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Half Sky over China: Women's Political Participation and Sex Imbalances, 1950–1990

By YANG YAO AND WUYUE YOU*
The National School of Development & China Center for Economic Research
Peking University

Abstract:

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I. Introduction

A growing number of studies have shown that female political participation improves women's welfare. Chattopadhyay and Duflo (2004) find that in Indian states where a certain number of village head positions are randomly reserved for women candidates, women leaders tend to make policy decisions that reflect women's concerns. Beaman et al. (2009) further find that the random reservation of positions for women leaders reduces villagers' biases against women leaders. Their more recent studies have found that women leaders serve as role models to raise the aspirations of parents and girls (Beaman et al. 2012). These results resonate in studies on other countries. For example, Miller (2008) shows that the enfranchisement of women in the United States directly resulted in greater local public spending that is more closely linked to women's needs, and reduces child mortality. However, two issues remain unsettled in the literature.

The first issue is whether these results can be applied to other settings. For example, Ban and Rao (2008) find that when they extend the finding of Chattopadhyay and Duflo (2004) to South Indian states with low levels of gender disparity, female leaders perform no differently than male leaders. Ferreira and Gyourko (2014) find that, consistent with the median voter theorem, the gender of elected mayors had no impact on policy outcomes in the case of American cities from 1950 to 2005.

The second issue is whether reservations for women leaders have a long-lasting effect in permanently changing societal perceptions about women. Beaman et al. (2009) show that people's views about women change gradually after the reservation is introduced, but they have not answered the question whether this change is long lasting.

This paper makes a contribution to filling the gaps in the literature. The paper provides a comprehensive study on whether and how changes in female political

participation contributed to change in the sex imbalance in China in 1950–90. In this period, Chinese society experienced tremendous political and social changes. Among them, the change in women's political and social status was probably one of most significant.

China's long-lasting imperial history had produced a complete set of patriarchal institutions and male-centered values. Women had to be subordinate to the authority of men throughout their lifetime. Political participation, a main symbol of social status, was only available for well-educated men through the imperial examinations. Most of all, parents' preference for sons led to poor health care and malnutrition for daughters; female infanticide and abandonment of newborn girls were not uncommon. Manifesting Sen's (1990) notion of "missing women," the imbalance in the sex ratio was evident and long-lasting in China. With the collapse of Imperial China in 1911, a revolution of female status began in the household and in public life. After the Chinese Communist Party (CCP) established the People's Republic of China (PRC) in 1949, this revolution was accelerated; female political participation became a national agenda and reached its peak in the early 1970s. By the late 1960s and early 1970s, the male-female sex ratio had dropped to its lowest levels, about 105 (males to 100 females). The sex ratio in the population and at birth began to increase again around the time when the one-child policy was introduced in 1979.

The CCP brought national and local changes. This paper explores the cross-sectional and temporal variations in 1950–90. At the beginning of the period, the strength of the CCP's influence closely followed its military activities before the PRC was founded. Female political participation followed the same pattern, and thus was exogenous to the formation of the sex ratio in subsequent years. Therefore, this period provides a nearly natural experiment for us to study the long-run effects of female political participation. The large fluctuations in the explanatory variable (female political participation) and the outcome variable (the

sex ratio) in this period increase the power of our tests. First, we have to obtain consistent results to explain not only how increased female political participation can lower the sex imbalance, but also how a reversal in female political participation can increase the sex imbalance. Second, by including periods of ups and downs in women's political participation and the sex ratio, we are able to avoid the confounding effect of time trends, which often plague empirical studies of panel data.

The variable we adopt to measure female political participation is female party membership (FP), which is defined by the share of women members in the CCP. The CCP began to draw women into the party before it obtained power, both for its political conviction of women's liberation and its need for broader support for its struggle against foreign enemies and its archrival, the Kuomintang (KMT). After the CCP took power, more women joined the party as a result of the CCP's painstaking efforts to modernize Chinese society. The CCP was the predominant political force in the country; joining the party was regarded as a personal achievement as well as a way to get closer to power.

For the outcome variable measuring sex imbalance, we mainly work with the female-male sex ratio in the population, because it is difficult to obtain historical data for the sex ratio at birth.[1] However, by studying the impacts of FP on subpopulations of different ages and birth orders, we are able to investigate whether FP had a larger impact on the sex ratio of children than on adults.

We obtain the main part of our data by digitizing the county chronicles of about 1,200 counties. We also use data from the CCP's records of its grassroots organizations, national censuses, the 2010 wave of the China General Social Survey (CGSS), and several other sources that provide county-level geographical

[1] Except for some descriptive analyses of historical data, we focus on the female-male sex ratio, so its coefficient in a regression is positive if more female political participation has a positive effect on the sex imbalance. This is more consistent with the convention for the presentation of a "positive" result.

information. The county chronicles provide data for CCP membership and its composition in a county, as well as the county's socioeconomic characteristics that are important for our study. To the best of our knowledge, this study is the first attempt to use county-level data to study socioeconomic and political changes in the Mao era (1949-1976).

The main difficulty encountered by our empirical identification of the causal effect of FP on the sex ratio is that there may be omitted variables that affect both variables. The son preference culture, for example, may influence women's participation in politics and the sex ratio, and it is difficult to measure son preference accurately. The literature on the impacts of women's political participation faces the same endogeneity concern. In addition to mandatory randomized political reservation programs (Chattopadhyay and Duflo, 2004; Beaman, et al. 2009, 2012; Kalsi, 2013), some authors use regression discontinuity design to study close electoral races between female and male candidates to obtain clearer identification results (Clots-Figueras, 2012; Brollo et al., 2013； Ferreira and Gyourko, 2014). We rely on the exogoneity of female party membership in 1950 (FP50 hereafter) to form our main identification strategy. The distribution of CCP membership in that year was mainly shaped by the CCP's military activities in the Anti-Japanese War and the Civil War. The areas of the CCP's military presence were quite diverse in the level of social and economic development as well as regional culture. Female party membership strongly followed CCP membership in 1950. Our identification assumption thus is that, conditional on other socioeconomic variables, FP50 could only shape the formation of the sex ratio of newborns in future years through its persistent influence on FP in contemporary periods.

To show the long legacy of female party membership in 1950, we first run a cross-sectional regression of the female-male sex ratio of the population in 1990 on FP50, conditional on the sex ratio of the population, CCP membership

(CCP50), and a set of socioeconomic variables, all measured in 1950, as well as a set of time-invariant geographical variables. The control variables capture the impacts of social norms on women, in addition to the CCP's political mobilization. Then we divide the period 1950–90 into eight sub-periods and conduct a cross-sectional ordinary least squares (OLS) regression for each sub-period, to see how female party membership in the year immediately before the period affects its sex ratio. For comparison, we include FP50 and CCP50 in each regression. The results show that the effect of contemporary FP is positive in most sub-periods, and especially large in the periods of the Great Famine (1959–61) and the Cultural Revolution (1966–76). In contrast, FP50 does not show any significant result in any sub-period except the period 1951–57, implying that the impacts of FP50 are absorbed by the contemporary FP in each sub-period, which is consistent with our exogeneity assumption.

Next, we conduct our baseline panel regressions for the age cohorts of 1990 to study how FP in each cohort's birth year affects the cohort's sex ratio in 1990. The 1990 census reports the sex ratio for each cohort in five-year age intervals. We trace the age cohorts back to 1951–55, and construct a panel of eight cohorts. Panel regressions then allow us to introduce county fixed effects (FEs) and cohort FEs to control for all the time-invariant and unobserved factors in each county, and countrywide time-varying and unobserved socioeconomic factors that may affect contemporary FP and the sex ratio. As a result, we would obtain a clear identification if there were no county-specific and time-varying unobserved factors co-moving with FP and the sex ratio.

To deal with the possibility of co-movement, we design an instrumental variable (IV) approach. Our identification assumption is that for a population cohort born in period *t*, the impact that FP in any year before that period has on the cohort's sex ratios in future years is summarized by the county FE and/or the sex ratio of the population in period *t* if the impact is not channeled through

contemporary FP in period *t*. This assumption is justified because the county FE and sex ratio of the population summarize all the changes in social norms formed before period *t*. Under this assumption, FP in any past year can serve as an IV for contemporary FP in period *t*. To get a clearer identification, we construct the instrument based on FP50.

As infanticide and abandonment of girls were the main causes of "missing women," we identify whether the positive effect of FP mainly comes from its contribution to the survival of young girls. Continuing to work with the panel data of the 1990 age cohorts, we define two stages of life, one before age 10 years (infancy-childhood) and the other after (youth-adulthood), for each cohort. We find that the contemporary FP of the infancy-childhood stage has a significantly positive effect on that cohort's sex ratio in 1990, but the contemporary FP of the youth-adulthood stage does not have any significant impact. This shows that the positive effect of female political participation has very likely worked by reducing the number of female infanticides and the abandonment of newborn girls and/or improving girls' health care and nutrition.

This result is reinforced by our comparison of the sex ratio of second births between the late 1970s and the 1980s. Prenatal sex selection came with the introduction of ultrasound B machines after the one-child policy was implemented in 1979. Sex selection was most common for second births. We find that, on average, a 1 percent higher FP in 1975 increases the gender parity of second births by about 0.2 percent in the 1980s, and this result is mainly driven by rural families. In contrast, FP in 1975 has no effect on the sex ratio of second births in 1976–79, the period just before the one-child policy. Our finding is consistent with Kalsi's (2013) result that the random assignment of women leaders in India lowers the boy-girl ratio of third births. To deal with the potential problem of missing variables, we include in the regressions a variable constructed from the

county FEs obtained from a panel regression of the sex ratio using data before 1975. The results barely change.

Finally, we explore two mechanisms through which women's political participation may influence the sex ratio. The first is the policy mechanism. The findings of Chattopadhyay and Duflo (2004) and Miller (2008) support this mechanism. Tate and Yang (2015) also find that firms with more women in leadership roles create a more female-friendly corporate culture, have a stronger preference for hiring female workers, and offer smaller pay gaps between men and women. Those studies show that women's political participation or leadership status works through the policy mechanism. To test this mechanism, we study the role of female party membership in two policy outcomes. One is the county government's social spending, which had a disproportionate impact on women, and the other is the implementation of family planning. However, we find that female party membership does not play a significant role in either case.

The second is the perception mechanism. The findings by Beaman et al. (2009, 2012) support this mechanism. Kalsi's (2013) finding also indicates that the election of female leaders changes people's perception about girls of higher-order births. Qian (2008) suggests that higher market value of adult women improved the survival rate of girls in China. CCP party membership carried political status and economic returns. Women's participation in the party thus demonstrated that women could have higher value than had been widely believed. In addition, as part of its effort to modernize China, the CCP consciously worked to mobilize women in grassroots society. In this process, women party members played a critical role in persuading other women to follow new norms as well as to participate in political activities. Women party members also played a role in stopping men's abuse of their wives and daughters. Therefore, a higher level of FP may have reduced the sex imbalance by changing society's perception of women. Using individual-level data provided by the 2010 CGSS, we find that

female party members and their husbands are more likely to support ideas implying gender equality. This piece of evidence lends support to the existence of the perception mechanism.

The rest of the paper is organized as follows. Section II presents a succinct description of the CCP's role in transforming Chinese society, sex imbalances in the study period, and female political status in the Mao era. Section III introduces the data sources and construction of the variables used in the descriptive and econometric analyses. Section IV provides descriptive evidence of the regional distributions of the CCP and female party membership and their changes over time. We pay particular attention to possible co-movements between FP and the sex ratio. Section V first describes the identification strategy, and then presents the OLS results for the impact of FP50 on the change in the sex ratio of the population between 1950 and 1990. The results of OLS regressions for sub-periods and panel IV regressions for the 1990 age cohorts are also presented. Section VI explores FP's differential impacts in infancy-childhood and youth-adulthood. Section VII provides several tests of the policy mechanism and perception mechanism. Section VIII concludes the paper.

II. Historical Background

A. CCP and the Transformation of Chinese Society

The interactions between the CCP and Chinese society have long been a key issue in the study of modern China. Most studies on the CCP's survival in the post-communist era focus on the CCP's transformation and adaptation to the evolving international environment and social changes inside the country (Guo et al., 2014; Zheng, 2010), as well as the gradual atrophy of the CCP's control over various aspects of society (Shambaugh, 2009). In the Mao era (1949–76), however, the party-state was in a central place to control and organize people's

lives from the womb to the tomb. In its struggle to capture power and mobilize society before 1949, the CCP had to establish links with various social groups and political strata (Tsou, 1986). Acting one of the most important lessons drawn from its military victory, after it obtained power in 1949, the CCP began to penetrate every corner of Chinese society. The CCP had about four million members in 1949; its membership quickly expanded to more than 13 million in 1958, and nearly two-thirds of the members were lower-class farmers.[2] "The abstract state-society relationship was thereby translated into numerous concrete face-to-face interactions between a Party branch and the mass" (Liu, 2006). The party charter specifically requires that "all enterprises, villages, organizations, schools, research institutes, communities, People's Liberation Army companies and all other basic-level units should establish the basic-level party organization when there are more than three party members."[3]

The CCP was determined to change the social structure, fundamental economic organizations, and how people had lived their lives for generations. At the personal level, one of the salient features of the Mao era was the promotion of the socialist New Man (Cheng, 2009). Although sacrifice for the country and loyalty to the party were its main characteristics, the New Man was also supposed to give up the old ways of living and embrace the modern ideas of social equality and new norms of personal interactions. Joining the party was definitely an important channel to become a New Man. Party members served as role models for ordinary people to undertake a quick personal transformation through active political participation. Notwithstanding its ideological face, party membership carried tangible political and economic returns. Although not every CCP member was a

[2] See the next section for the source.

[3] The Charter of the Chinese Communist Party, Chapter Five, Article 29.

cadre, party members served as agents of the state and had the privilege to participate in politics.

In rural villages and urban units, CCP members held regular meetings to study new party documents and discuss public affairs. And they carried out the party's policies (Li, 2009). Furthermore, CCP members had the opportunity to have a better career path, which in many cases led to better material rewards.[4] CCP members were considered as elites who were equipped with advanced revolutionary attitudes and exhibited superb performance in their workplaces and neighborhoods. In the Mao era, the party intentionally provided membership to some once-disadvantaged groups, such as women, poor farmers, floor workers, and the illiterate. This effectively changed the perspective of social norms toward them.

