Discussion of Hong, Lu, and Pan, "FinTech Adoption and Household Risk-Taking"

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Introduction

- This is a fascinating paper, on an important topic, with extraordinary data.
- FinTech is transforming the financial system: nowhere more dramatically than in China.
- And as it does so it generates the data needed to understand the process!

Outline

"This paper examines how FinTech can lower investment barriers and help households move toward optimal risk-taking...."

- Basic interpretation of the data: what are we measuring?
- Does FinTech usage stimulate risk-taking ("lower investment barriers")?
- If so, is that a welfare improvement (a "move towards optimal risk-taking")?

What Are We Measuring?

- Taobao is online spending ("Amazon of China").
- Alipay is QR-code scanning payment of physical goods (offline from the consumer's point of view).
- Both are market leaders in their segment.
- The paper measures the ratio FinTech = Alipay/(Alipay + Taobao).
- In the long run, this ratio will reflect consumers' preferences for online vs offline shopping, but in the sample period it is a proxy for new technology adoption ("tech-savviness").

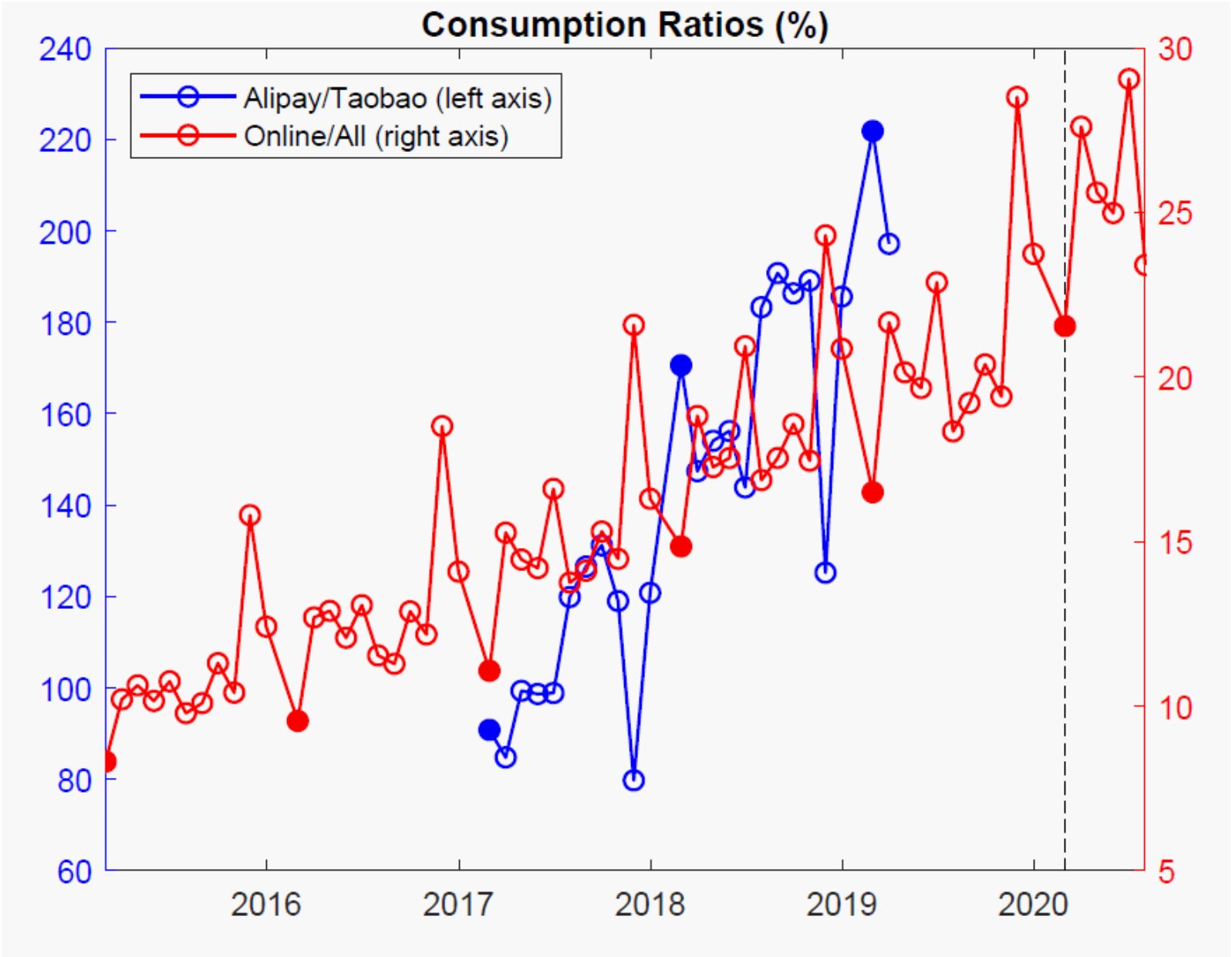
Aggregate Consumption Growth Rates

Panel A. Ant and Economy-wide Consumption Growth

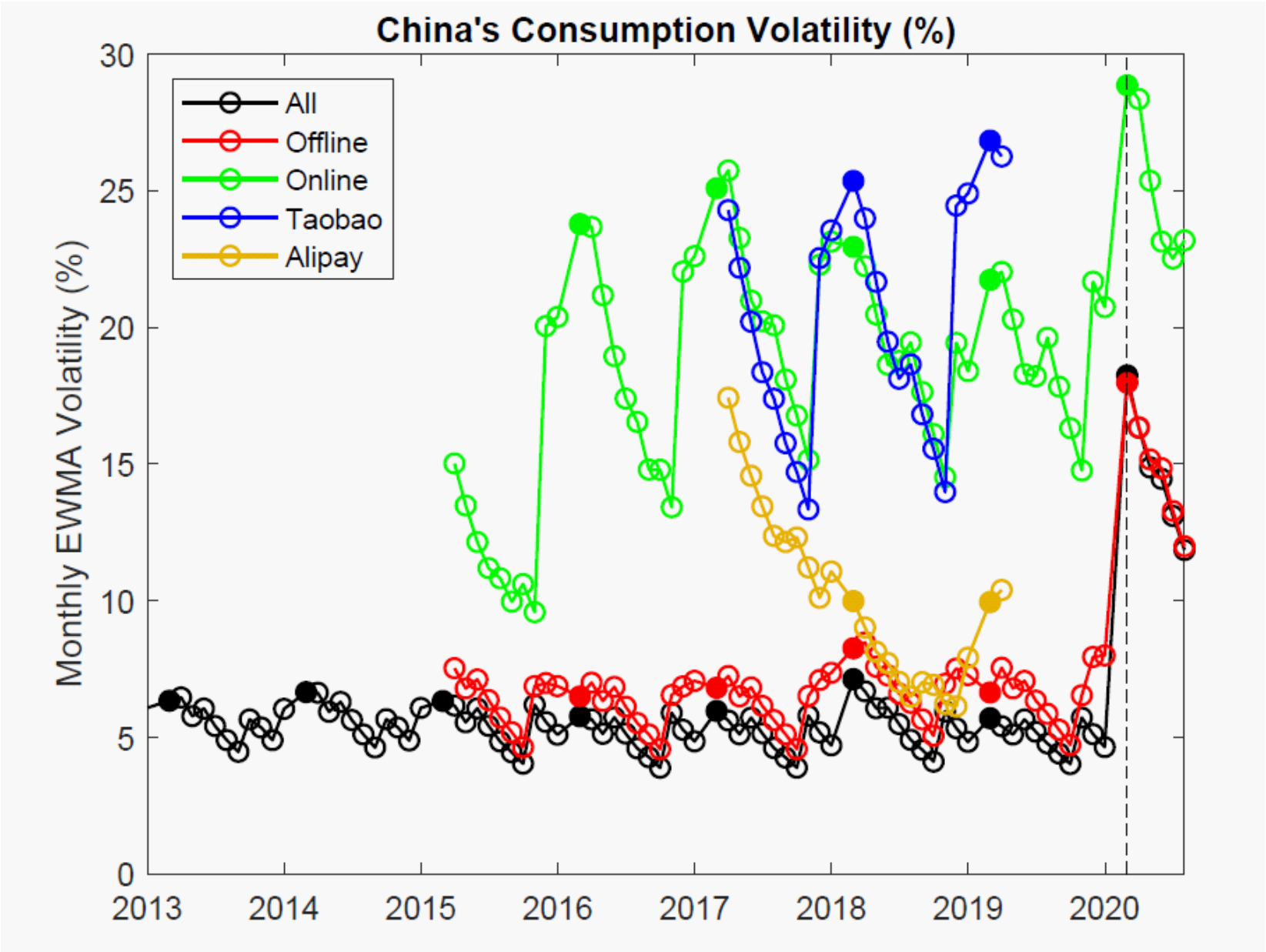
	Sample 2015–2019			Sample Jan.2017–Mar.2019				
	All	Online	Offline	All	Online	Offline	Taobao	Alipay
Mean	0.74%	2.83%	0.55%	0.39%	3.31%	-0.16%	2.11%	5.48%
Std.	5.14%	19.02%	6.61%	5.26%	19.19%	6.91%	21.08%	6.97%

