marrying someone with employment status k conditional on having met them, β^k is the expected match quality conditional on marrying a person with employment status k , and $p \equiv 1 - m(\pi\gamma^E + (1 - \pi)\gamma^U)$ is the probability the individual does not marry. Note that m and π are determined in equilibrium and are not exogenous.

Married individuals with employment status j at the end of the first period will choose to stay married if the utility value of staying married to a person with

Footnote 2 continued

the model's structure are adopted from Browning et al. (2011, Ch. 10). Note that Keeley (1977) provides an early application of search models to the marriage market, with a focus on the decision to enter the marriage market, the duration of search, and the importance of individual characteristics for the timing of first marriage.

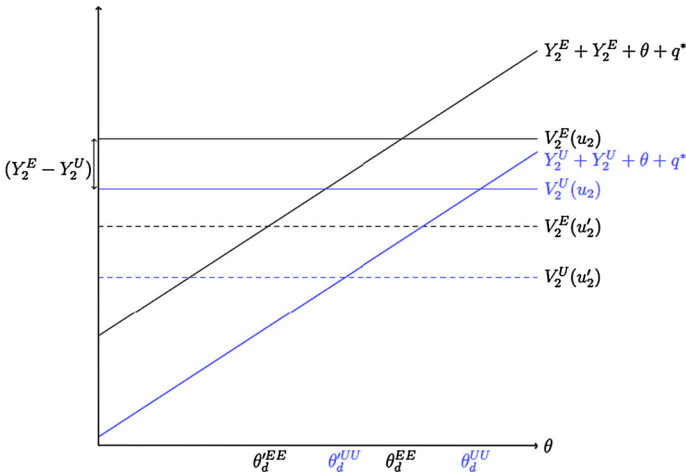


Fig. 1 Divorce decisions and higher unemployment. *Note:* with unemployment rates u_2 , couples that will be fully employed (EE) in the second period will choose divorce if their match quality is less than θ_d^{EE} . With a higher unemployment rate, u'_2 , a lower V_2^E reduces the match quality below which divorce occurs as re-entry to the marriage market appears less attractive. A higher unemployment rate also increases the portion of couples that are unemployed for whom θ_d^{UU} will be the relevant match quality below which divorce occurs

employment status k (W_2^{jk}) is greater than the expected utility of being a divorced individual. That is, divorce will occur if $V_2^j > Y_2^j + Y_2^k + \theta + q^* \equiv W_2^{jk}$.

The model then implies critical values of match quality that will be required for a marriage to survive into the second period that depend on the couple's second period employment status. Examples of the critical values for divorce (θ_d^{jk}) are depicted in Fig. 1 for two types of couples—both employed or both unemployed for the second period. For example, a couple that finds themselves fully employed in the second period will require their marriage to have a match quality of at least θ_d^{EE} for them to stay married. An increase in the second period unemployment rate (to u'_2) has two opposing effects on divorce decisions. On one hand, the recession worsens the quality of the pool of unattached individuals in the second period (π), so that a lower match quality is acceptable to remain married (θ_d^{EE}). On the other hand, a recession implies more individuals will become unemployed and require a higher match quality to remain married. In Fig. 1, a match quality of θ_d^{UU} is required if both become unemployed when unemployment rates are high. The balance of these effects on aggregate divorces will depend on many factors; for example, higher rates of divorce during a recession are expected when there is a larger gap between employment and unemployment income or when increases in job separation rates drive increases in unemployment rather than reductions in job finding rates.³

In the first period, an individual with employment status j will choose to marry when matched with someone of employment status k if the expected lifetime utility

³ The importance of job separation rates depends on initial conditions. In the Canadian context, the majority of individuals are employed.

associated with marriage, $W_1^{jk}(\theta)$, exceeds the expected utility of staying single for the first period and re-entering the marriage market in the second period, V_1^j .

$$W_1^{jk} = Y_1^j + Y_1^k + \theta - c + \lambda_{EE}\psi_{EE} + \lambda_{UU}\psi_{UU} + \lambda_{EU}\psi_{EU} + \lambda_{UE}\psi_{UE} \quad (2)$$

$$V_1^j = Y_1^j + \lambda_E \tilde{V}_2^E + \lambda_U \tilde{V}_2^U \quad (3)$$

where \tilde{V}_2^j represents expected utility in the second period without children, ψ represents second period utility as it depends on choices to remain married or divorce, and λ represents transition probabilities to second period employment status. For example, if the couple was fully employed in the first period ($jk = EE$), their probability of both being employed in the second period is $\lambda_{EE} = (1 - s)^2$, representing the likelihood that neither are separated from their jobs. The terms represented by ψ in Eq. (1) are

$$\psi_{EE} = \max(2Y_2^E + \theta + q^*, V_2^E)$$

$$\psi_{UU} = \max(2Y_2^U + \theta + q^*, V_2^U)$$

$$\psi_{EU} = \max(Y_2^E + Y_2^U + \theta + q^*, V_2^E)$$

$$\psi_{UE} = (1 - \delta)(Y_2^E + Y_2^U + \theta + q^*) + \delta V_2^U$$

where $\delta = \mathbb{I}[Y_2^E + Y_2^U + \theta + q^* < V_2^E]$ is an indicator variable describing whether a person employed in the second period within a mixed couple will opt for divorce.

The decision characterized by Eqs. (2) and (3) implies a critical value of match quality, θ_m^{jk} , whereby individuals of employment status j are just indifferent between marrying a person with employment status k and remaining single. Because of the tradeoff that can be made between a potential spouse's income and match quality in W_1^{jk} , matches made between two employed individuals will require a lower match quality than other matches for a marriage to be formed. The critical value θ_m^{jk} for first marriages is lower when the utility associated with having children is large or child production costs are low. This is partially offset by the value of holding the option to search for a spouse in the second period—which tends to make individuals more selective in their first marriage decision when more unattached individuals are available for remarriage (particularly employed individuals). These factors make the decision for a first marriage more complex than the decision for later marriages (whereby θ_m^{jk} depends only on Y_2^k). Greater life-cycle growth in earnings ($Y_2^k > Y_1^k$) may result in a lower match quality being acceptable for the formation of second marriages relative to first marriages.

