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Dating and Marriage during the COVID-19 Pandemic: Evidence from Japan

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Abstract

We conduct a novel survey of dating and marriage behaviors to better understand the persistent drop in marriage in Japan since the onset of the COVID-19 pandemic. In our survey, we ask participants about their personal relationship histories, which allows us to construct the time series of transition probabilities between being (i) single, (ii) unmarried with a partner, and (iii) married. We find that a single person has become less likely to find a dating partner and that an unmarried person with a dating partner has become more likely to get married since the pandemic. Our analysis highlights the importance of adopting policies that encourage relationship formation if the government would like to slow down the decline in marriage.

Keywords— COVID-19, Dating, Marriage, Pandemic
JEL— C81; I10; J11; J12

1 Introduction

The number of marriages has been declining in Japan for decades, as shown in Figure 1. It saw a sharp drop in 2020 after the COVID-19 pandemic broke out. The drop has been persistent since then. The number of marriages has not returned to its pre-pandemic trend. Cumulatively, more than 300,000 marriages have been "lost" in the 5 years since the beginning of the pandemic.
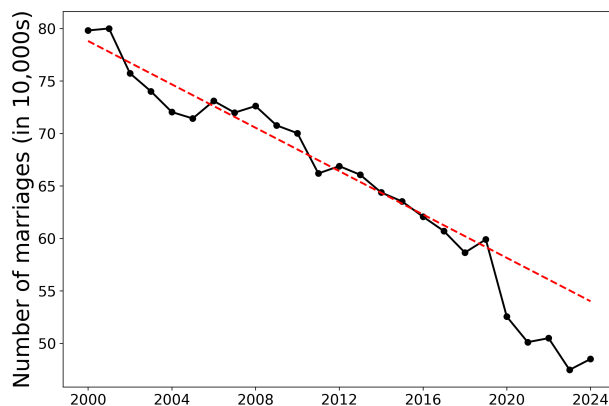

Figure 1: Number of marriages in Japan

Source: Ministry of Health, Labour and Welfare, *Vital Statistics of Japan.*

Note: Trend line shows fitted values from an OLS regression with a linear time trend, a monthly dummy, and a post-COVID dummy.

We conducted a novel survey of dating and marriage behaviors to better understand the below-trend evolution of marriage since the pandemic. In the survey, we ask our participants about their personal relationship histories, which allows us to construct time series of transition probabilities between being (i) single (i.e., unmarried without a partner), (ii) coupled (i.e., unmarried but with a partner), and (iii) married. We then analyze whether these transition probabilities have recently deviated from pre-pandemic trends, using time-series analysis.

Our main findings are that (i) it has become less likely for a single person to find a new dating partner and that (ii) it has become more likely for a coupled person to get married after 2020, relative to the pre-pandemic trend. The first result likely reflects reduced human-to-human interactions during the pandemic era to avoid contracting infection. Quantitatively, the first effect dominates the second, leading to the observed persistent decline in marriage since 2020.

Our analysis is policy-relevant for at least two reasons. First, the number of newborns has been declining in Japan for many decades, leading to an aging and shrinking population. The government has been trying to reverse the course or mitigate the trend, but without much success. Our result regarding the decline in relationship formation since the pandemic suggests that it might be effective for the government to pursue policies aimed at helping relationship formation, which in turn would increase the number of marriages and newborns.

Second, a better understanding of the pandemic's social impact is likely important for designing future pandemic policies. In designing pandemic policies, the government has to take into account tradeoffs between infection control and broader socio-economic impacts, including locked-down populations becoming lonely and depressed. Our result suggests that a pandemic—and policy responses to the pandemic—can persistently reduce relationship formation of young adults and affect the country's population dynamics for many years to come. The government may want to take this factor into account in formulating policies in the next pandemic.

Our study is related to the extensive literature on marriage. Some papers analyzed time-series marriage rates (Kirk, 1960; Bloom and Bennett, 1990; Espenshade, 1985; Goldstein and Kenney, 2001; Kalmijn, 2007; Geist, 2017; Wagner et al., 2020; Kim and Kim, 2021; Ghaznavi et al., 2022; Westrick-Payne et al., 2022). Others analyzed panel data for the transition between marital statuses (Raley, 1996; Oppenheimer et al., 1997; Smock and Manning, 1997; Clarkberg, 1999; Brien et al., 1999; Ermisch and Francesconi, 2000; Oppenheimer, 2003; Xie et al., 2003; Kalmijn, 2011; Jalovaara, 2012). We differ from these papers because we computed and analyzed time-series transition probabilities among relationship states—single, coupled, and married—from our retrospective survey.

Our study is also related to the literature on dating after the pandemic. Some papers studied the impact of the pandemic on relationship formation (Gibson, 2021; Liu et al., 2023; Rosenfeld, 2025), relationship maintenance (Williamson, 2020; Goodboy et al., 2021; Pietromonaco and Overall, 2021; Randall et al., 2022; Balzarini et al., 2023), and relationship dissolution (Barbuscia et al., 2023; Luppi et al., 2025). Many papers suggest that couple formation and maintainance became difficult during and after the pandemic. We give collaborative evidence for this argument by showing that the transition probability from single to coupled became lower after the pandemic than before.

Our study is related to the literature examining the effects of the pandemic on various outcomes using time-series models. Researchers have examined whether and how the COVID-19 outbreak affected pre-pandemic trends in labor market outcomes (Fukai et al., 2021; Fukai et al., 2023), marriage and divorce patterns (Ghaznavi et al., 2022), fertility (Luppi et al., 2020; Aassve et al., 2021), and suicide (Tanaka and Okamoto, 2021; Yoshioka et al., 2022). We apply a similar time series analysis for dating and marriage.

The rest of the paper is structured as follows: Section 2 describes our survey and presents the descriptive statistics. Section 3 describes our methodology. Section 4 describes the results of the analyses. Section 5 discusses limitations of our study. Section 6 concludes.

2 Survey

We conducted our survey from September 13, 2023 to September 15, 2023, in collaboration with Cross Marketing Inc., an online market research company based in Japan. About 160,000 people

are registered with the company. Registered people regularly receive survey invitations from the company. We offer our respondents a modest reward that can be used for online shopping upon completion.[1] We restricted our attention to those who were aged between 25 and 45 at the time of our survey. The distributions of gender and age were matched to those in the Population Census. We collected 10,000 responses.[2]

We asked our respondents about their personal relationship history in detail. We began by asking the respondents the number of their past dating partners, up to now for those who have never gotten married, and up to their first marriage for those who have gotten married.[3] Then, for each dating partner, we asked them when (which month of which year) they started the relationship.[4] We also asked them if the respondent was still with that partner. If yes, we asked them whether they got married to that partner (if so, when) or not. If no, we asked them whether (i) they got married to that partner but subsequently got divorced (if so, when) or (ii) ended the relationship without getting married (if so, when).

