How Social Insurance Affects Fertility Intentions - An Empirical Analysis Based on CGSS Data

Xiaofei Zhou
Lecturer, Faculty of economics, Southwestern Minzu university, Sichuan, China
zhangwenyan@wustl.edu

Abstract: In order to build a fertility-friendly society and promote the long-term balanced development of the population, it is necessary to formulate a series of fertility support measures, including financial, tax and insurance measures, centered on fertility policies. Therefore, it is necessary to understand and grasp the mechanism of the impact of social security on fertility as well as the degree of impact. Through theoretical and empirical analysis, this paper studies and analyzes the impact of social insurance on fertility intention by using the data of China General Social Survey (CGSS) 2017, and tries to design a series of empirical tests on the effect of social insurance on fertility intention. Through the study, it is found that social insurance affects fertility intention through both substitution effect and income correspondence, and thus the direction and magnitude of the impact of social insurance on participants vary according to the protection. The findings of this paper help us to better understand the impact of social insurance on fertility intentions and provide empirical support and policy rationale for improving the social insurance support measures around fertility policies.
Keywords: Social Insurance; Fertility Intentions; Impact; Effect Analysis

1. INTRODUCTION

Population has always been a fundamental, overall and strategic issue affecting China's economic and social development, and has traditionally been given high priority by the Party and the State. China is currently in a stage where low fertility and population aging coexist, and according to data from the seventh national census, the country's population reached 1.41 billion in 2020, with 13.5% of the population aged 65 years and older, yet the number of births decreased by 2.6 million compared with 2019, a decline of 18%. China is currently in a stage where low fertility and population aging coexist, and according to the data of the seventh national census, China's population will reach 1.41 billion in 2020, of which the proportion of people aged 65 and above will reach 13.5%, however, the number of births will decrease by 2.6 million compared with that of 2019, a decline of 18%. The co-existence of low fertility and population aging will inevitably lead to a significant decline in the working-age population and a decline in economic development potential, which will have a greater impact on the smooth and healthy operation of society. Therefore, it is

necessary to formulate a series of policies to support fertility to cope with the low fertility problem. On July 20, 2021, China's Decision of the Central Committee of the Communist Party of China and the State Council on Optimizing Reproductive Policies to Promote the Long-Term Balanced Development of Population was published. In August 2022, the National Health Commission, the National Development and Reform Commission, the Central Propaganda Department, the Ministry of Education, the Ministry of Civil Affairs, the Ministry of Finance, and the Ministry of Housing and Urban-Rural Development issued the "Guiding Opinions on the Further Improvement and Implementation of Support Measures for Active Childbearing", which explicitly mentioned "improving the maternity insurance and other related social insurance systems". It can be seen that social insurance is an important element of maternity support measures. In order to improve the social insurance system in a maternity-oriented manner, we should first find out what the impact of social insurance on maternity is. Many scholars have paid attention to the substitution between the protection function of social insurance and the function of maternity protection. Since ancient times, there has been a saying in China that "raising children for old age" has led to one of the main purposes of childbearing, namely, to provide security for the future, as the family traditionally bears the main responsibility for old age. However, in modern society, the rapid development of social insurance has changed the traditional "raising children for old age" model of intergenerational transfer of payments within the family, forming a "substitute" for the function of maternity protection, reducing the parents' economic needs for children and the need for protection, thus forming a "substitute" for maternity protection. This has reduced parents' economic and security needs for their children, thus creating a "crowding out" of childbearing. For example, Ebenstein & Leung found that the implementation of the new rural old-age insurance program helped reduce the sex ratio at birth (Ebenstein & Leung, 2010), that is, the new rural insurance program reduced the preference of "raising children for old age prevention" in rural areas; Zhang also conducted a study on rural areas and found that the implementation of social insurance helped reduce the preference of "raising children for old age prevention (Zhang, 2015)"; Zhang Chuanchuan & Zhang also conducted a study on rural areas and found that the implementation of social insurance helps to reduce the preference of "raising children to prevent old age (Zhang, 2015; Zhang