- Note the rapid average growth rate of Alipay spending (5.48% per month).
- Note the high volatility of all consumption growth (5.26% per month or $5.26 \times \sqrt{12} = 18.2\%$ annualized under the assumption of iid growth)
- Note the extreme volatility of Taobao consumption growth (21.08% per month or 73.0% annualized under the same assumption).
  - But is the iid assumption reasonable in this case?

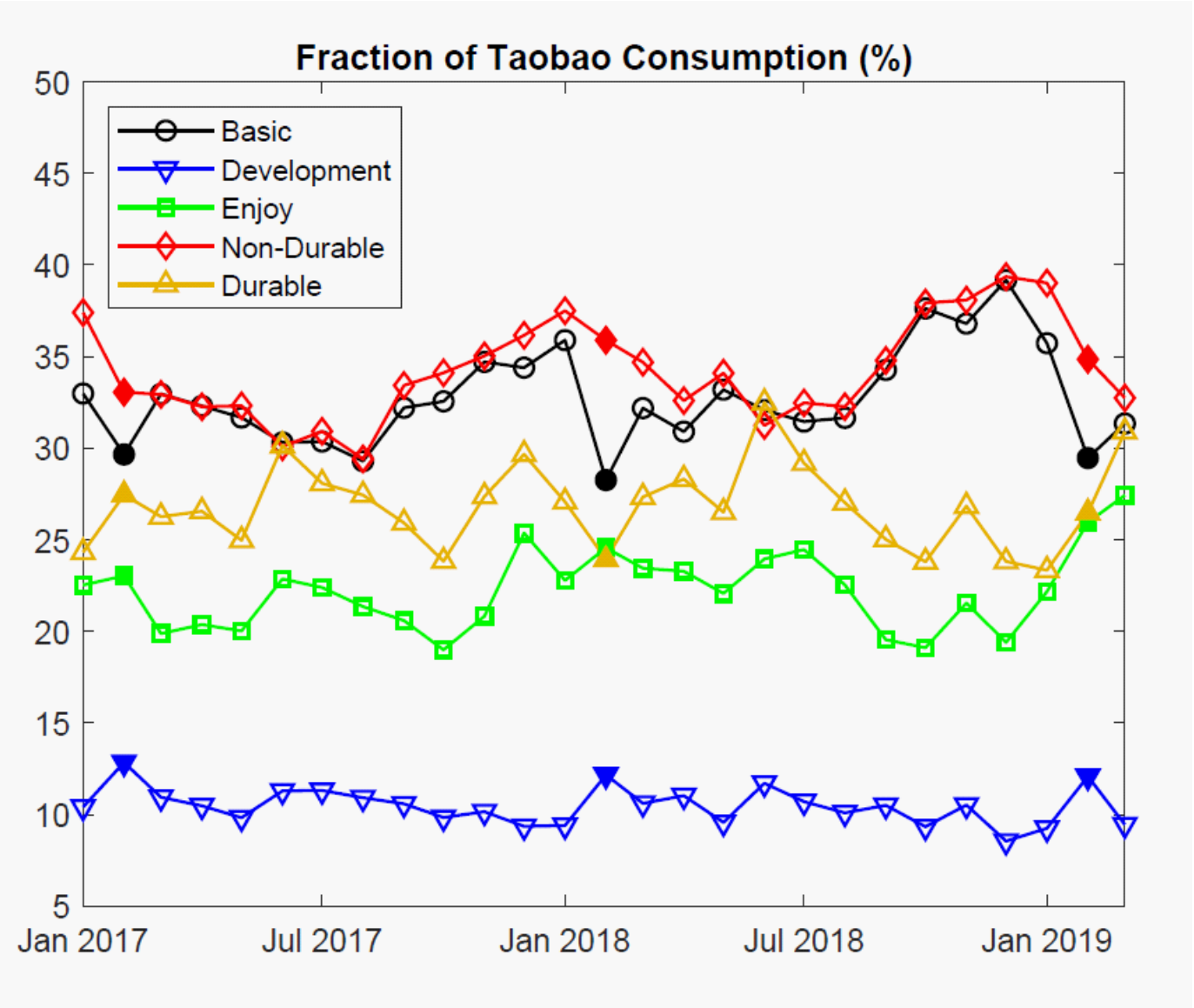
Aggregate Consumption Ratios



Seasonality in Volatility



What Do People Buy Online?



Seasonality in Aggregate Online Spending

- Online spending relative to offline spending peaks at the end of each year, and troughs early in the year around Chinese New Year.
- EWMA volatility of online spending growth peaks early in the year.
- Category shares of online spending are relatively stable, but "development" goods increase and "basic" goods decrease early in the year.
- All this evidence suggests that monthly consumption growth is not iid.
  - Volatility at longer horizons should be computed directly not imputed from monthly volatility.
  - Consumption growth rates need to be adjusted for seasonality and durability of purchases.
  - Seasonal measurement of risk could follow Jagannathan and Wang (2007) and use Q4-Q4 consumption growth.

Volatility in Individual Online Spending

Panel A. Summary Statistics for All Users (50,000 Users)

	Female	Age	Consumption	σ_C	AliFrac	Log(AliCnt)	ΔAliFrac	ΔLog(AliCnt)	Participate
Mean	0.61	30.4	2,155	1.21	0.54	3.01	0.08	0.59	0.375
Median	1.00	29.0	1,259	1.16	0.56	3.08	0.07	0.53	0.00
Std.	0.49	7.8	17,063	0.40	0.22	0.84	0.22	0.67	0.484

- Individual online spending growth volatility dwarfs the aggregate number: 121% per month!
- Even more so than the aggregate number, this needs to be adjusted to take account of seasonality and durability.
  - Individual online purchases are lumpy, and some of this is smoothed out by aggregation.
