

Decomposing the crude divorce rate in five countries: Singapore, Taiwan, South Korea, the UK, and Australia

Abstract

Over the past few decades, divorce level, measured by the crude divorce rate (“CDR”), has increased dramatically in both the East and the West, but has recently appeared to fall or level off in some countries. To investigate into whether the recent decline or stabilization of the CDRs reflects the real trends in divorce risk, a decomposition analysis has been conducted on the changes in the CDRs over the past 20 years on two western and three East Asian countries, namely, the UK, Australia, Taiwan, South Korea, and Singapore. The following is observed: the decline in the CDRs of the UK and Australia in the 1990s, and of Taiwan and Korea in the 2000s, was mainly due to shrinkage in the proportion of the married population rather than any reduction in divorce risk; among the five countries, only Australia experienced a genuine reduction in divorce risk between 2001 and 2011; and the continuous increase of Singapore’s divorce level between 1990 and 2010 may be is an unintentional effect of the government’s marriage promotion policies. The shift in the population age structure, and more importantly, the drastic decline in marriage, have seriously distorted the CDRs, making them unreliable indicators to monitor the divorce trends. The increasing heterogeneity of divorce risks among various age groups is however, of great relevance to social and public policy formulation in promoting healthy marriages. Differences in divorce profiles in the five countries are also discussed in this study.

Keywords: crude divorce rate, divorce risk, marriage, decomposition

Decomposing the crude divorce rate in five countries: Singapore, Taiwan, South Korea, the UK, and Australia

Introduction

As can be seen from the trends of the crude divorce rates (“CDR”), over the past few decades, not only western countries but also eastern countries have experienced a dramatic increase in divorce (Dommaraju and Jones 2011). But since the 1990s, a levelling off or declining trend of the CDRs has been observed in some western countries, such as in the US, the UK, and Sweden (Andersson and Kolk 2015; Goldstein 1999; The Economist 2009). Following the West, the CDRs of some Asian countries, such as Taiwan, South Korea, Japan, have also stabilized or started to fall in the early 2000s (Dommaraju and Jones 2011). All these trends seem to indicate that the “divorce surge is over” (Miller 2014), and leave an impression that the divorce risk of married couples is decreasing and the quality of marriage is improving. However, concerns are still growing in the increasing marital instability and potential serious consequences regarding the well-being of divorced men and women, as well as of children with divorced parents (Amato 2000; Dupre et al. 2009; Frisco et al. 2007; Hango and Houseknecht 2005; Hewitt and Turrell 2011; Liu and Umberson 2008; Yip et al. 2012; Yip et al. 2015).

Meanwhile, it has already been suggested that these statistics of divorce should be interpreted with caution (Crosby 1980; Dommaraju and Jones 2011; England and Kunz 1975; Goldstein 1999; Khoo and Zhao 2001; Kunz and England 1989). CDR, the most widely cited indicator of divorce, refers to the ratio of the number of divorces to the total population in a given period. As it is expressed in terms of the total population rather than the married

population in the risk pool, changes in the CDRs may not necessarily reflect real changes in divorce risks. Lee (2006) has already noticed that in South Korea, the CDRs in the period of 1990-2003 may have understated the magnitude of the increase in the divorce risk as the married population at risk of divorce is shrinking. Although Amato (2010) has pointed out that changes in the population age structure and proportions of the married population would affect the accuracy of the CDRs, it is still unknown however, to what extent the CDRs have been distorted by these compositional factors. Alternative indicators such as the refined divorce rate (the number of divorces divided by the number of married women), the age-specific divorce rate (the number of divorces divided by the number of married women in a certain age group), the age-standardized divorce rate have been suggested to rectify the shortcomings of the CDRs (Shryock 2013). But currently, not many national statistical offices have adopted those proposed indicators. Moreover, the general divorce rate (the number of divorces divided by the population aged 15 and above) is probably more readily available than those age-specific indicators, but still, it does not take into consideration the age structure and marriage incidence.

This study focuses on the CDRs and investigates into their changes under the big picture of population dynamics. It should be emphasized that behind the observed rise and fall (or stabilization) of the CDRs, there are other major changes in family behaviors over the past decades. Both in the West and the East, people nowadays are marrying at an older age and less frequently. This is accompanied by increasing cohabitation and prevailing non-marital childbearing in the western societies, while by a longer period of “effective singlehood” in the eastern societies (Jones 2007; Jones and Yeung 2014). Figure 1 shows the CDRs in 1990, 2000 and 2010 in 25 high-income western and eastern countries: the CDRs of countries in Group 1

showed some decline in the period under study, especially during 2000-2010; in contrast, the CDRs of countries in Group 2 increased continuously over 1990-2010. Does this imply that marital stability is improving in countries of Group 1 while worsening in Group 2? England and Kunz (1975) have argued that the CDRs can only be used to make comparisons over time or across countries when the two populations have “similar proportions of unmarried, non-risk members”. As shown in Figure 1, underlying the fluctuation of the CDRs, the CDRs in all those countries dropped substantially during the period under study, indicating a great decline in nuptiality. In this context, if the population size of a country keeps growing while the married population is relatively shrinking, it is very likely that the CDRs may misrepresent the divorce trends and underestimate the divorce risks among the married couples.

Fig. 1. Crude divorce rates and crude marriage rates in high-income western and East Asian countries: 1990-2010

Sources: OECD Family Database, SF3.1 Marriage and divorce rate; the Department of Household Registration under the Ministry of Interior of Taiwan; the Singapore Department of Statistics; the Korean Statistical Information Service Office.

Note: For the US, the CDRs in 1990 and 2000 refer to 1992 and 2005 while the CMR in 1990 refers to 1991; for Lithuania, the CDR in 2010 refers to 2008; for Canada, the CMRs in 1990 and 2010 refer to 1991 and 2008; for the UK, the CMR in 2010 refers to 2012; for New Zealand, the CDR in 1990 refers to 1992; for Taiwan, the CDR in 2000 refers to 2003 while the CMR refers to the 5-year moving average

[Insert Fig. 1 here]

Hence, the present research question is, “Do the trends of the CDRs reflect the actual divorce trends?” If not, what are the actual divorce trends? Is there any difference between East Asia and the West? To address these questions, a decomposition analysis has been conducted to assess the impacts of the population age structure, nuptiality, and the real divorce risk on the changes in the CDRs over the past 20 years. Five countries have been selected for the present

analyses, namely, Singapore, Taiwan, South Korea, the UK, and Australia, as they can, to some extent, represent the high-income developed countries in East Asia and the West. The three East Asian societies are selected because they share some homogeneity in their culture and social norms towards marriage, childbearing, and divorce; by contrast, and considerably different from the three Asian societies, in the UK and Australia, marriage and childbearing are not that closely related nowadays, divorce is much less stigmatized, and cohabitation, remarriage, and non-marital births are much more acceptable (Dommaraju and Jones 2011). By quantifying the roles of these three factors, this study not only helps to unveil the real divorce trends, but also enhances the understanding of the differences between the West and East Asia in family formation and dissolution in the past three decades.