& Chen, 2014)" in rural areas; Zhang Chuanchuan et al. took China's old-age pension insurance as an example (Zhang, 2015), and found that the implementation of the new rural old-age pension insurance helps to reduce the dependence of the rural population on the family's old-age pension through empirical research; Liu & Gong Based on the individual lifetime utility maximization framework analysis shows that social security has a substitution effect on the number of births (Liu & Gong, 2020); Zhou, Chen, & Liu analyze that the level of social security reduces the fertility rate by reducing the financial dependence of parents on their children in old age through the introduction of the economic mechanism of social old-age pension instead of family old-age pension (Zhou et al., 2024); Wang Tanyu and Peng Xiaobo use the 2000 to 2009 China Health and Nutrition Survey (CHNS) data from 2000 to 2009 to analyze and conclude that the new rural cooperative medical insurance leads to a 3% to 10% reduction in two-child fertility intentions (Wang & Peng, 2015). Generally speaking, the above studies have focused on finding the substitution effect of social insurance on childbearing, and thus on the proposition that "social insurance leads to lower childbearing". In the relationship between social insurance and childbearing, these scholars usually focus on "whether or not one has social insurance (old-age insurance or health insurance)", which is considered to be negatively correlated with each other. However, it is argued that the term "social security or not", while useful in studying the relationship between social security and childbearing, is not comprehensive. On the one hand, the substitution effect arises from the fact that the security function of social insurance makes it an alternative to having children. Thus, the size of the substitution effect is necessarily closely related to the level of social insurance coverage, which means that the substitution effect of social insurance may not be the same for different levels of coverage. On the other hand, in addition to its substitution effect on childbearing, the income effect of social insurance is equally important. The income effect of social insurance is reflected in the fact that it reduces the likelihood of uncertain future excess expenditures, which in turn leads to a decline in precautionary saving behavior in the current period and an increase in disposable income. Economists have long demonstrated the positive impact of economic income on fertility (Chen et al., 2019; Curtis et al., 2015; Fiori et al., 2018; Huang, 2019; Shao et al., 2023; Zhang et al., 2022) etc.), and thus the income effect is reflected in the positive impact of social insurance on fertility. The main work of this paper analyzes the substitution effect and income effect of social insurance on childbearing,

and empirically tests the effect of social insurance on childbearing with different levels of protection using data from the China General Social Survey (CGSS) 2017. The rest of the paper is organized as follows:The second part analyzes the mechanism of the effect of social insurance on fertility intentions based on the theory, the third part introduces the data and descriptive statistics of this paper, the econometric model used in this paper with the results of the empirical analysis, the fourth part carries out the robustness test of the results, and, finally, puts forward the corresponding policy recommendations based on the findings of this paper.

2. IMPACT OF SOCIAL INSURANCE ON FERTILITY INTENTIONS

Based on the classical model of economics, the impact of social insurance on fertility intentions can be understood in terms of both substitution effects and income effects. On the one hand, from the aspect of substitution effect, in modern society, the rapid development of social insurance has changed the protection mode of intergenerational transfer payment within the family, which is traditionally "raising children for old age", and formed a "substitution" for the protection function of childbirth, and reduced the economic demand for children and the demand for protection, thus forming a "crowding out" of childbirth. This reduces parents' economic and security needs for their children, thus creating a "crowding out" of childbearing. As a result, the substitution effect tends to be reflected in the negative impact of social insurance on fertility. On the other hand, in terms of income effects, social insurance helps to prevent the insured from incurring large expenditures due to future risks, thereby reducing precautionary savings and increasing current disposable income. According to Leibenstein who laid the foundations of microfertility economics, and subsequent economists who have confirmed the positive relationship between economic income and fertility, higher current disposable income may have a positive impact on fertility (Leibenstein, 1957). Generally speaking, the substitution effect and the income effect of social insurance exist at the same time. The impact of social insurance on fertility depends on the strength of the substitution effect and the income effect; if the substitution effect is stronger than the income effect, the impact of social insurance on fertility is negative, while when the income effect is stronger than the substitution effect, the impact

of social insurance on fertility is positive. When the level of social insurance coverage gradually increases, the substitution and income effects of social insurance on childbearing also increase due to the gradual increase in the economic compensation and risk-prevention effects. However, the increase in the substitution and income effects is not proportional. In particular, when the level of social insurance coverage is low, the income effect is generally higher than the substitution effect, which manifests itself as a positive effect of social insurance on fertility, while when the level of social insurance coverage is high, the income effect is lower than the substitution effect, which manifests itself as a negative effect of social security on fertility.

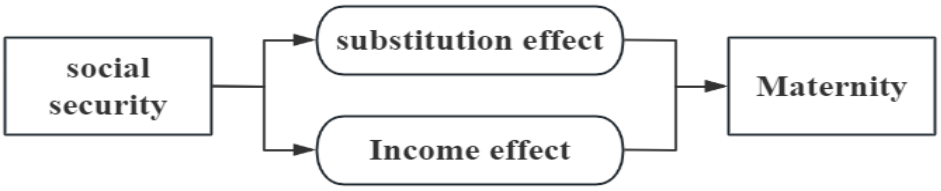

Figure 1: Analysis of the effect of social insurance on maternity

Based on the above theory, this paper distinguishes the data into three groups: the uninsured group, the health insurance group (participants with health insurance only), and the dual insurance group (participants with both health insurance and pension insurance). These three groups have different levels of social security coverage, with the level of coverage increasing in order from the uninsured group to the dual-insurance group. Using information on the population of childbearing age (aged between 18 and 50) included in the Chinese General Social Survey (CGSS) 2017 survey data, we show the relationship between the degree of social security coverage and fertility intentions, as shown in Table 1. Of these, social security status and fertility intentions were based on the CGSS 2017 questionnaire questions "Are you currently enrolled in the following social security programmes" and "How many children would you like to have if there were no policy restrictions?" Obtained.

