The Effect of Releasing the Only-Child Policy on Household Saving in China: Evidence and Mechanisms*

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Abstract

China's savings rate is notably high, where household savings play a dominant role, and the relationship between population policy and household savings rate has been widely discussed. This paper utilizes China's 2016 Universal Two-Child Policy as an exogenous policy shock, setting up a difference-in-differences model, and empirically tests that relaxing the family planning policy will lead to an increase in household savings. Furthermore, this effect is more pronounced in families with low income, low assets, and those where the first child is a girl. The conclusion from this paper differs from previous research, suggesting that the effect of population policy on household saving may be dynamic and changing over time.

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1 Introduction

The household savings rate in China has consistently remained at a high level over an extended period. Despite a decline post-2010, China's savings rate continues to be considerably higher compared to other countries. There has been extensive scholarly debate regarding the underlying causes of this elevated savings rate. Various academics have attempted to elucidate this phenomenon from multiple perspectives, including precautionary savings, cultural factors, consumption patterns, high housing prices, and the absence of effective investment opportunities for citizens. Additionally, there is a growing consensus regarding the significant correlation between China's high savings rate and its population policies.

Since the 1980s, China has been enforcing the Family Planning Policy (FPP) and the One-Child Policy (OCP), which over the subsequent three decades became a fundamental state policy. The implications of the OCP on China's household savings rate are multifaceted. On one hand, the traditional practice, especially prevalent in rural areas, of relying on children for support in old age meant that with only one child, families might increasingly depend on savings instead of support from multiple children (Choukhmane, Coeurdacier, and Jin (2013), İmrohoroğlu and K. Zhao (2018)). Furthermore, the policy led to a higher sex ratio, causing an imbalance in the marriage market. This imbalance compelled parents, particularly of male children, to accumulate assets such as real estate to enhance their child's prospects in the marriage market. This necessity has, in turn, exacerbated the housing price bubble and led to an increase in savings among these families. (Wei and X. Zhang (2011)) Conversely, having fewer children could potentially reduce family expenses related to childcare, including living costs, education, and healthcare, thereby possibly diminishing the propensity to save. Overall, the dynamics between fertility policies and the savings rate are intricate, warranting comprehensive analysis to enrich our understanding of China's savings paradigm. Moreover, as China currently grapples with inadequate domestic demand, discerning the reasons behind the persistently high savings rate is crucial for informed policy formulation and laying the groundwork for future economic growth.

The interplay between fertility policy and the savings rate is inherently complex. To disentangle this causality, it often necessitates reliance on external shocks. Since 2010, China's family planning policy has undergone several significant amendments. In 2011, the restricted two-child policy was implemented, allowing couples who were both only children to have a second child. This was followed by another policy in 2014, permitting couples with one only child to have a second child. In 2016, the universal two-child policy (UTCP) was introduced, enabling all couples to have a second child irrespective of their only-child status. This paper will leverage the 2016 UTCP as an empirical case study to examine the impact of fertility policies on the savings rate.

Existing literature has had extensive discussions on how the FPP affects the savings rate, but there is insufficient discussion on how relaxing this policy impacts the savings rate, and consensus is far from being reached. Most existing studies predict the impact of relaxing the FPP using theoretical models (e.g., Banerjee et al. (2014)), but their conclusions often contradict the existing empirical literature. There are also studies using the restricted two-child policy as a quasi-natural experiment (C. Cao and H. Wang (2022)), but this policy, which has been in place for a decade and was not uniformly implemented nationwide, lacks sufficient exogeneity as a policy shock. To date, few published studies have used the UTCP in 2016 as a quasi-natural experiment to investigate changes in the savings rate, making this paper quite innovative.

In this paper, I use the UTCP to construct treatment and control groups, and use CFPS 2012-2018 to set up my dataset. Then I employ a difference-in-differences (DID) method to explore the policy's impact on the treatment group in the baseline regression. And it turns out that UTCP significantly give rise to household saving rate.