B. Changing Female Political Status in Modern China

During the long history of imperial China, women lived under the male-dominated culture and institutions. The power of the empire was only accessible to well-educated males through the imperial examinations. Since the Ming Dynasty, women's status was further deteriorated. One of the most notorious customs developed against women was foot-binding. Women were physically restricted to their houses. Women were first subject to the authority of their parents, and then to that of their husbands throughout their whole life. Even after their husbands died, women had to obey the Widows' Virtue. All the roles women could play were limited within their household; participation in social life or public affairs was only imaginable for a few brave women.

Since the late Qing Dynasty, the idea of gender equality was gradually introduced. The KMT government of the Republic of China (1912–49) introduced

[4] Studies show that these advantages have lingered in the post-Mao era (Walder, 1995; Li et al., 2007; Guo et al., 2014).

legislation to grant women equal status in educational opportunities, marriage freedom, property ownership, and political participation. However, all these reforms were hardly put into practice in rural areas, because of the weak capacity of the KMT to penetrate grassroots society.[5] Consistent with its revolutionary ideal, and also to get as much support as possible for war and production, the CCP encouraged women to venture outside their homes, to join the revolution during its struggle for power. Many women were absorbed into the CCP; women's liberation was one of the CCP's central themes to transform China. This tradition was enhanced after the party took power in 1949. The CCP held the first women's national congress in March 1949, nearly seven months before the formal announcement of the establishment of the PRC. The congress created the All-China Federation of Women (commonly known as the "national fu-lian"). In its charter passed by the congress, it was stipulated that the federation was the organization for China's women's movement, and it "will strive to abolish all the feudal customs imposed on women, protect women's rights and children's welfare, and actively organize women to participate in all kinds of endeavors of (national) construction, so to realize gender equality and the liberalization of women."[6] Clearly, fu-lian acted as an arm of the CCP, to realize its vision of social equality. Female political participation was encouraged directly by the party and through fu-lian.

The CCP accelerated the elevation of women's political status in the later period of the Cultural Revolution. In 1973, female membership in the CCP's Central Committee reached a historical record of 12.9 percent. In 1975, when the

[5] The KMT had only about 2.7 million non-soldier members in 1929 when it finished consolidating power, and the membership grew to 5.2 million in 1937. Furthermore, over two-thirds of the members were cadres and intellectuals. As a result, the organizational capacity of the KMT was limited to the upper classes and urban elites, with the grassroots and rural society left to "local tyrants and evil gentry" (Wang, 2003).

[6] http://baike.baidu.com/link?url=tFEUo3rvOvFN2_s8jLpixYyl3yLkR_eJ74PNw0L3dmcfywqS5ItnfOWEM0JspVJ__WZashXTH9wWjKQ0q9OSI_. Accessed August 3, 2016. Translated by the authors.

Fourth National People's Congress (NPC) was convened, female representatives accounted for 22.6 percent of the total number of representatives, and women comprised one-fourth of the NPC's Standing Committee. Both were the highest in NPC history until 2013.[7] However, the rise of women's political participation was reversed after Mao's death in 1976. As the next section shows, female party membership in the country declined for some time, and female party membership in the countryside declined steadily until 1990 when our data end. The decline coincided with a general social trend for women to go back to their families.

Women's liberation in the Mao era had a particularly large impact in the countryside, because male-dominated clan culture often dominated village life. The quick expansion of the party allowed many women who had poor education and little wealth to join the party, breaking the long history of male dominance and inevitably raising the status of women. Women's liberation had the potential to reduce the son preference, which was once widely held by rural families, and thus reduce the sex imbalance. Studies of India suggest that female leaders could bring about women-friendly policies and raise society's awareness of gender equality (e.g., Chattopadhyay and Duflo, 2004; Beaman et al., 2009, 2012). In the period we study, the incidence of women leaders was extremely low, and there was limited variation across counties. The FP for which we do have data is more an indicator of women's political mobilization than women's decision-making power. For FP to influence the sex ratio, therefore, two channels other than the policy channel could be important.

The first is the demonstration channel. The literature shows that higher market value of adult women increases the survival rate of girls (e.g., Qian, 2008). In the case of Mao's China, CCP party membership carried political status and

[7] Female membership in the NPC reached 23.4 percent in its 12th congress, which started in 2013. This was the outcome of a resolution the NPC adopted two years earlier. http://news.sina.com.cn/c/2015-09-01/221532265735.shtml. Accessed August 3, 2016.

economic returns. Women's participation in the party thus demonstrated that women could have higher value than had been widely believed. In addition, women party members could serve as role models to raise the aspirations of parents and girls (Beaman et al., 2012). Indeed, the party deliberately promoted a female version of the New Man through the media, such as newspaper stories, movies, and novels.[8] This could have had an effect in changing the old social norms against women.

The second is the persuasion channel. As part of its penetration efforts, the CCP mobilized women in grassroots society. Every village set up a branch of the fu-lian. Usually it was headed by a female party member or a female activist. The purpose of the fu-lian was to carry out the tasks set by the charter of the national fu-lian. In particular, it aimed to help the village party branch to mobilize women whenever their participation was needed, and, more importantly, intervened if mistreatment of women or children happened. Because of the unique and powerful position of the CCP, the fu-lian's intervention could be effective.

Both channels mean that female political participation influenced the sex ratio by changing people's perceptions about women. Therefore, in contrast with the policy mechanism, we group the two channels together and call them "the perception mechanism." In our empirical analysis, we will study whether a higher level of FP reduced the sex imbalance in a county in subsequent years. To the extent that a higher level of FP indicates higher market and social value of women, our econometric exercises directly prove the demonstration channel. It is more difficult to prove the persuasion channel, because we do not have data to measure directly the role of the fu-lian or other women's organizations. As a substitute, we

[8] Two popular movies promoting a new image of women in the 1950s and 1960s were *Five Golden Flowers* (wu-duo jin-hua) and *Li Shuangshuang*. The first movie depicts five young woman cadres whose names just all happened to be "jin-hua"; the second movie describes how Li Shuangshuang, the head of her village's fu-lian, changed the perception of her fellow villagers—including her husband—about women (particularly about herself) as well as mobilized villagers to contribute to the commune.

will use individual-level data provided by the 2010 wave of the CGSS, to show that party membership not only changes a woman's perception about the role of women, but also changes her husband's.

C. "Missing Women" and the Sex Imbalance in China

Asia's "missing women" problem was first noticed by Sen (1990). It is a shortfall in the number of women because of sex-selective abortions and female infanticides, as well as unequal levels of health care and nutrition for newborn girls. Under a tradition of patriarchal order and son preference, sex imbalance in China has a long history. Table 1 shows the sex ratios of the population in historical China.

[Table 1 about here]

Sex imbalance in historical times was caused by a series of combined factors. Discrimination against daughters could lead to poor health care and malnutrition, and eventually the premature death of females (Attane, 2009). Premature mortality could also be caused by infanticide and the abandonment of newborn girls (Hesketh and Zhu, 2006). For female adults, early life conditions could have persistent impacts on their health and mortality (Huang and Elo, 2009). Poor educational attainment and the lack of economic opportunities could also result in women's low bargaining power in household decisions, and thus lower their quality of life.

It is noteworthy that the male-female sex ratio declined steadily throughout the first half of the twentieth century, despite the tremendous turmoil in that period. Figure 1 shows the change in the female-male sex ratio in the population from 1949 to 1990.[9] Throughout most of the 1950s, the ratio continued to increase,

[9] Our econometric analysis will study the female-male ratio for the sake of better exposure. So from now on, we will present the sex ratio in terms of men = 1.

although there was a dip just before the Great Famine. In the early 1960s, there was a sharp increase in the ratio. The effects of the Great Famine have to be considered for this increase, because women may have been more likely to survive the famine than men (Hoyenga and Hoyenga, 1982). The sex ratio settled at around 0.95 (or 105 if women = 100) in the 1960s, and moved back to around 0.94 (or 106 if women = 100) in the 1970s. However, there was a sharp drop in the ratio in the early years after the one-child policy was introduced in 1979.

[Figure 1 about here]

China carried out its first census in 1964, but its data are mostly inaccessible today. The next census was not carried out until 1982, but its relatively detailed data are not accessible either. It is therefore difficult to obtain accurate data for the sex ratio at birth for the years before 1982. The third census was done in 1990, and since then the census has been carried out regularly on a decade basis. Figure 2 depicts the female-male sex ratio for each birth cohort recorded in the 1990 census. The published statistics of the 1990 census report the number of people by sex by five-year birth cohort. The figure presents the sex ratio for nine birth cohorts, starting with the 1946–50 cohort and ending with the 1986–90 cohort (the horizontal axis is labeled by the ending year of each cohort).

Although the sex ratio of a birth cohort changed over time when the cohort became older (because men's and women's death rates may differ by age), and there were incompatibilities between cohorts (because different cohorts lived in different periods when they were the same age), Figure 2 provides a sense of the sex ratios at birth in individual periods of time. Relying on that information, we see that there were much larger fluctuations in the sex ratio at birth than the sex ratio of the population shown in Figure 1, although they followed more or less the same trends over time. Before 1960, the sex ratio at birth was between 0.93 (108 if women = 100) and 0.91 (110 if women = 100); it increased to around 0.95 in

the 1960s and the early part of the 1970s, but after 1975 it reverted back to the level before 1960. The imbalance after the one-child policy was introduced was alarming. According to the 1982, 1990, and 2000 censuses, the male-female sex ratio (women = 100) at birth increased from 108.5 in 1982 to 113.8 in 1990, and then to 119.9 in 2000.

[Figure 2 about here]

Li, Yi, and Zhang (2011) argue that the increase in the male-female sex ratio in the post-Mao period was a combined result of son preference, decrease in fertility induced by the one-child policy, and introduction of gender selection technology. The implementation of the one-child policy differed from place to place. Local governments could adjust the policy to their local conditions. For example, according to Central Document 7 of 1984, under some specified exceptional conditions, families could have a second child if the first one was a girl. But there was a lot of flexibility in the application of these "exceptions." Furthermore, the punishment for violating the one-child policy ranged from mild monetary fines to forced abortion. Gender selection technology—the ultrasound B—was introduced in the early 1980s. "Records of the Customs Administration show that 2,175 high-quality color ultrasound B machines were imported in 1989, with the peak years of importation falling between 1985 and 1989." (Zeng et al. 1993) The wide spread of ultrasound B machines made it possible to conduct prenatal sex identification and selection. Under the pressure of the one-child policy, parents with a strong desire for a son, especially when they had already given birth to a daughter, were more likely to have a prenatal abortion until a male fetus came.

However, explanations based on the one-child policy and gender selection technology focus only on the imbalance of the sex ratio since the 1980s, and treat gender preference as given. By investigating the sex ratios from 1950 to 1990, we try to identify whether female political status influenced the sex ratio over a

longer period of time, and whether it worked by transforming society's perceptions about women.

III. Data Sources

We make use of the county chronicles of 1,200 counties,[10] the 1990 census, and the publications of the CCP's local committees to obtain relevant historical information for 1950–90. We also use the 2010 wave of the CGSS to conduct a study of the perception of gender equality. We also consulted geographic information system (GIS) sources to obtain geographical information on the counties. In this section, we provide a description of the data sources and introduce the construction of the key variables we use in our empirical analysis.

Chinese counties have a long history of compiling county chronicles (called *xian-zhi* in Chinese). This tradition was halted after the CCP revolution. By the late 1980s and early 1990s, however, counties began to compile their chronicles again. The chronicles provide retrospective records about the county since 1949. Relevant to our study, they provide annual information on demography, CCP membership and branches, economic production, education and other indicators of social development, and the government budget and its allocation. Most of the data are presented in tables, but some of are scattered in the text. We digitized the relevant tables and, in the later stage of data collection, supplemented them by manual reading of the text.[11] Although a county's geographic boundaries might have changed during 1950–90, the county chronicles adjusted the demographic

[10] The Peking University Library has a collection of about 1,900 county chronicles from 21 provinces (the total number of counties is about 2,700 in the country). However, only about 1,600 of the chronicles report data on party membership, and about 1,200 report data on female party membership. Those counties are fairly evenly distributed across China (see our description in the next section), although counties in the western part of the country are systematically missing. Because the vast majority of the Chinese population lives in the central and eastern parts of the country, this omission is not likely to affect our main results.

[11] We obtained the county chronicles from the Peking University Library. The digitization of the tables and first round of proofreading were delegated to the library staff. We then did several rounds of clearance and collected more data from the text.

records, as well as other political, social, and economic statistics, to its jurisdiction at the time when the chronicles were compiled.

After the round of compilation at the end of the 1980s and the early 1990s, most counties stopped compiling county chronicles. Instead, statistical yearbooks have become the standard annual publication that records the economic and social data of a county. Although we can get most of the socioeconomic data from the statistical yearbooks, not all of them report the composition of CCP membership. In addition, the only source for us to obtain individual-level data that can be matched to specific counties is the 1-percent sample of the 1990 census.[12] That is why our data stop at 1990.

In 1997, the CCP committees at all levels published an internal publication, *The Materials of the Chinese Communist Party's Organizational History: 1921-1997* (*Zhongguo Gongchandang Zuzhi Shi Ziliao*, abbreviated as the *Materials* hereafter). This publication provides detailed information on CCP membership, composition, and local branches in the country and individual counties since the CCP's founding in 1921. We use the data provided by these publications to double-check the data on CCP membership provided by the chronicles. And in cases of missing data in the chronicles, these publications are the major sources we used to fill the gaps.

The published statistics of the 1990 census provide information on birth cohorts. We rely on those statistics to conduct our study of the 1990 birth cohorts. A 1-percent sample from the 1990 census records more detailed individual-level information on education, occupation, marriage, childrearing, and so forth.

The CGSS has been jointly conducted by Renmin University and the Hong Kong University of Science and Technology since 2003. We make use of the

[12] The individual-level data from censuses after 1990 could only be matched to prefectural cities. Another census that published individual-level data matched with county information is the 1-percent sample of the 1997 agricultural census. But it only contains information on the agricultural population.

2010 wave of the CGSS, which contains perception questions on gender inequality. GIS information is obtained from the *Chinese Historical GIS* compiled by the Harvard Yenching Institute (2007).

The main explanatory variables, female membership in the CCP (FP) and CCP membership in the population (CCP), are created based on the annual statistics provided by county chronicles and the *Materials*. In the chapter "Chinese Communist Party" in the chronicles, and the "Statistical Table of Basic Information of CCP Members" in the *Materials*, the number of CCP members each year since 1949 as well as breakdowns by gender, level of education, age, occupation, and ethnic status are recorded. As the data in the chronicles and the *Materials* were mainly compiled from historical documents in the official archives, recall biases should be minimal. The chronicles of each county and the *Materials* use the same classification system, making it possible for us to construct uniform measures.

