DISCUSSION PAPER SERIES

DP17607
(v. 3)

EMPOWERED YOUNG WOMEN: TRADE LIBERALIZATION AND WOMEN'S FAMILY DECISIONS IN CHINA

Difei Ouyang, Weidi Yuan and Yuan Zi

INTERNATIONAL TRADE AND REGIONAL ECONOMICS

ISSN 0265-8003

EMPOWERED YOUNG WOMEN: TRADE LIBERALIZATION AND WOMEN'S FAMILY DECISIONS IN CHINA

Difei Ouyang, Weidi Yuan and Yuan Zi

Discussion Paper DP17607
First Published 25 October 2022
This Revision 25 October 2023

Centre for Economic Policy Research
33 Great Sutton Street, London EC1V 0DX, UK
Tel: +44 (0)20 7183 8801
www.cepr.org

This Discussion Paper is issued under the auspices of the Centre's research programmes:

- International Trade and Regional Economics

Any opinions expressed here are those of the author(s) and not those of the Centre for Economic Policy Research. Research disseminated by CEPR may include views on policy, but the Centre itself takes no institutional policy positions.

The Centre for Economic Policy Research was established in 1983 as an educational charity, to promote independent analysis and public discussion of open economies and the relations among them. It is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions.

These Discussion Papers often represent preliminary or incomplete work, circulated to encourage discussion and comment. Citation and use of such a paper should take account of its provisional character.

Copyright: Difei Ouyang, Weidi Yuan and Yuan Zi

EMPOWERED YOUNG WOMEN: TRADE LIBERALIZATION AND WOMEN'S FAMILY DECISIONS IN CHINA

Abstract

Do trade-induced labor market opportunities affect women's marriage and fertility decisions? Exploiting regional variation in the exposure to the U.S. granting of Permanent Normal Trade Relations (PNTR), we find that more exposed Chinese prefectures experience a relative increase in the fraction of unmarried young women. This relative increase is due to young women delaying their first marriage and more married women choosing to divorce. The share of young women with children, as a result of changed marriage decisions, also experiences a relative decline in more exposed areas. We show that these shifts in family decisions coincide with a trade-induced increase in female workforce participation and reallocation of women relative to men to the service sector, where wages are higher.

JEL Classification: F16, J12, J13, J16

Keywords: Trade liberalization, Gender inequality, Family decisions, Chinese economy

Difei Ouyang - Difei.Ouyang@gmail.com
University Of International Business And Economics

Weidi Yuan - Weidi.Yuan@gmail.com
Nanjing University

Yuan Zi - yuan.zi@graduateinstitute.ch
Geneva Graduate Institute (IHEID) and CEPR

Acknowledgements
We thank Patricia Funk, Wolfgang Keller, Rachel Ngai, Barbara Petrongolo and participants at various seminars and conferences for valuable comments and discussions. Difei Ouyang gratefully acknowledges funding from the National Natural Science Foundation of China (grant no. 72303030). Weidi Yuan gratefully acknowledges funding from the National Natural Science Foundation of China (grant no. 72203089).

Empowered Young Women: Trade Liberalization and Women's Family Decisions in China *

Difei Ouyang[†] Weidi Yuan[‡] Yuan Zi[§]

Oct 2023

Abstract

Do trade-induced labor market opportunities affect women's marriage and fertility decisions? Exploiting regional variation in the exposure to the U.S. granting of Permanent Normal Trade Relations (PNTR), we find that more exposed Chinese prefectures experience a relative increase in the fraction of unmarried young women. This relative increase is due to young women delaying their first marriage and more married women choosing to divorce. The share of young women with children, as a result of changed marriage decisions, also experiences a relative decline in more exposed areas. We show that these shifts in family decisions coincide with a trade-induced increase in female workforce participation and reallocation of women relative to men to the service sector, where wages are higher.

JEL Classification: F16, J12, J13, J16

Keywords: trade liberalization, gender inequality, family decisions, Chinese economy

[*]First Draft: June 2022. We thank Patricia Funk, Wolfgang Keller, Rachel Ngai, Barbara Petrongolo and participants at various seminars and conferences for valuable comments and discussions. Difei Ouyang gratefully acknowledges funding from the National Natural Science Foundation of China (grant no. 72303030). Weidi Yuan gratefully acknowledges funding from the National Natural Science Foundation of China (grant no. 72203089).

[†]School of International Trade and Economics, University of International Business and Economics, *email*: difei.ouyang@gmail.com

[‡]School of Economics, Nanjing University, *email*: weidi.yuan@gmail.com

[§]The Graduate Institute of International and Development Studies (IHEID) & University of Oslo & CEPR, *email*: yuanzi.economics@gmail.com

1 Introduction

Over the past decades, China has experienced a remarkable integration into global markets with its accession to the WTO. Between 2000 and 2010, China's total trade in goods soared from half a trillion to over four trillion dollars. The rise of China's trade has been accompanied by many internal adjustments that have been extensively studied, ranging from urbanization, internal migration, to sectoral reallocation. A less noticed fact during this time is the dramatic shift in women's marriage and childbearing decisions: the share of unmarried young women surged by 72% and the share of those without children increased by 60%.[1]

How do young women's family decisions respond to globalization in developing countries? Existing studies on other economies have mostly focused on cross-industry comparisons and offered mixed findings.[2] On the other hand, focusing on China's trade expansion, Autor et al. (2019) finds that Chinese import competition has reduced marriage and fertility in the U.S. What is the other side of the coin? More generally, does international trade reduce marriage and fertility in one country and increase them in another, thus producing a global redistribution of gender power, just as it does for manufacturing jobs?[3] This paper aims to answer this question and understand the mechanism. We surprisingly find the answer is no. Interestingly, while trade shocks affect the U.S. and China in distinct ways, they have led to a relative increase in the gender empowerment of young women in both countries.

In this paper, we document the link between Chinese young women's marriage and fertility outcomes and a large, plausibly exogenous shock to local labor markets driven by a change in U.S. trade policy: the granting of permanent normal trade relationship (PNTR) to China in 2000. This trade shock differentially exposes Chinese regions to increased export opportunities via their initial industry structure. While Chinese exports to the U.S. have already been subject to low normal trade relations (NTR) tariffs prior to 2000, these tariff rates are subject to annual renewal, and the possibility of tariff increases due to China's loss of NTR status has created significant uncertainty for the U.S.-China trade prior to the policy change (Pierce and Schott, 2016).

Exploiting regional variations in PNTR exposure stemming from the initial differences

[1] See Section 2.1 for details. The young women (men) refer to those aged 20-39 throughout the paper. Figure 1 also shows that the share of young women who have never married has increased significantly and consistently year by year since 2000, whereas there was no similar trend before 2000.

[2] For example, Aguayo-Tellez et al. (2014); Juhn et al. (2013, 2014); Connolly (2022); Gaddis and Pieters (2017); Mansour et al. (2022); Connolly (2022); Gaddis and Pieters (2017).

[3] Autor et al. (2013), Pierce and Schott (2016) find that U.S. imports from China and the U.S. granting of PNTR to China reduce U.S. manufacturing jobs, while Erten and Leight (2021), Ouyang and Yuan (2019) find a corresponding manufacturing job gain in China.

in industry structure, we find that Chinese prefectures more exposed to PNTR experience a relative decline in the fraction of married young women between 2000-2010, primarily among women with low levels of education or rural hukou. Coefficient estimates suggest that the effects are sizable: a prefecture at the 90th percentile in terms of PNTR exposure experiences a 3.7 percentage point larger decline in the fraction of married young women (aged 20-39) compared to a prefecture at the 10th percentile. Like other studies utilizing the local market approach, our exercise does not study the level effect of trade liberalization on family decisions in China but rather the relative impact on areas more or less exposed to liberalization.

A decomposition reveals that the decline in the fraction of married young women is jointly contributed by the rise in the fraction of those who are divorced and those who have never been married, especially the latter. Noting that women aged 20 to 39 may not have finalized their marriage decisions, we interpret these findings as evidence that PNTR has reduced or *delayed* women's marriage in China. As expected, the fraction of young married men also declines in prefectures with greater exposures. However, when gender-specific trade shocks are introduced, only female-specific trade shocks matter for both young women and men, demonstrating that the effect of PNTR on marriage is primarily through affecting young women in China.

Our findings remain robust when accounting for a wide range of contemporaneous shocks and various start-of-period prefecture characteristics. We find no pre-existing trends between 1990-2000 in prefectures that are more exposed to PNTR. When conducting the analyses using alternative difference-in-differences specifications with the 1990-2000-2010 data and county-level regressions, the main results of interest change little. In placebo tests, we find that both younger women (aged 15-19) and older women (aged 40-49) show no response to the PNTR shock; and the marriage outcomes for young women (aged 20-39), which is the primary focus of this paper, were not influenced by the randomly assigned placebo PNTR shocks. Finally, in line with recent advancements in the literature (Adão et al., 2019; Goldsmith-Pinkham et al., 2020; Borusyak et al., 2022), we perform a series of validity checks that confirm the robustness of the shift-share design.

The decline in the fraction of married young women naturally has an impact on regional fertility outcomes. We find that PNTR also reduces the share of young mothers by a similar magnitude as the share of married young women. This is perhaps not surprising, as young women's decisions on marriage and childbirth are highly associated in China.[4] Specifically,

[4]Children of unmarried women in China have great difficulties in accessing social benefits such as public health insurance and education, as marriage certificates are usually required for issuing these benefits. In

a prefecture at the 90th percentile in terms of PNTR exposure experiences a 3.2 percentage point decrease in the share of young mothers compared to a prefecture at the 10th percentile. Again, because women aged 20-39 are still able to have children, we interpret this result as evidence that PNTR reduces or *delays* childbearing. Although statistically insignificant, we find that PNTR increases the number of children per young woman *with children*, possibly due to the income effect. As the result, the impact of PNTR on the number of children per young woman is negative but statistically insignificant.

Why do trade shocks contribute to the decline or delay in marriage and fertility? We lay out five hypotheses based on the trade-induced major economic or demographic changes that occurred at the time. The first hypothesis, "economic status," assumes that trade liberalization may affect marriage and fertility outcomes by changing the economic status of young women relative to men. The second hypothesis, "the role of education," posits that trade liberalization may affect women's family decisions by influencing their school enrollment or educational attainment. The third hypothesis is that trade may reduce marriage rates by creating a more gender-segregated labor market. The fourth hypothesis is that trade may result in a spatial Balassa-Samuelson effect (Fajgelbaum and Redding, 2022), thus raising the cost of marriage and childbearing more in trade-exposed regions. Finally, China's trade liberalization has led to a massive reallocation of labor across regions. Young people's marriage and fertility rates could also be affected if migration makes it more difficult for individuals to find their matches, or if migrants are less likely to marry due to economic and institutional constraints.

After providing direct and indirect evidence for or against each hypothesis, we find that the economic status hypothesis appears to be most consistent with data patterns. Young women have been positively, and differentially affected in two major ways. Firstly, in prefectures that are more exposed to PNTR, compared to men, there is a greater increase in women's workforce participation, which is mostly coinciding with the decrease in the share of women who do not work due to family obligations or are unemployed. Secondly, PNTR results in a reallocation of young women (relative to men) from the manufacturing sector to the higher-paying service sector. We find no evidence to support the other hypotheses.

Our paper contributes to the large literature on the economics of marriage and fertility.[5] In linking globalization to marriage and fertility outcomes, Autor et al. (2019) finds import competition from China reduces marriage and fertility in the U.S. by differentially reducing

both the 2000 and 2010 Census data, we find that unwed mothers almost do not exist.

[5]Chiappori (2020) and Doepke et al. (2022) provide reviews of the relevant literature.

employment and earnings of young adult males.[6] Keller and Utar (2022) finds the same shock contributes to gender disparity in Denmark by influencing women's fertility decisions near the end of their biological clock. In a developing country's context, our work is close in spirit with Jensen (2012), who finds that young women that are randomly getting jobs in processing outsourcing are less likely to get married or have children in rural India, and Heath and Mobarak (2015) and Kis-Katos et al. (2018), who find that young women delay their marriage and childbearing in response to job opportunities created by positive trade shocks in Bangladeshi and Indonesia, respectively. Consistent with these studies, our results are primarily driven by young women from rural areas with low levels of education.[7]

However, we do not find evidence that some potential channels identified in these studies, such as education (Heath and Mobarak, 2015; Jensen, 2012) or sectoral gender segregation (Kis-Katos et al., 2018), play a role in the context of China. These variations can result from China's distinct institutional and economic environment. For example, the median age of marriage for women in India is only 17 in Jensen (2012), whereas in China women can only legally marry after 20, an age at which most have finished high school or pre-high school education. Manufacturing and service jobs in China are also more concentrated in urban areas and migration across regions within the country is frequent, therefore its local labor markets are less segregated.

This paper finds that trade liberalization is most likely to affect the marriage and fertility outcomes of young Chinese women by changing their relative economic standing. This result complements existing research on the differential impact of trade on male and female workers in terms of labor market outcomes (Aguayo-Tellez et al., 2014; Juhn et al., 2013, 2014; Connolly, 2022; Gaddis and Pieters, 2017; Mansour et al., 2022; Connolly, 2022; Gaddis and Pieters, 2017; Hakobyan and McLaren, 2018; Wang et al., 2022; Yu et al., 2021). These studies mostly have focused on cross-industry comparisons of wages or employment, and have offered mixed findings. The paper closest to our spirit in this line of research is Molina and Tanaka (2020), where the authors find that women living near exporting factories in Myanmar are significantly more likely to be working, have a lower tolerance of domestic violence, and are less likely to be victims of domestic violence. In comparison, we focus on marriage and fertility outcomes and find that the decrease in marriage is consistent

[6]Relatedly, Besedeš et al. (2021) finds that import competition from China reduces the simple gender wage gap in the U.S. and causes higher entry of more educated women and exit of less educated men from the labor markets.

[7]Note that having a rural hukou (coming from a rural area) in China does not mean that someone was working in a rural area, as there was a large amount of internal migration during this period; for example, most migrant workers in cities held a rural hukou (Zi, 2020).

with a relative improvement in women's job opportunities. We also explore other potential mechanisms and identify a new general equilibrium effect in explaining the gender gap, namely that women are relatively more employed in the service sector (where wages are higher) in response to trade shocks.[8]

In the trade literature, there is a large body of work that uses the granting of PNTR as an exogenous trade shock and examines its impacts on various economic outcomes. This policy shift is found to have caused declines in U.S. employment (Pierce and Schott, 2016), consumer prices (Handley and Limão, 2017; Amiti et al., 2020), domestic investment (Pierce and Schott, 2018), as well as altered patterns of voter turnout (Che et al., 2022). Pierce and Schott (2020) also finds that U.S. areas that are more exposed to PNTR see a relative increase in fatal drug overdoses, particularly among whites. On the Chinese side, regions that are more exposed to PNTR are characterized by improved export participation of firms (Zhou and Zhang, 2021), increased innovation activities (Liu and Ma, 2020), product quality upgrading (Feng et al., 2017), increased foreign direct investment and secondary sector employment (Erten and Leight, 2021). However, to the best of our knowledge, this is the first paper that examines the impact of PNTR on family decisions and on gender-specific effects of the trade shock.

Finally, our paper also contributes to the literature on how trade shocks affect labor market adjustments in China, ranging from labor force participation (Dai et al., 2021; Wang et al., 2022; Yu et al., 2021), internal migration (Facchini et al., 2019; Zhou and Zhang, 2021; Zi, 2020), wages (Dai et al., 2020), sectoral worker reallocation (Ouyang and Yuan, 2019), legislative changes (Tian, 2019) and female manager appointment (Tang and Zhang, 2021). In a much smaller set of analyses focusing on *non-labor market* outcomes, the effects on worker health (Fan et al., 2020), life satisfaction (Crozet et al., 2018), and education (Li, 2018; Lin and Long, 2020) have been investigated. We add to this literature by examining how trade liberalization affects marriage and fertility, and by uncovering the possible causes of the trade-induced delay and decline in young women's marriage.

The rest of the paper is organized as follows. Section 2 describes the data and the empirical strategy, Section 3 presents the main results and robustness checks, and Section 4 discusses mechanisms. Section 5 concludes.

[8] In this regard, our finding also connects to Olivetti and Petrongolo (2014), Ngai and Petrongolo (2017), and Ngai et al. (2020), which highlight the role of production in services in explaining the gender gap.