To further clarify the mechanism, I subsequently conducte heterogeneity tests. Previous literature often found that relaxing the FPP in rural areas has almost no impact on the saving rate. Therefore, I examine the differential effects of the UTCP between urban and rural areas in the first place, and find that there are indeed differences, but they are not

significant. Second, I investigate whether the UTCP has heterogeneous effects on families with different income or assets. The results show that UTCP has a very significant impact on families with low income or low assets, but not much on families with high income or high assets. This provide me with important clues about the mechanism, leading me to believe that the increase in savings is due to the potential for a second child's birth and upbringing. To further verify this view, I use the gender of the firstborn for a heterogeneity test and found that families with a girl as the first child are more significantly affected by the UTCP, as they are more inclined to have a second child as the existing literature suggests. This further proves my conjecture. Then, to verify the correctness and effectiveness of the DID model I set up, I conducte parallel trend tests and placebo tests, respectively. The results suggest that the DID model is quite robust.

The rest of the paper is organized as follows. Section 2 reviews the existing literature. Section 3 presents the main regression of the paper. Section 4 describes the data used. Section 5 describes the main results. Finally, section 6 concludes.

2 Literature Review

This study relates to the existing academic research on population structure and savings rates.

Many theoretical research set OLG models and then empirically prove that FPP will increase the overall saving rate (e.g., Yongping Liu and Lu (2008), W. Wang (2010), Curtis, Lugauer, and Mark (2015).) There are different views that Banerjee et al. (2014) stated that focusing only on the partial equilibrium of old-age support will overstate the effect of aggregate fertility on household savings in OLG, and they set a general equilibrium model and predicted that a relaxation in FPP will have little effect on saving rate.

Empirical works mainly consist of two branches. Some scholars, taking a macro perspective, argue that family planning policies have led to a decrease in the proportion of

the working-age population, a decline in the child dependency ratio, and an increase in the elderly dependency ratio, thereby causing higher household savings rates (e.g., Modigliani and S. L. Cao (2004), Zhong and K. Li (2009), W. Wang (2010), Curtis, Lugauer, and Mark (2015), Dong and W. Zhao (2011), K. Liu and Yulin Liu (2015), Lugauer, Ni, and Z. Yin (2019)).

On the other hand, some researchers, by examining the micro-level family population structure, have found that family planning policies, by restricting the number of children, reduce the dependent population in households, leading to an increase in savings rates (e.g., Oliveira (2013), Ge, Yang, and J. Zhang (2018), H. Zhang, Liang, and Lin (2019)). There are also studies suggesting that family planning policies, by limiting the number of children, worsen the expected family support and elderly care risks, leading to a corresponding increase in household savings (e.g., Choukhmane, Coeurdacier, and Jin (2013), İmrohoroğlu and K. Zhao (2018)). Finally, some research indicates that family planning policies reinforce "son preference" behavior among parents, resulting in imbalances in sex ratio (Ebenstein (2010), Chen, H. Li, and Meng (2013)), thereby enhancing pre-saving behaviors by families with sons to increase their competitiveness in the future marriage market (Wei and X. Zhang (2011)). And there are different views such as Rosenzweig and J. Zhang (2014) claimed that the one-child policy are not major factors contributing to the high saving rate; Song, Coupé, and Reed (2021) criticizes other research didn't consider the situation before 1980, and they employed a Blinder-Oaxaca decomposition and found OCP does not contribute much to the high saving rate. This work is most similar to C. Cao and H. Wang (2022), they examine the relationship between relaxing the family planning policy and saving rate by setting a DID model viewing the selective two-child policy carried out in 2013 as an exogenous policy shock. The main result is similar as the early research, and they made further claim that family with a lower income and whose first child is a girl are more likely to save less, which is in consistence with traditional Chinese view.

More universally, this work contributes to a rich literature on explaining why China has

such a high saving rate (e.g., Y. Li and J. Yin (2007), D. Wang and Gong (2007), W. Wang (2009), Chamon and Prasad (2010), Yang, J. Zhang, and Zhou (2012).)

While research on this issue appears to be extensive, it seems that there is hardly solid consensus. The intricate correlation between fertility decisions, consumption choices, and savings decisions makes it challenging to isolate exogeneity in macro-level data analysis. Even some earlier predictions made using OLG models now appear to be inconsistent with the conclusions of many existing empirical studies.

The use of micro-level data to conduct quasi-natural experiments through exogenous policy shocks is relatively scarce, which might be attributed to the relatively short time since the policy changes were implemented. Furthermore, there are hardly any published research that have utilized the opening of the UTCP in 2016 as an exogenous shock. As mentioned earlier, the gradual implementation of the Two-Child Policy from 2014 was not synchronous across all provinces and cities. Therefore, it is believed that the effectiveness of our study should extend beyond that of C. Cao and H. Wang (2022). Additionally, I will employ the latest CFPS data to address this issue, and as of now, I have not come across any published research that has used this particular dataset.