Data and Methods

Data Source

Population by age, sex, and marital status, and the number of divorces by age and sex were required for each country's analysis. The divorce data were made available by the respective national statistical offices: the Department of Household Registration under the Ministry of Interior of Taiwan ("MOI"), the Singapore Department of Statistics ("DOS"), the Korean Statistical Information Service Office ("KOSIS"), the Office for National Statistics ("ONS") of the UK, and the Australian Bureau of Statistics ("ABS"). Population data were mainly based on the population censuses provided by the national statistical offices and the United Nations Statistics Division ("UNSD"). Data on the population by age, sex, and marital status from the UNSD can be used for analyses, as the UNSD has been collecting census statistics directly from

national statistical offices since 1984.

For the UK, the decomposition was for the periods 1991-2001 and 2001-2010. Due to limitation in data, only England and Wales were included in the analyses. In order to recalculate the CDRs as close as possible to the official estimates in the UK, the population data for 1991 were based on census tabulations, which were directly extracted from the UNSD, while the population data for 2001 and 2010 were based on mid-year population estimates, which were directly extracted from the ONS. For Australia, due to lack of divorce data broken down by age and sex for the year 1991, analyses were conducted only for the periods 1996-2001 and 2001-2011. For Singapore and Korea, the decomposition was performed for the two periods 1990-2000 and 2000-2010. For Taiwan, because the MOI distributes the population data annually but the data including comparable age groups were only available since 1995, analyses were performed for the period 1995-2003 (when the CDR had the largest increase) and the period 2003-2013 (when the CDR had the largest reduction).

Population data for the UK, Singapore, and Taiwan had no cases with unknown age or marital status. However, for Australia and Korea some of the population data were age-unknown or marital-status-unknown, so those unknown cases were redistributed proportionally to the observed counts. Regarding the divorce data, both South Korea and Taiwan had recorded the age of the husbands and the wives for all cases. For the UK and Australia, a very small proportion (less than 1%) of the divorces were age-unknown, therefore, the data were redistributed proportionally to the observed counts. For Singapore, the number of divorces used in both the official calculation of the CDRs and the present analyses includes divorce decrees and annulments. Age-unknown cases were first redistributed proportionally to the observed

counts; and to make the age classification consistent in Singapore, annulments in the 40-and-above age group (which was the oldest group in the age category under annulments) were then spread proportionally to the observed counts of the 40-44, 45-49, 50-54, 55-59, and 60-and-above age groups in the divorce decrees.

Methods

The proposed decomposition method enabled us to quantify the contributions of different factors behind the changes in the CDRs. Let P_T be the total population; P_i^m and P_i^f denote the male and female population of an age group i respectively; M_i^m and M_i^f denote the numbers of married males and females in an age group i respectively; D_i^m and D_i^f denote the numbers of divorces for males and females in an age group i respectively. Those with overbars denote the average between the two time points.

$$CDR_{male} = \sum (P_i^m / P_T) \times (M_i^m / P_i^m) \times (D_i^m / M_i^m) \quad (1)$$

$$CDR_{female} = \sum (P_i^f / P_T) \times (M_i^f / P_i^f) \times (D_i^f / M_i^f) \quad (2)$$

$$\begin{aligned} \Delta CDR_{male} = & \sum \Delta (P_i^m / P_T) \times \overline{(M_i^m / P_i^m)} \times \overline{(D_i^m / M_i^m)} + \sum \overline{(P_i^m / P_T)} \times \Delta (M_i^m / P_i^m) \times \overline{(D_i^m / M_i^m)} \\ & + \sum \overline{(P_i^m / P_T)} \times \overline{(M_i^m / P_i^m)} \times \Delta (D_i^m / M_i^m) \end{aligned}$$

(3)

$$\begin{aligned} \Delta CDR_{female} = & \sum \Delta (P_i^f / P_T) \times \overline{(M_i^f / P_i^f)} \times \overline{(D_i^f / M_i^f)} + \sum \overline{(P_i^f / P_T)} \times \Delta (M_i^f / P_i^f) \times \overline{(D_i^f / M_i^f)} \\ & + \sum \overline{(P_i^f / P_T)} \times \overline{(M_i^f / P_i^f)} \times \Delta (D_i^f / M_i^f) \end{aligned}$$

(4)

Equations (1) and (2) reveal how the CDRs for males and females may be affected by

changes in the population age structure, marriage patterns, and divorce risks of different age groups. In this paper, the CDRs for males and females in each country were first re-estimated and then decomposed into three age-specific components: (i) changes in the population age structure; (ii) changes in the age-specific proportions of the married population; and (iii) changes in the age-specific divorce risk (“ASDR”). Equations (3) and (4) demonstrate the specific decomposition of the changes in the CDRs for males and females. To reveal the real divorce trends, “the synthetic CDR” for males and females, respectively, was also estimated, under the assumption that the divorce risk of males and females changed over time, while the age structure and marriage patterns remained the same as they were in the early 1990s.

Results

Descriptive Examination of Trends in the CDRs and the ASDRs

Figure 2 shows trends of the CDRs for the five selected countries from 1990 to 2013. The UK and Australia have witnessed a steady decline in the CDRs since 1996. Unlike the two western countries, across the entire decade of the 1990s, there was a significant rise in the CDRs in the three Asian economies. Taiwan and Korea experienced a dramatic rise in the CDRs until 2003, reaching the peak levels of 2.9 and 3.4, respectively— levels that are comparable to or even higher than those of the UK and Australia; however, since 2004, the CDRs of Taiwan and Korea have started to decline. The CDR of Singapore though has increased continuously throughout the entire period of study (1990-2013), among the three East Asian countries, Singapore had a similar starting point as Korea and Taiwan in 1990, but the speed of its increase was much slower. In contrast to the divergence between East Asia and the West in the early

1990s, the CDRs in the early 2010s seemed to reflect a likely convergence in the divorce trends among the five countries.

Fig. 2. Trends of crude divorce rates in five countries 1990-2013

Sources: the Department of Household Registration under the Ministry of Interior of Taiwan, the Singapore Department of Statistics, the Korean Statistical Information Service Office, the Australian Bureau of Statistics, and Eurostat

[Insert Fig. 2 here]

Estimation of the ASDRs for males and females was then presented which reflects the real divorce risk among the married population. The results are shown in Figure 3. In the early 1990s, the ASDRs for Singapore, Taiwan and South Korea stayed at very similar levels, almost all of which were much lower than the levels in the UK and Australia. This indicates that the divergence in the CDRs at the beginning of the 1990s (see Figure 2) does reflect a real gap in the divorce risk between East Asia and the West.