Table 1: Relationship between the level of social insurance coverage and fertility intentions

	Uninsured Group	**Medical Insurance Group**	**Dual Insurance Group**
Fertility	1.768	1.855	1.856

Table 1 shows very visually the relationship between different levels of social insurance coverage and fertility intentions. As the level of social insurance coverage increases, fertility intentions rise as social insurance

moves from the uninsured group, to the health insurance group, to the dual insurance group. However, in the process of changing from the health insurance group to the dual insurance group, the average fertility intention only increased from 1.855 to 1.856, and the increase in fertility intention has been substantially reduced. The above data is basically consistent with the theoretical hypothesis of this paper, that in the process of changing the level of social insurance coverage from low to high, the substitution effect and the income effect have different magnitudes of change, thus showing the process of gradually increasing fertility intention with the increase in the level of coverage, but the magnitude of the increase is gradually decreasing.

3. EMPIRICAL STUDIES AND THEIR RESULTS

3.1 Data Sources

This paper adopts the 2017 survey data from the Chinese General Social Survey (CGSS), which is organised by the China Survey and Data Centre of Renmin University of China, and collects data regularly and systematically from important provinces, communities, households and individuals in China, covering a wide range of economic, political and cultural aspects.The data from the 2017 survey covers 783 variables and 12,582 households and individuals, including the important variables ‘social insurance’ and ‘fertility intention’ needed for this study. The data covers 783 variables and 12,582 households and individuals, including the important variables of ‘social insurance’ and ‘fertility intention’, which provide data support for the research of this paper. In accordance with the purpose of the study, the data were processed as follows: first, missing data and unusual or invalid data such as ‘unable to answer’ and ‘not applicable’ were deleted. Next, the age limit was set at 18 to 50 years of age for people of childbearing age. The data were processed to obtain a final sample of 5,155 observations. The data were still divided into three groups - the uninsured group, the health insurance group (participants with health insurance only), and the dual insurance group (participants with both health insurance and pension insurance). The three groups differ in the level of social security coverage, with the level of coverage increasing from the uninsured group to the dual-insurance group.

3.2 Modelling

(1). A test of the relationship between social insurance and fertility

intentions. In order to test the relationship between social insurance and fertility intention, this paper divides the sample data into two groups, i.e. the group with social insurance and the group without social insurance. According to the previous theoretical analysis, due to the fertility effect of social insurance, this paper expects that the average fertility intention of the group with insurance will be significantly higher than the average fertility intention of the group without insurance. The econometric model used in this paper is as follows:

$$FT = \alpha_0 + \alpha_1 INS + \beta \mathbf{X} + \varepsilon \quad (1)$$

Where FT is the explanatory variable of this study, i.e., fertility intention.INS is the explanatory variable that is the focus of attention in this paper and is a dummy variable that indicates the group in which the respondent is placed, when INS is 1 it means that the respondent is in the insured group, i.e., the experimental group, and when INS is 0 it means that the respondent is in the uninsured group, i.e., the control group. The vector X is a control variable reflecting a series of characteristics of the respondents. In order to be able to obtain more reliable measurement results, this paper adds variables belonging to the personal characteristics of the respondents, including age, gender, hukou, marital status, religious beliefs, ethnicity, the highest level of education, and political outlook. In addition to these factors, this paper also adds important factors that may affect fertility intentions, such as average annual personal income and the number of owned properties reflecting personal property income, BMI, self-assessment of health, hospitalisation due to illness, work affected by health status and mental health status reflecting physical health status, and self-assessment of personal well-being and attitudes towards old age reflecting personal attitudes towards life. The key parameter of interest in this paper is α_1, which should be positive and significant if social insurance has a positive effect on fertility intentions. There may be endogeneity problems with the estimation using model.

