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Income taxation and the timing of marriage

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Abstract

By modifying incentives, taxes affect human behavior. I investigate how the German income tax code affects the timing of marriages. The German income tax code contains provisions from which married couples stand to benefit relative to unmarried couples. If their individual incomes differ, legally married couples may benefit from jointly filing their income taxes due to progressive income taxation. The gain from joint taxation for married couples accrues every year. Couples also enjoy it in the year in which they marry, independent of the month of the marriage. I use data from the German Socio-Economic Panel to test if couples with larger gains from joint taxation are more likely to marry late in one year instead of early in the subsequent year. The results provide support for the hypothesis that pecuniary gains from joint taxation incentivize couples to prepone their marriages to the last quarter of a year, especially to December.

Keywords: Income taxes, timing of marriage, economics of marriage

JEL codes: J12, D10, H24

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1 Introduction

Incentives set by tax systems matter for human behavior. I investigate how the German income tax code affects the timing of legal marriages. The German income tax code contains provisions from which legally married couples stand to benefit relative to unmarried couples. The joint annual taxable income of married couples is split into two and taxed as if both partners' taxable incomes were equally high. Due to the progression of the German income tax, married couples therefore potentially benefit from a "marriage subsidy" if their incomes differ. Independent of the month of the marriage, the splitting rule also applies to the total income of the year in which couples marry.

The marriage subsidy may be a strong enough incentive for some couples to marry late in one year instead of early in the next year. That may help to explain why from 1984 to 2012 December marriages in Germany accounted for 9.3 percent of all marriages. For comparison: in Austria, which is culturally similar to Germany, individuals have been taxed independently of their marital status since 1973 (Wagschal 2001, 193) and, as Figure 3 illustrates, over the period from 1989 to 2012, only 4.5 percent of all marriages in Austria were formed in December.¹

I use individual-level and marriage-level data from the German Socio-Economic Panel to investigate which factors increase the probability that couples marry late in a year — in October, November, or December — instead of in one of the early months of the next year. The findings suggest that a higher gain from joint taxation increases the probability that a marriage takes place late in the year, especially in December.

In the extant literature on the effects of differences in the taxation of married couples versus unmarried couples, the marriage subsidy (or tax) is understood as the

¹ As elaborated on below, the Austrian tax code changed considerably in 1987, leading to a surge in marriages late in 1987. That is why the period from 1989 to 2012 is considered here.

decrease (or increase) in the joint income tax liability due to being legally married.

Results from the literature suggest that marriage subsidies increase the probability of marriage (see, for instance, Alm and Whittington 1999, 1995; Alm et al. 1999; Baker et al. 2004; Fisher 2013) and decrease the probability of divorce (Alm and Whittington 1997a).

The timing of marriages throughout the year has also been analyzed. Gelardi (1996) uses aggregate data on the total monthly number of marriages and finds that the timing of marriages in Canada and England and Wales was affected by changes in the rules concerning marital deductions. Using household-level data for the U.S., Alm and Whittington (1997b) find that couples who faced a marriage tax were inclined to postpone their marriage to the next year, whereas those couples who faced a marriage subsidy were prone to prepone their marriage.

Frimmel et al. (2014) analyze the durability of marriages whose timing was affected by the announcement of the suspension of a marriage subsidy in Austria. In August 1987, the government announced that a considerable subsidy amounting to 4,250 Euro (inflation-adjusted 2010 Euro) handed out to a couple of previously never married individuals was no longer available from January 1988 onwards. In reaction to the change, many couples in Austria preponed their marriages and got married late in 1987. To their surprise, Frimmel et al. (2014) find that the extra marriages were no less stable than other marriages, suggesting that the announcement of the suspension of the subsidy did not lead to the formation of premature marriages.

The size of the marriage subsidy in Germany depends on the couple's joint income as well as on the relative magnitudes of their two individual incomes. In the U.S., marriages can be penalized by the income tax code as well as subsidized,

depending, among other things, on the state in which a couple reside. In contrast, the German tax code either gives rise to a marriage subsidy or does not alter the tax dues of married versus unmarried couples, except for very special circumstances against which couples can protect themselves by choosing to be taxed individually.² The marriage subsidies in Germany also differ from the subsidy that was abolished in Austria in 1987, as they are not one-time subsidies but accrue annually.

Characteristics of the German tax code that lead to different tax treatments of married and unmarried individuals are presented in the next section. Section 3 provides a discussion of the costs and benefits from getting married and from the timing of marriages. Section 4 gives an overview of the used individual-level and marriage-level data from the German Socio-Economic Panel (GSOEP). Section 5 introduces the econometric model, discusses baseline results, and presents robustness checks. Section 6 contains concluding remarks.

2 Taxing married and unmarried individuals in Germany

The German tax code contains provisions that potentially favor legally married couples over unmarried couples. Since 1958, the income of married couples has by default been taxed jointly by making use of a splitting method. Thereby, the joint taxable income of married partners is halved and the tax code is applied to the halved income. The resulting tax liability is multiplied by two, giving the total tax liability of the married couple.

Due to progressive elements of the German tax code, joint taxation is usually preferable to individual taxation, for which married partners can always opt. First, a

² Disadvantages from the splitting method may arise, for instance, if one of the partners can carry a loss forward or if one of the partners has income that is tax-exempt but counts towards progression.

substantial personal exemption can be claimed twice even if one of the partners has no income within a tax year. The exemption potentially mitigates the effects of indirect progression. Second, by fictitiously halving a couple's joint income, the tax liability is potentially reduced by limiting the effect of the direct progression of the tax rate.

Together these progressive elements can give rise to a marriage subsidy for partners with unequal individual incomes as long as the halved income of the jointly taxed individuals has not reached a level at which the marginal tax rate does not increase with increases in income.

To illustrate the extent of the marriage subsidy, consider the tax year 2010. Couples could benefit from a maximum marriage subsidy of 15,694 Euro if one partner had no taxable income and the other partner had taxable income of 501,462 Euro or more. If one partner did not have any taxable income in 2010 and the other partner realized a taxable income between 105,762 and 250,730 Euro, the marriage subsidy amounted to 8,172 Euro. For individuals with taxable income above 52,881 Euro (half of 105,762 Euro) the marginal tax rate stayed constant at 42 percent until the taxable income hit 250,731 Euro at which point the marginal tax rate reached its highest level of 45 percent.³ Below a taxable income of 105,762 Euro of one partner while the other partner had no taxable income, the marriage subsidy decreased until the taxable income of the earning partner hit 8,004 Euro, the level of the personal income tax exemption for 2010.

The German income tax structure underwent some changes over the period from 1984 to 2012, especially with respect to the level of personal income tax exemption, which was increased several times, and the maximum marginal tax rate, which was lowered several times. However, the overall character of the income tax structure has not

³ The splitting advantage is further increased by reducing the base of the "solidarity surcharge" that has been introduced in 1991 and since 1998 has amounted to 5.5 percent of the owed income tax.

changed substantially and in particular the possibility for married couples to take advantage of the splitting method has not changed since it was introduced in 1958.⁴

3 Marriage and the timing of marriage

Becker (1973; 1974) provides a discussion of factors that influence the attractiveness of marriage. He focuses on how personal traits like income prospects, physical attractiveness, intelligence, or the relative income of two potential partners affect the attractiveness of forming a joint household.⁵ Becker (1974, S22) shortly discusses how rules that influence the easiness of divorce impact the perceived benefits of getting *legally* married. But he does not provide a detailed discussion of (tax) legal aspects of marriage.

Alm and Whittington (1997b, 224-225) build on the model of the decision to marry provided by Becker (1973; 1974). They include income taxes and model the timing of agreed upon marriages. To illustrate the tradeoffs confronted by a couple who have to decide whether to marry late in the current year t or early in the next year $t+1$, I adopt the model by Alm and Whittington (1997b) in so far as it speaks to the timing of marriages.