In the early 2000s, the ASDRs of the three Asian countries had a big increase, especially in Taiwan and Korea, narrowing the gap between East Asia and the West. It is worth noting that over the decade of 1990-2000, the ASDRs of the 15-24 and 25-29 age groups in the western countries had a reduction, while in East Asian countries, the ASDRs of those two age groups had a remarkable increase. Such difference in divorce risks among the younger age groups can also be seen in the early 2010s. This is probably because shotgun marriages have greatly reduced in western countries as cohabitation and out-of-wedlock births are more socially acceptable (Carmichael 2014; Ermisch 2001; Stevenson and Wolfers 2007), while premarital pregnancies in the three Asian countries usually end up in very fragile marriages.

In the early 2010s, a more convergent pattern of divorce risk between East Asia and the

West can be seen in Figure 3. It is noteworthy that in Taiwan and Korea, the ASDRs of the 15-29 age group had a further increase in the past decade, reaching a level even higher than that of Australia and the UK. The ASDRs of Australians aged 25-44, however, decreased over the period 2001-2011, making its age gradient of the divorce risk look much flatter than that of the UK's. In sum, although the CDRs of these five countries seem to be converging over the recent decade, there have been great variations in the divorce risks among different age groups and across countries.

Fig. 3. The age-specific divorce risks of married men and women

Note: Singapore's estimations are for the years 1990, 2000, and 2010; Taiwan's for 1995, 2003, and 2013; Korea's for 1990, 2000, and 2010; the UK's for 1991, 2001, and 2010; and Australia's for 1996, 2001, and 2011.

[Insert Fig. 3 here]

The Decomposition of Changes in the CDRs

A decomposition analysis on the changes of the CDRs in the past 20 years has been conducted. Table 1 shows the impacts of the population age structure, nuptiality, and divorce risk on changes in the CDRs. Figure 4 visualizes those results. In the first row of Figure 4, the black solid lines show the estimates of the CDRs of the five countries. The blue and red dashed lines show the synthetic CDRs for males and females, respectively. For each country, the synthetic CDRs can be regarded as a standardized CDR, which takes the population and its marital structure at the first time point as reference. Estimations of the CDRs were very close to the officially reported CDRs. As the official figures are often rounded off, if there is a small discrepancy between the present estimates and the official ones, it is probably because census-based population data have been used in this study, whereas the official CRDs were often based

on mid-year or year-end population estimates.

Table 1 Decomposition of changes in the CDRs

[Insert Table Here]

Fig. 4. Contributions of the age structure, nuptiality, and divorce risks to changes in the CDRs

[Insert Fig. 4 here]

The second row of Figure 4 shows the decomposition of changes in the CDRs during the first period of study by sex. The third row shows the results of the second period of study. For the period 1990-2010, Singapore experienced a continuous increase in its CDRs, though the level was relatively lower compared to that of other countries. In both periods 1990-2000 and 2000-2010, the increase of Singapore's CDRs was mainly caused by the increase in divorce risk. Changes in the age structure and nuptiality depressed the CDRs more significantly in the period 2000-2010: for males, the divorce risk pushed up the CDR by 0.58, while the nuptiality and age structure depressed it by about 0.14 and 0.07, respectively, thus leading to a net increase in the CDR of 0.38 (see Table 1); for females, the divorce risk contributed to 0.67, while the nuptiality and age structure contributed to -0.21 and -0.08, respectively (see Table 1). According to the trends of the CDRs*(male) and the CDRs*(female) shown in Figure 4, if the age structure and marriage patterns of men and women had remained the same as those in 1990, the synthetic CDRs in 2000 and 2010 would be higher than the actual CDRs. Therefore, due to shifts in the age structure and a decline in nuptiality, the CDRs have underestimated the increasing divorce trends in Singapore, especially in the past decade.

The CDRs in both Taiwan and Korea however, increased in the first period (1995-2003 for Taiwan; and 1990-2000 for Korea) and decreased in the second period (2003-2013 for Taiwan;

and 2000-2010 for Korea). The rising divorce risk in the first period was mainly responsible for the increase in the CDRs. The decline of the CDRs in the second period, however, was not the result of decline in divorce risk, but of decline in nuptiality, that is, of decrease in the proportions of the married population; the divorce risk among the married has actually increased, especially among females, imposing an upward pressure on the CDRs. For Taiwan, as seen in the CDRs*(male) and the CDRs*(female), if the age structure and marriage patterns remained unchanged, the synthetic CDRs of 2003 and 2013 were higher than the actual CDRs, and the divorce risk was increasing rather than decreasing. For Korea, the gap between the synthetic CDRs and the actual CDRs was small in 2000 but widened greatly in 2010, reflecting serious distortions in the CDRs due to changes in the age structure and, more importantly, in marriage patterns. The trends of the CDRs in those two places were very misleading which suggested a decline in divorce risk over the past decade. In fact, the decline of the CDRs stemmed from a shrinking share of married people in the population rather than any improvement in marital stability.

Over the past 20 years, both the UK and Australia have witnessed a steady decline in the CDRs. The small decline in the CDRs during the first period (1991-2001 for the UK; 1996-2001 for Australia) was caused by a significant decline in nuptiality, which was only partially offset by the increase in divorce risks. This was similar to the recent experiences of Taiwan and Korea. In the second period (2001-2010 for the UK; 2001-2011 for Australia), about 90% of the decline in the UK's CDRs can be attributed to a decline in nuptiality, and there was almost no change in regard to divorce risks; however, in Australia, about 70% of the decline in the CDRs was contributed by the real decline in divorce risks. For both the UK and Australia, the

wide gaps between the synthetic CDRs and the actual CDRs reveal the serious distortions arising from the reduction of marriage. The trends of the synthetic CDRs indicate a levelling out of divorce in the UK but a real decline of divorce in Australia in the past decade.

Age-specific contributions to changes in the CDRs

Figure 5 shows age-specific contributions (of the population age structure, nuptiality, and divorce risk) to changes in the CDRs for males. The first row shows the decomposition results for the first period. The second row shows the results for the second period. Figure 6 shows the age-specific contributions to changes in the CDRs for females. These two figures help to reveal the heterogeneity between males and females, and across different age groups in the five countries. Exact values of the results for each country are available from the authors.

Fig. 5. Age-specific contributions to changes in the CDRs: males

[Insert Fig. 5 here]

Fig. 6. Age-specific contributions to changes in the CDRs: females

[Insert Fig. 6 here]

As shown, the negative impact of the population age structure on the CDRs mainly stemmed from younger age groups. This is probably due to rapid fertility decline in those countries since the 1970s, resulting in the shrinking cohort size of those born in the 1970s and the 1980s.

