

Trends in Cohort Fertility Level in China

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1 Background

The number of births in China continues to decline. The data shows that the number of births in China was 12 million in 2020, and decreased to 9.02 million in 2023. According to the seventh national population census, China's fertility rate has fallen further, with its total fertility rate reaching a historical low of 1.3, and dropping into the “lowest-low fertility” level. Due to the impact of the tempo effect, in the current Chinese society where the postponement degree of marriage and childbirth continues to deepen, the total fertility rate cannot reflect the true fertility level of women.

For a long time, there has been limited research on the cohort fertility level of Chinese women. In the context of China's low fertility level, it is significant to pay attention to the change of trend in cohort fertility level. In this study, we focus on the number of children ever born by cohorts, using multiple indicators and decomposition methods to analyze the trend and characteristics of the cohort fertility level among Chinese women. Through this study, we hope to systematically analyze the overall trend of cohort fertility and examine the contribution of related factors, such as age-parity-specific fertility probability, parity progression ratio and educational structure to the change in the cohort fertility level.

2 Data and Method

2.1 Data

The data mainly used in this study were collected from the 2017 China Fertility Survey. The survey was conducted on a female population aged 15-60 residing in mainland China. The survey includes the women's pregnancy history, such as the end date of each pregnancy and result, categorized as live birth, stillbirth, spontaneous abortion, or induced abortion.

In this study, samples with age at childbearing less than 10 or more than 50, age at first marriage less than 10 and the year of first marriage or cohabitation missing were excluded, leading to a final sample size of 249,895 persons.

2.2 Method

Using nationally representative data and from a cohort perspective, we develop and apply demographic models to systematically analyze trends in the number of children ever born among Chinese women born between 1957 to 1987. The following five groups of measures and methods are employed in this study:

- (1) Calculate the number of children ever born by cohort and age-specific number of children ever born (CEB).
- (2) Calculate the difference in the number of CEB at corresponding ages between the observed cohort and a benchmark cohort to analyze the postponement and recuperation of CEB by

parity between cohorts.

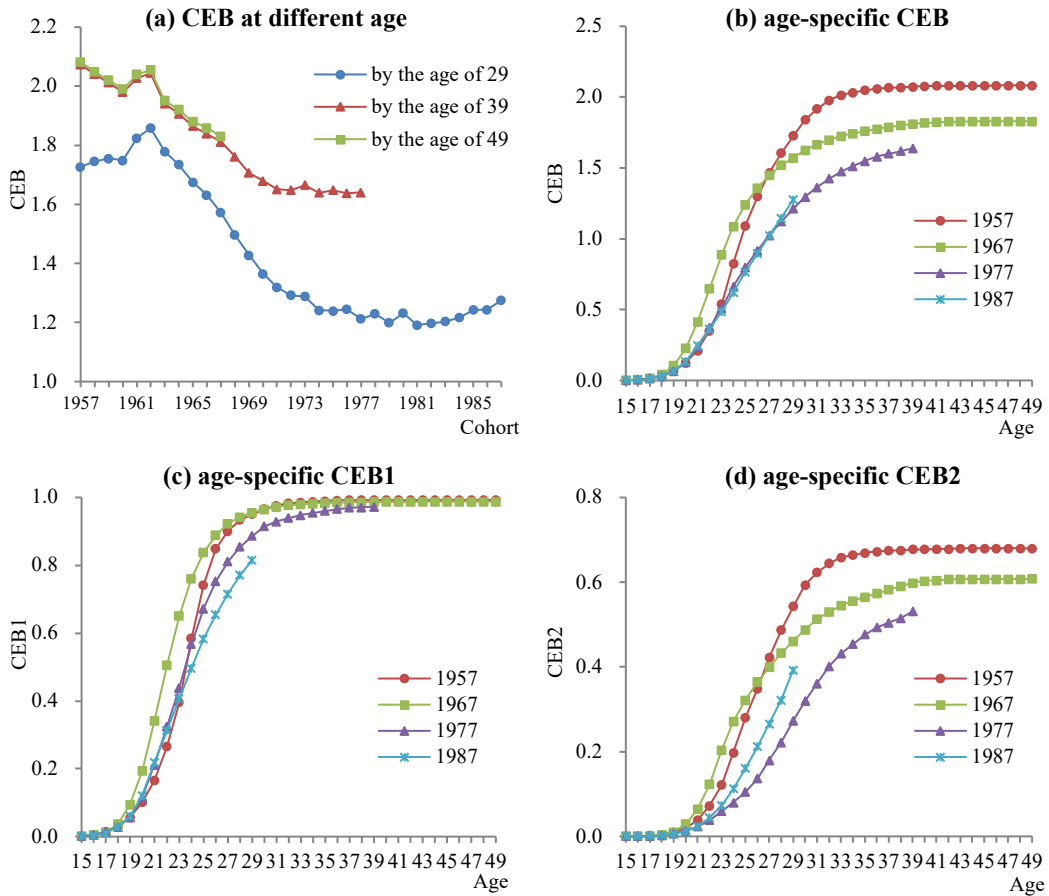
- (3) Decompose the change in the number of CEB among women born in 1957, 1967, 1977 and 1987. The decomposition method takes into account the sequential nature of childbearing as a chain of transitions from lower to higher parities. The change between the benchmark and observed cohorts is decomposed into the changes in the parity progression ratios ($PPR_{i-1, i}$).
- (4) We use the stepwise replacement method to decompose the differences in the number of children ever born at a given age between cohorts, analyzing the effect of age-parity-specific conditional probability of fertility on these changes.
- (5) Finally, we employ a decomposition method to examine the contribution of the change in the number of CEB specific to educational categories and the increase in educational structure to the change in the number of CEB between cohorts.