Two individuals, who already share a joint household, are assumed to have to decide when to legally marry. The cohabiting couple is assumed to legally marry if by doing so they can increase their joint consumption of a composite commodity Z . The composite commodity is produced by mixing units of market goods with household

⁴ Wersig (2013) provides a detailed overview of the discussions prior to the change from joint taxation of couples (with the option to exclude one partner's income from self-employed or employed work from joint taxation) to the implementation of the splitting method in 1958. Before 1958, married couples had a tax advantage over non-married couples due to income tax exemptions for house wives, separately taxed wives, and tax brackets open only to married individuals (Wersig 2013, 133).

⁵ Becker defines a marriage as the situation in which two individuals share the same household. Note that this definition of a marriage deviates from the legal concept of a civil marriage that is used in this paper.

work. Thereby, Z is assumed to encompass a broad range of goods produced in the household — including, for instance, children, love, sexual intercourse, or emotional support, but also feeding, cleaning, or caring. The necessary condition for a cohabiting couple to decide to legally marry is

$$(1) \quad Z^C < Z^M,$$

where Z^C is consumption of the composite commodity as a legally unmarried couple who cohabit and Z^M is consumption of the composite good as a legally married couple. Factors that increase the net benefits of being legally married thus make it more likely that a couple decide to marry. It is assumed that when a couple's amount of the composite commodity increases at least one of the partners benefits and none of the two partners is made worse off.

Tax effects brought about by legal marriage are one factor that may affect the difference between Z^C and Z^M . The larger the net benefits through changes in taxation due to getting married are, the larger is $Z^M - Z^C$.

Assume next that a couple who cohabit have already decided to get legally married and $Z^C < Z^M$ holds independent of the tax effects brought about by legal marriage. The couple then still have to decide whether to marry sooner (in period t) or later (in period $t + 1$). In the periods after $t + 1$ the couple will be married independent of their decision to marry either in t or in $t + 1$ and therefore they will also enjoy possible net benefits from being taxed as a married couple in the periods after $t + 1$ independent of their marriage timing decision.

Further, it is assumed that marrying in period t comes at a cost $d_t \geq 0$. The amount of the composite commodity available to the couple in period t when they marry in period t is thus reduced to $(Z^M)_t - d_t$. The cost d_t may represent higher prices for

organizing festivities on relatively short notice, the extra psychic burden caused by a relatively short planning period, or the cost borne as friends or family members may not be able to attend the wedding ceremony due to previous commitments. The couple's return to marry SOONER is denoted as Z_{SOONER}^M and amounts to

$$(2) \quad Z_{SOONER}^M = (Z^M)_t - d_t + (Z^M)_{t+1}$$

while the return to marry LATER is Z_{LATER}^M and equals

$$(3) \quad Z_{LATER}^M = (Z^C)_t + (Z^M)_{t+1}.$$

Future periods after $t + 1$ can be disregarded as Z^M in these later periods will be the same independent of the couple's decision to marry sooner or later.⁶ The couple marry sooner if

$$(4) \quad Z_{SOONER}^M > Z_{LATER}^M$$

or if

$$(5) \quad (Z^M)_t - d_t > (Z^C)_t$$

and thus if

$$(6) \quad d_t < (Z^M)_t - (Z^C)_t.$$

The larger the gains from being legally married, the more likely it is that inequality (6) holds and thus that the couple decide to marry in period t instead of period $t + 1$.

I use data from German marriages to test if larger increases in the joint after tax income of a couple in the form of marriage subsidies increase the probability of marrying late in one year instead of early in the subsequent year.

⁶ Due to the relatively short time period analyzed here, I ignore discounting issues related to marrying sooner or later.

4 Data

The data stem from the German Socio-Economic Panel, which has been carried out annually since 1984. From 1990 onwards, households in Germany's eastern states have been included. The data I use cover the years from 1984 to 2012.

In 1985, respondents were for the first time asked whether they married the year before and if so in which month. As I merge individual-level data at the "marriage level", the observational unit throughout the paper is a marriage. To reduce the influence of possibly confounding factors, I limit the dataset to individuals that married only once over the investigated period. 2,228 marriages remain in the sample.

Figure 1 shows the shares of the 2,228 marriages that took place in each of the twelve months over the period from 1984 to 2012. 10.1 percent of all marriages were formed in December and 2.47 percent in January. The peak month is August with 16.2 percent of all marriages in the sample.

Figure 2 depicts the shares per month of all marriages formed in Germany over the period from 1984 to 2012 based on data from the German statistical office. In Germany as a whole, 9.39 percent of all marriages were formed in December, 2.85 percent in January, and 12.47 percent in August, which is the second most popular month after May with 12.49 percent of all marriages. The data suggest that the sample from the GSOEP closely resembles the entire population with respect to the timing of marriages throughout the year.

Figure 3 compares the monthly shares of marriages in Germany to those from two culturally similar countries: Austria and Switzerland. As mentioned above, the taxation of individual incomes in Austria has not depended on an individual's marital status since 1973 (Wagschal 1973, 293). In Switzerland, a specific tax scale is applied to married

couples and marriage can come along with a tax or a subsidy depending on the level of income, the number of children, and the place of residence.⁷ Compared to Germany, where married couples are never punished by the income tax code relative to unmarried couples, relatively few marriages were formed in December in Austria from 1989 to 2012 (4.5 percent) and Switzerland from 1984 to 2012 (5.6 percent). The differences suggest that at least some German couples responded to the tax incentive by preponing their marriages to December.

The GSOEP contains information on annual individual gross labor income, which comprises all income from dependent employment. In any given year the respondents provide information on their individual labor income of the previous year.

Different rules apply to self-employed individuals that do not allow for a standardized consideration of their social insurance contributions. Self-employed individuals were therefore dropped from the sample. I also dropped couples in which at least one partner receives income from a pension. Pensions are treated differently from labor income when it comes to income taxes and social security contributions and pensions from different sources are again treated differently.

The GSOEP contains after tax income data only for the entire household. Unfortunately, households are not necessarily only comprised of the two marriage partners, but may include additional income earners. Therefore, I calculate an approximation of the individual taxable income based on pre-tax individual labor income

⁷ Income taxes in Switzerland are raised by the federal government, the cantons, and the communes. In 1984, the Federal Supreme Court of Switzerland decided that married couples may not be discriminated against by the cantonal tax codes relative to unmarried couples. The 1984 ruling did not relate to federal taxes. In 1994, the Swiss Federal Supreme Court ruled that a more than 10 percent difference constitutes discrimination. From 2009 onwards, several measures were taken to reduce the marriage tax of the federal tax code.

data to be able to derive income tax liabilities for individuals as well as for couples.⁸

First, I use the respective annual rates relevant for employees to deduct social security contributions from gross individual labor income: mandatory payments for health insurance, unemployment insurance, pension insurance, and long term care insurance.⁹ I make the simplifying assumption that all employee contributions to the social insurances are entirely tax-deductible from an individual's gross income, although their deductability was limited either by specifying maximum amounts and / or by specifying the share that could be deducted.¹⁰ Second, I deduct year-specific exemptions specified in the income tax code.¹¹

Based on this approximation of an individual's taxable income, I use year-specific versions of the German income tax code to calculate an individual's hypothetical income tax liability, including the solidarity surcharge that was introduced in 1991.

Given the complexities of the German income tax code, the method I use can only lead to an approximation of the hypothetical individual income tax liability. Fortunately, this limitation does not considerably affect my analysis, since it applies to the individuals of all marriages independent of the month in which a marriage was formed.