3 Empirical Strategy

The UTCP policy automatically divides the population into treatment and control groups. In the previous discussion, I have clarified that since 2016, even if neither parent is an only child, they are allowed to have a second child. Therefore, they are considered as the treatment group under this policy. It should be noted that if parent belong to a minority ethnicity, they were originally not subject to the one-child policy restrictions, and the specific family planning policies regarding minority ethnicities are different across province. However, the proportion of minority ethnicities in the childbearing population is quite low, so I did not take this factor into account when setting up the treatment group.

Then I employ a DID method to study the heterogeneous impact of this policy shock on the two groups. The baseline regression is conducted through

$$\text{Saving}_{it} = \alpha \times \text{Treat}_i \times \text{Policy}_t + \beta X_{it} + \mu_t + \theta_i + \varepsilon_{it} \tag{1}$$

where the unit of observation is a family i who were observed in year t. Saving_{it} measures the saving rate of the unit, determined as (disposable income - consumption) / disposable income. Treat_i is the dummy indicating whether the family is in the treatment group. It is 1 for cohorts that both parents are not only children, are of child-bearing age[1], and have already had one child. The Policy_t is the dummy showing whether this time period is after UTCP or not. It is 1 for cohorts that are after January 2016. The matrix X_{it} is all the control variables, including family size, the proportion of food expenditure, the proportion of medical care expenses, the proportion of housing expenses, the proportion of education and entertainment expenses, and the logarithm of family net assets. The controls μ_t and θ_i are time and family fixed effects, respectively. Thus, the coefficient α in expression 1 recovers the effect of treatment.

It is necessary to more meticulously introduce the selection of control variables. Apart from the total family assets, which are commonly controlled for in the literature, the variables I control for can largely be categorized into several types: Firstly, variables related to the structure of consumption, as I believe that families with different consumption structures might have varying consumption habits, which in turn could lead to different saving habits. Secondly, medical expenses, which indicate the health status of family members. Unexpected large medical expenses could also significantly alter a family's saving behavior. Thirdly, the size of the family, or more precisely, the number of people living together. This is controlled for because if young couples live with their parents from either side, the saving behavior of the elderly in the family might deviate from that of the couples of childbearing age. It's also worth noting that all the control variables are set in interaction forms with variables from

[1]Following common conventions and WHO standards, I define the childbearing age up to 45 years old.

the initial period in 2014 and time variables due to the potential endogeneity of changes in control variables over time.

There may be concerns that the data collection period for CFPS 2016 might overlap with the policy change period. Actually the transition period for the UTCP policy was quite short nationwide, and even in rural areas, the new policy has already been in place in the Spring Festival. The CFPS survey on household economic status was conducted from May 2016 to April 2017, so the concerns seem unnecessary.

Another potential concern with this exogenous policy shock is that adjustments to FPP might be anticipated, potentially resulting in a smoother change in household savings rates. However, in practice, despite residents' awareness of the "Three-Step" strategy for abolishing OCP, the specific time of the implementation still exhibited a high degree of randomness. In fact, the CPC's 18th Central Committee first proposed the "comprehensive implementation of the policy allowing one couple to have two children" in October 2015, and this policy was approved by the National People's Congress in December and came into effect on January 1, 2016. Therefore, the claim that treating this policy change as an exogenous shock does not introduce significant bias seems plausible.

4 Data

The data in this paper comes from China Family Panel Studies database (CFPS) provided by Peking University, which includes 2010-2020 investigations every 2 years with more than 14000 randomly picked people and families from the whole country. This dataset spans both before and after the implementation of the UTCP and tracks a cohort of individuals and households, enabling an examination of fertility decisions and intertemporal savings changes within specific families. In this section, I will introduce how I generated the specific panel dataset.

First, I need to screen for the treatment group that meets the criteria. Considering

the number of siblings of both parents, the 2010 CFPS data adult personal questionnaire included a question about the number of siblings, but this question was not included in all of subsequent CFPS surveys. Considering that the number of siblings for adults does not change in most case, I use the 2010 CFPS data for processing. Regarding the number of children, I use the 2014 CFPS data and select families that had given birth to only one child.

