Sui Generis: Conditional Free Compulsory Schooling and Financial Market Participation in China

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Abstract

We examine the effect of education on financial market participation and portfolio choice in China. Our identification strategy uses the exogenous variation in years of compulsory schooling that arose from a major reform in the late 1980s, combined with the overlapping single-child policy of 1980, which induced financial constraints on child school attendance for noncompliant households. Using a fuzzy regression discontinuity design that instruments the years of schooling with reform exposure, we find that education has a large influence on participation in markets for stocks and risky assets, the amounts invested, and portfolio diversification. The effects are larger for males and for residents of urban regions. Causal mediation analysis suggests that increased financial literacy and the decline in Confucian norms of filial piety are the primary channels of transmission of the effect of education on household financial behaviour. The results highlight the potential of educational, social, and market reform in a *sui generis* environment of limited household participation in financial markets.

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1. Introduction

The opening of the financial sector in contemporary China after the early 1990s plays a crucial role in fostering its large economic expansion over the last decades. As labour income per capita in households continues to increase, individual ability to allocate assets efficiently over time is paramount to increasing living standards and well-being (Campbell, 2006). The development of the financial sector over the last three decades has increased the availability of diverse financial products to households, such as stocks, bonds, mutual funds, and derivatives, as well as wealth management products and risk-free bank savings accounts.

However, despite the increase in savings rates in China, diversification in the portfolios of Chinese households is very limited. According to the Chinese Household Finance Survey conducted in 2013, there have approximately 60% of those respondents are having financial accounts, and over 80% of Chinese households own property. However, financial assets account for less than 30% of a typical Chinese portfolio. For instance, the proportion of investing in stocks and risky assets were 5.2% and 9.2%, respectively. For investing in mutual funds was 3.2%, By contrast, the proportions for investing in futures, gold, and non-RMB denominated assets were all less than 1%[1]. This figure is much lower than in developed countries such as the United Kingdom and the United States, for which the figures are just below 50% or around 20% if one excludes participation via defined-contribution accounts (Gomes *et al.*, 2021). According to Ge *et al.*, (2021), based on the 2014-2018 China Family Panel Studies (CFPS), 23% of Chinese residents participate in risky asset markets, including gold and foreign currencies, and 10% of financial wealth is allocated to risky assets[2].

Several studies attempt to explain the phenomenon of limited participation in risky asset markets from the perspectives of institutional and legal constraints (Cardak and Wikins, 2009; Brown *et al.*, 2019), social norms and interactions (Guiso, 2008), investor mentality (Hong *et al.*, 2004), risk aversion (Ayyagari *et al.*, 2017; Halko *et al.*, 2012), and financial literacy (van Rooij *et al.*, 2011), inter alia. A distinctive

[1] The statistical data were calculated by the authors based on the CHFS dataset for 2013.

[2] Risky assets entail stocks, bonds, mutual funds, derivatives, wealth management products, non-RMB foreign exchange assets, and/or gold. The estimates from the CFPS are likely to refer to the individual, rather than the household level.

literature examines the effect of education on financial market participation. Cooper and Zhu (2016), for example, suggest that educational attainment lowers the information costs that residents pay when making financial investments, which could make it more likely for households to have diversified portfolios.

A series of recent studies use compulsory schooling reforms to identify the causal effect of exogenous variation in years of schooling on household financial behaviours. Cole *et al.*, (2014) find that more years of education identified via the variation in state compulsory schooling laws in the USA increase financial market participation and investment returns considerably. The authors find that increases in cognitive ability and numeracy via more years of schooling have a causal effect on financial outcomes. Using two compulsory schooling reforms in 1947 and 1972 in the United Kingdom and a regression discontinuity design, Gray *et al.*, (2021) identify a positive effect of educational attainment on financial market participation. Using Swedish administrative data, Black *et al.*, (2018) find that an additional year of education due to a related compulsory-schooling reform increases stock market participation by two percentage points and the share of financial wealth invested in stocks by 10%. The relevant literature includes more studies for different countries, such as Oreopoulos (2007) and Cole *et al.*, (2016) for the United States, Ajayi (2020) for Kenya, García and Tessada (2013) for Chile, and Aydemir (2021) for Turkey, inter alia.

Our study examines the impact of educational attainment on financial market participation in China. The household financial outcomes involve investment in stocks and risky assets, amounts invested, and portfolio diversification. The identification strategy exploits two related and overlapping major policy reforms in China in the 1980s. The first reform is the compulsory-schooling reform that raised the mandatory years of schooling from six to nine. The reform was initiated in 1986-1987 in 20 Chinese provinces and gradually took effect in another nine provinces by 1992. The second overlapping reform was the one-child policy of 1980, which restricted urban residents of Han ethnicity into having only one child. Rural residents of Han ethnicity were allowed to have a second child if their first child was female. There were no limitations for individuals of non-Han ethnicity, as they are a small minority of the Chinese population.

The relevance of the two reforms is that individuals born in or after 1980 began primary school in 1986 and thus received nine years of compulsory schooling, compared to only six years for individuals born one year earlier (in 1979). The one-child policy included financial penalties for non-compliant households, such as exclusion from free schooling, inter alia. Hence, exposure to free compulsory schooling post reform was conditional on compliance with the one-child policy.

We use data from the 2013 wave of the China Households Finance Survey, which is based on a very rich questionnaire on all aspects of household financial behaviour. The data collectors provide household weights that render the resulting data nationally representative of China. The unique feature of the 2013 wave, compared to other waves, is that it contains all the essential questions related to ethnicity and the number of siblings. This enables the initiation of identification strategy based on the exclusion criteria for free compulsory schooling stipulated by the one-child policy. The data shows very limited financial market participation among Chinese households in 2013: 9.2% of the sample invest in risky assets and only 5.2% invest in stocks. In order to investigate the causal effect of education on household financial behaviour, we implement a fuzzy regression discontinuity design instruments the effect of years of schooling on household finances via exposure to the conditionally free compulsory-schooling reform.

We find that higher educational attainment due to the conditional free-schooling reform exerts a significant positive effect on financial market participation and portfolio diversification. Specifically, additional schooling exerts an effect of more than 50% on stock market participation and an effect of more than 30% on the probability of owning risky assets. There are effects of schooling of similarly sizeable magnitudes on the amounts invested on stocks and risky assets, along with the fractions of wealth and financial assets invested. The effects are significant for both males and females, although the magnitudes are higher for males. The results are not significant for residents of rural regions. We confirm these findings in a number of robustness exercises in this study. Causal mediation analysis suggests that the moderate increase in financial literacy and the decrease in Confucian norms of filial piety are the likely transmission channels through which increased schooling affects financial market participation.

Our study contributes to the related literature on household finance, social transmission mechanisms, and educational reform in several ways. First, this is a pioneering empirical study that examines how education affects financial market participation in China, using the context of the two most relevant and overlapping exogenous policy reforms. Second, although there is prior evidence of a positive relationship between educational attainment and financial market participation in other contexts (Almenberg and Dreber, 2015; Barnea *et al.*, 2010; Yoong, 2011), our study is most relevant to the limited literature that identifies the causal effect via exogenous policy changes (Cole *et al.*, 2016; Black *et al.*, 2018; Gray *et al.*, 2021). Third, this study presents evidence on the mediating role of cognitive skills such as financial literacy, as well as the evolution of social norms, such as filial piety, which exert a causal effect on household financial outcomes. Prior evidence from China (Chen *et al.*, 2019) suggests that stronger Confucian social norms reduce the gap in the savings rate between families with sons and with daughters. There is less evidence of the impact of education on financial literacy in China. The likely mediating role of financial literacy is of interest, given a very recent educational reform in China, which emphasizes on its importance, along with other cognitive skills.

The remainder of this study is organized as follows. Section 2 reviews the literature on the relationship among education and household financial behaviour, along with the likely mediating variables. In section 3, we describe the context of the two related reforms of the 1980s in China, which enable our identification strategy. Then, Section 4 introduced that data and presents our fuzzy regression discontinuity design. Section 5 discusses the empirical results, presents the series of robustness exercises, and the causal mediation analysis. Finally, Section 6 concludes and discusses the implications of our findings.

2. Background and Literature

In theory, households choose to save and borrow to smooth consumption over the lifecycle (Modigliani and Brumberg, 1954; Friedman, 1957), with the empirical evidence on consumption smoothing after the seminal work of Hall (1978) being mixed. The theoretical prediction is that people should invest higher fractions of their wealth

when they are young, so that they can smooth their consumption when they are old. A simple life-cycle asset allocation model implies that the risky share of financial wealth should be a decreasing function of age until retirement, with no clear predictions about behaviour after retirement.

However, the consensus in the analysis of the equity allocations of households is that a large fraction of the population simply does not own any stocks. Gomes, *et al.* (2021) report participation rates below 50% in the U.S.A, and far lower figures for other countries. Accounting for indirect investment in stocks via defined-contribution pension accounts, the actual figure for the USA is closer to 20% in 2010, which is even lower than the 36.8% figure of 1983. At the same time, in almost all developed countries, 90% of households own safe assets (such as *bank deposits*)[3]. The percentage of households investing in *bonds* is typically below 10% with the exception of Italy (14.6%), the United Kingdom (28.2%), and the USA (13%). Ownership in *real estate* is large, and varies significantly across countries, from as low as 44.2% (Germany) to 89.9% (Slovakia). Finally, some 10% of households have some form of *private business*, apart from Italy with a stunning 18.4%.

In the household survey of Choi and Robertson (2020), "years left until retirement" is the most cited factor as a determinant of equity shares by stock market participants, so life-cycle considerations clearly appear important to households. Other determinants of risk asset ownership involve income risk and borrowing constraints, human capital (as a close substitute for bonds rather than stocks), health risk, trust levels, internal habits, ambiguity aversion, return disasters, return expectation. household size, mortality expectations, inter alia. Using data from Swedish twins, Calvet and Sodini (2014) find evidence of decreasing relative risk aversion, i.e., portfolios with more risk assets being positively affected by financial and human capital (labour income), and negatively affected by habit formation (past consumption), leverage, and income risk.

However, there is no clear theoretical prediction regarding the role of education on investment behaviour. If education is seen as an investment option as a close

[3] The picture of participation differs substantially for the sample of developing economies (accounting for over 50% of the world's population). On average, only 60% households in these countries hold any form of financial asset, while real estate ownership is above 75% in every country considered.

substitute to a safe asset, e.g., a bond, then education could be negatively related to stock and risky asset market participation. However, if education increases cognitive abilities, willingness to take risks, and socialization, it could be the case that it has a positive effect on financial market participation. Hence, it is likely that any positive effect of education on household finances is mediated by other factors. We engage in the research question on whether years of schooling exert a positive impact on stock and risky asset market participation, or not. Moreover, we attempt to identify the mediators of any positive relationship.

There is a vast literature examining the effects of increased educational attainment on economic behaviour. Oreopoulos and Salvanes (2011) review the extant literature and present evidence on the pecuniary and non-pecuniary benefits of more years of schooling on labour and non-labour market outcomes. The authors discuss positive relationships with happiness and well-being, job satisfaction, employment probability, earnings, health, marital status, and trust, inter alia. Moreover, they suggest negative relationships with risky behaviours, e.g., smoking, teen pregnancies, arrests, premature deaths, and impulsiveness. The evidence suggesting a relationship between educational attainment, health behaviours and reduced mortality also includes Adams (2002) and Mazumder (2008) for the U.S.A and Van Kippersluis *et al.* (2011) for the Netherlands[4]. Moreover, educational attainment is known to be positively related to employment prospects, successful career paths, and labour market income. Oreopoulos (2006) finds that the increase in school-leaving age from 14 to 15 in the United Kingdom resulted in 14% higher earnings for individuals with more years of schooling. Acemoglu and Angrist (2001) find that students with an additional year of schooling earn around 10% more as adults in their lifetime.

All the above direct effects of more years of schooling can also be conceptually linked to indirect effects of schooling on financial market participation. Oreopoulos (2007) finds that an additional year of compulsory schooling increases lifetime wealth

[4] In contrast, Clark and Royer (2010) and Oreopoulos (2007) find small effects of years of schooling on physical condition in Great Britain. Moreover, Hanushek and Woessmann (2008) concur that there the cognitive skills of the population, rather than mere school attainment, are related to individual earnings, to the distribution of income, and to economic growth. Arguably, it is likely that the quality of schooling, rather than the years of compulsory, also play an important role on economic and financial outcomes.

by 15%. More educated individuals can be expected to save and invest more, may have access to make better investment choices, and can be perceived to accumulate greater wealth (Choi *et al.*, 2014). Moreover, Hanushek (2002) and Niedlich *et al.* (2021) find a relationship between years of schooling and trust towards others, including banks and financial institutions. Hence, educational attainment can be thought to be related to investment and financial market behaviour, both directly and indirectly. Its relationship could be positive, via the channels of trust, access to information, cognitive skill development, financial literacy, future-oriented behaviour and financial risk tolerance, inter alia. However, it could also be thought as a negative relationship if schooling disincentivizes generic risk-taking or if education reduces labour income uncertainty[5]. Moreover, if human capital is a close substitute to investment in risky assets, e.g., bonds, education could be thought to be negative related to investment. The following three sub-sections review the most relevant literature on education and investment, the evidence from China, and the literature on the indirect effects and candidate mediating and moderating variables of the relationship between schooling and financial investment.

2.1 Educational attainment and investment behaviour

Schooling can either be perceived as a form of financial investment or as a means to equip students with information-processing skills[6]. It can benefit decision-making in a variety of fields, including financial behaviours, rendering higher returns to investment and greater lifetime wealth. There is growing evidence that educational attainment encourages formal financial market participation and financial risk-taking. Ajaya and Ross (2020) find that one additional year of education of students in Kenya induces a

[5] In theory, riskless (labour) income is like an extra endowment of the safe asset, inducing the investor to readjust his/her financial portfolio to keep the share of total wealth invested in risky securities unchanged, relative to a model without labour income. Accounting for the fact that labour income is risky, makes the optimal portfolio allocation also determined by the correlation between future labour income realizations and stock returns, and the variance of labour income. If the correlation between labour income and stock returns is lower (higher) than 0.5, then the portfolio share invested in stocks is higher (lower) in the presence of labour income. Evidence suggests this correlation is close to zero for the average household. Even taking into account heterogeneity across industries, the highest values of this correlation still lie below 0.3 (Beshears, *et al.*, 2018; Gomes, *et al.*, 2021).

[6] Oreopoulos and Salvanes (2011) identified that higher aggregate schooling has direct and indirect effects (i.e., direct knowledge-based skills, mathematical skills, and less tangible skills such as critical thinking and social skills, etc.) with respect to financial behaviours.

8.1% increase in the likelihood of having a formal bank account. Cole, Paulson and Shastry (2014) use state-level variation in compulsory schooling laws across the U.S. to identify the effects of an additional year of education. They find positive effects on financial market participation and investment returns, with an additional year of education increasing the probability of owning equities by 4%. Moreover, Black *et al.*, (2018) using an exogenous variation in the years of compulsory schooling combined with comprehensive wealth data for the Swedish population and observe higher risky asset ownership by the more educated being, mediated by higher levels of wealth. For males in Sweden, an additional year of schooling increases risky asset market participation by 2 percentage points. Moreover, it increases the share of financial wealth allocated to stocks by 10%[7].

Cooper and Zhu (2016) estimate a structural life-cycle model of the association between formal education and high-risk market involvement. Higher levels of education are related to lower entry costs and a greater discount factor, and they draw the conclusion that education primarily influences stock market participation by raising income. So, the income stability of highly educated households tends to be greater improves the ability to take risks in the complex financial market. In addition, educational attainment can improve individuals' knowledge and skills, in another way to reduce the entry costs to participation in the financial market (Christiansen *et al.*, 2008). Rational decision making in efficient financial markets requires individuals to be able to gather, assess, integrate and process complex information. Schooling provides the foundation for individuals to develop these abilities. Although it is likely that higher education might be linked to more effective information processing[8], the effects of primary and secondary schooling for the development of cognitive skills are unambiguous (Huang and Zhou, 2013).

2.2 The effect of compulsory schooling on household outcomes in China

[7] On the other hand, using a regression discontinuity design that exploits the setting of two historical compulsory-schooling reforms in the United Kingdom, Gray, *et al.*, (2021) find limited effects of schooling on financial behaviours. One additional year of schooling exerts significant positive effects on the saving behaviours of females, but not of males.

[8] Park and Son (2015) find a positive impact of increase access to college education in Korea on a variety of outcomes including an increase of household risky assets holding.

A recent study by Cui *et al.*, (2021) uses the setting of the 1986 compulsory schooling reform in China and data from 2010-2018 waves of the China Family Panel Studies (CFPS) to evaluate the impact of children's education on parental longevity. They find a positive relationship between adult children's education and paternal longevity, but not maternal longevity. This indicates a stronger protective effect from adult children to fathers in China, in terms of costs of parental care as a mechanism. Their study entails implications for household finance in China. Firstly, the increased longevity of parents can potentially reduce premature inheritance or the early transfer of financial responsibilities to the younger generation. These could have negative or positive implications for investment in risky assets at young age, respectively. Secondly, the improved health of parents could lead to lower healthcare costs, thereby improving the financial resilience of a household. The implication is that there are fewer financial constraints prohibiting investment activity of the younger Chinese adults. Finally, the obvious implication is that the more years of schooling might translate into higher earnings and lower income uncertainty, both enabling investment activity.