Reduction of the age-specific proportions married has also depressed the CDRs greatly, especially in regard to those below age 40. Among the five countries, the negative impact of nuptiality was relatively smaller in Singapore and Australia. In the case of Singapore, this is

probably related to the government's strong marriage promotion policies. The government of Singapore has provided financial incentives, including a series of housing and taxation policies to encourage earlier marriages; it has also established the Social Development Unit and the Social Development Network to provide match-making services for the singles (Jones 2012b; Wong and Yeoh 2003). These policies may have helped to slow down marriage decline and encourage more people to marry, thereby leading to a smaller compositional effect on the CDRs from changes in the married population. For Australia, judging from the results of the 1996, 2001, and 2006 censuses, the declining trend of nuptiality appears to decelerate (Heard 2011). Compared to the first period of study, a decline in nuptiality among those below age 35 has exerted a larger depressing impact on the CDRs in Singapore, Taiwan, and Korea in the second period; whereas, in the UK, the depressing effect of nuptiality among those below age 35 has reduced during the period 2001-2010.

The impact of divorce risk on the CDRs has changed substantially over time and varies across different age groups. The results of the UK and Australia look relatively similar: in the first period, the rising divorce risk among those aged 30 and above pushed up the CDRs; whereas, in the second period, the declining divorce risk of the 25-44 age groups pulled down the CDRs in the UK and Australia. As for Taiwan and Korea, the rising divorce risk of males and females across all ages has contributed to the rise in the CDRs during the first period. In Taiwan, during the second period, the levelling-off of the divorce risk among males has had very little impact on the CDRs, while the rising divorce risk of females aged 25-34 still pushed up the CDRs. In Korea, during the period 2000-2010, the divorce risk of men and women aged 45 and above was still on the rise, imposing an upward pressure on the CDRs; whereas the

divorce risk of couples in their 30s has declined, thus depressing the CDRs.

Among the five countries, the case of Singapore seems to be unique: in the first period, the impact of nuptiality on the CDRs, especially among those aged below 40, was insignificant; in the second period however, the rise of divorce risks among those below age 40 contributed significantly to the increase in the CDRs.

Conclusions and Discussion

This study assessed the impacts of the population age structure, nuptiality, and divorce risk on the changes of the CDRs in five countries over the past twenty years. It has demonstrated how the CDRs can be misleading in reflecting the divorce trends in the selected countries, owing to dramatic changes in the marriage patterns, especially among those below age 40. The decrease of the CDRs in Taiwan and South Korea over the past decade, and in the UK over the last 20 years, was chiefly the result from a shrinking share of the married population rather than from a decline in divorce risk. This reveals that divorce risk is still a major social problem among married couples. Only Australia's decrease in the CDRs in the period 2001-2011 is driven by a real drop in the divorce risk. The findings in this study suggest that the declining CDRs, which have recently emerged in many countries (see Figure 1), may not be the result of a real decline in divorce risks, thereby calling for in-depth investigations and careful interpretations.

After “unveiling the mask of the CDR”, in contrast to the UK and Australia where the divorce risk has been levelling off or falling, the rising divorce risk, especially for women among the three East Asian countries, deserves special attention. Compared to the past, divorce

laws in East Asia have become more lenient, making divorce a more possible alternative to an unsatisfactory marriage (Huang 2005). For instance, in Taiwan, the divorce law in the 1980s favored men over women: at that time, fathers had priority in child custody; there was no provision for child support after divorce; and wives could only claim pre-marital properties (Jeng and McKenry 2001). However, in the 1990s, there had been changes in the divorce regulations in Taiwan, which greatly reduced the cost of divorce for women. Besides, with the rise of women's education, increasing economic independence is believed to be a common driving force for the upswing of divorce both in the West and the East (Jones 1997). On one hand, the improved economic status of women may increase marital stress as women's bargaining power within the household is enhanced (Mammen and Paxson 2000); on the other hand, it has reduced gains from marriage (Becker 2009) and made divorce a more affordable and acceptable choice for women in an unsatisfactory marriage (Lee 2006). Moreover, rising individualism in globalized and developed Asian economies also helps to produce a social climate more open to divorce (Atoh et al. 2004; Jeng and McKenry 2001; Jones 2012a; Toth and Kemmelmeier 2009). Compared to more individualistic western societies, recent evidence has shown that the divorced groups, especially among those aged 40 or below, were more vulnerable to suicide in advanced Asian economies, which have witnessed rapid socio-cultural transformation over the past few decades (Yip et al. 2012). The gradual decline of traditional family systems calls for expansion of the social welfare system to help the divorcees recover from the stressful experience of divorce and handle changes in many areas of life after divorce. The similarities in the findings of Taiwan and South Korea indicate that with the generalizability of these results in other highly developed regions and cities in Asia, the CDRs may also decrease,

which may not necessarily reflect the real divorce trends, as the unmarried population is getting much larger than the past in these places.

In the two western countries, the divorce risk of those aged below 50 has stabilized or decreased, while the risk of those older-age couples has gradually increased over the recent decade. The rising age at marriage is believed to be associated with higher marital stability (Heaton 2002; Raley and Bumpass 2003). This is probably because people who marry at an older age may be psychologically more mature and financially better off, and may have had more time to find their most suitable life partners (Heaton 2002; Weed 1974). In addition, rising cohabitation may also contribute to the declining divorce risk among the married in the West. As couples in unstable relationships may choose to cohabit, while those in more stable relationships may choose to enter into a marriage (Susan L Brown and Booth 1996), such self-selection may have filtered out unstable unions in the first place. Especially among those aged below 30, the growing social acceptance of cohabitation has reduced divorces of fragile shotgun marriages (Akerlof et al. 1996; Kennedy and Ruggles 2014; Stevenson and Wolfers 2007). However, it should also be stressed that without including the breakdowns of marriage-like unions, the CDRs in western countries may have seriously underestimated the real trends in family disruption. It has been shown that in 2011, 47% people aged 20-34 in Australia were currently living with a partner, 29% of whom were married, while 18% were cohabiting; and in the UK, 44% aged 20-34 were currently living with a partner, 22% being married, and 22% cohabiting (OECD Family Database 2011). Thus, more attention should be paid to the impact of unmarried breakups on the couples' and children's wellbeing, as this type of families is associated with higher instability (Thomson 2014). Besides, the increase of divorces among the

middle- and older-age population, termed as the “grey divorce revolution” (Susan L. Brown and Lin 2012), would have a great influence on population and healthcare policies in the future, as relationship breakdowns among older adults were found to have great negative impacts on their physical and mental health (Demey et al. 2014; Gray et al. 2011).

