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

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ΤΜΗΜΑ ΟΙΚΟΝΟΜΙΚΩΝ ΕΠΙΣΤΗΜΩΝ
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Structure

- **Motivation**
- **The Reforms**
- **Research Questions**
- **The Data** – CHFS 2013
- **Empirical Strategy**
- **Results**
- **Robustness**
- **Causal mediation analysis**
- **Conclusions**

The Puzzle: High Savings, Low Participation

- Why China?
  - China has one of the highest household savings rates globally, yet very limited engagement with financial markets.
  - Most Chinese households invest heavily in real estate and bank deposits.In contrast, stock market participation is below 10%, and risky asset ownership is even lower.
    - Gomes et al., 2021: In 2015, 12.4% of Chinese portfolios invested in equities and/or mutual funds, compared to 50% in the UK and 20% in the US (excluding defined-contribution plans).
  - This limited engagement constrains: Portfolio diversification, Long-term wealth accumulation, Efficient capital allocation in the economy

- Several studies suggesting causal effects of schooling on household financial behaviour in the U.S. (Cole et al., 2014 &2016; Orepoulos, 2007), the U.K. (Gray et al., 2021), and Sweden (Black et al., 2018), inter alia.
- We examine the effect of a unique dual related reform (of the 1980s) on household financial behaviour in China.
  - The first reform is the ***compulsory-schooling reform*** that raised the mandatory years of schooling from six to nine.
  - The second overlapping reform was the ***one-child policy*** of 1980.

Research Opportunity & Policy Relevance

Policy relevance:

- The Chinese government seeks to deepen capital markets and promote inclusive financial development.
- Identifying barriers to financial participation is key to designing effective policy.
- Education is frequently cited as a potential lever—but is the link causal?

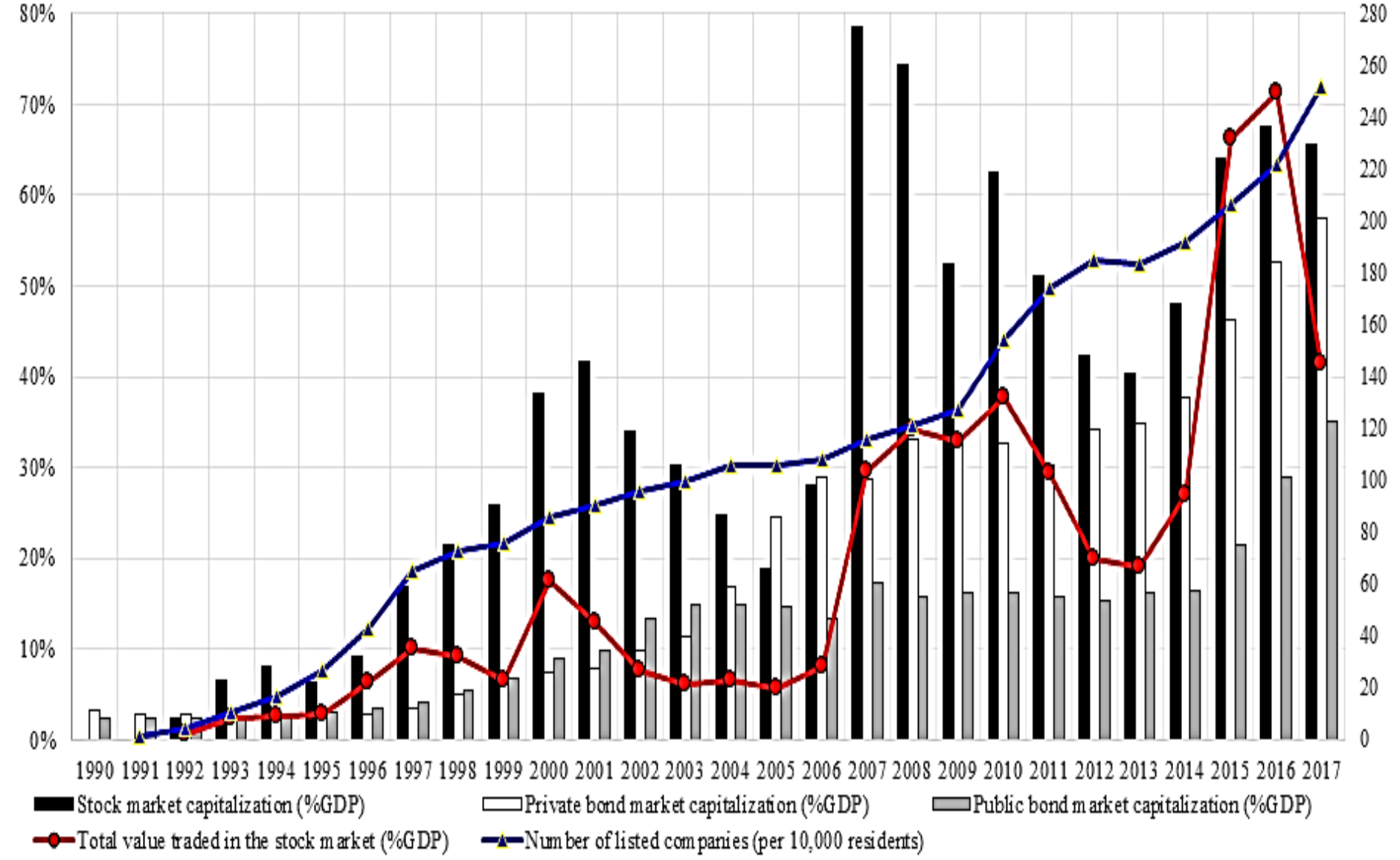
The Broader Debate:

- Does education improve financial behavior because of:
- Higher cognitive skills?
- Better access to financial information?
- Lower behavioural biases and better planning?
- Changes in attitudes toward risk and modernity?
- Or is it correlation driven by omitted variables like family background?

The Research Opportunity:

- A unique setting in China combines two overlapping reforms:
  - The 1986–1992 compulsory schooling expansion
  - The 1980 one-child policy, which created compliance-linked education access
- This policy context allows the authors to identify a quasi-experimental effect of education on financial outcomes.

The Evolution of the Financial Sector in China



Sui Generis - A Converging Vision:
Two Reforms, One Transformative Opportunity

🌱 **The One-Child Policy (1980):** Introduced to curb population growth, this sweeping social policy carried financial consequences: only compliant families—typically those with a single child—were eligible for state-funded education.

- In effect, access to free schooling became a reward for policy adherence.

📘 **The Education Reform (1986–1992):** A national mandate extended compulsory schooling from 6 to 9 years, targeting children aged 6 and under at the time.

- This reform signalled China's ambition to build human capital through a more educated, modern citizenry.

🔗 **The Powerful Intersection:** These two policies—born of demographic and developmental goals—merged into a conditional social contract:

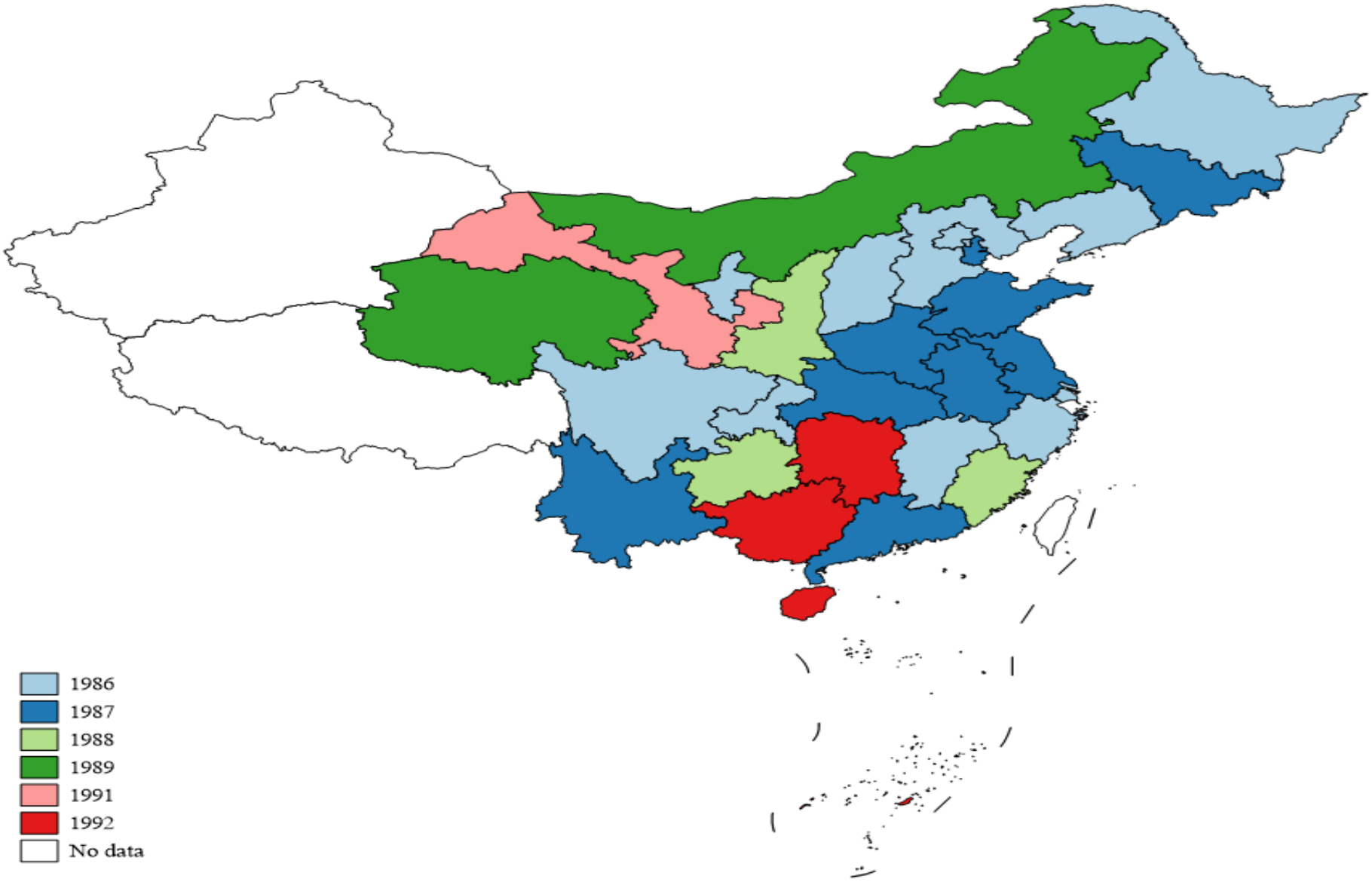
🎓 Free, extended education in exchange for demographic compliance.

➢ This unique conjunction created a quasi-natural experiment, enabling the study of how education shapes not only knowledge, but financial empowerment.

👥 **Who Did It Affect?** One key robustness check focuses on children born between 1980 and 1986—those who entered school exactly as the education reform was being phased in.