Chen *et al.*, (2022) utilise data from the China Health and Retirement Longitudinal Study (CHRLS) to investigate the causal effect of compulsory schooling on retirement well-being, in terms of pension income, social security participation and household wealth. They find positive impacts of higher educational attainment due to the 1986 compulsory schooling reform, with a pronounced effect among women, thereby highlighting a crucial role of compulsory education for financial well-being in the long term. They authors highlight the importance of compulsory education in reducing financial vulnerability upon retirement, via increasing participation in pension schemes and increasing household wealth.

Cui *et al.*, (2019) utilized the temporal and geographical variations of China's enforcement of compulsory schooling regulations as a foundation for a quasi-natural experiment, to examine the causal impact of maternal education on a broad spectrum of child developmental outcomes. Their findings suggest that maternal education exerts a beneficial impact on various aspects of child development, including school enrolment, mathematical competency, college aspirations and non-cognitive abilities. A indirect implication of the study by Cui *et al.*, (2019) related to household financial outcomes, is that maternal education can be of instrumental importance to shaping a households' financial trajectory by enabling children opportunities for employment,

inter alia.

In a study closer to ours, Ren *et al.*, (2020) examine the impact of the implementation of China's compulsory schooling law as a quasi-natural experiment that affects stock market investment. They authors use the Chinese Household Finance Survey (CHFS) of 2015 and find that education can significantly increase the probability of participating in the stock market, but does not necessarily lead to higher stock returns. They authors suggest that financial literacy, risk attitudes, occupations, and income are all candidate explanations of the positive relationship.

However, it is worth noting that none of the above studies identified the conditionality in China's compulsory schooling reform that stemmed from the earlier one-child policy of 1980. Our work improvises on that previous inquiry by Ren *et al.*, (2020), by acknowledging that reform exposure to free compulsory schooling was conditional on compliance with the one-child policy. Moreover, the CHFS 2015 does not enable the identification of compliance with the one-child policy for the full sample of participating household. Our study uses the 2013 CHFS data that entails all the relevant questions for identifying compliance with the one-child policy. In addition, we examine broader risky asset market participation and consider heterogeneous effects by gender and urbanisation. Finally, we use state-of-the art causal mediation analysis limits to examine the candidate transmission channels for the causal impact of educational attainment or risky asset market participation.

2.3 Indirect effects of education on financial behaviours

Ingale and Paluri (2020) conduct a bibliometric study of how years of schooling can affect financial behaviours that identifies 1,138 documents in the Web of Science database between 1985 and 2020. They suggest financial literacy is the key mediator to explain how more years of schooling influence participation in risky asset markets. According to the OECD (2017), countries with lower financial literacy often also have fewer years of compulsory education, as well as a higher likelihood of low saving and investment loss among households. Participation rates in financial markets are far greater in countries with more years of schooling and higher financial literacy. Lusardi and Mitchell (2014) emphasize the positive relationship between the years of schooling and financial literacy, despite the absence of a dedicated personal finance curriculum

in most countries at the time. Lusardi, *et al.* (2017) suggest that differences in financial literacy, formed early in life, can explain some 35% of retirement wealth inequality in the USA. Such large differences are likely to incur via heterogenous participation in financial markets across groups with different initial conditions, including educational attainment. van Rooij, et al. (2011) find large positive effects of financial literacy on stock market participation in the Netherlands. In a recent meta-analysis of the vast literature Kaiser, *et al.* (2022) find significant beneficial effects of financial literacy on downstream behaviours, despite previous suggestions of small and moderate effects (Fernandes, *et al.*, 2014).

In a related literature for China, filial piety is shown to influence a broad range of behaviours, including financial behaviours (Yeh *et al.*, 2013). According to Beford and Yeh (2019), filial piety is an attitude of respect towards parents, elders, and ancestors. It is one of the five constant virtues of Confucianism, which is a culture deeply embedded among Chinese households. According to Chen, et al., (2019), this culture exaggerates the preference for sons, as "…*confucianism is the main culture performing such implicit-contract enforcement functions and it heavily emphasizes male children's obligations to repay their parents in times of need*". It is a form of pure altruism from children towards parents, unrelated to strategic bequest motives (Bernheim, et al., 1985) or impure altruistic motives (Andreoni, 1989). The literature has also suggested a decline in Confucian norms in the Chinese society due to the rapid development and increase labour mobility. Chen *et al.* (2019) model how the decline in Confucian influence might be a driver behind the continuing rise in household savings rates in China. When such social norms decline, parents engage in risk-hedging for old age, by saving more earlier. This decline reduces the difference in savings between families with sons and those with daughters.

According to LooSee *et al.* (2013), filial piety mediates the relationship between education and financial well-being. Filial piety can be thought to strengthen the view of schooling children as a financial investment by parents. From the perspective of parents, noting the children's filial values, investment in the education of children can be seen as a financial investment, in terms of a standard altruism model augmented to include uncertainty and liquidity constraints (Antonji, et al., 1992; 1997). Hence, in terms of household finances, filial piety amounts to financial responsibilities of children

for supporting the retirement and old-age well-being of their parents and immediate elder relatives. In simple terms, it would purport that parents save and invest less, and invest more in the education of the children that will take care of them, particularly the male children. From the opposite lens of the child, it could encourage participation in financial markets as a way to support the financial well-being of the elderly[9]. Hence, its impact could be mixed, depending on lifecycle considerations and age.

3. *Sui Generis* Educational, Social, and Financial Reform

The centrally planned opening of China's financial sector is one of a kind in history. In July 1981, the Chinese State Council decided to resume the issuance of government bonds, starting the development of China's bond market after the reform and opening; in August 1984, the Shanghai Municipal Government approved the issuance of the Interim Administrative Measures on the Issuance of Shares, and in November of the same year. It was approved to issue RMB 500,000 ordinary shares to the public for the first time, kicking off the development of China's stock market. In May 1987, Shenzhen Development Bank was approved to issue RMB 7.9 million ordinary shares to the public, which was officially listed in the local securities exchange in April 1988, followed by organized stock trading in 1992. The establishment of the Shanghai and Shenzhen stock exchanges in 1990 was aimed at initiating formal financial market operations and facilitating investment opportunities for Chinese households (Ma, 2017). During 1998, China's securities market entered a phase of rapid development. The variety of stocks developed from a single A share at the beginning to B shares, which represent a domestic listed foreign stock, and H shares, which represent an overseas-listed foreign stock. The number of listed companies increased rapidly, from 14 in 1991 to 851 in 1998. *Figure 1* illustrates that equities' total market value rose from 2.1% of GDP in 1992 to 144.7% of GDP in 2017, and the total value of publicly developed

[9] The literature recognizes that filial piety often explains one's motivation to succeed (Yu and Kang, 1994; Salili, 1996) and could be one of the influential drivers of investment activities and entrepreneurship (Yu and Kang, 1994). Chen and Wong (2014) explore the mediating role of filial piety in the relationship between motivation to succeed and academic achievement among students in Hong Kong. They purport that filial piety shapes the mindset of Chinese students succeed academically in order to strengthen their future career prospects, and achieve better financial well-being.

bonds rose from 2.5% of GDP in 1990 to 35.1% of GDP in 2017.

[Insert Figure 1 about here]

3.1 The one-child policy reform in China

Starting in 1980, the Chinese government introduced a strict one-child policy for the largest population segments. It was a vital component of a series of population-control population policy reforms dating back to the 1960s. [10] The one-child policy originated in socialist ideology and shared values regarding the importance of household/family planning. The policy applied to Han-ethnicity citizens in urban regions and restricted them to having only one child per family.[11] However, gradually, rules relaxed for specific groups. Specifically, the one-child policy focused on citizens' ethnicity and *hukou*, which created different rules for urban Han, rural Han, urban non-Han, and rural non-Han populations.[12] For instance, an urban non-Han couple could have a second child, and a rural non-Han couple could even have more children due to their ethnic group size. In addition, the one-child policy was relaxed for rural families of Han ethnicity. They could have another child for labour productivity if the first child was a girl (Feng and Wang, 2014).

Meanwhile, supervision commissions formed in every province and extended to sub cities, counties, etc. The one-child policy-imposed penalties for noncompliant households, including rejection from public services, including from free schooling. Moreover, it involved the imposition of abortion, and sterilization (McElroy and Yang, 2000). As encouragement, local governments offered single-child families a series of rewards.[13] Local authorities also tightened the intensity of inspections and registration work on *hukou*; in addition, they conducted publicity campaigns and distributed posters

[10] China's one-child policy had three phases. In the first phase, there was no policy for family planning during 1949-1963, and during 1963-1971, the government established family planning commissions but paused during the Cultural Revolution. The second phase (1971-1979) widely advocated voluntary compliance with the fertility policy. In the third phase (1979-2015), the one-child policy was formally enacted as legislation, and compliance became required (Feng and Wang, 2014).

[11] China has 56 ethnic groups; the Han ethnicity comprises the majority (i.e., 93.3%) of the population. The remaining 55 ethnicities are all minority.

[12] *Hukou* is a registration method for households in China.

[13] The Chinese government provided one-child families with child-care benefits, welfare allowances, and preferential access to schooling (Arnold and Zhao, 1992).

to raise awareness among households.

3.2 The educational reform of 1986-1992 in China

The illiterate population in China was between 15% and 20% before 1949 due to the scarcity of schooling and unsystematic educational curriculums (Tsang, 2000). Therefore, accompanied by the central government's awakening awareness of education, in 1985 the Communist Party of China Central Committee decided to revamp the educational system because the strength and competitiveness of any country is a reflection of its educational standards, the quality of its academic qualifications, and the related provision of technical skills. Reflecting on educational priority, the Chinese government promulgated a structured modern reform, which is considered a milestone for the Chinese educational system. Starting on July 1, 1986, the number of years of compulsory schooling increased. The legislation specified that children at least six years of age would receive nine years of compulsory education. Previously, there were no age limits, and the legal requirement was six years of compulsory education. The reform thus required children to complete junior high school. According to Xie and Mo (2014), China's education reform is geared toward the unique characteristics of its socialist market economy and political system. Improving overall literacy, knowledge, and education levels of the people complements the development of the 4 The Chinese government provided one-child families with child-care benefits, welfare allowances, and preferential access to schooling (Arnold and Zhao, 1992). *Figure 2* maps the implementation of compulsory schooling reform by the administrative borders in China.

[Insert Figure 2 about here]

Starting in 1986, the Chinese government began strongly urging parents to enrol children in school for nine years of compulsory education (Garnaut *et al.*, 2018). This reform regulated two stages of compulsory education: six years of elementary school and three years of junior high school. School-age children would go straight through junior high school for free and without any selected examinations. Additionally, to guarantee enrolment and completion of nine years of education, the central government prohibited the employment of school-age children or adolescents. Simultaneously, local provincial governments were permitted to decide how and when to implement the rules in accordance with their economic and development situations (Fang *et al.*, 2012).

Table 1 presents the implementation year of educational reform of each province in detail. Hence, compulsory schooling reform took effect started from 1986, which transforming the education curriculum in rural Chinese regions to be more in line with urban Chinese regions (Lewin and Hui, 1989). The reform represented the first nationwide effort to stipulate a national education policy, ensuring that all Chinese children would receive nine years of free education beginning at age six, regardless of geographical location, ethnicity, or family background (Liu and Dunne, 2009). This ground-breaking reform has received substantial research attention, as it had far-reaching impacts on the lives of Chinese children exposed to the reform. According to Huang (2015), China's compulsory education law had profound effects on education among Chinese teenagers, particularly in rural regions, where illiteracy rates for people over the age of 15 drastically declined from 37.7% in 1982 to 11.6% in 2000. During the same period, the illiteracy rate in urban regions also dropped from 17.6% to 5.2%, illustrating major improvements among Chinese children after the 1986 reform (Huang, 2015).

[Insert Table 1 about here]

4. Data and Empirical Strategy

We utilize data from the China Household Finance Survey (CHFS), which is a pioneering project that gathers micro-level financial information on Chinese households. We employed the dataset of wave 2013, which geographically crosses 29 provincial regions and municipalities, 262 counties, and 1,048 communities. It offers comprehensive and extensive information about socioeconomic status and household financial circumstances, it also speculates on future household financial-development trends. Meanwhile, the survey asks about household financial planning and managing debt, attitudes toward and understanding of monitoring investment risk and accumulating wealth, awareness of financial products/services, etc. Additionally, the questionnaire to asking for detailed basic information about the individual and his/her productive life status, asked the person who was most knowledgeable about the financial situation of the household to act as a representative and answer a series of

questions about his/her household's financial behaviour[14].

4.1 Financial Market Participation and related summary statistics

In order to investigate the effect of education on financial market participation, our analysis stems from the selected questions for describing the financial market participation behaviour of households, which being presented as four explanatory groups. Our first outcome variable is an indicator of whether an individual directly owns stocks, which we refer to as direct stock market participation. *Table 2* presents that 5.2% of individuals in our sample own stocks, although there is not much difference in the participation percentages between men and women in the stock market. Women account for a slightly larger share than males (5.4% and 5.1%, respectively). The urban population has a stunning significant advantage over the rural population in terms of stock market participation (13.3% versus 1.2%). The second outcome variable is participation in risky assets, which means the individual owns stocks, bonds, mutual funds, derivatives, wealth management products, non-RMB foreign exchange assets, and/or gold. The figure shows that 9.2% of individuals own risky assets; this is higher than stock market participation. Also, 8.9% of males, 9.4% of females, 21.5% of urban residents, and 3.0% of rural residents own risky assets.

Our third group of outcome variables comprises the amount and shares of stocks and risky assets (i.e., the value of shares, stocks-to-financial-assets ratio, stocks-to-wealth ratio, value of risky assets, risky assets as a proportion of financial assets, and the risky-assets-to-wealth ratio). The figures in *Table 2* indicate that value of individuals owning stocks and owning risky assets among females higher in terms of males, while compared to individuals who live in urban region are significantly higher than rural regions. We also generate variables that capturing return on investment for stocks and risky assets by counting the ratio on financial assets and wealth. Lastly, we additionally generated outcome variables by calculated the number of financial assets held and portfolio variance[15] to measure their financial investment behaviour and

[14] According to the CHFS 2013 questionnaire design, the interviewer first asked each household the name of the person aged 16 or older who knew about the household's finances. For tracking households, the interviewer first asked each household for the name of the person aged 16 or older who knew about the household's financial situation, which was recorded as the respondent in the questionnaire.

[15] In *Appendix A*, we calculate the portfolio variance from the CHFS sample by using the formula for

performance. In *Table 2*, the investment portfolio of the Chinese household denotes 1.75 on average, females held 1.76 on average while males held 1.74 on average respectively. compared to those who live in urban regions presented 2.09 and only held 1.58 among rural region residents. Meanwhile, portfolio variance also gives similar results between females of 0.10 and males of 0.11, respectively. The standard deviation of portfolio variance among the urban region indicates 0.26, which is significantly higher than in the rural region which denotes 0.03.

4.2 Other variables and related summary statistics

In terms of demographic characteristics, the average disposable household income in the sample is ¥72,674.5, and households have 10 years of education on average. In addition, 51.1% of the respondents are male and 71.3% are married; 33.2% are in urban regions, and households have one or two children on average. The average age in the sample is 32.8.

Then we generate financial literacy variable computed from the Big 3 financial literacy questions in the CHFS2015 survey (Lusardi and Mitchell, 2014) capturing the fundamental financial concepts, i.e., interest, inflation, and financial risk (Klapper *et al.*, 2015). The exact wording of the questions was: (1) "Given a 4% interest rate, how much would you have in total after 1 year if you have 100 yuan deposited?" The answer options are signified in: "under 104", "104", "over 104", "cannot figure out". (2) "With an interest rate of 5% and an inflation rate of 3%, the staff you buy with the money you have saved in the bank for 1 year is?" The respondents give answers based on: "more than last year", "the same as last year", "less that last year", "cannot figure out". (3) "Which one do you think is more-risky, a stock or a fund?" Here are given options: "stock", "fund", "haven't heard about stock", "haven't heard about fund", "neither of them has been heard about". We combined the correct responses to these three questions and created an index ranging from 0 to 3. Table 2 presents the average index of financial literacy in China is 0.7 in 2013.

To measure attitudes toward financial risk, we use a relevant question from the CHFS, namely: "what kind of investment are you willing to choose if you win a lottery

calculating the portfolio variances and covariances. The results are in *Appendix Table A1*. We confirm these associations in the weighted pairwise correlation matrix in *Appendix Table B1*.

of ¥500,000?" The response categories were: (1) Unwilling to carry any risk; (2) Project with slight risk and return; (3) Project with average risk and return; (4) Project with slightly high-risk and slightly high-return; (5) Project with high-risk and high-return. The average score is 2.1. Van and Michayluk (2012) point out that financial risk tolerance varies with time and life experience (i.e., with high income and wealth categories; geographical location etc.), Barsky *et al*. (1997) demonstrate financial risk tolerance preferences between residents in the western United States and the rest of the nation presented differential at a statistically significant level since the geographical grouping of individuals are the most likely have higher income and wealth. The figures in *Table 2* indicate a significantly higher financial risk tolerance standard among urban respondents, and there have not much difference between male and female.