3 Results

3.1 Children ever born by cohort

In general, as shown in Figure 1, except for the 1961 and 1962 birth cohorts, there is a decreasing trend of the number of CEB by cohorts at the age of 29, 39 and 49.

For the number of children ever born by parities, the age-specific number of first children ever born in the later birth cohort decreased. Except for the cohort born in 1987, the age-specific number of second children ever born in the later birth cohort has decreased.



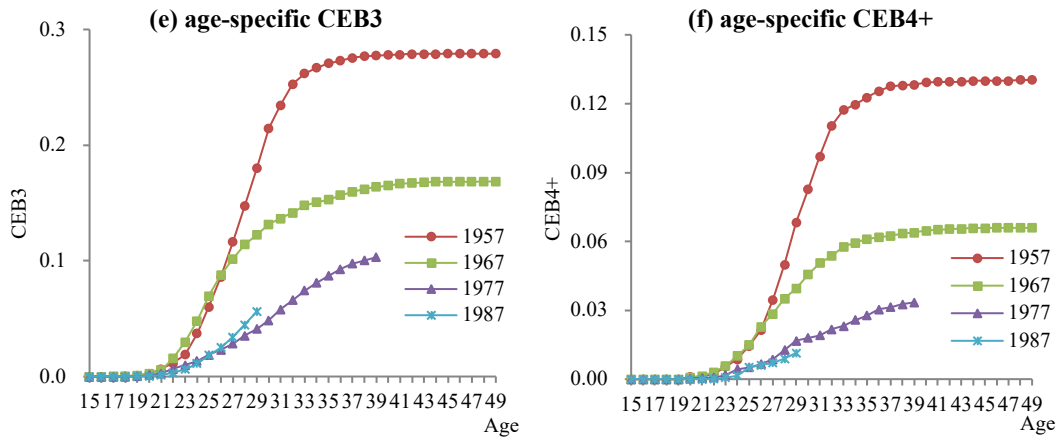


Figure 1. Children ever born by cohort, age-specific CEB and

Note: CEB denotes the number of children ever born in a cohort. CEB1, CEB2, CEB3, and CEB4+ denote the number of first, second, third, and fourth and above children ever born of a cohort respectively.