✨ **Takeaway:** At the crossroads of demographic control and educational expansion, China unintentionally crafted a social experiment

The timing of the educational reform across Chinese provinces



The timing of the educational reform across Chinese provinces

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

Research Questions

🔍 **Core Research Question:** Does increased educational attainment—driven by a conditional compulsory schooling reform—causally affect household financial market participation and portfolio behavior in China?

💡 **Specific Questions:**

- **Participation:** Does more schooling make individuals more likely to participate in financial markets—particularly stocks and risky assets?
- **Intensity:** Does education affect the amounts invested and the share of financial wealth allocated to risk-bearing assets?
- **Diversification:** Does more schooling lead to more diversified household portfolios, moving beyond real estate and cash holdings?
- **Heterogeneity:** Are these effects stronger or weaker for: Urban vs rural residents? Males vs females? Households with different levels of exposure to Confucian norms?
- **Mechanisms:** Through which channels does education influence financial behavior?

🧠 **Candidate Mechanisms:** Financial Literacy (Cognitive Channel), Social Norms (Cultural Channel), Economic Empowerment (Access Channel)

Identification: Fuzzy RDD Setup

- **Goal:** Estimate causal effect of education on financial participation using a policy discontinuity.
- **Running variable:** Birth year (centered at 1980), Z_i = birth year$_i$ – 1980
- **Cutoff:** $Z_i = 0 \rightarrow$ individuals born in or after 1980 eligible for conditional free education.
- **Fuzziness:** Not all eligible individuals comply fully → fuzzy RD design.

