

FinTech Adoption and Household Risk-Taking

ABFER Webinar Series

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Based on joint work with **Claire Yurong Hong** and **Xiaomeng Lu** from SAIF

Household Finance in the Age of FinTech

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- **FinTech Platforms:** Created by tech not finance firms.
 - ▶ Giant user bases, low operational costs, and a culture of “winner-take-all.”

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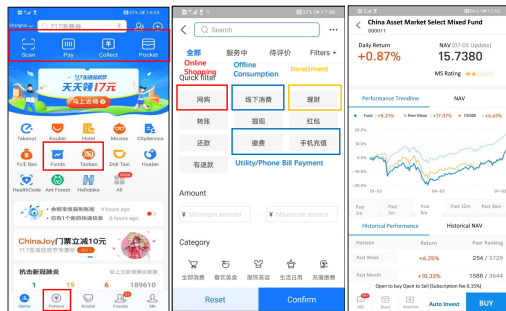
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Shrunk into one single app:

- ① Main-street banks
- ② Wall Street's brokers
- ③ Boston's asset managers
- ④ Connecticut's insurers
- ⑤ Amazon's shopping cart



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- **Super Apps:** Financial services delivered directly to households, free of traditional financial advisors. All-in-one ecosystems with a wide range of products.
- In China, activities central to household finance are taking place on FinTech platforms via super apps:
 - ▶ **Consumption:** online consumption accounts for 25% of the total.
 - ▶ **Investments:** 30% of mutual fund purchases takes place on FinTech platforms.
 - ▶ **Payments:** digital payments everywhere.

Motivations and Research Questions

*“The study of household finance is challenging because household behavior is **difficult to measure**, and households face **constraints** not captured by textbook models.”*

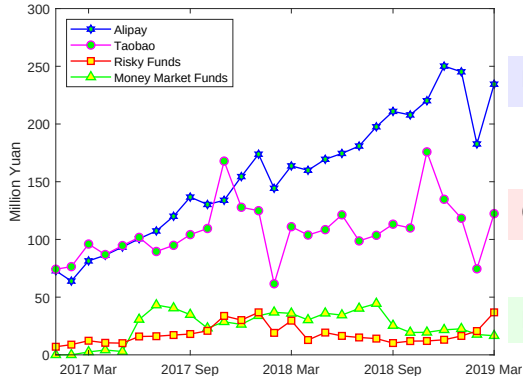
– John Campbell, 2006 AFA Presidential Address.

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- A random sample of 50,000 individuals from Ant Group.
- Consumption:
 - ▶ Basic
 - ▶ Development
 - ▶ Enjoy
- Investments:
 - ▶ Risky: Bond, Mixed, Equity, Index, QDII, Gold.
 - ▶ Money market.



Payments

Consumption

Investments

Motivations and Research Questions

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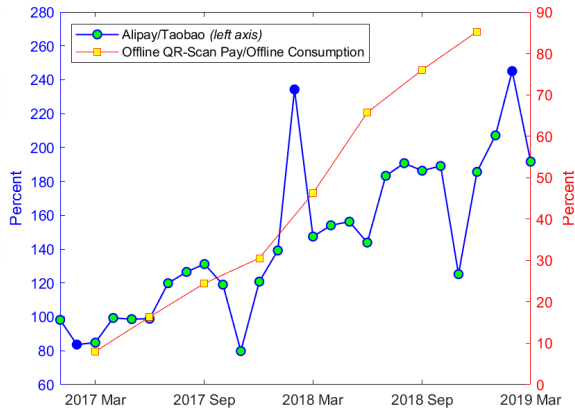
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- **Can FinTech lower investment barrier and improve household risk-taking?**
 - ▶ Physical costs: convenience, transaction costs, and access to information.
 - ▶ Psychological costs: familiarity, trust, and financial literacy.
- **Who benefits more from FinTech Advancements?**
 - ▶ The otherwise more constrained investors prior to the arrival of FinTech.
 - ▶ Individuals who are more risk-tolerant.
 - ▶ Individuals living in areas under-served by financial institutions.