The case of Singapore deserves further attention. The continuous increase in divorce risks might be related to the Singapore government’s intervention in individuals’ marriage decisions. Marriage promotion policies might have facilitated earlier marriages and slowed down the retreat from marriage; on the other hand, it might have incentivized more unstable couples to enter into marriage, thus creating more future divorces. In particular, the very appealing housing policy under the Marriage and Parenthood Package in Singapore has affected people’s decision to marry young. The Housing and Development Board (“HDB”) has a large volume of flats reserved for married couples and provides various financial assistance to reduce the cost of buying houses; however, being single is disincentivized, as singles can purchase a subsidized HDB flat only if they are 35 years of age or older. In Singapore, marriage and housing are so closely related that a marriage proposal “will you marry me?” is often paraphrased as “do you want a flat?” (Strijbosch 2015). As a result, marriage intentions may not only be driven by true romantic love, but also by those housing incentives. Thus, to some extent, the continuous increase of Singapore’s CDRs may be an unintentional consequence of its marriage promotion policies.

This study contains a few limitations. First, only three East Asian and two western countries are selected here, which cannot fully represent and reflect the divorce trends in the West and the East. However, if the related data are available in some other countries, our

research method can also be applied to explore into the factors behind the changes in the CDRs. And the US is not included in our analyses because of limited access to age-specific divorce data. Besides, in the US, the trends of the CDRs vary across states: the CDRs have declined in most states over 1990-2016 but in different magnitudes, while the CDRs in several states have been very fluctuating over the past twenty years (NVSS. 2016). The rising divorce trends before 1990 in the US were partly due to the switch from fault-based divorce law to no-fault divorce law (Nakonezny et al. 1995), while the recent declining CDRs may be because fewer and fewer people are getting married nowadays (Miller 2014). Hence, the declining CDRs observed in western countries like the US, the UK, and Australia should be interpreted with caution. Although the decomposition analysis is helpful in identifying the proximate causes of the rise and fall in the CDRs over the past two decades, it provides very limited empirical evidence on the fundamental causes of the changing divorce and marriage patterns in East Asia and the West. Although some existing literature has discussed some potential driving forces behind those changes, a systematic comparison between the East and the West is very much needed to provide a more complete picture. Besides, this study only investigated the divorce risk of different age groups without examining its heterogeneity across different socioeconomic groups. Nonetheless, the decomposition method presented in this paper can still be used in future research to unveil the socioeconomic differentials in divorce. Moreover, due to data limitation, the periods of study compared were not completely consistent across the five countries. Despite these limitations, this study could still serve as a warning of possible misinterpretations of the crude divorce rate.

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Table 1 Decomposition of changes in the CDRs

	Singapore		Taiwan		South Korea		the UK		Australia	
CDRs										
The early 1990s	1.34		1.56		1.05		2.89		2.93	
The early 2000s	1.57		2.88		2.60		2.75		2.85	
The early 2010s	1.95		2.29		2.44		2.16		2.28	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Decomposition for Period 1										
Age	0.02	-0.03	0.08	-0.01	0.21	0.10	0.12	0.05	-0.08	-0.09
Nuptiality	-0.03	-0.04	-0.34	-0.51	-0.24	-0.22	-0.67	-0.67	-0.23	-0.24
Divorce	0.24	0.30	1.58	1.84	1.58	1.67	0.41	0.47	0.23	0.26
Total change of the CDRs	0.23	0.23	1.32	1.32	1.54	1.54	-0.15	-0.15	-0.08	-0.08
Decomposition for Period 2										
Age	-0.07	-0.08	0.06	-0.01	0.16	-0.01	-0.07	-0.11	0.04	0.01
Nuptiality	-0.14	-0.21	-0.66	-0.77	-0.51	-0.55	-0.54	-0.52	-0.22	-0.22
Divorce	0.58	0.67	0.02	0.20	0.19	0.40	0.02	0.05	-0.41	-0.38
Total change of the CDRs	0.38	0.38	-0.58	-0.58	-0.16	-0.16	-0.58	-0.58	-0.58	-0.58
Synthetic CDRs										
The early 1990s (reference)	1.34	1.34	1.56	1.56	1.05	1.05	2.89	2.89	2.93	2.93
The early 2000s	1.57	1.64	3.25	3.65	2.62	2.74	3.30	3.37	3.17	3.20
The early 2010s	2.15	2.38	3.31	3.97	2.69	3.33	3.26	3.38	2.66	2.71

