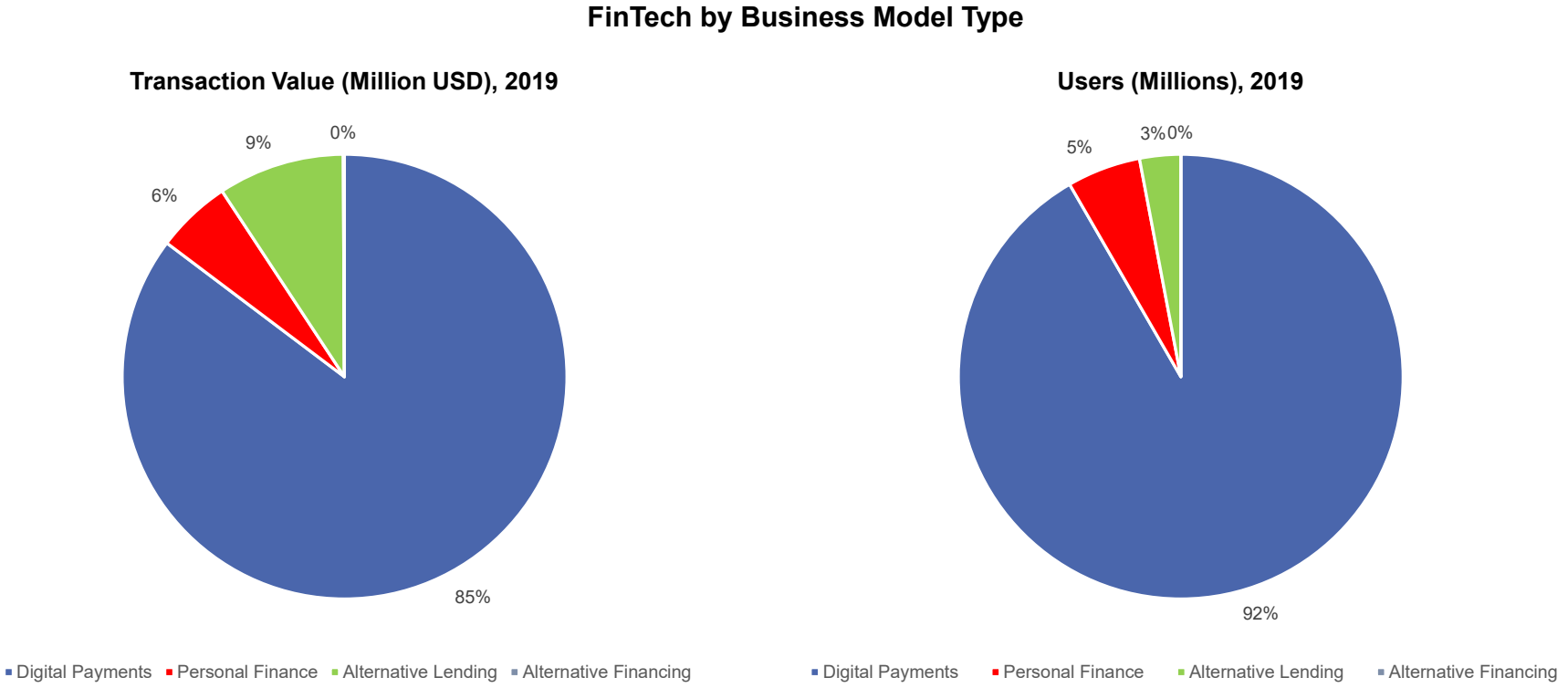
Advancing Asia's Payment Systems Through Financial Technology