From the responses to these questions, we construct a monthly time-series data of relationship status for each person. Figure 2 illustrates three illustrative examples of our monthly time-series data. Taken together, we have an unbalanced panel data set of personal relationship histories going back to the late 2000s. At each point in time, we can count the number of those who are single, those who are coupled, those who are married, and those who have been divorced. From this panel dataset, we construct the transition probabilities between the four relationship statuses, which are the main object of our analysis.

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[1]This survey was approved by the University of Tokyo's Ethics Review Committee (Application No.23-260.

[2]We asked our survey respondents two questions to examine the quality of the response: the year the Great East Japan Earthquake occurred (Answer: 2011) and the name of the Japanese Prime Minister in 2017 (Answer: Shinzo Abe). Among 10,000 respondents, 6,790 correctly answered both questions. Although this subsample is assumed to have clearer memories than the others, its gender balance shows a higher weight on males. Therefore, instead of this subsample, we focus on all samples in the main analysis. We also conducted the analysis using the subsample as shown in Appendix B. The key takeaways of the paper are robust.

[3]We asked respondents about their personal relationship histories only up to their first marriage. This survey design prevents us from knowing relationship histories after their first divorce. Thus, our "single" group excludes those without a partner if they have experienced a divorce. Similarly, our "coupled" group excludes those who are not married but with a partner if they have a divorce experience. Our "married" group excludes those who are in their second marriage or more. However, this design is unlikely to be quantitatively consequential because the number of people who have experienced a divorce is very small to begin with in our sample.

[4]For those who experienced more than ten matings, we asked them to report on ten matings that lasted for the longest period.
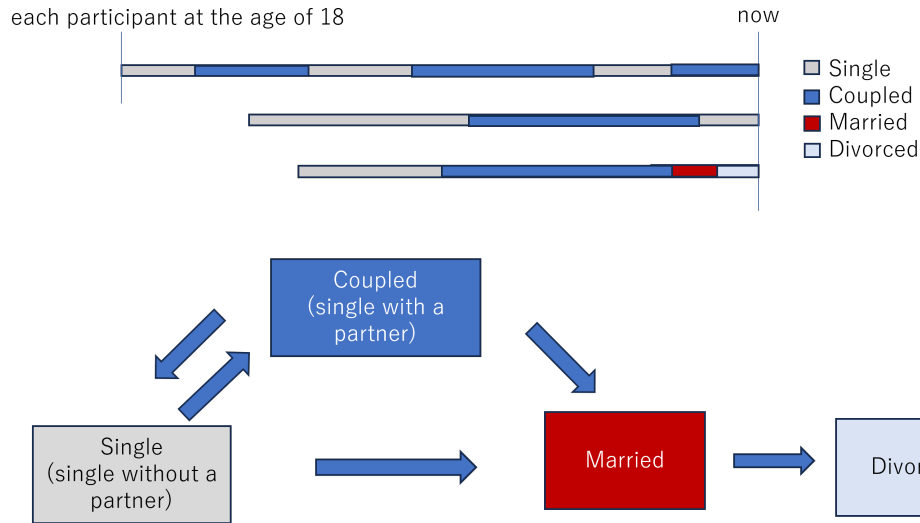
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Figure 2: Survey Design: An Illustration

We also asked our survey respondents about their demographic and socio-economic characteristics to examine the representativeness of our sample. Table 1 shows the summary statistics. Participants' gender shows an equal share by construction. Education distribution shows a larger share of university graduates than in official statistics: 69.8 percent are junior-college graduates or more highly educated in our survey, whereas 61.0 percent of Japanese aged between 25 and 44 are college graduates or more highly educated according to the National Census. Employment-type distribution shows a smaller share of permanent workers than in official statistics. 51.7 percent are permanently employed in our survey, whereas 69.8 percent of Japanese aged between 25 and 44 are permanently employed according to the Employment Status Survey. These data suggest that our respondents represent Japanese residents aged between 25 and 45 reasonably well.

Table 1: Summary statistics

	Value
Age	
Mean age	35.9
Gender	
Male (%)	50.7
Female (%)	49.3
Education	
High school or less (%)	31.2
Junior-College/University (%)	63.0
Graduate school (%)	5.8
Income in 2021	
< 4 (million yen) (%)	67.4
4–8 (million yen) (%)	27.7
$8 \leq$ (million yen) (%)	4.9
Employment in 2021	
Permanent (%)	50.9
Contract (%)	5.2
Part-time (%)	16.6
Others (%)	27.4
N	10,000

An important feature of our survey is that we asked a specific cohort about their relationship history. This retrospective nature of our survey generates an age trend in aggregate historical data on dating. The respondents were between 25 and 45 years old as of 2023, which means that they were between 15 and 35 years old as of 2013, as shown in Figure 3. Thus, the average age of our sample increases over time. To control for this age trend, we focus on age-group-specific transition probabilities between relationship statuses rather than at the aggregate level. In particular, we focus on age groups 25-29 and 30-34 because these age groups have constant within-group age compositions for a sufficiently long period before and after the pandemic: Those who are aged between 25 and 29 appear from 2007 to 2023. Those who are aged between 30 and 34 appear from 2012 to 2023.
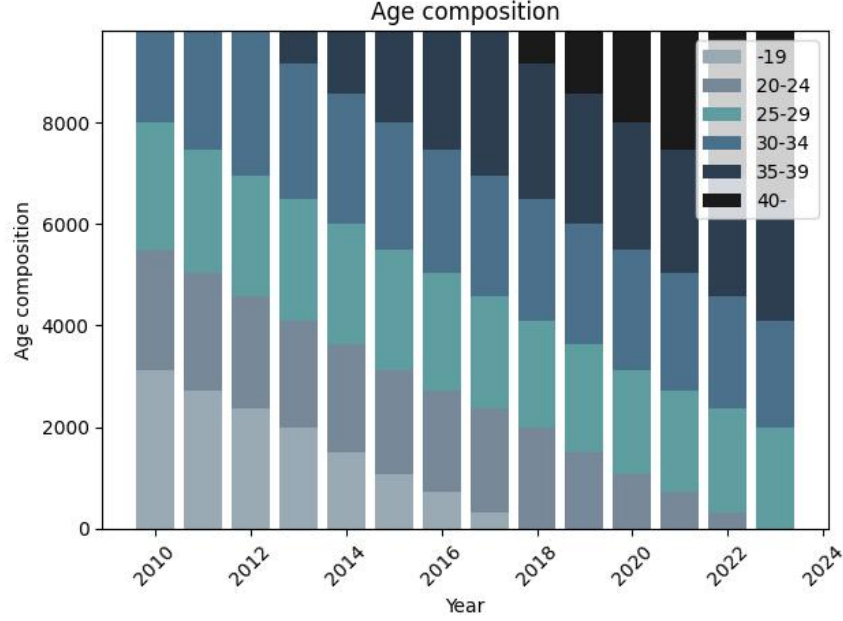
Figure 3: Age composition in Our Survey