2 Data and Empirical Strategy

2.1 Marriage and Fertility Rates across Prefectures

We compute the number of individuals in 337 time-consistent Chinese prefectures by demographic categories using 1‰ random-sampled microdata from the 2000 and 2010 Chinese Population Census. Observable demographics include age, gender, marital status, fertility history (female only), hukou status, education, migration, employment, and prefecture of residence. We use this information to calculate variables of interest, such as the decadal change in the fraction of young women (aged 20-39) who are married in each prefecture. For some analyses, we complement the data using variables computed from the 1% random-sampled microdata of the 1990 Census[9] and the 2005 population survey, and the 2020 Census data compiled from county-level statistics. Summary statistics of the variables used in this paper are presented in Table A1.

The primary focus of the paper is on the marriage and childbearing decisions of young women. In 2000, the median age of first marriage for women aged 20 to 39 is 22. Divorce rates are low (0.81%), but there is a substantial regional variation (s.d. = 0.79%). Between 2000 and 2010, the fraction of young women who are unmarried rises from 15.72% to 27.09%, almost entirely driven by the increases in never-married women and the incidences of divorce.[10] The fraction of young women without children also increases significantly, from 20.63% to 33.00% during the same period.

Among those who ever married, the median age at the first marriage has declined slightly to 23. Alongside these facts, the share of young women in school has increased by about 4.46 percentage points, from 1.11% to 5.57%. Among the rest who are not in school, women's paid labor force participation has decreased slightly, from 84.54% to 80.17%.[11] The employment of women in the manufacturing and service sectors, on the other hand, increased by a total of 19.61 percentage points between 2000 and 2010.[12]

Figure A1 presents the decadal change in the married young women shares across Chinese regions. The decline is relatively concentrated in the central and coastal regions, with the

[9]Note that China's administrative divisions undergo considerable changes between 1990 and 2000, so the corresponding time-consistent geo-boundary in this case may have more measurement errors.

[10]The increase in the fraction of never-married women and the increased incidences of divorce together account for 99.69% of the increase in the share of young women unmarried between 2000 and 2010.

[11]This decrease in overall labor force participation could be attributed to an initial overpopulation (hidden unemployment) in the agricultural sector. (Lewis, 1954)

[12]We find a similar pattern in male employment. Between 2000 and 2010, the employment of men in the manufacturing and service sectors increase by a total of 18.32 percentage points.

notable exception of the Hakka regions (eastern Guangdong, southern Guangxi, and western Fujian), where families are more patriarchal for historical and cultural reasons. Across prefectures, the unweighted decadal decline in the married young women shares averages 9% and has a standard deviation of 0.06 (Table A1, row 1). The fraction of young women without children increases by an average of 10 percentage points (Table A1, row 8); its regional variation is highly correlated with that of the share of young women who never married, as shown in Figure 2.

2.2 Measuring Regional Exposure to PNTR

Our measure of regional PNTR exposure is based on two sets of tariff rates in the U.S. tariff schedule. The first set, known as the NTR tariff, applies to goods imported from World Trade Organization (WTO) members. The second, known as the non-NTR tariff, is established by the Smoot-Hawley Tariff Act of 1930 and is typically larger than the corresponding NTR rate. Prior to China's accession to the WTO, the President of the United States grants China temporary access to the NTR rate, but subject to annual congressional approval.

As discussed in detail in Pierce and Schott (2016), the possibility of tariff increases due to the withdrawal of China's NTR status has created significant uncertainty for U.S.-China trade.[13] U.S. companies doing business in China cite "uncertainty surrounding the annual renewal of China's most-favored-nation trade status as the single most important issue affecting U.S. trade relations to China," according to the U.S. General Accounting Office (1994, p. 3). This uncertainty is removed with the U.S. granting of PNTR status to China in 2000, which becomes effective after China's accession to the WTO in 2001.[14] This trade policy change has created new export opportunities for Chinese firms and can explain more than a third of the increase in Chinese exports to the U.S. from 2000 to 2005, the largest export market for Chinese goods during the period (Handley and Limão, 2017).

Following Pierce and Schott (2016), we measure the trade uncertainty as the gap between non-NTR and NTR rates, i.e. the rise in U.S. tariffs on Chinese goods that would have occurred in the event of a failed renewal of NTR status:

$$NTRGap_j = NonNTRRate_j - NTRRate_j.$$

[13]Following the Chinese government's 1989 crackdown on the Tiananmen Square protests, the U.S. House of Representatives passes resolutions to terminate China's NTR status in 1990, 1991, and 1992, although the Senate does not.

[14]In October 2000, the U.S. granted China PNTR status - permanent Most Favored Nation (MFN) status in the U.S. terminology. This status becomes effective on January 1, 2002, following China's accession to the WTO in December 2001.

We refer to this difference as the NTR gap, and compute it for each 4-digit Chinese manufacturing (CIC4) industry j using the *ad valorem* equivalent NTR and non-NTR rates provided by Feenstra et al. (2002) and the crosswalk by Brandt et al. (2017).[15]

We then compute regional exposure to PNTR as the initial-employment-share weighted average NTR gap across the 4-digit manufacturing industries active in a prefecture c:

$$NTRGap_c = \sum_j \frac{L_{cj99}}{L_{c99}} \times NTRGap_j, \tag{1}$$

where c indexes prefectures, j indexes industries, and L presents employment. The fraction L_{cj99}/L_{c99} presents the share of industry j in total manufacturing employment in prefecture c in 1999, which is computed using the Chinese Annual Survey of Industrial Firms (ASIF). Across prefectures, the unweighted NTR gap averages 0.25 and has a standard deviation of 0.07 (Table A1). As illustrated in Figure A2, China's coastal regions are among the biggest beneficiaries of trade policy changes but there are also a reasonable number of prefectures in Middle and Western regions with large PNTR exposures.

We also explore trade shocks that differentially affect female and male workers. To include the gender dimension of variation, we follow Autor et al. (2019) and modify (1) by multiplying the initial period female or male share of employment in each industry by prefecture, apportioning the prefecture-level overall exposure into two additive subcomponents, $NTRGap_c^f$ and $NTRGap_c^m$:

$$\begin{aligned} NTRGap_c^f &= \sum_j \frac{f_{cj} L_{cj99}}{L_{c99}} \times NTRGap_j, \\ NTRGap_c^m &= \sum_j \frac{(1-f_{cj}) L_{cj99}}{L_{c99}} \times NTRGap_j, \end{aligned} \tag{2}$$

where f_{cj} is the initial female employment share in industry j, prefecture c. Because the ASIF data does not include information on employment by gender, we use the 2000 Census to calculate f_{cj}. The census reports employment at the 3-digit industry level, so f_{cj} reflects the share of female employment in the 3-digit CIC industry to which industry j belongs.

[15] Specifically, we use the *ad valorem* equivalent NTR and non-NTR rates provided by Feenstra et al. (2002) at the HS8 level for 1999, the year before PNTR is granted to China. We first aggregate these two rates to the HS6 level and then calculate the differences, then aggregate to the CIC4 level using a simple average. There are 423 CIC4 industries in total.

2.3 Other Variables

In the baseline analysis, we control for the regional exposure to Chinese import tariff cuts and input trade liberalization associated with the WTO accession, as in Zi (2020). We also control for start-of-period values of several prefecture demographic and development attributes: manufacturing employment share and rural population share, to account for structural change and urbanization, respectively; the fraction of female employed (aged 20-39) and minority population share, to account for the possibility that social or cultural norms may lead to differential changes in family decisions across prefectures; the fraction of population with college or higher education, to control for the potential impact of educational expansion and labor-saving technological change; a dummy indicating whether a prefecture is a special economic zone, which accounts for potential changes in FDI or processing trade policy. We also use income by gender and sector, by industry, by occupation from the 2005 population survey, wage by gender and prefecture from Urban Household Survey, housing and education information from regional and city statistical yearbooks, and the 2000 U.S. Census data from IPUMS when conducting robustness checks and discussing potential mechanisms.

2.4 Identification Strategy

Our baseline specification examines whether prefectures with higher NTR gaps experience differential changes in family decisions after the change in the U.S. trade policy,

$$\Delta y_c = \alpha + \beta NTRGap_c + \gamma \mathbf{X}_c + \mu_p + \varepsilon_c \tag{3}$$

where Δy_c is the decadal change of a variable of interest for prefecture c, such as the change in the fraction of young women (aged 20-39) who are currently married.[16] The main explanatory variable, $NTRGap_c$, is prefecture c's exposure to PNTR as we have described in equation (1), so the coefficient β captures whether local marriage and fertility outcomes are related to the prefecture-specific trade policy shocks.[17]. The term μ_p denotes the province-fixed effects and $\mathbf{X}_c$ is a set of additional controls. In the main specification, $\mathbf{X}_c$ includes contemporaneous Chinese tariff reductions after its WTO accession,[18] the initial shares of

[16]In China, the legal age of marriage for women is 20 years old.

[17]Although our dependent variables are available starting in 1990, we rely primarily on data from 1990–2000 for placebo analyses only. We opted for this approach due to the unavailability of employment share data across detailed manufacturing industries for the year 1990. However, it is worth noting that our main findings remain robust with standard difference-in-differences (DID) regressions using 1990, 2000, and 2010 data. Results from this alternative specification are presented in Section 3.5.3.

[18]Specifically, we construct regional output and input tariff cuts across Chinese prefectures between 1999

manufacturing employment, female employment (20–39), rural population, minority population, college or higher education population, and a dummy indicating whether a prefecture is a special economic zone.

When we are interested in distinguishing the effects of female industry versus male industry shocks, we access the effects of PNTR by fitting a model of the form

$$\Delta y_c = \alpha + \beta_1 NTRGap_c^f + \beta_2 NTRGap_c^m + \gamma \mathbf{X}_c + \mu_p + \varepsilon_c, \tag{4}$$

where $NTRGap_c^f$ and $NTRGap_c^m$ are the gender-specific trade shocks that we have described in equation (2).

3 Empirical Results

3.1 Marriage

Starting from this section, we analyze the effect of PNTR on young women's marriage and fertility outcomes. Table 1 presents the results of regressing the change in the fraction of young married women (20-39 years) on regional PNTR exposure. All regressions are weighted by the beginning-of-period population of the same age cohort. Column (1) of Table 1 presents the OLS results only controlling for initial manufacturing employment shares. Column (2) additionally controls the contemporaneous trade liberalization upon China's WTO accession, and column (3) includes the full set of baseline controls. Column (4) is the preferred specification, in which we further add province fixed effects to control for province-specific trends. In all cases, the point estimates of $NTRGap_c$ are negative and statistically significant at the 1% level. Including province fixed effects slightly reduces the estimated coefficient, but the magnitude is similar overall. The estimate of -0.23 ($s.e. = 0.07$) in column (4) of Table 1 implies that a unit increase in PNTR is associated with an approximately 23 percentage points relative decrease in the fraction of married young women. The difference between PNTR exposure in regions at the 90th and 10th percentiles is 0.16. Therefore, evaluated using the estimate in column (4), a prefecture at the 90th percentile experiences about a 3.7 percentage point larger decline in the fraction of married young women compared to a prefecture at the 10th percentile. The mean of $NTRGap_c$ is 0.25, indicating that the trade policy change on average is associated with a 5.75 percentage point decline in the share

and 2007, in a similar way as NTR gaps. Similar measures have been used in Lu and Yu (2015), Brandt et al. (2017), and Zi (2020) .

of married young women.

We also find that prefectures with higher shares of the educated population in 2000 experienced relatively larger declines in the share of married young women. Changes in the share of married young women are positively correlated with a prefecture's initial manufacturing employment rate and the share of the minority population, but the latter becomes insignificant once we control for province fixed effects. We do not find a robust correlation between the reduction in output (input) tariffs and the change in the regional female marriage share.

Marital Status by Type and Gender.— Having presented the negative relationship between $NTRGap_c$ and married young women shares, we next explore the impact of $NTRGap_c$ on people's marital status by type. In particular, we split the reason for being single into two types, never married or divorced. The results are reported in Table 2-I, columns (2) and (3). We find that high PNTR prefectures experience relatively larger increases in the fraction of women who have never married and in the fraction of divorces, which are statically significant at the 5% level. Because of the relatively low divorce rate in China (0.81% in 2000), about 86.96% of the change in the fraction of married young women in response to $NTRGap_c$ can be attributed to the change in the share of never-married young women. Men in the same age group also experience a relative decline in the share of marriages in high PNTR prefectures, as shown in column (4) of Table 2-I. However, this is entirely accounted for by the increased share of never-married young men; the estimated coefficient on the share of divorced men, on the other hand, is negative and statistically insignificant (columns (5)-(6), Table 2-I). As will be shown later, the PNTR-induced increase in divorce among younger women is primarily driven by women in the 35-59 age group, whose spouses may be older and therefore may not be in our sample.

Gender Specific Trade Shocks.— Table 2-II introduces gender-specific trade shocks using the specification (2). The difference between gender-specific shocks is driven primarily by high female employment shares in the apparel and textiles, toy manufacturing, and electronics industries. The correlation between these by-gender shocks is moderate ($\rho = 0.41$), leaving sufficient power to distinguish their independent effects. As presented in columns (1)-(6) of Table 2-II, the estimation results all point to the unique importance of female-specific trade shocks. A unit increase in female-specific trade shocks decreases married young women shares by 0.31 ($s.e. = 0.10$), and increases the share of women never married (divorced) by 0.27 (0.02) ($s.e. = 0.10, 0.01$, respectively). Female-specific trade shocks also reduce the share of married young men by a slightly smaller magnitude ($\beta = 0.23, s.e. = 0.09$), almost fully accounted for by the increases in never-married young men. On the other hand, trade shocks to men-specific industries affect neither young women nor men's marital status: the point estimates of $NTRGap_c^m$ are close to zero and statistically insignificant in all cases. These results suggest that the granting of PNTR affects marriage outcomes in China mainly by affecting women's marriage decisions – this will be important for interpreting our baseline results and discussing mechanisms in the later section.

Pre-trends.— There could be a possibility that prefectures more exposed to PNTR have different trends in their marriage market. For example, more exposed prefectures may have started a declining trend in the fraction of married young women long before China's WTO accession. To address this concern, we carry out a placebo test in Table 2-III, where the dependent variables are replaced by the decadal change in different outcomes between 1990-2000. If any differential trend that starts before 2000 in the local marriage markets confounds our results, the PNTR exposure should be correlated with it. However, all estimates are statistically insignificant and close to zero, mitigating such a concern.

Results by Age Cohorts.— Figure 3-(a) visualizes the effect of PNTR on marital status by types for young women in different age cohorts. We expect that PNTR will have a greater effect on young people's first marriages because older individuals are more likely to be married when the shock occurs. Similarly, we anticipate that PNTR will have a greater effect on the divorce rate among older age cohorts. Consistent with the expectation, we find that the younger the cohort, the stronger the positive effect of trade shocks on the fraction of never-married women, and the impact is statistically significant for the 20-24 and 25-29 age cohorts. On the other hand, the positive effect of PNTR on the fraction of divorced young women increases with the increases in age cohorts, and the impact is most significant for women aged 35-39. As a result, the effect of $NTRGap_c$ on the fraction of *married* young women is negative and statistically significant for the age cohorts 20-29 and 35-39, albeit caused by distinct reasons. Note that because women in these age groups may not have completed their decision to marry, we interpret these results as evidence that PNTR reduces or *delays* women's marriage in China.

3.2 Fertility

In this section, we analyze the effect of PNTR on the fertility outcomes of young women. The Chinese population census only surveys the fertility status of women who (ever) get married. This has two implications. First, never-married mothers are excluded from this survey question, even though they should represent a small portion of the population in the context of China.[19] Second, unlike marital status, we cannot observe fertility outcomes on the male side. With these limitations in mind, we repeat the exercises in Section 3.1 but examine fertility outcomes instead. The results are reported in Table 3.

Table 3-I presents the results of regressing the changes in three outcome variables on regional PNTR exposure: the number of children per young woman (20-39 years), the fraction of young women with children, and the number of children per young woman with children. All regressions are weighted by the beginning-of-period population of the same age cohort. Not surprisingly, we find a tight link between marriage and fertility decisions: a unit increase in PNTR exposure is associated with an approximately 0.2 relative decrease in the fraction of young women with children ($s.e. = 0.07$).[20] However, conditional on having children, a one-unit increase in PNTR exposure *increases* the number of children for those with children by 0.16 ($s.e. = 0.15$), though the effect is imprecisely estimated.[21] The two effects work in opposite directions and lead to a statistically insignificant decrease in the number of children per woman in more PNTR exposed prefectures ($\beta = -0.14$, $s.e. = 0.19$).