Presenter: Yueling Huang

August 11, 2020

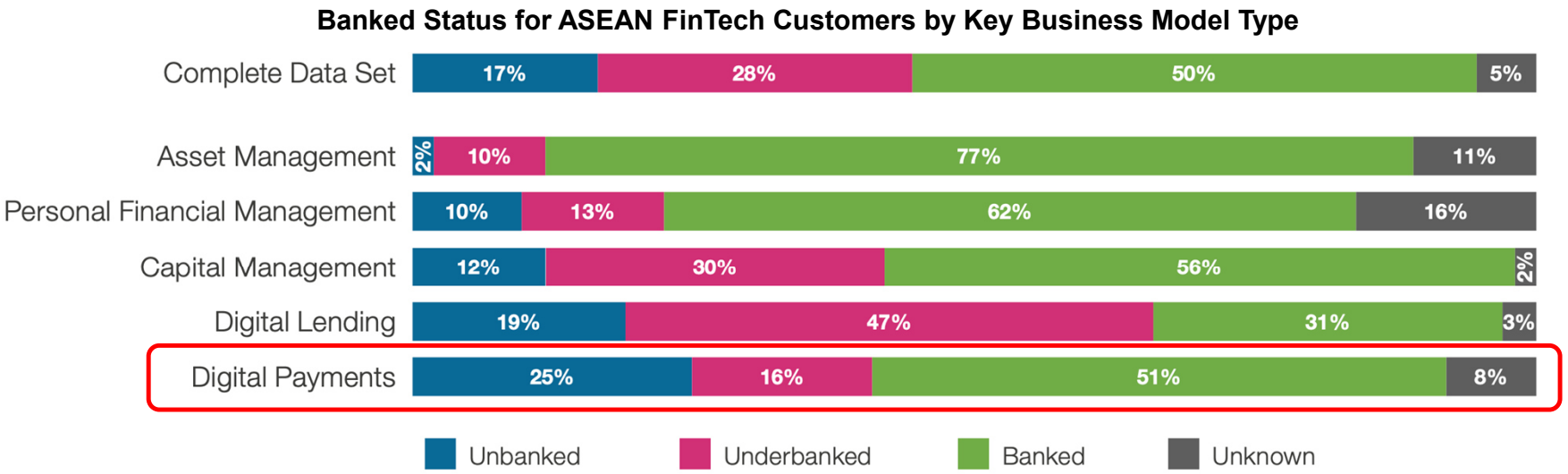
Digital payments the most important business model type in Asia's FinTech industry



Source: Statista (2020).

Digital payments promote financial inclusion

- GSMA (2020): mobile money "must be available to the unbanked".



Source: CCAF (2019).