3 Analysis

We define stock $Stock_{i,t}^{a}$ as the number of survey respondents in state i and in the age group a at time t. We define $Flow_{i,j,t,t-n}^{a}$ as the number of survey respondents in state j and in the age group a at time t who were in state i at time $t-n$. Let $a(x)$ be the age group that corresponds to the age group a x months later.

We define the transition probabilities between relationship statuses in three ways as follows.

- Annual

$$P_{i,j,t}^{age} = \frac{Flow_{i,j,t,t-12}^{a}}{Stock_{i,t-12}^{a(12)}} \tag{1}$$

- Quarterly

$$P_{i,j,t}^{a} = \frac{Flow_{i,j,t,t-3}^{a}}{Stock_{i,t-3}^{a(3)}} \times 4 \tag{2}$$

- Monthly

$$P_{i,j,t}^{age} = \frac{Flow_{i,j,t,t-1}^{a}}{Stock_{i,t-1}^{a(1)}} \times 12 \tag{3}$$

In the main body of the paper, we focus on annual measures because they are less noisy than monthly or quarterly measures. However, the results are qualitatively robust to monthly and quarterly measures, which are reported in the Appendix.

As discussed in Section 2, we focus on the dynamics of transition probabilities for two age groups: 25-29 and 30-34. For each age group, we select the sample period so that our respondents represent all ages within each group. If we include other periods, the age composition within each group is not constant throughout the sample periods. When we conduct the analysis using annual transition-probability measures, this consideration leads us to set the beginning and end of the sample period to January 2011 and August 2023 for the age group 25-29. It also leads us to set the beginning and end of the sample period to August 2013 to August 2023, respectively, for the age group 30-34.

We investigate whether the pandemic had any impact on the long-term trends in these transition probabilities. For each transition probability defined above, we estimate the impact using the following equation:

$$P_{i,j,t}^{age} = \beta_0 + \sum_k \mu_k D_k + \sum_m \mu_m D_m + \beta t + u_t \tag{4}$$

where D_k takes 1 if $k = K$ for $K \in (Apr2020, ..., Aug2023)$ and D_m takes 1 if $m = M$ for $M \in (Feb, ..., Dec)$. Thus, μ_k captures the time-specific effects after the pandemic, μ_m captures the seasonal effects, and β captures the time trend.

4   Results

Figures 4 and 5 show the results of our analysis. On the top panels in each figure, we show three major transition probabilities: (i) single to (ii) coupled, (ii) coupled to (i) single, and (ii) coupled to (iii) married. On the bottom panels, we show $\hat{\mu}_k$, the estimated time-specific effects after the pandemic with ninety percent confidence intervals.

For the age group 25-29 (Figure 4), the transition probability from single to coupled shows a positive trend over the ten years before 2020. However, it has fallen below that trend since 2020. Thus, it became less likely for a single person in this age group to find a new partner after the pandemic than the past trend would have predicted. The transition probability from coupled to single shows a negative trend before 2020. It followed the trend after 2020. The transition probability from coupled to married shows a positive trend before 2020. It has evolved above the trend since then. It became more likely for a coupled person in this age group to get married after the pandemic than the past trend would have predicted.
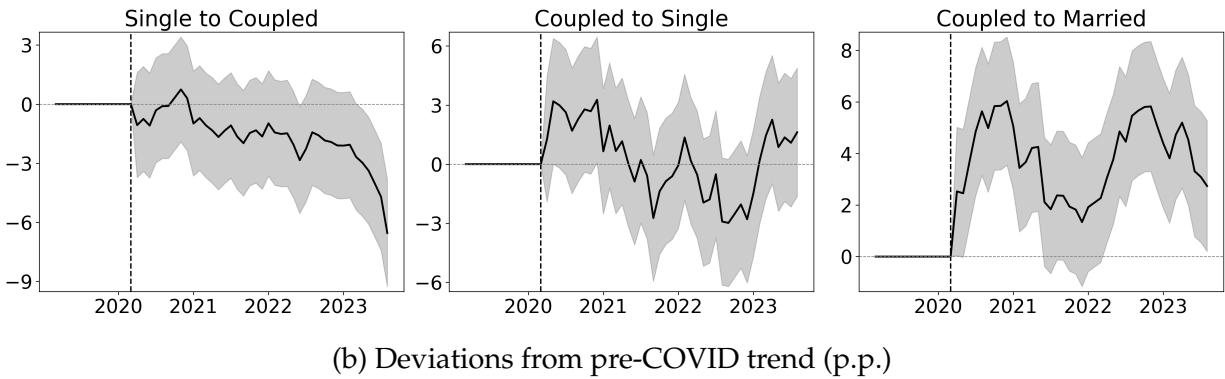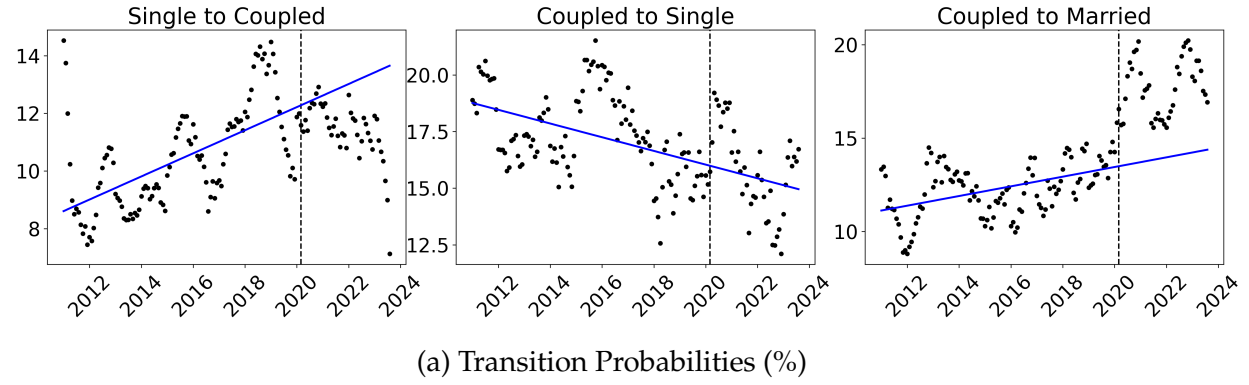
(a) Transition Probabilities (%)

(b) Deviations from pre-COVID trend (p.p.)