When calculated as described, the sum of the hypothetical individual income tax liabilities approximates a couple's hypothetical total income tax liability for the case of

⁸ Labor income appears to be a good enough proxy for total income. Total income is only available at the household level. For the households to which the marriage partners of 2,218 marriages belong, gross labor income on average accounts for 96,8 percent of total gross household income. 10 households have zero income before government transfers.

⁹ Civil servants are included in the data set. They are not obliged to join the statutory health, pension, long term care, or unemployment insurances. Therefore, no social security contributions are deducted from the gross income reported by civil servants. Since I ignore that civil servants can deduct part of their expenses for private insurance coverage from their income, I later provide robustness checks without marriages in which at least one partner is a civil servant and the results do not change considerably.

¹⁰ In fact, only since 2010 are health care and long term care contributions deductible in their entirety. A mandatory long term care insurance was introduced in 1995.

¹¹ This includes income-related exemptions (*Werbungskostenpauschale*) and basic exemptions (*Grundfreibetrag*).

separate taxation. Based on half of the sum of a couple's taxable individual labor incomes an approximation of half of their total income tax liability for the case of *joint* taxation can be calculated. The difference between the sum of the individual tax liabilities in the case of a separate filing and the sum of the individual tax liabilities in the case of joint filing is equal to a couple's marriage subsidy.

Means and medians of the marriage subsidy for marriages from the various months are depicted in Figures 4 and 5. With 1,198 Euro the mean is highest for December marriages, followed by October marriages with 971 Euro. The highest median marriage subsidy of 738 Euro is also found for December marriages, followed by July marriages with 506 Euro.

I adjust all income measures and the marriage subsidies for inflation by using the CPI data that is included in the GSOEP for eastern and western Germany. Descriptive statistics of the data can be found in Table 1.

5 Timing of marriages: a last quarter effect?

To test the hypothesis that couples who benefit from a higher marriage subsidy are more likely to marry late in the year, I follow Alm and Whittington (1997b) and start by comparing marriages from the last quarter to marriages from the first quarter. I estimate the following logit model

$$(2) \quad \text{LateMarriage}_m = \delta \text{MarriageSubsidy}_m + \gamma X_m + \pi + \rho + \mu_m$$

whereby the indicator *LateMarriage* takes on the value 1 if marriage *m* was formed in October, November, or December and 0 if it was formed in January, February, or March. The variable *MarriageSubsidy* is calculated as described in the previous section.

For marriages that occurred during the last quarter of a year the marriage subsidy is based on the individual income data from the year of the marriage. For marriages that occurred during the first quarter of a year, the calculated marriage subsidy is based on the individual income data of the *previous* year. It is thus a hypothetical marriage subsidy. The hypothetical marriage subsidy of the *previous* year is of interest since foregoing this benefit is part of the cost that the couple bears by marrying in the first quarter of a year and not in the last quarter of the previous year. In terms of the model presented in section 3, for first quarter marriages the marriage subsidy of the previous year indicates the foregone gross increase due to tax savings in the benefit of marrying sooner Z_{SOONER}^M .

X is a vector of controls and includes the following: assuming joint taxation, the total annual after tax income of marriage m is represented by *Income*. Again, for marriages in the last quarter, income data from the year of the marriage are used. For marriages in the first quarter of a year, income data from the *previous* year are used. The mean of the maximum years spent in school or professional training of the two partners while in the sample is captured by *Education*.¹² *Age* indicates the mean age of the two partners in the year of the marriage. *Age female* and *Age male* measure the age of the wife and husband at the time of marriage, respectively. To control for potential differences in the reaction to gains from joint taxation between couples in eastern and western Germany, the interaction term $MarriageSubsidy \times East$ is included. *East* is an indicator that takes on the value 1 if a marriage was formed in one of the east German states and 0 otherwise.¹³

¹² For the purpose of the paper this measure of education appears to be more useful than the years of schooling attained in the year of a marriage. It captures not only the attained level of education but is also a proxy of the expected level of education for the case that the education has not been finished in the year of the marriage.

¹³ The city state Berlin is coded as a western state.

A year fixed effects term is included with π , ρ is a state fixed effects term, and μ_m is an error term.

Table 2 presents the results. The reported coefficients of the logit estimates are marginal effects evaluated at the means of the independent variables. The estimated coefficients for *MarriageSubsidy* carry the expected positive sign and are statistically significant at the five percent level in all specifications of Table 2. Couples seem to be more likely to marry in the last quarter of a year the higher their marriage subsidy is.

The marginal effect of the gains from joint taxation on the timing of marriages is also significant in size. For instance, the coefficient for *MarriageSubsidy* in specification VI of Table 2 suggests that at the means of the remaining independent variables an increase in the marriage subsidy by 1,000 Euro increases the probability of a marriage occurring in fall by approximately 3.2 percentage points. Of the 765 marriages considered for specification VI, 69.3 percent took place in the last quarter of the year and on average the marriage subsidy amounted to 993 Euro. When the marriage subsidy triples from its average to 2,979 Euro, the probability of preponing a marriage increases by slightly more than 6 percentage points.

In Table 2 the coefficients on *Income* always carry positive signs and are strongly statistically significant. The results suggest that after controlling for the size of the marriage subsidy higher income couples are more likely to marry late in the year. The coefficients for the remaining control variables are insignificant. Those for the interaction term *MarriageSubsidy* \times *East*, for instance, point to no differences with respect to the reaction to gains from joint taxation between couples in eastern and western Germany.

Overall, the baseline results provide strong evidence for the hypothesis that as the marriage subsidy increases, the probability of a marriage taking place in the last quarter of a year increases.

To shed light on how splitting gains affect the probability that a marriage is preponed to one of the months of October, November, or December, I reestimate (2) by including marriages that occurred during the first quarter of a year and only marriages from October, or November, or December.

The results for marriages in December are depicted in Table 3. In this case, the dependent variable is an indicator that is equal to 1 if a marriage occurred in December and 0 if it occurred in the first quarter of a year. The estimates for the coefficients on *MarriageSubsidy* are again positive and highly statistically significant. The results strongly point to a positive effect of marriage subsidies on the probability that a marriage occurs in December.

The corresponding results for comparing marriages from November and October to marriages that occurred in the first quarter of a year are presented in Tables 4 and 5. The results for October marriages in Table 5 also point to a positive effect of the marriage subsidy on a marriage taking place in October, but the coefficients on *MarriageSubsidy* are smaller than in the case of the results for December marriages. The results for November marriages in Table 4 do not point to any effect of the marriage subsidy on the decision to marry in November.

It is surprising that the results suggest a positive effect of the marriage subsidy on the decision to marry in December and October but not on the decision to marry in November. A potential explanation for this finding is that those who want to realize a marriage subsidy at the last minute end up marrying in December and those who plan

with more foresight to marry in the last quarter of a year marry in October instead of November. After all, the distribution of marriages over all months suggests that people prefer to marry in the warmer summer months and in Germany the expected temperature is considerably higher in October than in November.

Overall the results suggest that higher marriage subsidies induce couples to shift their marriages to the last quarter of a year. The effect appears to be most pronounced for marriages that occur in December.

I conduct a number of checks to see if the baseline results are robust. First, I compare marriages from the last quarter to marriages from the second quarter. As January, February, and March are months in which relatively few marriages are formed, it is possible that marriages that are preponed to the last quarter of a current year would have taken place not in the first quarter of the subsequent year but rather in the second quarter of the subsequent year.

Results from a reestimate of (2) in Table 6 are based on data on marriages from the last quarter and the second quarter. The coefficients on *MarriageSubsidy* are again always positive and statistically significant. They also suggest that the higher the gains from joint taxation in the previous year are, the higher is the probability that a marriage is formed in the last quarter of a year. The results for *Age* imply that older couples are less inclined to marry in the second quarter, while the results for *Education* point to couples with more years of schooling being less inclined to marry late in the year. Further, the results suggest that a couple's after tax income does not affect the decision to marry in the second quarter or the last quarter.