3.2 The postponement and recuperation of cohort CEB

Compared with the 1967 birth cohort, the postponement of fertility in later birth cohorts deepened. Although there is some recuperation of childbearing at later reproductive ages, this recuperation is weaker in later birth cohorts.

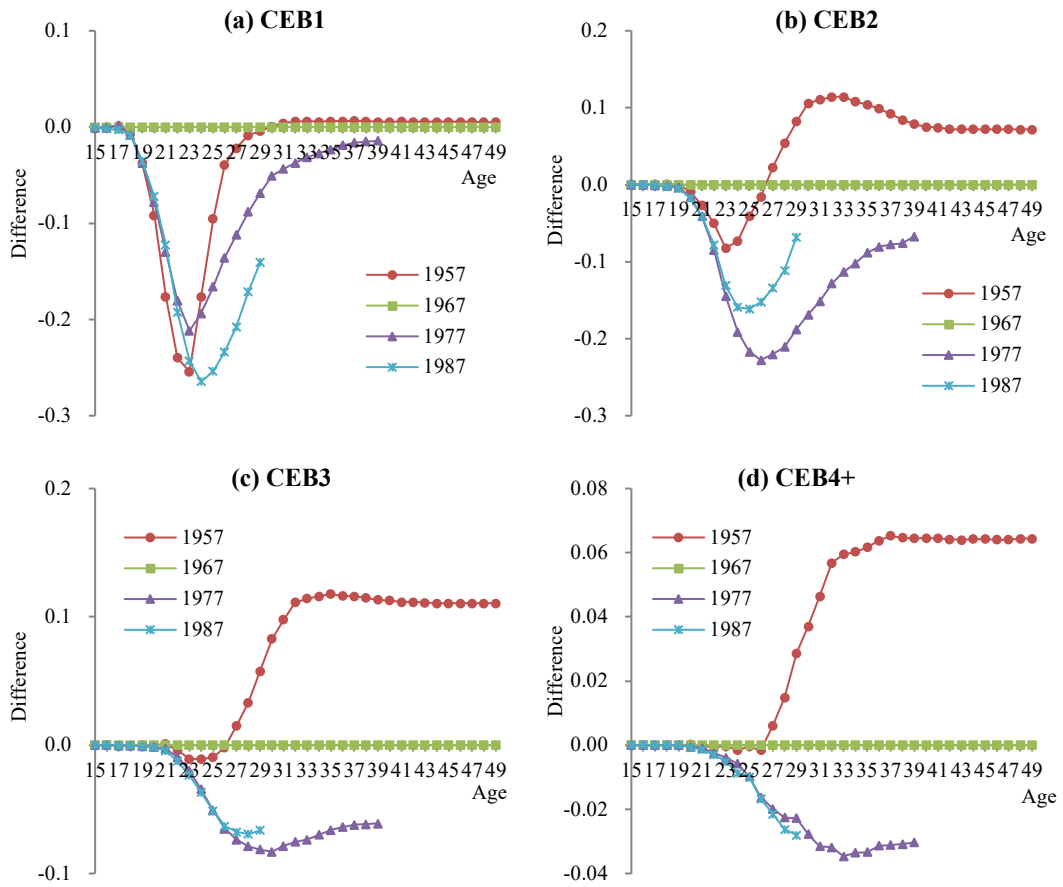


Figure 2. Postponement and Recuperation of CEB

3.3 The effect of parity progression ratios

Figure 3 shows that the decline in the number of CEB in later birth cohorts is mostly driven by reductions in the progression ratios to first birth. The decline of fertility among urban, higher-educated women is mostly attributable to the reduction in the progression ratios to first birth; while the decline of fertility among rural, less educated women is attributable to the reduction in the progression ratios to third birth.