Figure 4: Transition Probabilities for Age 25–29

For the age group 30-34 (Figure 5), the transition probability from single to couple shows a slightly increasing trend before 2020. It has declined since 2020. Thus, it became less likely for a single person aged between 30 and 34 to find a new partner after the pandemic in absolute terms. The transition probability from coupled to single shows a positive trend before 2020. Although it deviated positively from the trend in 2020, it subsequently fell below the trend in 2021. Finally, the transition probability from coupled to married shows a positive trend before 2020. It declined a bit in the first two years of the pandemic, but it has been increasing since then, exceeding the pre-pandemic level from mid-2022.

(a) Transition Probabilities (%)

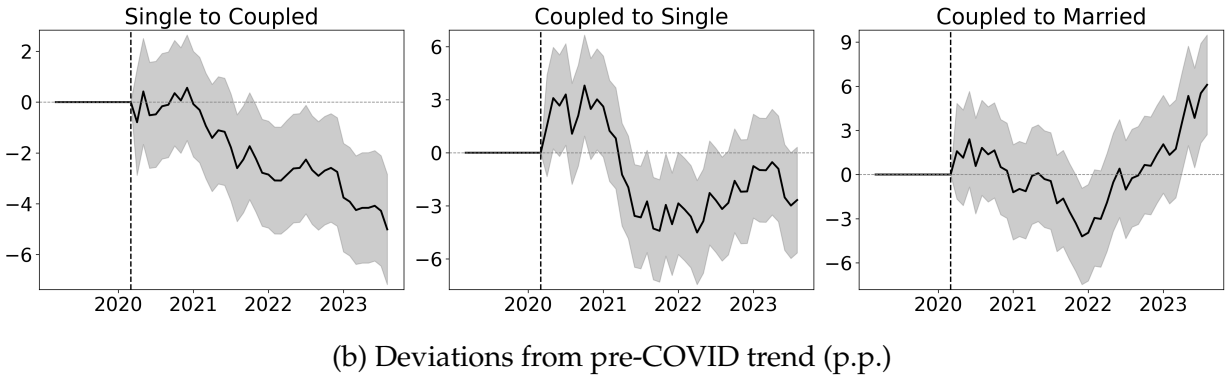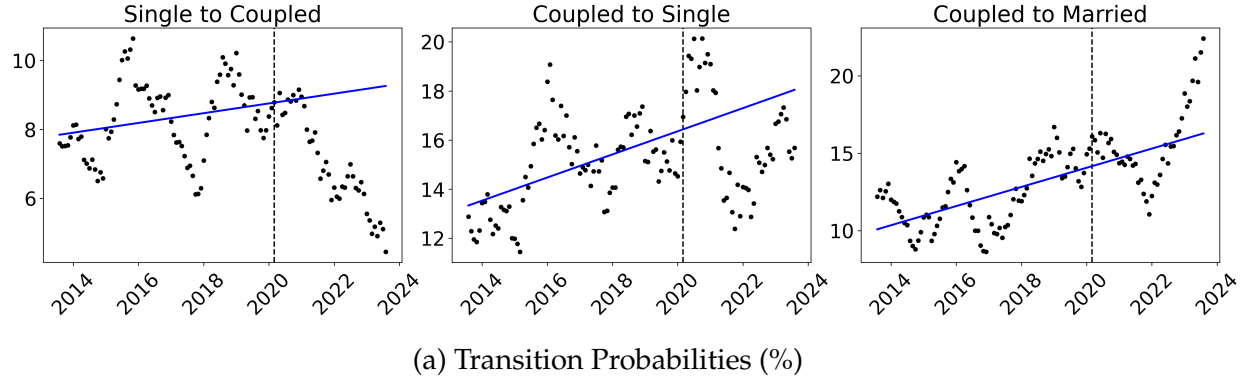(b) Deviations from pre-COVID trend (p.p.)

Figure 5: Transition Probabilities for Age 30–34

To summarize, we observed that it has become less likely for a single person to find a new dating partner since the pandemic and that it has become more likely for a coupled person to get married since the pandemic. These observations are common to both age groups 25-29 and 30-34. We find that these two observations are robust to (i) alternative measures for transition probabilities: quarterly and monthly and (ii) an alternative sample. See Appendix B for these robustness results.

The decline in the transition probability from single to coupled in our data is consistent with the sharp decline in marriage after the pandemic in the official statistics shown in Figure 1. However, our analyses also suggest that the transition probability from coupled to married increased after the pandemic, which works to mitigate the decline in marriages. The former effect dominates the latter because the transition from the single to the coupled occurs in a larger volume than the transition from the coupled to the married, as shown in Table 2.

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Table 2: Flow Volume

			(Unit: Person)
Age	**Single to Coupled**	**Coupled to Single**	**Coupled to Married**
25-29	144.9	99.7	80.2
30-34	99.3	72.8	63.3

5   Discussion

Our survey is subject to two methodological limitations. First, our survey may suffer from recall bias because it is retrospective. We asked survey participants to recall their relationship histories going back to ten years ago. Memories of such distant past might not be accurate.

Second, our survey does not allow us to examine differences in dating and marriage behaviors across cohorts. Our respondents are aged between 25 and 45 as of 2023. Our findings are specific to this cohort. There might be interesting variations in dating and marriage behaviors in Japan, which we leave for future research.

6   Conclusion

In this study, we conducted a survey on individual relationship histories and computed transition probabilities among relationship statuses: single, coupled, and married. We then analyzed whether these transition probabilities deviated from trends during the pandemic.