In Table 7, I present results from estimations that compare marriages from December, or November, or October to marriages in the second quarter of a year. They confirm the previous results and imply the strongest effect of the marriage subsidy on marriages formed in December, a weaker effect for October marriages, and again no such effect for November marriages.

Second, my approximation of the marriage benefit is based on assumptions regarding the tax treatment of social contributions that is less fitting for civil servants. Further, I disregard that untaxed unemployment benefits do count towards the progression of the taxation of the remaining income. Therefore, I reestimate (2) without marriages that include at least one partner who is a civil servant or receives unemployment benefits or both. The results in Table 8, however, closely resemble the baseline results. The treatment of civil servants and the unemployed therefore does not drive the findings.

Third, the calculation of the marriage subsidy is based on labor income alone, but income from other sources potentially also affects a couple's marriage subsidy. Therefore, I reestimate (2) without all marriages from households in which gross labor income accounts for less than 90 % of the total gross income of all household members. The results in Table 9 for marriages from all last quarter months and in Table 10 for marriages from October, or November, or December corroborate the baseline results.

Fourth, I use the marriage subsidy for the year of the marriage for all marriages, including those marriages that were formed in a first quarter. So far I used the hypothetical marriage subsidy for the *previous* year for first quarter marriages. Foregoing that subsidy is part of the cost of marrying in the first quarter of the current year instead of in the last quarter of the previous year. In the case of a first quarter

marriage the size of the marriage subsidy for the year of the marriage should not affect the decision not to prepone a marriage to the previous year. Therefore, the effect of the marriage subsidy on the probability of marrying in the last quarter of a year is expected to be weaker in this specification.

This robustness check addresses the following concern: possibly the results presented so far are not driven by a smaller hypothetical marriage subsidy in the previous year for marriages that occurred in the first quarter, but by unobserved factors that reduce the marriage subsidy and also make a marriage in the first quarter more likely.

As marriages from the last quarter are still included in the specification and a high marriage subsidy may be responsible for some of the marriages to have occurred in the last quarter, the positive effect of the marriage subsidy on the probability of a marriage to take place in the last quarter is expected to be weaker but not necessarily nil.

The results are shown in Tables 11 and 12. As expected, they suggest a weaker effect of the marriage subsidy on the probability that a marriage occurs in the last quarter of a year. In the comparison of marriages from the last quarter to first-quarter marriages, the coefficients for *MarriageSubsidy* in Table 11 even carry negative signs, but are only weakly statistically significant, with the coefficient on *MarriageSubsidy* being statistically insignificant in specification VI. The results in Table 12 further reveal that only in the case of the comparison of November marriages to first-quarter marriages is an increase in the marriage subsidy in the year of the marriage suggested to have a negative effect on the probability that a marriage occurs late in the year. Given the previous results for marriages from each of the last quarter months, it is not surprising that whereas for December and October marriages a previously positive effect of the marriage subsidy

simply becomes insignificant, for November marriages a previously insignificant effect of the marriage subsidy becomes negative and statistically significant.

The positive and statistically significant coefficients on a marriage's after tax income in Tables 11 and 12, which are about the same size as in the baseline results in Table 2, again point to a positive relationship between the level of income and marrying late in the year. As this finding is robust although the subsidy for marriages from the first quarter is calculated based on the partners' income from the year of the marriage, the positive relationship between higher joint after tax income and late marriages does not seem to result from an unconsidered interaction between joint after tax income and the marriage subsidy.

Similarly, I compare marriages from the last quarter to those of the second quarter based on the marriage subsidy for the year of the marriage for all marriages, including those marriages that were formed in a second quarter. I thus reproduce Tables 6 and 7 based on the marriage subsidy of the respective years of the marriages. The results in Tables 13 and 14 illustrate that, as expected, the effect of the marriage subsidy from the year of the marriages on the decision to marry late in the year is weaker than in Tables 6 and 7. In Table 13 the results for *MarriageSubsidy* point to a weakly statistically significant positive effect. The results in Table 14 reveal that the positive coefficients on *MarriageSubsidy* in Table 13 are driven by marriages from December alone. But, as expected, the comparison of the results in Table 14 and Table 7 again reveals a weaker effect of the marriage subsidy when it is calculated based on the year of the marriage.

6 Concluding remarks

The results presented here indicate that the incentives structured by the German tax code are strong enough to shift some marriages from the first and second quarter of one year to the last quarter of the previous year. The findings therefore provide further evidence that pecuniary incentives by way of tax advantages matter even for such intimate decisions as to when to get married.

The results further suggest that the effect of marriage subsidies on the preponement of marriages from the next year to a current year is strongest in the case of marriages from December, weaker for marriages formed in October, and absent for November marriages. The different results for marriages from the last quarter months call for an explanation. Possibly the positive effect of the marriage subsidy on the probability of a marriage occurring in December results from those who want to realize a marriage subsidy at the last moment, whereas last quarter marriages induced in part through the marriage subsidy but planned with more foresight tend to be scheduled for October, which offers nicer weather prospects than November.

Especially the findings for December marriages suggest that the preponement of marriages does not always result from long-term marriage planning, but rather may be the outcome of a rushed decision to get married. As the decision to marry in December for some marriages appears to be driven by being able to realize a marriage subsidy for an additional year, fruitful future research may address the question whether in Germany marriages formed in December are less stable than marriages formed in any of the other months.

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Figure 1
Monthly fraction of marriages 1984-2012 in Germany:
based on 2,228 marriages from the German Socio-Economic Panel

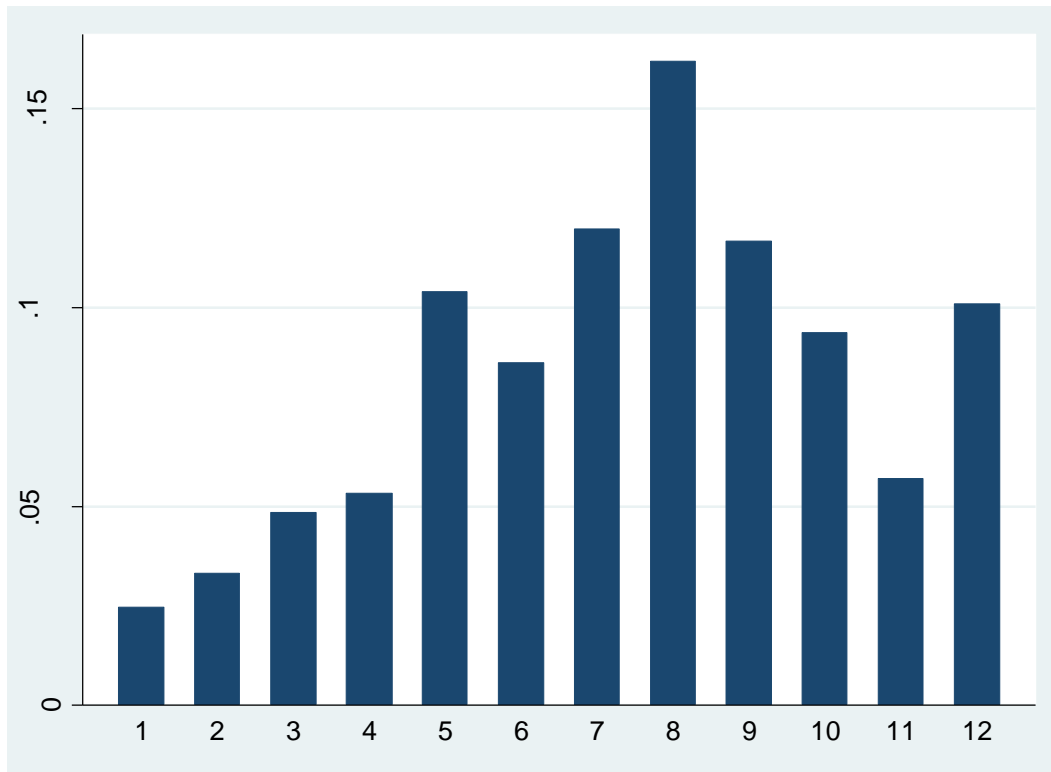


Figure 2
Monthly fraction of marriages 1984-2012 in Germany:
based on data on 1.25 million marriages from the German Federal Statistical Office