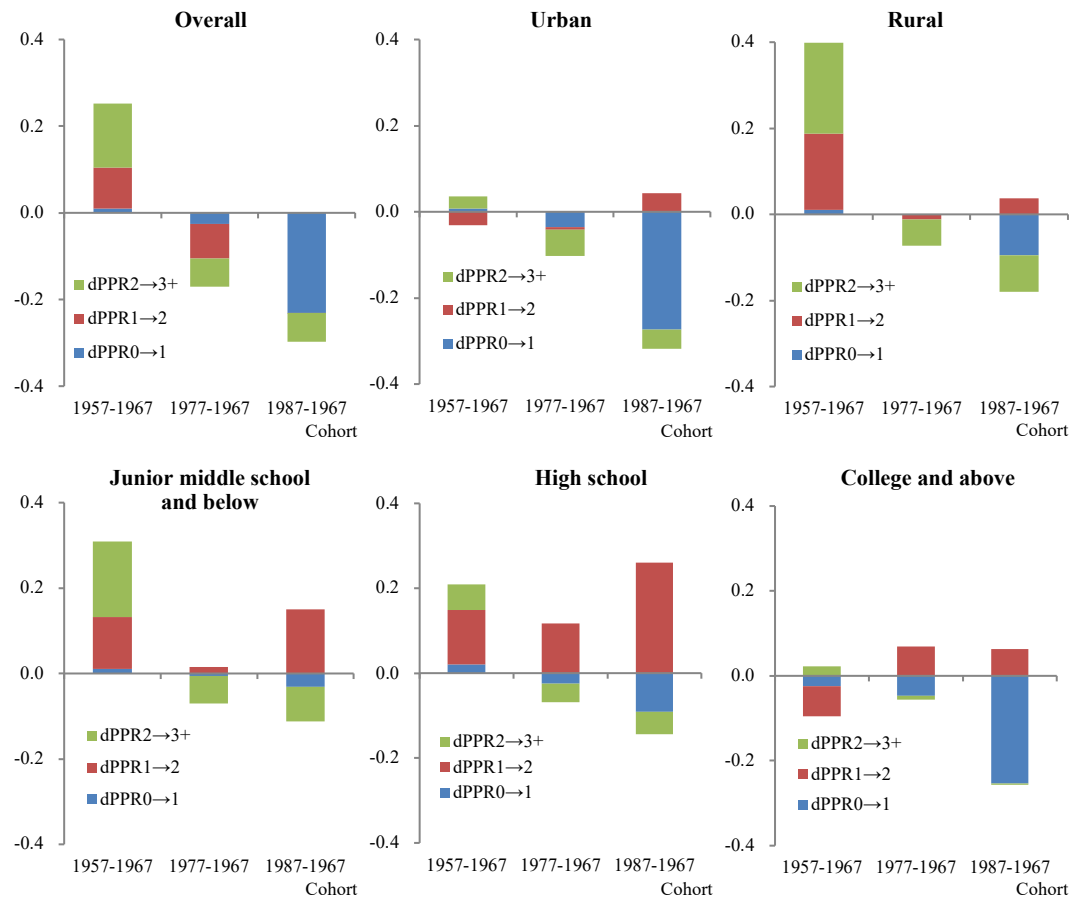


Figure 3. Contribution of given PPR to overall differences in CEB

3.4 The effect of age- and parity-specific fertility probability

The differences between cohorts' number of first births (CEB1) and the number of second childbirths (CEB2) are both decomposed into the effect of changes in age- and parity-specific conditional fertility probability to the overall changes, as shown in Figure 4 and Figure 5.

The results show that the decline in the number of CEB is affected by changes in age-parity-specific conditional probability, and the contribution of the age-specific conditional probability of first birth becomes larger in later birth cohorts.