The main outcome variables, the sex ratio of the population each year between 1950 and 1990 and the sex ratio of birth cohorts in 1990, were obtained from the records in the county chronicles and the 1990 census, respectively. The chronicles record the number of men and women each year. The 1990 census reports the population's gender composition in 1990 by five-year birth cohort. This makes it convenient for us to break the 40 years between 1951 and 1990 into eight periods that correspond to the eight birth cohorts reported for 1951–90 by the census. The main concern is whether migration had an impact on the sex ratios of the 1990 cohorts. If that were true, our estimates of the impact of FP in historical times would be biased. However, the rigid registration system (the *hukou* system) in China heavily impeded migration across regions.[13] Migration was limited

[13] The *hukou* system was introduced in 1958 as a response to the large influx of people from the countryside to the city during the Great Leap Forward. Before that, migration was scant in rural areas. Forty million people entered cities in 1958, but half of them were sent back to their home villages at the end of the 1959–61 famine. Migration was effectively stopped until the late 1980s.

especially before 1990, when even traveling needed an official recommendation. Therefore, we contend that migration was not a significant factor affecting sex ratios during 1950–90.

In our estimations, we also make use of county-level, time-variant socioeconomic variables as controls or outcome variables, including per capita value of industrial output, per capita government budgetary spending and share of social spending, average years of schooling of the population, and average years of schooling by sex.[14] Data on the value of industrial output and budgetary spending are recorded on a yearly basis in the county chronicles, although missing cases are not uncommon. The chronicles do not record educational attainment by gender each year in detail; only some of the chronicles report the results of the 1964 and 1982 censuses. We rely on the 1-percent sample of the 1990 census to infer educational attainment by gender. To be exact, the average years of schooling in a specific year are calculated for people who were age 18 years or older in that year. Individuals are supposed to have finished education by that age. The average years of schooling of each sex are calculated in the same way.[15]

Two other socioeconomic variables we will use are the shares of rural residents and Han people in 1990. Data for both variables were obtained from the 1990 census. Because of the restriction set by the *hukou* system, there were limited changes in the two shares between 1950 and 1990. Therefore, we will treat them as time-invariant in this period. We can control the process of industrialization and urbanization by per capita industrial output. To capture the influence of the Great Famine, we follow Mu and Zhang (2008) and Meng and Qian (2009), and

[14] China's gross domestic product (GDP) accounting was only started in the early 1980s, so the county chronicles do not record GDP data for earlier years.

[15] In the 1-percent census sample, education is recorded by a category variable with values 1, 2, 3, … indicating illiterate, elementary school dropout, elementary school, and so forth. We converted this variable into a continuous variable of years of schooling by the rule illiterate = 0 year, elementary school = 5 years, middle school = 8 years, high school = 10 years, and college = 14 years. Dropout from a certain level is set to be the average of the schooling years one level below and the schooling years of that level.

infer the severity of the famine from the gap between the population of the 1956–58 birth cohort and the population of the 1959–61 birth cohort, using the individual-level data reported by the 1-percent sample of the 1990 census. We also use the 1990 census to construct two county-level variables, employment rate and share of workers in the textile and sewing industry in 1990, which we will control in our regressions.

We obtained a county's geographic attributes from the *Chinese Historical GIS*. (Harvard Yenching Institute, 2007) The attributes include the distance to the provincial capital, the distance to the nearest treaty port, the share of hilly land, and the average altitude.

The one-child policy provides a natural experiment for us to test some of the effects that female political participation could have had on the sex imbalance. The outcome variable for this part of our study is the sex of the second birth. Relevant information at the individual level, including the birth and gender of children, education, occupation, and the size and *hukou* type of the family, all come from the 1-percent sample of the 1990 census.

To test the policy mechanism, we study two outcomes, the share of social spending in county government budgetary spending, and the average births per woman of childbearing age during the one-child policy period. The county chronicles provide annual data for the first variable, and the 1-percent sample of the 1990 census provides data for the second variable.

To check the perception mechanism by which FP impacts the sex ratio, we make use of the individual data provided by the 2010 wave of the CGSS. The opinions about gender equality in the CGSS are measured by five questions. The first is whether males should focus on careers while females focus on families (Family); the second is whether males are born to be more competent than females (Competence); the third is whether it is better for a woman to marry a successful man than to work well (Marriage); the fourth is whether female

workers should be laid off first during an economic recession (Layoff); and the last is whether couples should share housework (Housework). The answers are coded from 1 to 5, with 1 indicating "totally disagree" and 5 indicating "totally agree." To make the values consistent with the rule that a larger number indicates greater bias against women, we reverse the order of the answers to the last question. The survey also provides information about each respondent's gender, age, education, political identity, occupation, marriage status, as well as his or her spouse's corresponding information.

In Appendix I, summary statistics are provided for the variables to be used in this paper.

IV. Female Party Membership in 1950–90

To establish a causal relationship between female political participation and the sex ratio, it is critical for us to make sure that our main explanatory variable, FP, is exogenous with respect to the econometric system we consider. In this section, we provide a detailed descriptive analysis of the distribution of FP in 1950, its evolution over time, and its relationship with the sex ratio.

Table 2 shows the CCP and female party membership at the national level and in our sample counties from 1949 to 1987. The first three columns show the situation at the national level. CCP membership increased steadily in the population, and, except for a short period after 1976, the ratio of female membership also increased at the national level. However, this ratio was still way below the share of women in the population by 1987. Our sample counties do not include any urban districts; party membership in them reflects the CCP's recruitment in the broad rural areas where the majority of residents were still rural until the late 1980s. The last two columns in Table 2 present CCP membership and female party membership in our sample counties. Although CCP membership followed the national trend, FP declined steadily between 1976 and 1987. This

prolonged decline might reflect the party's paradigmatic ideological and organizational shift to recruit better educated, economically more capable, and young members. Apparently, women in the countryside were not as competitive as their counterparts in the city.

[Table 2 about here]

The main worry about the effects of FP on the sex imbalance is that the variation in FP may be a result of influences exerted by regional factors, such as societal perceptions and the spread of education, which also influence the sex ratio. Some of those factors can be controlled by observed variables, but others cannot. Our estimates would fall prey to the missing variable problem if we failed to address this issue. In the following, we will show that the distributions of CCP membership and FP in the early 1950s were highly correlated with the CCP's military activities in the Anti-Japanese War and the following Civil War. The areas of heavy CCP military presence were quite diverse in the level of social and economic development as well as regional culture. Conditional on the observed social, economic, and geographic variables we introduced in the last section, the incidence of CCP membership and FP in the early 1950s was likely to be exogenous to the formation of the sex ratio in future years.

The two figures in Figure 3 present the distribution of CCP regional committees (including CCP committees at the provincial and regional levels) during the Anti-Japanese War and the Civil War, respectively. The committees were concentrated in the Anti-Japanese War base areas and guerrilla areas, such as the Shan-Gan-Ning Base (Shannxi, Gansu and Ningxia border areas), Jin-Cha-Ji Base (Shanxi, Chahaer, and Hebei border areas), and Jin-Ji-Lu-Yu Base (Shanxi, Hebei, Shandong, and Henan border areas), as well as the areas hosting the three major campaigns (Liao-Shen Campaign, Huaihai Campaign, and Ping-Jin Campaign) in which the CCP army won a decisive victory against the KMT army in the Civil

War. Figure 4 presents CCP membership in our sample counties in 1950 (CCP50). CCP membership clearly matched the distribution of the local CCP committees shown in Figure 3. In the areas of Anti-Japanese War bases and the areas hosting the three major campaigns (particularly in northeast China), CCP membership was between 1.09 and 12.13 percent. In all other areas, it was sparse, but not without variations.

[Figures 3, 4 about here]

The Anti-Japanese base areas were underdeveloped by the standards of the 1940s; they still belong to the lower tail of socioeconomic development today. In contrast, two of three major Civil War campaigns, Liao-shen and Ping-Jin, were fought in relatively more advanced areas in the 1940s, one around Shenyang, an industrial powerhouse at the time, and the other around Beiping (currently Beijing), the Qing imperial capital and later a cultural center. The spread of CCP membership in the rest of the country was quicker in areas where the CCP had guerrilla branches before it gained national power (Liu, Zhang, and Zhang, 2015). As Koss (2014) notes, the distribution of CCP membership persisted for a long time. Figure 5 shows that party membership in 1976 and 1985 was still highly correlated with CCP50.

[Figure 5 about here]

The historical evidence gives us confidence that treating CCP membership as exogenous with respect to the formation of the sex ratio is a safe choice.[16] What should worry us is the incidence of FP, because it could be more related to long-

[16] There is a possibility that the incidence of CCP membership in some regions incidentally coincided with some gender-related cultural preferences. For example, in northeast China, which the CCP occupied first at the end of the Anti-Japanese War, CCP membership was high and people did not have a strong son preference. This could produce a spurious positive correlation between CCP membership and the sex ratio in that region, but it does not change the exogeneity of CCP membership. What should worry us is that in that region there would be more female CCP members due to the influence of a more open culture toward women. As we will show, however, this can be effectively controlled once we control for CCP membership.

term cultural preferences that might not be changed quickly by the penetration of the CCP. Next, we will conduct several tests to show that, conditional on the observed social, economic, and geographic variables, female party membership in 1950, FP50, is exogenous to the formation of sex ratios in future years.

We first present in Figure 6 the distribution of FP50. Clearly, the distribution of FP50 followed closely the distribution of CCP membership shown in Figure 4. This finding gives us confidence that, like CCP50, FP50 can be treated as exogenous, conditional on the observed social, economic, and geographic variables. In Figure 7, we split the sample into four quarters by FP50 and present the change in FP for each quarter over time. There was a clear trend of convergence among the four quarters, although the top quarter remained above the other three quarters throughout 1950–90. This raises the question whether the areas hosting the top quarter had different cultural preferences toward women. To answer this question, we explore the determinants of FP over time, by running simple OLS regressions of FP on CCP membership, the sex ratio of the population, provincial dummies, as well as the socioeconomic and geographic variables introduced in the last section, for four representative years: 1950, 1965, 1976, and 1985. The results are reported in Appendix II.

[Figures 6 and 7 about here]

As expected, CCP membership has a significant and positive effect on FP in all years. However, the size of the effect diminishes over time. This finding shows that factors other than the CCP's penetration were playing a more and more important role in determining FP. The contrast is really between 1950 and the later years. In 1950, none of the variables other than CCP50, not even the female-male sex ratio of the population, has a significant effect on FP50. In the later years, the sex ratio of the population and the ratio female education/male education have positive impacts. These two results are somewhat expected,

because the two ratios tend to move together with higher levels of female political participation. A county with a higher ratio of Han population or a higher ratio of rural population, further away from the provincial capital or with more ragged surfaces tends to have a lower level of FP. The result for Han population is probably a result of the CCP's deliberate efforts to recruit female party members among the minority population. The other results indicate that a more rural or remote county tends have a lower level of FP. A somewhat surprising result is that a county of higher altitude tends to have a higher level of FP. This is probably also related to the CCP's deliberate efforts to recruit female party members among the minority population. In summary, the results show the direction of the CCP's efforts to increase female party membership over the years. The most important result is that in 1950 female party membership, FP50, is only affected by the CCP membership in that year.

Figure 8 links the sex ratio in 1950–90 with the four quarters defined by FP50. Panel A in the figure presents the raw data. The sex ratios of the lower three quarters were not distinguishable in 1950. In subsequent years, the first quarter always had the lowest female-male ratios, and the third quarter dominated the second quarter except for a short period around the Great Famine. This pattern holds even if all three quarters of counties started with roughly the same level of the sex ratio as in 1950. The worry is about the fourth quarter, whose sex ratios remained the highest throughout 1950–90. A close check finds that the counties in the fourth quarter are mostly in the north and northeast of China, where son preference was weaker than in the other regions, and the CCP built consolidated Anti-Japanese bases or occupied first at the end of the Anti-Japanese War. Because the sex ratio of the population is a good indicator reflecting the cumulative results of son preference, we regress FP50 on CCP50 and the sex ratio of the population in 1950 (S50), and use the residuals to regroup the counties. The performances of the four new quarters are presented in panel B in Figure 8.

Except for the third quarter, which had a low sex ratio, the other three quarters have similar levels of the sex ratio in 1950. But the first quarter diverged rapidly from the second and fourth quarters to have a lower sex ratio in the 1950s. After the mid-1960s, the order of the sex ratio began to get sorted out, and after 1980 it strictly followed the order of the four quarters of FP50.

[Figure 8 about here]

In summary, we conclude from Figure 8 that FP50 did not have a definitive relationship with the sex ratio in the short run, once party membership (CCP50) and S50 are controlled, but had a positive impact on the female-male sex ratio in the long run. It took time for female political participation to have an impact on the sex ratio, because it was difficult to break up existing social norms. It is quite possible that the new norms had to fight with the old norms, and did not get a definitive victory in the 1950s. The inability of FP50 to determine sex ratios in this period thus supports our identification strategy, namely, once we control CCP50, S50, and as many socioeconomic and geographic variables as possible, FP50 is exogenous to the formation of the sex ratio in future years.

V. Empirical Strategies and Results

A. Empirical Strategy

To derive our empirical model, we first discuss the formation of the sex ratio in the total population over time. Let t denote the calendar year (or time period that we will define). We start by noting that the population of either sex in any year t, say P_{kt}, k = male, female, can be decomposed into two components, its predecessor in year $t - 1$, $P_{kt\text{-}1}$, and the change happening between the two years. The change can be modeled by the combined influence of CCP membership, FP,

and a set of socioeconomic and geographic variables in year $t - 1$ plus a random shock received in year t. So we have

(1) $P_{kt} = \left(P_{kt-1}\right)^{\varphi_k} e^{D_{kt}}$,

where

$D_{kt} = \beta_k FP_{t-1} + \gamma_k CCP_{t-1} + \delta_k Z_{t-1} + \varepsilon_{kt}$, $k = M, F$ indicating the sex.

In the equation, *FP* and *CCP* are, respectively, female membership in the CCP and the CCP's membership in the population, Z is the set of socioeconomic and geographic variables that we used in Appendix II (albeit measured in different years), ε_{kt} is the random shock each sex receives in year t, and β_k, γ_k, φ_k and δ_k are parameters to be estimated. Equation (1) describes the data-generating process (DGP) for our empirical analysis. This DGP is very coarse, because it includes the changes happening in the birth rates and death rates of both sexes at different life stages. We do this because we do not have detailed birth and death data.