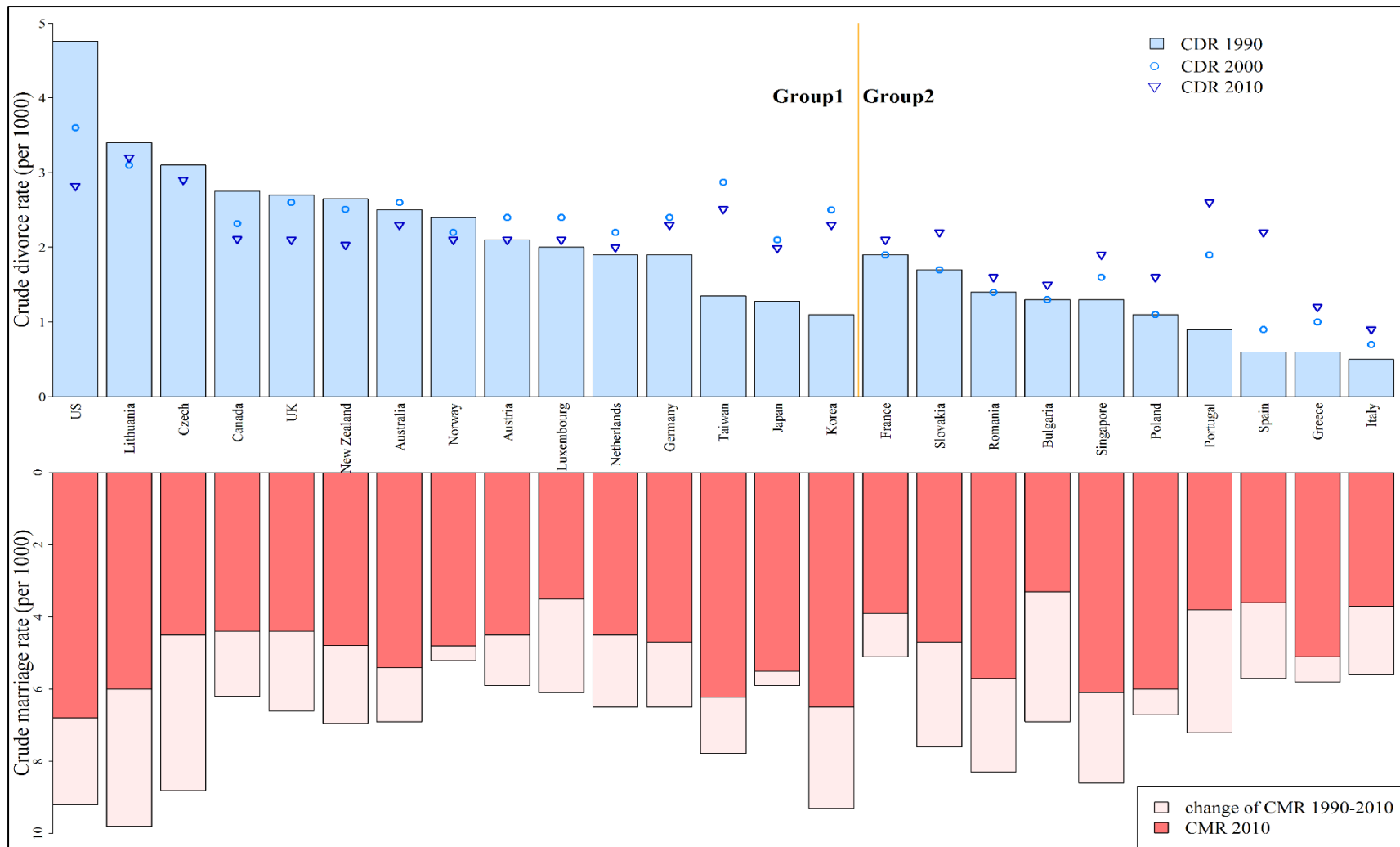


Fig. 1. Crude divorce rates and crude marriage rates in high-income western and East Asian countries: 1990-2010