Table 3-II introduces the gender-specific trade shocks. A unit increase in female-specific trade shocks decreases the share of women with children by 0.24 ($s.e. = 0.10$), which is statistically significant at the 5% level. Female-specific trade shocks are also negatively associated with the number of children per woman and positively associated with the number of children per woman with children, although both are not statistically significant. The male-specific shocks, on the other hand, do not have statistically significant effects in all cases. These results are consistent with the response of marriage to PNTR and again point to the unique importance of female-specific trade shocks.

Table 3-III reports the placebo test in which the dependent variables are replaced by the decadal change in the corresponding outcomes between 1990-2000. Again, all estimates are statistically insignificant and close to zero, mitigating the concern of the presence of differential pre-trends.

Finally, Figure 3-(b) visualizes the effect of PNTR on women's fertility outcomes in different age cohorts. As expected, the older the cohort, the weaker the negative effect of

[19] Specifically, a new birth of an unmarried woman can hardly acquire an official hukou, which affects children's schooling and other welfare services. Beyond institutional constraints, fertility choice is tightly associated with marriage decisions in China for cultural reasons as well.

[20] Recall that a unit increase in PNTR exposure is associated with an approximately 0.23 relative decrease in the fraction of married young women.

[21] Existing research suggests that trade-induced improvements in female labor market conditions often lead to lower fertility rates (Schultz, 1985; Schaller, 2016; Giuntella et al., 2022; Do et al., 2016; Li, 2021). The positive effect we find here may be due to the one-child policy artificially suppressing China's fertility rate to a very low level. Trade-induced income improvements can ease the financial pressure of raising children under the one-child policy, leading some families to have more children.

PNTR on the number of children per woman and the share of young women with children. Both effects are only significant for the 20-24 age group, possibly because a greater share of women in the older age group has already completed their reproductive decisions by the time PNTR occurs. Again, since women may not have completed their fertility decisions at the age of 20-39, we interpret these results as evidence that PNTR has reduced the share of young women having children or *delayed* their fertility.

3.3 Heterogeneous Effects on Young Women of Different Types

We further explore the heterogeneous effects of PNTR on different types of young women's marriage and fertility outcomes. A natural conjecture is that more educated women may have a greater say in their personal matters; thus, their decisions may be more responsive to PNTR. However, on the other hand, PNTR may have a greater impact on the opportunity cost of marriage and childbearing for rural or low-educated women through various channels (which we discuss in the next section) and thus affect their family choices more.

Specifically, we consider two comparisons. The first is between women with rural (agriculture) and urban (non-agriculture) hukou. Note that having a rural hukou in China does not mean that someone is working in a rural area. For instance, most migrant workers who work in cities hold rural hukou from their place of birth (Zi, 2020). The second is between low-educated (below high school education) and high-educated (high school education or above) young women. Rural or low-educated women presumably should have lower incomes and economic status than urban and high-educated women; they account for 73.4% and 79.8% of total young women in the 2000 Census, respectively.

Table 4 provides the corresponding results on marriage decisions. Columns (1) and (7) of Table 4-I show that prefectures with higher PNTR exposure experience greater declines in marriage shares for both hukou types. Further examination reveals that PNTR affects rural females primarily by increasing the share of never-married women, while urban females by increasing the share of divorces (columns (5) and (9), respectively). On the other hand, although PNTR also increases the fraction of the divorced (never married) population among rural (non-rural) women, the effect is not statistically significant, as reported in column (3) (column (11)).[22]

Table 4-II compares young women with low- and high-educational attainment. The baseline results are driven almost exclusively by the responses of young women with less

[22] The impact of trade shocks on divorced women is inaccurately estimated, probably because they represent only a small fraction of the total young female population.

than high school education. As shown in columns (1)-(6), PNTR significantly reduces the fraction of married women by increasing the fraction of divorced and never-married women in the low-education group, with point estimates being similar to the baseline case. In contrast, the marriage decisions of high-educated women do not appear to be correlated with PNTR shocks (columns (7)-(12)).

To alleviate the concern that rural and low-education groups may largely overlap, we control for the 2000-2010 changes in the share of high-educated (rural) young women when regressing by household (education) type. Adding the additional control does not change our results in any meaningful manner, as presented in even columns of Table 4-I, II.

Table A2 provides results on fertility decisions. PNTR reduces the fraction of young mothers in rural and low-education groups more, which is consistent with the marriage results. The remaining outcomes are imprecisely estimated but qualitatively in line with our baseline findings: a prefecture's PNTR exposure is positively associated with the regional decline in the fraction of women with children and the increase in the number of children per woman with children, regardless of women types.

3.4 Shift-share Designs

Recent research on identification and inference in shift-share designs indicates that consistency can be attained if either the shares or the shifts are exogenous (Adão et al., 2019; Borusyak et al., 2022; Goldsmith-Pinkham et al., 2020). In particular, Goldsmith-Pinkham et al. (2020) formalizes an approach for shift-share identification and consistency based on the exogeneity of the shares, imposing no explicit assumption of shock exogeneity. Borusyak et al. (2022) proposes a different framework based on the quasi-random assignment of shocks while allowing the shares to be endogenous.

In our setting, the validity of our shift-share design relies on the exogeneity of the shifts. The U.S. sets the NTR and non-NTR tariffs against all its trading partners and thus is unlikely to be affected by the demographic conditions of one particular country-China. More importantly, seventy-nine percent of the variation in the NTR gap across industries arises from variation in non-NTR rates (Pierce and Schott, 2016), set 50 years before the normalization of U.S.-China relations and 70 years before China's WTO accession. Therefore, we apply the equivalence results of Borusyak et al. (2022) and transform our prefecture-level specification into a shift-level specification, re-estimating the effect of PNTR on young women's marital and fertility decisions across industries.

We first justify the quasi-experimental view of our research design. Panel (a) of Table A3 summarizes the distribution of industry shocks (g_j) and the industry-level weights (s_j) from the equivalence result. The shock, measured by $NTRGap_j$, is well distributed with a mean of 0.27, a standard deviation of 0.16, and an interquartile range of 0.25. The effective sample size of our equivalent regression (the inverse HHI of the s_j) is also relatively high: 76.31 across CIC4 industries and 54.98 when aggregated to the 3-digit Chinese manufacturing industry (CIC3) level. The largest shock weight is only 6% in the CIC4 industry and 7% in the CIC3 industry, suggesting a considerable variation across industries. The intra-class-correlations (ICCs) of shocks within the CIC3 and CIC2 industries are 0.15 and 0.05, respectively. These reveal moderate clustering of shock residuals at the CIC3 level but less evidence of clustering of shocks at a higher CIC2 level, so it will be sufficient to cluster standard errors at the level of CIC3 groups. The inverse HHI estimate in column (5) of Panel (a) indicates that there is still an adequate, effective sample size at this level of shock clustering.

Panel (b) of Table A3 reports industry-level and region-level tests of the balance of shocks. The industry-level covariate is log wages in 1999, with which we find no statistically significant correlation for NTR Gap. The region-level covariates are the beginning-of-period baseline controls: fraction of female employed (aged 20-39), the share of population with rural hukou, the share of the minority population, the share of the population with college or higher education, special economic zone dummy; and pre-trend (1990-2000) changes in the fraction of married young women. Throughout the analysis, we control for the share of manufacturing employment. We again find no statistically significant relationship between these variables and the shocks across time, except for the share of the minority population. Areas that benefit from larger NTR Gaps tend to have smaller minority populations, which may lead to different regional marriage dynamics. We include the baseline controls in the shift-level regressions below.

Having assessed the plausibility of the quasi-experimental nature of the shift-share design, we next revisit the effect of PNTR on young women's marriage and fertility outcomes. Panel (c) of Table A3 reports the shift-share coefficients and valid exposure-robust standard errors[23] obtained from equivalent industry-level regressions. Based on the ICCs results reported above, we cluster standard errors at the CIC3 level. Overall, the estimated coefficients are economically and statistically significant.

[23]The method by Borusyak et al. (2022) estimates shift-share coefficients at the level of shocks and yields asymptotically valid standard errors, thus providing an alternative solution to the invalid conventional standard errors in shift-share regression (because observations with similar exposure shares may have correlated residuals) raised and solved by Adão et al. (2019).

3.5 Additional Robustness Checks

3.5.1 Placebo Analyses

In this subsection, we perform two placebo exercises to validate our baseline results. In the first exercise, we run the same regression as the baseline but look at changes in marriage and fertility outcomes for women aged 15-19, 40-44, and 45-49 years. These women are either largely done with their marriage and fertility decisions or have not yet begun when the trade shock occurs. Therefore, unless the baseline results are driven by unobserved confounders, such as the secular trends in marriage and fertility rates in China, we should expect that the NTR gap has no effect on women in these age groups. The estimation results are reported in Table A4. Indeed, we find that the point estimates of PNTR on various marriage and fertility outcomes are close to zero and statistically insignificant in all cases.

Throughout the analysis, we assume that the trade risk experienced by China in different regions at WTO accession is driven by different reductions in tariff uncertainty across industries. To evaluate this assumption, in the second exercise, we repeat the baseline estimates 100 times, with the industry-level NTR shocks being randomly assigned to calculate the regional exposures. The estimation results are reported in Table A5, which shows that among the 100 regression estimates with the randomly assigned industrial trade shocks, only 7 (8) are positive (negative) and statistically significant at or below 10% level. The remaining estimates are statistically insignificant, with negative coefficients in 43 cases and positive coefficients in 42 cases. Overall, the estimated coefficients from this falsification exercise are very dispersed and centered around zero, as shown in Figure A3.

3.5.2 County-level Outcomes

Prefectures, which are used as the unit of analysis in our baseline regressions, are fairly large administrative units. Compared to the commuting zones in the U.S., the Chinese prefectures are about twice the size on average and 1.5 times the size when the 10 largest (but sparsely populated) prefectures in autonomous regions are excluded (Zi, 2020). To address the concern that prefecture-level regressions may mask potentially large heterogeneity among the smaller administrative units, we also estimate the main results of the paper at the county level.

The estimated results are reported in Table A6. We find that a unit increase in the county-level NTR gap is associated with a 0.16 relative decrease in the share of married young women, contributed by both the increase in the share of young women who have never married and who have divorced. All point estimates are significant and quantitatively comparable to that of the baseline. For fertility outcomes, we find that an increase in the NTR gap is associated with a decrease in the share of young women who have children and an increase in the average number of children among women with children, with the estimated coefficient of the latter turn statistically significant. Overall, the results are very similar when regressions are performed at the county level, confirming the robustness of our findings.

3.5.3 Difference-in-Differences Specifications

To probe the validity of the main findings further, we also explore a number of alternative specifications. In Table A7, we use a difference-in-differences specification to analyze the effect of reduced trade policy uncertainty on regional marriage outcomes. The sample included is the decadal data from 1990 to 2010; the specification we employ is the following:

$$y_{ct} = \alpha + \beta NTRGap_c * Post_t + \gamma \mathbf{X}_{ct} + \mu_c + \mu_{pt} + \varepsilon_c \tag{5}$$

where $Post_t$ is a post-WTO dummy equalling one for the year 2010. The remaining variables share the same notation as the baseline specification. The additional controls $\mathbf{X}_{ct}$ are constructed following the baseline. When a baseline control is time-invariant, we control for its interaction with $Post_t$. Furthermore, we use prefecture- and province-time fixed effects to control prefecture-specific time-invariant confounders and province-specific trends. The results of estimating equation (5) are reported in Table A7. We find that a unit increase in the NTR gap is associated with a 0.22 relative decrease in the proportion of married young women, contributed by both the increase in the share of young women who have never married and who have divorced. All point estimates are significant and fairly close to the baseline. For fertility outcomes, we find that an increase in the NTR gap is associated with a decrease in the share of young women who have children.

We also examine the link between trade uncertainty reduction and the evolution of married women shares year by year. This way, we can examine the dynamic effects of the trade policy. In this case, we also introduce the 2020 data to probe the long-run impact of PNTR. For 2020, we only have access to the census data compiled from county-level statistics (rather than a micro-sample), which only allows us to calculate the fraction of married women aged at or above 15 in each region. Therefore, we choose it as the outcome of interest. The sample included is the decadal data from 1990 to 2020. Specifically, we run an event-study type of regression, with the year 2000 left as a comparison. The estimation results are visualized in Figure A4, where the bounds in blue indicate the 90% confidence intervals. We find that the impact of PNTR on marriage is negative and significant in both years 2010 and 2020, with a slightly muted impact in 2020. In addition, as we find earlier in a slightly different specification, the impact of PNTR in the year 1990 is statistically insignificant and very close to zero, alleviating concerns about pre-trends.

3.5.4 Other Policy Changes

Finally, another important concern with our findings is that in addition to trade uncertainty reduction and tariff liberalization, there might be other concurrent policy or economic shocks that affect women's family decisions across regions. Specifically, we consider how external tariff cuts, FDI liberalization, the end of the Multi-Fiber Arrangement (MFA), import licensing and quota changes, SOE reforms, currency appreciation, the 2008 financial crisis, and the Chinese university expansion would have affected our main results. To save space, we focus on the fraction of married young women as the outcome of interest.

These contemporaneous policy shocks are constructed as follows. For FDI liberalization, we first categorize a 4-digit CIC industry as subject to FDI restrictions if it is either restricted or prohibited between 1999 and 2007 and calculate the industry-level differences over this period; we then construct prefecture-level changes employing the initial industry mix. The regional exposures to external tariff changes and to exchange rate changes are constructed as a trade-share-weighted average across partner countries following Zi (2020). We use the share of initial regional employment in apparel industries that are subject to MFA to control for the potential impact of the end of MFA following China's WTO accession. For import licensing and quotas changes, we first calculate the reduction in the share of imports regulated by non-tariff barriers through licenses and quotas between 1999 and 2007 of each 4-digit CIC industry and then construct the prefecture-level changes employing the initial industry mix. Finally, we use the initial employment shares of the financial sector, the initial employment shares of state-owned enterprises (SOEs), and the number of 985 universities in each prefecture to control for the potential impacts of the financial crisis, SOE reform, and education expansion in China, respectively.

Columns (1)-(8) of Table A8 report the regression results when controlling for one factor at a time, and column (9) reports the estimation result accounting for all of the above-mentioned factors. Except for FDI liberalization and the reduction of foreign tariffs, the effect of other policies on the fraction of young women married is almost zero. In all cases, the point estimates for $NTRGap$ are consistently negative, statistically significant, and quantitatively similar to the baseline case.[24] This again confirms the robustness of our finding.

4 Understanding the Mechanism

Having established the link between PNTR and regional change in marriage and fertility outcomes among young women, we now turn to understanding the mechanism. Based on the main development of the Chinese economy in the period, we lay out five hypotheses. The first hypothesis is the role of economic status: trade liberalization may shift the relative employment opportunities of young women versus men and thus affect their marriage decisions. A second hypothesis regards the role of education. For example, trade liberalization tends to alter the returns to education through various channels (Heath and Mobarak, 2015; Blanchard and Olney, 2017; Li, 2018; Lin and Long, 2020), causing young women to continue their studies and defer marriage. A third hypothesis is that trade can reduce marriage incidence by creating a more gender-segregated labor market. For example, trade liberalization may lead to more women working in female-intensive industries, increasing the cost of searching for potential partners and thus deterring their marriage (Goni, 2022). The fourth hypothesis is that trade liberalization can also create a spatial Balassa-Samuelson effect (Fajgelbaum and Redding, 2022). In this case, locations with greater PNTR tend to have higher population densities, urban population shares, and higher relative prices of nontraded goods. This may raise the cost of marriage and childbearing by placing a strain on, for example, housing and educational resources. Finally, China's trade liberalization has led to massive labor reallocation across regions (Facchini et al., 2019; Zhou and Zhang, 2021; Zi, 2020). If young female workers tend to move to a different location than male workers due to regional differences in industry specialization, trade may create a gender imbalance in the spatial dimension, thus affecting young people's marriage opportunities.