To control the woman's age, I directly remove samples from the 2014 data whose birth year was before 1969. I do not include them in the control group because of the significant potential correlation between age and savings rate. It should be noted that the information on whether someone is the only child can only be obtained through the 2010 adult questionnaire. Respondents who were 18 years old in 2010 would have been 22 years old in 2014. Therefore, this study lacks samples of females younger than 22. Considering that the majority of women have a childbearing age greater than 22, the negative impacts brought about by this are limited.

In this way, I have established the treatment group, and other families in the same age group naturally become the control group.

After this, I create an indicator for the savings rate, calculated in 2014, 2016, and 2018 as (total household net income - total consumption expenditure) / total household net income. To avoid the influence of extreme values on the data, I delete samples with a savings rate below -0.5.

The additional variables I have included are: whether the family is in an urban or rural area, the gender of the first child, family size (expressed in terms of the number of people eating at the same table in CFPS), the proportion of food expenditure, the proportion of living expenses, the proportion of medical care expenses, the proportion of housing loan expenses, and the logarithm of family net assets. All these variables are obtained and calculated through the 2014 CFPS survey.

It is worth noting that the CFPS dataset has limited coverage in provinces in mainland China such as Tibet, Qinghai, Xinjiang, Ningxia, Inner Mongolia, and Hainan. This may

Table 1: Summary Statistics

	Treatment Group (962 Observations)		Control Group (1566 Observations)		
Urban Samples	653		652		
Rural Samples	309		914		
	Mean (1)	Std. Dev. (2)	Mean (3)	Std. Dev. (4)	Treatment − Control (5)
Saving Rate in 2014	0.222	0.330	0.259	0.353	−0.038**
Saving Rate in 2016	0.283	0.327	0.285	0.352	−0.002
Family Characteristics					
Family Size	3.427	1.025	4.534	1.460	−1.107***
Final Income (log)	10.957	0.699	10.789	0.706	0.167***
Net Asset (log)	12.550	1.354	12.244	1.172	0.306***
Consumption (log)	10.587	0.678	10.346	0.719	0.241***
Total Expenditure (log)	10.783	0.688	10.549	0.757	0.233***
Consumption Proportion					
Food	0.342	0.166	0.325	0.173	0.016*
Medical Care	0.053	0.0864	0.066	0.102	−0.013***
Housing	0.113	0.119	0.126	0.144	−0.013*
Education and Entertainment	0.116	0.124	0.113	0.148	0.003
Mortgage	0.040	0.603	0.074	0.603	0.034**
Dress	0.070	0.053	0.069	0.050	0.001

Note: This table reports basic summary statistics of the dataset, including mean value and standard deviation respectively for treatment group and control group. The differences between the two groups has been t-tested.
* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

limit the applicability of the analysis to remote areas, resulting in loss of some generalizability.

Table 1 lists the summary statistics of the key variables for the treatment group and the control group. All the indicators for family characteristics and consumption proportion use the data in 2014.

These statistics provide two main insights. First, families in treatment group are significantly different from those in control group in terms of family size, final income, net asset, total expense, and consumption, which coincide with our intuition. Families in the two groups does not have big difference in their consumption pattern except for expenses

Table 2: Benchmark Regression Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All	All	All	Urban	Urban	Rural	Rural
Treat × Policy(α)	0.034**	0.063***	0.055**	0.069***	0.023	0.052	0.067
	(0.0165)	(0.0200)	(0.0276)	(0.0225)	(0.0343)	(0.0374)	(0.0459)
Control Variables	No	No	Yes	No	Yes	No	Yes
Family Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.01	0.01	0.05	0.01	0.04	0.00	0.08
Observations	2854	2854	2854	1497	1436	1429	1400

Note: This table reports α in the regression of 1. Columns 1-3 report the result of all samples. Columns 4 and 6 report the result of urban samples. Columns 5 and 7 report the result of rural samples. Standard errors clustered at county level are in parentheses.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

in medical care. Therefore, the different effect of UTCP on saving rate may not be caused by the difference in consumption pattern. I have included four consumption characteristics in the control variable following the existing literature. Scond, it is also worth noting that families in treatment group have lower saving rate than those in control group, which hold both before and after the policy shock, while the difference is not so significant after the treatment. I consider it as the narrowing saving rate gap between the treatment group and the control group after the policy shock.

5 Results

5.1 Main Results

I conduct a benchmark regression on Equation 1 using the dataset I have just described. Table 2 shows the main results, where I gradually include family fixed effect and control variables, and conduct regressions separately with the full sample, urban sample, and rural sample.