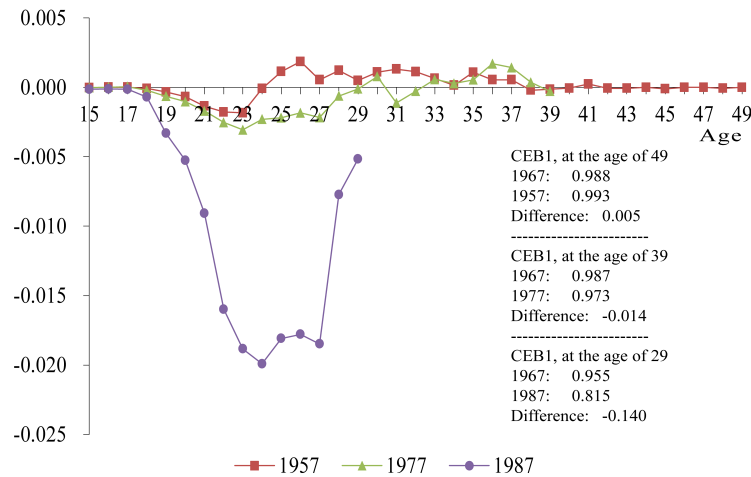


Figure 4. Contributions of age-specific conditional probability of fertility to first birth on the differences of CEB1 between cohorts

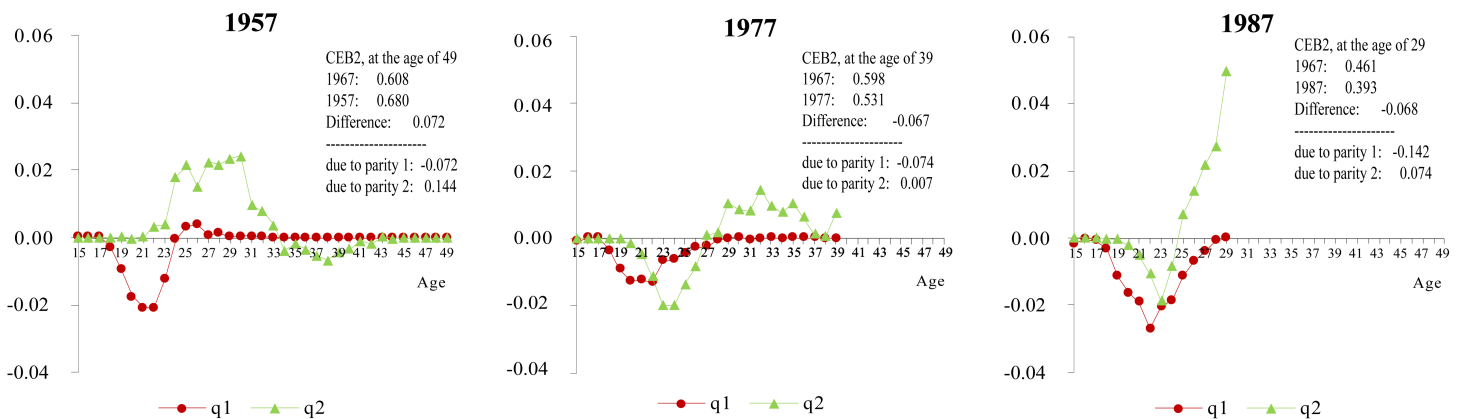


Figure 5. Contributions of age-specific conditional probability of fertility to first birth (q1) and second birth (q2) on the differences of CEB2 between cohorts

3.5 The effect of educational structure and changes in education-specific fertility by parity

Figure 6 presents the effect of changes in educational structure and changes in education-specific fertility on the overall differences of CEB compared with the 1967 birth cohort. The educational level of women affects cohort fertility, and the contribution of changes in educational structure to the decreasing of the number of CEB increases in later birth cohorts.

The contributions to changes in CEB across educational categories are shown in Figure 7. Compared with the 1967 birth cohort, the decline in the number of CEB among women with lower educational attainment is mostly driven by the reduction in the transition to third and fourth birth; while the decline in the number of CEB among women with higher education is mostly attributed to the reduction in the transition to first birth.