We present multiple evidence for or against each hypothesis and find that the empirical patterns appear most consistent with the economic status hypotheses. So we first present evidence for this hypothesis and then discuss the rest.

[24] Notably, the estimated coefficient on the number of 985 universities is close to zero. This is due to the fact that the impact of educational expansion is largely controlled for by the initial share of the population with college or higher education, which has been included as our baseline control throughout the paper. In most cases, the estimated coefficient on this variable is negative and significant, suggesting that young people are less likely to marry after the higher education expansion - consistent with the findings in, for example, Si (2022).

4.1 Economic status

The importance of economic status in influencing family decisions can be traced to Becker (1973), who argues that an increase in the relative economic status of women reduces the gains from family specialization and therefore reduces the prevalence of marriage. In contrast, a rise in men's economic opportunities has the opposite effect. Because it is the shifts in women's *relative* economic status that matters, we modify the baseline specification to examine the differential effects of PNTR on young men and women:

$$\Delta y_{cg} = \alpha + \beta_1 NTRGap_c \times Female_g + \beta_2 NTRGap_c + \beta_3 Female_g + \gamma \mathbf{X}_c + \mu_p + \varepsilon_c \quad (6)$$

where Δy_{cg} is the decadal change of the outcome variable y for gender g in city c and $Female_g$ represents a female dummy. With this specification, the effect of $NTRGap_c$ on young men is captured by β_2, while β_1 captures the differential effect of $NTRGap_c$ on young women relative to that on young men.

First, we study the impact of PNTR on the share of young women who are not employed, compared to that of young men. Panel (a) of Table 5 presents the results. Columns (1)-(3) examine each of the three most common reasons for young people who leave the labor force: school/training, family obligations, and health limitations. These reasons together account for 84.06% and 79.07% of young people exiting the labor force in 2000 and 2010, respectively. while column (4) looks at the unemployment response. The estimates in columns (1)-(3) indicate that PNTR significantly decreases the fraction of women out of the labor force relative to that of men, and almost exclusively through the reduction in the fraction of women who leave the labor force due to family issues. As indicated in column (2), a unit increase in PNTR reduces the ten-year change in the proportion of young women who do not work due to family obligations by 0.14 ($s.e = 0.04$) relative to that of men, with the latter being barely affected by PNTR. Regardless of gender, PNTR has a negligible effect on the proportion of individuals out of the labor force due to education or health limitations, as reported in columns (1) and (3). Finally, the estimates in column (4) indicate that while PNTR does not affect the fraction of unemployed young men, a unit increase in PNTR reduces the fraction of unemployed young women by 0.03 ($s.e = 0.02$) relative to that of young men. Overall, estimates in Panel (a) of Table 5 indicate that PNTR enhances young women's labor market participation rate mainly by reducing the proportion of housewives and decreasing the fraction of unemployed young women relative to that of young men.

We next investigate the impact of PNTR on the employment of young women versus young men in Panel (b) of Table 5 and Table A9. Column (1) of Table 5 considers the broad impacts on overall employment, and the rest columns consider employment by sector. The estimates in column (1) show that PNTR significantly increases female employment relative to males - a unit increase in PNTR increases the ten-year change in young female employment share by 0.13 ($s.e = 0.05$) over that of males. Having presented the effects of PNTR on the extensive margin (employment), we next consider the intensive margin (working time). Earlier studies (Facchini et al., 2019; Fan et al., 2020) have shown an increase in working time in prefectures more exposed to reduced trade policy uncertainty. Does this intensive margin also change differently between young females and males? Table A9 investigates this. It is important to note that due to inconsistencies in reporting between the Population Census in 2000 and 2010, we have constructed our own measures of working time.[25] Columns (1)-(2) consider the change in weekly working hours, while columns (3)-(4) examine the change in the fraction of workers who work over time. Columns (1) and (3) employ the baseline specification (via Eq.3); the results align with earlier studies showing an overall increase in total working time due to the reduction in trade policy uncertainty. Columns (2) and (4) employ the modified specification (via Eq.6) and show that female workers experience a relatively greater increase in working time, compared to male workers. Thus, the findings suggest that PNTR significantly increases female labor participation along the extensive and intensive margin, compared to males.

Columns (2)-(4) of Table 5 examine employment by sector. The salient new finding is that PNTR leads to a differential redistribution of employment across industries for young women and men.[26] For the directly affected sector, manufacturing, a unit increase in PNTR leads to an increase of the share of manufacturing employment for young men by 0.38 ($s.e = 0.06$), but the increase is 0.31 ($s.e = 0.07$) *less* for young women compared to men. On the other hand, the service employment share for young men falls by 0.04 ($s.e = 0.06$) while the employment share for young women increases by 0.09 (interaction $\beta = 0.15, s.e = 0.07$).

[25] The 2000 Census reports the total *working days* in the last week, yet the 2010 Census reports the total *working hours* in the last week. To obtain time-consistent measures, we construct weekly working hours in 2000 by multiplying the working days by 8. We further define an individual as a part-time worker if she works less than 5 days a week in 2000 or less than 40 hours a week in 2010, as a full-time worker if she works between 5 and 6 days a week in 2000 or between 40 and 44 hours a week in 2010, and as working overtime if she works more than 6 days a week in 2000 or more than 44 hours a week in 2010 (according to the Labour Law of PRC, established in 1994). Note that the time-inconsistent definition may induce measurement error.

[26] Estimates in columns (2)-(4) of Panel (b) also suggest that prefectures with greater NTR gaps are characterized by shrinking agricultural and expanding secondary total employment, which is broadly consistent with the existing finding in, for example, Erten and Leight (2021) (although we focus on 20-39 year-olds' employment). Appendix Table A17 provides estimates for young women and men pooled together to further demonstrate this.

In sum, the estimation results suggest that PNTR leads to a reallocation of young males relative to females to manufacturing. In contrast, PNTR significantly improves female's relative labor participation, particularly in the services sector.

Figure A5 shows the monthly income by gender and sector in 2005, notwithstanding the absence of wage information in the 2000 and 2010 censuses.[27] As expected, agricultural workers have the lowest average income, while male workers across all industries earn more than female workers. In addition, two new stylized facts emerge. First, the average wage in the service sector is higher than in agriculture or manufacturing. Second, the gender pay gap[28] is the smallest in the service sector and the largest in the agriculture sector. This indicates that the expansion of female total employment and the reallocation of females to the service sector, driven by PNTR, are likely to narrow the average wage difference between young women and young men rather than widening it. As a supplement, evidence from the Urban Household Survey (UHS) confirms that an increase in PNTR in a prefecture is indeed associated with a relative increase in average wages of young women, which we report in column (1) of Table A10.[29]

In particular, the service sector is quite heterogeneous, with a large dispersion in wages. Do female workers relocated to the service sector end up in relatively high-paying industries? The remaining columns of Table A10 test this conjecture. Specifically, we calculate the average income by CIC 2-digit industry in 2005, and based on the median within the service sector, we classify industries into two groups: high- and low-paying. Columns (2)-(3) show that an increase in PNTR is associated with a relative increase in the fraction of young women employed in both high-paying and low-paying industries within the service sector, with the former to be statistically significant. Columns (4)-(5) consider the high-paying and low-paying occupations within the service sector and find similar results. Thus, we interpret these findings as indirect evidence that PNTR improves the economic status of young women relative to young men.

Is the relative shift in female employment to the service sector really related to the decline in female marriage and fertility rates, or is it just a pseudo correlation? Table A11 tries to address this concern to some extent. Specifically, we calculate the fraction of young women

[27]The 2005 Chinese population survey (mini-census) reports each respondent's monthly income.

[28]We follow OECD. (2023) to define the the gender pay gap as the difference (%) between median earning of men and women relative to median earning of men.

[29]The strength of the Urban Household Survey is that it contains information on respondents' wages and it was conducted in years close to our baseline (2002, 2009). Its limitation is that it only includes urban households and 171 Chinese prefectures. We refer interested readers to the notes of Table A10 for details of the estimate.

with children by industry using the 2000 *U.S. Census* data, and based on the median we classify industries into two groups, high- and low-fertility.[30] In mapping U.S. industries to Chinese 3-digit CIC industry codes, we find the classification to be relevant: Table A11-(a) shows that in China, the fraction of women married in low-fertility industries is 10% lower than in high-fertility industries, and the average number of children is only 64% of the latter in 2000. However, a striking finding in Table A11-(a) is that nearly 70% of the low-fertility industries are services. In addition, the columns of Table A11-(b) show that the effect of PNTR on increasing female employment and decreasing marriage and fertility is mainly driven by the low-fertility industries. This suggests that PNTR-induced regional redistribution of employment and declines in marriage and fertility among young women can hardly be a coincidence.[31]

Overall, the results presented above indicate that PNTR not only differentially improves female employment but also causes relatively more young women to move to the services sector, where wages are higher. These findings are consistent with our conjecture that PNTR leads to a relative increase in women's economic status, which ultimately reduces or delays their marriage and fertility. Table A12 further demonstrates that the estimates of Table 5 remain robust when focusing on married individuals: the relative improvement in young women's employment persists after marriage, indicating that the rise in females' relative economic status is not transitory. Consistent with our baseline findings, Table 6 indicates that the differential employment effects are predominantly driven by the population with low educational attainment and those with a rural hukou.

In conclusion, although we cannot directly evaluate how PNTR affects the gender pay gap, the observed differential employment adjustments to PNTR and suggestive evidence on wages across sectors and gender indicate that PNTR improves the economic standing of young women in China relative to young men.

4.2 Women Education

In addition to economic status, PNTR may also affect young women's family choices by affecting their educational decisions. First, positive trade shocks can lead to higher local

[30] We choose to use fertility rates for classification because there is less correlation between being married and having a family and/or raising children in the U.S. compared to China. However, our results are robust to using the female marriage rate for the classification. The results are available upon request.

[31] Industries with low fertility rates do not seem to correlate with long working hours: the top 5% of CIC-4 digit industries with low fertility rates are concentrated in three broad (CIC-2 digit) industry categories: technology promotion, technical services, and entertainment. So it is unlikely that women have no time to marry or have children because they have entered these industries.

incomes, which may enable more families to pay for their children's education. The increased share of young women in school may naturally cause women to delay marriage, as students are less likely to marry before graduation. Second, trade shocks can affect the return on education, thereby incentivizing more women to pursue higher education, which in turn alters their opportunity cost of marriage and childbirth (Becker, 1991). We examine these two possibilities in Table A13.

Column (1) of Table A13 shows that PNTR has a negligible and statistically insignificant effect on the decadal change in the fraction of young women currently in school. Since 99.46% of women in China complete school education before the age of 24, the result may be subject to attenuation bias because the age range of 20-39 may be too wide. Therefore, column (2) repeats the regression of column (1) but focuses on women aged 20-24. The point estimate increases slightly but remains statistically insignificant. In conclusion, we find no evidence that PNTR is associated with regional changes in the share of young women in school.

Columns (3)-(6) of Table A13 examine whether PNTR has incentivized more females to pursue higher education. Since China has a nine-year compulsory education system,[32] we examine the impact of PNTR on the change in the fraction of young women with more than a junior high school education. In particular, we separate high school education from college or higher, and we examine both the full sample of young women (20-39 years old) as well as women aged 20-24. We do not find any evidence that greater PNTR exposure is associated with an increase in the fraction of women with higher education. For women in the 20-24 age group with a college or higher degree, the point estimate even has the wrong sign, although it is not statistically significant.

Thus, education access, either by affecting the incidence of young women in school or their overall educational attainment, cannot explain our main findings.

4.3 Gender Segregation in Local Labor Market

Our third hypothesis is that trade can reduce marriage incidence by creating a more gender-segregated labor market. For example, trade liberalization may lead to more young women working in female-intensive industries, reducing their chances of meeting potential partners. To probe whether there is a greater increase in gender concentration in high PNTR regions, we construct an industry gender-concentration index (GCI) inspired by the Herfindahl-

[32]That is, education at the junior high school level or below is compulsory for young people.

Hirschman Index (HHI):

$$GCI_{ct} = \sum_j w_{jc} \times \left(f_{jct}^2 + (1 - f_{jct})^2 \right),$$

where w_{jc} is the start-of-period employment share of industry j in prefecture c, and f_{jct} is the share of young female over total young employment of industry j in prefecture c in year t. Intuitively, if the young people in an industry are gender-balanced, $f_{jct} = 0.5$ and $f_{jct}^2 + (1 - f_{jct})^2 = 0.5$. More imbalanced the gender gets, the greater the value of $f_{jct}^2 + (1 - f_{jct})^2$.

We then test whether Chinese prefectures that are more exposed to PNTR experience a relative increase in their GCI index. Table A14 presents the results. Note that we only observe prefecture gender-specific employment by each CIC 3-digit industry, therefore the GCI index is computed from that level. As suggested in column (1) of Table A14, we find no effect of PNTR on changes in gender concentration in industries. Column (2) finds that gender-specific trade shocks also do not significantly change the degree of the local labor market's gender segmentation. Columns (3)-(4) instead use aggregate sectors (agriculture, manufacturing, service, and others) to compute the GCI index and column (4) finds the opposite sign of the point estimate. This nevertheless should not come as a surprise. In 2000, female employment is largely concentrated in agriculture.[33] And as shown in Section 4.1, PNTR leads to more females working in the manufacturing and services sectors. Therefore, when gender concentration is measured in very aggregated sectors, PNTR is expected to result in more, not less, gender-balanced industrial structures.

4.4 Marriage and Childbearing Costs

Trade liberalization can also create a spatial Balassa-Samuelson effect: locations with greater export opportunities may have higher population densities, urban population shares, and higher relative prices of nontraded goods (Fajgelbaum and Redding, 2022). This means that areas with high PNTR may face, among other things, more rapid increases in housing prices and more severe shortages of educational resources, both of which can have a significant impact on the marriage and fertility decisions of young people in China. We explore these possibilities in Table A15.

In Table A15, column (1), we compute the decadal change in commercial housing prices

[33] In 2000, the fraction of employment in agriculture is 62.27% for young female and 53.86% for young male.

(per square meter) between 2000 and 2010 and correlate it with the regional NTR gap.[34] Interestingly, we find that prefectures with higher PNTR experience a relative decrease (or smaller increase) in housing prices, which may be due to an increase in housing supply in high PNTR regions. In column (3), we find that prefectures with higher exposure to PNTR also experience a relative increase in the teacher-student ratio.[35] While the point estimate is statistically insignificant, the overall findings contradict our hypothesis that prefectures with higher PNTR will experience greater housing price increases or more severe teacher shortages.

Finally, as seen in columns (2), (4), and (5) of Table A15, the point estimates of PNTR on the share of young women married continue to be robust and quantitatively comparable to the baseline estimate when controlling for changes in housing prices and teacher-student ratios. Thus, it does not appear that changes in the potential costs of marriage and childbearing are the main reason for young women's decisions to delay or avoid marriage.

4.5 Internal Migration

Finally, trade shocks often lead to substantial labor force adjustment across firms, sectors, and regions. Existing studies suggest that PNTR induces considerable migration across regions in China (e.g., Facchini et al. (2019); Zhou and Zhang (2021)). Migration can affect the local marriage outcome in various ways. First, migrant workers tend to marry later.[36] Therefore, trade may induce a compositional effect on regional marriage outcomes by affecting migration. Secondly, if young female and male workers migrate to different destinations, trade may create gender imbalances in the spatial dimension, affecting young people's marriage opportunities. Finally, young migrants often prefer to marry the locals. Thus, the more migrants there are, the smaller the fraction of marriageable locals, making it harder to find a match.[37] In short, both the share and gender composition of migrants may affect the local marriage market. We explore these possibilities in Table A16.

Table A16, Panel (a) examines the possibility of the compositional effect. Column (1) of Panel (a) confirms, consistent with the findings of Facchini et al. (2019), that more exposed

[34] The data comes from China Statistical Yearbook for Regional Economy; the housing price is computed as total sales of commercial houses divided by the total floor spaces sold (square meter).

[35] We use the teacher-student ratio for elementary school because it is the stage of education closest to marriage. The data are from the China City Statistics Yearbook.

[36] In 2000, the share of immigrants getting married is 15.34 percentage points lower than that of locals.