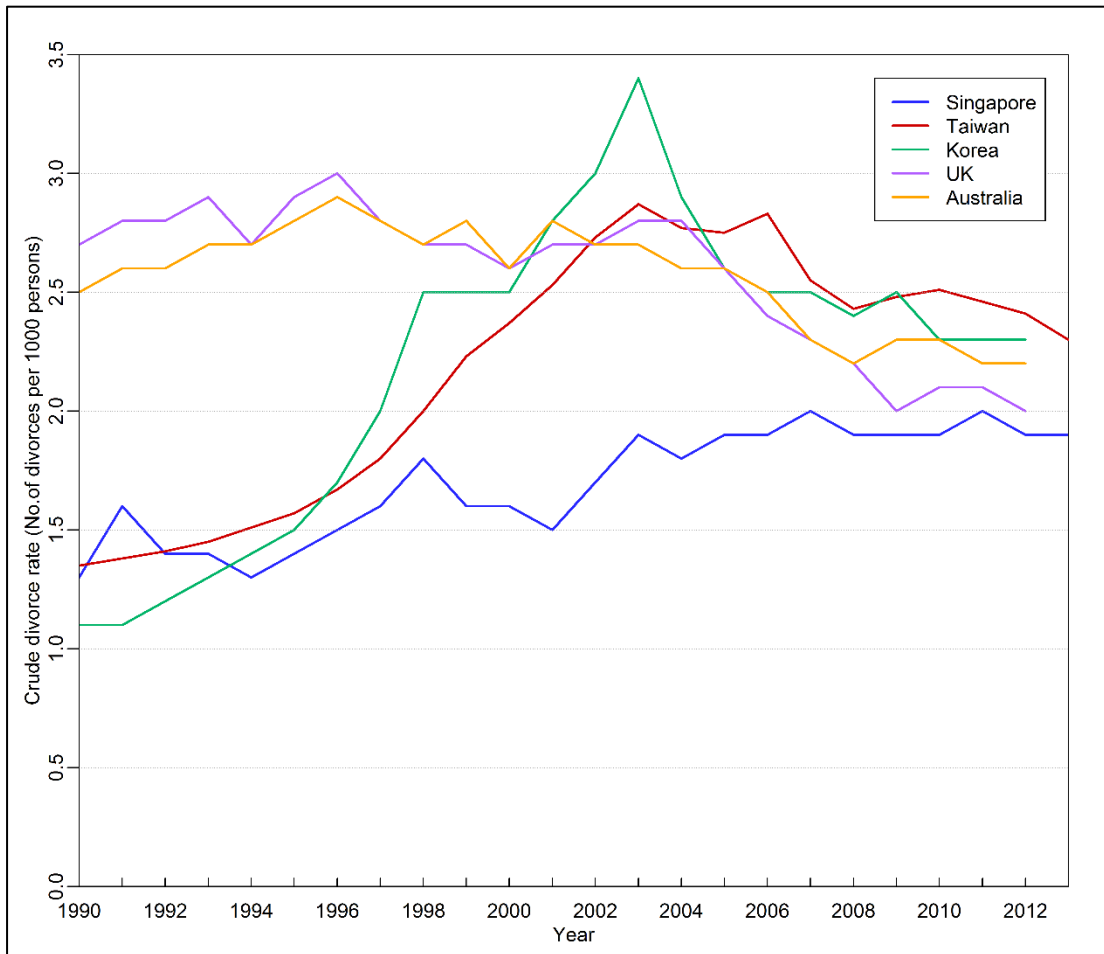


Fig. 2. Trends of crude divorce rates in five countries 1990-2013

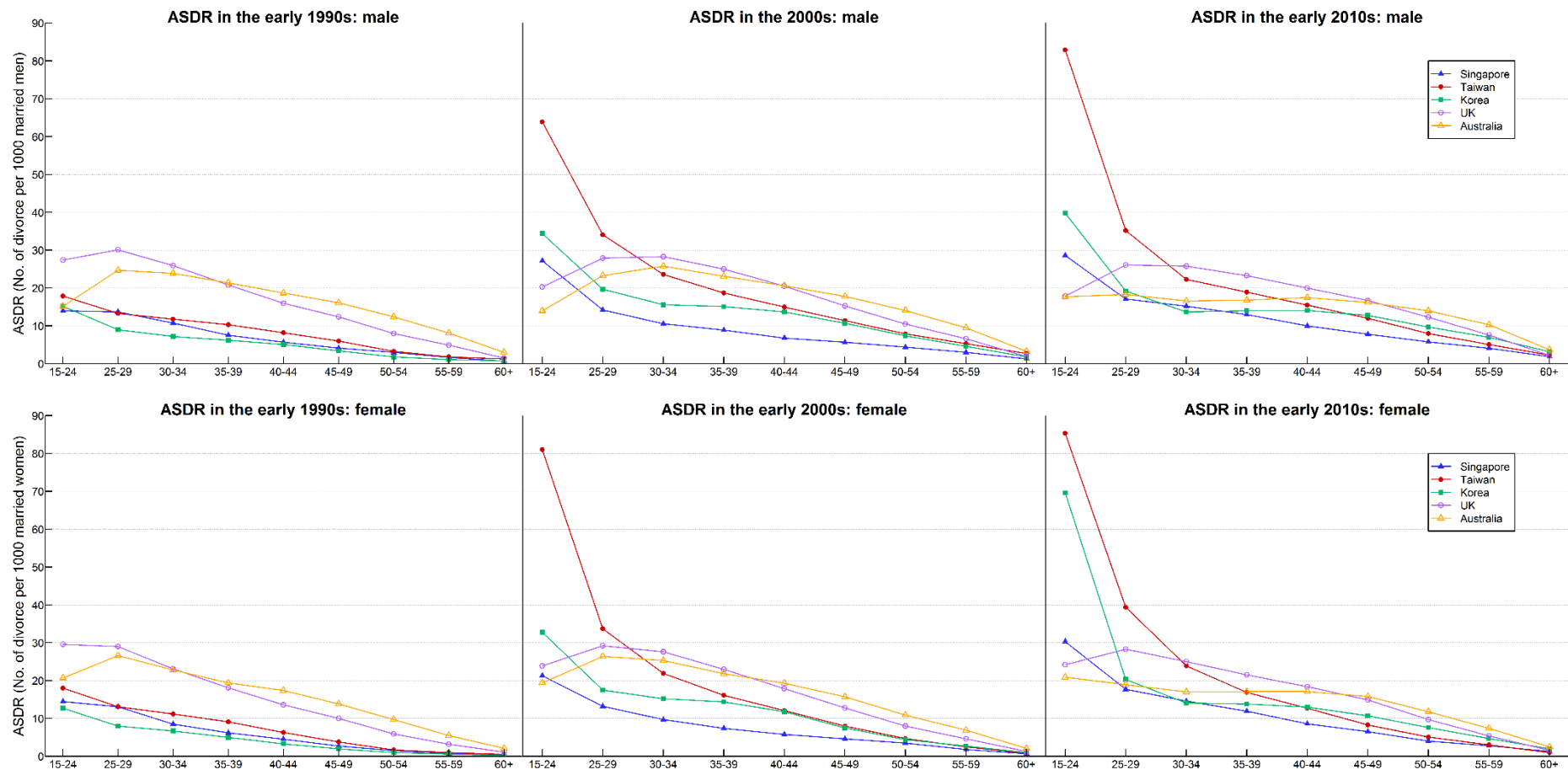


Fig. 3. The age-specific divorce risks of married men and women

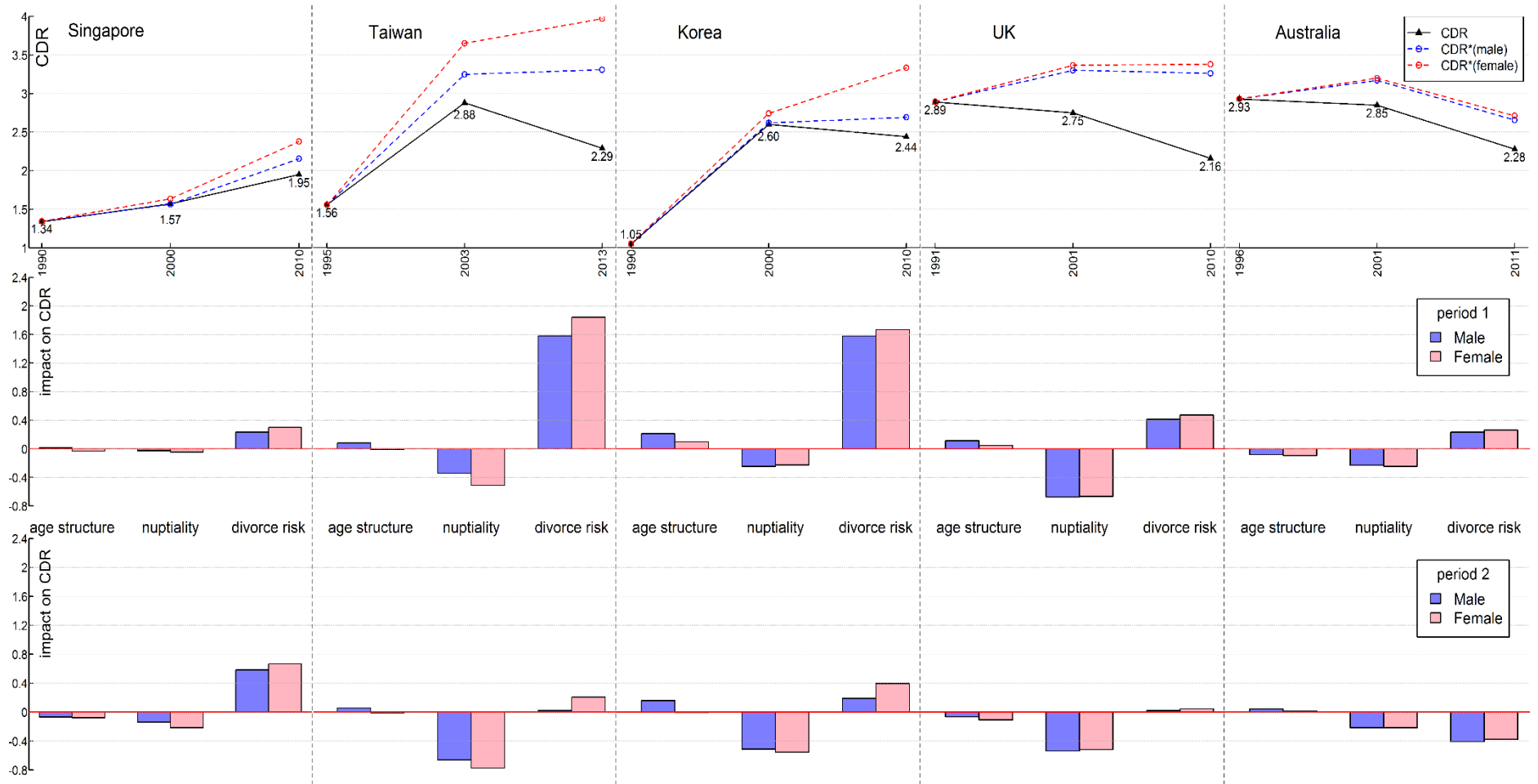


Fig. 4. Contributions of the age structure, nuptiality, and divorce risks to changes in the CDRs