Offline Digital Payments via QR-Code Scan

买菜也能扫码支付了 绍兴首家智慧农贸市场下月使用

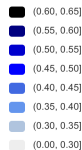
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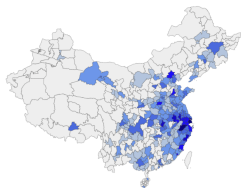
Individual-Level Measures of FinTech Adoption

- Individual i 's consumption on Alipay and Taobao during month t :

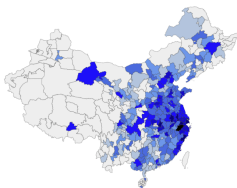
$$\text{AliFrac}_t^i = \frac{\text{Alipay}_t^i}{\text{Alipay}_t^i + \text{Taobao}_t^i}$$



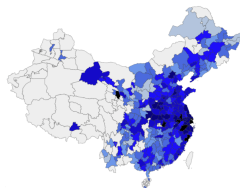
- Aggregated to the city level using individuals' location information:



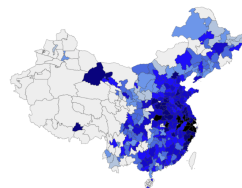
2017Q2



2017Q4



2018Q2



2018Q4

Individual-Level Measures of Risk-Taking and Consumption Volatility

28,393 Active Users (> 100 RMB Fund Purchases)									
			Consumption		FinTech		Risk-Taking		
	Female	Age	C (¥)	σ_C	AliFrac	Δ AliFrac	Participate	Risky Share	σ_W (%)
Mean	0.61	31.1	2,292	1.21	0.55	0.08	0.66	0.45	1.77
Median	1.00	30.0	1,396	1.16	0.57	0.07	1.00	0.15	0.18
Std	0.49	7.8	4,732	0.40	0.22	0.17	0.47	0.47	2.97

All 50,000 Users									
Mean	0.61	30.4	2,155	1.21	0.54	0.08	0.38		
Median	1.00	29.0	1,259	1.16	0.56	0.07	0.00		
Std	0.49	7.8	17,063	0.40	0.22	0.22	0.48		

- Participate: Equals one for active users with positive investment in risky funds.
- Risky Share: Fraction of risky-fund investments over total portfolio holdings.
- σ_W : Portfolio return volatility.
- σ_C : Taobao consumption growth volatility.

Can FinTech Improve Household Risk-Taking? Individual-Level Findings

- FinTech adoption from zero to one corresponds to an increase of
 - ▶ **12.7%** in risky participation (average=38% among 50,000 individuals)
 - ▶ **13.1%** in risky share (average=45% among 28,393 individuals)
 - ▶ **0.43%** in portfolio volatility (average=1.77% among 28,393 individuals)

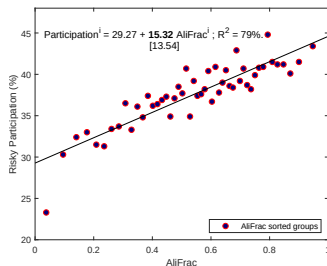
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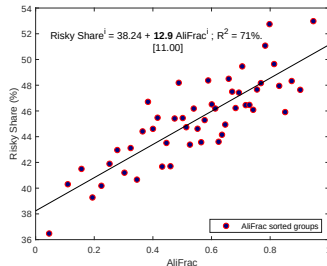
	Participate		Risky Share		σ_w (%)	
AliFrac	0.127*** (10.47)	0.239*** (17.94)	0.131*** (7.65)	0.146*** (7.80)	0.431*** (4.76)	0.446*** (4.59)
σ_c	0.037*** (7.37)	0.019*** (3.69)	0.052*** (7.87)	0.018*** (2.72)	0.345*** (8.43)	0.163*** (4.07)
Log(C)		0.076*** (30.06)		0.031*** (9.03)		0.128*** (5.46)
Female		-0.067*** (-12.24)		-0.102*** (-15.12)		-0.542*** (-15.52)
Log(Age)		0.007 (0.57)		-0.171*** (-11.11)		-0.861*** (-10.50)
City FE	Y	Y	Y	Y	Y	Y
Adjusted R2	0.004	0.024	0.006	0.025	0.004	0.016
N	50,000	50,000	28,393	28,393	28,393	28,393

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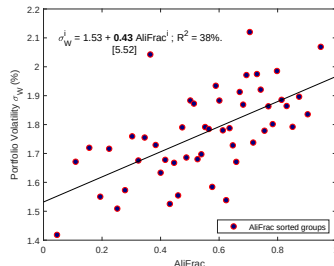
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Participate