We found that (i) singles have become less likely to find a new dating partner and that (ii) couples have become more likely to get married during the pandemic than before 2020. The first result likely reflects reduced human-to-human interactions during the pandemic era to avoid contracting infection. Quantitatively, the first effect dominates the second, leading to the observed persistent decline in marriage in official statistics since 2020. The result regarding the decline in relationship formation suggests that it might be effective for the government to pursue policies aimed at helping relationship formation, which in turn would increase the number of marriages and newborns.

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Appendix

A   Questionnaire

Introduction

This survey is an academic research project conducted by the Laboratory of Taisuke Nakata, Graduate School of Economics, The University of Tokyo, and commissioned to Cross Marketing Inc.

The purpose of this survey is to understand people's dating history and marriage. It includes questions about when you dated, as well as about your work and income.

All responses will be processed statistically and anonymized so that no individual can be identified. Summary data or raw data may be made public, but they will never be released in a way that can identify individuals. The data will not be used for any purpose other than this research. Please answer each question as you think.

Estimated response time: 10 minutes.

Participation is voluntary. You may stop answering at any time by closing your browser. In that case, no incentive points will be awarded.

If you agree with the above and wish to participate, please select "Next". If you do not wish to participate, you may end the survey here (no incentive points will be given).

Respondent criteria

- Men and women aged 25–45 who are registered panel members.

- Sampling will be arranged so that age and gender ratios match a nationally representative sample.

- If the survey company can provide basic demographic data (age, gender, prefecture/municipality), those questions may be omitted.

Questions

Q1. Please indicate your gender. (Single Answer)

- Male
- Female

Q2. Please indicate your age. (Pre-coded Data)

Q3. Please indicate the prefecture where you currently live. (Pre-coded Data)

Q4. What was your annual income in 2019? If you had no income, please select "Under 2 million yen."

- Under 2 million yen
- 2–4 million yen
- 4–6 million yen
- 6–8 million yen
- 8–10 million yen
- 10 million yen or more

Q5. What was your occupation/employment status in 2019? (Single Answer)

- Student
- Unemployed
- Permanent employee (no fixed-term contract)
- Fixed-term contract (contract employee, entrusted employee)
- Part-time or temporary worker
- Temporary staff dispatched from an agency
- Self-employed or freelance (e.g., restaurant, retail/wholesale, farming, medical practice, writer), or family business worker (e.g., family member engaged in restaurant, retail/wholesale, farming)
- Other (free description)

Q6. What was your annual income in 2021? If you had no income, please select "Under 2 million yen."

- Under 2 million yen
- 2–4 million yen

- 4–6 million yen

- 6–8 million yen

- 8–10 million yen

- 10 million yen or more

Q7. What was your occupation/employment status in 2021? (Single Answer)
(Same options as Q5)

Q8. What is your highest level of education completed? (Single Answer)

- Junior high school or elementary school

- High school

- Junior college (including technical colleges)

- University

- Graduate school

Q9. From age 18 up to the present, how many people of the opposite sex have you dated?
If you have ever been married, please answer with the number of partners you dated up to your first marriage (including your first spouse). (Numeric)

Q10. Around what year and month did you start dating this person? (Numeric: year and month)

Q11. Which of the following best describes your current relationship with this person? (Single Answer)

- Married and still married

- Married but later divorced

- Not married but still dating

- Not married and later broke up

Q12. If Q11 = "Married and still married" or "Married but later divorced":
Around what year and month did you register your marriage? (Numeric: year and month)

Q13. If Q11 = "Married but later divorced":
Around what year and month did you divorce? (Numeric: year and month)

Q14. If Q11 = "Not married and later broke up":
Around what year and month did you break up? (Numeric: year and month)

Q15. In what year did the Great East Japan Earthquake occur? (Numeric)

Q16. Who was Japan's Prime Minister in 2017? (Open-ended)

B Robustness

B.1 Transition Probabilities: Monthly Basis, All Respondents

When we conduct the analysis using monthly transition-probability measures, we set the beginning and end of the sample period to February 2010 and August 2023, respectively, for the age group 25-29 and to September 2012 and August 2023, respectively, for the age group 30-34.
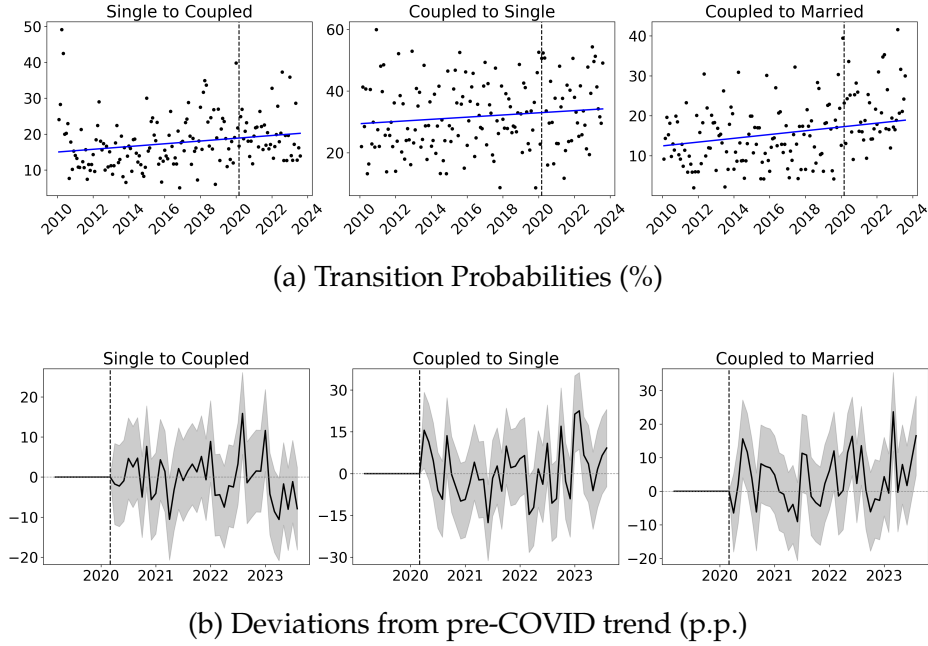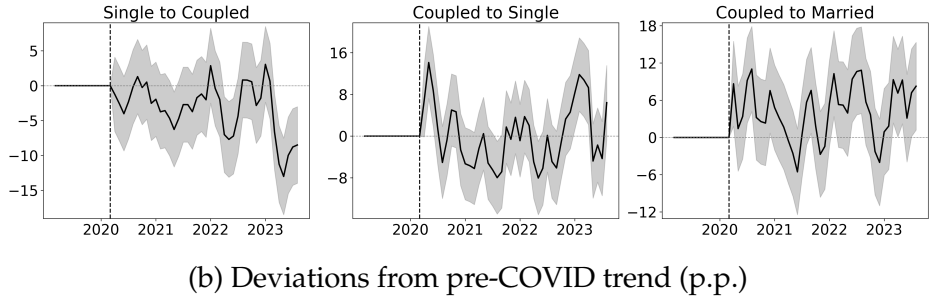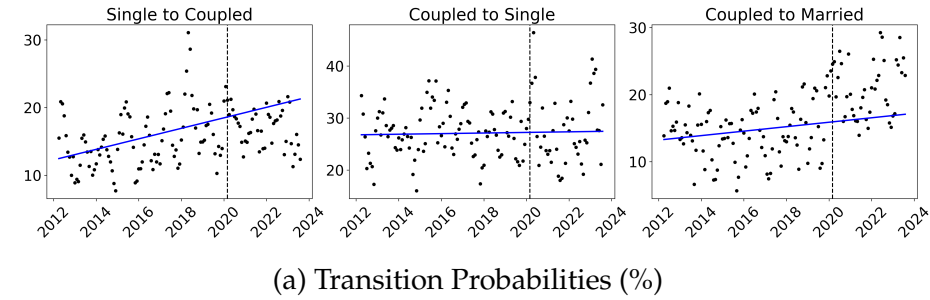