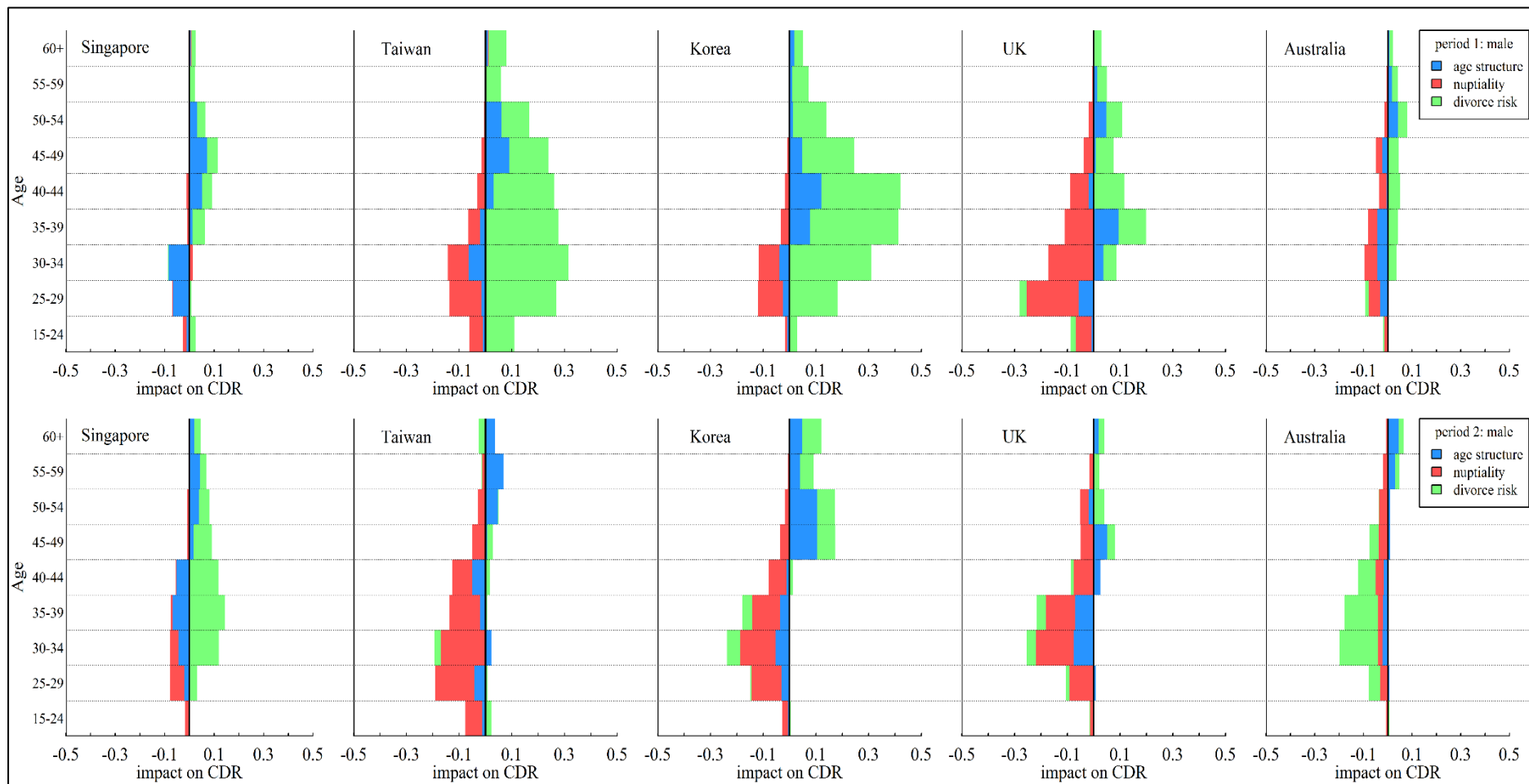


Fig. 5. Age-specific contributions to changes in the CDRs: males

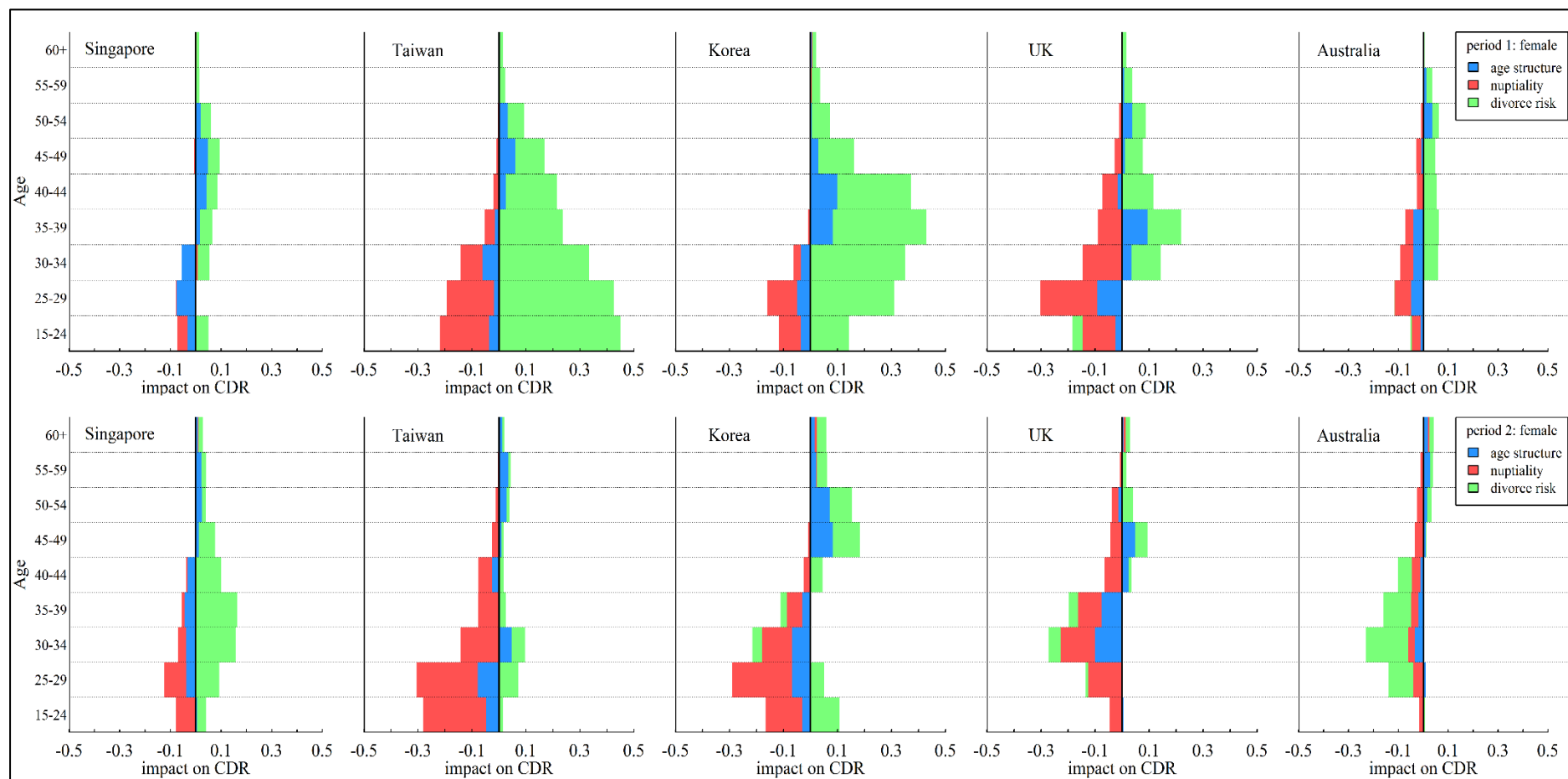


Fig. 6. Age-specific contributions to changes in the CDRs: females