To show the long legacy of FP in 1950, we first consider the changes in the sex ratio throughout the four decades, that is, $t = 1990$ and $t - 1 = 1950$. Taking logs on both sides of equation (1) and subtracting the equation for men from the equation for women, we obtain the relationship between the female-male sex ratio in 1990, S_{90}, and the female-male ratio in 1950, S_{50}:

(2) $\ln S_{90} = \beta FP50 + \gamma CCP50 + \varphi \ln S_{50} + \delta Z_{50} + \varepsilon_{90}$,

where $(\beta, \gamma, \varphi, \delta) = (\beta_F, \gamma_F, \varphi_F, \delta_F) - (\beta_M, \gamma_M, \varphi_M, \delta_M)$, and $\varepsilon_{90} = \varepsilon_{F,90} - \varepsilon_{M,90}$. The main parameter of interest is β. Because FP50 is preset with respect to the

dependent variable, neither reverse causality nor simultaneity bias should be a worry to us. The remaining confounding factor for an unbiased estimate of β is the possibility of the existence of missing variables. More specifically, if there were time-persistent but unobserved factors influencing female party membership and the sex ratio over time, then the estimate of β could be biased. However, we believe that this possibility is unlikely to exist under the specification of equation (1), for the reason we provided in the last section. To make it clear, our identification assumption is:

IA. Conditional on CCP50 and S50, as well as the set of socioeconomic and geographic variables Z_{50}, FP50 is orthogonal to ε_{90}.

In addition to the change in the sex ratio over the long period, 1950–90, we are also interested in the performance of female political participation in different sub-periods of time. This exercise is useful because the period 1950–90 was very volatile in political dynamic and economic-social changes. To proceed, we define eight sub-periods: 1951–57 (early years of the PRC), 1958–61 (Great Famine),[17] 1962–66 (pre-Cultural Revolution), 1967–71 (first half of the Cultural Revolution), 1972–76 (second half of the Cultural Revolution),[18] 1977–80 (early years of the post-Mao period), 1981–85 (early years of the one-child policy), and 1986–90 (conclusion of the first decade of the one-child policy). Then we run the following OLS regression for each sub-period:

$$(3)\ \ln S_{it} = \beta FP_{it-1} + \gamma CP_{it-1} + \beta' FP50 + \gamma' CCP50 + \varphi \ln S_{it-1} + \delta Z_{it-1} + \varepsilon_{it},$$

[17] We classify 1958 in the famine period because the sex ratio in this year was quite different from those of the earlier years. This might be due to the massive migration brought by the Great Leap Forward.

[18] The defining event of the two periods of the Cultural Revolution was the escape and death of Mao's heir-designate, Lin Biao, in September 1971.

where t indicates the ending year of a specific sub-period, $t - 1$ indicates the ending year of the previous period, and the definitions of the variables are the same as in equation (2). We add FP50 and CCP50 in the equation to test whether they still have an impact on the sex ratio in later years, once contemporary female party membership and CCP membership of those years are controlled. [19] Because in our panel study we will use FP50 as the IV for FP in the later years, this exercise is meaningful to provide a test for whether FP50 satisfies the exclusion restriction of IV. Except for the sub-period 1951–57, now we need to worry about the missing variable issue for $FP_{t\text{-}1}$ because, as shown by our explorative results in the last section, the correlation between FP and the socioeconomic and geographic variables in later years became stronger over time, thus raising the concern that FP in the later years could be correlated with the error term. So the results in this part are more indicative than decisive.

To deal with the potential endogeneity problem implied by equation (3), we design an IV approach to study the sex ratio of newborns. We note first that the DGP implies that the impact of $FP_{t\text{-}1}$ on the sex ratio of a cohort born in year t is summarized by the sex ratio of the population just before the cohort was born, S_t, or transferred into FP_t.[20] The 1990 census provides data on the sex ratio for five-year birth cohorts in 1990. These data allow us to study eight birth cohorts for 1951–90. To abuse the notation, let t be the starting year of the cohort born in period t (the cohort is also called cohort t); then we can estimate the following two-way FE model:

$$(4)\quad \ln S_{it,90} = \beta FP_{it} + \gamma CP_{it} + \varphi \ln S_{it} + \delta W_{it} + \theta_i + \mu_t + \varepsilon_{it,90},$$

[19] For the subperiod 1951–57, we have $t - 1 = 1950$. So in the regression for that subperiod, CCP50 and FP50 appear as $CCP_{t\text{-}1}$ and $FP_{t\text{-}1}$.

[20] However, the sex ratio of the population in year t is directly affected by $FP_{t\text{-}1}$, because it includes people born before that year.

where $S_{it,90}$ is the female-male sex ratio of cohort t of county i in 1990, W_{it} is the set of time-variant variables introduced in section 3, θ_i is the FE for county i, μ_t is the FE for period t, and $\varepsilon_{it,90}$ is an i.i.d. error term. All the right-hand-side variables are measured in the starting year of period t. The parameters to be estimated measure the effects of the right-hand-side variables on newborns. For female political participation in past years to have an effect, its impacts have to go through the childhood and adulthood of a particular cohort.

The county FEs control all the time-invariant unobserved factors that might affect FP_{it} and $S_{it,90}$. However, FP_{it} still may not be orthogonal to $\varepsilon_{it,90}$ because of county-specific, time-variant factors. For example, during the Cultural Revolution, some counties might have taken more radical moves than others to recruit female members into the CCP and at the same time to push harder for gender equality. To deal with this issue, we use FP50 to instrument FP_{it}. Clearly, FP_{it} is highly correlated with FP50. To see that FP50 satisfies the exclusion restriction, we note that $FP50$ could influence $S_{t,90}$ only through the following three channels: (1) it was correlated with $S_{t,90}$ through some long-lasting unobservable cultural traits; (2) it changed women's status, which had been manifested by the sex ratios before period t; and (3) it changed women's status, which could have a long-lasting effect through and beyond period t, including (3a) a persistent component that has never changed since, and (3b) an evolving component that has changed over time. Apparently, the first channel is controlled by the county FEs, and the influence through the second channel is summarized by S_t. As for the third channel, the first component is also captured by the county FEs, because the impact predates the econometric system, and the second component is captured by FP_t, fulfilling the very idea of instrumentation.

The challenge is that FP50 does not vary over time. But Figure 7 tells us that there was a strong trend of convergence for FP. This reminds us to link the change

in FP, instead of its level, to FP50. After several rounds of experimenting,[21] we settled on the following instrument for FP_{it}:

$$(5)\quad FP_{IV,it} = FP50_i \times FP50_i \times \sum_{t=1}^{8} tD_t \ ,$$

where D_t is a dummy variable for period t. Because it is constructed from FP50, $FP_{IV,it}$ is correlated with FP_{it} as long as FP50 is correlated with FP_{it}. The square of FP50, instead of FP50 itself, is used to simulate the speed of convergence shown in Figure 7. In a panel IV regression, our construction in effect assumes that the change in FP over a period is correlated with FP50 squared. Because of the convergence of FP, $FP_{IV,it}$ should have a negative coefficient in the first-stage regression.

B. Empirical Results

Several OLS results of equation (1) for the legacy of FP50 are presented in Table 3. Columns (1) to (3) are the results for the whole sample. Column (1) does not include the socioeconomic and geographic variables. The coefficient of FP50 is highly significant and positive; the coefficient of CCP50 is not significant; and, as expected, the coefficient of S50 is highly significant and positive. Column (2) adds three socioeconomic variables measured in 1950: per capita industrial output, female education/male education, and mean years of schooling of the population. Column (3) adds all the additional socioeconomic and geographic controls. The results for FP50, CCP50, and S50 in columns (2) and (3) are qualitatively the same as those in column (1), although the magnitude of the coefficient of FP50

[21] The purpose of our experiment is mainly to find an instrument that satisfies the exclusion restriction and produces stable and reasonable estimates in the second-stage regression. Because the instrument can be any variable as long as it is correlated with the endogenous variable and uncorrelated with the error term, we have a wide range of room for the experiment.

declines, and the coefficient of CCP50 turns slightly significantly negative in column (3). Among the control variables, the only surprising result is that the ratio female education/male education in 1950 has a significant and negative impact on the population's female-male ratio in 1990.

[Table 3 about here]

Even by the estimate provided in column (3), the impact of FP50 is not trivial. The point estimate indicates that for an increase of one percentage point in FP50, the female-male ratio in 1990 would increase by 0.05 percentage points. Between 1950 and 1975, female party membership increased by 4.58 percentage points on average in the sample counties, while the female-male ratio of the population increased by 1.32 percentage points (computed from the figures provided in Figure 1). So the contribution of increasing female party membership constitutes 17 percent of the total increase of the female-male ratio.

The contrast between the performances of female party membership inside the CCP and the CCP's own membership in the population is striking. It shows that female political participation improves women's survival rates even when the CCP's overall political mobilization does not have any effect, or, if it does, it functions through the mobilization of women.

The last three columns in Table 3 repeat the regressions in the first three columns, using a smaller sample that excludes the counties in the top quarter of FP50. Panel A in Figure 8 shows that the sex ratios of this quarter were systematically higher than those of the rest of the sample counties. Excluding this quarter can potentially give us a more robust identification. The results for FP50 are qualitatively the same as those in the first three columns, although FP50 now has larger coefficients. Considering the diverging performances of the three lower quarters shown in panel A in Figure 8, this result is not surprising.

Table 4 presents the OLS results of equation (3) for the eight sub-periods defined in the last subsection. We do not show the results for the socioeconomic and geographic variables to save space. Although contemporary CCP membership still has no effect, or even a negative effect in some periods, the impact of contemporary female party membership remains significantly positive in all the sub-periods except 1962–66 and 1981–85 when it turned insignificant. However, there are significant variations among the other periods. Female party membership had the strongest effect in 1958–61, when the Great Famine happened. An increase of one percentage point in female membership would lead to an increase of 0.16 percentage points in the female-male ratio in that period, more than three times the impact obtained for 1950–90. This result is obtained after controlling for the severity of the famine. The impact is also very strong in the second half of the Cultural Revolution, 1972–76. The equivalent figure is 0.12 percentage points, more than two times the impact for 1950–90. The Great Famine was an extraordinary event. Political organizations could collapse as a result of its severity. The finding that female political participation had the strongest impact during the famine shows exactly the opposite. A careful historical study is needed to find out how that happened. The result for the second half of the Cultural Revolution is easier to understand, because this was the period of the fastest increase in women's political status.

[Table 4 about here]

A striking result is that neither FP50 nor CCP50 had a significant effect in any subperiod. This is an important result for our identification strategy in the panel IV regressions of equation (4). It means that once their contemporary counterparts are controlled, FP50 and CCP50 lose explanatory power for the sex ratio of the population in subsequent periods. That is, FP50 and CCP50 can be treated as

exogenous to the econometric system studying the sex ratio in later years. This finding is even stronger for equation (4), which studies newborns in a certain period later than 1950.

Finally, Table 5 presents the results of panel regressions for equation (4). Column (1) shows the FE results without considering the endogeneity problem of FP. The coefficient of FP is 0.21, much larger than we obtained in the OLS regressions for the sex ratio of the population. However, now CCP membership is shown to have a significantly negative coefficient. This raises the question whether the large positive effect of FP is brought about by the high correlation between FP and CCP membership. So we delete CCP membership and FP, respectively, from the regression and present the results in columns (2) and (3). In column (2), where CCP membership is deleted, the coefficient of FP indeed becomes smaller, but nevertheless remains highly significantly positive. In column (3), where FP is deleted, the coefficient of CCP membership remains highly significantly negative, albeit its magnitude becomes smaller. In the next two columns, we present the IV results for the specifications of the first two columns, respectively. The Cragg-Donald F-statistics in both IV regressions are very large. Considering the strong trend of convergence in female party membership, this should not be a surprising result. The regressions produce estimates of FP whose values are very close to those of the corresponding FE regressions reported in columns (1) and (2), avoiding the common problem of inflated IV estimates. We also add the IV $FP_{IV,it}$ in the FE regressions, and find that $FP_{IV,it}$ is not significant in any regression, suggesting that the IV satisfies the exclusion restriction. Lastly, in columns (6) and (7), we confine our sample to the birth cohorts of 1971–90, so that the effect of FP50 is more likely to be exerted through contemporary FP. Column (6) presents the FE results, and column (7) presents the IV results. Column (6) produces a larger estimate for FP than that in column (1), but the IV estimate in column (7) is more inflated than the IV

estimate in column (4). In general, it seems that FP has a larger effect in 1971–90 than in earlier years, a result that is consistent with the trends shown in Figure 8.

[Table 5 about here]

A somewhat surprising result is that the coefficient of S_{it} is significantly negative in columns (1) to (5). This result is likely caused by the nature of the two-way FE method and our study of newborn cohorts. This method only takes within-county variations into consideration; thus, the coefficient is produced by the change in the sex ratio over two adjacent newborn cohorts. So the negative coefficients of S_{it} only reflect the inertia of growth in the sex ratio.

VI. Impacts of Female Political Participation at Different Life Stages

Having established the positive role of female political participation in reducing the sex imbalance, our next task is to identify whether this positive role is mainly manifested by FP's contributions to the survival of women during their infancy and childhood or during adulthood. The tradition of son preference, infanticide, and abandonment of newborn girls, along with the neglect of their health and nutritional intake, could lead to premature death of girls. In contrast, young and adult women might be more resilient to maltreatment and abuse. The introduction of the one-child policy and prenatal sex identification technology in the early 1980s brought widespread prenatal sex-selective abortions, especially in the case of second births. Thus, we will also study whether female political participation helped to improve the female-male ratio of second births when the first birth was a girl.

The challenge is that the 1990 census does not provide data on sex ratios for life stages by cohorts. This forces us to focus again on the sex ratio of each cohort in 1990, $S_{t,90}$. The periods we work with are the same as those defined for equation

(4). What is different here is that we now divide a birth cohort's life into two stages: infancy-childhood (ages 0 to 10 years), and youth-adulthood (ages over 10 years). Let τ denote life stage, with $\tau = C$ indicating infancy-childhood, and $\tau = A$ indicating youth-adulthood. Because birth cohorts are defined by a five-year interval, a cohort born in period t entered youth-adulthood in period $t + 2$. For cohort $t \leq 6$, $\tau = C$ corresponds to the periods t and t+1; and $\tau = A$ corresponds to the periods $t + 2,\ldots, 8$. Cohorts 7 and 8 were only in their childhood and infancy during our study period, so we will drop them in our regressions. Following the DGP presented for equation (1), the population of either sex in 1990 of cohort t, $t = 1$ to 6, can be decomposed into two parts, one corresponding to infancy-childhood and the other corresponding to youth-adulthood:

(6) $P_{kt,90} = P_{kt,C} D_{kt,A}$, $k = M, F$.

where $P_{kt,C}$ is the (unobserved) population of a cohort at the end of their childhood, which we parameterize as the follows:

(7) $P_{kt,C} = \exp\left(\beta_{kC} FP_t + \delta_{kC} W_t + \varepsilon_{kt,C}\right)$.