(1) On the one hand, there may be specific reasons why individuals choose whether or not they are socially insured, for example, those in better health and with higher incomes are more inclined to opt out of social insurance, while these individuals tend to have higher fertility intentions at the same time. To deal with this problem, this paper uses a kernel matching method of propensity score matching to estimate the average treatment effect of health insurance participation. Second, the omission of endogeneity due to health factors. Health is an important factor affecting fertility, yet measures of health are currently not uniform in academia, and

although self-assessed health is a commonly used indicator for studying health (Jylhä, 2009; Kaplan & Camacho, 1983; Maddox & Douglass, 1973; Shadbolt, 1997), yet many scholars continue to question the accuracy of self-assessed health, arguing that the actual state of health tends to be at odds with the self-assessed health to some degree (Krause & Jay, 1994; Suchman et al., 1957; Thorslund & Lundberg, 1994). In order to better measure health problems and to avoid endogenous problems caused by missing variables, this paper includes multiple measures of health such as height and Body Mass Index (BMI), hospitalisation due to illness, impacts on work due to health conditions, and mental health, in addition to self-assessed health.

(2). Test of the effect of the level of social insurance coverage on fertility

Full confirmation of the path of the degree of social insurance coverage on fertility intentions requires distinguishing between substitution effects and income effects. However, it is difficult to distinguish between these two effects, which often coexist and vary in the same direction as the degree of social insurance coverage. Thus, this paper attempts to socially skillful empirical evidence to indirectly prove the fertility effect of the degree of social insurance protection. Firstly, as mentioned earlier, although the substitution effect and the income effect of social insurance on childbearing increase with the increase in the level of protection, the substitution effect and the income effect vary in magnitude in the process of changing the level of social insurance protection from low to high, which results in the process of a gradual increase in the willingness to give birth with the increase in the level of protection but a gradual decrease in the magnitude of the increase. Accordingly, this paper divides the sample data into the uninsured group, the health insurance group (health insurance only) and the dual insurance group (both health insurance and pension insurance), and incorporates the degree of protection into the model to empirically test the impact of changes in the degree of protection on fertility intentions. The econometric model used is as follows:

$$FT = \beta_0 + \beta_1 ins_1 + \beta_2 Ins_2 + \gamma \mathbf{X} + \varepsilon \quad (2)$$

Where ins_1 denotes a dummy variable for whether the respondent is in the health insurance group, which when it takes the value of 1 indicates that the respondent is in the health insurance group, and ins_2 denotes a dummy variable for whether the respondent is in the dual insurance group, which when it takes the value of 1 indicates that the respondent is in the dual insurance group. ins_1 and ins_2 are included in the model at the same time, and the benchmark group is the uninsured group. Other control

variables are the same as in model

(1).We are concerned with the sign and magnitude of δ_1 and δ_2. Secondly, because the influence of traditional Chinese culture and customs is still so strong, there may be a large difference between the effects of increased social insurance coverage on the birth of boys and on the birth of boys. When the substitution effect of social insurance increases, the traditional 'boy preference' may lead to a greater substitution effect for the birth of girls, that is to say, a greater reduction in the willingness of insured persons to give birth to girls. An increase in the income effect of social insurance, on the other hand, may lead to a larger income effect for boys, i.e. a higher willingness to have boys. When both effects increase, the combination of the two effects leads to a greater increase in the willingness to have a boy than to have a girl. Based on the above assumptions, this paper conducts regressions on the willingness to have a boy and the willingness to have a girl to identify the strength of the income effect and the substitution effect. In view of the fact that the traditional idea of ' giving preference to sons over daughters may be more pronounced in rural areas of China, this paper also conducted regressions on the rural population and the urban population separately, and judged the strength of the income effect and the substitution effect on the basis of the regression results.

Finally, according to theory, both the substitution effect and the income effect of social insurance for maternity are likely to vary with the income of the maternity decision-maker, as shown by a stronger effect for lower-income individuals and a lower effect for higher-income groups. In response to these assumptions, the paper then proceeds to divide the sample into a low-income group and a high-income group, using income as the median boundary.

3.3 Empirical Findings

Table 2 demonstrates the results of descriptive statistics for the main variables in the model. From the descriptive statistics, it can be judged that the fertility intentions of the population of childbearing age are generally low, with an average fertility intention of only 1.847.

According to the relevant survey conducted by the National Bureau of Statistics, the number of children desired by women of childbearing age nationwide is 1.8, and the sample data used in this paper are more in line with this figure.