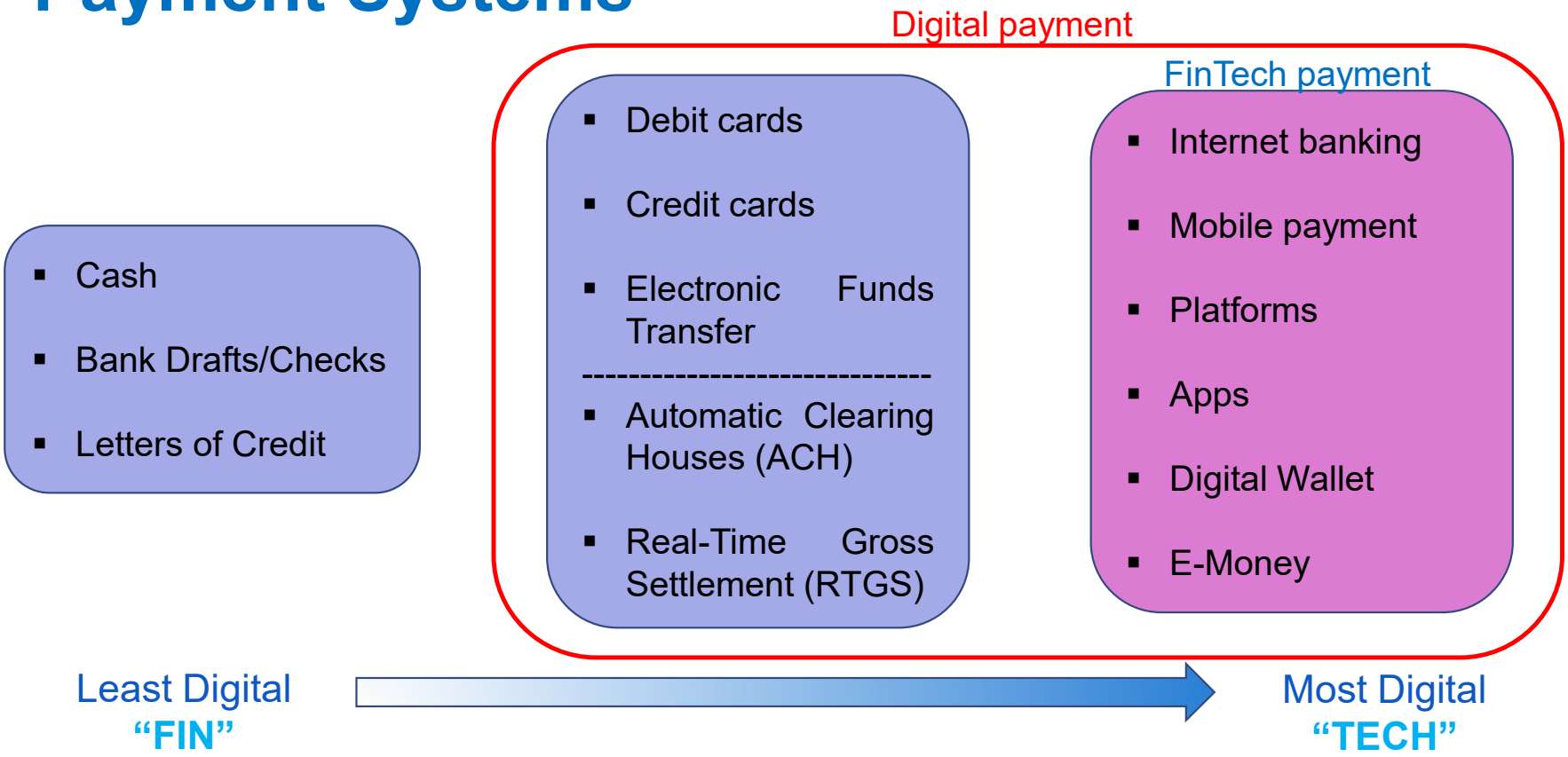
Key Messages

- FinTech payments (e.g.: e-money, mobile money) are growing rapidly and revolutionizing retail payments, esp. in emerging economies.
- FinTech payment makes retail payments more efficient (cheaper, faster, safer), transparent and inclusive.
- FinTech payment leverages network effects (big data, broad customer base, multi-purpose technology) and is an enabler for e-commerce, FinTech/financial development and financial inclusion.
- Covid-19 calls for the digitalization of G2P/G2B.
- Policy makers are encouraged to: (i) bridge existing regulatory gaps to reflect key changes of digitization, (ii) expand access, particularly to the more socially disadvantaged groups, (iii) promote regional cooperation, (iv) utilize digital tools in their own business practices (e.g.: digital G2P/G2B, CBDC), (v) encourage FinTech providers to constantly leverage the latest technologies to upgrade cyber-security measures.

Agenda

- FinTech payment systems
- Country case study: People's Republic of China
- Cross-country analysis
- Policy recommendations