The table demonstrates that α's are positive under various settings. Moreover, controlling

the family fixed effect leads to a more significant and large α. Relative to the control group, the estimate indicates a 6.3% in saving rate of UTCP cohorts if family fixed effects are controlled. Additionally, taking the control variables into account slightly decrease α while does not make α pale into insignificant. Relative to the control group, the estimate indicates a 5.5% in saving rate of UTCP cohorts if taking control variables and both fixed effects into account. This implies the UTCP policy has given rise to the household saving rate significantly.

The results I obtained seem contradict with existing studies utilizing 2014 restricted two-child policy as an exogenous policy shock. To further verify the effectiveness of my DID design and gain a deeper understanding of the mechanism, I perform several heterogeneity tests and robustness checks.

After further reviewing the related literature and consulting with experts in the field, I propose that one possible explanation for this phenomenon may stem from housing prices: between 2013 and 2016, China experienced a considerable increase in housing prices, a trend that began in first-tier cities before spreading to other areas, with housing prices in first-tier cities increasing by more than threefold in five years. The rise in housing prices had a heterogeneous impact on the savings rates of the treatment and control groups. Couples of childbearing age with one child in the treatment group might have various reasons for wanting to save money to buy a house for their child, whereas a significant portion of the control group consists of couples without children, who would not have this concern. I will continue to investigate this issue more thoroughly to verify this assumption.

5.2 Heterogeneity Tests

In order to specifically figure out the possible mechanisms of the effect of UTCP on saving rate, I conduct several heterogeneous effects tests in this part.

5.2.1 Rural area and Urban area

First, I examine the different effect of UTCP on urban area and rural area.[2] In table2, I conduct the regression in urban and rural area separately and get column (5) - (7). If there is no control variables introduced, the effect in urban area is larger and more statistically significant than the effect in rural area. After introducing the control variables, both effects are no longer statistically significant, and, paradoxically, the effect in rural area is much larger than in urban area. This pattern need to be further explained.

In order to more clearly understand the role of control variables in this regression, I add them one by one and found that the reason for the aforementioned phenomenon is due to the fact that the control variable values for urban and rural samples have significant systematic differences. This causes a biased estimation of the coefficients. After introducing control variables, more differences between urban and rural areas are captured by these variables, preventing me from obtaining an accurate estimate of α. Based on this reason, I only provide a descriptive interpretation of the content in column (5) - (7) of table 2, which is that before introducing control variables, the UTCP policy has a greater and more significant impact on urban areas.

To examine whether the difference are significant, I conduct another regression through

$$\text{Saving}_{it} = \alpha \times \text{Treat}_i \times \text{Policy}_t + \beta \times \text{Treat}_i \times \text{Policy}_t \times \text{Urban}_i + \gamma X_{it} + \mu_t + \theta_i + \varepsilon_{it} \quad (2)$$

where the unit of observation is a family i who were observed in year t. Urban_i is a dummy showing whether the family lives in urban area or rural area. It is 1 for cohorts who live in urban area. Accordingly, β captures the heterogeneous effect of UTCP on urban and rural

[2]It should be noted that the urban-rural classification in this paper is based on whether the family's residence in 2014 was in an urban or rural area. This method of classification is similar to that used for permanent residents, rather than being based on household registration (Hukou). The advantage of this approach is that many families with rural hukou are actually living and working in cities, a phenomenon that is widespread in China. Considering the UTCP policy, they should be more appropriately classified as urban population because if they choose to give birth to children, it is more likely that the childbirth will occur in urban area.

Table 3: Heterogeneity on Urban and Rural

	(1)	(2)
Treat × Policy(α)	0.063***	0.053*
	(0.0241)	(0.0303)
Treat × Policy× Urban (β)	0.001	0.005
	(0.0224)	(0.0222)
Control Variables	No	Yes
Family Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
R^2	0.01	0.05
Observations	2944	2944

Note: This table reports α and β in the regression of 2. Standard errors clustered at county level are in parentheses.
* Significant at the 10 percent level.
*** Significant at the 1 percent level.

area. It is worth noting that I assume that the impact of policy shock on urban and rural areas are heterogeneous, while the control groups share no difference facing the policy shock. Therefore, the equation drops the effect solely caused by geographical locations. The results are reported in table3.

The result could be a bit disappointing that β is not statistically significant in whichever case where α remain statistically significant. β is positive if anything, but we can not reject β being zero, implying that there could be possibly no significant difference in the effect of UTCP on urban and rural area.