Lastly, we generate a proxy for filial piety, approximating Confucian values comes. As an informal structure within China, the extent of Confucian influence varies significantly across regions due to historical and economic reasons that children have obligated to their parents unconditionally, including supporting them when they are old (Cheung, 2009). Confucianism impacts the behaviours of households and, consequently, affects households' investing preferences (Ge and Kong, 2021). Here, we comprise CHFS2015 survey questions that illustrate the filial piety proxy (Chen *et al*., 2019). Our proxy for Confucian value exact from the questions that enable the generation of categorical variables for filial piety to entail seven categories contains: 1) supporting parents is the primary purpose for marriage; 2) raising children to take care of the parents when they get old; 3) the most trait that prefers for the child to have is filial piety (obey their parents); 4) they defined the filial piety as giving money to parents in their old age; 5)the main way of the old-age plan is support from the child; 6) they assert that children have the responsibility for their old-age life; 7) the way of old-age living they would like to choose nursing at home. Chen *et al*., (2019) identify the weakening influence of filial piety has increased saving behaviour in China, their research confirms the notion that parents regard their children, particularly boys, as a source of retirement income for old age. But persistent accelerated development of finance would be effectively offset the reliability of children as financial instruments and divert them to select other financial portfolios for old-age life safeguarding.

[Insert Table 2 about here]

4.2 Empirical strategy

We begin by examining the relationship between years of compulsory education and exposure to educational reform. My analysis also includes individuals in households subject to the one-child policy, which denoted children who enter school at age six will complete their nine years of compulsory education at age 15. Therefore, children who are under 15 when the policy is implemented are educated for a longer period than would have been the case if the policy had not been implemented; they are thus the treatment group and children over 15 are the reference group. To capture years of schooling among individuals, we use the question from the CHFS2013 questionnaire, which asks about educational attainment in ways that enable conversion to years of schooling. As shown in *Figure 3*, which presents binned scatterplots of the weighted fraction of the sample with more than or equal to 9 years of education on the vertical axis, and distance to reform on the horizontal axis. Distance to reform is defined as year of birth, plus 6 years, minus the year in which the compulsory schooling reform was implemented at each province. In panel A, the scatterplot is based on the raw data, based on discrete changes in year of reform. In panel B, the scatterplot is based on discrete changes in distance to reform, for the two groups based on the inclusion criteria to unconditional free schooling specified by the one-child policy in 1980. Here, we propose the specification based on two equations. The equation of first-stage estimate is:

$$Schooling_i = \alpha_0 + \alpha_1 Reform\_Exposure_i + \theta_i + \delta_i + \rho_i + X_i + \varepsilon_i \quad (1)$$

Where $Schooling_i$ denotes the number of years of schooling of individual i. $Reform_i$ is an interaction term reflecting whether the individual involved to the educational reform and at the schooling age post the single-child reform. θ_i, δ_i, and ρ_i denote provincial region, birth cohort, and urban status fixed effects. X_i, or other control variables, represent the list of control variables; they include triple interactions of cohort, province and urbanization fixed effects, as well as cohort, province and urbanization specific linear trends, gender fixed effects, and urban-rural transition fixed effects.

[Insert Figure 3 about here]

4.2.1 Fuzzy regression discontinuity design

We implement a fuzzy regression discontinuity design (RDD) to identify the causal effect of schooling on the household financial outcomes of interest regarding stock and risky-asset market participation. Fuzzy RDD is an instrumental-variables (IV) regression (Angrist and Lavy, 1999), in which years of schooling are instrumented via an exogenous policy instrument, namely reform exposure. Reform exposure captures exposure to the two overlapping policy reforms, namely the one-child policy of 1980 and the educational reform of 1986-1992 as an exogenous policy shock.

The previous equation (1) presents the first-stage of our fuzzy RDD model, with the second-stage equation being presented by the equation below:

$$Y_i = \omega_0 + \omega_1 \widehat{schooling}_i + \theta_i + \delta_i + \rho_i + X_i + \varepsilon_i \qquad (2)$$

Where Y_i signifies the explanatory variables of interest, including stock ownership, risky assets holding, value of shares, stocks-to-financial-assets ratio, stocks-to-wealth ratio, value of risky assets, risky-assets-to-financial-assets ratio, risky-assets-to-wealth ratio, etc. Here, $\widehat{schooling}_i$ is instrumented with reform exposure in equation (1). The parameter of interest is $\omega_{1,}$ which represents the causal relationship between schooling and financial outcomes. To accommodate heteroskedasticity and arbitrary serial correlation across cohorts within provinces, we group standard errors at the provincial level. In addition to the fundamental specification in equation (1), we estimate specifications using parental controls, provincial-specific trends, and region by cohort dummies. As we shall see in the subsequent section, the estimations are highly robust to the precise selection of specification.

As described, the reform is not applied uniformly among provinces. Our empirical method is thus predicated on the premise that exposure to the reform is essentially indicative, which implies birth cohort-fixed effects, province-fixed effects, and urbanization fixed effects, etc. We also conduct an experiment to see whether there is a correlation between when reforms are implemented and other observable qualities; the findings are in *Appendix Table B2*. Each parent's level of education, membership in a political party, year of birth, occupation (business/management), and adherence to Confucian values are all accessible background variables to explore. In each column, we provide the coefficients from a regression of a binary indicator of reform exposure on the mean family background characteristics of the birth cohort in a specific

municipality. In the supplementary materials, we further demonstrate this by showing that our primary estimates hold even when controlling for other factors related to the respondents' families.

Following Black *et al.,* (2018), they cluster standard error by municipality to allow for serial correlation, which are robust to the inclusion of region-by-year controls. we show that our estimates are robust include a full set of fixed province effect, cohort fixed effect and urbanisation fixed effect.

4.2.2 Causal mediation analysis

Furthermore, we employ the novel estimation procedure proposed by Dippel *et al.* (2019), which expands the standard instrumental-variables model of equation (2), via adding the two following equations (3) and (4). In equation (3) we estimate the effect of schooling on the mediating variable M. The regression is an IV model similar to that of equation (2) in which schooling is instrumented by reform exposure. The equation includes that standard list of control variables, i.e., similar to equation (2). Then, equation (4) presents the final stage of the causal mediation analysis, in which both the instrumented mediator and schooling are introduced in the model simultaneously.

$$M_i = \varphi_0 + \varphi_1 \widehat{schooling}_i + \theta_i + \delta_i + \rho_i + X_i + \varepsilon_i \qquad (3)$$

$$Y_i = \eta_0 + \eta_1 \widehat{M}_i + \theta_i + \delta_i + \rho_i + X_i + \varepsilon_i \qquad (4)$$

Causal mediation analysis purports that a variable is a mediator if it exerts a significant impact on the outcome Y in the model of equation (4), and at the same time, the effect of schooling vanishes in the same model. Our list of candidate mediators is presented in the following sections. The *Appendix C* presents and illustrates the specifics of the causal mediation analysis in greater detail[16].

Moreover, in order to solve the problem of sample selection bias, we adopt the Heckmam two-step method. To do so, we run probit equation on stock ownership and reform exposure explained by the instruments discussed above, to obtain the Mills ratio

[16] We do this respectively to explain calculations that follow the principle of showing in *Appendix C*. *Table C1* plots the process in detail.

(the ratio of the probability density function and the cumulative density function of each observation) at the first stage. The second stage equation adds the Mills ratio of the probit model describing the effect of schooling on investment returns.

5. Empirical Results

Our first-stage estimation demonstrates the relationship between exposure to the reform and years of education. In panel A of *Table 3*, we present the regression results of the first-stage effects of reform exposure on education using five different specifications. We find that schooling reform increases education by 0.52 years; for those of schooling age, it rises by 0.22 years after the single-child reform, whereas for exposure to both reforms, education years increases by 0.68.

When we next add triple interactions of birth cohort, province, and urbanization fixed effects to the base specification (column 5). The coefficient is 0.65. Column (7) adds province-specific linear trends to the base specification (column 5), which slightly increases the coefficients to 0.67. Despite control cohort fixed effects, province fixed effects, urban-rural transition fixed effects, and gender fixed effects in column (8), the estimate denotes 0.77. In column (9), once again, we add other demographic controls based on column (8), which represent a coefficient of 0.49 that inevitably decreases but at a significance level of 0.01. Furthermore, in panel B of table 3, we present the first-stage regression results of a subsample (i.e., male, female, urban individuals, rural individuals, household heads) that use specifications based on column (8). We find the reform increases education by 0.46 years for males and 1.05 years for females; it increases by 0.98 years in urban regions and by 0.47 years in rural regions; it also increases by 0.82 years for household heads. As the effect of years of education on reform exposure remains positive and statistically significant at the 1% level, therefore, education attainment is a sufficient instrument.

[Insert Table 3 about here]

5.1 Educational attainment and financial market participation

Table 4 shows how schooling affects stock market participation. Panel A shows the

estimates for stock market participation of the pooled sample; panel B is for males, panel C is for females, panel D is for urban regions, and panel E is for rural regions. The first column shows the relationship between schooling and stock market participation by using an ordinary least squares (OLS) model. The coefficients are statistically and economically significant at the 1% level for all panels, which is consistent with Black *et al.*, (2018). The specific estimation for using instrumental variables (IV) under a variety of specifications is in columns (2)-(6), respectively. Controlling for cohort, province, and urban fixed effects applied to specification columns (2)-(4); column (3) adds the triple-interaction terms of cohort, province, and urban fixed effects based on columns (2)-(4), including the cohort-province-urban linear trend in the baseline specification (column 2). An additional control includes gender fixed effect in column (5) and other demographic variables in column (6). In column (2), the effect of an additional year of education on the probability of stock market participation is 49.2%; it is 69.9% for males and 46.3% for females. The magnitudes of the effect of an additional year of schooling for the sub-samples of individuals living in urban s and rural region become 46.8% and 18%, respectively. All panels are economically and statistically significant at the 1% level. In columns (3)-(6), we show that our estimates are robust to adding a variety of specifications, which all present very consistent findings.[17] Overall, based on the regression results in *Table 4*, we find that education significantly facilitates individual participation in the stock market.

[Insert Table 4 about here]

The estimates in both panels of *Table 5* report the effect of risky market participation[18]. We measure risky market participation via broader risky financial behaviour (i.e., ownership of stocks, bonds, mutual funds, derivatives, wealth management products, non-RMB foreign exchange assets, and/or gold). *Table 5* reports

[17] However, Stephens and Yang (2014) demonstrate that adding interactions of census area and year of birth to the model generally are not robust to the results when they are based on compulsory schooling laws for identification in the United States.

[18] We measure risky-asset market participation via ownership of broader range of financial assets entailing risk (i.e., not deposit accounts), which include ownership of stocks, bonds, mutual funds, derivatives, wealth management products, non-RMB foreign exchange assets, and/or gold. The CHFS has detailed information about whether the respondent holds each of these assets or not, along with the amounts of these assets held.

the coefficients from our main IV estimation model for risky market participation, controlling for the variety of attitudinal variables in the same line as Table 4. The results in *Table 5* provide interesting associations regarding the expected directions for schooling years, namely that years of education are positively related to participation in risky markets. Specifically, the magnitude of the effect is 30.2% in the pooled sample, and the effects are significant at the 1% level. The effect is of a 50.0% magnitude in males, a 26.7% magnitude in females, a 30.3% magnitude in urban regions, and an 11.8% magnitude in rural regions; they are statistically and economically significant at the 1% level. Thus, individuals with more education are more likely substantially involved in risky markets, whereas the IV estimate of coefficient of males expresses a stronger effect than for females, in both urban and rural regions.

[Insert Table 5 about here]

We additionally investigate how educational attainment affects holdings of stocks and risky assets, which may also influence the allocation decisions of possession of shares of stocks and risky assets. *Table 6* reports the coefficients from our IV estimates in which the dependent variables are the shares of stock and risky holdings, respectively. The magnitude of these coefficients is interpreted as the ratio of the coefficient divided by the predicted probability of the model, multiplied by 100. Specifically, the presented estimates quantify the change in the likelihood of identifying a category (i.e., pooled sample, financial asset owners, males, females, urban regions, rural regions) associated with years of schooling.

The estimates in panel A of *Table 6* indicate a relatively strong positive relationship between years of schooling and shares of stock (64.7%, significant at the 1% level). In panel B, the magnitude effects on the ratio of stocks to financial assets is 62.4%, and the effect is of a 73.5% magnitude of the ratio of stocks to wealth in panel C. Moreover, we look at the intensive margin and examine the effects of education on shares of risky holdings. Panel D of *Table 6* reveals a modestly significant positive correlation between shares of risky assets and years of schooling. Panels E and F report the coefficients from our IV models, in which the dependent variables are the ratios of risky-assets-to-financial-assets and risky-assets-to-wealth, respectively. The effects are positive, in the magnitudes of 54.4% and 55.3%, respectively.

[Insert Table 6 about here]

5.2 The effect of education on portfolio diversification

Furthermore, we consider how education affects asset diversification for seven asset categories in our analysis of households' portfolio choice, as well as how it affects portfolio variance. The association is economically and statistically significant at the 1% level. In panel A of *Table 7*, the positive coefficients on years of schooling in the regression for number of assets held is 0.112, and on the effect is 6.4% of pooled sample; for financial assets owners, the magnitude effects on the number of assets held by 2.8%; for males and females, the magnitude effects on the number of assets held by 5.3% and 6.3%, respectively; for urban regions and rural regions, the magnitude effects on the number of assets held by 7.2% and 5.3%, respectively. In panel B, we show the effects on portfolio variance, which present a strong schooling effect with a coefficient of 0.05 by 46.5%, a coefficient of 0.067 by 35.9% for financial assets owners, a coefficient of 0.066 by 63.3% for males, a coefficient of 0.037 by 33.2% for females, a coefficient of 0.098 by 37.5% for urban regions, and a coefficient of 0.016 by 52.8% for rural regions. Schooling increases the likelihood of diversifying financial assets and having optimal asset portfolios.

[Insert Table 7 about here]

The OLS results and the estimation of instrumental variables suggest that education is highly relevant for financial market participation. As an example, individuals with a better family environment tend to be more educated, and they also have the ability to take more risk in equity assets. In general, more educated households are more likely to participate in equity and financial markets. Further, using the household equity returns calculated from the data, we investigate how years of education affect investment returns. Consistent with the IV regression results, we find that years of schooling have a significant effect on households' return on investment in the financial markets. This is correspondent with empirical studies in developed countries such as the United States (Cole *et al.*, 2014) and Sweden (Black *et al.*, 2018), which find that education enhances households' financial behaviour and financial market participation.

5.3 Robustness exercises

In this section, we perform several robustness exercises to verify the validity of primary findings, i.e., the positive effect of education and ownership of stocks or other risky assets, as well as the positive effect on stock and risky asset ownership, and the positive effect on portfolio diversification. Then, we attempt a novel inquiry into the candidate transmission mechanisms of the causal effect of schooling on stock and risky-asset market participation.

Table 8 conducts a number of robustness exercises catering to different types of concerns regarding the validity of IV estimates, which replicates our primary estimation of Table 4. In *panel A* of *Table 8*, we restrict the sample to household heads, in order to ensure that coefficient estimates are not biased by multiple responses from household with different sizes. There, the estimates show that the positive effect of years of education on household heads is significant at the 1% level and of a magnitude of 62.7% on stock ownership, 46.8% on risky assets ownership, 61.0% on logarithmic value of stocks, 51.6% on logarithmic value of risky assets, 54.4% on the ratio of stocks to financial assets, 58.1% on the ratio of risky assets to financial assets, 7.3% on number of assets held, and 44.0% on portfolio variance. Regarding the ratio of stocks to wealth and the ratio of risky assets to wealth, the effects are statistically significant at the 5% level indicating 59.1% and 50.3% respectively.

In panel B of *Table 8*, we present coefficients and robust standard errors from weighted IV regressions by using data from a combination of CHFS 2013 and CHFS 2015, instead of using only cross-sectional data in 2013. The estimates corroborate my earlier conclusions, and the impacts are statistically and practically identical to those we observed. That is, the estimates confirm the robustness of the positive effect of years of schooling on financial market participation, and the effect becomes significant at the 1% level. Additionally, we perform estimates from the subsample of household heads of CHFS 2015 outcomes. In panel C of *Table 8*, exogenous increases in education lead to greater stock market participation and increases in the share of financial wealth allocated to stocks and risky assets.

In panel D of *Table 8*, we present the penultimate robustness exercise, by restricting the sample to individuals who were born between 1980 and 1986. Those are the individuals who started school between 1986 and 1992, i.e., the years in which the

compulsory schooling reform was gradually implemented at different provinces. We consider this a most convincing robustness exercise, as any effect is to be identified by individuals who got exposed to the schooling reform earlier rather than later. The effects show robustness and are even of a higher magnitude compared to the baseline estimates.

[Insert Table 8 about here]

[Insert Table 9 about here]

5.4 Causal mediation analysis

We find that in China, exogenous improvements in education result in more stock market involvement and increase the proportion of financial wealth allocated to stocks and risky assets, contingent upon participation. Specifically, according to the estimations, years of schooling are positively associated with stock market involvement, present ownership of risky assets, asset holding, and portfolio variance. In this section, we test the mediators for how years of schooling affect financial market participation. In particular, we use an innovative estimate method in Pinto *et al.*, (2019), which uses both an IV and assumptions on the error structure for identification. See *Appendix C*.

