Discussion on Advancing Asia's Payment Systems Through Financial Technology

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Outline

I. Highlights of the study
II. Fintech and payments landscape
III. Country case study and cross-country analysis
IV. Conclusion

Highlights of the study

- **Focusing on retail payments) the study discussed ten stylized facts regarding FinTech payment systems.**
  - ✓ **(Facts 1-4) There is growing importance of digital payments (as measured by the increased relative importance of card and e-money.**
  - ✓ **(Facts 5-10) Along with e-commerce, e-money and mobile payments usage are increasing despite the relatively small average value of its transactions.**

- **Case study explored the province-level variation in the various "Fintech" indicators contained in the PKU Digital Financial Inclusion Index of China (PKU-DFIIC). Empirical results showed the positive impact of FinTech payments on e-commerce and general FinTech development.**

- **Cross-country analyses revealed the importance of FinTech in e-commerce, remittance activities and "inclusion" of the informal economy.**

Fintech and payments landscape

- Latest BIS (2017)–"Red Book" Statistical update or Committee on Payments and Market Infrastructure "Statistics on payment, clearing and settlement systems in the CPMI countries" **show generally similar landscape".**

- The following have increasingly become important parts of the Fintech landscape:
  - ✓ Stability issues (e.g. liquidity and risk management)
  - ✓ Data protection issues (e.g. KYC, detection of fraud and laundering)
  - ✓ Regulatory issues
  - ✓ Motivations behind increased demand for digital transactions (e.g. real-time transactions and consumer facing applications)
  - ✓ Challenges of inequality*

- Mobile money transaction (volume) for airtime top-up is particularly high for East Asia and Pacific, but average values are very small. This is probably due to the nature of P2P transactions used in informal markets where people buy goods in smaller quantities multiple times in a day.

*The increased dependence on mobile phones over time might initially worsen income inequality and aggravate the rural-urban and young-old divide. In some countries, access to mobile payment services can be challenging for the poor or elderly. Less technologically adept parts of society are the most affected by the sudden change.

Table 2 (of the paper)

Dependent variable: Log(e-commerce sales) + e-commerce purchase (million Yuan))

Instrument: Log(insurance index)

Variables	(1) First stage	(2) 2SLS	(3) First stage	(4) 2SLS	(5) First stage	(6) 2SLS
Log of insurance index	0.841***		1.073***		0.758***	
	(0.119)		(0.0730)		(0.122)	
Log of payment index		0.936***		1.738***		0.821***
		(0.226)		(0.356)		(0.229)
Log of GDP per capita	0.340***	0.513*	0.0522	0.479*	0.395***	0.248
	(0.120)	(0.278)	(0.0399)	(0.249)	(0.133)	(0.243)
Share of rural population	0.653*	-4.104***	0.00871	-3.558***	0.345	-4.664***
	(0.371)	(0.762)	(0.124)	(0.696)	(0.392)	(0.637)
Share of population aged 65+	1.808	-4.198*	-0.397	-3.185	3.655**	-2.375
	(1.287)	(2.160)	(0.421)	(1.958)	(1.633)	(2.389)
Log of broadband subscribers	0.0822***	-0.0122	0.0584***	-0.0524	0.105***	-0.0340
	(0.0268)	(0.0486)	(0.00871)	(0.0504)	(0.0317)	(0.0554)
Constant	-4.719***	0.677	-2.906***	-3.501	-4.807***	4.313*
	(1.410)	(2.815)	(0.571)	(2.792)	(1.523)	(2.301)
Time fixed effects	No	No	Yes	Yes	No	No
Region fixed effects	No	No	No	No	Yes	Yes
Observations	186	186	186	186	186	186
R-squared	0.511	0.761	0.950	0.780	0.550	0.835

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

- Study employed a panel data approach to control for multiple factors and reduce endogeneity concerns (n= 31; t=8).
- Study also conducted a 2SLS estimation using FinTech insurance as an instrument for FinTech payments as an explanatory variable for e-commerce.