Risky Share



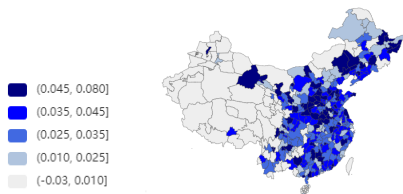
σ_W

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- Tracking the same individual's change in FinTech adoption from 2017 to 2018,
 - ▶ $\Delta \text{AliFrac}=1$ corresponds to $\Delta \text{Participate}=\mathbf{1.4\%}$ and $\Delta \text{Risky Share}=\mathbf{8.7\%}$.

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$\Delta\text{AliFrac}$: 2018 minus 2017

	$\Delta\text{Participate}$	$\Delta\text{Risky Share}$
$\Delta\text{AliFrac}$	0.014** (2.08)	0.087*** (5.30)
σ_c	0.009** (2.23)	-0.010 (-1.32)
$\text{Log}(C)$	0.013*** (8.25)	0.000 (0.10)
Female	-0.025*** (-8.31)	-0.004 (-0.68)
$\text{Log}(\text{Age})$	-0.041*** (-5.98)	0.012 (0.98)
City FE	Y	Y
Adjusted R2	0.004	0.154
N	50,000	28,393

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- Monthly panel regressions with fixed effects:

Fixed Effect	Participate	Risky Share
none	12.6%	11.1%
individual	9.53%	3.90%
month $\times$ city	6.95%	9.17%
individual+month $\times$ city	0.57%	1.95%

Can FinTech Improve Household Risk-Taking? City-Level Findings

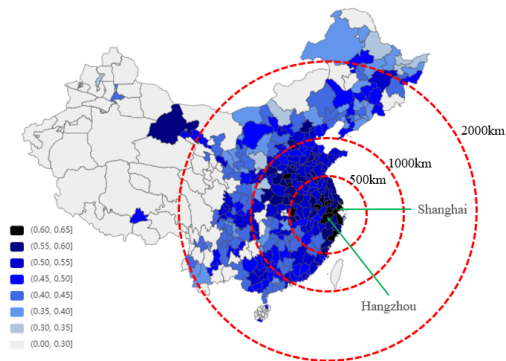
- FinTech adoption at city level: less affected by individual's self-selection.
 - ▶ Results consistent with our individual-level findings, both in levels and changes.

Can FinTech Improve Household Risk-Taking? City-Level Findings

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- IV test: Use distance to Hangzhou as an instrument for FinTech penetration.

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First Stage: $Y=AliFrac$					
	≤ 200	≤ 500	≤ 1000	≤ 2000	All
Log(Distance to HZ)	-0.392*** (-5.99)	-0.437*** (-3.99)	-1.096** (-2.31)	-1.955** (-2.14)	-1.995** (-2.16)
Controls	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Observations	238	799	2,278	4,624	4,879
R-squared	0.85	0.66	0.54	0.51	0.50

First Stage: $Y=AliFrac$					
	≤ 200	≤ 500	≤ 1000	≤ 2000	All
Log(Distance to SH)	0.124 (0.54)	0.129 (0.70)	-0.936* (-1.84)	-1.731* (-1.77)	-1.766* (-1.77)
Controls	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Observations	238	799	2,278	4,624	4,879
R-squared	0.81	0.65	0.53	0.49	0.48

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- FinTech adoption at city level: less affected by individual's self-selection.
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- IV test: Use distance to Hangzhou as an instrument for FinTech penetration.
- Comparing the economic significance of IV vs OLS tests:

	FinTech (one-std)	Risky Share	
		All Cities	$\leq 500\text{km}$
OLS	AliFrac	1.17% (3.04)	2.34% (2.21)
IV	$\widehat{\text{AliFrac}}$	1.16% (2.32)	4.10% (5.26)

Who Benefits More from FinTech Advancements?