Previous studies that used the 2014 restricted two-child policy as an exogenous shock often found significant differences between urban and rural areas(e.g., C. Cao and H. Wang (2022)). These differences stem from the varying degrees of enforcement strength and timing of the policy implementation in rural areas compared to cities. In many rural areas, even before 2014, violations of the FPP policies were not actually subjected to fines, whereas FPP policies in cities were much stricter enforced. In contrast, the UTCP in 2016 was almost simultaneously implemented nationwide, with stronger enforcement in rural areas, reducing

Table 4: Heterogeneity on Income and Assets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Income	Income	Income	Income	Assets	Assets	Assets	Assets
Group	Below	Below	Above	Above	Below	Below	Above	Above
Treat × Policy(α)	0.176***	0.087**	-0.025	0.062*	0.115***	0.119**	0.031	0.003
	(0.0301)	(0.0404)	(0.0262)	(0.0371)	(0.0320)	(0.0420)	(0.0256)	(0.0358)
Control Variables	No	Yes	No	Yes	No	Yes	No	Yes
Family Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.05	0.10	0.00	0.07	0.02	0.07	0.00	0.10
Observations	1512	1456	1432	1398	1345	1345	1597	1509

Note: This table reports α in the regression of 1. Columns 1-4 report the results of samples whose final income is below the average and above the average. Columns 5-8 report the results of samples whose net assets is below the average and above the average. Standard errors clustered at county level are in parentheses.
* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

the differences between urban and rural policies. This may to some extent explain the fact β not being statistically significant.

5.2.2 Different Income Groups

Second, I aim to investigate whether the UTCP has heterogeneous effects on families with different income and assets levels. If families increase their savings to prepare for future childbirth and upbringing, it's possible that families with lower income and assets might increase their savings to a greater extent, as having a second child could impose a greater financial burden on them. I conduct regressions on 1 separately for samples with net assets above and below the average level, and for annual incomes above and below the average level. The results are presented in table 4 below. To be noted that the average log value of net assets for the whole sample is 12.3595, which corresponds to an average net asset value of 223,164.4 Chinese yuan; the average log value of annual income for the whole sample is 10.8529, equivalent to an average annual income of 51,684.3 Chinese yuan.

The results of the regression suggest that the UTCP indeed has a greater effect on increasing savings for families with lower income and net assets. As indicated in the second

column of table 4, for families with an annual income below the average level, the UTCP led to an 8.7% increase in savings for the treatment group, which is a substantial proportion! Correspondingly, the impact of the UTCP on families with higher income and net assets is not very significant. This result is consistent across columns 1-4 and 5-8, indicating that the conclusion does not depend on whether the family has a lower income or lower net assets. In response to our earlier conjecture, this implies that families may be increasing savings to prepare for the future birth and upbringing of a second child.

To examine whether the difference are significant, I conduct a similar regression as 2 through

$$\begin{aligned}\text{Saving}_{it} =&\alpha \times \text{Treat}_i \times \text{Policy}_t + \beta \times \text{Treat}_i \times \text{Policy}_t \times \text{Lowincome/Lowasset}_i \\ &+ \gamma X_{it} + \mu_t + \theta_i + \varepsilon_{it} \end{aligned} \tag{3}$$

where the unit of observation is a family i who were observed in year t. $\text{Lowincome/Lowasset}_i$ is a dummy showing whether the log income or log assets of the family are below the average. It is 1 for cohorts who has a low income or assets. Accordingly, β captures the heterogeneous effect of UTCP on the richer half and the poorer half. The results are reported in table5.

The regression results point out that β is significantly positive in all conditions, which implies that the differences between the low-income and high-income groups as well as between the low- and high-wealth groups are highly significant, and the addition of triple difference makes the original DID coefficient α insignificant. This suggests that the UTCP policy has a clear and significant effect on the low-income and low-wealth groups, while it has possibly no effect on the high-income and high-wealth groups. This further validates our conjecture that the increase in residential savings may be in preparation for childbearing and raising a second child.