To abuse the notation, now W_t includes CCP_t and S_t as well as the time-variant socioeconomic variables. $D_{kt,A}$ describes the survival rate of cohort t in its youth-adulthood. We parameterize it as the follows:

(8) $D_{kt,A} = \exp\left(\beta_{kA}\ FP_t + \gamma_{kA} FP_{t+2} + \delta_{kA} W_t + \delta_{kA}{}' W_{t+2} + \varepsilon_{kt,A}\right)$.

In the equation, FP_t and W_t enter because welfare in infancy and childhood, such as the nutrition supply, which was impacted by the variables in period t, may have a persistent influence through the cohort's youth-adulthood. Then the sex ratio of cohort t in 1990 is

(9) $\ln S_{t,90} = (\beta_C + \beta_A)FP_t + \gamma_A FP_{t+2} + (\delta_C + \delta_A)W_t + \delta_A' W_{t+2} + \varepsilon_t$,

where

$(\beta_C, \beta_A, \gamma_A, \delta_C, \delta_A) = (\beta_{FC}, \beta_{FA}, \gamma_{FA}, \delta_{FC}, \delta_{FA}, \delta_{FA}') - (\beta_{MC}, \beta_{MA}, \gamma_{MA}, \delta_{MC}, \delta_{MA}, \delta_{MA}')$

is the vector of parameters and

$\varepsilon_t = \left(\varepsilon_{Ft,C} + \varepsilon_{Ft,A}\right) - \left(\varepsilon_{Mt,C} + \varepsilon_{Mt,A}\right)$.

Equation (9) is the specification that we will use. We can only estimate $\beta_C + \beta_A$, which measures the cumulative impact of FP_t, not β_C and β_A separately. If we find that $\beta_C + \beta_A > \gamma_A$, we can conclude that to affect a cohort's sex ratio in 1990, female political participation in the time of the cohort's infancy-childhood is more important than female political participation in the time of its youth-adulthood. Furthermore, if FP_{t+2} plays a more significant role than FP_t in determining the survival rate in a cohort's adulthood, that is, $\beta_A \leq \gamma_A$, we know that β_C must be positive. That is, female political participation has a positive effect on the cohort's childhood.

Table 6 shows the regression results of equation (9). Like equation (4), this model allows us to estimate it by the two-way FE method, which controls county FEs and cohort (period) FEs. For comparison, we also report the results of the pooled OLS. The FE and OLS regressions produce very similar estimates for FP_t, which are both significantly positive. In contrast, the coefficient of FP_{t+2} is statistically and economically insignificant in the FE regression, and weakly significantly negative in the OLS regression. So as far as the impact on a cohort's sex ratio in 1990 is concerned, female political participation in the time of the cohort's infancy-childhood is much more important than female political participation in the time of its youth-adulthood. This result should not be

surprising, because young girls are more vulnerable than young or adult women to social norms against women, and the maltreatment and neglect a girl receives in her childhood may have long-lasting effects.

[Table 6 about here]

The last column in Table 6 reports the results of the panel IV regression. For FP_t, we still use the IV defined by equation (5). For FP_{t+2}, we replace FP50 by FP55, because FP_{t+2} starts in 1961. The estimates for FP_t and FP_{t+2} remain qualitatively the same as those produced by the FE, although both are inflated in size.

Under the assumption that FP_{t+2} plays a more significant role than FP_t in determining a cohort's survival rate in its youth-adulthood, we can conclude from the results in Table 6 that female political participation has a positive effect on the cohort's childhood. Next, we provide additional evidence using the one-child policy as a natural experiment. The literature finds that after ultrasound B machines were introduced, the one-child policy significantly increased the probability of gender-selective abortions on second and higher-order births (Li, Yi, and Zhang, 2011). According to Central Document 7 of 1984, rural families could have a second child if the first one was a girl. We thus expect that selective abortions were especially severe for second or higher-order births among families whose first child was a girl. This provides an opportunity to conduct an almost ideal test for whether female political participation affects the sex ratio at birth.

Taking advantage of the household-level data provided by the 1-percent sample of the 1990 census, we focus on the gender of second births during the first decade of the one-child policy (1980–90) among families whose first baby was a girl. We focus on the second birth because higher-order births might be affected by families' budget constraints. In addition, we check whether the situation differs

between rural and urban families, because the demand for sons and the desire for more children were much stronger in rural areas. As a falsification test, we also study whether female political participation has a significant impact on the sex of the second birth in 1976–79, just before the one-child policy was about to be implemented. Supposedly, when there was no constraint on the number of children, families did not need to care about the sex of their second baby. As a result, better female political participation did not necessarily affect the sex balance of second births before the one-child policy was introduced. However, after the policy was introduced, its impact could be increased because families with son preference now had greater urgency to have a boy once their first baby was a girl.

Table 7 presents the results. The dependent variable is a binary variable indicating whether a family's second child was a girl when its first child was a girl. The linear probability model is adopted to run the regressions. The explanatory variable is female party membership in 1975, FP75. We also control CCP membership, CCP75; the female-male sex ratio in the population; the value of per capita industrial output in the same year; as well as a set of county- and family-level observable characteristics, which are listed below the table.

[Table 7 about here]

The baseline results for periods 1976–79 and 1980–90 are presented in columns (1) and (2), respectively. The contrast is stark: female party membership has a positive and significant effect in 1980–90, but not in 1976–79. If the number of women members increased by one percentage point in 1975, the probability of the second birth being a girl in 1980–90 would be increased by 2.2 percent. Another contrast is that the effects of CCP membership and the sex ratio in 1975 are significantly positive and large in both periods. This finding shows that female

political participation has an independent impact. However, our finding may still be confounded by the lack of sufficient control of social norms, although we believe that the sex ratio in 1975 has already placed a control on social norms. To deal with this possibility, we obtain the county FE from a panel IV regression of equation (4) on the sample counties before 1975, and stack them to create a new variable that serves as an additional control in the regressions. This new variable summarizes all the county-level unobserved cultural traits that might affect people's attitudes toward women. The new results for the two periods are presented in columns (3) and (4) in Table 7. They are qualitatively the same as the results in the first two columns.

All four columns show that rural families are more likely to choose the sex of the second birth than urban families in both periods, and Han families are more likely to do so in 1980–90. The first result is expected, and the second result makes sense because Han families traditionally had stronger son preference than minority families, and family planning was only loosely implemented for minorities. Columns (5) and (6) present the results for rural and urban families separately for 1980–90. As in columns (3) and (4), the variable of county FE is added. The positive effects of female party membership and the CCP's own membership entirely come from rural families, as does the difference between Han families and minority families.

In summary, using the one-child policy as a natural experiment, we find strong evidence that female political participation increases the sex ratio of second births after the policy was introduced. The other results reported in Table 7, notably, those for CCP membership, the contrast between rural and urban residents, and the contrast between Han and minorities, provide additional support for this result.

VII. Mechanisms

How did female political participation act to reduce the sex imbalance? In this section, we test the two mechanisms, that is, the policy mechanism and the perception mechanism, which we introduced in section 2. To test the policy mechanism, we conduct the following two studies: (1) whether more female political participation increased a county's budgetary expenditure that had the potential to improve the welfare of women; and (2) whether more female political participation had an impact on the implementation of the one-child policy. We do not have direct measures to account for the perception mechanism. As an alternative, we use the individual-level data provided by the 2010 wave of the CGSS to investigate whether party membership changed a woman's and her husband's perceptions about gender equality.

A. Social Spending

The county chronicles provide annual data for a county's social spending as well as total budgetary spending. For social spending, the chronicles include spending on education, sanitary and health facilities, and social relief. Although they would improve the population's welfare in general, these items would be likely to improve women's welfare more. Because men enjoyed better education in the past, and women began to narrow the gap with men since the Mao era, more spending on education would benefit women more than men. However, women were more vulnerable than men were to the risks of hazardous sanitary and health conditions, primarily because women faced the risks of childbearing.[22]

The data provided by the county chronicles allowed us to build a panel that runs from 1953 until 1985. The outcome variable is log per capita social spending. We

[22] The role of social relief was unclear, because it was mostly aimed at sick and old families or families that were subject to natural disasters. However, most of the county chronicles do not provide more disaggregated data.

control log per capita budgetary spending and the lagged term of log per capita social spending in the regressions. To reduce the noise in the data, we divide the period into seven sub-periods: 1953–57, 1958–60, 1961–65, 1966–70, 1971–75, 1976–80, and 1981–85. For each sub-period, we calculate average per capita budgetary spending and per capita social spending. For the right-hand-side variables, in addition to FP and CCP membership, we also include average years of schooling of the population, the ratio female schooling years/male schooling years, and per capita industrial output. All the variables take the value in the initial year of each sub-period.[23]

Our preliminary exploration found that CCP50 had long-lasting impacts on government budgetary and social spending. There could be two reasons for this finding. First, the central government could give larger fiscal transfers to the counties with a heavier CCP military presence before and thus with a more consolidated power base. Second, counties with higher levels of initial CCP membership were more organized, so they were able to collect more taxes. In Figure 9, we divide the sample counties into four equal quarters by CCP50, and show their average log per capita budgetary and social spending in 1953–85. Panel A shows log per capita budgetary spending. Counties in the higher-order quarters had higher levels of budgetary spending in 1953, and that pattern persisted stably until 1985. Panel B shows log per capita social spending. Although the pattern in panel A still existed, there was a strong trend of convergence. It seems that counties in the higher-order quarters set a target of social spending and other counties tried to meet that target over time. This suggests that we need to control CCP50. Because we will still instrument FP using the instrument defined as FP50, shown in equation (5), and FP50 was

[23] Because budgetary and social spending are in logarithm terms, inflation is absorbed by the period dummies, so we do not need to worry about it in our regressions.

highly correlated with CCP50, we control the influence of CCP50 by constructing a variable "CCP50×time trend" as follows:

$CCP50_i \times \sum_{t=1}^{7} tD_t$.

In the FE regressions, this variable controls the convergence of per capita social spending.

[Figure 9 about here]

Table 8 reports the results of the FE and instrumented FE regressions. Consistent with the convergence story, a significantly negative coefficient is produced for the variable "CCP50×time trend" in both regressions. Neither the FE regression nor the instrumented FE regression produces a significant estimate for female political participation. This finding can be contrasted with the case of contemporary CCP membership, which has a positive and significant estimate in both regressions. We conclude that female political participation does not have a significant impact on social spending.

[Table 8 about here]

B. Implementation of the One-Child Policy

Next we check the influence of female party membership on the implementation of the one-child policy. As there was a lot of flexibility in the application of the policy at the grassroots level, we should find some correlations between female party membership and the birth rates of a county between 1981 and 1990, if female political participation influenced policy. The outcome variable is average births of women of childbearing age in the period. The explanatory variable is female party membership in 1980 (FP80). The control

variables include CCP membership and socioeconomic and geographic variables, all measured in 1980. Following Qian (2008), we add two new variables, the employment rate and the share of workers in the textile and sewing industry, to control for the opportunity cost of having more children. To control for social norms that affected the number of children a family would have, we follow the method we used in Table 7 to estimate a variable of county FE. This time we conduct a panel regression for the average number of children in a county, given by women of childbearing age during 1966–70, 1971–75, and 1976–80. Contemporary FP, instrumented by the instrument constructed in equation (5), as well as other related variables, are included to estimate the county FE. Table 9 reports the results of the implementation of the one-child policy. Column (1) does not include the variable of county FE, and column (2) does include it. It is evident that female party membership does not have any significant effect on the average number of births no matter whether the county FE are taken into account.

[Table 9 about here]

C. Female Political Participation and Individual Attitudes toward Women

We use the answers to the five questions about gender equality provided by the 2010 wave of the CGSS to study whether party membership affects women's own as well as their husbands' perceptions about gender equality. We only study individuals over age 40 years, because their opinions are more stable than those of younger people, and the periods during which they grew up coincided more with the period in this study. The ordered probit model is applied to study the answers to each question. For the explanatory variable, we are primarily interested in women's party membership, and want to know how it influences women's own and their husbands' answers. The results are presented in Tables 10 and 11. The control variables are listed in the tables.

[Tables 10 and 11 about here]

Table 10 uses the whole sample and studies how a woman's party membership affects her own perception about women. First, an average woman is not particularly more inclined to favor gender equality than an average man is. The average woman is more likely than the average man to believe that it is more important for a woman to marry a successful man than to succeed herself. However, the average woman is more likely to disagree that the wife should do more housework than the husband, or that women should be laid off first in an economic downturn. However, the average woman is not much different from the average man regarding the question about family and competence. Echoing the CCP's ideological orientation, party members are more likely to favor gender equality than ordinary people are. In particular, party members express significantly stronger opinions in disagreement with questions (2), (3), and (4) than ordinary people do. The most important finding is that female party members are even more likely to favor gender equality than either male party members or non-member women, particularly on questions (1), (3), and (4). As expected, a rural resident is more likely than an urban resident to give a more positive answer to each of the five questions, and people with more education are inclined to give more negative answers.

Table 11 uses the sample of men and studies how the party membership of a man's wife affects his answers to the five questions. Although the findings for the other variables are consistent with those presented in the previous table, we find that the wife's party membership makes the husband more inclined to give a more negative answer to each of the five questions, and the gap is statistically significant for questions (1), (2), and (5).

Although they may be subject to the challenge of the existence of some unobserved confounding factors that affect party membership and gender

preferences, the results indicate that being a party member is not only associated with a woman's own positive view on gender equality, but it is also associated with her husband's positive view on gender equality. The possibility that women's political participation changes people's perceptions about women cannot be ruled out.

VIII. Conclusion

Women's liberation was an essential part of China's modernization process in the last century. More positive perceptions about gender equality, as well as the improved status of women in political life contributed to this great transformation. Using data compiled from county chronicles and combining them with the 1990 census, we find that the growing number of women members of the CCP, as a symbol of women's improved political status, played a significant role in reducing the sex imbalance in 1950–90. The influence still existed in the post-Mao period, particularly after the one-child policy was installed, and it was more significant for girls in their infancy and childhood. Additional econometric exploration suggests that the positive effect of female political participation was more likely to be realized by transforming people's perceptions about gender equality than by changing government policies. Those results show that female political participation does have long-lasting effects on the society.