(a) Transition Probabilities (%)

(b) Deviations from pre-COVID trend (p.p.)

Figure 6: Transition Probabilities for Age 25–29: Monthly Basis, All Respondents

(a) Transition Probabilities (%)

(b) Deviations from pre-COVID trend (p.p.)
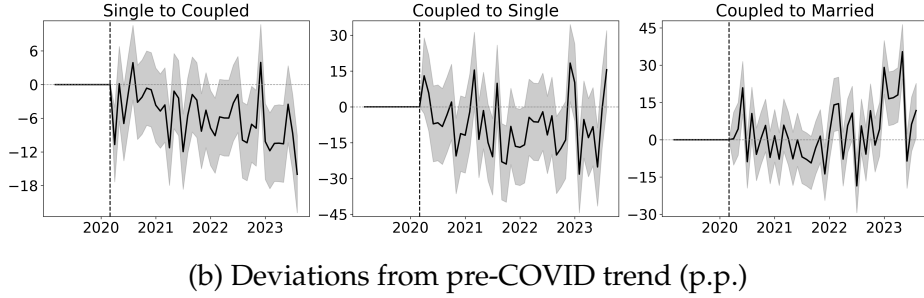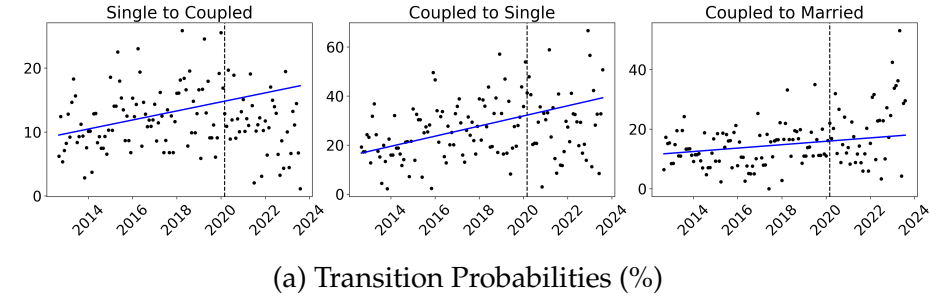
Figure 7: Transition Probabilities for Age 30–34: Monthly Basis, All Respondents

B.2 Transition Probabilities: Quarterly Basis, All Respondents

When we conduct the analysis using quarterly transition-probability measures, we set the beginning and end of the sample period to April 2012 and August 2023, respectively, for the age group 25-29 and to November 2012 and August 2023, respectively, for the age group 30-34.

(a) Transition Probabilities (%)

(b) Deviations from pre-COVID trend (p.p.)

Figure 8: Transition Probabilities (Age 25–29): Quarterly Basis, All Respondents

(a) Transition Probabilities (%)

(b) Deviations from pre-COVID trend (p.p.)
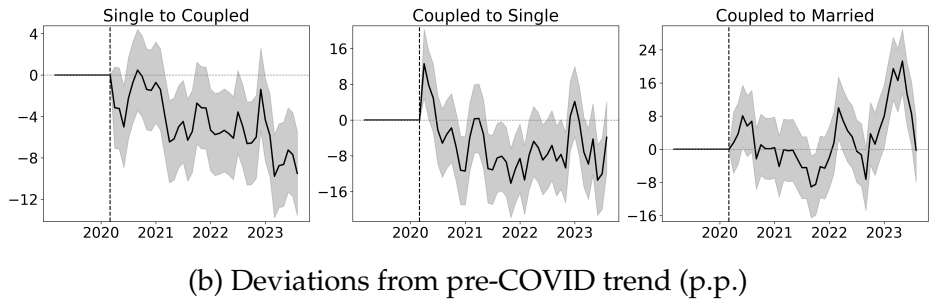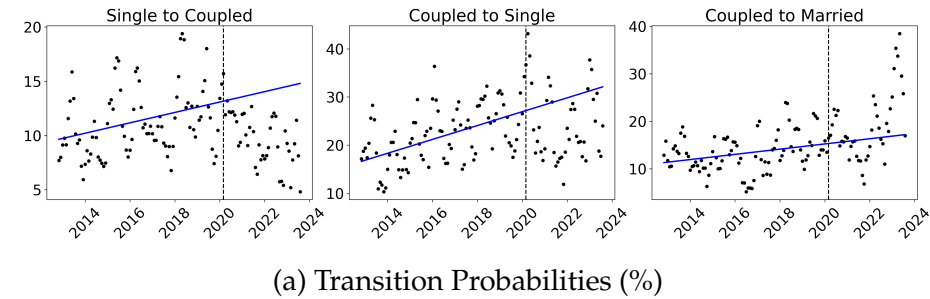
Figure 9: Transition Probabilities (Age 30–34): Quarterly Basis, All Respondents