- Without such an adjustment, consumption volatility cannot be interpreted as the overall risk exposure of an individual.

Measuring Risk-Taking

- The paper measures mutual fund purchases and sales on the Ant Group (Alipay) investment platform, and holdings for a short sample period (August 2017-December 2018).
- Some users have trivial purchases and are excluded in the "active user" sample.
- Measures of risk-taking:
  - Risky mutual fund participation rate (66% on average in the active user sample)
  - Risky mutual fund share (45% on average)
  - Monthly portfolio return volatility (1.77% on average, or 6.1% annualized).
- Basic fact: all these measures are positively correlated with FinTech spending ratio and with consumption volatility.

What Predicts FinTech Spending?

Panel A. Tech-Savviness

	AliFrac				Log(AliCnt)			
	All Users		Active Users		All Users		Active Users	
σ_C	0.032***	0.034***	0.033***	0.035***	0.044***	0.054***	0.042***	0.052***
	(11.13)	(12.31)	(9.47)	(10.52)	(4.85)	(6.31)	(3.31)	(4.37)
Log(C)	-0.104***	-0.107***	-0.107***	-0.109***	0.133***	0.124***	0.130***	0.121***
	(-81.59)	(-94.95)	(-72.19)	(-80.70)	(19.60)	(25.10)	(17.15)	(20.31)
Female	-0.054***	-0.050***	-0.055***	-0.051***	-0.170***	-0.160***	-0.190***	-0.180***
	(-16.95)	(-16.18)	(-16.00)	(-15.21)	(-14.94)	(-13.70)	(-16.04)	(-14.74)
Log(Age)	0.000	-0.002	-0.015	-0.017	-0.816	-0.818	-0.861	-0.863
	(0.03)	(-0.27)	(-1.61)	(-1.86)	(-23.04)	(-28.26)	(-23.49)	(-26.97)
Log(GDP)	0.023**		0.022**		0.123**		0.1292**	
	(2.50)		(2.18)		(2.17)		(2.07)	
Log(Income)	0.029***		0.029***		0.1172***		0.1262***	
	(4.32)		(4.45)		(3.28)		(3.39)	
Log(Population)	0.006		0.005		0.0138		0.0233	
	(0.90)		(0.71)		(0.35)		(0.59)	
Log(#Branch)	-0.003		-0.004		0.0194		-0.0077	
	(-0.35)		(-0.34)		(0.40)		(-0.13)	
Citylevel=1	-0.059**		-0.059**		-0.2612**		-0.267**	
	(-2.50)		(-2.65)		(-2.20)		(-2.22)	
City FE	N	Y	N	Y	N	Y	N	Y
R2	0.210	0.208	0.230	0.230	0.0857	0.086	0.096	0.095
N	49,087	50,000	27,886	28,393	49,087	50,000	27,886	28,393

What Predicts Risk-Taking?