In addition to contributing to the literature on female political participation, our paper makes a significant contribution to the study of modern Chinese history. To the best of our knowledge, our study is the first to utilize the county chronicles to study the Mao era, and the first to offer a systematic assessment of the spread of female CCP membership and its impacts on the sex imbalance in the countryside. The Mao era witnessed some of the most devastating damages to Chinese society in the country's recent history. Our paper by no means is intended to glorify this period of time. Nevertheless, the rise of women's status was a distinctive

achievement of the Mao era, particularly in the countryside. By establishing a causal relationship between the rise of female party membership and the increase in the female-male ratio, we have shown that raising women's political status was one of the channels to ignite improvement in women's overall welfare in the Mao era.

However, our results also establish a causal relationship between the decline of female party membership and the decline of the female-male sex ratio in the first 15 years of the post-Mao era. Between 1975 and 1985, female party membership declined by 1.12 percentage points in our sample counties. Using the estimate provided by the IV regression reported in Table 5, this would be translated into a decline of 0.32 percentage points in the female-male sex ratio of newborn cohorts, or 12 percent of the total decline in the average female-male sex ratio of newborn cohorts in the 1970s and 1980s.

Women's political participation has been progressing more slowly in the post-Mao era. Our data from the county chronicles show that regress even has happened in the countryside. In the meantime, women's social status has declined. The female labor force participation rate has declined substantially; discrimination against women in the workplace is not uncommon (Lai et al., 2016). Further, women's self-perception has changed. Field experiments conducted in Beijing and Taipei by Booth et al. (2016) on three cohorts of people born in 1958, 1966, and 1977, respectively, find that Beijing women from the 1958 birth cohort are more competitive than Beijing women from later birth cohorts. There must be complex causes behind the negative trends in the reform era, but one of them is certainly the CCP's own transformation from a revolutionary party to a pragmatic party that takes economic growth as its first priority. Although the results of this transformation have been largely positive, it is probably time for the CCP to correct some of its negative social consequences,

among which the regress of women's political, social, and economic status is a significant one.

Notwithstanding the declining trend, women in contemporary China are still likely to enjoy higher status than women in other countries with comparable conditions. Despite the sharp decline, China's female labor participation rate was 64 percent in 2010, still much higher than the world average ((Lai et al., 2016). Booth et al. (2016) also find that Beijing women are significantly more inclined to compete than Taipei women. Rising female political participation in the Mao era did have exerted long-lasting effects on the Chinese society.

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TABLE 1. SEX RATIOS IN CHINESE HISTORY

Period	*Estimated sex ratio (female as 100)*
1368-1398	112.93
1749-1845	116-121
1909-1911	121.71
1932-1936	113.04
1946-1947	110

Note: Sex ratios are for the whole population. They are collected from the estimates provided by Jiang (1998). The estimates for years before 1900 are based on the historical county chronicles compiled in the Qing Dynasty, and estimates for years after 1900 are obtained using the historical materials of the household censuses done by the KMT government.

TABLE 2. CCP AND FEMALE PARTY MEMBERSHIP IN SELECTED YEARS (MILLIONS)

Year	Nationwide			Sample counties	
	Number of CCP members	*Population share of CCP members* (%)	*Share of female members* (%)	*Population share of CCP members* (%)	*Share of female members* (%)
1949	4.49	0.83	11.85	0.91	8.65
1955	9.39	1.53	10.07	1.36	9.58
1965	18.71	2.58	11.52	2.18	11.47
1975	33.38	3.61	13.23	2.81	13.09
1976	35.08	3.74	13.53	2.91	13.19
1978	36.98	3.84	13.46	3.01	12.89
1981	39.66	3.96	13.42	3.14	12.23
1985	44.26	4.18	13.71	3.28	11.80
1987	47.76	4.37	14.17	3.46	11.67

Note: National data are obtained from the CCP internal publication *The Materials: 1921-1997*, Volume 7. Data for sample counties are obtained from *The Materials* compiled by each county as well as the county chronicles. County chronicles and the *Organization Materials* were mainly compiled in the late 1980s and early 1990s, so records are only available until the late 1980s.

TABLE 3. THE IMPACTS OF FP50 ON THE POPULATION'S SEX RATIO IN 1990

	Ln(*S90*)					
Variable	*Whole sample*			*fourth quarter of FP50 excluded*		
	(1)	(2)	(3)	(4)	(5)	(6)
FP50	0.111***	0.0900***	0.0524**	0.179***	0.139***	0.0845*
	(0.0235)	(0.0252)	(0.0243)	(0.0422)	(0.0445)	(0.0449)
CCP50	-0.0935	-0.0930	-0.213*	0.194	0.159	0.127
	(0.0968)	(0.0983)	(0.120)	(0.163)	(0.161)	(0.228)
Ln(S50)	0.201***	0.202***	0.179***	0.201***	0.200***	0.183***
	(0.0101)	(0.0106)	(0.0112)	(0.0117)	(0.0122)	(0.0131)
Ln(per-capita industrial output50)		0.00468***	0.00540***		0.00517***	0.00530**
		(0.00142)	(0.00172)		(0.00167)	(0.00214)
Female edu50/Male edu50 (years)		-0.0261**	-0.0207*		-0.0260**	-0.0218
		(0.0116)	(0.0116)		(0.0132)	(0.0137)
Mean pop edu50 (years)		0.00608***	0.00468***		0.00530***	0.00442**
		(0.00149)	(0.00148)		(0.00171)	(0.00175)
Share of Han			-0.0153**			-0.0163**
			(0.00639)			(0.00724)
Share of rural residents			0.0138			-0.000804
			(0.0197)			(0.0243)
Ln(distance to provincial capital)			-0.00396**			-0.00543***
			(0.00160)			(0.00204)
Ln(distance to nearest treaty port)			0.00286			0.00397*
			(0.00192)			(0.00235)
Average altitude (km)			-0.00902***			-0.00921**
			(0.00333)			(0.00395)
Share of hilly grounds			-0.0327***			-0.0303***
			(0.00575)			(0.00732)
Provincial dummies			Y			Y
Obs.	969	918	918	736	700	700
R-squared	0.321	0.358	0.507	0.304	0.333	0.467

Note: Standard errors clustered at the provincial level are in parentheses. Significance levels: * 10%, **5%, ***1%.

TABLE 4. RESULTS OF OLS REGRESSIONS FOR SUB-PERIODS

	$Ln(S_t)$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variable	t =1957	t =1961	t =1966	t =1971	t =1976	t =1980	t =1985	t =1990
	t-1=1950	t -1=1957	t -1=1961	t -1=1966	t -1=1971	t -1=1976	t -1=1980	t -1=1985
FP_{t-1}	0.100**	0.156***	-0.0102	0.0770*	0.124***	0.0919**	-0.000186	0.0648**
	(0.0449)	(0.0604)	(0.0523)	(0.0397)	(0.0309)	(0.0323)	(0.0276)	(0.0306)
CCP_{t-1}	-0.379*	-0.108	0.232	0.0194	-0.494***	-0.217	0.0448	-0.114
	(0.224)	(0.319)	(0.172)	(0.206)	(0.147)	(0.137)	(0.111)	(0.118)
$Ln(S_{t-1})$	0.724***	0.734***	0.600***	0.748***	0.739***	0.791***	0.754***	0.749***
	(0.0207)	(0.0200)	(0.0174)	(0.0163)	(0.0142)	(0.0147)	(0.0141)	(0.0175)
FP50		-0.0176	0.0446	-0.00983	0.0298	0.0202	0.0240	-0.00772
		(0.0426)	(0.0337)	(0.0244)	(0.0190)	(0.0169)	(0.0147)	(0.0156)
CCP50		-0.0230	-0.215	-0.0842	0.126	-0.0346	-0.0686	-0.0244
		(0.280)	(0.185)	(0.145)	(0.106)	(0.0945)	(0.0795)	(0.0824)
Other controls	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	892	928	935	951	953	954	945	935
R-squared	0.732	0.765	0.747	0.825	0.855	0.858	0.852	0.806

Note: Standard errors clustered at the provincial level are in parentheses. Significance levels: * 10%, **5%, ***1%. For the regression for the period 1959–61, the severity of the Great Famine is controlled. "Other controls" include the social-economic and geographic variables used in Appendix II, as well as provincial dummies.

TABLE 5. RESULTS OF PANEL REGRESSIONS FOR THE SEX RATIOS OF BIRTH COHORTS IN 1990

Variable	*FE* (I)	*FE* (II)	*FE* (III)	*IV*(I)	*IV*(II)	*FE*(IV)	*IV*(III)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1951–90	1951–90	1951–90	1951–90	1951–90	1971–90	1971–90
FP_t	0.208***	0.161***		0.282***	0.189***	0.332***	0.640**
	(0.0256)	(0.0244)		(0.0690)	(0.0585)	(0.0527)	(0.319)
CCP_t	-0.704***		-0.205**	-0.759***		-0.0389	-0.254
	(0.120)		(0.101)	(0.157)		(0.228)	(0.377)
Ln(S_t)	-0.0534***	-0.0462***	-0.0211*	-0.0571***	-0.0481***	-0.0214	-0.0438
	(0.0142)	(0.0142)	(0.0120)	(0.0157)	(0.0155)	(0.0263)	(0.0337)
Other time-variant controls	Y	Y	Y	Y	Y	Y	Y
County fixed effects	Y	Y	Y	Y	Y	Y	Y
Period fixed effects	Y	Y	Y	Y	Y	Y	Y
Number of counties	1,193	1,193	1517	965	965	1174	959
Cragg-Donald Wald F-statistic				1157.25	1521.01		93.99
Obs.	8,451	8,455	1,1213	7,482	7,485	4,445	3,779
R-squared	0.466	0.463	0.437			0.621	

Note: Standard errors clustered at the county level are in parentheses. Significance levels: * 10%, **5%, ***1%. "Other time-variant controls" include per capita industrial output, female education/male education, and mean population education.

TABLE 6. THE EFFECTS OF FEMALE POLITICAL PARTICIPATION IN DIFFERENT LIFE STAGES

	$Ln(S_{t,90})$		
Variable	OLS	FE	FE + IV
	(1)	(2)	(3)
FP_t	0.243***	0.221***	0.451***
	(0.0228)	(0.0259)	(0.102)
FP_{t+2}	-0.0411	-0.0194	-0.245
	(0.0261)	(0.0331)	(0.175)
CCP_t	-0.0724	-0.633***	-0.890***
	(0.0923)	(0.121)	(0.182)
CCP_{t+2}	-0.505***	-0.467***	-0.326*
	(0.106)	(0.116)	(0.190)
Ln(S_t)	0.0599***	-0.0470***	-0.0527***
	(0.0131)	(0.0155)	(0.0171)
Ln(S_{t+2})	0.0647***	-0.0175	0.00268
	(0.0162)	(0.0167)	(0.0251)
Cragg-Donald Wald F-statistic			102.173
Other time-variant controls at *t*	Y	Y	Y
Other time-variant controls at *t*+2	Y	Y	Y
Provincial dummies	Y		
Other time-invariant controls	Y		
County fixed effects		Y	Y
Period fixed effects		Y	Y
Number of counties	1,171	1,171	960
Obs.	8,355	8,355	7,417
R-squared	0.234	0.470	

Note: Standard errors clustered at the provincial level/county level are in parentheses. Significance levels: *10%, **5%, ***1%. "Other time-variant controls" include per-capita industrial output, female education/male education, and mean population education.

TABLE 7. RESULTS USING THE ONE-CHILD POLICY AS A NATURAL EXPERIMENT

Variable	Sex of second birth (female = 1, male = 0)					
	(1)	(2)	(3)	(4)	(5)	(6)
	1976-1979	1980-1990	1976-1979	1980-1990	1980-1990	1980-1990
	Whole sample	Whole sample	Whole sample	Whole sample	Rural families	Urban families
FP75	-0.0547	0.199**	0.0131	0.220**	0.234***	-0.217
	(0.120)	(0.0808)	(0.123)	(0.0867)	(0.0902)	(0.322)
CCP75	1.206**	0.962***	1.303***	1.142***	1.113***	1.695
	(0.474)	(0.314)	(0.494)	(0.322)	(0.340)	(1.357)
$Ln(S_{75})$	0.108*	0.256***	0.143**	0.238***	0.235***	0.405**
	(0.0627)	(0.0411)	(0.0683)	(0.0478)	(0.0486)	(0.204)
Rural family dummy	-0.0412***	-0.0241**	-0.0476***	-0.0270***		
	(0.0125)	(0.00954)	(0.0133)	(0.0101)		
Han dummy	0.00557	-0.0136**	-0.00249	-0.0236***	-0.0237***	-0.0264
	(0.0103)	(0.00658)	(0.0104)	(0.00724)	(0.00749)	(0.0267)
Estimated county FEs			Y	Y	Y	Y
Other controls	Y	Y	Y	Y	Y	Y
Obs.	150,430	372,135	130,978	325,880	317,434	8,446
R-squared	0.088	0.068	0.089	0.071	0.071	0.050

Note: The linear probability model is applied to all four regressions. Standard errors clustered at the county level are in parentheses. *Significant at 10%, **5%, ***1%. "Other controls" include the provincial dummies, the following county-level variables: the average births per woman in the corresponding period, the per capita industrial output value, the distance to the provincial capital, the distance to the nearest treaty port, the share of hilly grounds, and the average altitude, and the following family-level variables: father's years of schooling, mother's years of schooling, and the family's size. Estimated county FEs are obtained from an FE + IV regression of equation (4) on the sample counties before 1975.

TABLE 8. FEMALE POLITICAL PARTICIPATION AND SOCIAL SPENDING, 1953–85

	Ln(*per capita social spending*)	
Variable	(1) FE	(2) FE + IV
Female party membership	-0.110	-0.767
	(0.134)	(0.519)
CCP membership	3.472***	4.172***
	(0.450)	(0.625)
Ln(per capita budgetary spending)	0.517***	0.513***
	(0.0115)	(0.0118)
Lagged ln(per capita social spending)	0.144***	0.146***
	(0.0114)	(0.0121)
CCP50 × time trend	-1.227***	-1.247***
	(0.110)	(0.113)
Cragg-Donald Wald F-statistic		300.18
Other time-variant controls	Y	Y
County fixed effects	Y	Y
Period fixed effects	Y	Y
Number of counties	963	841
Obs.	5,379	4,861
R-squared	0.953	

Note: Standard errors clustered at the county level are in parentheses. *Significant at 10%, **5%, ***1%. The period covered is 1953–85, which is divided into seven sub-periods, 1953–57, 1958–60, 1961–65, 1966–70, 1971–75, 1976–80, and 1981–85. For each sub-period, we calculate the average per capita budgetary spending and per capita social spending, respectively. The FP, CCP membership, as well as other time-variant controls, including the average years of schooling of the population, the ratio female years of schooling/male years of schooling and per capita industrial output, all take values in the initial year of each sub-period.