Table 2: (a) Descriptive Statistics of Main Variables

	Population (Statistics)	**Uninsured Group**	**Medical Insurance Group**	**Dual Insurance Group**	**Note**
Fertility Intention	1.847	1.768	1.855	1.856	
Personal Characteristics					
Age	36.653	33.432	33.741	38.395	Continuous variable indicating age
Male	0.467	0.486	0.453	0.47	Dummy variable with a value of 1 for male
Agricultural	0.552	0.583	0.707	0.481	Dummy variable, a value of 1 indicates agricultural status
Unmarried	0.2	0.328	0.273	0.148	Dummy variable, a value of 1 means unmarried
Ethnicity	1.37	1.474	1.48	1.307	Values 1-8 indicate Chinese, Mongolian, Manchu, Hui, Tibetan, Zhuang, Viennese, and others.
Below Junior High School	0.486	0.524	0.583	0.438	Dummy variable, value 1 means below junior high school
High School/Vocational High School/Junior College/ Technical School	0.191	0.215	0.21	0.18	Dummy variable, a value of 1 means high school/vocational high school/junior college/technical school.
University College	0.125	0.088	0.087	0.146	Dummy variable, a value of 1 means university college
Undergraduate	0.17	0.146	0.105	0.202	Dummy variable, a value of 1 indicates a university undergraduate degree

Table 2: (b) Descriptive Statistics of Main Variables

	Population (Statistics)	Uninsured Group	Medical Insurance Group	Dual Insurance Group	Note
Undergraduate or above	0.028	0.027	0.015	0.034	Dummy variable, a value of 1 means more than undergraduate degree
Political Appearance	1.357	1.269	1.247	1.418	1-4 denote masses, Komsomol members, democrats and communists respectively
Religion					
Buddhism	0.039	0.038	0.033	0.041	Dummy variable, a value of 1 indicates Buddhism
Taoism	0.002	0	0.002	0.002	Dummy variable, a value of 1 indicates Taoism
Folk belief	0.014	0.012	0.026	0.01	Dummy variable with value 1 for folk beliefs
Islam	0.021	0.029	0.017	0.021	Dummy variable with value 1 for Islam
Catholicism	0.002	0.004	0.001	0.002	Dummy variable with value 1 for Catholicism
Christianity	0.013	0.01	0.016	0.013	Dummy variable, value 1 for Christianity
Income					
Property					
Average Annual Income	8.633	7.631	7.24	9.38	Logarithm of average annual personal income
Number of Properties Owned	0.638	0.459	0.471	0.737	Number of properties used by individuals
Physical Health					
BMI	22.59	22.22	22.13	22.85	Calculated
Health Self-Assessment	3.869	3.919	3.849	3.869	Values from 1 to 5, with larger numbers indicating better health
Hospitalisation	0.189	0.182	0.219	0.177	Number of hospital admissions for sickness in the last 12 months

Table 2: (c) Descriptive Statistics of Main Variables

	Population (Statistics)	**Uninsured Group**	**Medical Insurance Group**	**Dual Insurance Group**	**Note**
Health Impact on Work	4.232	4.303	4.153	4.254	The larger the number, the lower the impact on work.
Mental status	3.857	3.858	3.787	3.886	The smaller the number, the more frustrated you are.
Attitude towards life					
Self-assessment of Happiness	3.856	3.76	3.786	3.901	1-5, the larger the number, the happier you are
Attitude towards old age	2.649	2.557	2.579	2.694	Values 1-4 indicate that the government is responsible, the children are responsible, the elderly are responsible, and all three parties share the burden equally.
Observations	5155	521	1374	3260	

Note: The BMI indicator is calculated based on the respondents' answers to the questionnaire about weight and height, which is calculated by the formula "weight ÷ height2"; the hospitalisation due to illness was obtained based on the questionnaire 'How many times have you been hospitalised due to illness or injury in the past 12 months? Health affecting work was obtained according to the questionnaire 'In the past four weeks, how often have health problems affected your work or other daily activities', and psychological condition was obtained according to the indicator 'In the past four weeks, how often have you felt depressed or frustrated'. How often you have felt depressed or frustrated' in the questionnaire.

Table 3 shows the results of the regression using model (1). Column (1) of the table shows the results of the regression with only one explanatory variable (social insurance); column (2) shows the results of the regression with the addition of personal characteristics; column (3) shows the results of the regression with the addition of religion; column (4) shows the results of the regression with the addition of income and property; column (5) shows the results of the regression with the addition of health; and column (6) shows the results of the regression with the addition of attitude towards life.

Table 3: Results of the Regression of Fertility Intentions on Social Security

Explained Variable: Fertility Intentions						
	(1)	(2)	(3)	(4)	(5)	(6)
Social Security	0.105***	0.08**	0.073**	0.072**	0.072**	0.069*
	(0.036)	(0.036)	(0.035)	(0.035)	(0.035)	(0.035)
Personal Characteristics		Yes	Yes	Yes	Yes	Yes
Religion			Yes	Yes	Yes	Yes
Property Income				Yes	Yes	Yes
Physical Health					Yes	Yes
Attitude Towards Life						Yes
_Cons	1.751***	1.618***	1.627***	1.638***	1.045***	1.209***
	(0.034)	(0.212)	(0.211)	(0.213)	(0.26)	(0.272)
Observations	5155	5155	5155	5155	5155	5155
R-Squared	0.002	0.04	0.052	0.052	0.057	0.062

Note: Standard errors in parentheses, *** indicates significant at the 1 per cent level of significance, ** indicates significant at the 5 per cent level of significance and * indicates significant at the 10 per cent level of significance.