Further analysis

- Interaction variables can be specified as some “regional dummy variable multiplied by an independent variable”.
  - ✓ This will help identify regional differences not just in terms of fixed slopes (per region) but also in terms of the magnitudes of the coefficient.

- In addition to the formal tests of instrument relevance and homogeneity, a test for model over-identification will help add robustness to the results.*

- An additional instrument can be accommodated by the same model, in case e-commerce strongly feedbacks on GDP (e-commerce is a contributor to aggregate production, by definition).

* As an extension, the Arellano-Bond or Blundell-Bond Generalized Method of Moments estimation could be explored to potentially alleviate concerns over the correlation between time-invariant characteristics (fixed effects) and the regressors.

Table 3 (of the paper)
Dependent variables: Log(FinTech product type index)

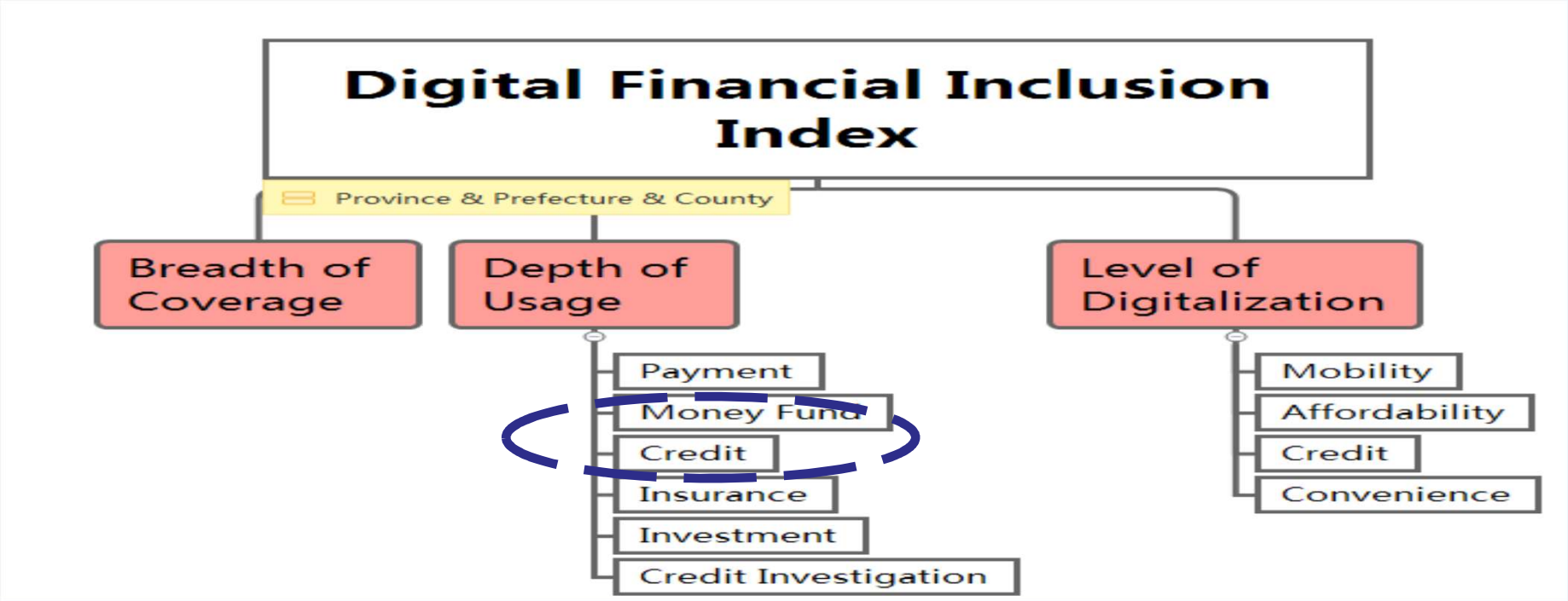
Variables	(1) Insurance	(2) Money Funds	(3) Credit	(4) Investment	(5) Credit Investigation
Log of payment index	1.178***	2.031***	0.583***	2.899***	5.351***
	(0.112)	(0.147)	(0.0391)	(0.183)	(0.429)
Log of primary insurance payment	0.411***				
	(0.124)				
Log of GDP per capita	0.301	-0.313*	0.0578	-0.358*	-1.193***
	(0.187)	(0.183)	(0.119)	(0.191)	(0.273)
Share of rural population	1.697**	-0.305	-0.397	-0.133	-0.669
	(0.706)	(0.454)	(0.359)	(0.515)	(0.801)
Share of population aged 65+	-0.690	-2.305*	-0.715	1.525	2.834
	(1.721)	(1.358)	(0.772)	(1.833)	(2.447)
Log of broadband subscribers	-0.530***	-0.0141	0.151***	-0.0985**	-0.185**
	(0.109)	(0.0366)	(0.0281)	(0.0416)	(0.0727)
Constant	-2.656	-1.817	0.463	-6.117***	-9.808***
	(2.088)	(1.938)	(1.304)	(2.017)	(3.121)
Time fixed effects	No	No	No	No	No
Region fixed effects	No	No	No	No	No
Province fixed effects	No	No	No	No	No
Observations	246	185	246	155	123
R-squared	0.659	0.788	0.800	0.740	0.650