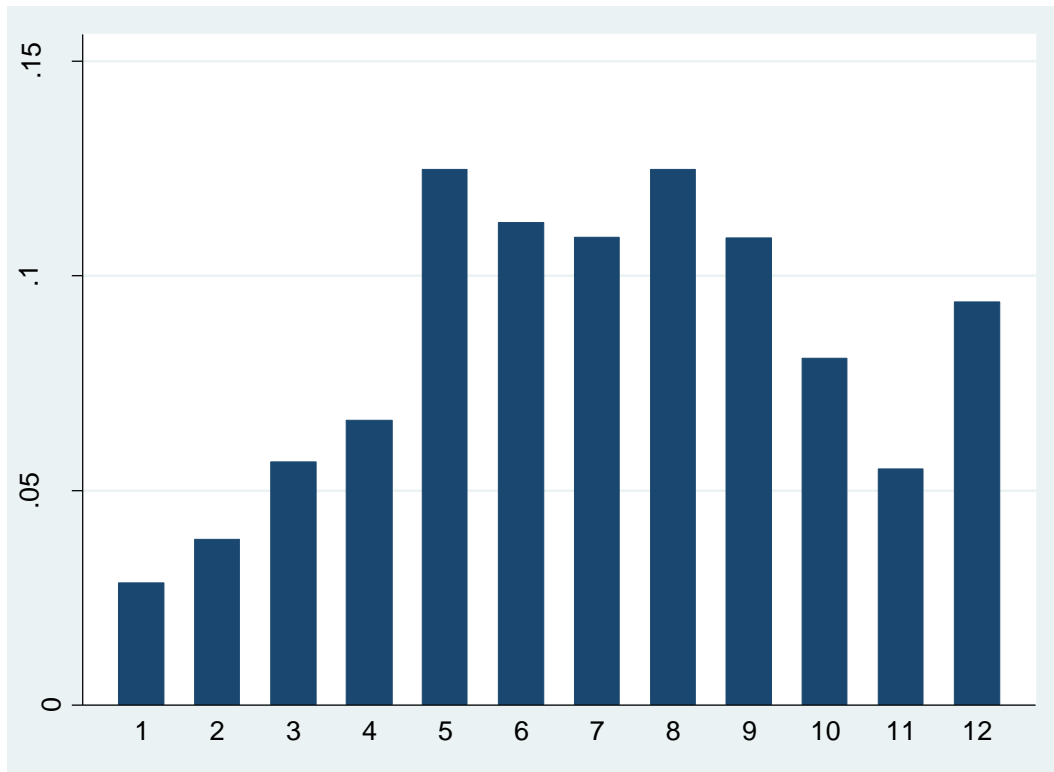
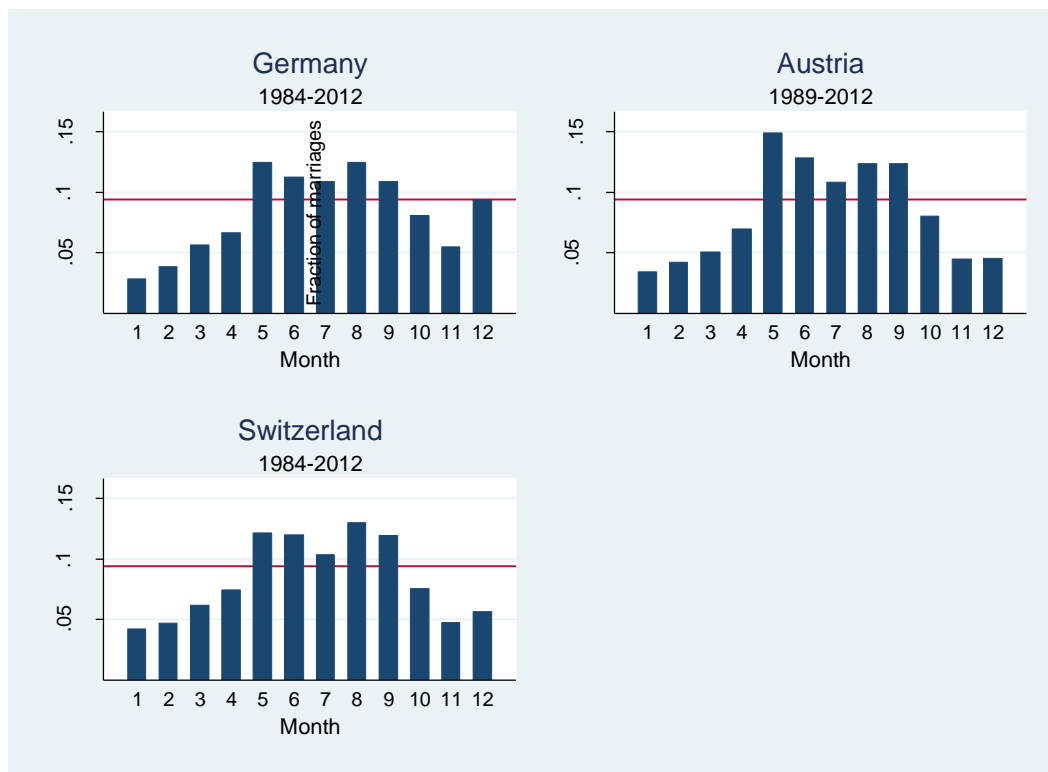


Figure 3
 Monthly fraction of total marriages:
 Germany, Austria, and Switzerland



In August 1987, the Austrian government announced that a considerable subsidy of 4,250 Euro (inflation-adjusted 2010 Euro) for a couple of previously never married individuals was not available from January 1988 onwards. That change considerably affected the marriage timing decision in 1987 and 1988. Therefore, data for Austria are from the years 1989 to 2012. The red horizontal line at 0.094 indicates the fraction of marriages formed in December in Germany over the period from 1984 to 2012 and helps comparing the fraction of marriages formed in Austria and Switzerland in December over the same period. In Austria, individual incomes are taxed independent of the marital status. In Switzerland, it depended on the income, the number of children, and the place of residence whether a married couple received a subsidy or had to pay a tax relative to an unmarried couple.