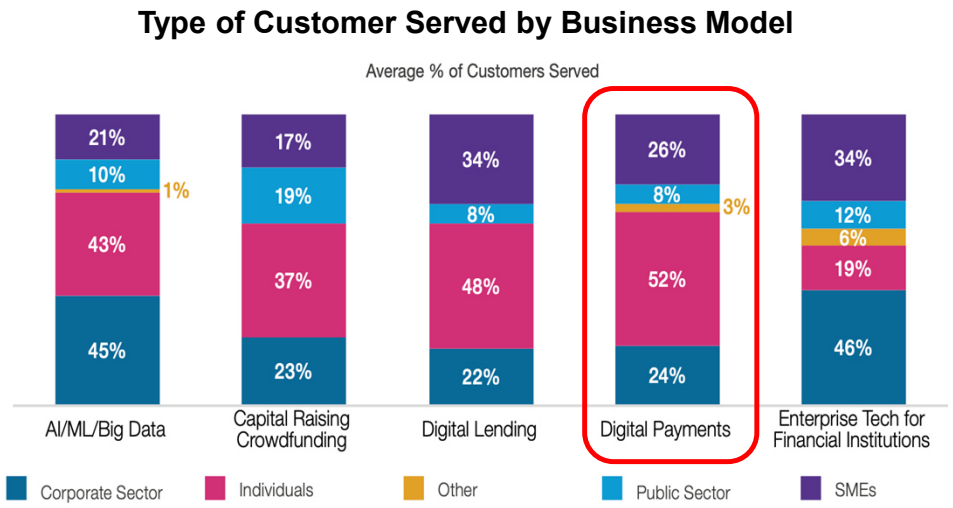
Payment Systems



Source: Author's illustration.

Retail Payments

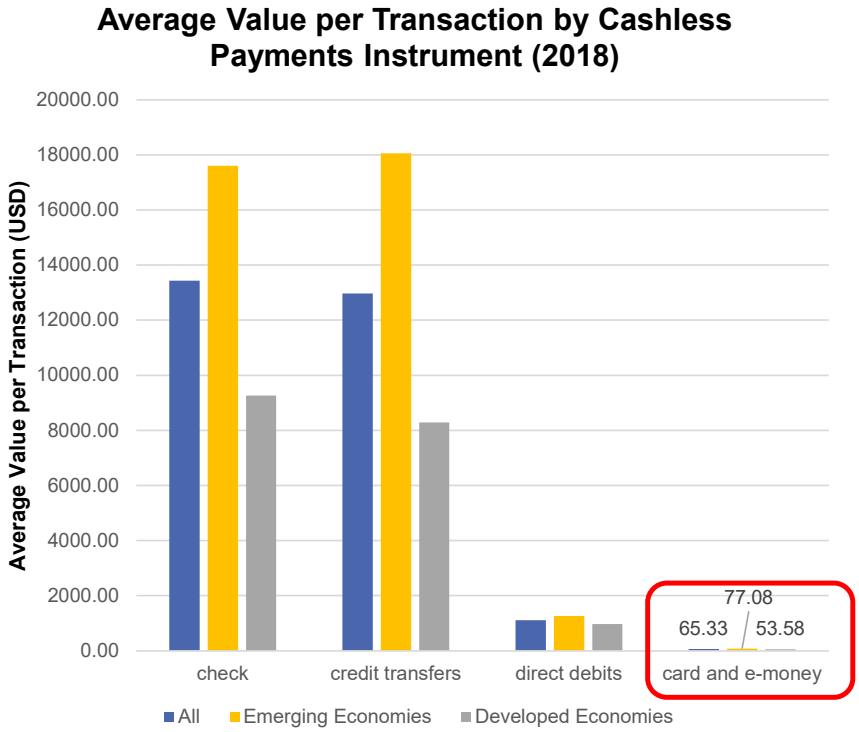
- Payment systems that transfer large volume of funds of relatively small value.