In this framework, an increase in the unemployment rate makes it less likely for unattached individuals to meet an employed person in the marriage market, so that on average a higher match quality will be required to form a marriage. As such, we expect to see fewer first and second marriages during recessions. With respect to first marriages, however, the value of holding the option to search for a spouse later in life is likely affected by an increase in the unemployment rate—by increasing the likelihood of meeting someone and (given persistence in unemployment) reducing

the likelihood that a potential future spouse is employed. We expect first marriages to be more sensitive to fluctuations in unemployment rates when there is less churning in the labor market (characterized by low job separation and job find rates). In contrast, first marriages will be less sensitive to unemployment rate fluctuations when the labor market is such that individuals already expect employment status to change with a high probability. In this latter case, we might expect second marriages to be more sensitive to changes in the unemployment rate than first marriages.⁴

To summarize, we have presented a simple model of the marriage market in which marriage, divorce and remarriage rates may be affected by changes in the rate of unemployment. In this framework, the likelihood of forming a marriage is likely to fall when unemployment rises. First marriages are expected to be less sensitive than second marriages to changes in the unemployment rate when the labor market is characterized by high separation and job finding rates. The likelihood of divorce may rise or fall when unemployment rates rise. The effect of a recession on divorce depends on the balance of a recession's negative effects on the gains from staying in an existing marriage and the negative effect on the quality of the pool of unattached individuals that divorced individuals may be matched with.

3 Data and measurement

We have constructed marriage and divorce flow measures based on vital statistics data at the province level that are comparable to the measures used in the existing literature.⁵ Note that information on marriage and divorce in each province is not publicly available on a monthly basis or by age group. For marriage rates, we have quarterly measures representing the number of marriages that occur in each province per 1,000 single females (from the third quarter of 1981 to the fourth quarter of 2004).⁶ For divorce rates, we have constructed annual measures representing the number of divorces that occurred in each province per 1000 married females (1976–2003). Note that for the statistical analysis in Sect. 5, we construct corresponding provincial unemployment rates and control variables (measured quarterly or annually).

Our primary data source for this study is the Canadian Labour Force Survey (LFS). We make use of the monthly microdata files of the LFS from 1976 to 2011. The survey covers the civilian, non-institutionalized population aged 15 years and over and is the official source for unemployment rates. As the unemployment rates

⁴ On this point, the comparative statics of the model are not straightforward. Details are available as per footnote 2.

⁵ The annual number of divorces by province is found in Statistics Canada Cansim Table 053-0002. The quarterly number of marriages is found in Statistics Canada Cansim Table 053-0001.

⁶ The denominator was chosen to be consistent with Schaller (2012), one of the US studies most comparable in methods to the present study. As Statistics Canada does not publish a consistent population series at this level on a quarterly basis, we construct our estimates of the number of single females from the LFS. Note the LFS survey weight design is based on the Canadian Census and our resulting marriage rates closely match those available for recent years (Statistics Canada Cansim Table 101-1008).

are used to define the geographic-specific parameters of Canada's unemployment insurance programs, the LFS has a large sample size (approximately 56,000 households sampled every month) and the sample design ensures reliable estimates at various geographic levels.⁷ The survey also collects information on marital status, educational attainment, and other demographic and labor market information. Since 1976, few changes have been made to the survey's sampling methods or questionnaires.

We use the monthly files to construct a data set of provincial unemployment rates (representing men age 25–54) for each month 1976–2011, which we use as our measure of macroeconomic conditions. We have chosen to exclude women, individuals under age 25 and individuals age 55 and over from our measure of unemployment because the nature of their labor market choices is quite different over the business cycle. Furthermore, the choices of these demographic groups have changed substantially over the time period considered here—women's participation in the labor force has increased, educational attainment has increased, and early retirement patterns have changed over time. As unemployment rates do not necessarily align with all other indicators of economic activity, we examine the robustness of our results using analogous employment rates.⁸

We also use the LFS to construct age-specific provincial measures of marital status and family structure for each month 1976–2011. We consider four age groups—age 25–34, 35–44, 45–54, and 55–64. The constructed measures are stock measures.

With respect to marital status, we measure the portion of each province's population in each age group that is never-married, married (including common-law), or divorced (including separated) in each month 1976–2011.⁹ Starting in November 1999, the coding of marriage changes slightly, allowing us to distinguish between legal marriages, common-law unions, divorces, and separations.¹⁰ Note that the survey allows respondents to report their marital status as “living common-law” without explanation and this might not reflect their legal status.¹¹ We also create separate stock

⁷ See Statistics Canada (2011) for more details. In 2012 there were 55 Employment Insurance economic regions in Canada's 10 provinces.

⁸ We note that the NBER's Business Cycle Dating Committee uses several measures to date peaks and troughs, including real GDP, employment and real income (described at <http://www.nber.org/cycles/recessions.html>). The NBER notes that unemployment rates are often a leading indicator of business cycle peaks (increasing before the peak occurs) and a lagging indicator of business cycle troughs. Conceptually, real GDP could be a useful measure to consider, but provincial data is not available for monthly or quarterly frequencies.

⁹ The age-province-year-month panel data set has 17,280 observations. The cell sizes for the constructed monthly marriage and divorce rates average 1774 observations, with a minimum of 107 observations (occurring for PEI, Canada's smallest province) and a maximum of 7,648 observations.

¹⁰ There were also changes in the treatment of same-sex relationships in 1999. Until September 1999, respondents reporting themselves to be in a same-sex marriage or common-law union would be recoded by Statistics Canada as single individuals. Since September 1999, these individuals are coded as married or common-law. We do not see a significant change in marriage or common-law rates as a result of this change. Public use data files do not allow us to separately identify same-sex and opposite-sex relationships. In Canada, same-sex unions were first legally recognized by Ontario in 2003 and same-sex marriage was legalized across Canada in 2005.

¹¹ Legal definitions of common-law unions vary by province.

measures based on these more narrow categories for 1999–2011. We may expect differences across these more narrow categories as, for example, legal marriages and common-law unions typically involve very different investments in a relationship and the extent to which public goods are shared within the family unit.¹²

With respect to family structure, we construct variables describing the type of economic family that the individual belongs to. An economic family refers to “persons who live in the same dwelling and who are related by blood, marriage (including common-law) or adoption” (Statistics Canada 2011). We create five variables, representing the portion of individuals in each age group and province that are unattached (a person living alone or with unrelated people), single parents with children under 18 years of age, single parents with children 18–24 years of age, husband-wife families (who do not have children or whose children are under age 25), and other families. Other families will include multigenerational households (for example children age 25 and older living with their parents or elderly parents living with their children), economic families that include adults with siblings, and grandparent-grandchild families.

We create two variables to help control for changing demographics within a province over time. First, we measure the portion of individuals age 25 and older that are over age 65 and refer to this as the portion of the population that are elderly. Second, we measure the portion of individuals in the population age 25 and older that have a university degree (representing a Bachelor’s degree or higher).