In terms of further examining the channels through which education takes place, we study various characteristics. These estimates are in *Table 9* and *Table 10*. Each column has baseline estimates by calculating in the context of equation (3) and adding in equation (4); we apply the same specification as in column (5) of table 4. In these columns, we gradually add controls for marital status, number of children, physical condition, logarithmic income, earnings uncertainty, saving rate, logarithmic wealth, financial wealth ratio, net financial wealth, financial risk tolerance, filial piety, and financial literacy. Ozbilgin (2010) argues that there is a lack of consensus regarding the mediating factors of the effect of educational attainment on investment behaviour in developed and developing countries, due to apparent cultural, gender, and socioeconomic differences. Ozbilgin (2010) challenges the traditional viewpoint that there is a causal relationship between education and financial market participation, drawing upon the theory of cognitive behavior on portfolio choice in Christelis *et al.*, (2010) to illustrate that investment behaviors are influenced by many other individual characteristics, such as uncertainty-avoidance preferences, intelligence, family

background, and previous investment experience.

We use the key explanatory variables of stock ownership, risky asset ownership, and number of assets held in panels A, B, and C of Table 9, respectively. In Table 9, we provide the subsequent results of stock shares, risky assets, and portfolio variances with IV mediating effects in panels A, B, and C. Specifically, financial literacy and filial piety show the prominent mediating effects: 1.27 and 1.51 in stock ownership, 1.13 and 1.34 in owning risky assets, 0.88 and 1.05 in number of assets held, respectively.

[Insert Table 9 about here]

In *Table 10*, we conduct one final exercise to test proposed mediators in the context of the logarithm value of stocks and the logarithm value of risky assets, as well as portfolio variance. Additionally, we identify the causal chain in financial literacy and filial piety from the aspects of logarithm of stocks, logarithm of risky assets, and portfolio variance in the same fashion in Table 9. Essentially, these results suggest that financial literacy and filial piety are two important channels through which education affects financial market participation. Factors such as marital status, number of children, physical condition, logarithmic income, savings rate, logarithmic wealth, financial wealth ratio, net financial wealth, filial piety, and financial literacy mediate the significant effect of the years of schooling. However, earnings uncertainty and financial risk tolerance have insignificant, minimal effects on the mediating coefficients. Financial literacy and filial piety show prominent mediating effects: 1.28 and 1.52 in stock holdings, 1.17 and 1.39 in risky asset holdings, and 1.13 and 1.34 in portfolio variances, respectively. Essentially, these results suggest that financial literacy and filial piety are two important channels through which education affects financial market participation. Factors such as marital status, number of children, physical condition, logarithmic income, savings rate, logarithmic wealth, financial wealth ratio, net financial wealth, filial piety, and financial literacy have a significant effect on the years of schooling. However, earnings uncertainty and financial risk tolerance have insignificant minimal effects on any of the mediating coefficients.

[Insert Table 10 about here]

As demonstrated earlier, we find that education has a significant causal effect on the financial market investment performance of households, but there are two possible

problems with our earlier analysis. First, we use only one year of cross-sectional data. Compared to other household-level variables, stock returns are more clearly affected by macroeconomic and market sentiment and can be highly volatile. Therefore, using only one period of data may not be sufficient to find an association between education and financial investment performance. Second, whether or not to participate in the financial market is a process of choice. Those households that choose to participate in the stock market may be significantly different from other households. This implies that our findings may be subject to sample selection bias. To address the issue of sample selection bias, we use the Heckman test to calibrate the bias and report the results in *Table 11*. The calibrated results are consistent with the baseline results.

[Insert Table 11 about here]

6. Concluding Remarks

We examine the effect of educational attainment on financial investment behavior using data from the 2013 China Household Finance Survey (CHFS). We account for endogeneity in educational attainment using reform exposure to conditional free schooling based on the 1980 one-child policy and the 1986 compulsory schooling reform that increased mandatory schooling from six to nine years. The exclusions from free schooling stem from noncompliance with the one-child policy for the majority of the Chinese population.

Noting the low equity and risky-asset market participation in China and in the sample, we find that individuals exposed to the reform are more than 50% more likely to invest in the stock market and more than 30% more likely to invest in risky assets. Moreover, we find that schooling has a large effect on portfolio diversification. The results are robust to dropping university graduates, dropping individuals residing near special economic zones, and for individuals living in the province in which they were born and those who moved away. My findings are also robust for the subsamples of household heads and for individuals born within narrower windows around the reform (i.e., 10 or five years before or after the reform).

When examining the potential transmission channels of the causal relationship

between education and investment activity, we find that increased financial literacy among individuals with higher educational attainment moderates how years of schooling affect financial market participation. This is also the case with the declining Confucian norms of filial piety in Chinese society. Hence, the findings in this study have significant policy implications. The labour income and wealth of Chinese households has increased over the last decades as a result of significant economic development and increasing savings rates. However, the transformation of this higher disposable income into higher accumulated wealth for older generations, and resulting lower inequality, is limited by low financial knowledge, financial exclusion, limited financial market participation, and low portfolio diversification.

As we find that higher educational attainment, even with conditions, is likely to improve household financial outcomes by encouraging desirable behaviours, it is likely that eliminating exclusion restrictions and implementing educational reform aimed at cultivating cognitive skills such as financial literacy will solidify China's economic, financial, and social transformation. Toward that aim, the Chinese government announced that the one-child policy program was ending in early 2016 and all families would be allowed to have two children, a change that has yet to lead to a sustained increase in birth rates. Abolishing exclusions and constraints on schooling children from larger families could further improve household financial outcomes as a foundation of China's sustained endogenous growth.

Moreover, in 2019, the Chinese Regulatory Securities Commission (CSRC) announced plans for primary and secondary schools across the nation to teach financial literacy; pilot courses are being introduced in certain provinces. China's Ministry of Education and the CSRC agreed to introduce a more comprehensive curriculum and scale-up the financial literacy pilot program. In late July 2021, the State Council introduced another major educational reform that included among its aims the introduction of a financial literacy curriculum. Although the specifics are yet to be determined, the study indicates that an earlier more generic reform induces positive effects on household financial outcomes via increased financial literacy. It is likely that a reform that specifically aims at a customized related curriculum will have large effects on financial market participation, as a healthy foundation of financial sector development, endogenous growth, and reduced inequality.

Finally, Chen *et al.*, (2019) suggest that the national decline in Confucian

influence has contributed to the steady increase in savings, and that little or no difference exists in savings rates in regions with or without Confucian influence, as both family types have to prepare for uncertainties. The evidence suggests that the decline in Confucian values is a channel for transforming savings to investment. Hence, China's social transformation, the cultivation of relevant affective skills, alongside the abolishment of the one-child policy is likely to induce further improvements in household financial outcomes for males and females alike.

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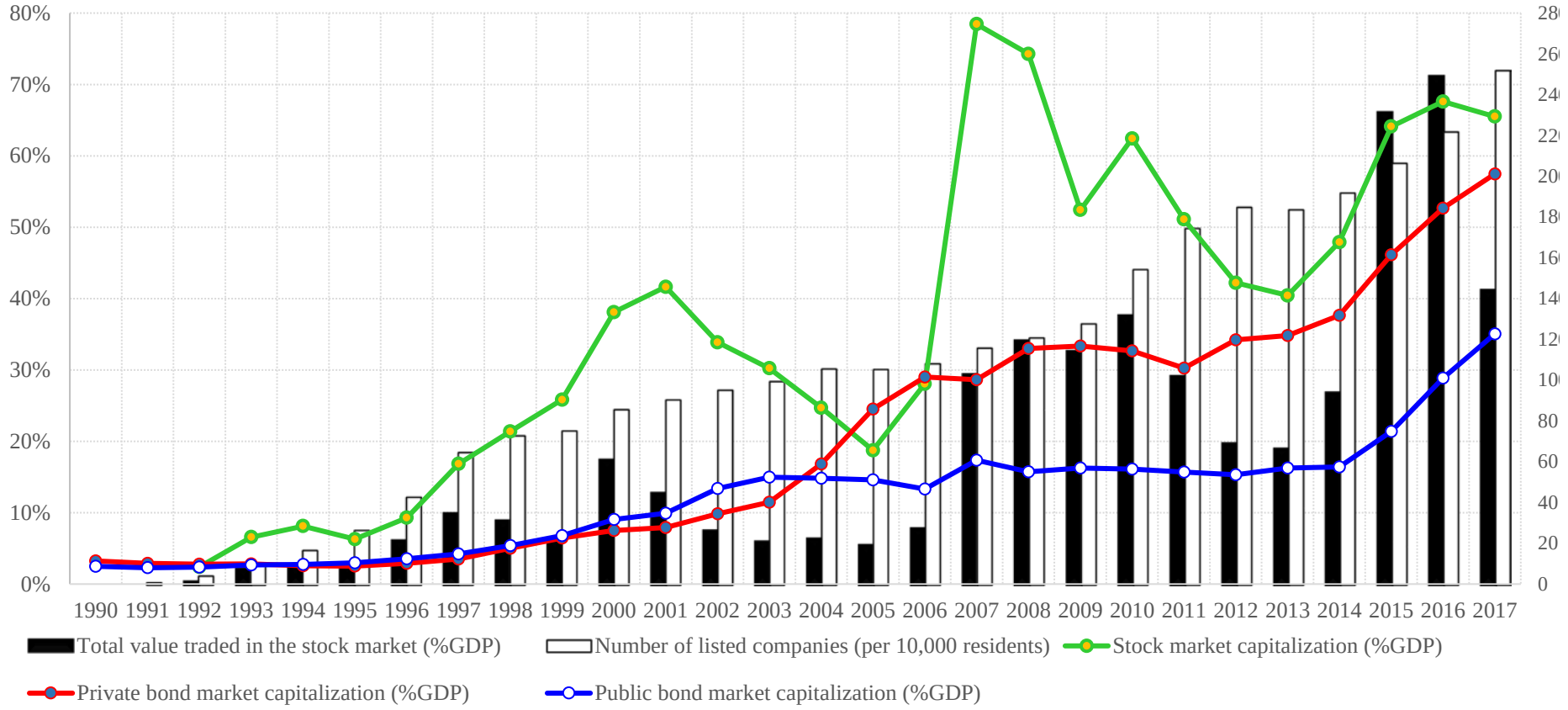

Figure 1

The Evolution of the Financial Sector in China Between 1990-2017

This figure uses data from the World Bank's Financial Structure Database, available at: https://www.worldbank.org/en/publication/gfdr/data/financial-structure-database. The figure presents financial sector development in China since 1990, in terms of the development of stock and bond markets. The black bars depict stock market capitalization as a percentage of the Chinese GDP, the red line shows the total value traded in the stock market as a percentage of GDP, and the blue line shows the number of listed companies. Then, the white bars depict the private bond market capitalization as a percentage of GDP, and the grey bars capture the public bond market capitalization as a percentage of the Chinese GDP.

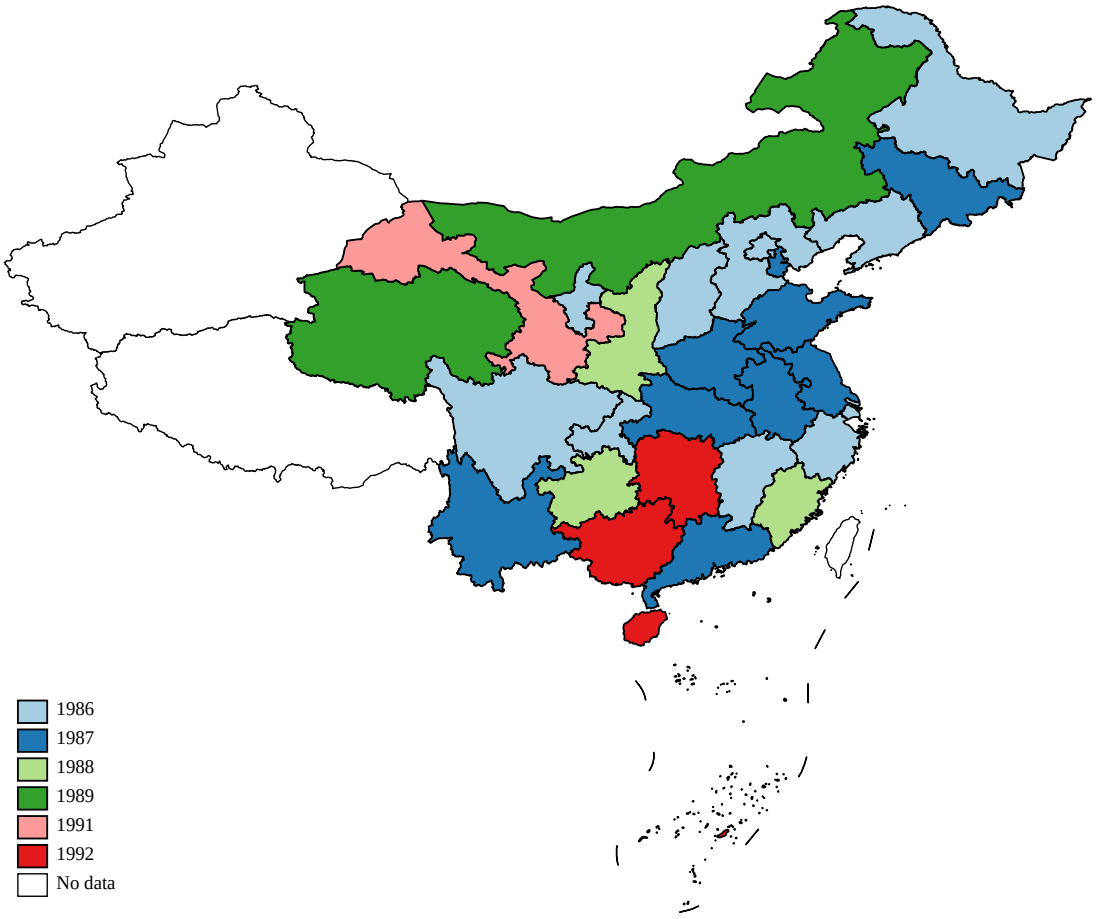

Figure 2

Map of the educational reform by Chinese province

The figure maps the administrative borders of the 31 major provinces in China. The 11 provinces that have implemented compulsory schooling reform in 1986 are shown in light blue colour (Beijing, Hebei, Shanxi, Heilongjiang, Shanghai, Zhejiang, Jiangxi, Chongqing, Sichuan, Ningxia, Liaoning), the 9 provinces of 1987 is shown in deep blue colour (Tianjin, Jilin, Jiangsu, Anhui, Shandong, Henan, Hubei, Guangdong, Yunnan), and the 3 provinces of 1988 is shown in light green (Fujian, Guizhou, Shaanxi). The 2 provinces that enacted educational reform in 1989 are shown in deep green colour (Inner Mongolia, Qinghai), and the 1 province of 1991 is shown in pink (Gansu). Additional 3 provinces (Hunan, Guangxi, Hainan) enacted in 1992 are shown in red, while regions without data are presented in white The map coordinates for the Chinese administrative regions, along with map platforms are available at: http://datav.aliyun.com/tools/atlas/index.html.

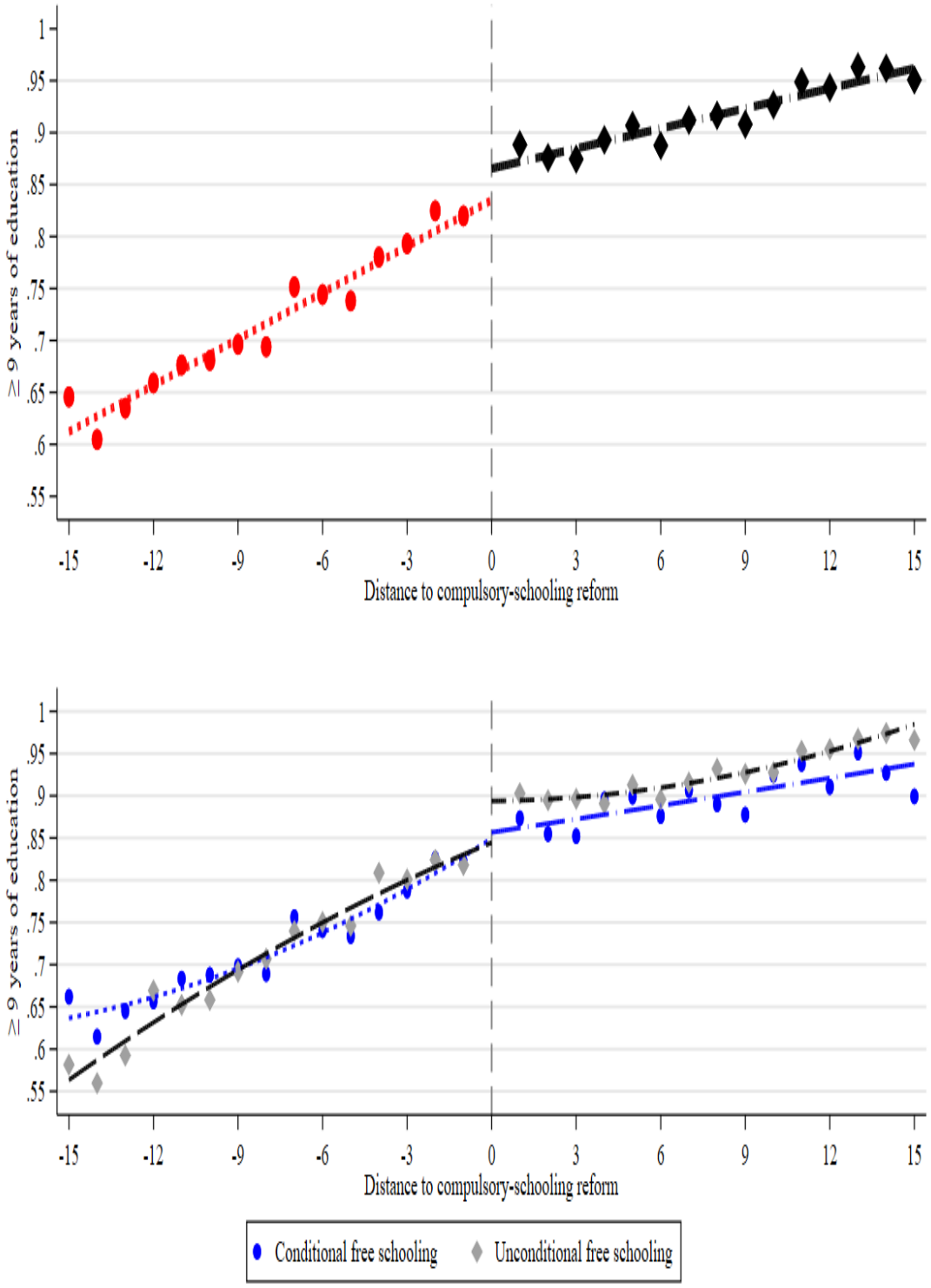

Figure 3

Individuals with ≥years of schooling based on distance to reform

This figure presents the Distribution of years of schooling 10 and 15 years before and after the reform, on the top of each panel present the effect of educational reform, in the bottom of each panel plots the effect by including two reforms.