[37] Related, Lichter et al. (2015) finds that white immigrants are far more likely than other groups to marry U.S.-born natives, while black immigrants are much less likely to marry black natives or out-marry with other groups.

prefectures indeed experience a relative increase in the share of young migrants.[38] Columns (2)-(4) of Table A16-(a) repeat the baseline regressions in columns (1)-(3) of Table 1, but also control for the decadal change in the proportion of young migrants. Prefectures with a greater inflow of migrants do experience a more significant decline in the fraction of married young women and an increase in the fraction of never-married young women. However, the point estimates of PNTR continue to be robust and quantitatively comparable to the baseline. Thus, local marriage outcomes do not appear to be driven by the compositional change. This may not be surprising, because despite the size of internal migration, they are still small compared to the total population of each region.

Table A16, Panel (b) considers the possibility of trade-induced imbalances in the local marriage market. Column (1) of Table A16-(b) demonstrates that more exposed prefectures have more young male migrants than young female migrants. However, as indicated in column (2), this effect is rather modest and does not translate into a significant local gender disparity, mitigating the concern of trade-induced gender disparities in the spatial dimension. Columns (3) and (4) further show that there is no evidence that PNTR is associated with a decrease in the ratio of young female locals to total young male individuals, nor with the ratio of young male locals to total young females. That is, even assuming that all migrants prefer to marry locals, there is no evidence that the incidence of marriage among young individuals is affected.

Overall, the results presented in Table A16 suggest that the influx of migrants is unlikely to be the primary explanation for our baseline findings.

5 Conclusion

By examining the granting of Permanent Normal Trade Relations (PNTR) by the U.S. to Chinese exports, we study the impact of trade-induced labor market opportunities on young Chinese women's marriage and fertility decisions. We find that Chinese prefectures with a greater PNTR exposure experience a relative increase in the fraction of unmarried young women. This relative increase is due to young women reducing or delaying their first marriages and more married women choosing to divorce. As a result of changed marriage decisions, the number of children per woman and especially the share of women with children also experience a relative decline in more exposed areas. We show that these shifts in family

[38] A migrant is an individual who resides in a prefecture but with a hukou outside the province or a hukou under the pending status. This is a consistent measure in the 2000 and 2010 Census questionnaires. Other measures comparing the residence locality five years ago and the current locality generate similar results.

decisions coincide with a trade-induced reallocation of women relative to men to the service sector, where wages are higher. Trade-induced changes in educational choices or migration patterns, marriage costs, or gender segregation in labor market that may be caused by PNTR, on the other hand, do not appear to explain the decline in female marriage and fertility in China.

References

Adão, Rodrigo, Michal Kolesár, and Eduardo Morales, "Shift-share designs: Theory and inference," *The Quarterly Journal of Economics*, 2019, *134* (4), 1949–2010.

Aguayo-Tellez, Ernesto, Jim Airola, Chinhui Juhn, and Carolina Villegas-Sanchez, "Did trade liberalization help women? The case of Mexico in the 1990s," in "New analyses of worker well-being," Emerald Group Publishing Limited, 2014.

Amiti, Mary, Mi Dai, Robert C Feenstra, and John Romalis, "How did China's WTO entry affect US prices?," *Journal of International Economics*, 2020, *126*, 103339.

Autor, David, David Dorn, and Gordon Hanson, "The China syndrome: Local labor market effects of import competition in the United States," *American Economic Review*, 2013, *103* (6), 2121–68.

_ , _ , and _ , "When work disappears: Manufacturing decline and the falling marriage market value of young men," *American Economic Review: Insights*, 2019, *1* (2), 161–78.

Becker, Gary S, "A theory of marriage: Part I," *Journal of Political economy*, 1973, *81* (4), 813–846.

_ , *A treatise on the family: Enlarged edition*, Harvard university press, 1991.

Besedeš, Tibor, Seung Hoon Lee, and Tongyang Yang, "Trade liberalization and gender gaps in local labor market outcomes: Dimensions of adjustment in the United States," *Journal of Economic Behavior & Organization*, 2021, *183*, 574–588.

Blanchard, Emily J and William W Olney, "Globalization and human capital investment: Export composition drives educational attainment," *Journal of International Economics*, 2017, *106*, 165–183.

Borusyak, Kirill, Peter Hull, and Xavier Jaravel, "Quasi-experimental shift-share research designs," *The Review of Economic Studies*, 2022, *89* (1), 181–213.

Brandt, Loren, Johannes Van Biesebroeck, Luhang Wang, and Yifan Zhang, "WTO accession and performance of Chinese manufacturing firms," *American Economic Review*, 2017, *107* (9), 2784–2820.

Che, Yi, Yi Lu, Justin R Pierce, Peter K Schott, and Zhigang Tao, "Did trade liberalization with China influence US elections?," *Journal of International Economics*, 2022, *139*, 103652.

Chiappori, Pierre-André, "The theory and empirics of the marriage market," *Annual Review of Economics*, 2020, *12*, 547–578.

Connolly, Laura, "The effects of a trade shock on gender-specific labor market outcomes in Brazil," *Labour Economics*, 2022, *74*, 102085.

Crozet, Matthieu, Laura Hering, and Sandra Poncet, "Looking for the bright side of the China Syndrome: Rising export opportunities and life satisfaction in China," *CEPII Working Paper*, 2018.

Dai, Mi, Wei Huang, and Yifan Zhang, "Persistent effects of initial labor market conditions: The case of China's tariff liberalization after WTO accession," *Journal of Economic Behavior & Organization*, 2020, *178*, 566–581.

_ , _ , and _ , "How do households adjust to tariff liberalization? Evidence from China's WTO accession," *Journal of Development Economics*, 2021, *150*, 102628.

Do, Quy-Toan, Andrei A Levchenko, and Claudio Raddatz, "Comparative advantage, international trade, and fertility," *Journal of Development Economics*, 2016, *119*, 48–66.

Doepke, Matthias, Anne Hannusch, Fabian Kindermann, and Michèle Tertilt, "The economics of fertility: A new era," Technical Report, National Bureau of Economic Research 2022.

Erten, Bilge and Jessica Leight, "Exporting out of agriculture: The impact of WTO accession on structural transformation in China," *Review of Economics and Statistics*, 2021, *103* (2), 364–380.

Facchini, Giovanni, Maggie Y Liu, Anna Maria Mayda, and Minghai Zhou, "China's "Great Migration": The impact of the reduction in trade policy uncertainty," *Journal of International Economics*, 2019, *120*, 126–144.

Fajgelbaum, Pablo and Stephen J Redding, "Trade, structural transformation, and development: Evidence from Argentina 1869–1914," *Journal of Political Economy*, 2022, *130* (5), 1249–1318.

Fan, Haichao, Faqin Lin, and Shu Lin, "The hidden cost of trade liberalization: Input tariff shocks and worker health in China," *Journal of International Economics*, 2020, *126*, 103349.

Feenstra, Robert C, John Romalis, and Peter K Schott, "US imports, exports, and tariff data, 1989-2001," 2002.

Feng, Ling, Zhiyuan Li, and Deborah L Swenson, "Trade policy uncertainty and exports: Evidence from China's WTO accession," *Journal of International Economics*, 2017, *106*, 20–36.

Gaddis, Isis and Janneke Pieters, "The gendered labor market impacts of trade liberalization evidence from Brazil," *Journal of Human Resources*, 2017, *52* (2), 457–490.

Giuntella, Osea, Lorenzo Rotunno, and Luca Stella, "Globalization, fertility and marital behavior in a lowest-low fertility setting," *NBER Working Paper*, 2022.

Goldsmith-Pinkham, Paul, Isaac Sorkin, and Henry Swift, "Bartik instruments: What, when, why, and how," *American Economic Review*, 2020, *110* (8), 2586–2624.

Goni, Marc, "Assortative Matching at the Top of the Distribution: Evidence from the World's Most Exclusive Marriage Market," *American Economic Journal: Applied Economics*, 2022, *14* (3), 445–87.

Hakobyan, Shushanik and John McLaren, "NAFTA and the Wages of Married Women," Technical Report, National Bureau of Economic Research 2018.

Handley, Kyle and Nuno Limão, "Policy uncertainty, trade, and welfare: Theory and evidence for China and the United States," *American Economic Review*, 2017, *107* (9), 2731–83.

Heath, Rachel and A Mushfiq Mobarak, "Manufacturing growth and the lives of Bangladeshi women," *Journal of Development Economics*, 2015, *115*, 1–15.

Jensen, Robert, "Do labor market opportunities affect young women's work and family decisions? Experimental evidence from India," *The Quarterly Journal of Economics*, 2012, *127* (2), 753–792.

Juhn, Chinhui, Gergely Ujhelyi, and Carolina Villegas-Sanchez, "Trade liberalization and gender inequality," *American Economic Review*, 2013, *103* (3), 269–73.

_ , _ , and _ , "Men, women, and machines: How trade impacts gender inequality," *Journal of Development Economics*, 2014, *106*, 179–193.

Keller, Wolfgang and Hale Utar, "Globalization, gender, and the family," *The Review of Economic Studies*, 2022.

Kis-Katos, Krisztina, Janneke Pieters, and Robert Sparrow, "Globalization and social change: Gender-specific effects of trade liberalization in Indonesia," *IMF Economic Review*, 2018, *66* (4), 763–793.

Lewis, Aw, "Economic development with unlimited supplies of labour.," *Manchester School of Economic and Scial Studies*, 1954, *22*, 139–191.

Li, Bingjing, "Export expansion, skill acquisition and industry specialization: Evidence from China," *Journal of International Economics*, 2018, *114*, 346–361.

Li, Jie, "Women hold up half the sky? Trade specialization patterns and work-related gender norms," *Journal of International Economics*, 2021, *128*, 103407.

Lichter, Daniel T, Zhenchao Qian, and Dmitry Tumin, "Whom do immigrants marry? Emerging patterns of intermarriage and integration in the United States," *The ANNALS of the American Academy of Political and Social Science*, 2015, *662* (1), 57–78.

Lin, Faqin and Cheryl X Long, "The impact of globalization on youth education: Empirical evidence from China's WTO accession," *Journal of Economic Behavior & Organization*, 2020, *178*, 820–839.

Liu, Qing and Hong Ma, "Trade policy uncertainty and innovation: Firm level evidence from China's WTO accession," *Journal of International Economics*, 2020, *127*, 103387.

Lu, Yi and Linhui Yu, "Trade liberalization and markup dispersion: evidence from China's WTO accession," *American Economic Journal: Applied Economics*, 2015, *7* (4), 221–53.

Mansour, Hani, Pamela Medina, and Andrea Velasquez, "Import competition and gender differences in labor reallocation," *Labour Economics*, 2022, *76*, 102149.

Molina, Teresa and Mari Tanaka, "Globalization and female empowerment: Evidence from Myanmar," *IZA Discussion Paper*, 2020.

Ngai, L Rachel and Barbara Petrongolo, "Gender gaps and the rise of the service economy," *American Economic Journal: Macroeconomics*, 2017, *9* (4), 1–44.

— , **Claudia Olivetti, and Barbara Petrongolo**, "Structural transformation and the U-shaped female labor supply," *Working paper*, 2020.

OECD., A, *OECD Employment Outlook 2023*, OECD publishing Paris, 2023.

Olivetti, Claudia and Barbara Petrongolo, "Gender gaps across countries and skills: Demand, supply and the industry structure," *Review of Economic Dynamics*, 2014, *17* (4), 842–859.

Ouyang, Difei and Weidi Yuan, "China syndrome redux: New results on global labor reallocation," *SSRN Working Paper*, 2019.

Pierce, Justin R and Peter K Schott, "The surprisingly swift decline of US manufacturing employment," *American Economic Review*, 2016, *106* (7), 1632–62.

— **and** — , "Investment responses to trade liberalization: Evidence from US industries and establishments," *Journal of International Economics*, 2018, *115*, 203–222.

— **and** — , "Trade liberalization and mortality: evidence from US counties," *American Economic Review: Insights*, 2020, *2* (1), 47–64.

Schaller, Jessamyn, "Booms, busts, and fertility testing the Becker model using gender-specific labor demand," *Journal of Human Resources*, 2016, *51* (1), 1–29.

Schultz, T Paul, "Changing world prices, women's wages, and the fertility transition: Sweden, 1860-1910," *Journal of Political Economy*, 1985, *93* (6), 1126–1154.

Si, Wei, "Higher education expansion and gender norms: evidence from China," *Journal of Population Economics*, 2022, *35* (4), 1821–1858.

Tang, Heiwai and Yifan Zhang, "Do multinationals transfer culture? Evidence on female employment in China," *Journal of International Economics*, 2021, *133*, 103518.

Tian, Yuan, "International trade liberalization and domestic institutional reform: Effects of WTO accession on Chinese internal migration policy," *The Review of Economics and Statistics*, 2019, pp. 1–45.

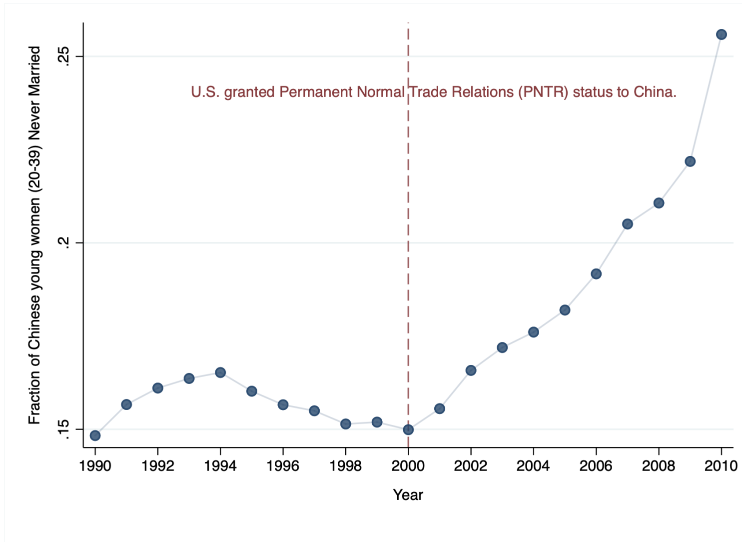
Tukey, John W, *Exploratory data analysis*, Vol. 2, Reading, MA, 1977.

Wang, Feicheng, Krisztina Kis-Katos, and Minghai Zhou, "Import Competition and the Gender Employment Gap in China," *Journal of Human Resources*, 2022.

Yu, Zhen, Xiaoling Wu, Meng Li, and Rufei Guo, "Import competition and the gender gap in labor force participation: Evidence from China," *China Economic Review*, 2021, *69*, 101689.

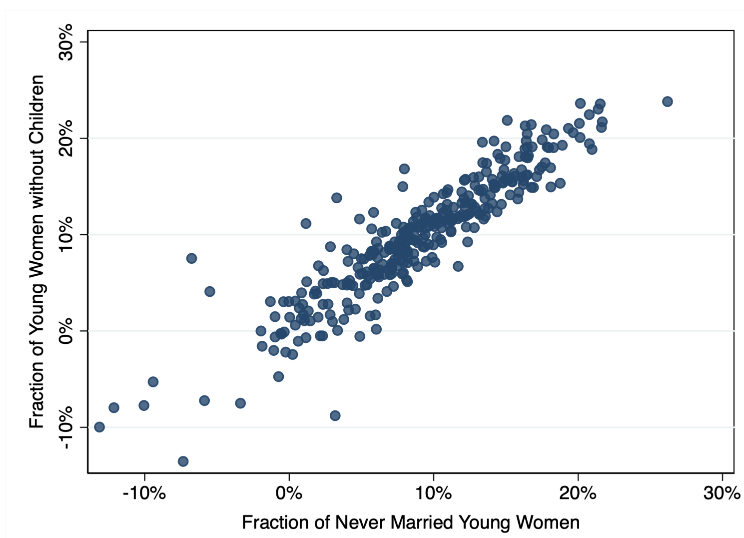
Zhou, Kang and Junsen Zhang, "Trade normalization, export quality, and in-migration of skilled workers: Evidence from China," *Journal of Economic Behavior & Organization*, 2021, *184*, 375–387.

Zi, Yuan, "Trade liberalization and the great labor reallocation," *CEPR Working Paper*, 2020.