In some ways, the stock measures of family status are of limited use and interpretation, particularly with respect to understanding individuals’ incentives and behavior. (See Bitler et al. 2004; Lichter et al. 2002 for a discussion of the merits of stock and flow measures). Of importance for this study, stock measures representing current family structure represent the outcomes of decisions made recently and in the distant past. As such, changes in the stock of married people, for example, represent both the decision to get married as well as decisions to stay married. This can be viewed as one of the merits of using stock measures. However, flow measures are better used if we are primarily interested in understanding incentives and behavior. That is, during recessions do people have more or less incentive to get married and/or divorced? In the literature, marriage and divorce rates representing flows in and out of marriage have been most common, particularly in US studies.

4 Canadian trends in family structure and business cycle fluctuations

As in the United States (see Schaller 2012), there has been a steady decline over time in the propensity to get married among Canadians. In Fig. 2 we see that annual flows into marriage fell from 29.1 marriages per thousand single females in 1982 to only 17.5

¹² In Canada, most common-law relationships that have lasted at least 1 year are generally treated the same as legal marriages in terms of child custody or taxation. Upon separation, however, legal claims for the division of assets or property are typically difficult and expensive, as rights are held with the individual that legally purchased the asset. For longer relationships, spousal support may be required upon separation.

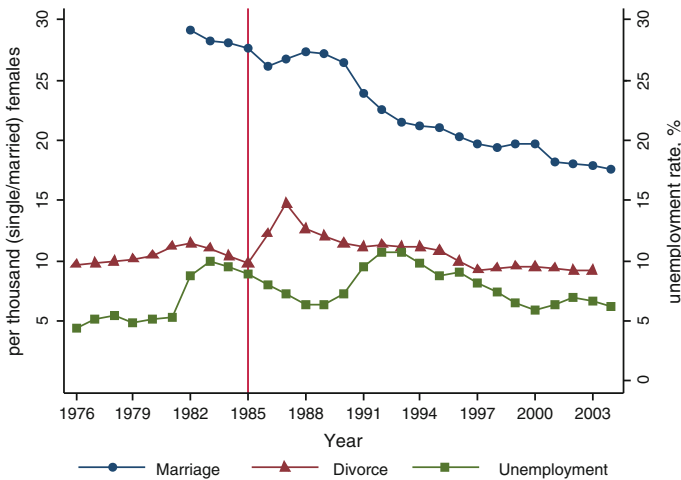


Fig. 2 Unemployment rates and flows into marriage and divorce in Canada, 1976–2004. *Note:* marriage rates are the number of marriages registered each year per thousand single females. Divorce rates are the number of divorce registrations each year per thousand married females. The vertical line marks the year the Divorce Act of 1985 came into force. *Source:* Authors’ tabulations based on Statistics Canada Cansim Tables 53-0001, 53-0002, and 51-0010

marriages per thousand single females in 2004 and the downward trend shows little sign of leveling off.¹³ Unlike the United States (see Schaller 2012), we do not see a clear trend in divorce flows. There appears some increase in the number of divorces (per 1,000 married females) from 1976 to 1982. The number of divorces then falls before spiking upwards after 1985. This reflects a response to major changes in the available grounds for divorce following the 1985 Divorce Act.¹⁴ The 1985 Act allowed for the “breakdown of marriage” (represented by 1 year of separation) as grounds for divorce and allowed for most divorce cases to be settled out of court. It appears many couples simply delayed filing for divorce until the Act came into force. Interestingly, there is also a small uptick in marriage flows corresponding to the uptick in divorce flows after 1985, likely representing remarriages among those recently divorced. Otherwise, the annual flows into divorce appear fairly steady until the mid 1990s (averaging 11.5 divorces per thousand married women from 1982 to 1994), and then fall slightly before stabilizing again. From 1997 to 2003, there were an average 9.4 divorces per thousand married women.¹⁵

¹³ Note the marriage and divorce rates constructed in this study are consistent with available rates from Statistics Canada. (Statistics Canada Cansim Table 101-1008 provides marriage rates for 2000–2004 and Table 101-6505 provides divorce rates for 2004 and 2005).

¹⁴ See Douglas (2006) for a description of the 1985 Divorce Act. In the statistical analysis that follows, this type of nation-wide change in legislation is controlled for with the inclusion of year fixed effects in the models.

¹⁵ In 1997 new child support guidelines were imposed in the Divorce Act, increasing formal child support agreements. Peters et al. (2004) present evidence that such measures will improve child support establishment and collection, changing the costs of divorce. In the statistical analysis that follows, this type of nation-wide change in legislation is controlled for with the inclusion of year fixed effects in the models.

In Table 1 we see that the trends in stock measures for marriage and divorce are consistent with the flow measures in Fig. 2.¹⁶ The portion of individuals that are married (or common-law) in each age group has declined over time.¹⁷ The stock measures for marriage reflect various historical changes in marriage flows. The sharpest decline in marriage is among Canadians age 25–34, reflecting a delay in first marriage. (From 2000 to 2004, the average age of first marriage among men and women increased from 29.5 and 27.5 to 30.5 and 28.5, respectively.¹⁸) Since 2000, there is not as large a decline in the portion of 35–44 year olds who are married. This too reflects the increase in average age of first marriage. The corresponding portion of individuals divorced within each age group is also consistent with the observed marriage and divorce flows. Despite a general increase in the stock of divorced individuals over the 1976–2000 period, there has been some decrease for younger groups over the 2000–2011 period. This in part reflects the recent decline in divorce flows, but also the reduced opportunity for divorce (i.e. not being married). The decline in marriage (and remarriage) has resulted in a larger stock of older individuals (age 45–64) that are divorced.

As individuals are increasingly not getting married, what types of families are they living with? In Table 1, we also provide the portion of individuals in each type of economic family by age group. Among those aged 25–34 we see some increase in the portion that are ‘unattached’, living either alone or with individuals that they are not related to. There is also some increase in the portion of 25–34 year olds that are single parents. The increase in the portion of 25–34 year olds living in “other” family types is more substantial. For this age group, this largely reflects individuals who have never married and we expect in most cases individuals are living with parents.¹⁹

Among 35–44 year olds there is a substantial increase in the portion ‘unattached’ from 1976 to 2000, followed by a slight decline. The recent decline corresponds to the decline in the portion divorced. There is a continued increase in the portion that are single parents (with children under 18 years of age). Among those age 45–54 and 55–64, there is a clear upward trend in the portion unattached corresponding to the stock of divorcees. Generally there is a lower probability to be a single parent in this age group, particularly a single parent with children under age 18. Like other age groups in this category, there is an increasing tendency to be in ‘other’ family types. For the older age groups this likely captures both adult children (over age 24) and elderly parents joining their household.

¹⁶ To check the consistency of our stock and flow measures, we compared our 2001–2003 provincial estimates of married women at time t to estimates of the number of married women at $t - 1$ plus flows into marriage at t less flows into divorce at t . As expected, the latter is almost always slightly larger (by 11 % on average) as separations are not accounted for. We thank an anonymous referee for suggesting this test.