First Stage: Discontinuity in Schooling

Model: $$\text{Schooling}_i = \alpha_0 + \alpha_1 \cdot D_i + f(Z_i) + \epsilon_i$$

- $D_i = 1$ if $Z_i \geq 0$ (born in or after 1980)
- $f(Z_i)$: smooth function of birth year (e.g. linear, quadratic)
- Interpretation: $\alpha_1 > 0$ indicates increase in schooling at cutoff

Reduced Form and Second Stage (2SLS):

Reduced form: $$Y_i = \gamma_0 + \gamma_1 \cdot D_i + f(Z_i) + \eta_i$$

Second stage (FRD estimator): $$Y_i = \beta_0 + \beta_1 \cdot \hat{S}_i + f(Z_i) + u_i$$

- $\hat{S}_i$: predicted years of schooling from first stage
- β_1 = LATE: local average treatment effect of schooling on financial outcomes

The Data: CHFS 2013

- **China Household Finance Survey:** Collected by a dedicated center in South-Western University, established in 2010
- Covers ***29 provinces*** (out of 31), 97,904 individuals in China in 2013
- The sample comprises of individuals who were born in a given province, ***15 years before or after the educational reform***.
- The educational reform was implemented ***gradually*** between 1986-1992
- The sample comprises of ***43,888*** individuals.

What is unique in the wave of 2013?

❖ We use the 2013 wave of the CHFS, because it ***enables identifying*** the initiation of our identification strategy based on the exclusion criteria for free compulsory schooling stipulated by the ***one-child policy***, *i.e.* ethnicity, urban/rural region, and the number of siblings.

Summary Statistics

	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)
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

Main Results – Financial Outcomes of Education Reform

📈 **Key Findings:** Substantial Financial Effects of Education

The conditional free-schooling reform significantly increased:

- ✓ Stock market participation: ↑ 49.2%
- ✓ Risky asset participation: ↑ 30.2%
- ✓ Asset allocation share (toward financial assets): ↑ 6.4%
- ✓ Portfolio diversification: ↑ 46.5%

🟢 All effects are statistically significant and economically large, suggesting powerful downstream impacts of education on financial decision-making.

👥 **Subgroup Insights**

- ❖ Gender: Significant for both males and females; Effects larger for males
- ❖ Region: Urban residents show strong positive effects; No significant effect for rural residents

🧪 Robustness Checks Passed: Findings remain consistent when:

- 🔹 Excluding individuals with higher education (to isolate baseline treatment)
- 🔹 Dropping: Special Economic Zones; Coastal cities
- 🔹 The sample of the 2015 data and its household heads
- 🔹 Subsample robustness: Household heads only; Individuals born ±10 or ±5 years around 1980 cutoff; Cohorts born 1980–1986 (those schooling during reform rollout)