Panel A. Tech-Savviness and Risk Taking

	Participate				Risky Share			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tech-Savviness	0.154***	0.136***	0.127***	0.239***	0.130***	0.140***	0.131***	0.146***
	(13.06)	(11.50)	(10.47)	(17.94)	(7.68)	(8.64)	(7.65)	(7.80)
σ_C			0.037***	0.019***			0.0519***	0.018***
			(7.37)	(3.69)			(7.87)	(2.72)
Log(C)				0.076***				0.031***
				(30.06)				(9.03)
Female				-0.067***				-0.102***
				(-12.24)				(-15.12)
Log(Age)				0.007				-0.171***
				(0.57)				(-11.11)
City FE	N	Y	Y	Y	N	Y	Y	Y
Adjusted R2	0.005	0.004	0.004	0.024	0.004	0.004	0.006	0.025
N	50,000	50,000	50,000	50,000	28,393	28,393	28,393	28,393

Correlation vs Causality

- The paper argues that FinTech causally encourages financial risk-taking, presumably by lowering information, hassle, and fixed costs.
  - This is plausible, but hard to demonstrate conclusively.
- The obvious difficulty is that omitted variables such as general intelligence, market-oriented education, social connectedness, or openness to new experiences could easily drive both FinTech spending and risk-taking.
- To address this, the paper uses a geographical approach.
  - FinTech penetration in a city predicts risk-taking in that city.
  - Change in FinTech penetration predicts change in risk-taking.
  - FinTech penetration predicts risk-taking when instrumented by distance from Hangzhou (Alibaba headquarters city).
- The remaining concern: do social trends generally emanate from eastern China (Hangzhou-Shanghai region)?

Is Financial Risk-Taking a Good Thing?

- Financial economists generally argue that all individuals should have some equity exposure to earn the equity premium.
- The low observed equity participation rate may reflect fixed costs of equity market participation or behavioral biases such as ambiguity aversion, but either way it is a social problem.
- If FinTech lowers these fixed costs and encourages participation, that is likely to be a good thing.
- So far so good... but the paper makes a much stronger argument.