¹⁷ It is worth noting that the portion of individuals married or common-law in Quebec is similar to other provinces and trends in a similar way. However, couples in Quebec are much more likely to be common-law rather than legally married. See also footnote 21.

¹⁸ According to Cansim Table 101-1002.

¹⁹ In 2011, 85 % of individuals in ‘other’ families were never married. Only 3% were divorced or separated. Unfortunately, limited information in the LFS prevents reliable characterization of other family members so we cannot confirm how many are living with parents.

Table 1 Marital status (%) and family type (%) by age, 1976, 2000, and 2011

Age	Years	Marital Status		Family Type				
		Married	Divorced	Unattached	Single, kids <18	Single, kids 18–24	Husband-wife	Other
25–34	1976	79.43	3.94	11.61	2.89	0.38	82.58	2.54
	2000	61.55	4.10	19.49	4.80	0.42	69.31	5.98
	2011	57.54	2.97	20.87	4.92	0.68	65.22	8.32
35–44	1976	86.79	4.92	6.41	3.91	0.36	87.05	2.28
	2000	74.77	9.26	13.59	6.51	0.72	75.05	4.14
	2011	74.17	8.39	13.41	7.63	0.66	73.85	4.46
45–54	1976	84.71	4.82	7.91	3.31	1.51	84.06	3.21
	2000	78.29	11.78	12.68	3.31	2.57	76.63	4.82
	2011	73.89	12.23	14.69	4.31	3.11	71.12	6.77
55–64	1976	78.05	4.22	14.46	1.40	1.74	77.78	4.62
	2000	77.02	10.82	16.60	0.70	0.99	75.43	6.28
	2011	74.56	13.05	18.02	0.89	1.47	72.16	7.46
25–64	1976	82.19	4.43	10.00	2.96	0.88	83.15	3.01
	2000	72.67	8.86	15.37	4.26	1.17	74.05	5.15
	2011	70.08	9.20	16.66	4.48	1.54	70.57	6.75

Source: Authors' tabulations from the LFS

Numbers represent the percent of individuals in each age group that belong to each marital status and family type category. Married includes common-law and Divorced includes separated. Widows and never married are omitted marital status categories

There is considerable variation across provinces and over time in the types of families people belong to (Fig. 3). For example, British Columbia (BC) had the highest portion of individuals that were 'unattached' in 1976 (13 %) while Newfoundland (NL) had the lowest (4 %). In 2011, Quebec (QC) had the highest portion of individuals that were unattached (20 %). Newfoundland remained the province with the lowest portion unattached, but the rate had tripled to reach 12 %. With respect to changes in the likelihood of living in 'other' family types, Ontario had the lowest portion in 1976 (2 %) and became the province with the highest portion (8 %) in 2011. Provinces such as New Brunswick (NB) have hardly changed at all on this dimension—with portion of individuals in 'other' families rising from 4.3 % in 1976 to 4.5 % in 2011. Perhaps less obvious in Fig. 3 is the variation in single parenthood across provinces. The portion of individuals that were single parents increased over time in all provinces, but increased more in some provinces than others. For example, the portion of individuals in single parent families in Saskatchewan (SK) doubled from 3 to 6 % while in Alberta (AB) the portion only increased by 1.3 % points.

There also exists substantial variation in the unemployment rates of men age 25–54 across provinces and over time (Fig. 4).²⁰ While the provinces share the same

²⁰ Similar patterns are documented in Ariizumi and Schirle (2012), although they present unemployment rates representing both sexes age 15 and over, as defined by Statistics Canada.

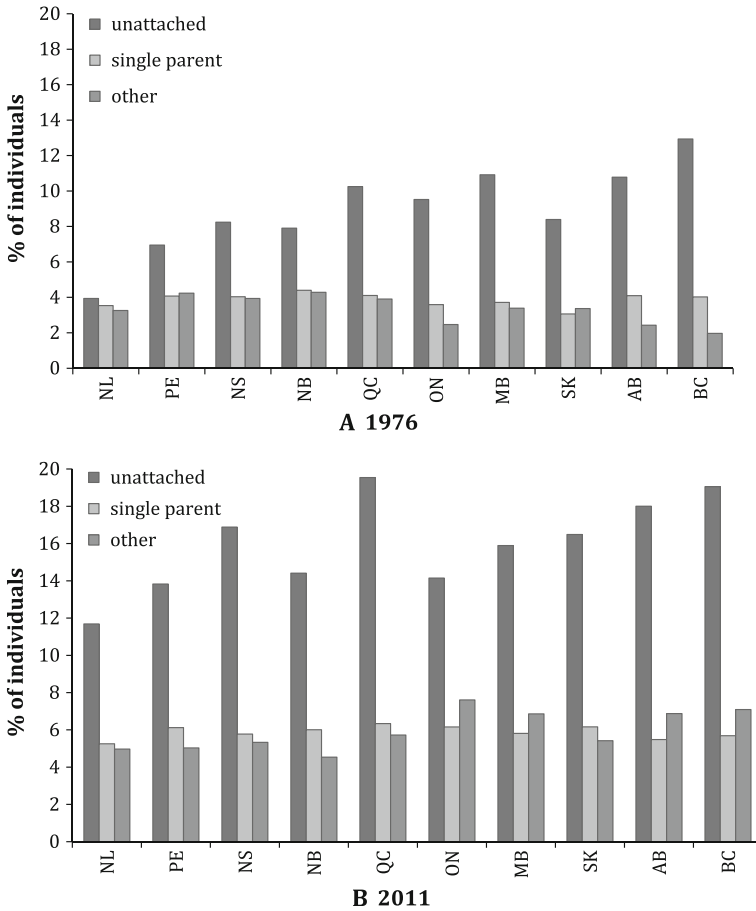


Fig. 3 Family structure by province, 1976 and 2011. *Note:* Sample represents individuals age 25–64. Omitted from the figure is the category for husband-wife families. *Source:* Authors' tabulations from the LFS

broad pattern in unemployment rates over time, there are clear provincial differences in the timing and depth of recessions and recovery. For example, the recession in the early 1980s hit British Columbia much harder than Ontario or Manitoba. While unemployment rates continued to climb after 1983 in British Columbia, Saskatchewan and Newfoundland, unemployment rates declined in Ontario, Quebec, and Manitoba. In the early 1990s, we see Saskatchewan and New Brunswick barely affected by the recession, while most others experienced large and sustained increases in unemployment rates. Over the early 2000s, there is a general decline in unemployment rates, though some provinces (such as Ontario) see little improvement, while others (such as British Columbia) experience steeper declines. In the most recent recession, we can see that some provinces (Alberta, Ontario, British Columbia) were hit much harder than others.