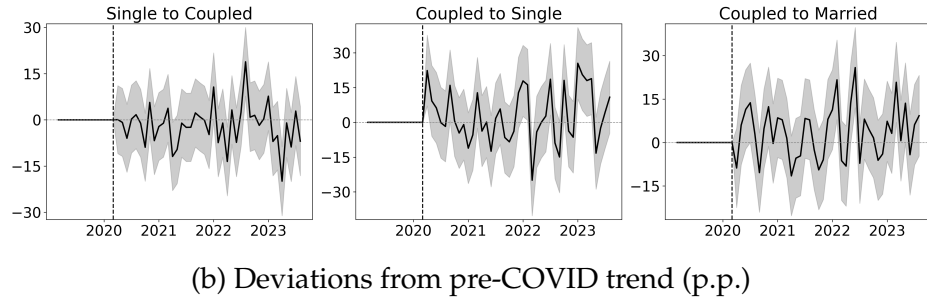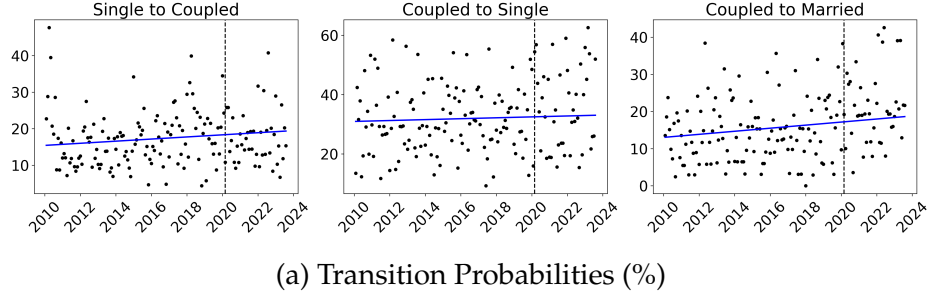## B.3 Transition Probabilities: Monthly Basis, Quality-Controlled Sub-sample

(a) Transition Probabilities (%)

(b) Deviations from pre-COVID trend (p.p.)

Figure 10: Transition Probabilities (Age 25–29): Monthly Basis, Sub-sample

(a) Transition Probabilities (%)
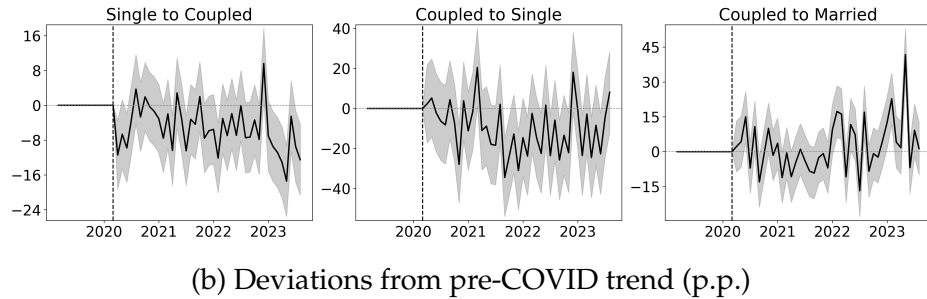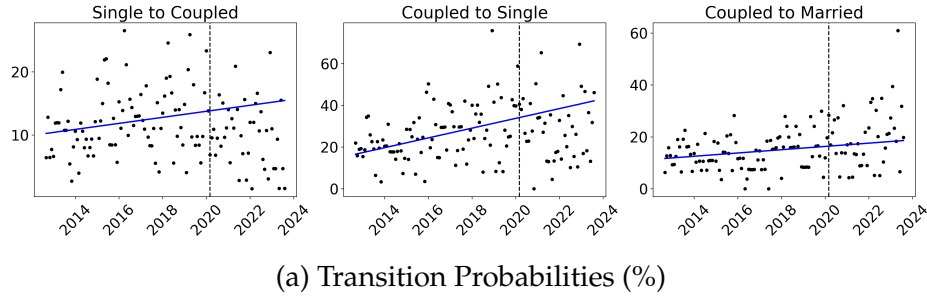

(b) Deviations from pre-COVID trend (p.p.)

Figure 11: Transition Probabilities (Age 30–34): Monthly Basis, Sub-sample

B.4 Transition Probabilities: Quarterly Basis, Quality-Controlled Sub-sample
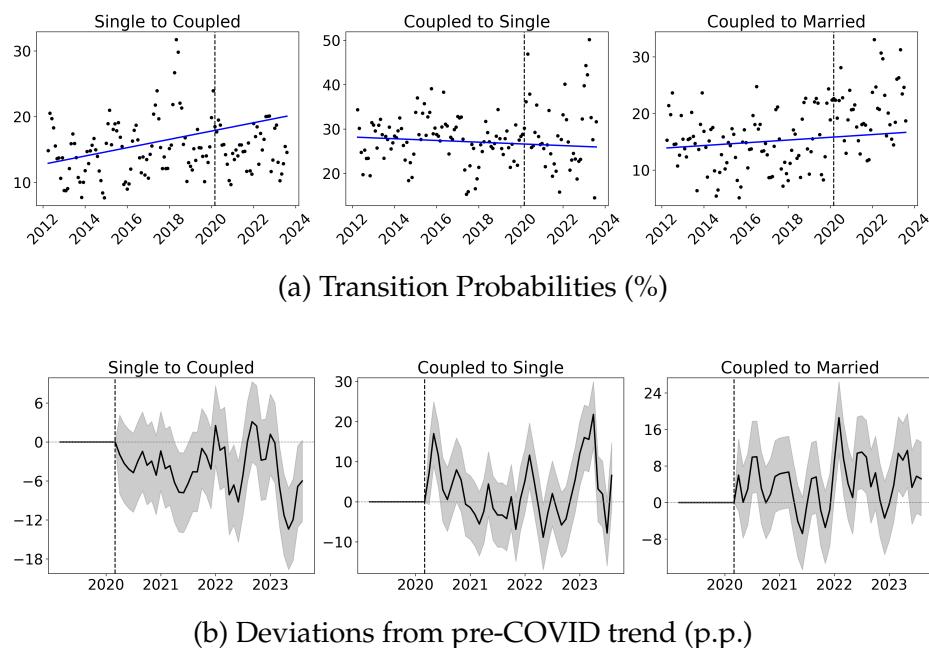

(a) Transition Probabilities (%)

(b) Deviations from pre-COVID trend (p.p.)