Table 5: Heterogeneity on Income and Assets through DDD

	(1)	(2)	(3)	(4)
	Income	Income	Assets	Assets
Treat × Policy(α)	-0.025	-0.030	0.031	-0.28
	(0.0265)	(0.0329)	(0.0255)	(0.0331)
Treat × Policy× Lowincome/Lowassets (β)	0.201***	0.189***	0.083**	0.196***
	(0.0265)	(0.0406)	(0.0255)	(0.0437)
Control Variables	No	Yes	No	Yes
Family Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
R^2	0.03	0.06	0.01	0.06
Observations	2944	2854	2944	2854

Note: This table reports α and β in the regression of 3. Columns 1, 2 report the result with Lowincome$_i$, and columns 3,4 report the result with Lowassets$_i$. Standard errors clustered at county level are in parentheses.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

5.2.3 Gender of the First Child

To rigorously examine my hypothesis, I conduct a heterogeneity test specifically targeting the gender of the first child. The gender of the first child is likely to influence parents' decisions regarding fertility and savings, and the phenomenon of preferring sons over daughters still exists in China. There is already extensive research explaining that families with a first-born girl are more inclined to have a second child. Therefore, I am also concerned about whether the impact of the UTCP varies depending on the gender of the first child. If my hypothesis holds, the α for families whose first child is a girl should be higher than those whose first child is a boy. I conduct regressions on 1 separately for the two samples. The results are as shown in table 6.

From the table, I find that, regardless of whether control variables are introduced or not, the impact of the UTCP is greater and relatively more significant on families with a first-born girl than those with a first-born boy. Furthermore, after the introduction of control variables, the regression results for families with a first-born boy are no longer significant.

Table 6: Heterogeneity on Gender of the First Child

	(1) Boy	(2) Boy	(3) Girl	(4) Girl
Treat × Policy(α)	0.047*	0.040	0.088***	0.068*
	(0.0258)	(0.0324)	(0.0330)	(0.0386)
Control Variables	No	Yes	No	Yes
Family Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
R^2	0.01	0.05	0.01	0.05
Observations	2520	2450	2240	2172

Note: This table reports α in the regression of 1. Columns 1, 2 report the result of families whose first child is a boy. Columns 3, 4 report the result of families whose first child is a girl. Standard errors clustered at county level are in parentheses.
* Significant at the 10 percent level.
*** Significant at the 1 percent level.

This suggests that families whose first child is a girl have a stronger incentive to increase savings.

This is consistent with my hypothesis that families whose first child is a girl are preparing for the birth of a second child, and therefore increasing their savings.

5.3 Robustness Checks

5.3.1 Parallel Trend Test

To visually show the DID effect and the parallel trend, I plot out policy shock changes of household saving rate within different groups through the time series. Figure 1 depicts that the gap between the treatment group and the control group is gradually narrowed at the policy shock. Furthermore, saving rates of both groups stay paralleled after the policy shock.

It is noted in the graph that the savings rate of the control group in 2014 was higher than that of the treatment group and significant at the 5% level. In fact, most families in the control group have children, with less than 5% of the control group families being

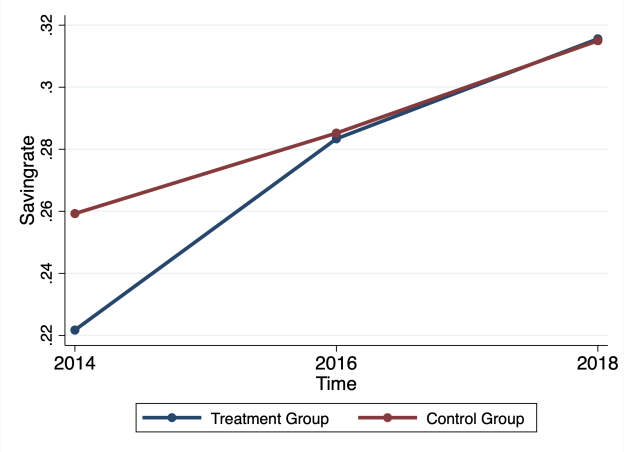

Figure 1: DID Effect and Time Parallel Trend

childless. Moreover, table 1 shows that the families in the control group have, on average, one more person than those in the treatment group, while their annual income and net assets are significantly lower than those of the treatment group. I believe this could be the reason for their higher savings rate. Their families are larger, with less income and assets, hence a weaker ability to withstand risks, necessitating more precautionary savings. Additionally, most children in the control group families are older, and parents may have started saving earlier to prepare real estate for their children. Coupled with the significant rise in China's housing prices from 2010 to 2013, it is not surprising that their savings rate was higher than that of the treatment group in 2014.