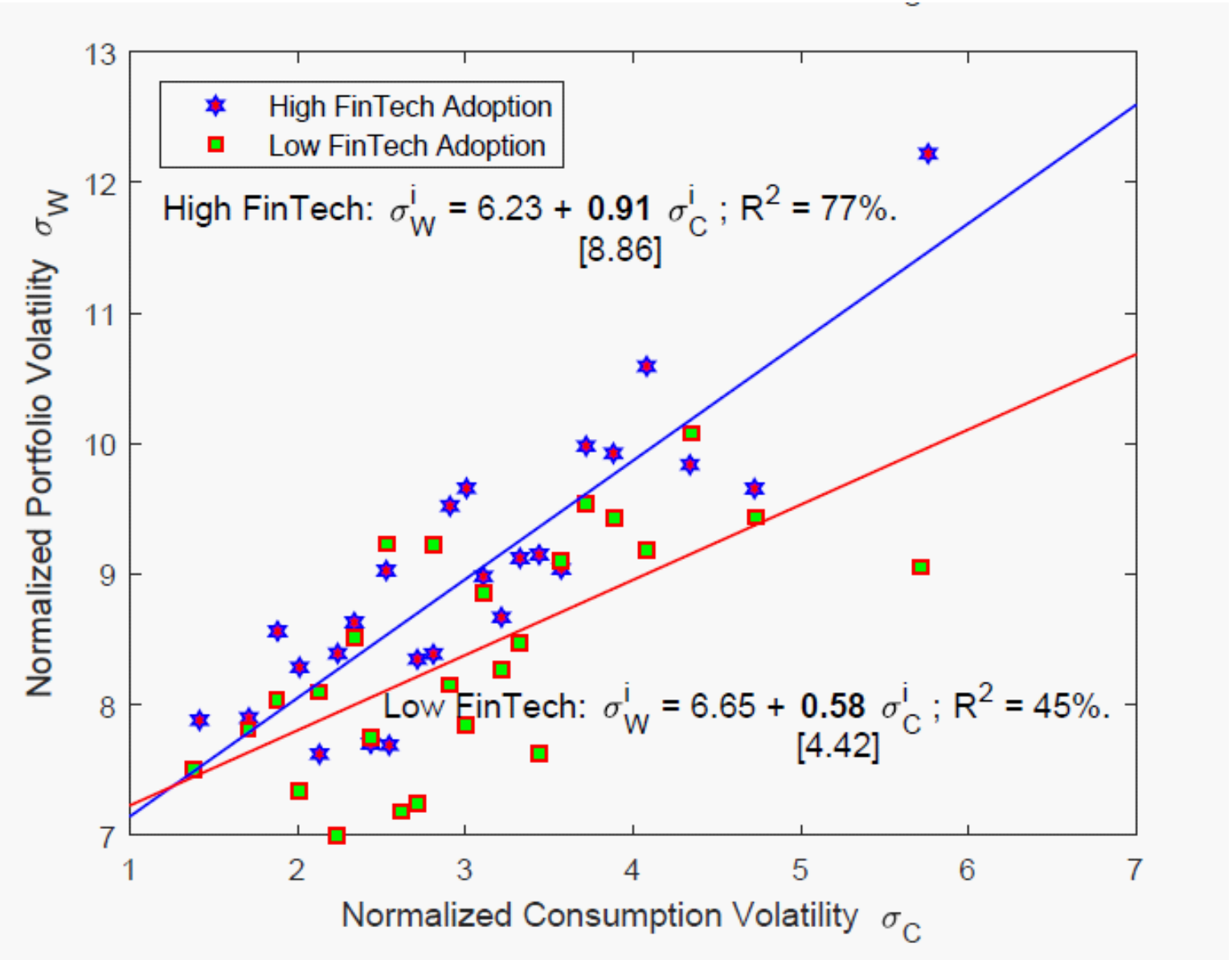
The Merton Model of Optimal Risk-Taking

- In the Merton (1969, 1971) model of an optimal infinite-lived investor, living off financial wealth with iid returns, optimal portfolio risk equals optimal consumption volatility and both are driven by risk aversion:

$$\sigma_w = \sigma_c = \frac{SR}{\gamma},$$

  where SR is the Sharpe ratio of the risky asset.
- The paper shows that FinTech is associated with a stronger cross-sectional relation between σ_w and σ_c as measured in the data.
- On this basis the paper argues that FinTech moves us closer to the optimal Merton world.

Portfolio Volatility and Consumption Volatility



Problems with the Optimal Risk-Taking Interpretation

- Measured online spending volatility is far too high to represent the volatility of flow consumption that is needed for the Merton model.
- Measured wealth volatility excludes implicit wealth from nonfinancial assets and human capital that is needed for the Merton model.
- Even if we could solve these measurement problems, the equality of wealth volatility and consumption volatility is an implication of the intertemporal budget constraint, not optimization.
  - With iid returns and consumption growth, the two must always be equal.
  - More generally, the two must be equal at long horizons provided that the consumption-wealth ratio is stationary.
- Hence, the alignment of these two concepts tells us nothing about whether investors are choosing portfolios that match their risk aversion.
  - To learn about this, it is essential to have some independent measure of risk aversion, e.g. from survey data.

Idiosyncratic vs Aggregate Risk

- It is more promising to look at another implication of the Merton model.
- In that model, investors should only take compensated aggregate risk, not uncompensated idiosyncratic risk. Hence, consumption and portfolio returns should be perfectly correlated cross-sectionally, and perfectly correlated with the aggregate market return.
- In a richer model with income risk, portfolios can be used to hedge that risk but consumption growth should still be highly correlated across investors, and highly correlated with the aggregate market return.
- We can ask, is FinTech associated with increases in these correlations?
- If not, it is possible that Chinese investors are using risky mutual funds to speculate and increase their idiosyncratic risk exposure rather than to earn the equity premium or to hedge income risks as financial theory would recommend.