Robust standard errors in parentheses
***p<0.01,**p<0.05,*p<0.1

- Five types of FinTech products (insurance, money funds, credit, investment, credit investigation) other than payments were gauged to determine the general effect of FinTech payments on over all FinTech development.

Further analysis

- What was the basis for the choice of the five types of Fintech products as indicators of "general Fintech developments"?
- Why not perform a panel or IV regression to evaluate the relationship between Fintech payments and other fintech products (to address feedback effects)?
- There are two credit sub-indices in the PKU-Digital Financial Inclusion Index of China.



Source: Institute of Digital Finance-Peking University (2019), "The Peking University Digital Financial Inclusion Index of China (2011-2018)"

Table 4 (of the paper)

Dependent variable: log(value of e-commerce (million USD))

Variables	(1)	(2)	(3)	(4)
Digital	0.0394***	0.0402***	0.0540***	0.0573***
	(0.0132)	(0.0143)	(0.0154)	(0.0190)
Log of GDP per capita	0.599	0.575	0.698	0.622
	(0.401)	(0.421)	(0.427)	(0.526)
Share of rural population	-0.00176	-0.00205	0.0291	0.0290
	(0.0167)	(0.0167)	(0.0191)	(0.0226)
Share of population aged 65+	2.189	2.086	4.725	4.651
	(7.318)	(7.373)	(10.30)	(7.140)
Log of broadband per 100 people	0.615*	0.622*	0.496	0.503*
	(0.323)	(0.327)	(0.353)	(0.303)
Constant	-20.58***	-20.40***	-23.31***	-22.80***
	(3.411)	(3.505)	(3.892)	(4.613)
Time fixed effects	No	Yes	No	Yes
Region fixed effects	No	No	Yes	Yes
Observations	153	153	153	153
R-squared	0.516	0.516	0.547	0.548