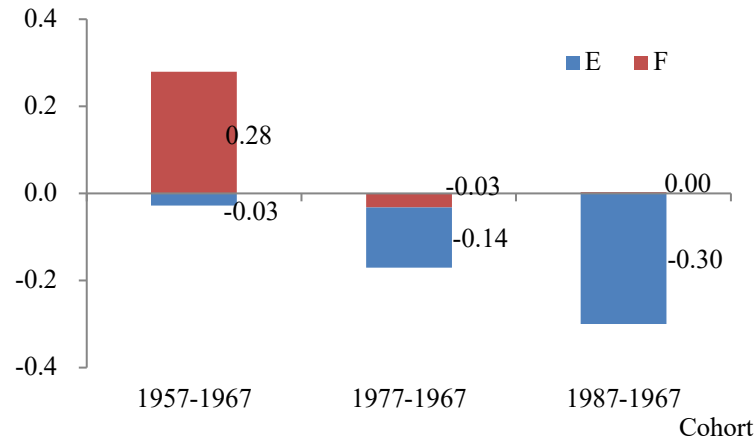


Figure 6. Contributions of educational structure (E) and changes in education-specific fertility (F) on the change of CEB between cohorts

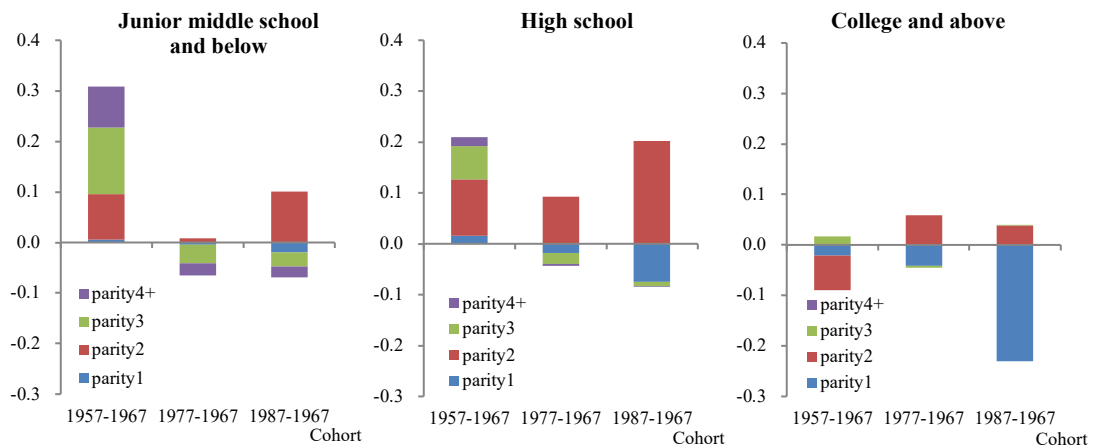


Figure 7. Parity-specific contributions to changes in CEB across educational categories

4 Conclusion

There is a decreasing trend in the number of children ever born by cohort. The postponement of the first childbirth deepens among women in later birth cohorts.

The decline in the number of children ever born in later birth cohorts is mostly driven by reductions in the progression ratios to first birth. The decline of fertility among urban, higher-educated women is mostly attributable to the reduction in the progression ratios to first birth; while the decline of fertility among rural, less educated women is attributable to the reduction in the progression ratios to third birth.

The decline in the number of children ever born is also affected by changes in age-parity-specific conditional fertility probability, and the contribution of the age-specific conditional probability of first birth becomes larger in later birth cohorts. The educational level of women affects cohort fertility, and the contribution of changes in educational structure to the decrease of the average number of children ever born increases in later birth cohorts.

As women in later cohorts continue to postpone marriage and first childbirth, the number of children ever born among young women is expected to decrease in the future.