(I) The effect of education on participation in stock markets

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*

(II) The effect of education on participation in risky markets

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*

(III) The effect of education on amounts and shares of stock and risky holdings

	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*

(IV) The effect of education on portfolio diversification

	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*

Robustness Exercises I

	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*

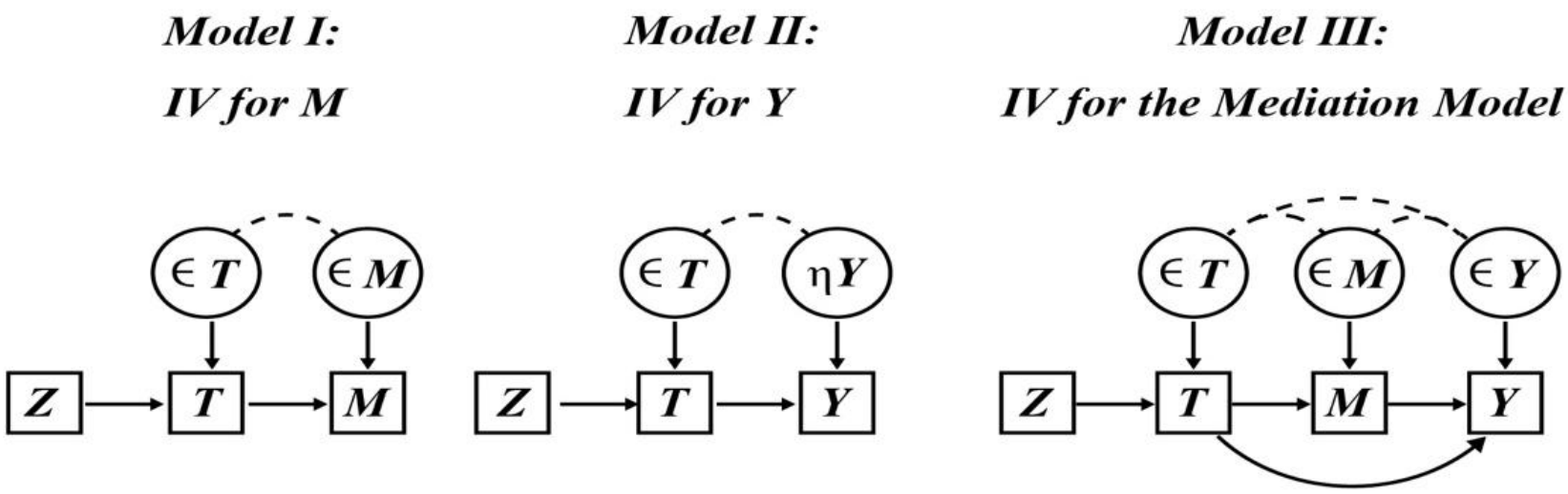
Robustness Exercises II

	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: Keeping individuals born [-10, +10] years of reform (31,293 obs.)										
	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
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 C: Keeping individuals born [-5, +5] years of reform (15,732 obs.)										
	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)
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 D: Individuals born between 1980-1986 (10,140 obs.)										
	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)
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*

Causal Mediation Analysis

Dippel *et al.*, (2019):

$$Z = \epsilon_z$$
$$T = \beta_T^Z * Z + \epsilon_T$$
$$M = \beta_M^T * T + \epsilon_M$$
$$Y = \beta_Y^T * T + \beta_Y^M * M + \epsilon_Y$$



Causal Mediation Analysis

- **List of candidate mediators/moderators (12):**
  Marital status, number of children, physical condition, logarithmic income, savings rate, logarithmic wealth, financial wealth ratio, net financial wealth, earnings uncertainty, financial risk tolerance, filial piety, financial literacy
- ***Financial literacy*** and ***filial piety*** appear to exert the strongest mediating effects (>1) on financial market participation.
  - In the causal mediation analysis for a fuzzy RDD framework, their inclusion – one at a time – renders the effect of schooling insignificant. This does not happen for the remaining candidate mediators.
  - Higher ***financial literacy*** appears to be exerting the strongest mediating effect (~ 1.05 – 1.52).
  - Weaker Confucian norms of ***filial piety*** provide another transmission mechanism through which increased schooling affects financial market participation (mediation effect ~ 0.88 – 1.28).

Causal Mediation Analysis I

	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*

Causal Mediation Analysis II

	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*

Extenions: What about Returns?

	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***

Conclusion: Education as a Gateway to Financial Empowerment

🔍 **What We Show:** A conditional free-schooling reform, uniquely tied to China's one-child policy, led to substantial, causal increases in: Stock and risky asset participation; Financial portfolio diversification; Asset reallocation toward modern financial instruments → Also investment returns

🌉 **How It Works:** Education matters not just through knowledge—but by shifting: Cognitive capacity (via financial literacy), Cultural norms (through diminished filial piety constraints), Economic agency (via better planning and risk tolerance).

🧪 **Rigorous Evidence:** Findings are robust across multiple subsamples, specification checks, and identification windows.

📣 **Why It Matters:** In a society with high savings but low market participation, education offers a scalable policy lever to unlock financial inclusion.

- These insights hold relevance beyond China in its early years of development, i.e., for any developing economy aiming to modernize its household financial systems.

🚀 **The Big Picture:** At the intersection of education and demographic reform, we uncover a powerful force for financial empowerment and inclusive growth.

Additional material:
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*