Table 1

Overview of implementation year of compulsory schooling reform in China

This table presents the years in which 29 provinces have implemented compulsory schooling reform year during 1986-1992.

Year	Province
1986	Beijing, Hebei, Shanxi, Heilongjiang, Shanghai, Zhejiang, Jiangxi, Chongqing, Sichuan, Ningxia, Liaoning
1987	Tianjin, Jilin, Jiangsu, Anhui, Shandong, Henan, Hubei, Guangdong, Yunnan
1988	Fujian, Guizhou, Shaanxi
1989	Inner Mongolia, Qinghai
1991	Gansu
1992	Hunan, Guangxi, Hainan

Table 2

Weighted Summary Statistics for CHFS 2013

This table summarizes the weighted averages for the demographic characteristics and financial outcomes of the pooled sample of respondents in the survey of the CHFS2013 databases (Column 1). It denotes weighted averages of individuals, who age between 18 to 48. The remaining Column (2) shows samples of males, Column (3) for females; Column (4) indicates the respondents who were based in urban regions, Column (5) for rural regions. [A] all monetary values are reported in Chinese Yuan in 2013.

	Pooled sample	**Males**	**Females**	**Urban Region**	**Rural Region**
No. of Observations	*43,888*	*22,366*	*21,522*	*17,064*	*26,824*
	(1)	(2)	(3)	(4)	(5)
No conditionality in free schooling	48.2%	48.1%	48.2%	45.5%	49.5%
Aged ≥6 post single-child reform	44.0%	51.5%	36.1%	41.6%	45.1%
Reform exposure (interaction term)	29.0%	33.8%	24.0%	28.8%	29.1%
Ownership of stocks	5.2%	5.1%	5.4%	13.3%	1.2%
Ownership of risky assets	9.2%	8.9%	9.4%	21.5%	3.0%
Value of stocks[A]	8,145.7	7,759.8	8,548.7	20,526.0	1,985.1
Value of risky assets[A]	11,047.9	10,821.0	11,284.9	27,946.0	2,639.2
Stocks-to-financial asset ratio	2.4%	2.3%	2.5%	6.2%	0.6%
Risky-to-financial asset ratio	4.4%	4.2%	4.5%	10.9%	1.1%
Stocks to wealth ratio	0.6%	0.6%	0.6%	1.4%	0.2%
Risky assets to wealth ratio	1.0%	1.0%	1.0%	2.4%	0.3%
#Assets held	1.75	1.74	1.76	2.09	1.58
Portfolio variance	0.11	0.10	0.11	0.26	0.03
Wealth[A]	546,478.7	533,296.1	560,247.0	922,229.0	359,502.2
Disposable income[A]	72,674.5	72,478.6	72,879.2	104,769.9	56,703.6
Value of financial assets[A]	56,422.8	55,471.8	57,416.1	99,260.4	35,106.5
Years Of Education	10.4	10.6	10.2	12.8	9.3
Male	51.1%	100.0%	0.0%	49.7%	51.8%
Age	32.8	32.7	32.8	33.4	32.5
Physical condition [1, 5]	2.97	3.02	2.93	3.08	2.92
Urban region	33.2%	32.3%	34.1%	100.0%	0.0%
Parents living in urban region	25.7%	24.8%	26.5%	66.2%	5.5%
Married	71.3%	67.0%	75.8%	70.0%	72.0%
#Children	1.45	1.49	1.42	0.84	1.76
Financial literacy	0.66	0.65	0.67	0.94	0.53
Attitude to financial risk	2.09	2.09	2.09	2.27	2.00
Confucian values - Filial piety	2.33	2.36	2.29	1.61	2.68

Table 3

The effect of the reforms on years of schooling

This table reports the effect of the reforms on years of schooling. In the Panel A, Column (1) – Column (5) shows results including control cohort fixed effects, Province fixed effects, urbanization fixed effects. In addition, Columns (6) and (7) include: (6) interaction of cohort-province and urbanization fixed effects and (7) Cohort-province-urbanisation linear trends. Column (8) presents the results controlling for cohort fixed effects, provinces fixed effects, gender and urban-rural transition fixed effect. Column (9) additionally add other demographic control variables in the basis of Column (8). The specifications of Panel B are identical to that of Column 8 of Panel A. shows sub-samples in categories of males, females, urban, rural and household heads. The asterisks denote the following levels of significance: * p<0.10, ** p<0.05, *** p<0.01.

Panel A: Pooled sample (43,888 obs.)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
No conditionality in free schooling	0.516***	–	0.515***	0.320***	–	–	–	–	–
	[0.043]		[0.043]	[0.061]					
Aged ≥6 post single-child reform	–	0.219*	0.206*	0.037	–	–	–	–	–
		[0.115]	[0.116]	[0.122]					
Reform exposure (interaction term)	–	–	–	0.370***	0.677***	0.650***	0.673***	0.769***	0.488***
				[0.082]	[0.056]	[0.055]	[0.056]	[0.056]	[0.050]
Cohort FE	+	+	+	+	+	+	+	+	+
Province FE	+	+	+	+	+	+	+	+	+
Urbanisation FE	+	+	+	+	+	+	+	–	–
Cohort*Province*Urbanisation FE	–	–	–	–	–	+	–	–	–
Cohort-Province-Urbanisation Linear Trend	–	–	–	–	–	–	+	–	–
Gender	–	–	–	–	–	–	–	+	+
Urban-Rural Transition FE	–	–	–	–	–	–	–	+	+
Other Control Variables	–	–	–	–	–	–	–	–	+
%Effect	*5.0%*	*2.1%*	*4.9%*	*3.6%*	*6.5%*	*6.2%*	*6.5%*	*7.4%*	*4.7%*
Predicted probability	*10.42*	*10.42*	*10.42*	*10.42*	*10.42*	*10.42*	*10.42*	*10.42*	*10.42*

Panel B: Sub-samples	*Males*	*Females*	*Urban*	*Rural*	*Household heads*
	(10)	(11)	(12)	(13)	(14)
Reform exposure (interaction term)	0.463***	1.053***	0.984***	0.471***	0.815***
	[0.077]	[0.076]	[0.084]	[0.063]	[0.109]
%Effect	*4.4%*	*10.3%*	*7.7%*	*5.1%*	*8.0%*
Predicted probability	*10.64*	*10.19*	*12.75*	*9.26*	*10.20*
No. of Observations	*22,366*	*21,522*	*17,064*	*26,824*	*12,786*

Table 4

The effect of education on participation in stock markets

This table reports OLS and IV estimates of the effect of education on participation in stock markets in China, along with the dependent variable is stock market participation. The asterisks denote the following levels of significance: ***: p<0.01, **: p<0.05, *: p<0.10. Panel A present the Pooled sample, Panel B and Panel C present the sub-sample in Males and Females, respectively. Panel D and Panel E present the samples who are in urban and rural regions. In column 1 (7, 13, 19 and 25), present OLS estimates on the pooled sample of respondents, in a specification with cohort and province fixed effects as well as urbanization fixed effects. In columns 2 (8, 14, 20, and 26) present IV estimates are shown from models controlling the same fixed effects as column 1. In column 3 (9, 15, 21 and 27) additionally add the interaction term Cohort*Province*Urban FE. In column 4 (10, 16, 22 and 28) adheres a cohort-by-province linear trend to the specification of column 1. In column 5 (11, 17, 23 and 29) the estimates presented are from models controlling for cohort fixed effects, province fixed effects, urban-rural transition fixed effects and males. In addition, in column 6 (12, 18, 24 and 30) a rich list of control variables is added to the specification column (5), including marital status, number of children, logarithmic terms for household wealth and household income, and labor market status. The symbol † denotes OLS estimates. The % effect is calculated as the ratio of the coefficient of in interest divided by the linear prediction induced of the model. The coefficient of interest is that of years of schooling.

Panel A: Pooled sample	(1)†	(2)	(3)	(4)	(5)	(6)
Years of schooling	0.009***	0.026***	0.025***	0.026***	0.032***	0.047***
	[0.000]	[0.005]	[0.005]	[0.005]	[0.005]	[0.011]
%Effect	*17.1%*	*49.2%*	*48.5%*	*49.9%*	*61.3%*	*90.4%*
Predicted probability	*0.0525*	*0.0525*	*0.0525*	*0.0525*	*0.0525*	*0.0525*
No. observations	*43,888*	*43,888*	*43,888*	*43,888*	*43,888*	*43,888*
Panel B: Males	(7)	(8)	(9)	(10)	(11)	(12)
Years of schooling	0.009***	0.036***	0.048**	0.037***	0.037***	0.044***
	[0.001]	[0.014]	[0.019]	[0.014]	[0.011]	[0.016]
%Effect	*17.9%*	*69.9%*	*93.9%*	*72.9%*	*73.2%*	*87.3%*
Predicted probability	*0.0508*	*0.0508*	*0.0508*	*0.0508*	*0.0508*	*0.0508*
No. observations	*22,366*	*22,366*	*22,366*	*22,366*	*22,366*	*22,366*
Panel C: Females	(13)	(14)	(15)	(16)	(17)	(18)
Years of schooling	0.009***	0.025***	0.025***	0.025***	0.026***	0.041***
	[0.001]	[0.005]	[0.005]	[0.005]	[0.004]	[0.010]
%Effect	*16.8%*	*46.3%*	*46.1%*	*46.6%*	*47.2%*	*76.4%*
Predicted probability	*0.0542*	*0.0542*	*0.0542*	*0.0542*	*0.0542*	*0.0542*
No. observations	*21,522*	*21,522*	*21,522*	*21,522*	*21,522*	*21,522*
Panel D: Urban region	(19)	(20)	(21)	(22)	(23)	(24)
Years of schooling	0.021***	0.062***	0.072***	0.064***	0.067***	0.095***
	[0.001]	[0.011]	[0.012]	[0.011]	[0.010]	[0.021]
%Effect	*15.9%*	*46.8%*	*54.0%*	*48.5%*	*50.6%*	*71.2%*
Predicted probability	*0.1331*	*0.1331*	*0.1331*	*0.1331*	*0.1331*	*0.1331*
No. observations	*17,064*	*17,064*	*17,064*	*17,064*	*17,064*	*17,064*
Panel E: Rural region	(25)	(26)	(27)	(28)	(29)	(30)
Years of schooling	0.003***	0.002	0.002	0.002	0.006*	0.008
	[0.000]	[0.003]	[0.003]	[0.003]	[0.004]	[0.006]
%Effect	*22.8%*	*18.0%*	*16.1%*	*20.0%*	*50.4%*	*65.9%*
Predicted probability	*0.0124*	*0.0124*	*0.0124*	*0.0124*	*0.0124*	*0.0124*
No. observations	*26,824*	*26,824*	*26,824*	*26,824*	*26,824*	*26,824*
Cohort FE	+	+	+	+	+	+
Province FE	+	+	+	+	+	+
Urban FE	+	+	+	+	–	–
Cohort*Province*Urban FE	–	–	+	–	–	–
Cohort*Province*Urban linear trend	–	–	–	+	–	–
Urban-rural transition FE	–	–	–	–	+	+
Gender	–	–	–	–	+	+
Other control variables	–	–	–	–	–	+

Table 5

The effect of education on participation in risky markets

This table reports estimates of participation in risky markets, The specifications of the six columns of each panel are identical to those of Table 4.

Panel A: Pooled sample	(1) †	(2)	(3)	(4)	(5)	(6)
Years of schooling	0.014***	0.028***	0.027***	0.028***	0.038***	0.052***
	[0.001]	[0.007]	[0.007]	[0.007]	[0.007]	[0.013]
%Effect	*14.9%*	*30.2%*	*29.9%*	*30.7%*	*41.4%*	*56.6%*
Predicted probability	*0.0916*	*0.0916*	*0.0916*	*0.0916*	*0.0916*	*0.0916*
No. observations	*43,888*	*43,888*	*43,888*	*43,888*	*43,888*	*43,888*
Panel B: Males	(7)	(8)	(9)	(10)	(11)	(12)
Years of schooling	0.014***	0.044**	0.050**	0.046**	0.051***	0.059***
	[0.001]	[0.018]	[0.025]	[0.018]	[0.014]	[0.021]
%Effect	*16.0%*	*50.0%*	*56.0%*	*51.9%*	*57.1%*	*65.9%*
Predicted probability	*0.0890*	*0.0890*	*0.0890*	*0.0890*	*0.0890*	*0.0890*
No. observations	*22,366*	*22,366*	*22,366*	*22,366*	*22,366*	*22,366*
Panel C: Females	(13)	(14)	(15)	(16)	(17)	(18)
Years of schooling	0.013***	0.025***	0.028***	0.025***	0.027***	0.039***
	[0.001]	[0.006]	[0.006]	[0.006]	[0.006]	[0.013]
%Effect	*14.3%*	*26.7%*	*29.7%*	*26.9%*	*28.9%*	*41.7%*
Predicted probability	*0.0943*	*0.0943*	*0.0943*	*0.0943*	*0.0943*	*0.0943*
No. observations	*21,522*	*21,522*	*21,522*	*21,522*	*21,522*	*21,522*
Panel D: Urban region	(19)	(20)	(21)	(22)	(23)	(24)
Years of schooling	0.029***	0.065***	0.070***	0.067***	0.075***	0.102***
	[0.001]	[0.013]	[0.014]	[0.013]	[0.012]	[0.025]
%Effect	*13.6%*	*30.3%*	*32.5%*	*31.0%*	*34.9%*	*47.4%*
Predicted probability	*0.2151*	*0.2151*	*0.2151*	*0.2151*	*0.2151*	*0.2151*
No. observations	*17,064*	*17,064*	*17,064*	*17,064*	*17,064*	*17,064*
Panel E: Rural region	(25)	(26)	(27)	(28)	(29)	(30)
Years of schooling	0.005***	0.004	0.003	0.004	0.011*	0.009
	[0.001]	[0.006]	[0.006]	[0.006]	[0.006]	[0.011]
%Effect	*18.2%*	*11.8%*	*10.2%*	*13.6%*	*35.1%*	*28.6%*
Predicted probability	*0.0301*	*0.0301*	*0.0301*	*0.0301*	*0.0301*	*0.0301*
No. observations	*26,824*	*26,824*	*26,824*	*26,824*	*26,824*	*26,824*
Cohort FE	+	+	+	+	+	+
Province FE	+	+	+	+	+	+
Urban FE	+	+	+	+	–	–
Cohort*Province*Urban FE	–	–	+	–	–	–
Cohort*Province*Urban linear trend	–	–	–	+	–	–
Urban-rural transition FE	–	–	–	–	+	+
Gender	–	–	–	–	+	+
Other control variables	–	–	–	–	–	+

Table 6

The effect of education on amounts and shares of stock and risky holdings

This table reports estimates of six indicators of amounts and shares of stock and risky holdings in China. Coefficients from weighted linear probability models are presented, along with robust standard errors – clustered at the household level – in brackets. In panel A, the dependent variable is the logarithm of the amount invested in stocks. The dependent variable in panel B is the ratio of stocks to financial assets. In Panel C it is the ratio of stocks to wealth. Panel D presents estimates of the logarithm of the amount invested in risky assets. The dependent variable in panel E is the ratio of risky assets to financial assets. The dependent variable of panel F is the ratio of risky assets to wealth. All specifications are identical to Column 5 of Table 2.4, and the comments therein apply. Columns 1, 7, 13, 19, 25 and 31 present estimates for the pooled sample. Columns 2, 8, 14, 20, 26 and 32 present estimates for the sub-sample of financial asset owners. Columns 3, 9, 15, 21, 27 and 33 present estimates for the sub-sample of males. Columns 4, 10, 16, 22, 28 and 34 present estimates for the sub-sample of females. Columns 5, 11, 17, 23, 29 and 35 present estimates for the sub-sample residing in urban regions. Columns 6, 12, 18, 24, 30 and 36 present estimates for the sub-sample residing in rural regions.