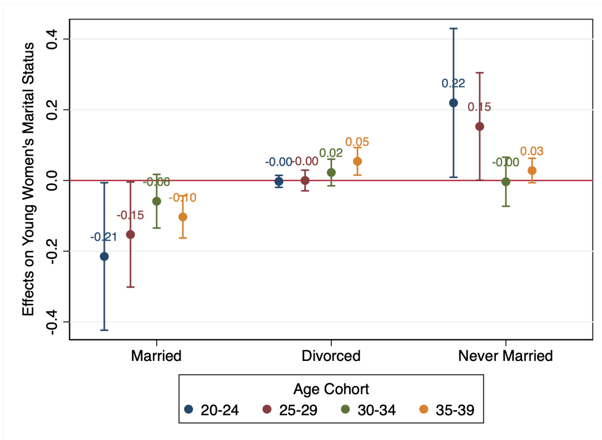
Notes: This figure shows the estimated fraction of never-married young women (aged 20-39) from 1990 to 2010. We use China's Population Census data 2010 for the calculation. For 2010, the share is calculated as the number of women aged 20-39 who were never married in 2010 divided by the total number of women aged 20-39. For 2009, the figure is calculated as the total number of women aged 20-39 in 2009 and who were never married before 2009 divided by the total number of women aged 20-39 in 2009, and so on.

Figure 1: Fraction of Never-married Young Women in China (age 20-39)

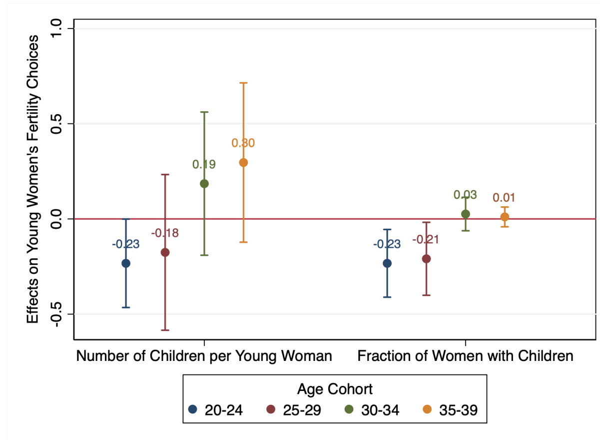


Notes: This figure presents the decadal change in the share of never married young women against that of young women without children across 337 Chinese prefectures between years 2000 and 2010.

Figure 2: Regional Change in Share of Young Women Never Married vs. without Children



(a) Marital Status



(b) Fertility Choices

Notes: (a): We replicate Table 2-I, columns (1)-(3) for young women in four different age cohorts: 20-24, 25-29, 30-34, 35-39 and plot the estimates and 10% confidence intervals. (b): We replicate Table 3-I, columns (1)-(2) for young women in four different age cohorts: 20-24, 25-29, 30-34, 35-39 and plot the estimates and 10% confidence intervals.

Figure 3: The Effect of PNTR on the Family Decisions of Young Women by Age Groups

Table 1: Effects of PNTR on Fraction of Young Women Married

	Main			
	(1)	(2)	(3)	(4)
NTR Gap	-0.32***	-0.35***	-0.29***	-0.23***
	(0.07)	(0.09)	(0.07)	(0.07)
Fraction of employment in manufacturing	0.25***	0.25***	0.35***	0.34***
	(0.07)	(0.07)	(0.04)	(0.05)
Output tariff changes		0.12	-0.30	-0.18
		(0.25)	(0.21)	(0.19)
Input tariff cuts		-0.85	0.98	1.52**
		(0.66)	(0.66)	(0.64)
Fraction of young women employed			0.02	0.05
			(0.04)	(0.05)
Fraction of population with rural hukou			0.06	0.07
			(0.05)	(0.05)
Fraction of minority population			0.07***	0.01
			(0.01)	(0.02)
Fraction of population with college or above education			-0.74***	-0.81***
			(0.22)	(0.22)
Special economic zone dummy			0.04	0.06*
			(0.03)	(0.03)
Province fixed effects				Yes
Observations	337	337	337	337
R-squared	0.17	0.18	0.43	0.58

Notes: The dependent variable is the 10-year change in fraction of young women (aged 20-39) currently married. The sample contains 333 prefectures and four directly controlled municipalities. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table 2: Effects of PNTR on Young People's Marital Status

	Young Women			Young Men		
	Married	Divorced	Never Married	Married	Divorced	Never Married
	(1)	(2)	(3)	(4)	(5)	(6)
I. Overall trade shocks						
NTR Gap	-0.23***	0.02**	0.20***	-0.17***	-0.00	0.19***
	(0.07)	(0.01)	(0.07)	(0.06)	(0.01)	(0.07)
R-squared	0.58	0.16	0.60	0.52	0.18	0.51
II. Gender-specific trade shocks						
Female-specific NTR Gap	-0.31***	0.02	0.27***	-0.23**	0.01	0.24**
	(0.10)	(0.01)	(0.10)	(0.09)	(0.02)	(0.10)
Male-specific NTR Gap	-0.13	0.02	0.10	-0.09	-0.02	0.12
	(0.11)	(0.02)	(0.11)	(0.11)	(0.02)	(0.11)
R-squared	0.58	0.16	0.60	0.52	0.19	0.51
III. Pre-trend: 1990-2000						
NTR Gap	0.03	0.01	-0.02	-0.01	0.01	0.01
	(0.05)	(0.01)	(0.05)	(0.09)	(0.01)	(0.08)
R-squared	0.54	0.54	0.54	0.36	0.50	0.36
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	337	337	337	337	337	337

Notes: The dependent variable is the 10-year change in marital status of young people (aged 20-39). Columns (1)-(3) are fraction of young women currently married, divorced, never married. Columns (4)-(6) are fraction of young men currently married, divorced, never married. The sample contains 333 prefectures and four directly controlled municipalities. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table 3: Effects of PNTR on Young Women's Fertility Decisions

	Number of Children per Woman	Fraction of Women with Children	Number of Children per Woman with Children
	(1)	(2)	(3)
I. Overall trade shocks			
NTR Gap	-0.14	-0.20***	0.16
	(0.19)	(0.07)	(0.15)
R-squared	0.535	0.61	0.64
II. Gender-specific trade shocks			
Female-specific NTR Gap	-0.18	-0.24**	0.19
	(0.31)	(0.10)	(0.26)
Male-specific NTR Gap	-0.08	0.14	0.12
	(0.31)	(0.11)	(0.29)
R-squared	0.55	0.61	0.64
III. Pre-trend: 1990-2000			
NTR Gap	-0.03	-0.01	0.15
	(0.29)	(0.05)	(0.33)
R-squared	0.39	0.63	0.52
Baseline controls	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes
Observations	337	337	337

Notes: The dependent variable is the 10-year change in fertility decisions of young women (aged 20-39). The sample contains 333 prefectures and four directly controlled municipalities. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Heterogeneous Effects of PNTR on Young Women's Marital Status

	Married		Divorced		Never Married		Married		Divorced		Never Married	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
I. By Hukou	Rural						Urban					
NTR Gap	-0.19***	-0.18**	0.01	0.01	0.18**	0.16**	-0.20*	-0.21**	0.05*	0.05*	0.15	0.16
	(0.07)	(0.07)	(0.01)	(0.01)	(0.07)	(0.07)	(0.11)	(0.11)	(0.03)	(0.03)	(0.11)	(0.10)
Fraction of high-educated young women		-0.38***		-0.00		0.37***		-0.16***		0.00		0.17***
		(0.07)		(0.01)		(0.07)		(0.05)		(0.01)		(0.05)
Observations	337	337	337	337	337	337	337	337	337	337	337	337
R-squared	0.59	0.63	0.14	0.14	0.59	0.63	0.44	0.46	0.19	0.19	0.46	0.48
II. By Edu	Low						High					
NTR Gap	-0.20***	-0.20***	0.02*	0.02*	0.16**	0.16***	-0.12	-0.12	0.02	0.02	0.10	0.10
	(0.06)	(0.06)	(0.01)	(0.01)	(0.06)	(0.06)	(0.13)	(0.13)	(0.03)	(0.03)	(0.12)	(0.12)
Fraction of rural young women		0.00		-0.02		0.02		-0.01		0.03		-0.02
		(0.08)		(0.01)		(0.07)		(0.10)		(0.02)		(0.10)
Observations	337	337	337	337	337	337	336	336	336	336	336	336
R-squared	0.55	0.55	0.15	0.16	0.55	0.55	0.46	0.46	0.17	0.18	0.46	0.46
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the 10-year change in marital status of young women (aged 20-39). Columns (1), (2), (7) and (8) are fraction of young women currently married. Columns (3), (4), (9) and (10) are fraction of young women divorced. Columns (5), (6), (11) and (12) are fraction of young women never married. The sample contains 333 prefectures and four directly controlled municipalities. Columns (7)-(12) in Panel II contain only 332 prefectures and four directly controlled municipalities as the Golog Tibetan Autonomous Prefecture has no sample of high educated women in 2000. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Effects of PNTR on Gender Gaps

(a) Unemployed or Not in the Labor Force, by Reason

	School or Training	Family Obligations	Health Limitations	Unemployment
	(1)	(2)	(3)	(4)
NTR Gap × Female	0.01	-0.14***	-0.01	-0.03*
	(0.03)	(0.04)	(0.00)	(0.02)
NTR Gap	0.04	-0.01	0.00	-0.01
	(0.03)	(0.04)	(0.01)	(0.02)
Female	-0.00	0.06***	0.00	0.00
	(0.01)	(0.01)	(0.00)	(0.01)
Baseline controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes
Observations	674	674	674	674
R-squared	0.57	0.40	0.13	0.63

Notes: The dependent variables in columns (1)-(4) are the 10-year change in the fraction of young people (aged 20-39) by gender that are out of the labor force due to school or training, family obligations, and health limitations, and are unemployed but are actively looking jobs, respectively. The denominator is always the total number of young people of a given gender in a given year. The sample contains 333 prefectures and four directly controlled municipalities × 2 gender groups (women or men). Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

(b) Total Employment or Employment by Sector

	Employed	Agriculture	Manufacturing	Service
	(1)	(2)	(3)	(4)
NTR Gap × Female	0.13***	0.05	-0.31***	0.15**
	(0.05)	(0.09)	(0.07)	(0.07)
NTR Gap	0.06	-0.12	0.38***	-0.04
	(0.05)	(0.09)	(0.06)	(0.06)
Female	-0.06***	-0.03	0.07***	-0.02
	(0.01)	(0.02)	(0.02)	(0.02)
Baseline controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes
Observations	674	674	674	674
R-squared	0.54	0.64	0.58	0.37

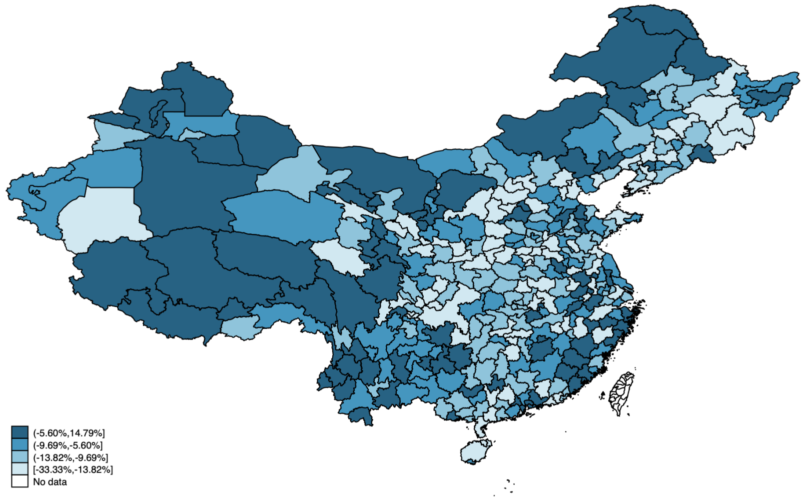
Notes: The dependent variables in columns (1) to (4) are the 10-year changes in the shares of total employment, employment in the agricultural sector, employment in the manufacturing sector, and employment in the services sector for young people (20-39 years old) by gender, respectively. The denominator is always the total number of young people of a given gender in a given year. The sample contains 333 prefectures and four directly controlled municipalities × 2 gender groups (women or men). Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Heterogeneous Effects of PNTR on Gender Gaps in Labor Markets

	Employed	Agricul-ture	Manufactur-ing	Service	Employed	Agricul-ture	Manufactur-ing	Service
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I. By Hukou	Rural				Urban			
NTR Gap × Female	0.11*	0.04	-0.36***	0.16**	0.16*	0.04	-0.09	0.04
	(0.05)	(0.12)	(0.09)	(0.06)	(0.09)	(0.05)	(0.09)	(0.12)
NTR Gap	0.04	-0.11	0.40***	-0.09	0.12	0.01	0.27***	-0.03
	(0.06)	(0.12)	(0.07)	(0.06)	(0.09)	(0.05)	(0.09)	(0.11)
Female	-0.05***	-0.02	0.09***	-0.03*	-0.06**	-0.01	-0.01	0.02
	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.01)	(0.02)	(0.03)
Observations	674	674	674	674	674	674	674	674
R-squared	0.48	0.57	0.53	0.38	0.30	0.31	0.31	0.23
II. By Edu	Low				High			
NTR Gap × Female	0.12**	0.05	-0.31***	0.14**	0.01	-0.16**	-0.01	-0.02
	(0.06)	(0.11)	(0.09)	(0.09)	(0.09)	(0.07)	(0.09)	(0.13)
NTR Gap	0.11**	-0.12	0.37***	-0.01	0.06	0.06	0.26***	-0.08
	(0.06)	(0.11)	(0.07)	(0.06)	(0.08)	(0.08)	(0.08)	(0.11)
Female	-0.07***	-0.03	0.08***	-0.03**	-0.02	0.09***	-0.03	-0.01
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)
Observations	674	674	674	674	673	673	673	673
R-squared	0.53	0.59	0.57	0.45	0.31	0.30	0.38	0.20
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

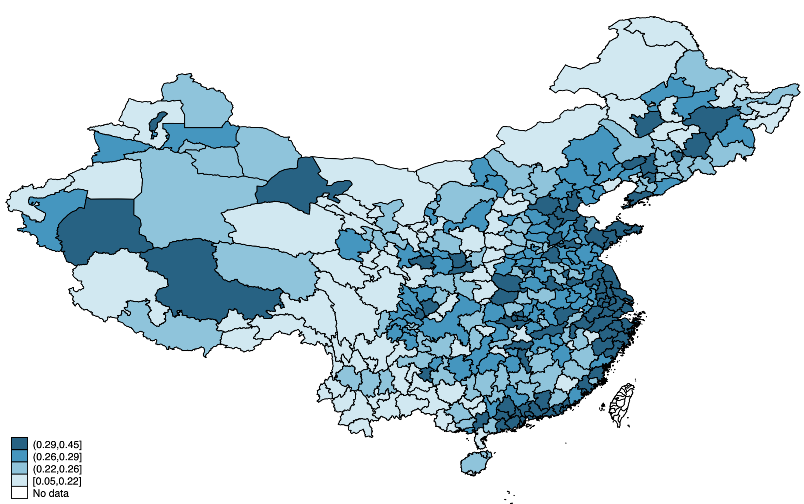
Notes: The dependent variable is the 10-year change in fraction of young people (aged 20-39) in labor markets. In Panel I, Columns (1)-(4) are fraction of young women or men (with rural hukou) employed, employed in agricultural sector, employed in manufacturing sector and employed in service sector; Columns (5)-(8) are fraction of young women or men (with non-rural hukou) employed, employed in agricultural sector, employed in manufacturing sector and employed in service sector. In Panel II, Columns (1)-(4) are fraction of young women or men (below high school education) employed, employed in agricultural sector, employed in manufacturing sector and employed in service sector; Columns (5)-(8) are fraction of young women or men (with high school education or above) employed, employed in agricultural sector, employed in manufacturing sector and employed in service sector.The sample contains 333 prefectures and four directly controlled municipalities × 2 gender groups (women or men). Columns 4-8 of Panel II have one less as the Golog Tibetan Autonomous Prefecture has no sample of high educated women in 2000. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Appendix



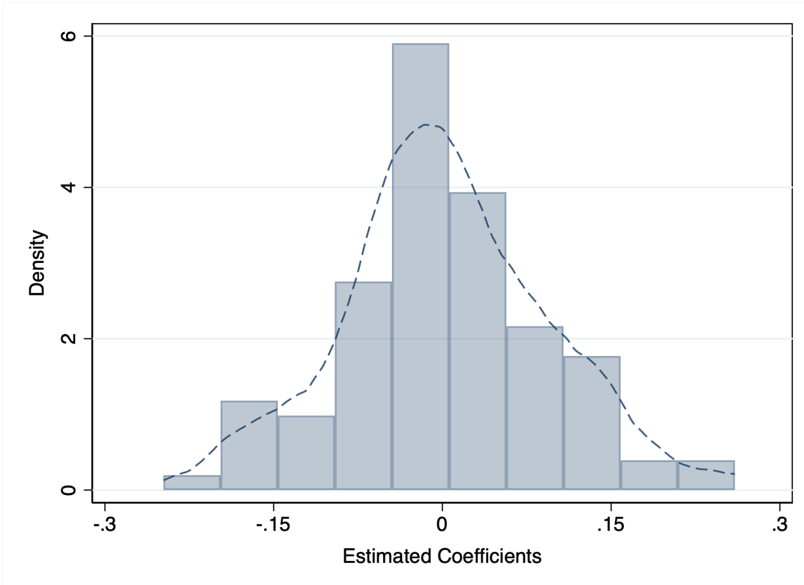
Notes: This figure presents the regional variation in decadal change in the fraction of young women aged 20-39 who are married. The darker prefectures experience greater increase, or less decrease in the share of married young women.