The regression results show that when no control variables are added (column (1)), social insurance has a significant effect on fertility intentions and is significant at the 1 per cent level. After the gradual addition of control variables such as individual characteristics, religious beliefs, income and property, physical health and attitude towards life, social insurance still has a positive effect on fertility intentions, indicating that social insurance helps to increase the average fertility intentions of participants. This conclusion shows that at this stage, the income effect of social insurance on fertility intentions is higher than the substitution effect and shows a positive effect. In terms of magnitude, the coefficient of influence of social insurance on the fertility effect is 0.07 (column (6)). This means that fertility intentions are 0.07 higher in the social insurance group than in the uninsured group, i.e. 7 more children per 100 people of reproductive age. The regression results indicate that social insurance has a greater impact on fertility intentions.

Table 4: Estimates of the Propensity Score Matching Method for the Effect of Health Insurance on Fertility Intentions

	Process Group	**Control Group**	**Discrepancy Between**	**Standard Error**	**T-Value**
ATT	1.852	1.762	0.090	0.040	2.260

Next, the paper estimates the average treatment effect using the kernel matching method of propensity score matching, and the results are shown

in Table 4.As can be seen in Table 4, the average treatment effect of health insurance on fertility intentions remains significant at the 5 per cent level after using propensity score matching. The average treatment effect is 0.09, up 0.02 from 0.07 before unmatched, which means that after dealing with self-selection, fertility intentions are 0.09 higher in the social insurance group compared to the uninsured group, i.e., there will be 9 more children per 100 people of childbearing age. The results of the assessment of the degree and size of the effect of social insurance on fertility intentions are in line with the expectations of this paper. The estimation of the average treatment effect using propensity score matching helps to reduce the differences between the experimental and control groups and obtain more reliable results. In terms of the magnitude of the estimation results, the difference between the propensity score matching method and the least squares estimation results is only 0.02. Therefore, this paper still uses the least squares method for estimation in the subsequent studies. Table 5 presents the results of the path test for the effect of security level on fertility intentions, where column (1) presents the regression results obtained by grouping the samples according to the level of security, columns (2) and (3) present the results of the regressions with the intention to have a boy and the intention to have a girl as the explanatory variables, respectively, columns (4) and (5) show the results of the regressions with the rural and urban samples, respectively, columns (6) and (7) show the results of the regressions with the samples with less than the median income and the samples above the median income, respectively. columns (6) and (7) are the results of the regressions for the below median income and above median income samples, respectively.

Table 5: (a) Results of the Path Test for the Effect of Level of Security on Fertility Intentions

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
	Level of security	Birth of a boy	Birth of a girl	Rural	Urban	Low income	High income
Social Insurance Group		0.054**	0.019	0.087*	0.047	0.098**	0.004
		(0.025)	(0.027)	(0.048)	(0.062)	(0.046)	(0.067)
Medical Insurance Group	0.062*						

Table 5: (b) Results of the Path Test for the Effect of Level of Security on Fertility Intentions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(0.036)						
Dual Insurance Group	0.055						
	(0.034)						
Personal Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Religion	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income and Property	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Health	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude towards Life	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	1.039***	0.611**	0.507**	1.111***	1.064*	1.219***	0.972
	(0.271)	(0.194)	(0.204)	(0.346)	(0.567)	(0.353)	(0.675)
Observations	5155	4441	4441	2509	1932	2580	1861
R-squared	0.062	0.059	0.033	0.083	0.055	0.088	0.062

Note: Standard errors in parentheses, *** indicates significant at the 1 per cent level of significance, ** indicates significant at the 5 per cent level of significance and * indicates significant at the 10 per cent level of significance.