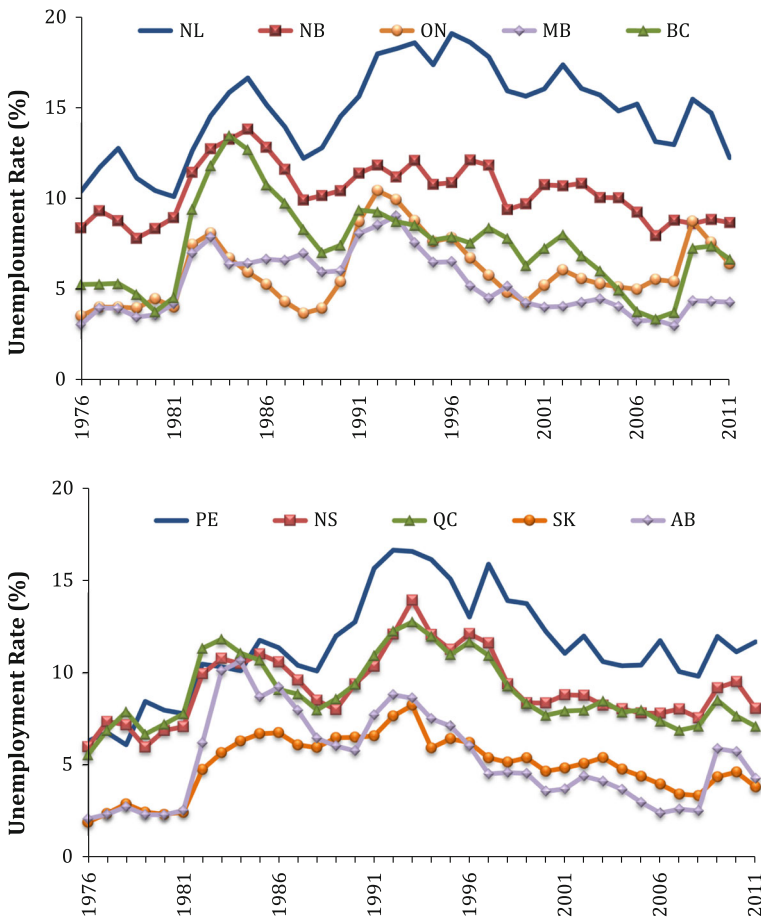


Fig. 4 Unemployment rates of men age 25–54, by province, 1976–2011. *Source:* Authors’ tabulations from the LFS

5 The effect of unemployment on family structure

5.1 Econometric model

Similar to recent US studies, we use a panel data model to estimate the relationship between family structure and business cycle fluctuations. A time series approach to estimating this relationship is not able to control for secular changes in family structure and the economy that may be spuriously correlated. The panel data model used here allows us to control for province, year, and quarter fixed effects, as well as province-specific trends.

Our main regression equation takes the form

$$R_{apm} = \beta UR_{ptm} + \delta X_{ptm} + \alpha_a + \rho_p + \tau_t + \gamma_p t + q_m + \varepsilon_{apm} \quad (4)$$

where R_{apm} is the relevant family structure variable (stock) representing those in

age group a , province p , year t , and month m . UR_{pim} is the provincial unemployment rate of men age 25–54 in month m . X_{pim} represents the demographic controls for the portion of the population over age 65 and the portion with a university degree. The fixed effects α_a allow for age specific intercepts in the family structure equation, common to all provinces and years. The fixed effect ρ_p controls for any time-invariant provincial characteristics and τ_t accounts for Canada-wide year effects. We also include province-specific trends (γ_{pt}) and when using monthly data we allow for quarter fixed effects (q_m). The estimate of β will reflect the average effect of increases in the unemployment rate on family structure.²¹ When estimating the equation, all observations are weighted by the population in each age-province-month-year group. Robust standard errors are provided, clustered at the province level.

For our stock measures of family structure, we also estimate the model in Eq. (4) for each age group. This allows all coefficients in the model (including province, year, and quarterly fixed effects) to vary for each age group.

As the vital statistics data for marriage flows is only available quarterly, we alternatively constructed our monthly LFS variables on a quarterly basis and included in the regression equation an indicator variable for the ‘summer’ quarters (covering April–September). The regression equation for marriage flows is then

$$M_{ptq} = \beta UR_{ptq} + \delta X_{ptq} + \rho_p + \tau_t + \gamma_{pt} + s_q + \varepsilon_{ptq} \quad (5)$$

Similarly, divorce flows are only available on an annual basis, so corresponding unemployment rates are constructed to represent each year-province observation. The regression equation for divorce flows is then

$$D_{pt} = \beta UR_{pt} + \delta X_{pt} + \rho_p + \tau_t + \gamma_{pt} + \varepsilon_{pt} \quad (6)$$

6 Results

In Table 2 we present the coefficients representing the effect of increasing the unemployment rate on marriage and divorce flows. Fluctuations in the business cycle have clear effects on marriage decisions. Estimates that control for demographics, province and year fixed effects, and provincial trends suggest that raising the unemployment rate by 1 percentage point is associated with a 13 % decline in the number of marriages formed per thousand single females each quarter, or 0.98 fewer marriages per thousand single females per quarter. The magnitudes are larger than, though comparable to, US estimates by Schaller (2012) which suggested a 1 percentage point increase in state unemployment rates was associated with a 1.5 % decline in the annual marriage rate, or 0.78 fewer marriages per thousand single females per year. In contrast to US results, changes in the

²¹ We cannot strictly interpret this effect as causal as there remain potential endogeneity issues. For example, it is possible that a change in marital stocks for unobserved reasons not captured by the fixed effects or provincial trends could influence the unemployment rate. Also, we are not able to account for possible non-linear temporal patterns in the male earnings structure that differ across provinces and are not captured by provincial trends or nation-wide year and quarter effects. We thank anonymous referees for their suggestions regarding this limitation of our study.