TABLE 9. FEMALE POLITICAL PARTICIPATION AND BIRTHS PER WOMAN OF CHILD-BEARING AGE IN 1981–90

	Births per woman of child-bearing age	
Variable	(1)	(2)
FP80	0.198	-0.345
	(0.191)	(0.242)
CCP80	-0.733	1.633*
	(0.696)	(0.841)
Estimated county FEs		Y
Other controls	Y	Y
Obs.	1,108	946
R-squared	0.729	0.741

Note: Standard errors clustered at the provincial level are in parentheses. *Significant at 10%, **5%, ***1%. "Other controls" include provincial dummies, distance to the provincial capital, distance to the nearest treaty port, share of hilly grounds, average altitude, log(per capita industrial output), share of Han population, share of rural population, average years of schooling of the population, ratio of educational attainment between women and men, employment rate, and share of workers in the textile and sewing industry. Estimated county FEs are obtained from an FE + IV regression of equation (4) on the sample counties before 1980.

TABLE 10. PARTY MEMBERSHIP AND GENDER PERCEPTIONS

	Family	*Competence*	*Marriage*	*Layoff*	*Housework*
Variable	(1)	(2)	(3)	(4)	(5)
Female	-0.0165	0.0282	0.114***	-0.0836***	-0.0981***
	(0.0274)	(0.0267)	(0.0266)	(0.0271)	(0.0272)
Party member	-0.0735	-0.117**	-0.0937**	-0.176***	-0.0262
	(0.0460)	(0.0455)	(0.0453)	(0.0468)	(0.0464)
Party member × female	-0.301***	-0.205**	-0.107	-0.217**	-0.115
	(0.0824)	(0.0825)	(0.0815)	(0.0870)	(0.0849)
Age	-0.00487***	0.000143	-0.00463***	0.00566***	0.00213*
	(0.00120)	(0.00117)	(0.00116)	(0.00118)	(0.00119)
Rural resident	0.352***	0.191***	0.104***	0.196***	0.0848***
	(0.0299)	(0.0293)	(0.0292)	(0.0298)	(0.0299)
Education	-0.215***	-0.202***	-0.134***	-0.144***	-0.0170
	(0.0166)	(0.0164)	(0.0163)	(0.0168)	(0.0167)
Obs.	7,413	7,399	7,386	7,360	7,408
LR chi2	790.83	538.03	262.66	425.14	45.03

Note: Standard errors are in parentheses. *Significant at 10%, **5%, ***1%. The sample includes respondents older than age 40 years in the 2010 wave of the CGSS. Education is recorded as 0 = elementary or illiterate; 1 = junior high; 2 = senior high; 3 = college or above.

TABLE 11. WIFE'S PARTY MEMBERSHIP AND HUSBAND'S GENDER PERCEPTIONS

	Family	*Competence*	*Marriage*	*Layoff*	*Housework*
Variable	(1)	(2)	(3)	(4)	(5)
Party member	-0.117**	-0.209***	-0.164***	-0.241***	-0.0210
	(0.0488)	(0.0482)	(0.0479)	(0.0494)	(0.0491)
Wife being party member	-0.196**	-0.135*	-0.00242	-0.114	-0.149*
	(0.0814)	(0.0814)	(0.0808)	(0.0841)	(0.0833)
Age	-0.00391**	0.00220	-0.00128	0.00432**	-0.00298*
	(0.00171)	(0.00168)	(0.00167)	(0.00170)	(0.00171)
Rural resident	0.372***	0.168***	0.100**	0.208***	0.0753*
	(0.0433)	(0.0423)	(0.0421)	(0.0431)	(0.0431)
Education	-0.111***	-0.0980***	-0.0770***	-0.0701***	-0.0142
	(0.0235)	(0.0231)	(0.0231)	(0.0236)	(0.0236)
Wife's education	-0.0549***	-0.0155	0.00868	0.0383**	0.0530***
	(0.0176)	(0.0172)	(0.0172)	(0.0175)	(0.0175)
Obs.	3,627	3,623	3,613	3,601	3,628
LR chi2	321.00	160.55	69.41	132.96	19.43

Note: Standard errors are in parentheses. *Significant at 10%, **5%, ***1%. The sample includes respondents older than age 40 years in the 2010 wave of the CGSS. Education is recorded as 0 = elementary or illiterate; 1 = junior high; 2 = senior high; 3 = college or above.

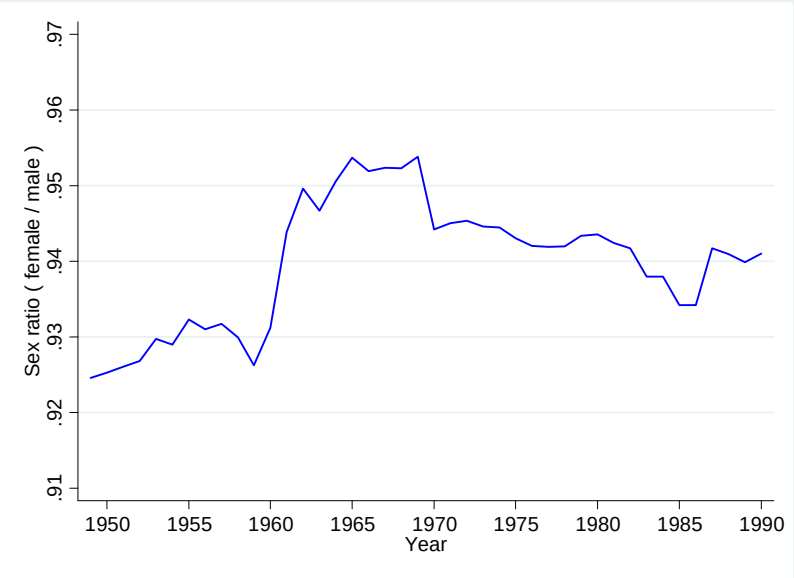

FIGURE 1. SEX RATIO OF THE POPULATION: 1949–90 (MEN = 1)

Note: The sex ratio of the population each year is calculated from the statistics provided by NBS (2010): *Compiled Materials on Sixty Years of the People's Republic of China*.

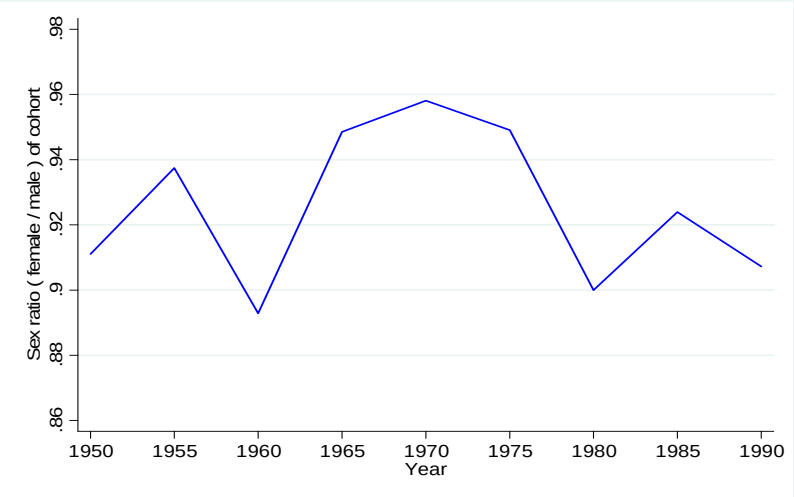

FIGURE 2. SEX RATIOS OF BIRTH COHORTS IN THE 1990 CENSUS (MEN = 1)

Note: The sex ratios are calculated from the 1-percent sample of the 1990 population census for nine cohorts who were respectively born in 1946–50, 1951–55, 1956–60, 1961–65, 1966–70, 1971–75, 1976–80, 1981–85, and 1986–90. The label on the horizontal axis denotes the final year of each period.

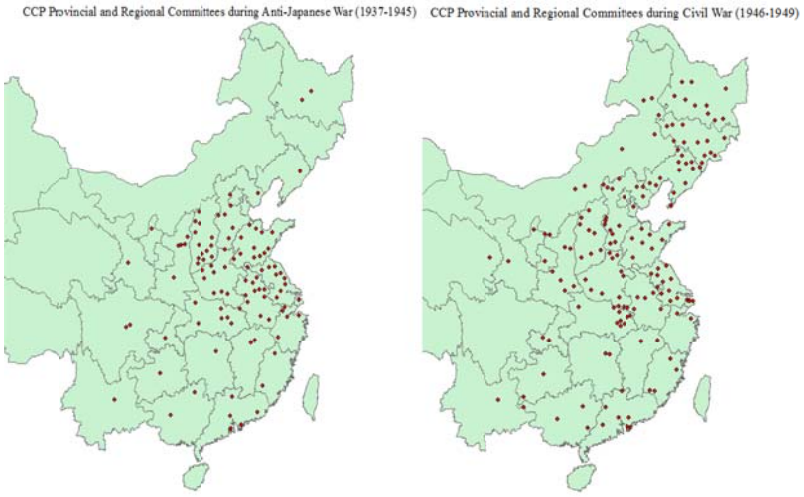

FIGURE 3. DISTRIBUTION OF THE CCP PROVINCIAL AND REGIONAL COMMITTEES DURING THE ANTI-JAPANESE WAR AND THE CIVIL WAR

Sources: The Materials, Volume 3 and Volume 4.

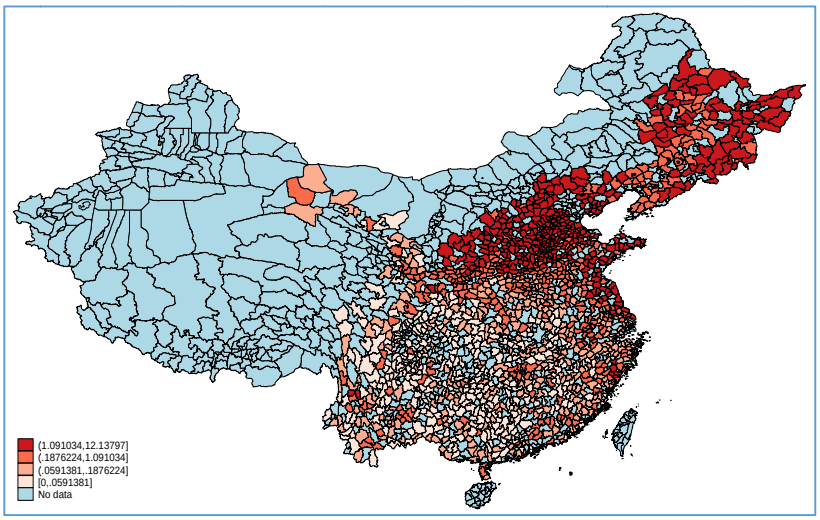

FIGURE 4. DISTRIBUTION OF CCP50 (UNIT: 100×CCP/POPULATION)

Sources: County chronicles; *The Materials*.

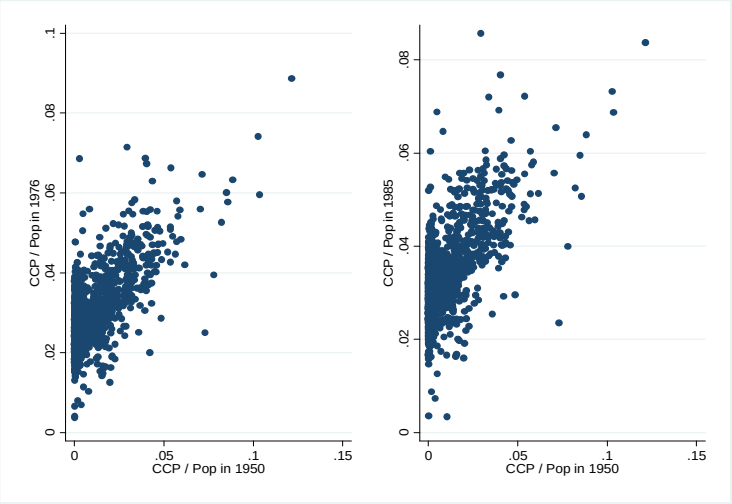

FIGURE 5. PERSISTENCE OF CCP MEMBERSHIP IN SAMPLE COUNTIES

Note: Figure 5(a) shows the correlation between CCP membership in 1976 and that in 1950, and the correlation coefficient is 0.435; Figure 5(b) shows the correlation between CCP membership in 1985 and that in 1950, and the correlation coefficient is 0.444.

Sources: County chronicles; *The Materials*.

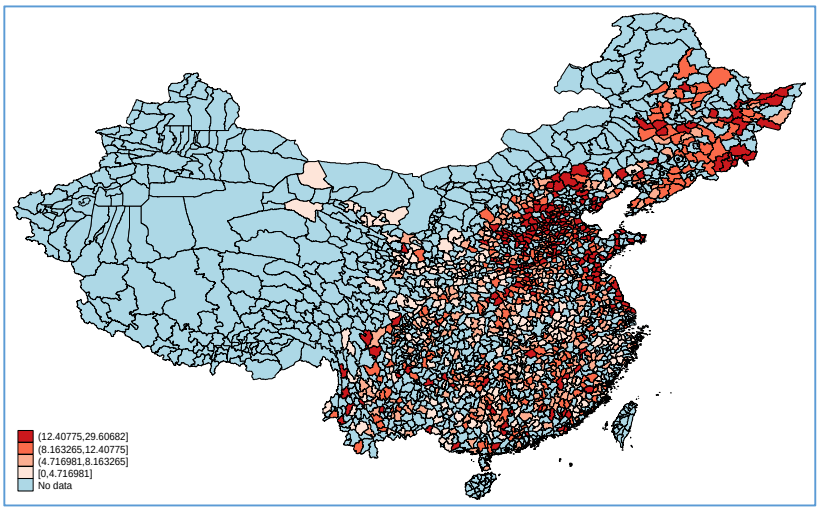

FIGURE 6. DISTRIBUTION OF FP50 (100×FEMALE CCP/CCP)

Sources: County chronicles; *The Materials*.