- **Risk-taking improvement stronger for more risk-tolerant individuals.**

- ▶ Proxy individuals' risk tolerance using their consumption volatility σ_C .
Insights from Merton's portfolio and consumption problem:

$$\sigma_C = \sigma_W = \text{risky share} \times \sigma_R = \frac{1}{\gamma} \frac{\mu - r}{\sigma_R}$$

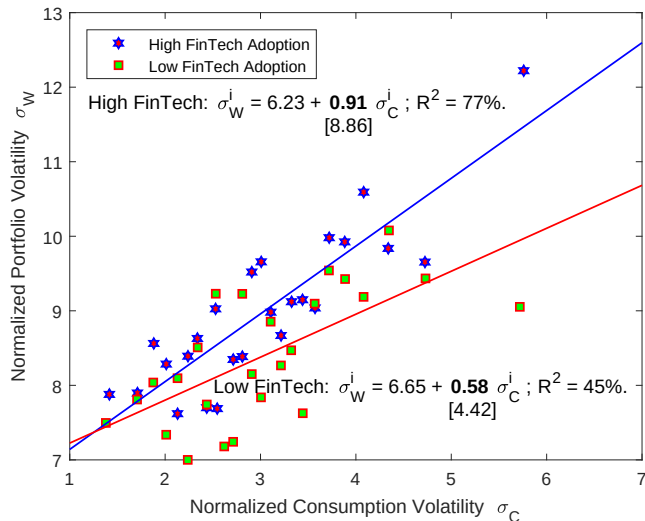
- **Quantify the FinTech improvement relative the optimal risk-taking.**

- ▶ The alignment of σ_W and σ_C is substantially closer to Merton's optimal solution for investors with high FinTech adoption.

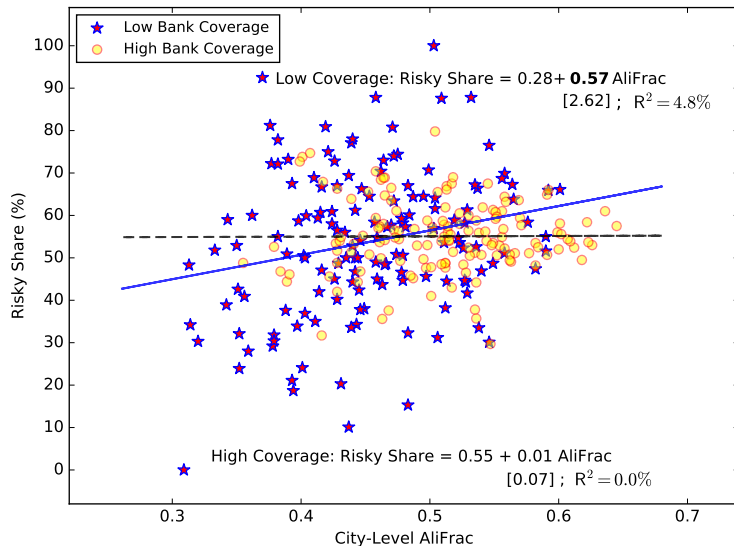
- **Cities under-served by banks benefit more from FinTech penetration.**

- ▶ Proxy financial-service coverage using number of local bank branches.

Optimal Alignment of Consumption and Investment



Cities Under-Served by Banks Benefit More from FinTech Penetration



- **Theory:** Markowitz (1952), Tobin (1958), and Merton (1969, 1971).
- **Household Finance:** Campbell (2006).
- **Risk-Taking and**
 - ▶ **Consumption Volatility:** Mankiw and Zeldes (1991).
 - ▶ **Familiarity:** Hong, Kubick and Stein (2004).
 - ▶ **Trust:** Guiso, Sapienza, and Zingales (2008).
- **Technology and Investor Behavior:**
 - ▶ Internet and stock trading: Barber and Odean (2002).
 - ▶ FinTech platforms and mutual fund flows: Hong, Lu, and Pan (2020).

Conclusions

- We study how FinTech can help households move toward optimal risk-taking:
 - ▶ FinTech adoption improves risk-taking, more for risk-tolerant individuals.
 - ▶ FinTech can help improve the alignment of risk-taking and consumption.
 - ▶ Cities with low banking coverage benefit more from FinTech penetration.
- Interpretations of our findings:
 - ▶ FinTech convenience reduces physical costs, increasing participation.
 - ▶ Repeated usage of Alipay builds familiarity and trust, increasing risk-taking.
- Future of FinTech:
 - ▶ Brighter for emerging economies lacking financial infrastructures.
 - ▶ From Tech to Fin, more content building.