Figure 4
Estimated marriage subsidy by month:
means in inflation-adjusted 2010 Euro

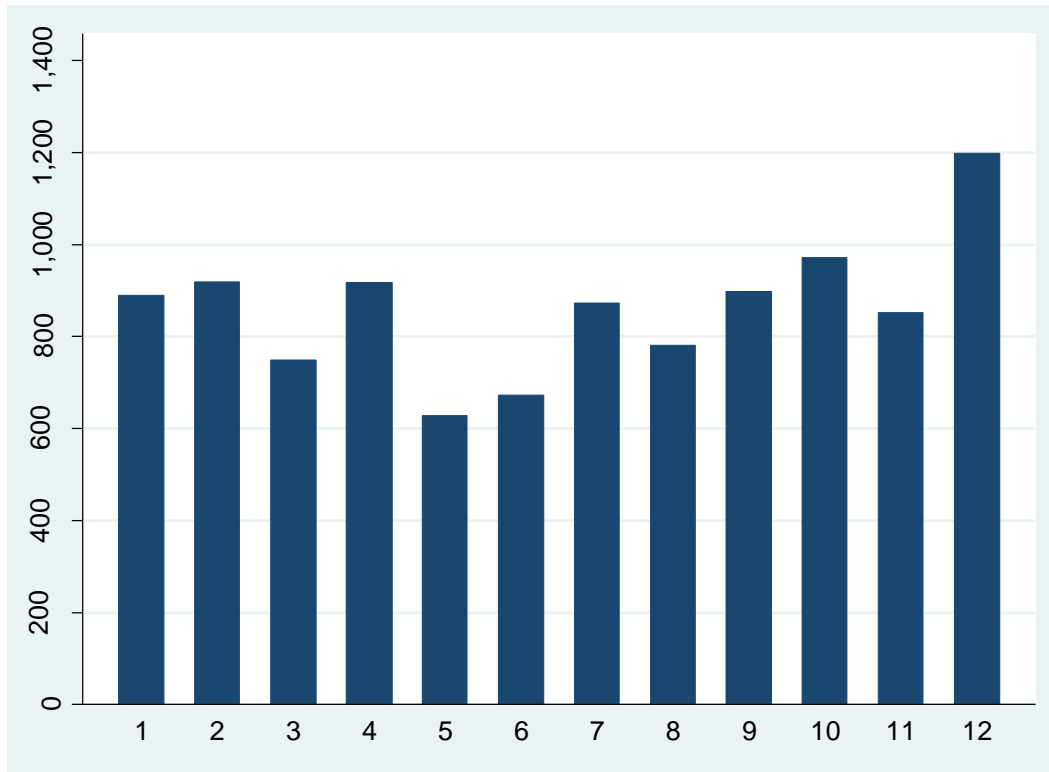


Figure 5
Estimated marriage subsidy by month:
medians in inflation-adjusted 2010 Euro

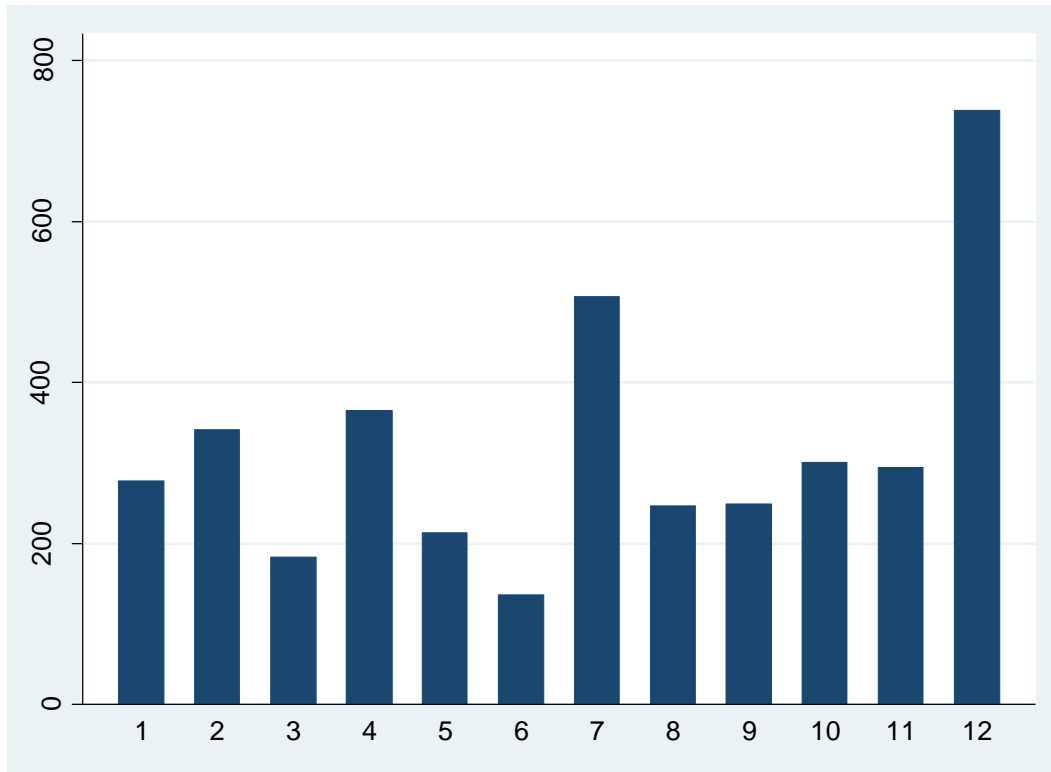


Table 1
Summary Statistics

	N	mean	sd	min	max	Description
Late marriage	2,228	0.252	0.434	0	1	1 if the marriage occurred in the last quarter of a year and 0 otherwise
December marriage	2,228	0.101	0.301	0	1	1 if the marriage occurred in December and 0 otherwise
November marriage	2,228	0.0570	0.232	0	1	1 if the marriage occurred in November and 0 otherwise
October marriage	2,228	0.0938	0.292	0	1	1 if the marriage occurred in October and 0 otherwise
Marriage subsidy	2,228	0.854	1.262	0	12.15	Gain due to joint taxation compared to separate taxation in thousands of Euro deflated by the GSOEP deflator to 2010 Euro
Household income	2,228	32.32	17.96	0	204.1	Sum of the after tax and social contributions income in thousands of Euro of the two marriage partners, assuming joint taxation. Deflated by the GSOEP deflator to 2010 Euro
Education	2,199	12.08	2.411	7	18	Mean years of schooling and professional training of the maximum panel-life years of schooling and professional training of the partners of a marriage.
Age	2,228	31.18	7.803	17.17	64.17	Average age of the two marriage partners
Age female	2,228	29.79	7.975	16.67	65.67	Female age in the year of marriage
Age male	2,228	32.57	8.382	17.67	66.08	Male age in the year of marriage of
East	2,228	0.129	0.335	0	1	An indicator that takes the value 1 if a marriage was formed in one of the eastern German states and 0 otherwise

Table 2
Gains from joint taxation: Marrying in the last quarter vs. marrying in the first quarter of
a year
Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
Marriage subsidy	0.0334** (0.0142)	0.0327** (0.0151)	0.0359** (0.0158)	0.0358** (0.0159)	0.0353** (0.0159)	0.0324** (0.0163)
Income		0.00373*** (0.00109)	0.00440*** (0.00121)	0.00438*** (0.00126)	0.00442*** (0.00127)	0.00439*** (0.00127)
Education			-0.0105 (0.00830)	-0.0105 (0.00831)	-0.0104 (0.00832)	-0.0104 (0.00832)
Age				0.000115 (0.00239)		
Age male					0.00158 (0.00320)	0.00163 (0.00320)
Age female					-0.00160 (0.00346)	-0.00155 (0.00346)
Marriage subsidy × East						0.0393 (0.0552)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	778	778	765	765	765	765

Note: Marriages from the last quarter are compared to marriages from the first quarter. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October, November, or December and zero if the marriage was formed in January, February, or March. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in the last quarter and in the year preceding the marriage for marriages in the first quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3
Gains from joint taxation: Marrying in December vs. marrying in the first quarter of a
year
Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
Marriage subsidy	0.0740*** (0.0243)	0.0728*** (0.0261)	0.0778*** (0.0271)	0.0738*** (0.0272)	0.0739*** (0.0272)	0.0664** (0.0272)
Income		0.00477*** (0.00173)	0.00561*** (0.00185)	0.00504*** (0.00190)	0.00504*** (0.00190)	0.00492*** (0.00190)
Education			-0.0176 (0.0137)	-0.0179 (0.0137)	-0.0179 (0.0137)	-0.0182 (0.0137)
Age				0.00402 (0.00345)		
Age male					0.00174 (0.00454)	0.00193 (0.00454)
Age female					0.00230 (0.00469)	0.00238 (0.00470)
Marriage subsidy × East						0.117 (0.103)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	454	454	447	447	447	447