Figure A1: Regional Change in Share of Married Young Women, 2000-2010



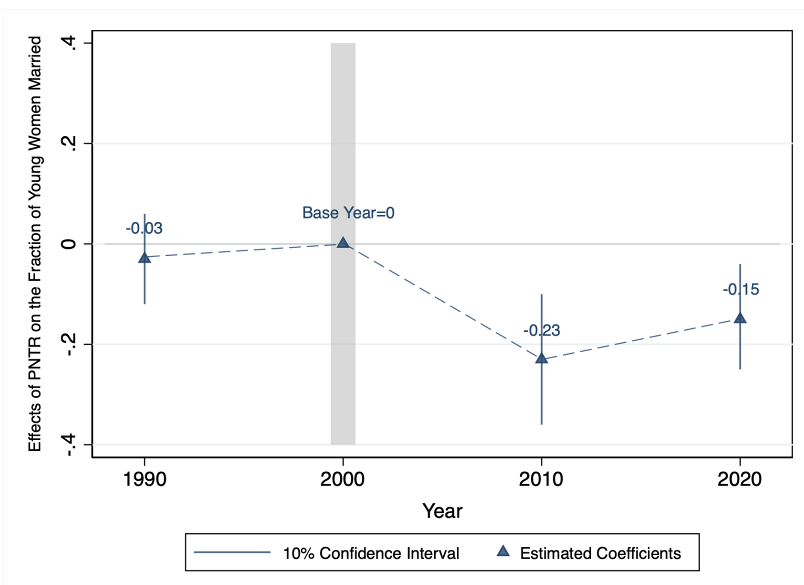
Notes: This figure presents the regional variation in their exposure to trade shocks due to the U.S. granting of PNTR to China. The calculation of the regional PNTR exposure is given by equation (1), with darker prefectures experiencing greater trade shocks.

Figure A2: Regional exposure to PNTR



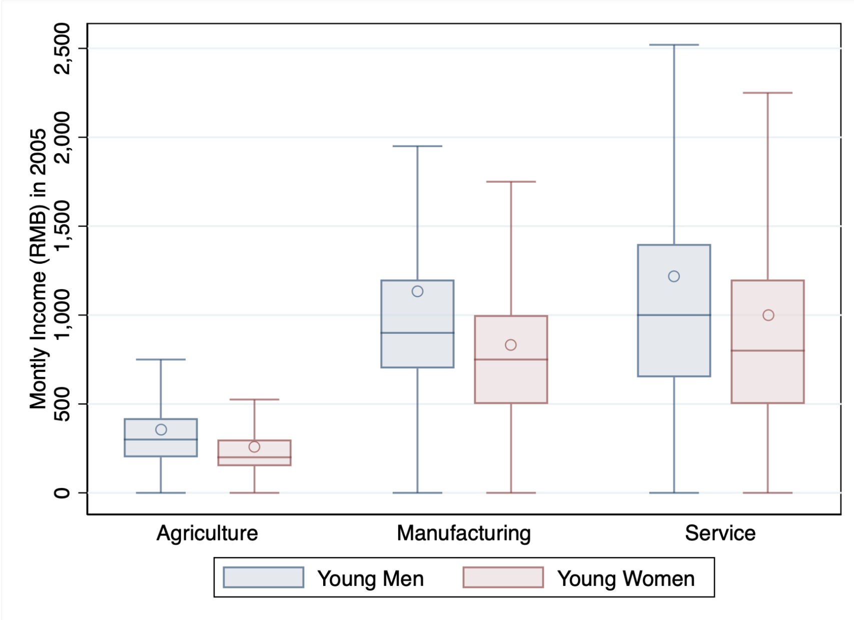
Notes: This figure presents density distribution of the estimated coefficients following the main specification where the dependent variable is the decadal change in the share of currently married young women between 2000-2010, with the industry-level NTR gap being randomly assigned 100 times.

Figure A3: Placebo: Randomly Assigned NTR Gap



Notes: This figure presents the estimated coefficients and 10% confidence intervals following the dynamic Difference in Differences specification. The dependent variable is the fraction of young women (aged 20-39) currently married for 1990-2010; for 2020, we can only calculate the fraction of women (aged 15 or above) currently married. The base year is 2000. We include the interaction term of baseline controls and year, prefecture fixed effects and province-year fixed effects. The sample contains 333 prefectures and four directly controlled municipalities across 4 periods: 1990, 2000, 2010 and 2020. Robust standard errors are clustered at prefecture level. Models are weighted by the prefecture young population (aged 20-39) at 2000.

Figure A4: Robustness Checks: Dynamic DiD



Notes: This figure visualizes the box plots of individual wages by sector and gender in China. We use individual monthly income information from the 2005 Chinese population survey and plot the summary statistics by gender and sector. The circle, central line, upper and lower hinges of the box are the mean, median, 75th and 25th percentile of individual monthly income. The upper and lower adjacent lines are upper and lower adjacent values, as defined by Tukey (1977).

Figure A5: Monthly Income by Gender and Sector in 2005

Table A1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
I. Dependent variables (10-Year Δ)					
(a) Year 2000-2010:					
Fraction of young women married	-0.09	0.06	-0.33	0.15	337
Fraction of young women divorced	0.00	0.01	-0.05	0.13	337
Fraction of young women never married	0.09	0.06	-0.13	0.26	337
Fraction of young men married	-0.09	0.06	-0.29	0.17	337
Fraction of young men divorced	0.00	0.01	-0.06	0.06	337
Fraction of young men never married	0.08	0.06	-0.16	0.28	337
Number of birth per young women	-0.27	0.17	-1.55	0.16	337
Fraction of young women with children	-0.10	0.06	-0.24	0.14	337
Number of birth per young women with children	-0.16	0.17	-1.5	0.23	337
Fraction of young women as students	0.04	0.03	-0.02	0.17	337
Fraction of young women as housekeepers	0.02	0.06	-0.20	0.17	337
Fraction of young women disabled or aged	0.00	0.01	-0.06	0.03	337
Fraction of young women as job seekers	-0.02	0.02	-0.19	0.05	337
Fraction of young men as students	0.04	0.70	-0.04	0.16	337
Fraction of young men as housekeepers	0.00	0.01	-0.03	0.08	337
Fraction of young men disabled or aged	0.00	0.01	-0.04	0.03	337
Fraction of young men as job seekers	-0.01	0.03	-0.17	0.05	337
Fraction of young women employed	-0.07	0.08	-0.30	0.24	337
Fraction of young women employed in agriculture	-0.15	0.11	-0.54	0.19	337
Fraction of young women employed in manufacturing	0.00	0.05	-0.16	0.21	337
Fraction of young women employed in service	0.07	0.06	-0.10	0.36	337
Fraction of young men employed	-0.05	0.05	-0.24	0.12	337
Fraction of young men employed in agriculture	-0.14	0.10	-0.46	0.22	337
Fraction of young men employed in manufacturing	0.01	0.06	-0.12	0.25	337
Fraction of young men employed in service	0.06	0.07	-0.17	0.51	337
Fraction of young women (rural hukou) married	-0.10	0.07	-0.35	0.16	337
Fraction of young women (rural hukou) divorced	0.00	0.01	-0.05	0.13	337
Fraction of young women (rural hukou) never married	0.09	0.07	-0.15	0.27	337
Fraction of young women (non-rural hukou) married	-0.07	0.10	-0.67	0.19	337
Fraction of young women (non-rural hukou) divorced	0.00	0.02	-0.1	0.11	337
Fraction of young women (non-rural hukou) never married	0.07	0.10	-0.19	0.67	337
Fraction of young women (high education) married	-0.15	0.13	-1	0.47	336
Fraction of young women (high education) divorced	-0.00	0.02	-0.13	0.11	336
Fraction of young women (high education) never married	0.15	0.13	-0.47	1	336
Fraction of young women (low education) married	-0.05	0.06	-0.35	0.15	337
Fraction of young women (low education) divorced	0.01	0.02	-0.04	0.14	337
Fraction of young women (low education) never married	0.04	0.05	-0.15	0.26	337

Table A1: Descriptive Statistics (Continued)

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**N**
Fraction of young women (rural hukou) employed	-0.07	0.08	-0.31	0.21	337
Fraction of young women (rural hukou) employed in agriculture	-0.19	0.13	-0.68	0.26	337
Fraction of young women (rural hukou) employed in manufacturing	0.03	0.06	-0.15	0.35	337
Fraction of young women (rural hukou) employed in service	0.08	0.06	-0.06	0.33	337
Fraction of young women (non-rural hukou) employed	-0.04	0.11	-0.40	0.38	337
Fraction of young women (non-rural hukou) employed in agriculture	0.01	0.08	-0.28	0.50	337
Fraction of young women (non-rural hukou) employed in manufacturing	-0.07	0.07	-0.27	0.20	337
Fraction of young women (non-rural hukou) employed in service	0.04	0.12	-0.83	0.43	337
Fraction of young women (high education) employed	-0.11	0.10	-0.36	0.24	337
Fraction of young women (high education) employed in agriculture	-0.01	0.08	-0.19	0.50	337
Fraction of young women (high education) employed in manufacturing	-0.04	0.07	-0.25	0.20	337
Fraction of young women (high education) employed in service	-0.05	0.13	-0.67	0.46	337
Fraction of young women (low education) employed	-0.04	0.08	-0.48	-0.24	337
Fraction of young women (low education) employed in agriculture	-0.14	0.12	-0.60	0.29	337
Fraction of young women (low education) employed in manufacturing	0.02	0.06	-0.20	0.32	337
Fraction of young women (low education) employed in service	0.07	0.06	-0.13	0.31	337
Housing price	0.78	0.27	-0.57	1.53	293
Teacher-student ratio	0.01	0.03	-0.44	0.05	260
(b) Year 1990-2000:					
Fraction of young women married	0.01	0.05	-0.22	0.18	337
Fraction of young women divorced	0.01	0.01	0	0.12	337
Fraction of young women never married	-0.01	0.05	-0.22	0.22	337
Fraction of young men married	0.02	0.06	-0.14	0.25	337
Fraction of young men divorced	0.01	0.01	0	0.08	337
Fraction of young men never married	-0.02	0.06	-0.24	0.14	337
Number of birth per young women	-0.28	0.24	-1.22	1.19	337
Fraction of young women with children	0.03	0.06	-0.26	0.32	337
Number of birth per young women with children	-0.43	0.26	-1.67	0.33	337
II. Explanatory variables					
NTR Gap	0.25	0.07	0.05	0.45	337
Female-specific NTR Gap	0.12	0.05	0.01	0.27	337
Male-specific NTR Gap	0.14	0.03	0.03	0.21	337
III. Control variables					
Fraction of employment in manufacturing	0.11	0.10	0	0.75	337
Output tariff change	-0.08	0.03	-0.24	-0.01	337
Input tariff cuts	-0.05	0.01	-0.09	-0.02	337
Fraction of young women employed	0.82	0.11	0.45	0.97	337
Fraction of population with rural hukou	0.73	0.15	0.15	0.94	337
Fraction of minority population	0.16	0.26	0	0.99	337
Fraction of population with college or above education	0.03	0.03	0	0.17	337
Special economic zone dummy	0.02	0.13	0	1	337

Notes: This table provides descriptive statistics for the variables used in the main empirical analyses.

Table A2: Heterogeneous Effects of PNTR on Young Women's Fertility Decisions

	Number of Children per Woman	Fraction of Women with Children	Number of Children per Woman with Children	Number of Children per Woman	Fraction of Women with Children	Number of Children per Woman with Children
	(1)	(2)	(3)	(4)	(5)	(6)
I. By Hukou		Rural			Urban	
NTR Gap	-0.02	-0.18**	0.25	-0.30	-0.16	-0.08
	(0.22)	(0.08)	(0.17)	(0.21)	(0.12)	(0.17)
Observations	337	337	337	337	337	337
R-squared	0.59	0.59	0.67	0.38	0.48	0.35
II. By Edu		Low			High	
NTR Gap	-0.11	-0.18***	0.18	-0.01	-0.10	0.22
	(0.21)	(0.07)	(0.17)	(0.18)	(0.12)	(0.18)
Observations	337	337	337	336	336	334
R-squared	0.60	0.56	0.66	0.44	0.45	0.36
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the 10-year change in fertility decisions of young women (aged 20-39). The full sample contains 333 prefectures and four directly controlled municipalities. The missed samples are due to lack of data for young women and young women with children. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Equivalent Shift-level Estimates

(a) Shock summary statistics

Mean	SD	Interquartile Range	Effective sample		Largest s_j weights		No. of		ICCs within	
			CIC4	CIC3	CIC4	CIC3	CIC4	CIC3	CIC3	CIC2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0.27	0.16	0.25	76.31	54.98	0.06	0.07	423	161	0.15	0.05

Notes: This table reports the summary statistics of shocks. Columns (1)-(7) summarize the distribution of shock g_j across industries. Shocks are measured by the NTR gap. All statistics are weighted by the average industry exposure shares s_j. Columns (8)-(9) report the number of industries at CIC4 and CIC3 level, respectively. Columns (10)-(11) reports the intra-class-correlation coefficients (ICCs) of shocks within CIC3 group and CIC2 group, respectively.

(b) Shock balance tests

Balance variables	Coef.	SE
	(1)	(2)
Industry level log wage, 1999	0.00	(0.03)
Prefecture level fraction of young women employed, 2000	0.02	(0.01)
Prefecture level fraction of population with rural hukou, 2000	0.02	(0.02)
Prefecture level fraction of minority population, 2000	-0.09***	(0.03)
Prefecture level fraction of population with college or above education 2000	-0.00	(0.00)
Prefecture level Special economic zone dummy, 2000	0.00	(0.01)
Prefecture level fraction of young women currently married, 1990-2000	-0.00	(0.00)

Notes: The first row of this table reports coefficients from regressions of the industry-level covariate on the NTR Gap, weighted by average industry exposure shares, with standard errors (provided in parentheses) clustered at the CIC3 level. The remaining rows of this table report coefficients from regression of the prefecture-level covariates and pre-trends on the shift-share, controlling for manufacturing employment share in 2000. CIC3-clustered exposure-robust standard errors are reported and obtained from equivalent industry-level regressions.

(c) Shift-share estimates from an equivalent shift-level regression

	Married	Divorced	Never Married	Number of Children per Woman	Fraction of Women with Children	Number of Children per Woman with Children
	(1)	(2)	(3)	(4)	(5)	(6)
Coefficient	-0.23***	0.02**	0.20**	-0.14	-0.20**	0.16
	(0.08)	(0.01)	(0.08)	(0.20)	(0.08)	(0.20)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of regions	337	337	337	337	337	337
No. of industries	423	423	423	423	423	423

Notes: This table reports the shift-share coefficients from regression of the change in regional young women's marital and fertility decisions on the region's exposure to PNTR. Exposure-robust standard errors (provided in parentheses) are obtained from equivalent industry-level regression, allowing for clustering of shocks at the CIC3 level. The sample includes 337 prefecture-level cities and 423 industries.