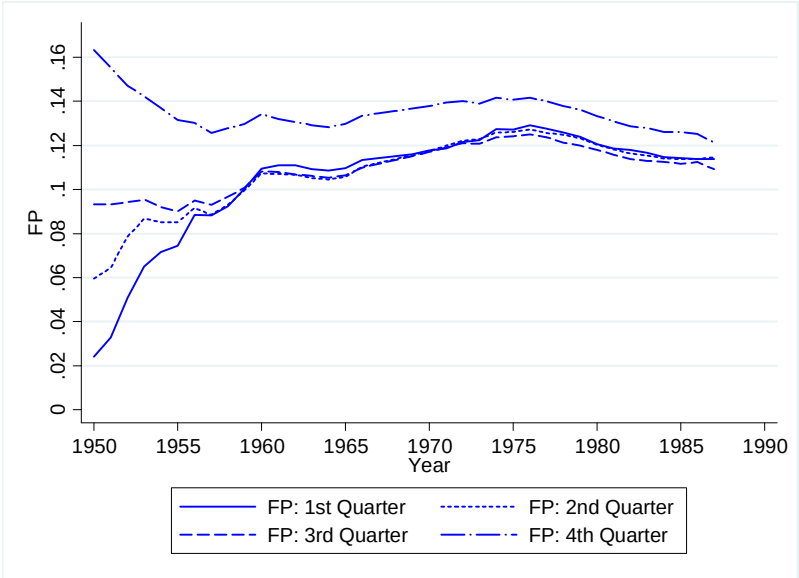

FIGURE 7. FEMALE PARTY MEMBERSHIP BY FP50 QUARTERS IN 1950–90

Sources: County chronicles; *The Materials*.

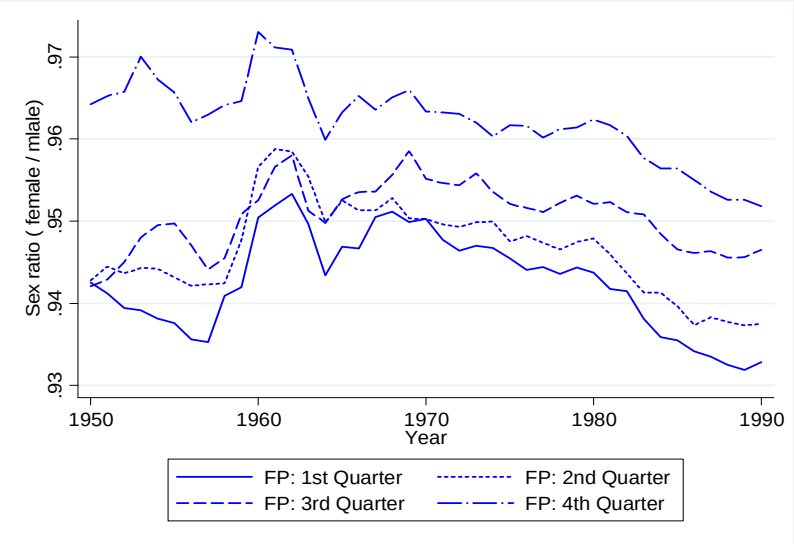

FIGURE 8. FP50 AND SEX RATIOS IN 1950–90 PANEL A: RAW DATA

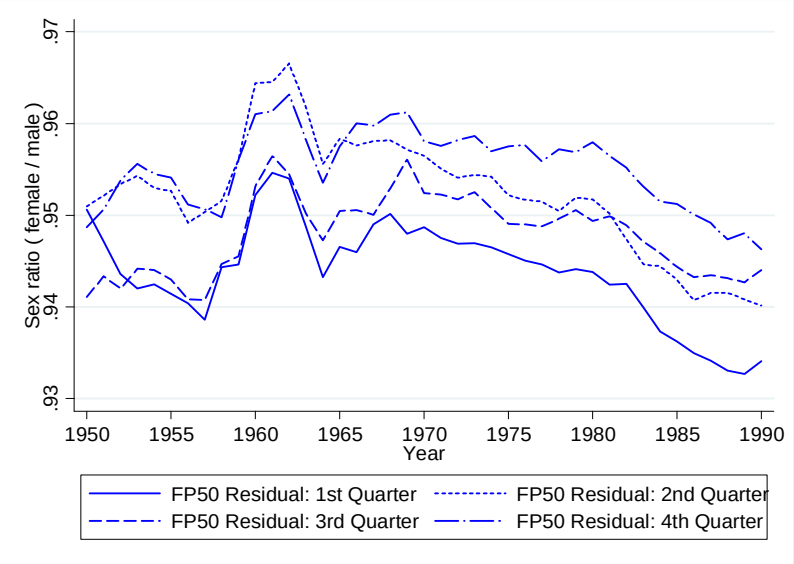

FIGURE 8. FP50 AND SEX RATIOS IN 1950–90 PANEL B: FP50 NET OF THE IMPACTS OF CCP50 AND S50

Sources: County chronicles; *The Materials*.

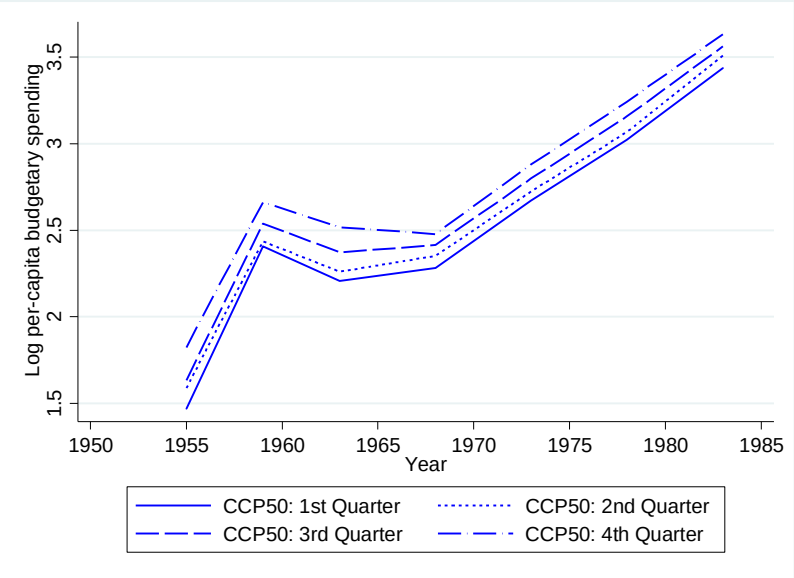

FIGURE 9. CCP50 AND GOVERNMENT BUDGETARY AND SOCIAL SPENDING: 1953–85 PANEL A: PER CAPITA BUDGETARY SPENDING

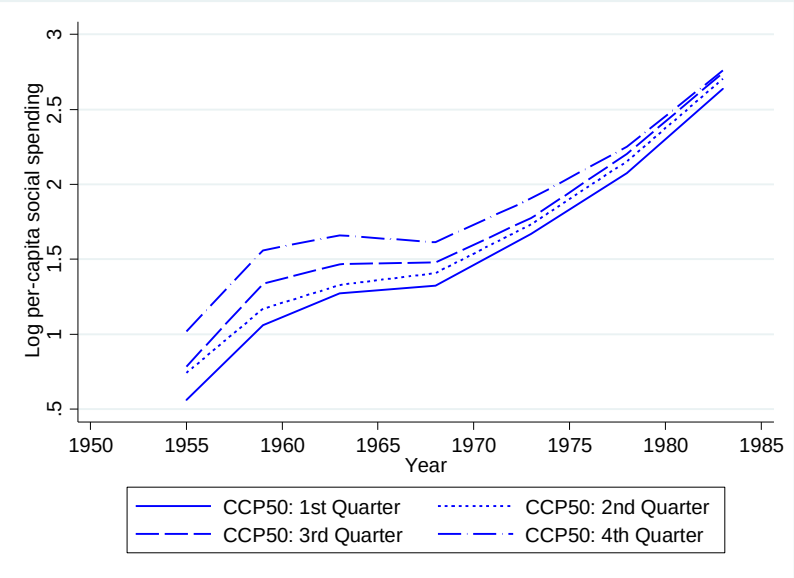

FIGURE 9. CCP50 AND GOVERNMENT BUDGETARY AND SOCIAL SPENDING: 1953–85 PANEL B: PER CAPITA SOCIAL SPENDING

Appendix I. Summary Statistics of Variables

COUNTY-LEVEL VARIABLES (FROM COUNTY CHRONICLES, THE MATERIALS, THE 1990 CENSUS, THE 1-PERCENT SAMPLE OF THE 1990 CENSUS, AND CHGIS)

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
Female-male ratio of the population (S_t)	67,207	0.951	0.075	0.416	1.676
Female-male ratio of each cohort in 1990 ($S_{t,90}$)	71,736	0.935	0.060	0.343	2.462
Female CCP/ CCP (FP_t)	47,444	0.116	0.038	0.000	0.539
CCP / Pop (CCP_t)	63,588	0.024	0.013	0.000	0.490
Per capita industrial output (yuan)	61,452	117.446	290.002	0.000	9628.339
Female education / male education	67,769	0.392	0.222	0.000	2.000
Mean pop education (years)	67,855	3.253	1.679	0.000	10.438
Share of Han	71,736	0.874	0.255	0.005	1.000
Share of rural residents	71,736	0.881	0.089	0.147	1.223
Distance to provincial capital (km)	72,366	204.847	120.258	6.292	973.964
Distance to nearest treaty port (km)	72,366	320.193	241.560	3.353	1645.418
Altitude (km)	72,444	0.659	0.778	0.001	4.352
Share of hilly grounds	72,444	0.637	0.273	0.016	1.000
Per capita social spending (yuan)	48,349	7.068	7.847	0.000	314.322
Per capita budgetary spending (yuan)	54,495	18.760	26.303	0.000	1158.99
Births per woman of child-bearing age in 1981–90	1,708	1.069	0.261	0.426	1.969
Births per woman of child-bearing age in 1976–80	1,708	0.822	0.233	0.320	1.671
Severity of famine	1,654	0.292	0.217	-0.750	0.841
Share of workers in textile and sewing industry in 1990	1,708	0.011	0.020	0.000	0.245
Employment rate in 1990	1,708	0.565	0.059	0.317	0.736
Female employment rate in 1990	1,653	0.886	0.185	0.025	1.000
Female employment rate / male employment rate in 1990	1,652	0.824	0.173	0.023	1.169

Note: The number of observations is counted by county-year.

HOUSEHOLD-LEVEL VARIABLES (FROM THE 1-PERCENT SAMPLE OF THE 1990 CENSUS)

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
Sex of second birth (female = 1, male = 0)	1,005,585	0.486	0.500	0.000	1.000
Rural family dummy	1,275,657	0.868	0.338	0.000	1.000
Father's education (years)	1,216,196	2.662	0.992	1.000	7.000
Mother's education (years)	1,274,174	2.151	0.976	1.000	7.000
Han dummy	1,302,806	0.925	0.264	0.000	1.000
Household size	1.302,806	4.502	1.297	1.000	20.000

INDIVIDUAL-LEVEL VARIABLES (FROM CGSS 2010)

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
Whole Sample					
Female dummy	7,847	0.508	0.500	0.000	1.000
CCP dummy	7,839	0.140	0.347	0.000	1.000
Age	7,844	55.893	11.347	40.000	96.000
Education	7,832	0.901	0.993	0.000	3.000
Attitude questions					
Family	7,824	3.681	1.210	1.000	5.000
Competence	7,809	3.078	1.277	1.000	5.000
Marriage	7,795	3.179	1.217	1.000	5.000
Layoff	7,767	2.213	1.050	1.000	5.000
Housework	7,819	3.889	1.059	1.000	5.000
Male Sample					
CCP dummy	3,853	0.214	0.410	0.000	1.000
CCP dummy of wife	3,852	0.056	0.231	0.000	1.000
Age	3,856	56.247	11.379	40.000	96.000
Rural resident dummy	3,661	0.539	0.499	0.000	1.000
Education	3,846	1.037	1.009	0.000	3.000
Education of wife	3,849	1.006	1.126	0.000	3.000
Attitude questions					
Family	3,846	3.664	1.205	1.000	5.000
Competence	3,841	3.033	1.250	1.000	5.000
Marriage	3,831	3.091	1.211	1.000	5.000
Layoff	3,817	2.227	1.029	1.000	5.000
Housework	3,847	3.839	1.088	1.000	5.000

Note: The sample comprises respondents who were over age 40 years at the time of the survey. The answers to the attitude questions are coded 1 to 5, with 1 = strongly disagree, 5 = strongly agree, and the other three numbers in between.

APPENDIX II. DETERMINANTS OF FEMALE PARTY MEMBERSHIP (FP) IN SELECTED YEARS

			FP	
Variable	*1950*	*1965*	*1976*	*1985*
	(1)	*(2)*	*(3)*	*(4)*
CCP / pop	1.922***	1.623***	1.511***	1.262***
	(0.157)	(0.127)	(0.104)	(0.101)
Ln(female pop/male pop)	0.0254	0.133***	0.146***	0.148***
	(0.0158)	(0.0123)	(0.0135)	(0.0166)
Female education/male education	0.0207	0.0285***	0.0468***	0.0474***
	(0.0178)	(0.00950)	(0.00718)	(0.00695)
Mean pop education	0.00194	-0.000548	-0.00266***	-0.00300***
	(0.00250)	(0.00120)	(0.000950)	(0.000852)
Ln(per capita industrial output)	0.000795	0.00197*	-0.00102	-0.00431***
	(0.00127)	(0.00104)	(0.00113)	(0.00103)
Share of rural residents	-0.0340	-0.0769***	-0.117***	-0.158***
	(0.0251)	(0.0153)	(0.0126)	(0.0122)
Share of Han	-0.00160	-0.0207***	-0.0123***	-0.0109***
	(0.00909)	(0.00491)	(0.00407)	(0.00386)
Ln(distance to nearest treaty port)	0.000429	-0.00151	0.00362***	0.00316**
	(0.00269)	(0.00152)	(0.00128)	(0.00125)
Ln(distance to provincial capital)	-0.000267	-0.00366***	-0.00348***	-0.00220**
	(0.00221)	(0.00128)	(0.00109)	(0.00104)
Share of hilly grounds	0.00226	-0.0161***	-0.0107***	-0.00730**
	(0.00832)	(0.00453)	(0.00376)	(0.00357)
Altitude	-0.00863	0.0128***	0.0101***	0.0119***
	(0.00548)	(0.00237)	(0.00195)	(0.00185)
Provincial dummies	Y	Y	Y	Y
Obs.	892	1,087	1,117	1,112
R-squared	0.482	0.470	0.535	0.531

Note: The regressions are run on sample counties with available data. Standard errors clustered at the provincial level are reported in parentheses. * , **, and *** indicate, respectively significance at the 10%, 5%, and 1% level.