	Pooled sample	Financial asset owners	Males	Females	Urban region	Rural region
Panel A: Log(Shares)	(1)	(2)	(3)	(4)	(5)	(6)
Years of schooling	0.359***	0.475***	0.426***	0.281***	0.741***	0.072**
	[0.058]	[0.079]	[0.115]	[0.051]	[0.115]	[0.037]
%Effect	*64.7%*	*49.2%*	*79.5%*	*49.0%*	*52.5%*	*56.5%*
Predicted probability	*0.5544*	*0.9655*	*0.5361*	*0.5735*	*1.4105*	*0.1284*
No. observations	*43,888*	*25,858*	*22,366*	*21,522*	*17,064*	*26,824*
Panel B: Stocks/Financial Assets	(7)	(8)	(9)	(10)	(11)	(12)
Years of schooling	0.015***	0.020***	0.019***	0.011***	0.032***	0.003*
	[0.003]	[0.004]	[0.006]	[0.003]	[0.006]	[0.002]
%Effect	*62.4%*	*48.1%*	*83.6%*	*42.5%*	*52.1%*	*54.7%*
Predicted probability	*0.0243*	*0.0422*	*0.0233*	*0.0253*	*0.0617*	*0.0056*
No. observations	*43,888*	*25,858*	*22,366*	*21,522*	*17,064*	*26,824*
Panel C: Stocks to Wealth	(13)	(14)	(15)	(16)	(17)	(18)
Years of schooling	0.004***	0.006***	0.005**	0.004***	0.009***	0.001
	[0.001]	[0.002]	[0.002]	[0.001]	[0.002]	[0.001]
%Effect	*73.5%*	*56.2%*	*81.0%*	*58.2%*	*61.9%*	*49.4%*
Predicted probability	*0.0060*	*0.0105*	*0.0057*	*0.0063*	*0.0145*	*0.0018*
No. observations	*43,888*	*25,858*	*22,366*	*21,522*	*17,064*	*26,824*
Panel D: Log(Risky Assets)	(19)	(20)	(21)	(22)	(23)	(24)
Years of schooling	0.441***	0.586***	0.564***	0.329***	0.896***	0.100*
	[0.073]	[0.098]	[0.148]	[0.063]	[0.137]	[0.058]
%Effect	*46.9%*	*35.8%*	*61.8%*	*34.0%*	*39.6%*	*35.6%*
Predicted probability	*0.9400*	*1.6371*	*0.9125*	*0.9688*	*2.2638*	*0.2813*
No. observations	*43,888*	*25,858*	*22,366*	*21,522*	*17,064*	*26,824*
Panel E: Risky/Financial Assets	(25)	(26)	(27)	(28)	(29)	(30)
Years of schooling	0.024***	0.033***	0.032***	0.017***	0.051***	0.004
	[0.004]	[0.006]	[0.008]	[0.004]	[0.008]	[0.003]
%Effect	*54.4%*	*42.8%*	*75.6%*	*37.3%*	*47.1%*	*33.0%*
Predicted probability	*0.0437*	*0.0761*	*0.0422*	*0.0452*	*0.1088*	*0.0113*
No. observations	*43,888*	*25,858*	*22,366*	*21,522*	*17,064*	*26,824*
Panel F: Risky Assets to Wealth	(31)	(32)	(33)	(34)	(35)	(36)
Years of schooling	0.006***	0.007***	0.004	0.005***	0.012***	0.001
	[0.001]	[0.002]	[0.003]	[0.001]	[0.003]	[0.001]
%Effect	*55.3%*	*42.2%*	*45.3%*	*50.8%*	*51.7%*	*9.8%*
Predicted probability	*0.01*	*0.0175*	*0.0097*	*0.0104*	*0.0236*	*0.0033*
No. observations	*43,888*	*25,858*	*22,366*	*21,522*	*17,064*	*26,824*

Table 7

The effect of education on portfolio diversification

This table reports estimates of two different indicators of financial market participation in China, i.e., the number of distinctive asset classes held in panels A, and portfolio variance in panels B. All specifications are identical to Column 5 of Table 4. The specifics of the calculation of portfolio variance are presented in ***Appendix A***. From Column1 to 6, presents the observation of pooled sample, financial assets owners, males, females, urban region, rural region.

	Pooled sample	Financial asset owners	Males	Females	Urban	Rural
Panel A: #Assets held	(1)	(2)	(3)	(4)	(5)	(6)
Years of schooling	0.112***	0.064***	0.092**	0.111***	0.151***	0.084***
	[0.022]	[0.017]	[0.042]	[0.019]	[0.030]	[0.029]
%Effect	*6.4%*	*2.8%*	*5.3%*	*6.3%*	*7.2%*	*5.3%*
Predicted probability	*1.7495*	*2.27*	*1.7378*	*1.7618*	*2.0875*	*1.5814*
No. observations	*43,888*	*25,858*	*22,366*	*21,522*	*17,064*	*26,824*
Panel B: Portfolio variance	(7)	(8)	(9)	(10)	(11)	(12)
Years of schooling	0.050***	0.067***	0.066***	0.037***	0.098***	0.016**
	[0.009]	[0.013]	[0.019]	[0.008]	[0.017]	[0.007]
%Effect	*46.5%*	*35.9%*	*63.3%*	*33.2%*	*37.5%*	*52.8%*
Predicted probability	*0.1072*	*0.1867*	*0.1041*	*0.1104*	*0.2615*	*0.0304*
No. observations	*43,888*	*25,858*	*22,366*	*21,522*	*17,064*	*26,824*

Table 8

Robustness Exercises

This table reports the effect on household heads of CHFS2013 sample, panel data of CHFS 2015 sample as well as entailing sub-sample of household heads, and individuals born between 1980-1986. The specification is identical of column 5 of Table 4, entailing cohort and province fixed effects, as well as cohort-by-province fixed effects.

	Stock ownership	**Risky asset ownership**	**Log (Shares)**	**Log (Risky assets)**	**Stocks/ Financial Assets**	**Risky/ Financial Assets**	**Stocks to Wealth**	**Risky Assets to Wealth**	**#Assets held**	**Portfolio variance**
Panel A: Sample of household heads (12,786 obs.)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Years of schooling	0.045***	0.057***	0.463***	0.644***	0.018***	0.033***	0.005**	0.007**	0.138***	0.063***
	[0.012]	[0.016]	[0.133]	[0.170]	[0.006]	[0.009]	[0.002]	[0.003]	[0.040]	[0.021]
%Effect	*62.7%*	*46.8%*	*61.0%*	*51.6%*	*54.4%*	*58.1%*	*59.1%*	*50.3%*	*7.3%*	*44.0%*
Linear prediction	*0.0719*	*0.1209*	*0.759*	*1.25*	*0.0327*	*0.0572*	*0.0083*	*0.0138*	*1.8897*	*0.1423*
Panel B: CHFS 2015 outcomes (34,096 obs.)										
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Years of schooling	0.037***	0.049***	0.417***	0.571***	0.020***	0.031***	0.013***	0.020***	0.169***	0.101***
	[0.007]	[0.011]	[0.084]	[0.114]	[0.004]	[0.006]	[0.003]	[0.004]	[0.031]	[0.019]
%Effect	*60.2%*	*37.0%*	*60.1%*	*41.4%*	*64.7%*	*50.2%*	*73.4%*	*61.7%*	*9.0%*	*56.8%*
Linear prediction	*0.0612*	*0.1322*	*0.6933*	*1.3786*	*0.0306*	*0.0626*	*0.0173*	*0.033*	*1.8755*	*0.1777*
Panel D: Sample of household heads – CHFS 2015 outcomes (9,230 obs.)										
	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
Years of schooling	0.056**	0.077**	0.548*	0.926**	0.019	0.060***	0.01	0.021*	0.203**	0.143*
	[0.029]	[0.034]	[0.316]	[0.385]	[0.015]	[0.021]	[0.010]	[0.013]	[0.081]	[0.075]
%Effect	*62.8%*	*40.8%*	*54.0%*	*47.4%*	*42.0%*	*66.8%*	*41.2%*	*46.1%*	*10.0%*	*55.4%*
Linear prediction	*0.0899*	*0.188*	*1.0143*	*1.9528*	*0.045*	*0.0892*	*0.0252*	*0.0459*	*2.0237*	*0.2575*
Panel D: Individuals born between 1980-1986 (10,140 obs.)										
	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)
Years of schooling	0.039***	0.057***	0.414***	0.629***	0.015***	0.034***	0.003	0.008**	0.119***	0.064***
	[0.011]	[0.014]	[0.117]	[0.151]	[0.006]	[0.008]	[0.002]	[0.003]	[0.039]	[0.018]
%Effect	*74.58%*	*60.25%*	*77.03%*	*65.21%*	*65.42%*	*75.45%*	*64.50%*	*74.87%*	*6.76%*	*58.25%*
Linear prediction	*0.0517*	*0.0946*	*0.537*	*0.9644*	*0.0225*	*0.0447*	*0.0052*	*0.0104*	*1.7613*	*0.1106*

Table 9

Causal Mediation Analysis (*43,888 obs.*) on stock ownership, risky asset ownership and number of assets held

This table summaries of related parameters and explains how causal mediation analysis can be assessed. The mediator variables considered are married/cohabiting in column 1, 13, 25, number of children in column 2, 14, 26, physical condition in column 3, 15, 27, the income of logarithm in column 4, 16, 28, earnings uncertainty in column 5, 17, 29, savings rate in column 6, 18, 30, the wealth of logarithm in column 7, 19, 31, financial wealth ratio in column 8, 20, 32, net financial wealth in column 9, 21, 33, financial risk tolerance in column 10, 22, 34, filial piety in column 11, 23, 35, financial literacy in column 12, 24, 36. Panel A presents the results of stock ownership, Panel B presents risky assets ownership and Panel C reports the number of assets held. All regressions include control variables identical to column 5 of Table 4.

	Married/ cohabiting	*Number of children*	*Physical condition*	*Log (Income)*	*Earnings uncertainty*	*Savings rate*	*Log (Wealth)*	*Financial wealth ratio*	*Net financial wealth*	*Fin. risk tolerance*	*Filial piety*	*Financial literacy*
Panel A: Stock ownership	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Years of schooling	0.008***	0.008***	0.020***	0.023***	0.007***	0.010***	0.043**	0.008***	0.009***	0.029*	-0.009	-0.017
	[0.001]	[0.001]	[0.003]	[0.004]	[0.002]	[0.001]	[0.019]	[0.001]	[0.001]	[0.016]	[0.006]	[0.013]
Mediator	-0.140***	-0.058***	-0.398***	-0.136***	0.06	0.172***	-0.330*	1.136***	0.647***	-0.635	-0.226***	0.662**
	[0.026]	[0.011]	[0.113]	[0.044]	[0.040]	[0.060]	[0.188]	[0.368]	[0.229]	[0.506]	[0.075]	[0.330]
Direct effect	*0.008*	*0.008*	*0.020*	*0.023*	*0.007*	*0.010*	*0.043*	*0.008*	*0.009*	*0.029*	*-0.009*	*-0.018*
Indirect effect	*0.026*	*0.026*	*0.015*	*0.012*	*0.027*	*0.024*	*-0.008*	*0.027*	*0.025*	*0.005*	*0.044*	*0.052*
Total effect	*0.034*	*0.034*	*0.034*	*0.034*	*0.034*	*0.034*	*0.034*	*0.034*	*0.034*	*0.034*	*0.034*	*0.034*
Mediation effect	*0.76*	*0.76*	*0.43*	*0.34*	*0.79*	*0.70*	*-0.24*	*0.77*	*0.74*	*0.16*	*1.27*	*1.51*
Panel B: Risky asset ownership	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Years of schooling	0.013***	0.013***	0.025***	0.028***	0.012***	0.015***	0.049**	0.013***	0.014***	0.035**	-0.005	-0.014
	[0.001]	[0.001]	[0.003]	[0.005]	[0.002]	[0.001]	[0.021]	[0.001]	[0.001]	[0.017]	[0.007]	[0.014]
Mediator	-0.147***	-0.060***	-0.417***	-0.142***	0.06	0.180***	-0.345*	1.192***	0.677***	-0.664	-0.237***	0.692**
	[0.035]	[0.015]	[0.134]	[0.052]	[0.041]	[0.068]	[0.208]	[0.415]	[0.257]	[0.543]	[0.084]	[0.353]
Direct effect	*0.013*	*0.013*	*0.025*	*0.028*	*0.012*	*0.015*	*0.049*	*0.013*	*0.014*	*0.035*	*-0.005*	*-0.014*
Indirect effect	*0.027*	*0.028*	*0.016*	*0.012*	*0.029*	*0.025*	*-0.009*	*0.028*	*0.027*	*0.006*	*0.046*	*0.054*
Total effect	*0.040*	*0.040*	*0.040*	*0.040*	*0.040*	*0.040*	*0.040*	*0.040*	*0.040*	*0.040*	*0.040*	*0.040*
Mediation effect	*0.68*	*0.68*	*0.38*	*0.30*	*0.70*	*0.62*	*-0.21*	*0.69*	*0.66*	*0.14*	*1.13*	*1.34*
Panel C: #Assets held	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)
Years of schooling	0.049***	0.049***	0.073***	0.079***	0.047***	0.053***	0.121**	0.048***	0.051***	0.092**	0.013	-0.005
	[0.002]	[0.002]	[0.009]	[0.013]	[0.005]	[0.002]	[0.048]	[0.002]	[0.002]	[0.036]	[0.017]	[0.030]
Mediator	-0.294***	-0.121***	-0.835**	-0.284**	0.127	0.361**	-0.691	2.481***	1.356**	-1.331	-0.475**	1.387*
	[0.102]	[0.041]	[0.348]	[0.132]	[0.092]	[0.154]	[0.478]	[0.940]	[0.580]	[1.168]	[0.200]	[0.737]
Direct effect	*0.049*	*0.049*	*0.073*	*0.079*	*0.047*	*0.053*	*0.121*	*0.048*	*0.051*	*0.093*	*0.013*	*-0.005*
Indirect effect	*0.055*	*0.055*	*0.031*	*0.025*	*0.057*	*0.051*	*-0.017*	*0.056*	*0.053*	*0.011*	*0.091*	*0.109*
Total effect	*0.104*	*0.104*	*0.104*	*0.104*	*0.104*	*0.104*	*0.104*	*0.104*	*0.104*	*0.104*	*0.104*	*0.104*
Mediation effect	*0.53*	*0.53*	*0.30*	*0.24*	*0.55*	*0.49*	*-0.17*	*0.54*	*0.51*	*0.11*	*0.88*	*1.05*

Table 10

Causal Mediation Analysis (43,888 obs.) on the logarithms of stocks and risky assets, and portfolio variance

This table reports estimates of causal mediation model for logarithms of stocks in Panel A, logarithms of risky assets in Panel B, and portfolio variance in Panel C. All mediator variables are kept normalized measures with the identical fashion shown in Table 9.