The reason I did not include the saving rate before the UTCP is that CFPS changed the survey scope regarding total household consumption expenditure in 2014, which directly affected the savings rate data I calculated. If the 2012 savings rate data were used, it would show that both the treatment and control groups experienced a decline in savings rate of more than 10% between 2012 and 2014. Existing literature does not provide evidence that there was a significant decrease in Chinese household savings during 2012-2014, which is hard to reconcile with reality.

The impact of the UTCP on household savings should primarily be short-term. I believe that during the period 2016-2018, or more precisely, mid-2017 to mid-2019 if considering the

Table 7: Placebo Test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All	All	All	Urban	Urban	Rural	Rural
Treat × Policy(α)	0.023	0.024	-0.274	0.031	-0.067	0.016	0.009
	(0.0167)	(0.0215)	(0.0301)	(0.0262)	(0.0400)	(0.0372)	(0.0474)
Control Variables	No	No	Yes	No	Yes	No	Yes
Family Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.00	0.00	0.02	0.00	0.04	0.00	0.04
Observations	2444	2444	2375	1223	1174	1204	1184

Note: This table reports α in the placebo test. Columns 1-3 report the result of all samples. Columns 4 and 6 report the result of urban samples. Columns 5 and 7 report the result of rural samples. Standard errors clustered at county level are in parentheses.

statistical timing of the CFPS, the UTCP should not have heterogeneous impacts on the treatment and control groups. Therefore, I think the parallel trends of the 2016-2018 data can prove the effectiveness of DID to some extent. Of course, it cannot be denied that lack of the parallel trend test for 2012-2014 does, to some extent, question the validity of DID.

5.3.2 Placebo Test

To further validate the effectiveness of the DID setup I employed, I conduct a placebo test. In this test, I fictitiously create a policy shock in 2018, marking $\text{Policy}'_t = 1$ in 2018 and $\text{Policy}'_t = 0$ in 2016, and use the real treatment group dummy Treat_i to construct an interaction term. Ideally, the regression on 1 using this fictitious DID should yield an insignificant coefficient α.

The results of the placebo test are shown in table 7. I use the exact same setup as in the table 2, and it can be seen that the coefficients α are insignificant in all settings. This indicates that the results in table 2 are exactly caused by the policy, and not due to the differential impact of unobservable factors on the treatment and control group families.

6 Conclusion

How population policy affects China's savings rate is a crucial part of understanding the causes of China's high household savings rate. Currently, China's economic development faces obstacles due to insufficient domestic demand, and the high savings rate exacerbates this situation. In 2023, China fully lifted the three-child limit, marking the end of the forty-year-long family planning policy. How this policy will impact China's savings rate and thereby affect the demand side of the economy, and what policies the government should implement to boost domestic demand, are topics of active discussion among economists.

In this paper, I use the 2016 universal two-child policy as an exogenous shock and employ the DID method to empirically test that relaxing the family planning policy will increase the household savings in China. This effect is more significant in families with low income or low assets, and in families where the first child is a girl, suggesting that the reason for increased savings may be to prepare for the birth and upbringing of a second child. This factor's impact on increasing savings outweighs the effect of reduced savings due to having children for old age support. Also, the fact that families with a girl as the first child are more affected by the UTCP policy indicates that the phenomenon of preferring sons over daughters still exists in China in the 21st century, and this issue has not been completely eradicated.

The limitations of this paper include the need to further strengthen the validity of the parallel trend test for 2012-2014. The CFPS data is missing in some regions and age groups, and further tracking whether the treatment group families have actually had a second child and the corresponding long-term effects are necessary. These limitations cause this study to lose some generality and are awaiting further refinement and discussion in future research.

It's also worth noting that the research findings of this paper reveal that, regardless of whether in the policy treatment or control group, the savings rate continuously rose from 2014 to 2018. This may be due to increased precautionary savings driven by rising risks in the securities market and increased uncertainty, or due to increased savings rates caused by

high housing prices. The specific mechanisms still require further research to clarify.

As policy implications, my result suggest that the government should take various measures to reduce child-bearing costs, such as limiting extracurricular tutoring in compulsory education period, providing more holidays and strengthening social child-bearing functions to alleviate the anxiety of dual-worker families, stabilizing housing prices to reduce savings for marriage houses, and regulating exorbitant bride prices. It is encouraging that many of the policy tools mentioned above have gradually been implemented in recent years, and the results of this study suggest that these policies should be somehow effective in reducing the high household saving rate in China.

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