Figure 12: Transition Probabilities (Age 25–29): Quarterly Basis, Sub-sample

(a) Transition Probabilities (%)

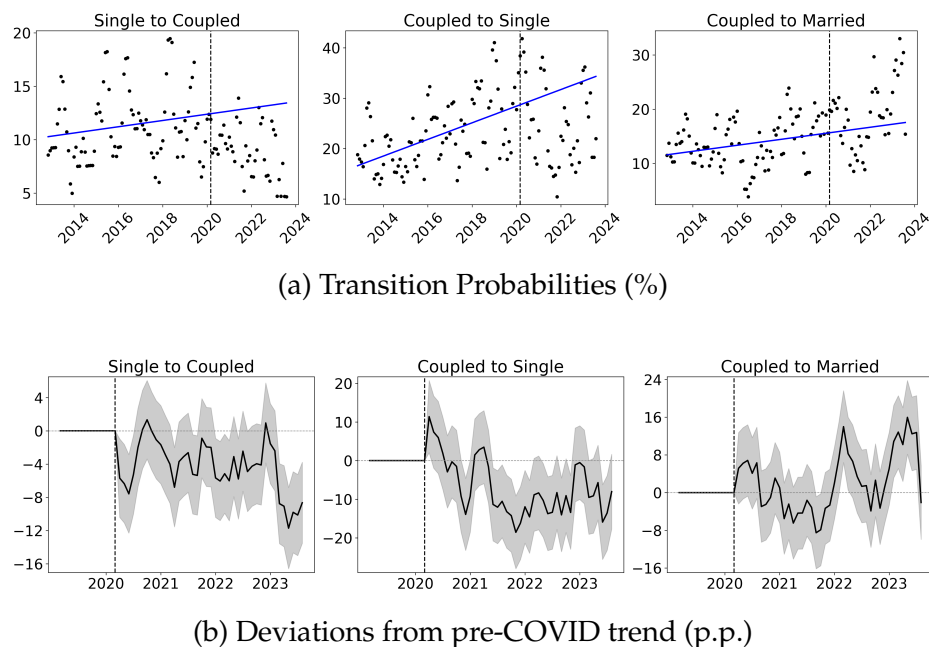(b) Deviations from pre-COVID trend (p.p.)

Figure 13: Transition Probabilities (Age 30–34): Quarterly Basis, Sub-sample

B.5 Transition Probabilities: Annual Basis, Quality-Controlled Sub-sample
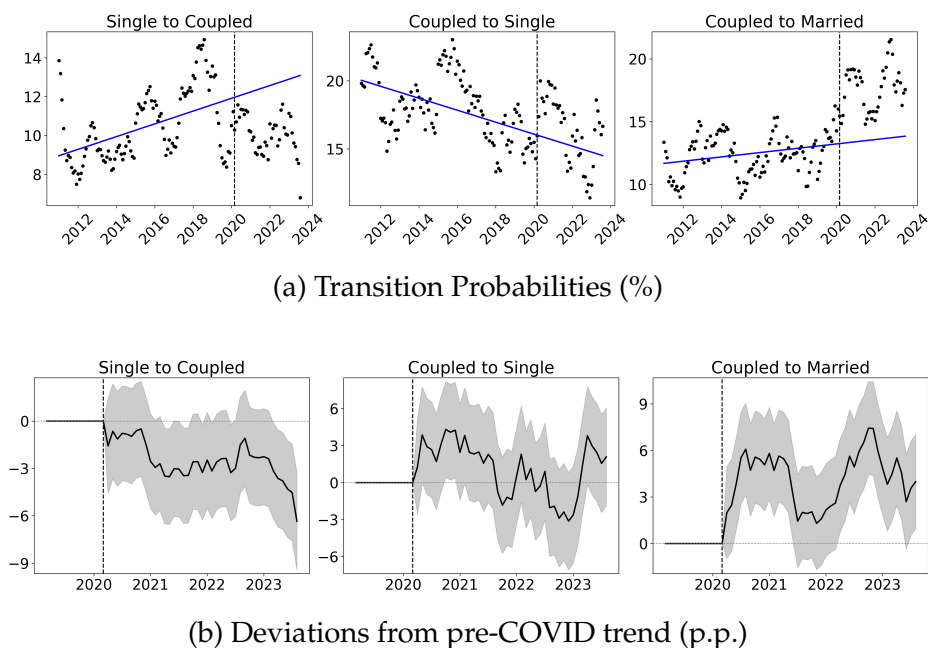

(a) Transition Probabilities (%)

(b) Deviations from pre-COVID trend (p.p.)

Figure 14: Transition Probabilities (25–29): Annual Basis, Sub-sample

(a) Transition Probabilities (%)
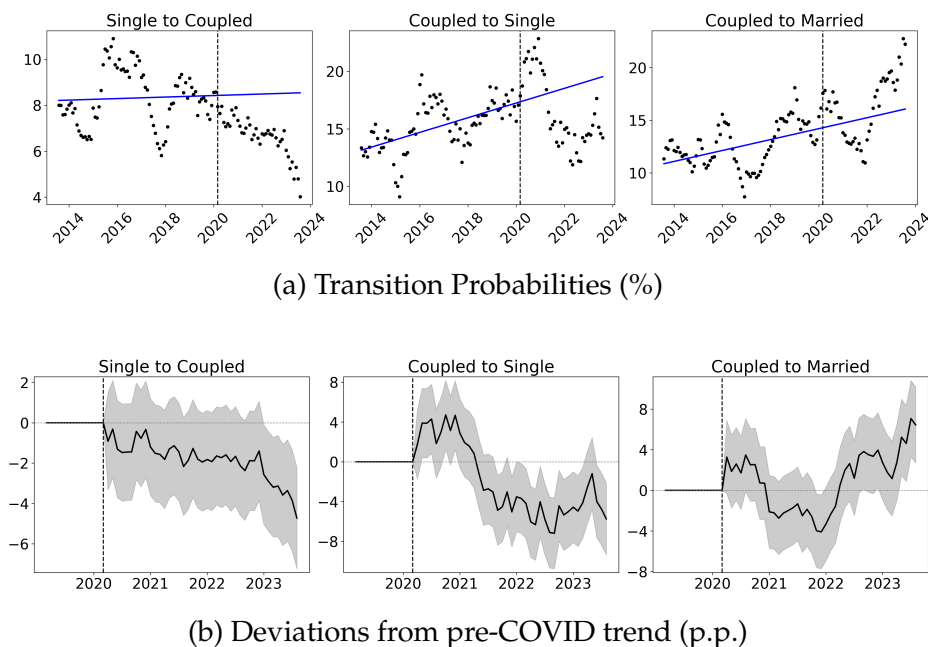

(b) Deviations from pre-COVID trend (p.p.)

Figure 15: Transition Probabilities (Age 30–34): Annual Basis, Sub-sample