Note: Marriages from December are compared to marriages from the first quarter. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in December and zero if the marriage was formed in January, February, or March. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in December and in the year preceding the marriage for marriages in the first quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4
Gains from joint taxation: Marrying in November vs. marrying in the first quarter of a
year
Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
Marriage subsidy	0.00183 (0.0224)	0.00162 (0.0228)	0.000535 (0.0233)	-0.00163 (0.0234)	-0.00309 (0.0235)	-0.00773 (0.0240)
Income		0.00279 (0.00176)	0.00326* (0.00196)	0.00262 (0.00202)	0.00277 (0.00205)	0.00272 (0.00205)
Education			-0.00768 (0.0140)	-0.00654 (0.0140)	-0.00680 (0.0140)	-0.00795 (0.0141)
Age				0.00376 (0.00361)		
Age male					0.00523 (0.00498)	0.00531 (0.00499)
Age female					-0.00200 (0.00570)	-0.00193 (0.00571)
Marriage subsidy × East						0.0798 (0.0919)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	355	355	352	352	352	352

Note: Marriages from November are compared to marriages from the first quarter. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in November and zero if the marriage was formed in January, February, or March. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in November and in the year preceding the marriage for marriages in the first quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5
Gains from joint taxation: Marrying in October vs. marrying in the first quarter of a year
Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
Marriage subsidy	0.0363* (0.0194)	0.0358* (0.0200)	0.0404* (0.0209)	0.0514** (0.0216)	0.0506** (0.0216)	0.0524** (0.0224)
Income		0.00415*** (0.00152)	0.00511*** (0.00179)	0.00672*** (0.00190)	0.00679*** (0.00193)	0.00682*** (0.00193)
Education			-0.00911 (0.0127)	-0.00986 (0.0126)	-0.00958 (0.0128)	-0.00967 (0.0128)
Age				-0.00937** (0.00391)		
Age male					-0.00159 (0.00557)	-0.00166 (0.00557)
Age female					-0.00797 (0.00608)	-0.00796 (0.00607)
Marriage subsidy × East						-0.0285 (0.0839)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	438	438	429	429	429	429

Note: Marriages from October are compared to marriages from the first quarter. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October and zero if the marriage was formed in January, February, or March. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in October and in the year preceding the marriage for marriages in the first quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6
Robustness check: Marrying in the last quarter vs. marrying in the second quarter of a
year
Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
Marriage subsidy	0.0528*** (0.0154)	0.0534*** (0.0152)	0.0578*** (0.0159)	0.0509*** (0.0161)	0.0515*** (0.0162)	0.0527*** (0.0176)
Income		-0.000614 (0.00103)	0.000192 (0.00109)	-0.000841 (0.00119)	-0.000816 (0.00119)	-0.000799 (0.00119)
Education			-0.0183** (0.00795)	-0.0173** (0.00801)	-0.0175** (0.00801)	-0.0176** (0.00801)
Age				0.00713*** (0.00243)		
Age male					0.00142 (0.00333)	0.00140 (0.00333)
Age female					0.00584 (0.00355)	0.00583 (0.00355)
Marriage subsidy × East						-0.00953 (0.0447)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,083	1,083	1,068	1,068	1,068	1,068

Note: Marriages from the last quarter are compared to marriages from the second quarter. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October, November, or December and zero if the marriage was formed in April, May, or June. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in the last quarter and in the year preceding the marriage for marriages in the second quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7
 Robustness check: Marrying in December, or November, or October vs. marrying in the
 second quarter of a year
 Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
	December marriages		November marriages		October marriages	
Marriage subsidy	0.0498*** (0.0154)	0.0484*** (0.0164)	0.00817 (0.0104)	0.00724 (0.0107)	0.0361*** (0.0133)	0.0391*** (0.0143)
Income	-0.00109 (0.00107)	-0.00112 (0.00107)	-0.00170* (0.000926)	-0.00171* (0.000923)	0.000355 (0.00116)	0.000417 (0.00117)
Education	-0.0167* (0.00873)	-0.0166* (0.00873)	-0.00838 (0.00747)	-0.00835 (0.00748)	-0.0121 (0.00795)	-0.0125 (0.00801)
Age male	0.00259 (0.00348)	0.00260 (0.00348)	0.00498 (0.00322)	0.00498 (0.00323)	-0.00515 (0.00424)	-0.00531 (0.00425)
Age female	0.00683* (0.00359)	0.00688* (0.00359)	0.000383 (0.00322)	0.000406 (0.00322)	0.00358 (0.00414)	0.00360 (0.00415)
Marriage subsidy × East		0.0118 (0.0415)		0.0126 (0.0410)		-0.0346 (0.0420)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	750	750	646	646	730	730

Note: Marriages from October, or November, or December are compared to marriages from the first quarter. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October, or November, or December and zero if the marriage was formed in April, May, or June. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in the last quarter and in the year preceding the marriage for marriages in the second quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 8

Robustness check: Marrying in the last quarter vs. marrying in the first quarter of a year
 Marriages with at least one civil servant and marriages with at least one person that
 receives unemployment benefits excluded

Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
	Marriages with civil servants dropped		Unemployment benefits receiving marriages dropped		Marriages with civil servants or unemployment benefits dropped	
Marriage subsidy	0.0358** (0.0167)	0.0318* (0.0170)	0.0411** (0.0163)	0.0379** (0.0166)	0.0442** (0.0172)	0.0403** (0.0175)
Income	0.00495*** (0.00137)	0.00492*** (0.00137)	0.00435*** (0.00134)	0.00430*** (0.00134)	0.00477*** (0.00144)	0.00471*** (0.00144)
Education	-0.0125 (0.00894)	-0.0127 (0.00895)	-0.0111 (0.00869)	-0.0112 (0.00869)	-0.0140 (0.00941)	-0.0141 (0.00943)
Age male	6.93e-06 (0.00350)	6.93e-05 (0.00349)	0.00265 (0.00340)	0.00271 (0.00339)	0.00104 (0.00375)	0.00113 (0.00374)
Age female	0.000396 (0.00375)	0.000466 (0.00375)	-0.00238 (0.00359)	-0.00226 (0.00360)	-0.000348 (0.00389)	-0.000217 (0.00390)
Marriage subsidy × East		0.0525 (0.0581)		0.0527 (0.0668)		0.0584 (0.0684)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	696	696	679	679	613	613

Note: Marriages from the last quarter are compared to marriages from the first quarter. Marriages in which at least one partner was a civil servant, received unemployment benefits, or both were dropped. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October, November, or December and zero if the marriage was formed in January, February, or March. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in the last quarter and in the year preceding the marriage for marriages in the first quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 9

Robustness check: Marrying in the last quarter vs. marrying in the first quarter of a year
 Dropping marriages who live in households in which labor income accounts for less than
 90% of total household income

Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
Marriage subsidy	0.0373** (0.0149)	0.0391** (0.0159)	0.0418** (0.0165)	0.0413** (0.0166)	0.0405** (0.0166)	0.0380** (0.0171)
Income		0.00370*** (0.00118)	0.00428*** (0.00131)	0.00415*** (0.00138)	0.00419*** (0.00139)	0.00417*** (0.00139)
Education			-0.0109 (0.00881)	-0.0107 (0.00883)	-0.0105 (0.00885)	-0.0106 (0.00886)
Age				0.000727 (0.00264)		
Age male					0.00238 (0.00336)	0.00245 (0.00336)
Age female					-0.00185 (0.00370)	-0.00183 (0.00371)
Marriage subsidy × East						0.0300 (0.0549)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	716	716	704	704	704	704