Table A4: Placebo: Different Age Cohorts

	Young Women			
	Married	Divorced	Never Married	Fraction of Women with Children
	(1)	(2)	(3)	(4)
I. Age cohort 15-19				
NTR Gap	0.01	-0.00	0.02	-0.00
	(0.03)	(0.00)	(0.04)	(0.02)
Observations	337	337	337	337
R-squared	0.18	0.14	0.19	0.20
II. Age cohort 40-44				
NTR Gap	-0.01	-0.01	0.02	0.01
	(0.04)	(0.02)	(0.02)	(0.03)
Observations	335	335	335	335
R-squared	0.21	0.25	0.13	0.20
III. Age cohort 45-49				
NTR Gap	-0.02	-0.00	0.01	-0.00
	(0.05)	(0.03)	(0.03)	(0.03)
Observations	337	337	337	337
R-squared	0.22	0.32	0.20	0.20
Baseline controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes

Notes: The dependent variables in Panel I, II, III are the 10-year change in marriage status and fertility decisions of women aged 15-19, 40-44 and 45-49, respectively. The sample contains 333 prefectures and four directly controlled municipalities. Two prefectures have no sample of young women aged 40-44 in 2000 thus are not included in Panel II. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Placebo: Randomly Assigned NTR Gap

	Negative	Positive
Significant at 1 percent	1	2
Significant at 5 percent	2	3
Significant at 10 percent	5	2
Insignificant	43	42

Notes: The table summarizes the estimated coefficients following the main specification, where the dependent variable is the decadal change in the share of currently married young women between 2000-2010, with the industry-level NTR gap being randomly assigned 100 times.

Table A6: Robustness Checks: County-level Analysis

	Young Women					
	Married	Divorced	Never Married	Number of Children per Woman	Fraction of Women with Children	Number of Children per Woman with Children
	(1)	(2)	(3)	(4)	(5)	(6)
NTR Gap	-0.16***	0.02**	0.13***	0.04	-0.15***	0.28***
	(0.05)	(0.01)	(0.05)	(0.12)	(0.05)	(0.10)
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2827	2827	2827	2827	2827	2827
R-squared	0.19	0.03	0.19	0.24	0.19	0.34

Notes: The dependent variable is the 10-year change in marital status and fertility decisions of young women (aged 20-39). Columns (1)-(3) are fraction of young women currently married, divorced, never married. Columns (4)-(6) are the number of children per young woman, fraction of young women with children, number of children per young woman with children. The sample contains 2827 counties. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period county young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A7: Alternative Specification: Difference-in-Differences

	Young Women					
	Married	Divorced	Never Married	Number of Children per Woman	Fraction of Women with Children	Number of Children per Woman with Children
	(1)	(2)	(3)	(4)	(5)	(6)
NTR Gap× Post	-0.22**	0.02**	0.19**	-0.16	-0.21**	0.23
	(0.09)	(0.01)	(0.09)	(0.26)	(0.09)	(0.26)
Baseline controls× Post	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Province-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1011	1011	1011	1011	1011	1011
R-squared	0.80	0.80	0.82	0.90	0.90	0.90

Notes: The dependent variable is the fraction of young women (aged 20-39) currently married. Post is a dummy variable that equals 1 if the year is after 2000. Additional policy controls are described in Table A8. The sample contains 333 prefectures and four directly controlled municipalities across 3 periods: 1990, 2000 and 2010. Robust standard errors clustered at prefecture level are provided in parentheses. Models are weighted by the prefecture young population (aged 20-39) at 2000. *** p<0.01, ** p<0.05, * p<0.1.

Table A8: Robustness Checks: Additional Policy Controls

	Fraction of Young Women Married								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
NTR Gap	-0.23***	-0.24***	-0.21***	-0.20**	-0.24***	-0.23***	-0.23***	-0.23***	-0.21**
	(0.07)	(0.07)	(0.08)	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)
External tariff reduction	-0.20*								-0.20
	(0.10)								(0.13)
FDI liberalization		-6.21*							-7.53**
		(3.32)							(3.41)
MFA relaxation			-0.02						-0.05
			(0.04)						(0.04)
Import licensing and quotas changes				-3.66					-1.85
				(6.09)					(6.23)
Exchange rate changes					0.42				0.50
					(0.48)				(0.47)
Fraction of employment in financial sector						-0.05			-0.26
						(0.89)			(0.88)
Fraction of employment in SOE							0.00		-0.00
							(0.03)		(0.03)
# of 985 universities								0.00	0.00
								(0.01)	(0.01)
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	337	337	337	337	337	337	337	337	337
R-squared	0.58	0.59	0.58	0.58	0.58	0.58	0.58	0.58	0.59

Notes: The dependent variable is the 10-year change in the fraction of young women (aged 20-39) currently married. Details of how additional policy controls are constructed are described in the text. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A9: Effects of PNTR on Gender Gaps in Working Time

	Working Hours		Fraction of Overtime Workers	
	(1)	(2)	(3)	(4)
NTR Gap	6.53	3.33	0.27**	0.15
	(4.16)	(3.23)	(0.13)	(0.11)
NTR Gap × Female		6.79*		0.25**
		(3.60)		(0.12)
Female		-3.32***		-0.12***
		(0.97)		(0.03)
Baseline controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes
Observations	337	674	337	674
R-squared	0.57	0.57	0.64	0.63

Notes: In column (1), the dependent variable is the change (2000-2010) in the average weekly working hours of young people. In column (2), the dependent variable is the change (2000-2010) in the average weekly working hours of young people by gender. In column (3), the dependent variable is the change (2000-2010) in the fraction of young workers who work overtime. In column (4), the dependent variable is the change (2000-2010) in the fraction of young workers who work overtime by gender; the denominator is always the total number of young workers of a given gender in a given year. In columns (1) and (3), the sample contains 333 prefectures and four directly controlled municipalities. In columns (2) and (4), the sample contains 333 prefectures and four directly controlled municipalities × 2 gender groups (women or men). Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A10: Additional Checks: Economic Status

		Employment in Service			
	Wage	High-paying industries	Low-paying industries	High-paying occupations	Low-paying occupations
	(1)	(2)	(3)	(4)	(5)
NTR Gap × Female	0.56*	0.11***	0.03	0.09***	0.05
	(0.30)	(0.04)	(0.04)	(0.03)	(0.05)
Female	-0.19**	-0.04***	0.01	-0.03***	0.01
	(0.09)	(0.01)	(0.01)	(0.01)	(0.01)
NTR Gap	-0.27	-0.09**	0.05	-0.06*	0.02
	(0.27)	(0.04)	(0.04)	(0.03)	(0.05)
Baseline controls	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	350	674	674	674	674
R-squared	0.31	0.28	0.37	0.35	0.36

Notes: In column (1), the dependent variable is the change (2002-2009) in the average wage of young women or men. We use the UHS data, and the sample contains 171 prefectures and four directly controlled municipalities × 2 gender groups (women or men). In column (2)((3)), the dependent variable is the change (2000-2010) in the fraction of young women or men who work in high (low) -paying industries of the service sector. We use the 2005 Chinese population survey data to categorize the service sector into high-paying and low-paying industries. In column (4)((5)), the dependent variable is the change (2000-2010) in the fraction of young women or men whose occupations are high (low) -paying in the service sector. We use the 2005 population survey data to categorize the service sector into high-paying and low-paying occupations. The sample contains 333 prefectures and four directly controlled municipalities × 2 gender groups. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A11: Female High and Low Fertility Industries

(a) An Overview

	Fraction of Women Married	Number of Children per Woman	Agriculture	Manufacturing	Service
	(1)	(2)	(3)	(4)	(5)
High-fertility	86.67%	1.34	6 (3.28%)	125 (68.31%)	40 (21.86%)
Low-fertility	76.46%	0.86	8 (4.35%)	47 (25.54%)	124 (67.39%)

Notes: The table presents an overview of high-fertility and low-fertility 4-digit CIC industries. We employ the U.S. 2000 Census data to calculate the fraction of young women with children for each 4-digit NAICS industry and further match it to the 3-digit CIC industry level using a self-constructed crosswalk. An industry is defined as high-fertility if its fraction of young women with children is above the median value. Column (1) reports the fraction of Chinese young women currently married in 2000 for high-fertility and low-fertility industries. Column (2) reports the number of children per Chinese young woman in 2000. Columns (3)-(5) report the number of high- and low-fertility industries in the agriculture, manufacturing, and service sectors, respectively. The fractions of high- and low-fertility industries in each sector are provided in parentheses.

(b) Additional Checks

	Employed	Fraction of Young Women Married	Number of Children per Woman
	(1)	(2)	(3)
NTR Gap × Low-fertility	0.29***	-0.03	-0.52**
	(0.09)	(0.09)	(0.20)
Low-fertility	0.16***	0.00	0.25***
	(0.02)	(0.03)	(0.06)
NTR Gap	-0.04	-0.22***	0.10
	(0.08)	(0.10)	(0.21)
Baseline controls	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes
Observations	674	673	673
R-squared	0.81	0.31	0.37

Notes: In column (1), the dependent variable is the decadal change (2000-2010) in the fraction of young women employed in high-fertility or low-fertility industries. In column (2), the dependent variable is the decadal change (2000-2010) in the fraction of young women currently married in high-fertility or low-fertility industries. In column (3), the dependent variable is the decadal change (2000-2010) in the number of children per young woman in high-fertility or low-fertility industries. The sample contains 333 prefectures and four directly controlled municipalities × 2 industry groups (high- or low-fertility). The missed sample is due to the lack of data. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A12: Effects of PNTR on Gender Gaps in Labor Markets After Marriage

	Employed	Agriculture	Manufacturing	Service
	(1)	(2)	(3)	(4)
NTR Gap × Female	0.19***	-0.01	-0.26***	0.17***
	(0.06)	(0.10)	(0.08)	(0.07)
NTR Gap	0.04	-0.06	0.32***	-0.02
	(0.06)	(0.09)	(0.06)	(0.06)
Female	-0.10***	-0.01	0.06***	-0.04**
	(0.02)	(0.03)	(0.02)	(0.02)
Baseline controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes
Observations	674	674	674	674
R-squared	0.55	0.62	0.59	0.44

Notes: The dependent variable is the 10-year change in the fraction of ever married young people (aged 20-39) in labor markets. Columns (1)-(4) are fraction of young women (men) employed, employed in agricultural sector, employed in manufacturing sector, employed in service sector. The sample contains 333 prefectures and four directly controlled municipalities × 2 gender groups (women or men). Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A13: Effects of PNTR on Young Women's School Enrollment

	Aged 20-39	Aged 20-24	Aged 20-39	Aged 20-24	Aged 20-39	Aged 20-24
	(1)	(2)	(3)	(4)	(5)	(6)
	At School		High School Educated		College-educated or Above	
NTR Gap	0.03	0.11	0.04	0.08	0.03	-0.00
	(0.03)	(0.10)	(0.05)	(0.10)	(0.04)	(0.10)
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	337	337	337	337	337	337
R-squared	0.64	0.48	0.69	0.47	0.81	0.55

Notes: The dependent variable is the 10-year change in school enrollment of young women. Columns (1)-(2) are fraction of young women currently at school. Columns (3)-(4) are fraction of young women with high school education. Columns (5)-(6) are fraction of young women with college education or above. The sample contains 333 prefectures and four directly controlled municipalities. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A14: Effects of PNTR on Labor Markets' Segmentation

	Changes in Gender Concentration Index (GCI), 2000-2010			
	CIC 3-digit Industry		CIC Aggregate Sector	
	(1)	(2)	(3)	(4)
NTR Gap	-0.03		-0.03	
	(0.04)		(0.02)	
Female-specific NTR Gap		-0.06		-0.06*
		(0.05)		(0.03)
Male-specific NTR Gap		0.03		0.01
		(0.06)		(0.03)
Baseline controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes
Observations	337	337	337	337
R-squared	0.52	0.52	0.41	0.42

Notes: The dependent variable is the 10-year change in local labor markets' segmentation. Columns (1)-(2) use the 3-digit industry (CIC3) to construct the segmentation index. Columns (3)-(4) use the sector (agriculture, manufacturing, service and others) to construct the segmentation index. The sample contains 333 prefectures and four directly controlled municipalities. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A15: PNTR and the Costs of Marriage and Childbearing

	Housing Price	Young Women Married	Teacher-student Ratio	Young Women Married	Young Women Married
	(1)	(2)	(3)	(4)	(5)
NTR Gap	-0.70**	-0.22***	0.01	-0.23***	-0.22***
	(0.33)	(0.07)	(0.05)	(0.08)	(0.08)
Housing price		-0.01			-0.00
		(0.01)			(0.02)
Teacher-student ratio				0.15***	0.15***
				(0.04)	(0.04)
Baseline controls	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	291	291	260	260	255
R-squared	0.52	0.61	0.26	0.63	0.63

Notes: The dependent variables are the 10-year change in housing price (local CPI deflated), fraction of young women married, teacher-student ratio (elementary school), and fraction of young women married. The full sample contains 333 prefectures and four directly controlled municipalities. The missed samples are due to lack of data. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A16: Migration as a Mechanism

(a) Inflow of Migrants

	Migrants	Married	Divorced	Never Married
	(1)	(2)	(3)	(4)
NTR Gap	0.10**	-0.21***	0.02**	0.17**
	(0.04)	(0.07)	(0.01)	(0.07)
Migrants		-0.27**	-0.00	0.29***
		(0.11)	(0.01)	(0.11)
Baseline controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes
Observations	337	337	337	337
R-squared	0.83	0.60	0.16	0.62

Notes: The dependent variable in column (1) is the 10-year change in fraction of young people (aged 20-39) who are migrants. The dependent variables in column (2)-(4) are the 10-year change in fraction of young women (aged 20-39) currently married, divorced or widowed, never married. The sample contains 333 prefectures and four directly controlled municipalities. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

(b) Gender Imbalances

	Sex Ratio of Migrants	Sex Ratio	Female Locals to Male Locals and Male Migrants	Male Locals to Female Locals and Female Migrants
	(1)	(2)	(3)	(4)
NTR Gap	3.15*	0.02	-0.17	-0.03
	(1.77)	(0.10)	(0.11)	(0.10)
Baseline controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes
Observations	320	337	337	337
R-squared	0.10	0.47	0.61	0.49

Notes: The dependent variable in column (1) is the 10-year change in the sex ratio of young migrants (aged 20-39). The dependent variable in column (2) is the 10-year change in the sex ratio of young people (aged 20-39). The dependent variable in column (3) is the 10-year change in the ratio of young women locals (aged 20-39) to total young men (aged 20-39). The dependent variable in column (4) is the 10-year change in the ratio of young men locals (aged 20-39) to total young women (aged 20-39). The sample in column (1) contains 316 prefectures and four directly controlled municipalities as 17 prefectures have no sample of young female migrant in year 2000 or 2010. The sample in columns (2)-(4) contains 333 prefectures and four directly controlled municipalities. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

Table A17: Effects of PNTR on (Non-) Labor Market Outcomes: Young Men and Women Combined

(a) Fraction of Young People in Non-Labor Markets

	School or Training	Family Obligations	Health Limitations	Unemployment
	(1)	(2)	(3)	(4)
NTR Gap	0.04	-0.09**	-0.00	-0.03
	(0.03)	(0.04)	(0.01)	(0.02)
Baseline controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes
Observations	337	337	337	337
R-squared	0.66	0.63	0.21	0.72

Notes: The dependent variable is the 10-year change in fraction of young people (aged 20-39) in non-labor markets. Columns (1)-(4) are fraction of young people who are out of the labor force due to school or training, family obligations, health limitations, and who are job seekers, respectively. The sample contains 333 prefectures and four directly controlled municipalities. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.

(b) Fraction of Young People in Labor Markets

	Employed	Agriculture	Manufacturing	Service
	(1)	(2)	(3)	(4)
NTR Gap	0.13**	-0.10	0.22***	0.04
	(0.06)	(0.10)	(0.06)	(0.06)
Baseline controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes
Observations	337	337	337	337
R-squared	0.66	0.67	0.64	0.41

Notes: The dependent variable is the 10-year change in fraction of young people (aged 20-39) in labor markets. Columns (1)-(4) are fraction of young people employed, employed in the agricultural sector, employed in the manufacturing sector, employed in the service sector. The sample contains 333 prefectures and four directly controlled municipalities. Robust standard errors are provided in parentheses. Models are weighted by the beginning-of-period prefecture young population (aged 20-39). *** p<0.01, ** p<0.05, * p<0.1.