	Married/ cohabiting	*Number of children*	*Physical condition*	*Log (Income)*	*Earnings uncertainty*	*Savings rate*	*Log (Wealth)*	*Financial wealth ratio*	*Net financial wealth*	*Fin. risk tolerance*	*Filial piety*	*Financial literacy*
Panel A: Log(Stocks)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Years of schooling	0.086***	0.086***	0.209***	0.244***	0.074***	0.109***	0.459**	0.082***	0.095***	0.311*	-0.102	-0.192
	[0.005]	[0.006]	[0.031]	[0.047]	[0.022]	[0.009]	[0.205]	[0.009]	[0.008]	[0.169]	[0.067]	[0.145]
Mediator	-1.522***	-0.624***	-4.319***	-1.470***	0.656	1.865***	-3.575*	12.316***	7.012***	-6.882	-2.455***	7.173**
	[0.276]	[0.115]	[1.208]	[0.476]	[0.431]	[0.650]	[2.033]	[3.946]	[2.436]	[5.481]	[0.803]	[3.570]
Direct effect	*0.087*	*0.086*	*0.209*	*0.244*	*0.074*	*0.109*	*0.459*	*0.082*	*0.095*	*0.311*	*-0.102*	*-0.192*
Indirect effect	*0.284*	*0.285*	*0.161*	*0.127*	*0.296*	*0.261*	*-0.089*	*0.288*	*0.275*	*0.059*	*0.472*	*0.562*
Total effect	*0.370*	*0.370*	*0.370*	*0.370*	*0.370*	*0.370*	*0.370*	*0.370*	*0.370*	*0.370*	*0.370*	*0.370*
Mediation effect	*0.77*	*0.77*	*0.43*	*0.34*	*0.80*	*0.71*	*-0.24*	*0.78*	*0.74*	*0.16*	*1.28*	*1.52*
Panel B: Log(Risky assets)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Years of schooling	0.138***	0.137***	0.278***	0.317***	0.125***	0.164***	0.562**	0.133***	0.148***	0.394**	-0.077	-0.178
	[0.007]	[0.007]	[0.038]	[0.057]	[0.025]	[0.010]	[0.242]	[0.011]	[0.009]	[0.195]	[0.079]	[0.166]
Mediator	-1.733***	-0.710***	-4.916***	-1.674***	0.726	2.123***	-4.070*	14.042***	7.982***	-7.834	-2.795***	8.166**
	[0.364]	[0.150]	[1.476]	[0.582]	[0.489]	[0.763]	[2.400]	[4.628]	[2.858]	[6.324]	[0.946]	[4.083]
Direct effect	*0.138*	*0.137*	*0.278*	*0.317*	*0.125*	*0.164*	*0.562*	*0.133*	*0.148*	*0.394*	*-0.077*	*-0.178*
Indirect effect	*0.323*	*0.324*	*0.183*	*0.144*	*0.336*	*0.298*	*-0.101*	*0.328*	*0.313*	*0.067*	*0.538*	*0.640*
Total effect	*0.461*	*0.461*	*0.461*	*0.461*	*0.461*	*0.461*	*0.461*	*0.461*	*0.461*	*0.461*	*0.461*	*0.461*
Mediation effect	*0.70*	*0.70*	*0.40*	*0.31*	*0.73*	*0.65*	*-0.22*	*0.71*	*0.68*	*0.15*	*1.17*	*1.39*
Panel C Portfolio variance	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)
Years of schooling	0.026***	0.025***	0.049***	0.055***	0.024***	0.030***	0.096**	0.025***	0.027***	0.068**	-0.010	-0.027
	[0.001]	[0.001]	[0.007]	[0.010]	[0.004]	[0.002]	[0.041]	[0.002]	[0.002]	[0.033]	[0.014]	[0.029]
Mediator	-0.290***	-0.119***	-0.822***	-0.280***	0.115	0.355***	-0.681*	2.349***	1.335**	-1.31	-0.468***	1.366*
	[0.071]	[0.029]	[0.267]	[0.103]	[0.080]	[0.137]	[0.406]	[0.839]	[0.519]	[1.070]	[0.169]	[0.702]
Direct effect	*0.026*	*0.025*	*0.049*	*0.056*	*0.024*	*0.030*	*0.097*	*0.025*	*0.027*	*0.068*	*-0.010*	*-0.027*
Indirect effect	*0.054*	*0.054*	*0.031*	*0.024*	*0.056*	*0.050*	*-0.017*	*0.055*	*0.052*	*0.011*	*0.090*	*0.107*
Total effect	*0.080*	*0.080*	*0.080*	*0.080*	*0.080*	*0.080*	*0.080*	*0.080*	*0.080*	*0.080*	*0.080*	*0.080*
Mediation effect	*0.68*	*0.68*	*0.38*	*0.30*	*0.70*	*0.63*	*-0.21*	*0.69*	*0.66*	*0.14*	*1.13*	*1.34*

Table 11

The effect of schooling on investment returns: IV models with Heckman correction

This table reports the effect of schooling on investment performance that adoption in the second stage of the Heckman model.

	Cumulative stock returns since purchase			Stock returns in the last year		Risky asset returns in the last year	
	≥0	***Decile***	***Ratio***	***≥0***	***Decile***	***≥0***	***Decile***
Panel A: 2013 individual outcomes *(43,888 obs.)*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years of schooling	0.014***	0.151***	0.036***	0.022***	0.095***	0.024***	0.098***
	[0.003]	[0.022]	[0.008]	[0.003]	[0.022]	[0.003]	[0.023]
$\lambda_{Heckman's}$	0.218***	2.500***	0.554***	0.409***	1.422***	0.405***	1.433***
	[0.009]	[0.061]	[0.021]	[0.007]	[0.063]	[0.007]	[0.064]
%Effect	*57.3%*	*54.1%*	*56.9%*	*47.9%*	*57.7%*	*49.3%*	*55.0%*
Linear prediction	*0.0244*	*0.2797*	*0.0625*	*0.0458*	*0.1641*	*0.0485*	*0.1775*
Panel B: 2013 household head outcomes *(12,786 obs.)*							
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Years of schooling	0.027***	0.275***	0.051***	0.039***	0.163***	0.040***	0.170***
	[0.007]	[0.058]	[0.018]	[0.007]	[0.052]	[0.008]	[0.054]
$\lambda_{Heckman's}$	0.219***	2.483***	0.555***	0.405***	1.391***	0.403***	1.398***
	[0.012]	[0.085]	[0.030]	[0.010]	[0.082]	[0.010]	[0.084]
%Effect	*79.8%*	*71.1%*	*60.3%*	*61.4%*	*72.4%*	*60.7%*	*70.8%*
Linear prediction	*0.0343*	*0.3874*	*0.0853*	*0.0628*	*0.2253*	*0.0655*	*0.2401*
Panel C: 2015 individual outcomes *(31,366 obs.)*							
	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Years of schooling	0.023***	0.144***	0.034***	0.022***	0.160***	0.023***	0.156***
	[0.006]	[0.044]	[0.012]	[0.005]	[0.049]	[0.006]	[0.049]
$\lambda_{Heckman's}$	0.296***	2.188***	0.672***	0.386***	1.467***	0.386***	1.492***
	[0.012]	[0.079]	[0.028]	[0.010]	[0.081]	[0.010]	[0.082]
%Effect	*56.3%*	*47.9%*	*36.9%*	*41.8%*	*74.3%*	*40.7%*	*69.2%*
Linear prediction	*0.0405*	*0.3003*	*0.0908*	*0.0537*	*0.2158*	*0.0566*	*0.2255*
Panel D: 2015 household head outcomes *(8,994 obs.)*							
	(22)	(23)	(24)	(25)	(26)	(27)	(28)
Years of schooling	0.032	0.21	0.035	0.032**	0.363**	0.033**	0.352*
	[0.021]	[0.144]	[0.048]	[0.016]	[0.184]	[0.017]	[0.183]
$\lambda_{Heckman's}$	0.297***	2.241***	0.691***	0.391***	1.341***	0.392***	1.374***
	[0.026]	[0.175]	[0.060]	[0.020]	[0.217]	[0.020]	[0.215]
%Effect	*54.9%*	*48.5%*	*27.2%*	*42.1%*	*115.3%*	*41.1%*	*108.0%*
Linear prediction	*0.0576*	*0.4329*	*0.1278*	*0.0769*	*0.3152*	*0.08*	*0.3257*

Appendix A: Portfolio Variance Calculation

The proxy for portfolio variance is the standard deviation of the portfolio's asset returns. We calculate weights based on the holdings of various assets in the CHFS database, i.e., the percentage of each asset in the entire portfolio. In addition, We compute the variances and covariances of daily returns between 4th January and 31st December 2013. It retrieves information from the Wind database. The formula for calculating the portfolio variance for seven financial assets, including stocks, bonds, mutual funds, derivatives, wealth management products, foreign currency, and gold, takes into account not only the riskiness of individual assets, but also the correlation between each pair of assets in the portfolio.

$$\begin{aligned} Portfolio\ Variance = {} & \omega_1^2\sigma_1^2 + \omega_2^2\sigma_2^2 + \omega_3^2\sigma_3^2 + \omega_4^2\sigma_4^2 + \omega_5^2\sigma_5^2 + \\ & + \omega_6^2\sigma_6^2 + \omega_7^2\sigma_7^2 + 2\omega_1\omega_2 Cov_{1,2} + 2\omega_1\omega_3 Cov_{1,3} + \\ & + 2\omega_1\omega_4 Cov_{1,4} + 2\omega_1\omega_5 Cov_{1,5} + 2\omega_1\omega_6 Cov_{1,6} + \\ & + 2\omega_1\omega_7 Cov_{1,7} + 2\omega_2\omega_3 Cov_{2,3} + 2\omega_2\omega_4 Cov_{2,4} + \\ & + 2\omega_2\omega_5 Cov_{2,5} + 2\omega_2\omega_6 Cov_{2,6} + 2\omega_2\omega_7 Cov_{2,7} + \\ & + 2\omega_3\omega_4 Cov_{3,4} + 2\omega_3\omega_5 Cov_{3,5} + 2\omega_3\omega_6 Cov_{3,6} + \\ & + 2\omega_3\omega_7 Cov_{3,7} + 2\omega_4\omega_5 Cov_{4,5} + 2\omega_4\omega_6 Cov_{4,6} + \\ & + 2\omega_4\omega_7 Cov_{4,7} + 2\omega_5\omega_6 Cov_{5,6} + 2\omega_5\omega_7 Cov_{5,7} + 2\omega_6\omega_7 Cov_{6,7} \end{aligned} \quad \text{(A1)}$$

where:

ω_i presents the weight of each asset;

σ_i^2 presents the variance of each of each asset;

$Cov_{i,j}$ denotes the covariance between two assets *i* and *j*, respectively. This is calculated as the product of $\rho_{i,j} \times \sigma_i\sigma_j$, where $\rho_{i,j}$ is the correlation coefficient between assets.

Meanwhile, the mathematical relationship between covariance and correlation that We use the formula below:

$$\rho_{1,2} = \frac{Cov_{1,2}}{\sigma_1\sigma_2} \quad \text{(A2)}$$

Eventually, We calculated the standard deviation of the portfolio variance by the square root of the portfolio variance:

$$Portfolio\ Variance = \sqrt{Portfolio\ Variance} \quad \text{(A3)}$$

Table A1

The Standard Deviation and Covariance Matrix for the Returns of the Seven Asset Classes in China during 2013

This table presents the standard deviation of daily returns across seven assets classes during the period between 4th January and 31st December 2013 in China (Column 1), along with the covariance of returns among the seven financial assets (Columns 2-8). The following indices were used: stocks – CSI 300, which is a capitalization-weighted stock market index designed to replicate the performance of the top 300 stocks traded on the Shanghai Stock Exchange and the Shenzhen Stock Exchange; bonds – China Bond Index: mutual funds – CSI300 ETF Index Returns, derivatives – CSI1000 ETF Index Returns, foreign exchange – USD-HKD index, gold – China Metal Index returns. For wealth management products – China Bank's wealth management product index and returns are computed via the monthly change. The returns data was obtained from the Wind database.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Standard Deviation	Stocks	Bonds	Mutual Funds	Derivatives	Wealth Management Products	Foreign Currency Assets	Gold
Stocks	0.013997515	-	-	-	-	-	-	–
Bonds	0.001409021	0.0000000341	-	-	-	-	-	–
Mutual Funds	0.012308714	0.0001689166	-0.0000002723	-	-	-	-	–
Derivatives	0.006446885	0.0000430913	-0.0000001003	0.0000362474	-	-	-	–
Wealth Management Products	0.029124545	-0.0029984428	-0.0003801680	-0.0025807029	-0.0012605593	-	-	–
Foreign Currency Assets	0.000128169	-0.0000002087	0.0000000042	-0.0000001825	-0.0000002080	-0.0000444887	-	–
Gold	0.006527411	0.0000414278	0.0000000294	0.0000346742	0.0000376065	-0.0014857591	-0.0000002039	–

Appendix B: Additional Results

Table B1

Weighted correlation matrix

This table reports the correlation matrix for all individuals in the China Household Finance Survey in the year of 2013. The asterisk denotes the following level of significance: *p<0.05.

	Years of education	Ownership of stocks	Ownership of risky assets	Value of stocks	Value of risky assets	Stocks-to-financial asset ratio	Risky-to-financial asset ratio	#Assets held	Portfolio variance	Financial literacy	Urban region	Male	Marital Status	#Children
Years of education	1.00													
Ownership of stocks	0.22***	1.00												
Ownership of risky assets	0.27***	0.75***	1.00											
Value of stocks	0.22***	0.99***	0.73***	1.00										
Value of risky assets	0.27***	0.77***	0.98***	0.78***	1.00									
Stocks-to-financial asset	0.17***	0.82***	0.61***	0.85***	0.65***	1.00								
Risky-to-financial asset	0.24***	0.70***	0.82***	0.72***	0.87***	0.76***	1.00							
#Assets held	0.32***	0.51***	0.61***	0.51***	0.62***	0.36***	0.49***	1.00						
Portfolio variance	0.23***	0.65***	0.85***	0.63***	0.85***	0.56***	0.72***	0.48***	1.00					
Financial literacy	0.25***	0.17***	0.22***	0.17***	0.23***	0.13***	0.19***	0.28***	0.18***	1.00				
Urban region	0.46***	0.25***	0.30***	0.24***	0.30***	0.20***	0.26***	0.30***	0.26***	0.24***	1.00			
Male	0.06***	-0.01*	-0.01*	-0.01*	-0.01*	-0.01	-0.01	-0.01***	-0.01*	-0.01***	-0.02***	1.00		
Marital Status	-0.25***	0.02***	0.02***	0.02***	0.02***	0.01***	0.01***	0.03***	0.02***	0.02***	-0.03***	-0.09***	1.00	
#Children	-0.23***	-0.11***	-0.13***	-0.11***	-0.13***	-0.08***	-0.11***	-0.19***	-0.12***	-0.20***	-0.29***	-0.02***	-0.04***	1.00

Table B2

Predicting reform exposure by parental characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
Father: Years of education	0.001	0.001	0.001	0.001	0.001	0.001
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Mother: Years of education	0.001	0.001	0.001	0.001	0.001	0.001
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Parents: Party members	0.005	0.005	0.005	0.005	0.006	0.004
	[0.005]	[0.005]	[0.005]	[0.005]	[0.006]	[0.006]
Parents: Business or Management	-0.005	-0.005	-0.006	-0.004	-0.002	-0.008
	[0.006]	[0.006]	[0.006]	[0.006]	[0.008]	[0.008]
Parental values: Filial piety	-0.009	-0.008	-0.007	-0.009	-0.01	-0.001
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.014]
Parental values: Gender equality	-0.014	-0.011	-0.012	-0.012	-0.018	0.004
	[0.014]	[0.013]	[0.013]	[0.013]	[0.014]	[0.021]
Parental values: Missing	-0.014	-0.017	-0.017	-0.018	0.001	-0.049**
	[0.012]	[0.012]	[0.011]	[0.012]	[0.013]	[0.019]
Male	0.009***	0.010***	0.011***	0.009***	–	–
	[0.003]	[0.003]	[0.003]	[0.003]		
Han ethnicity	-0.229***	-0.221***	-0.221***	-0.221***	-0.169***	-0.276***
	[0.006]	[0.007]	[0.007]	[0.007]	[0.008]	[0.009]
Log(#Siblings)	-0.350***	-0.344***	-0.343***	-0.345***	-0.319***	-0.368***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.006]	[0.007]
Missing #Siblings	-0.633***	-0.622***	-0.621***	-0.623***	-0.546***	-0.637***
	[0.008]	[0.008]	[0.008]	[0.008]	[0.014]	[0.010]
Parents: Urban region	-0.132***	-0.135***	-0.136***	-0.135***	-0.140***	-0.134***
	[0.006]	[0.006]	[0.006]	[0.006]	[0.007]	[0.007]
At schooling age post SCR_s	0.479***	0.457***	0.469***	0.457***	0.576***	0.332***
	[0.009]	[0.011]	[0.014]	[0.011]	[0.013]	[0.014]
Urban FE	+	+	+	+	+	+
Cohort FE	+	+	+	+	+	+
Province FE	–	+	+	+	+	+
Cohort*Province*Urban FE	–	–	+	–	–	–
Cohort-Province-Urban linear trend	–	–	–	+	–	–
Predicted probability	*0.2902*	*0.2902*	*0.2902*	*0.2902*	*0.3384*	*0.2399*
No. of Observations	*43,888*	*43,888*	*43,888*	*43,888*	*22,366*	*21,522*

Notes: This table reports estimates of the relationship between parental characteristics and refor exposure. ***p<0.01, **p<0.05, *p<0.1.

Table B3

Additional Robustness Exercises I

This table reports the effect on sub-sample of dropping university graduates, entailing the non-special economic zones individuals, and also status of individuals moves or stay with their parents. The specification is identical of column 5 of Table 4, entailing cohort and province fixed effects, as well as cohort-by-province fixed effects.

	Stock ownership	**Risky asset ownership**	**Log (Shares)**	**Log (Risky assets)**	**Stocks/ Financial Assets**	**Risky/ Financial Assets**	**Stocks to Wealth**	**Risky Assets to Wealth**	**#Assets held**	**Portfolio variance**
Panel A: Keeping individuals born [-10, +10] years of reform (31,293 obs.)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Years of schooling	0.034***	0.039***	0.373***	0.458***	0.016***	0.025***	0.004***	0.006***	0.101***	0.054***
	[0.006]	[0.008]	[0.067]	[0.084]	[0.003]	[0.005]	[0.001]	[0.002]	[0.024]	[0.011]
%Effect	*60.9%*	*41.6%*	*64.2%*	*47.3%*	*64.6%*	*55.8%*	*74.6%*	*58.6%*	*5.7%*	*48.4%*
Linear prediction	*0.0552*	*0.0946*	*0.5809*	*0.9682*	*0.0251*	*0.045*	*0.0059*	*0.0101*	*1.7571*	*0.1117*
Panel B: Keeping individuals born [-5, +5] years of reform (15,732 obs.)										
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Years of schooling	0.044***	0.055***	0.476***	0.616***	0.019**	0.036***	0.006**	0.010***	0.146***	0.066***
	[0.014]	[0.017]	[0.149]	[0.184]	[0.007]	[0.010]	[0.003]	[0.004]	[0.052]	[0.023]
%Effect	*76.1%*	*54.6%*	*79.6%*	*60.1%*	*77.7%*	*76.9%*	*108.4%*	*90.8%*	*8.2%*	*55.9%*
Linear prediction	*0.0576*	*0.1006*	*0.5977*	*1.0261*	*0.0245*	*0.0462*	*0.0058*	*0.0107*	*1.7809*	*0.1188*
Panel C: Individuals living in the same province as their parents (36,632 obs.)										
	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
Years of schooling	0.025***	0.028***	0.281***	0.333***	0.012***	0.019***	0.004***	0.005***	0.104***	0.041***
	[0.006]	[0.007]	[0.062]	[0.078]	[0.003]	[0.004]	[0.001]	[0.002]	[0.026]	[0.010]
%Effect	*60.0%*	*37.5%*	*64.4%*	*43.6%*	*63.7%*	*54.4%*	*79.1%*	*55.2%*	*6.1%*	*46.8%*
Linear prediction	*0.0414*	*0.0754*	*0.4365*	*0.7634*	*0.0192*	*0.0345*	*0.0055*	*0.009*	*1.7085*	*0.0869*
Panel D: Individuals living in a different province than their parents (7,256 obs.)										
	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)
Years of schooling	0.058***	0.071***	0.627***	0.816***	0.025***	0.041***	0.004*	0.007**	0.130***	0.084***
	[0.013]	[0.016]	[0.144]	[0.173]	[0.007]	[0.011]	[0.002]	[0.003]	[0.041]	[0.022]
%Effect	*48.8%*	*37.7%*	*50.0%*	*41.0%*	*46.0%*	*42.3%*	*44.0%*	*43.7%*	*6.5%*	*36.7%*
Linear prediction	*0.1181*	*0.1877*	*1.254*	*1.9883*	*0.0541*	*0.0979*	*0.0092*	*0.0164*	*1.993*	*0.2279*

Table B4

Additional Robustness Exercises II

This table reports IV estimates for 4 distinctive sub-samples of individuals. The specification is identical of column 5 of Table 4, entailing cohort, urbanization and province fixed effects.