In terms of the effect of the level of coverage on fertility intentions (column (1)), the coefficient of the health insurance group on fertility intentions is 0.062 compared to the benchmark group (uninsured group) and is significant at the 10 per cent level, suggesting that participation in health insurance only leads to an average increase in fertility intentions of 6.2 children per 100 persons of the population of childbearing age, while the coefficient of the dual-insurance group on fertility intentions is 0.056 compared to the benchmark group, but is not significant. In terms of the magnitude of the coefficient, the estimate for the dual-insurance group is lower than that for the health insurance-only group, suggesting that fertility intentions do not increase proportionally with the level of coverage. This finding confirms the prediction of this paper that when the level of protection increases, the substitution effect increases at the same time as the income effect, leading to a possible slowdown or decline in the growth rate of the impact of social insurance on fertility intentions. Looking at the results of the regressions of willingness to have a boy and willingness to have a girl (columns (2) and (3)), the coefficient of social insurance on the willingness to have a boy is 0.054 and is significant at the 5 per cent level, however, the coefficient of social insurance on the willingness to have a girl is not significant and is numerically lower than the coefficient of the

willingness to have a boy, which is only 0.019. This is in line with our expectation that an increase in the level of social insurance coverage leads to a larger income effect for having a boy and a larger substitution effect for having a girl. This leads to a significant difference in the willingness to have a girl and the willingness to have a boy. From the regression results for the rural and urban sub-samples (columns (4) and (5)), the coefficient of the effect of social insurance on fertility intentions in the rural sample is 0.085, which is significant at the 10 per cent level, whereas in the urban sample, the effect of participation in health insurance on fertility intentions is insignificant, with a coefficient of 0.045, which is lower than that of the effect of social insurance in the rural sample. This is in line with our expectation that the impact of social insurance on fertility intentions is greater in rural areas, where the influence of traditional ‘gender preferences in childbearing’ is still prevalent. Looking at the results of the regressions for the low-income and high-income sub-samples (columns (6) and (7)), the coefficient of the effect of social insurance on fertility intentions in the low-income sample is 0.98 and is significant at the 5 per cent level, whereas the effect of enrolling in health insurance on fertility intentions in the high-income sample is not significant, and the value of 0.004 suggests that the extent of the effect of health insurance is low, much lower than in the low-income sample. the extent of the effect of health insurance. This is in line with our expectations, suggesting that both the substitution effect and the income effect of social insurance on fertility are related to income, and that there is a tendency for both the substitution effect and the income effect to decrease as income increases.

4. ROBUSTNESS CHECK

To test the robustness of the results of this paper, the following tests were conducted: (1) narrowing the age group of respondents in the sample by restricting the age to 20 years old and above; (2) restricting the age to less than 45 years old; and (3) replacing the explanatory variables with fertility behaviours. Fertility behaviour indicates the number of children actually born to the population of childbearing age, whereas fertility intention refers to the subjective precursor of fertility in an individual or a family, and is importantly different from fertility behaviour. Individuals with fertility intentions do not necessarily have children due to the interference of specific reasons in reality, but high fertility intentions imply that there is a possibility for individuals to have children in the future. If the effect of social insurance is still significant when the explanatory

variable is fertility behaviour, it shows that the study of fertility intention in this paper has some reliability.

Table 6: Robustness Test Results

	Explained Variable: Fertility Intentions		**Explained Variable: Reproductive Behaviour**
	Age greater than 20 years	Less than 45 years of age	
Social Security	0.065*	0.082**	0.132**
	(0.036)	(0.04)	(0.058)
Personal Characteristics	Yes	Yes	Yes
Religion	Yes	Yes	Yes
Income and Property	Yes	Yes	Yes
Physical Health	Yes	Yes	Yes
Attitude towards Life	Yes	Yes	Yes
_Cons	0.774***	1.012***	-1.24***
	(0.287)	(0.353)	(0.44)
Observations	5025	3778	5119
R-Squared	0.067	0.061	0.247

Note: Standard errors in parentheses, *** indicates significant at the 1 per cent level of significance, ** indicates significant at the 5 per cent level of significance and * indicates significant at the 10 per cent level of significance.

Table 6 shows us the results of the robustness test, and we can see that the results are still significant after narrowing the age range of the sample and changing the explanatory variable to fertility behaviour, indicating that the findings of this paper are somewhat stable.

5. FINDINGS AND VALUE OF THE STUDY

By combing the literature and theoretical analyses, this paper proposes that the effects of social insurance on fertility should be analysed from two perspectives, namely, the substitution effect and the income effect of social insurance. In the past, scholars were often more concerned about the proposition that 'the higher the protection, the stronger the fertility intention' or 'the higher the protection, the lower the fertility intention' does not persist, with the changes in the degree of social insurance protection, the substitution effect and the income effect are inversely related, and the combined effect of the changes of the two determines the impact of social insurance on fertility intention. The combined effect of these changes determines the impact of social insurance on fertility intentions. Accordingly, this paper designed a series of empirical tests to verify the speculation that the income effect is higher than the substitution