Note: Marriages from the last quarter are compared to marriages from the first quarter. Marriages from households in which gross labor income of all members of the household accounted for less than 90 % of the household's total gross income were dropped. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October, November, or December and zero if the marriage was formed in January, February, or March. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in the last quarter and in the year preceding the marriage for marriages in the first quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 10
 Robustness check: Marrying in December, or November, or October vs. marrying in the
 first quarter of a year
 Dropping marriages who live in households in which labor income accounts for less than
 90% of total household income

	(I)	(II)	(III)	(IV)	(V)	(VI)
	December marriages		November marriages		October marriages	
Marriage subsidy	0.0823*** (0.0292)	0.0730** (0.0290)	0.0106 (0.0266)	0.00385 (0.0274)	0.0602** (0.0240)	0.0653*** (0.0253)
Income	0.00512** (0.00212)	0.00501** (0.00212)	0.00212 (0.00222)	0.00206 (0.00223)	0.00655*** (0.00210)	0.00665*** (0.00211)
Education	-0.0192 (0.0152)	-0.0197 (0.0153)	-0.00977 (0.0153)	-0.0117 (0.0154)	-0.0114 (0.0138)	-0.0114 (0.0138)
Age male	0.00335 (0.00481)	0.00364 (0.00480)	0.00569 (0.00505)	0.00594 (0.00509)	-0.000439 (0.00564)	-0.000647 (0.00566)
Age female	-0.000868 (0.00503)	-0.000884 (0.00503)	-0.000439 (0.00570)	-0.000367 (0.00573)	-0.00663 (0.00608)	-0.00664 (0.00608)
Marriage subsidy × East		0.120 (0.0995)		0.104 (0.102)		-0.0673 (0.0893)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	405	405	323	323	399	399

Note: Marriages from October, or November, or December are compared to marriages from the first quarter. Marriages from households in which gross labor income of all members of the household accounted for less than 90 % of the households total gross income were dropped. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October, November, or December and zero if the marriage was formed in January, February, or March. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in the last quarter and in the year preceding the marriage for marriages in the first quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 11
 Robustness check: Marrying in the last quarter vs. marrying in the first quarter of a year
 Using gains from joint taxation of the year of the marriage for all marriages
 Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
Marriage subsidy	-0.0154 (0.0114)	-0.0233** (0.0117)	-0.0215* (0.0120)	-0.0236** (0.0120)	-0.0244** (0.0122)	-0.0188 (0.0130)
Income		0.00542*** (0.00116)	0.00603*** (0.00129)	0.00554*** (0.00133)	0.00556*** (0.00133)	0.00571*** (0.00133)
Education			-0.00819 (0.00824)	-0.00801 (0.00825)	-0.00782 (0.00826)	-0.00821 (0.00825)
Age				0.00296 (0.00244)		
Age male					0.00324 (0.00327)	0.00327 (0.00327)
Age female					-0.000418 (0.00354)	-0.000760 (0.00355)
Marriage subsidy × East						-0.0408 (0.0353)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	865	865	850	850	850	850

Note: Marriages from the last quarter are compared to marriages from the first quarter. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October, November, or December and zero if the marriage was formed in January, February, or March. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in the last quarter and for marriages in the first quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 12
 Robustness check: Marrying in December, November, or October vs. marrying in the first
 quarter of a year
 Using gains from joint taxation of the year of the marriage for all marriages
 Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
	December marriages		November marriages		October marriages	
Marriage subsidy	-0.00319 (0.0174)	0.00327 (0.0193)	-0.0604*** (0.0204)	-0.0611*** (0.0218)	-0.0236 (0.0184)	-0.0117 (0.0192)
Income	0.00542*** (0.00177)	0.00561*** (0.00177)	0.00373** (0.00168)	0.00371** (0.00170)	0.00709*** (0.00184)	0.00736*** (0.00181)
Education	-0.0174 (0.0125)	-0.0181 (0.0126)	-0.00270 (0.0115)	-0.00272 (0.0115)	-0.00262 (0.0116)	-0.00402 (0.0117)
Age male	0.00329 (0.00437)	0.00331 (0.00436)	0.00648 (0.00464)	0.00648 (0.00465)	-0.00107 (0.00519)	-0.00111 (0.00524)
Age female	0.00476 (0.00455)	0.00438 (0.00459)	-0.00206 (0.00506)	-0.00204 (0.00508)	-0.00521 (0.00568)	-0.00577 (0.00574)
Marriage subsidy × East		-0.0339 (0.0400)		0.00647 (0.0565)		-0.0905 (0.0653)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	520	520	419	419	501	501

Note: Marriages from October, or November, or December are compared to marriages from the first quarter. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October, or November, or December and zero if the marriage was formed in January, February, or March. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in the last quarter and for marriages in the first quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 13
 Robustness check: Marrying in the last quarter vs. marrying in the second quarter of a
 year
 Using gains from joint taxation of the year of the marriage for all marriages
 Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
Marriage subsidy	0.0224** (0.0111)	0.0228** (0.0111)	0.0286** (0.0117)	0.0208* (0.0116)	0.0212* (0.0117)	0.0189 (0.0120)
Income		-0.000584 (0.000877)	-8.26e-05 (0.000968)	-0.00146 (0.00107)	-0.00143 (0.00107)	-0.00144 (0.00107)
Education			-0.0127* (0.00688)	-0.0111 (0.00695)	-0.0113 (0.00695)	-0.0113 (0.00695)
Age				0.00903*** (0.00214)		
Age male					0.00279 (0.00301)	0.00286 (0.00302)
Age female					0.00636** (0.00319)	0.00638** (0.00319)
Marriage subsidy × East						0.0303 (0.0418)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,328	1,328	1,300	1,300	1,300	1,300

Note: Marriages from the last quarter are compared to marriages from the second quarter. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October, November, or December and zero if the marriage was formed in April, May, or June. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in the last quarter and for marriages in the second quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 14
Robustness check: Marrying in December, November, or October vs. marrying in the
second quarter of a year
Using gains from joint taxation of the year of the marriage for all marriages
Logit results

	(I)	(II)	(III)	(IV)	(V)	(VI)
	December marriages		November marriages		October marriages	
Marriage subsidy	0.0264*** (0.00971)	0.0232** (0.00984)	-0.00411 (0.00932)	-0.00578 (0.00986)	0.0135 (0.00984)	0.0143 (0.0101)
Income	-0.00108 (0.000901)	-0.00109 (0.000901)	-0.00168** (0.000760)	-0.00166** (0.000761)	-0.000132 (0.00100)	-0.000141 (0.00101)
Education	-0.0124* (0.00650)	-0.0123* (0.00648)	-0.00188 (0.00540)	-0.00196 (0.00537)	-0.00533 (0.00629)	-0.00536 (0.00630)
Age male	0.00279 (0.00270)	0.00284 (0.00270)	0.00445* (0.00243)	0.00449* (0.00244)	-0.00316 (0.00310)	-0.00321 (0.00311)
Age female	0.00617** (0.00278)	0.00625** (0.00278)	0.000772 (0.00244)	0.000792 (0.00245)	0.00369 (0.00312)	0.00372 (0.00313)
Marriage subsidy × East		0.0419 (0.0360)		0.0245 (0.0386)		-0.0143 (0.0426)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	970	970	860	860	950	950

Note: Marriages from October, or November, or December are compared to marriages from the second quarter. Logit estimates are reported. The dependent variable is equal to one if the marriage was formed in October, or November, or December and zero if the marriage was formed in April, May, or June. The marriage subsidy in thousands of Euro indicates the gain from joint income taxation compared to separate taxation in the year of the marriage for marriages in the last quarter and for marriages in the second quarter. The coefficients are marginal effects evaluated at the mean of the independent variables. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1