Table 2 The effect of unemployment on flows into marriage and divorce

Dependent variable:	(1)	(2)	(3)	(1)	(2)	(3)
	Quarterly marriages per thousand single females	Quarterly marriages per thousand single females	Quarterly marriages per thousand single females	Log (quarterly marriages per thousand single females)	Log (quarterly marriages per thousand single females)	Log (quarterly marriages per thousand single females)
(A) Marriage(1981-Q3-2004-Q4)						
	-0.7626*** (0.1673)	-0.8567*** (0.1364)	-0.9770*** (0.1062)	-0.0997*** (0.0305)	-0.1195*** (0.0289)	-0.1296*** (0.0254)
<i>Controls for:</i>						
Elderly (%)	Yes	Yes	Yes	Yes	Yes	Yes
University (%)	Yes	Yes	Yes	Yes	Yes	Yes
Summer quarter	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes
Province trend	No	No	Yes	No	No	Yes
No of observations	940	940	940	940	940	940
R-square	0.637	0.810	0.830	0.628	0.845	0.869
(B) Divorce (1976-2003)						
	-0.0549 (0.0967)	0.1299 (0.1021)	-0.0040 (0.0470)	-0.0065 (0.0114)	0.0132 (0.0095)	-0.0019 (0.0027)
<i>Controls for:</i>						
Elderly (%)	Yes	Yes	Yes	Yes	Yes	Yes
University (%)	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes

Table 2 continued

Dependent variable:	Annual divorces per thousand married females		Log (annual divorces per thousand married females)	
	No	Yes	No	Yes
Province trend				
No of observations	280	280	280	280
R-square	0.131	0.859	0.120	0.926

Source: Authors' tabulations, see text for details

Robust standard errors are in parentheses. FE refers to fixed effects

*** Denotes statistical significance at the 1 % level

unemployment rate do not appear to have a significant effect on flows into divorce in Canada.²²

We then investigate the stock of individuals in each marital state, relying on monthly variation for our estimates.²³ These are presented in Table 3, and we see that the size of the estimate depends on the set of controls used in regression. Our preferred specification is presented in the third column, which includes province and year fixed effects and provincial trends. Consistent with our flow estimates, we see that a 1 percentage point increase in the unemployment rate is associated with 0.06 percentage point reduction in the portion of individuals who are married. Specifications that included lagged unemployment rates (not presented here) resulted in similar estimates.²⁴ To put this into perspective, this would imply 12,137 fewer Canadians age 25–64 are married when unemployment rates rise by 1 percentage point.²⁵ The significant impact appears driven by a reduction in legal marriages and not common law unions (noting this is based on more recent data).²⁶ Interestingly, the impact of unemployment on marriage does not imply a significant impact on the portion that have never been married.

We also see in Table 3 a significant increase in the portion of the population divorced in response to an increase in unemployment. Estimates suggest a 1 percentage point increase in the unemployment rate is associated with a 0.05 percentage point increase in the portion divorced. As with marriage, the inclusion of lagged unemployment rates (not presented here) do not substantially change the results.²⁷ Notice this is not inconsistent with our estimates based on divorce flows, and points to the value of investigating both flow and stock measures when investigating family structure. The results in Table 2 suggested that when unemployment rates are high, individuals are not more likely to get divorced. Individuals are, however, less likely to get married. In particular, divorcees are less likely to remarry—resulting in the increased stock of divorcees. Note that the estimates appear to have a larger effect on divorce rather than separation.

There are interesting age differences in the effects of unemployment on marital stocks, presented in Table 4. For younger adults (age 25–34) an increase in the unemployment rate is associated with a significant reduction in the portion legally married, but not the portion in common-law unions (noting this result only

²² As Quebec residents have a lower tendency to be legally married, we checked whether results for divorce flows were different when Quebec observations were excluded from the panel. The coefficients are similar and are not statistically significant when excluding Quebec. These results are available from the authors upon request.

²³ We also derived stock estimates based on quarterly measures. Results for marriage are not statistically significant. Results for divorce are similar to that described in the following paragraphs.

²⁴ We included four lags. Coefficients on the contemporaneous unemployment rate was -0.044 and the previous month was -0.013 . Earlier lags were not significantly different from zero. These results are available from the authors upon request.

²⁵ Based on 2007 population estimates (Statistics Canada Cansim tables 051-0001 and 051-0010).

²⁶ Using the November 1999–December 2011 subsample, the effect of the unemployment rate on married/common-law stocks is much larger (the coefficient is -0.1231). Results for divorce are very similar to those presented in Table 3.

²⁷ The effect on divorce is similar, however there appears to be some lagged effect of unemployment on separation. These results are available from the authors upon request.

Table 3 The effect of unemployment on marital status (stock measure)

	(1)	(2)	(3)	N
(A) January 1976–December 2011				
Married/common law	−0.3578** (0.1494)	−0.0473* (0.0247)	−0.0630** (0.0194)	17280
Divorced/separated	0.0884 (0.0626)	0.0735*** (0.0147)	0.0533*** (0.0133)	17280
Never Married	0.2911** (0.0992)	−0.0232 (0.0205)	0.0050 (0.0183)	17280
(B) November 1999–December 2011				
Legally married	−1.1961 (0.9379)	−0.1642** (0.0605)	−0.1455*** (0.0412)	5840
Common law	1.0678 (0.7214)	−0.0344 (0.0691)	0.0224 (0.0230)	5840
Divorced	−0.0378 (0.0747)	0.0646** (0.0256)	0.0359** (0.0140)	5840
Separated	0.0023 (0.0324)	0.0399* (0.0190)	0.0145 (0.0122)	5840
<i>Controls for:</i>				
Elderly (%)	Yes	Yes	Yes	
University (%)	Yes	Yes	Yes	
Age FE	Yes	Yes	Yes	
Quarter FE	Yes	Yes	Yes	
Province FE	No	Yes	Yes	
Year FE	No	Yes	Yes	
Province trend	No	No	Yes	

Source: Authors' tabulations, see text for details

Dependent variable represents the percentage of individuals belonging to the specified marital status group. FE refers to fixed effects. Robust standard errors are in parentheses

***, **, * Denotes statistical significance at the 1, 5 and 10 % levels, respectively

represents marriage and unemployment since 1999). Combined, there is no significant effect on the portion of 25–34 year olds that are married or living common-law, and no effect on the portion never-married. This result lies in sharp contrast with US results suggesting the effect of unemployment on marriage flows is concentrated among the 26–35 year old age group (Schaller 2012). There is no significant unemployment effect on divorce stocks among the 25–34 year olds in Canada. In older age groups (35–64), increases in the unemployment rate have a significant negative effect on the portion married or common-law (with estimates suggesting emphasis be placed on legal marriage) and a positive significant effect on the portion divorced. Only among the 55–64 year old group do we see a significant increase in the portion of individuals that have never married (and arguably this reflects a select group of individuals). These results support the assertion that during recessionary periods remarriage may be more seriously affected than first marriages.