effect at lower levels of social insurance protection, which is manifested in the fact that an increase in the level of social security promotes an increase in fertility intentions, whereas when the level of social security is high, it may lead to a substitution effect higher than the income effect, which is manifested in the process of decreasing fertility intentions as the level of protection is gradually increased. The empirical test also found that social insurance at this stage has a significant positive effect on fertility intentions. Therefore, it is feasible to improve the social insurance system and formulate a maternity-oriented and ‘maternity-friendly’ social insurance system, which will help to promote the increase of fertility intentions. However, in the process of policy formulation, it is necessary to keep track of the changes in the level of social insurance coverage. On the one hand, the level of social insurance coverage should be kept within the range that maximises the marginal impact on fertility intentions. On the other hand, it is important to avoid excessive levels of social security coverage that could have a negative impact on fertility intentions. It should be noted that although this paper has explored the effect of social insurance on fertility intentions, it has not been able to further analyse the threshold value of the impact of the level of social insurance protection on fertility intentions due to the limitation of the data itself. With the development of society and economy, the increase of social insurance coverage has become an inevitable trend, therefore, exploring the threshold of the effect of social insurance coverage on fertility intention has become a theoretical and empirical research topic to be followed up and carried out in depth in this paper in a timely manner.

5.1 Chinese Classification Number
F840.61

5.2 Literature Identification Number
A

References

Chen, S.-M., Zhang, Y., & Wang, Y.-B. (2019). Individual differences in relative fertility costs and fertility benefits and their effects on fertility desire for a second child in China: a latent profile analysis. *Reproductive health*, *16*, 1-9.

Curtis, C. C., Lugauer, S., & Mark, N. C. (2015). Demographic patterns and household saving in China. *American Economic Journal: Macroeconomics*, *7*(2), 58-94.

Ebenstein, A., & Leung, S. (2010). Son preference and access to social insurance: evidence from China's rural pension program. *Population and Development Review*, *36*(1), 47-70.

Fiori, F., Graham, E., & Rinesi, F. (2018). Economic reasons for not wanting a second child: Changes before and after the onset of the economic recession in Italy. *Demographic research*, *38*, 843-854.

Huang, W. (2019). Influence of Social Security on the Fertility Intention of Second Child——Based on the Research of Chinese General Social Survey.

Jylhä, M. (2009). What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Social Science & Medicine*, *69*(3), 307-316.

Kaplan, G. A., & Camacho, T. (1983). Perceived health and mortality: a nine-year follow-up of the human population laboratory cohort. *American journal of epidemiology*, *117*(3), 292-304.

Krause, N. M., & Jay, G. M. (1994). What do global self-rated health items measure? *Medical care*, *32*(9), 930-942.

Leibenstein, H. (1957). The theory of underemployment in backward economies. *Journal of Political Economy*, *65*(2), 91-103.

Liu, Z., & Gong, Y. (2020). INCOME, SOCIAL SECURITY AND CHINESE FAMILIES'"TWO-CHILD" DECISIONS: EVIDENCE FROM URBAN RESIDENTS'FERTILITY INTENTIONS. *The Singapore Economic Review*, *65*(06), 1773-1796.

Maddox, G. L., & Douglass, E. B. (1973). Self-assessment of health: A longitudinal study of elderly subjects. *Journal of health and social behavior*, 87-93.

Shadbolt, B. (1997). Some correlates of self-rated health for Australian women. *American journal of public health*, *87*(6), 951-956.

Shao, S., Tian, Z., Zhang, Y., & Li, B. (2023). The housing status and two-child fertility willingness of floating population: Evidence from the Chinese General Social Survey. *Economic Analysis and Policy*, *80*, 247-266.

Suchman, E. A., Phillips, B. S., & Streib, G. F. (1957). An analysis of the validity of health questionnaires. *Soc. F.*, *36*, 223.

Thorslund, M., & Lundberg, O. (1994). Health and inequalities among the oldest old. *Journal of Aging and Health*, *6*(1), 51-69.

Wang, T., & Peng, X. (2015). The impact of social security on fertility desire: evidence from the new rural cooperative medical scheme. *Econ. Res. J*, *2*, 103-117.

Zhang, C. (2015). Children, old-age support and pension in rural China. *China Agricultural Economic Review*, *7*(3), 405-420.

Zhang, C., & Chen, B. (2014). Can "social pension" replace "family pension"?—Evidence from China's new rural social pension insurance. *Economic Research*, *49*(11), 102-115.

Zhang, J., Li, X., & Tang, J. (2022). Effect of public expenditure on fertility intention to have a second child or more: Evidence from China's CGSS survey data. *Cities*, *128*, 103812.

Zhou, T., Chen, Y., & Liu, T. (2024). Research on the Factors Influencing the Fertility Intentions of Women of Childbearing Age under the Three-Child Policy: Empirical research based on CGSS 2021 data.