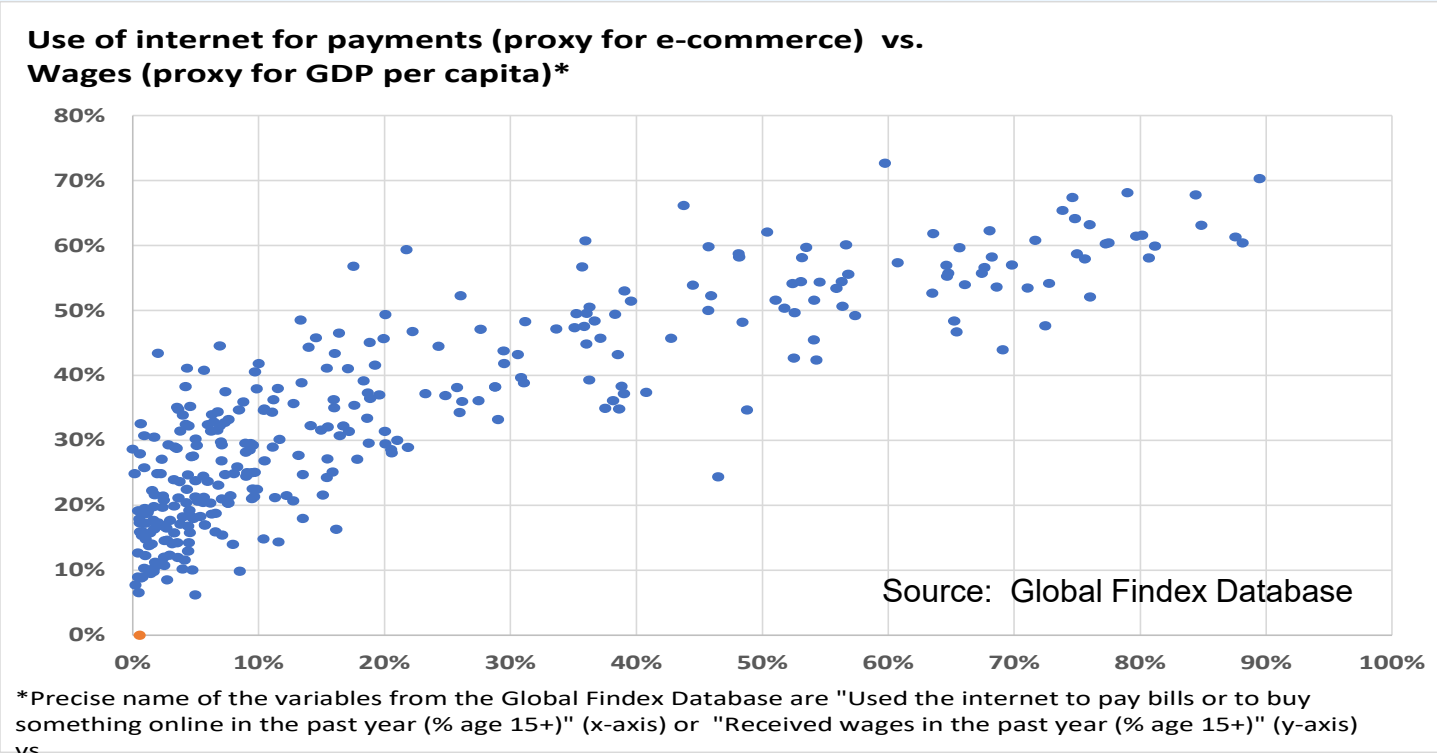
Robust standard errors in parentheses

*** p<0.01, **p<0.05,*p<0.1

- Cross-country analyses reveal the importance of FinTech in e-commerce, remittance activities and the “inclusion” of the informal economy.

Further analysis

- Remittances were highlighted as particularly relevant for developing countries. Potentially, this factor may be added as a control to the cross-country regression for better insight.
- With GDP being not significant in the cross-country regression, other proxy variables (for e-commerce and GDP) from the Global Findex Database can be tested for significance*:
  - ✓ *Used internet to pay bills or to buy something online in the past year (% age 15+)*
  - ✓ *Paid online for internet purchase (% internet purchasers, age 15+)*
  - ✓ *Received wages in the past year (% age 15+)*



*Precise name of the variables from the Global Findex Database are "Used the internet to pay bills or to buy something online in the past year (% age 15+)" (x-axis) or "Received wages in the past year (% age 15+)" (y-axis) vs

Conclusion

- This paper demonstrated a "data-driven approach" to the empirical assessment of the benefits of digital/FinTech payments.

- The combined use of empirical exercises and the richness of collected data helped show the relatively significant impact of Fintech payments on e-commerce and other Fintech products. Thus,

Payments → E-commerce and selected Fintech products → Fintech developments

- Regressions involved "payments" as a determinant of e-commerce (Tables 1 and 2, 4) and fintech product type (Table 3)

- The above should be compared against the goal of studying "**the Advancement of Asia's Payment Systems Through Financial Technology",** which implies

Payments ← Fintech

Thank you!

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