Table 4 The effect of unemployment on marital status (stock measures), by age

Age	25–34	35–44	45–54	55–64
(A) Jan. 1976–Dec. 2011				
Married/common law	−0.0217 (0.0417)	−0.0880** (0.0303)	−0.0829** (0.0289)	−0.0707** (0.0288)
Divorced/separated	0.0206 (0.0134)	0.0673** (0.0215)	0.0827** (0.0305)	0.0523** (0.0173)
Never married	−0.0052 (0.0488)	0.0097 (0.0215)	−0.0075 (0.0152)	0.0341* (0.0183)
(B) Nov. 1999–Dec. 2011				
Legally married	−0.1423* (0.0648)	−0.2298** (0.0997)	−0.0573 (0.0865)	−0.1497** (0.0595)
Common law	−0.0499 (0.0532)	0.0866 (0.0502)	0.0103 (0.0498)	0.0384 (0.0414)
Divorced	−0.0008 (0.0137)	0.0814** (0.0316)	0.0135 (0.0227)	0.0519** (0.0222)
Separated	0.0129 (0.0138)	−0.0018 (0.0285)	0.0224 (0.0141)	0.0231 (0.0127)

Source: Authors' tabulations, see text for details

Dependent variable represents the percentage of individuals belonging to the specified marital status group. All specifications include controls for the portion elderly, portion with a university degree, quarterly fixed effects, province and year fixed effects and provincial trends. Robust standard errors are in parentheses

***, **, * Denotes statistical significance at the 1, 5 and 10 % levels, respectively

The results for the oldest age group, however, are not entirely robust to the use of employment rates as the indicator of macroeconomic activity. Notably (from estimates not presented here) a change in the employment rate does not have significant effects on marriage stocks for 55–64 year olds or divorce/separation stocks for 45–64 year olds.²⁸

As expected, the results presented thus far indicate that recessions—by raising the average match quality required for a marriage to be formed—reduce flows into marriage. The estimated effects of recessions on the stock of married, divorced, and never-married individuals suggest second marriages are more sensitive to the business cycle than first marriages. With respect to Canadians' divorce decisions, a recession's effects on the incomes of unattached individuals available for remarriage appears to balance out a recession's negative effects on the gains of staying in an existing marriage, so that increases in unemployment appear to have no significant effect on divorce flows.

Are changes in family structure over the business cycle consistent with these results? We are also interested in determining whether individuals are altering their family structure in ways not captured by marriage and divorce rates—for example, by joining households with extended family members during recessions.

²⁸ These estimates are available from the authors upon request.

In Table 5, we present estimates of the effect of unemployment on the portion of individuals in each economic family type. The significant reduction in the portion of individuals living in husband-wife families in response to an increase in unemployment is consistent with estimates for the reduction in the portion that are married. Notably, it is not individuals in the 25–34 age range that are significantly less likely to be in husband-wife families, rather it is individuals in the 35–54 age range (Table 6).

Most interestingly, unemployment's negative effects on marriage do not lead to a larger aggregate portion of individuals living alone (unattached). There appears to be some effect for those aged 35–54. Typically, unattached individuals in the 35–44 age range have never married (72 % of unattached individuals were never married in 2011). This is less so the case for those age 45–54, as 54 % of the unattached in this age group were never married in 2011. As such, the increase in unattached individuals in the 35–54 age range will reflect reductions in both first and subsequent marriages.

There is also a significant positive effect of higher unemployment on the portion of individuals that are in single parent families with children under age 18. The effect is most prominent for the younger age groups. Among those age 35–44 in 2011, 56 % of single parents (with children under 25) are divorcees. For this group, then, the increase in single parenthood in recessions often reflects the reduction in remarriage. For the age 25–34 group, however, this is not as clear. In 1976, 56 % of individuals in single parent families were divorcees. In 2011, however, only 22 % were divorcees while 68 % were never married.²⁹ As such, this result could represent several things for 25–34 year olds—a reduction in first marriages, a reduction in remarriages, as well as an increase in fertility rates when unemployment rates are high. The latter appears unlikely—by constructing estimates based on annual fertility data and models structured similar to those presented here, we found that changes in the unemployment rate (or lagged unemployment rate) did not have a significant effect on the fertility rates of 25–29 year old women in Canada.³⁰

It is only among 55–64 year olds that an increase in the unemployment rate appears to have a significant positive effect on the number of individuals in single parent families with children age 18–24. The age difference in results is somewhat expected as individuals in the 55–64 age group are more likely to have the older children. The result may represent several factors at play. On one hand, this reflects the same reduction in remarriage noted with respect to other variables. This may also, however, reflect a tendency for young adults under age 25 to remain with their parents longer during recessionary periods—perhaps while furthering their education. For example, studies (such as Betts and McFarland 1995) have shown that an increase in unemployment rates is associated with rises in full-time community college attendance. Also, Kaplan (2012) has shown that the coresidence rate of young adults (age 16–34) with their parents decreases when employment rates or average hours worked increases.

²⁹ Based on authors' tabulations from the LFS.

³⁰ For the dependent variable we used the number of live births per woman age 25–29, 1980–2005, from Cansim Table 102-4503.

Table 5 The effect of unemployment on family structure (1976–2011)

	(1)	(2)	(3)	No of observations
Unattached	0.0809 (0.1589)	-0.0205 (0.0594)	0.0331 (0.0307)	17280
Single, kids <18	0.0384* (0.0195)	0.0418*** (0.0099)	0.0329*** (0.0093)	17280
Single, kids 18–24	0.0346*** (0.0070)	-0.0040 (0.0039)	-0.0020 (0.0020)	17280
Husband-wife	-0.2081 (0.1611)	-0.0382 (0.0392)	-0.0756** (0.0250)	17280
Other	0.0541* (0.0272)	0.0208 (0.0310)	0.0115 (0.0081)	17280
<i>Controls for:</i>				
Elderly (%)	Yes	Yes	Yes	
University (%)	Yes	Yes	Yes	
Age FE	Yes	Yes	Yes	
Quarter FE	Yes	Yes	Yes	
Province FE	No	Yes	Yes	
Year FE	No	Yes	Yes	
Province trend	No	No	Yes	

Source: Authors' tabulations see text for details

Dependent variable represents the percentage of individuals belonging to the specified family structure group. FE refers to fixed effects. Robust standard errors are in parentheses

***, **, * Denotes statistical significance at the 1, 5 and 10 % levels, respectively

Table 6 The effect of unemployment on family structure, by age (1976–2011)

Age	25–34	35–44	45–54	55–64
Unattached	-0.0016 (0.0579)	0.0505* (0.0266)	0.0587* (0.0270)	0.0209 (0.0560)
Single, kids <18	0.0532** (0.0179)	0.0421** (0.0155)	0.0107 (0.0084)	-0.0058 (0.0049)
Single, kids 18–24	-0.0033 (0.0024)	-0.0033 (0.0044)	-0.0118 (0.0088)	0.0150* (0.0080)
Husband-wife	-0.0542 (0.0440)	-0.0774** (0.0314)	-0.0846** (0.0326)	-0.0598 (0.0378)
Other	0.0059 (0.0111)	-0.0119 (0.0101)	0.0270** (0.0113)	0.0297 (0.0251)