	Stock ownership	Risky asset ownership	Log (Shares)	Log (Risky assets)	Stocks/ Financial Assets	Risky/ Financial Assets	Stocks to Wealth	Risky Assets to Wealth	#Assets held	Portfolio variance
Panel A: Dropping university graduates (36,790 obs.)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Years of schooling	0.023***	0.030***	0.254***	0.332***	0.010***	0.015***	0.003**	0.004*	0.117***	0.045***
	[0.006]	[0.009]	[0.066]	[0.094]	[0.003]	[0.005]	[0.001]	[0.002]	[0.034]	[0.012]
%Effect	*63.8%*	*45.3%*	*68.2%*	*49.6%*	*61.3%*	*49.2%*	*68.8%*	*52.1%*	*6.9%*	*56.8%*
Linear prediction	*0.0359*	*0.0672*	*0.3723*	*0.6695*	*0.0168*	*0.0304*	*0.0042*	*0.0071*	*1.6877*	*0.0786*
Panel B: Dropping special economic zones and coastal cities (29,445 obs.)										
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Years of schooling	0.035***	0.055***	0.391***	0.611***	0.019***	0.030***	0.012***	0.019***	0.173***	0.099***
	[0.008]	[0.011]	[0.089]	[0.120]	[0.004]	[0.006]	[0.003]	[0.004]	[0.034]	[0.020]
%Effect	*62.0%*	*45.2%*	*62.1%*	*48.1%*	*72.6%*	*55.2%*	*78.7%*	*63.5%*	*9.3%*	*59.7%*
Linear prediction	*0.0558*	*0.1227*	*0.6296*	*1.2714*	*0.0266*	*0.0548*	*0.0158*	*0.0301*	*1.8585*	*0.1655*

Table B5

The effect of schooling on investment returns: IV models with Heckman correction – First stage

	CHFS2013 outcomes	Sample of household heads- CHFS 2013 outcomes	CHFS2015 outcomes	Sample of household heads – CHFS 2015 outcomes
Reform exposure	0.241***	0.292***	0.192***	0.115
	[0.045]	[0.081]	[0.056]	[0.118]
Enterprise	0.116**	0.034	0.123**	0.038
	[0.051]	[0.057]	[0.060]	[0.068]
_cons	-2.321***	-2.568***	-2.194***	-2.041***
	[0.124]	[0.247]	[0.155]	[0.287]
No. of Observations	*43,888*	*12,786*	*31,366*	*8,994*

Appendix C: Causal Mediation Analysis

We use mediation analysis to shed light on the causal mechanisms through the effect of schooling on financial market participation. Our mediation models include of a treatment variable *T* (in this case, years of education), a final outcome *Y* (in this case, financial market participation portfolios) and a mediating variable *M* (here, marital status, number of kids, physical condition, income, uncertainty earnings, savings, wealth, ratio of financial wealth, net financial wealth, financial risk tolerance, filial piety, financial literacy) that represents a mechanism by which T affects Y. The mediating variable, *M*, is indeed causally impacted by *T*, and mediates part of the overall causal effect of *T* on *Y*. The model basically differentiates the 'total effect' into 'direct effect' and 'indirect effect' of *T* on *Y* through *M*. Hence, We employ an instrumental variable *Z*, which could be added to cope with the endogeneity of both *T* and *M*.

We capture the coefficient of direct effect (DE= β_Y^T) of *T* on *Y* which is independent of *M*. Then multiplying the coefficients of *M* and *T* by the coefficients of *Y* gives the indirect effect through *M*, denoted by IE= $\beta_{\mathrm{M}}^{\mathrm{T}} * \beta_{\mathrm{Y}}^{\mathrm{M}}$. Regarding this mechanism, the total effect can be calculated by summing up these two terms, total effect (TE)= $\beta_Y^T + \beta_{\mathrm{M}}^{\mathrm{T}} * \beta_{\mathrm{Y}}^{\mathrm{M}}$.

Essentially, We have three model equations, which are graphically represented in <u>*Table C1*</u>. As model 1 estimating the causal effect of *T* on *M* and model 2estimating the causal effect of *T* on *Y* that are both estimating by using the standard IV models, where *T* is endogenous and *Z* is introducing exogenous variable. Model 3 is causal mediating equation identified with instrumental variable *Z*. $M = f_M(T, \epsilon_M)$ and $Y = f_Y(T, M, \epsilon_Y)$, which means *T* through *M* indirectly and directly causing *Y*. Hence, in the regression of *Y* on *T* and *M*, there are two potentially endogenous variables, but only one instrumental variables, *Z*, addresses their endogeneity. The approach that proposed by Dippel *et al.*, (2019), Causal mediation effect equations of Model 3 are denote following:

$$Z = \epsilon_z$$

$$T = \beta_T^Z * Z + \epsilon_T$$

$$M = \beta_M^T * T + \epsilon_M$$

$$Y = \beta_Y^T * T + \beta_Y^M * M + \epsilon_Y$$

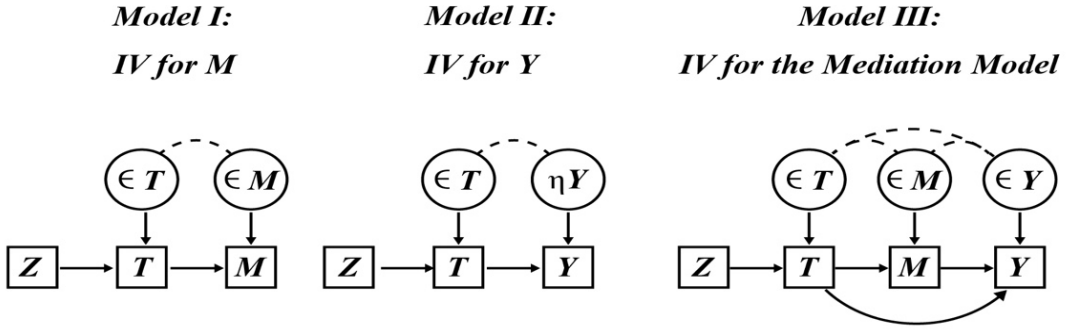

Figure C1
Graphical description of causal moderation analysis

Table C1

The Effect of Years of Schooling on the Candidate Mediating Variables

This table reports instrumental variable regressions for the effect of years of schooling on each of the candidate mediator variables in analysis. This is the second step out of the three steps required for causal mediation analysis, as illustrated in the Appendix 3C. The specification also includes cohort and province fixed effects, along with a constant term.

Dependent variable	*Married/ cohabiting*	*Number of children*	*Physical condition*	*Log (Income)*	*Earnings uncertainty*	*Savings rate*	*Log (Wealth)*	*Financial wealth ratio*	*Net financial wealth*	*Fin. risk tolerance*	*Filial piety*	*Financial literacy*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Years of schooling	-0.192***	-0.485***	-0.037**	-0.125**	0.552**	0.088**	0.034	0.027***	0.051***	0.006	-0.168***	0.078***
	[0.017]	[0.054]	[0.016]	[0.053]	[0.272]	[0.037]	[0.045]	[0.007]	[0.016]	[0.035]	[0.039]	[0.023]
Male	0.011	0.191***	0.113***	0.087***	-0.229	-0.064***	-0.045*	-0.019***	-0.024***	-0.004	0.133***	-0.054***
	[0.011]	[0.030]	[0.011]	[0.031]	[0.152]	[0.020]	[0.026]	[0.004]	[0.008]	[0.020]	[0.023]	[0.013]
Urban-urban transition	0.680***	1.329***	0.297***	1.143***	7.246***	-0.188	0.865***	-0.059**	-0.175***	0.365***	-0.528***	0.137
	[0.068]	[0.213]	[0.063]	[0.214]	[1.086]	[0.150]	[0.180]	[0.030]	[0.064]	[0.141]	[0.157]	[0.091]
Rural-urban transition	0.534***	1.137***	0.270***	0.738***	8.210***	-0.191*	0.590***	-0.043*	-0.167***	0.103	-0.253**	0.056
	[0.053]	[0.162]	[0.050]	[0.170]	[0.801]	[0.114]	[0.138]	[0.023]	[0.047]	[0.108]	[0.122]	[0.070]
Urban-rural transition	0.238***	0.559***	0.087**	0.372***	-0.341	0.011	0.392***	-0.008	-0.080***	0.07	-0.180**	0.028
	[0.033]	[0.095]	[0.034]	[0.112]	[0.469]	[0.117]	[0.096]	[0.017]	[0.026]	[0.073]	[0.080]	[0.046]
Rural-rural transition	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
No. of Observations	*43,888*	*43,888*	*43,888*	*43,888*	*43,263*	*43,888*	*43,888*	*43,802*	*43,888*	*43,888*	*43,888*	*43,888*

Table C2

Causal Mediation Analysis I – The Effect of Years of Schooling on Remaining Dependent Variables (43,888 obs.)

This table reports instrumental variable regressions for the effect of 12 candidate mediator variables on the ratio of the value of stocks to financial aseets in panel A, and on the ratio of the value of risky to financial assets in panel B. All specifications include urbanization, cohort and province fixed effects, along with a constant term (not shown). This table complements Tables 10 and 11 in the analysis, by showing the effect of years of schooling on the remaining dependent variables of the previous sections.

Mediator	*Married/ cohabiting*	*Number of children*	*Physical condition*	*Log (Income)*	*Earnings uncertainty*	*Savings rate*	*Log (Wealth)*	*Financial wealth ratio*	*Net financial wealth*	*Fin. risk tolerance*	*Filial piety*	*Financial literacy*
Panel A: Stocks/Financial Assets	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Years of schooling	0.004***	0.003***	0.009***	0.010***	0.003***	0.004***	0.019**	0.003***	0.004***	0.013*	-0.005	-0.008
	[0.000]	[0.000]	[0.001]	[0.002]	[0.001]	[0.000]	[0.009]	[0.000]	[0.000]	[0.007]	[0.003]	[0.006]
Mediator	-0.065***	-0.027***	-0.184***	-0.063***	0.027	0.079***	-0.152*	0.524***	0.298***	-0.293	-0.104***	0.305*
	[0.014]	[0.006]	[0.056]	[0.021]	[0.018]	[0.029]	[0.088]	[0.179]	[0.111]	[0.236]	[0.036]	[0.156]
Direct effect	*0.004*	*0.004*	*0.009*	*0.010*	*0.003*	*0.005*	*0.019*	*0.003*	*0.004*	*0.013*	*-0.005*	*-0.008*
Indirect effect	*0.012*	*0.012*	*0.007*	*0.005*	*0.013*	*0.011*	*-0.004*	*0.012*	*0.012*	*0.003*	*0.020*	*0.024*
Total effect	*0.016*	*0.016*	*0.016*	*0.016*	*0.016*	*0.016*	*0.016*	*0.016*	*0.016*	*0.016*	*0.016*	*0.016*
Mediation effect	*0.77*	*0.78*	*0.44*	*0.35*	*0.81*	*0.71*	*-0.24*	*0.79*	*0.75*	*0.16*	*1.29*	*1.53*
Panel B: Risky/Financial Assets	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Years of schooling	0.006***	0.006***	0.015***	0.017***	0.006***	0.008***	0.031**	0.006***	0.007***	0.021*	-0.006	-0.012
	[0.000]	[0.000]	[0.002]	[0.003]	[0.001]	[0.001]	[0.014]	[0.001]	[0.001]	[0.011]	[0.005]	[0.010]
Mediator	-0.101***	-0.041***	-0.286***	-0.097***	0.043	0.123***	-0.237*	0.816***	0.464***	-0.455	-0.162***	0.475**
	[0.019]	[0.008]	[0.083]	[0.032]	[0.029]	[0.044]	[0.135]	[0.266]	[0.168]	[0.363]	[0.054]	[0.237]
Direct effect	*0.006*	*0.006*	*0.015*	*0.017*	*0.006*	*0.008*	*0.031*	*0.006*	*0.007*	*0.021*	*-0.006*	*-0.012*
Indirect effect	*0.019*	*0.019*	*0.011*	*0.008*	*0.020*	*0.017*	*-0.006*	*0.019*	*0.018*	*0.004*	*0.031*	*0.037*
Total effect	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*
Mediation effect	*0.75*	*0.75*	*0.42*	*0.33*	*0.78*	*0.69*	*-0.23*	*0.76*	*0.72*	*0.15*	*1.24*	*1.48*

Table C3

Causal Mediation Analysis II – The Effect of Years of Schooling on Remaining Dependent Variables (43,888 obs.)

This table reports instrumental variable regressions for the effect of 12 candidate mediator variables on the value of stocks to wealth ratio in panel A, and on the value of risky assets to wealth ratio in panel B. All specifications include urbanization, cohort and province fixed effects, along with a constant term (not shown). This table complements Tables 10 and 11 in the analysis, by showing the effect of years of schooling on the remaining dependent variables of the previous sections.

	Married/ cohabiting	*Number of children*	*Physical condition*	*Log (Income)*	*Earnings uncertainty*	*Savings rate*	*Log (Wealth)*	*Financial wealth ratio*	*Net financial wealth*	*Fin. risk tolerance*	*Filial piety*	*Financial literacy*
Panel A: Stocks to Wealth	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Years of schooling	0.001***	0.001***	0.002***	0.003***	0.001**	0.001***	0.005**	0.001***	0.001***	0.004	-0.002	-0.003
	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.003]	[0.000]	[0.000]	[0.002]	[0.001]	[0.002]
Mediator	-0.019***	-0.008***	-0.054***	-0.018***	0.008	0.023**	-0.045*	0.154***	0.088**	-0.086	-0.031**	0.090*
	[0.005]	[0.002]	[0.019]	[0.007]	[0.006]	[0.010]	[0.027]	[0.056]	[0.035]	[0.071]	[0.012]	[0.049]
Direct effect	*0.001*	*0.001*	*0.002*	*0.003*	*0.001*	*0.001*	*0.005*	*0.001*	*0.001*	*0.004*	*-0.002*	*-0.003*
Indirect effect	*0.004*	*0.004*	*0.002*	*0.002*	*0.004*	*0.003*	*-0.001*	*0.004*	*0.003*	*0.001*	*0.006*	*0.007*
Total effect	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*
Mediation effect	*0.83*	*0.83*	*0.47*	*0.37*	*0.86*	*0.76*	*-0.26*	*0.84*	*0.80*	*0.17*	*1.38*	*1.64*
Panel B: Risky Assets to Wealth	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Years of schooling	0.001***	0.001***	0.003***	0.004***	0.001***	0.002***	0.007**	0.001***	0.002***	0.005*	-0.001	-0.003
	[0.000]	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]	[0.003]	[0.000]	[0.000]	[0.003]	[0.001]	[0.003]
Mediator	-0.023***	-0.009***	-0.065**	-0.022**	0.01	0.028**	-0.054	0.187***	0.106**	-0.104	-0.037**	0.109*
	[0.008]	[0.003]	[0.026]	[0.010]	[0.007]	[0.013]	[0.033]	[0.071]	[0.047]	[0.088]	[0.016]	[0.062]
Direct effect	*0.001*	*0.001*	*0.003*	*0.004*	*0.001*	*0.002*	*0.007*	*0.001*	*0.002*	*0.005*	*-0.002*	*-0.003*
Indirect effect	*0.004*	*0.004*	*0.002*	*0.002*	*0.005*	*0.004*	*-0.001*	*0.004*	*0.004*	*0.001*	*0.007*	*0.009*
Total effect	*0.006*	*0.006*	*0.006*	*0.006*	*0.006*	*0.006*	*0.006*	*0.006*	*0.006*	*0.006*	*0.006*	*0.006*
Mediation effect	*0.76*	*0.76*	*0.43*	*0.34*	*0.79*	*0.70*	*-0.24*	*0.77*	*0.73*	*0.16*	*1.26*	*1.50*