Source: Authors' tabulations, see text for details

Dependent variable represents the percentage of individuals belonging to the specified marital status group. All specifications include controls for the portion elderly, portion with a university degree, quarterly fixed effects, province and year fixed effects and provincial trends. Robust standard errors are in parentheses

***, **, * Denotes statistical significance at the 1, 5 and 10 % levels, respectively

Finally, it is interesting that only among the 45–54 year olds do we see a significant increase in ‘other’ family types associated with increases in the unemployment rate. It is possible that this represents an increase in adult children (over age 25) living with their parents during recessions. If this were the case, however, we would also expect to see a significant increase in the portion of 25–34 year olds living in ‘other’ family types during recessions and this is not the case. As such, it seems more likely that this positive effect of unemployment represents elderly parents moving in with their children during recessions. It is also possible this result represents 45–54 year olds that move in with siblings (likely to be in the same age group).

To summarize, we see that the business cycle has a significant effect on family formation and family structure, and the nature of that effect appears to vary substantially by age. For the youngest group studied, there is some evidence that after 1999, young adults aged 25–34 were less likely to get legally married during recessions, but there is not a significant effect on the portion that were married (including common-law) or never-married in the broader sample for 1976–2011. In terms of their family structure, the only significant effect of an increase in unemployment rates is an increase in the portion of 25–34 year olds that were single parents. For the older groups, the evidence suggests that a reduced tendency to remarry during recessions is important. For those age 45–54 we also see evidence of other family types being formed during recessions—likely representing elderly parents joining the household. For those aged 55–64, we see evidence suggesting children age 18–24 may be remaining in the home longer during recessions.

7 Discussion and concluding remarks

The evidence presented here suggests that business cycle fluctuations have significant and sizeable effects on family structure in Canada. A 1 percentage point increase in the unemployment rate is associated with a 13 % reduction in the quarterly number of marriages per thousand single females. Contrary to US evidence, however, there is not a significant change in the number of divorces when unemployment rates rise. Overall, the evidence presented suggests a significant reduction in Canadian remarriages during recessionary periods and only small effects on other aspects of family formation.³¹

Why might we see a greater sensitivity of remarriages to the business cycle? The framework presented in this paper suggested that an increase in unemployment will raise the average quality of matches required for marriages to be formed. As the level of churning in the labor market also affected the sensitivity of first marriages to the business cycle, the greater sensitivity of remarriages than first marriages would suggest a relatively high level of churning in Canada’s labor market. That is, in an environment where individuals anticipate a high likelihood of changing their

³¹ Arguably, the observed reduction in remarriage rates among single parents could have negative implications for child welfare. However, the implications for child welfare would depend on the quality of matches that would otherwise be formed. If bad remarriages are avoided, this could have a positive effect on children. Welfare implications require further research.

employment status from one period to the next, a small change in current unemployment rates is less likely to significantly alter their expectations for the employment status of individuals they meet in the future.

Cross-country differences in labor market mobility may help us understand why US marriage flows appear slightly less sensitive to business cycle fluctuations than Canadian marriage flows—Schaller's (2012) estimates indicated a 1 percentage point increase in the unemployment rate was associated with 0.78 fewer marriages per thousand single females per year in the US. Our estimates suggest 0.98 fewer marriages per thousand single females per year in Canada. Evidence suggests that over the period we examine in this study, US labor markets exhibit slightly more churning than Canadian labor markets. For example, estimates for job separation rates in Elsby et al. (2009) and Shimer (2012) exhibit a steady downward trend since the late 1970s, but appear to be slightly higher on average than comparable estimates presented in Campolieti (2011).

We caution, however, that the framework used in this paper is quite stylized, and the mechanisms working to affect marriage formation over the business cycle warrant further investigation. For example, costs of producing children may also fall during recessions, further lowering requirements for first marriage match quality during recessions. It may also be important to consider negotiations between spouses and how marriage acts as an institution that governs work in household production (as in Grossbard-Shechtman 1993), as compensation for such work could vary over the business cycle in ways that differ for those seeking first and second marriages.

We would also like to reconcile the cyclicalities of divorce flows in the US with what we observe in the Canadian data. Recessions are associated with a reduction in US divorce rates but have no significant effect on Canadian divorce rates. Applying the framework presented in this paper, the US results imply that a US recession's negative effect on remarriage prospects upon divorce outweighs the negative effect of a recession on the gains associated with staying in a marriage. In Canada, the latter effect is large enough to balance these opposing forces. This difference in the net effect might arise for two reasons in our framework. First, a recession's negative effect on the gains to staying married is expected to be larger if there is a larger gap between employment and unemployment income. This is unlikely the explanation, however, as Canada is generally thought to have a more generous social safety net to support the unemployed during recessions.³² Moreover, the unemployment insurance system in Canada is designed to ease eligibility requirements in periods of high unemployment.³³ Second, the negative effect of recessions on the gains to staying married is expected to be larger if increases in separation rates rather than reductions in job finding rates are driving increases in unemployment. Evidence from studies examining flows in and out of unemployment suggests this will be an important mechanism. For example, Campolieti (2011) provides evidence that Canadian job separation rates have a strong countercyclical pattern (rising during

³² See for example Blank and Hanratty (1993) for a Canada-US comparison.

³³ Important for this relationship, there are several income support programs that effectively have marriage "penalties". See for example Baker et al. (2004).

recessions) over the 1976–2008 period while Canadian job finding rates do not have a cyclical pattern after the mid-1990s. There is conflicting evidence regarding the cyclicity of job separation rates in the US (see Elsby et al. 2009; Shimer 2012). Furthermore, Elsby et al. (2009) found that the role played by separation rates (relative to job finding rates) in changes in US unemployment rates had diminished over time. Overall, the clearer cyclicity of Canadian job separation rates may help us reconcile the cyclicity of US and Canadian divorce flows.

The results of this paper have highlighted the complex relationship between family formation decisions and business cycle conditions. More research is required to understand the precise mechanisms underlying our empirical results. We expect further investigation of labor market mobility to prove interesting, and note there are several other possible mechanisms we have not considered. For example, we have not considered how uncertainty in match quality might vary over the business cycle. Bloom et al. (2012) suggests income uncertainty rises sharply during recessions and this could affect perceptions of match quality. We have not explored risk-sharing motives for marriage, which Shore (2010), Chami and Hess (2005) and Nordblom (2004) suggest is an important factor in family formation decisions. Given the complexity of family formation decisions, further investigation of potential mechanisms that might underlie the business cycle's effects on family formation will be valuable.

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