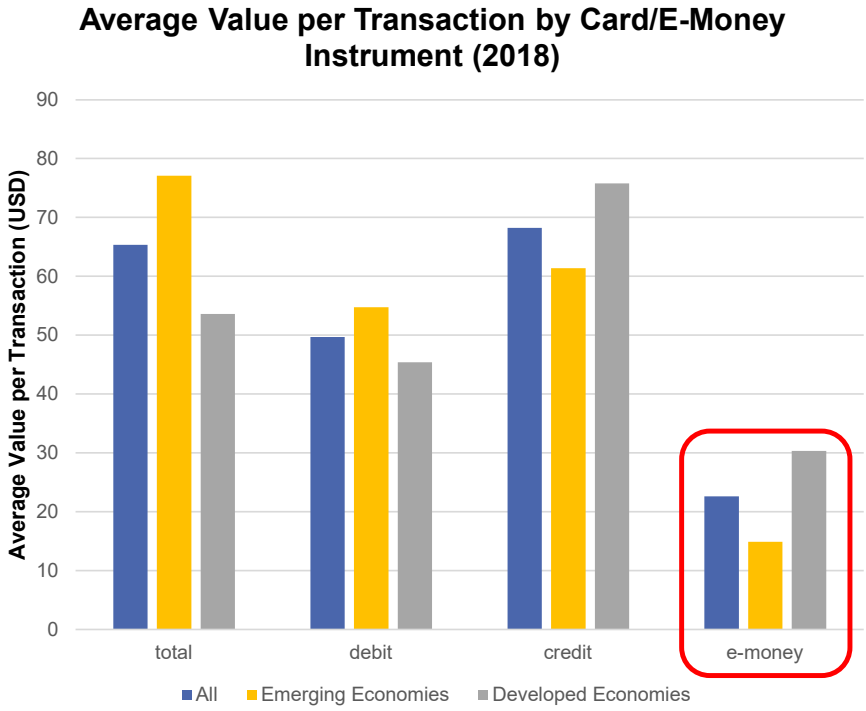


- **C2C:** venmo, xoom (A PayPal Service), Ria, TransferWise
- **C2B:** Pay, G Pay, 支付宝 ALIPAY, 微信支付 WeChat Pay, STARBUCKS COFFEE, GrabPay, GCash
- **G2P/G2B: Covid-19**

Source: CCAF (2019).

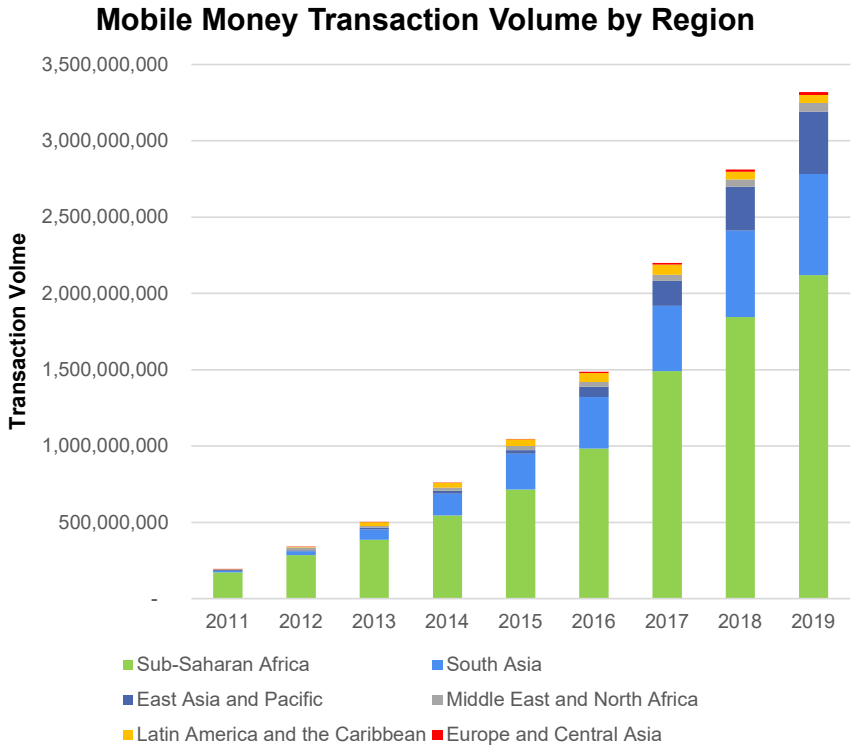
E-money is revolutionizing retail payments by accommodating even smaller value of payments

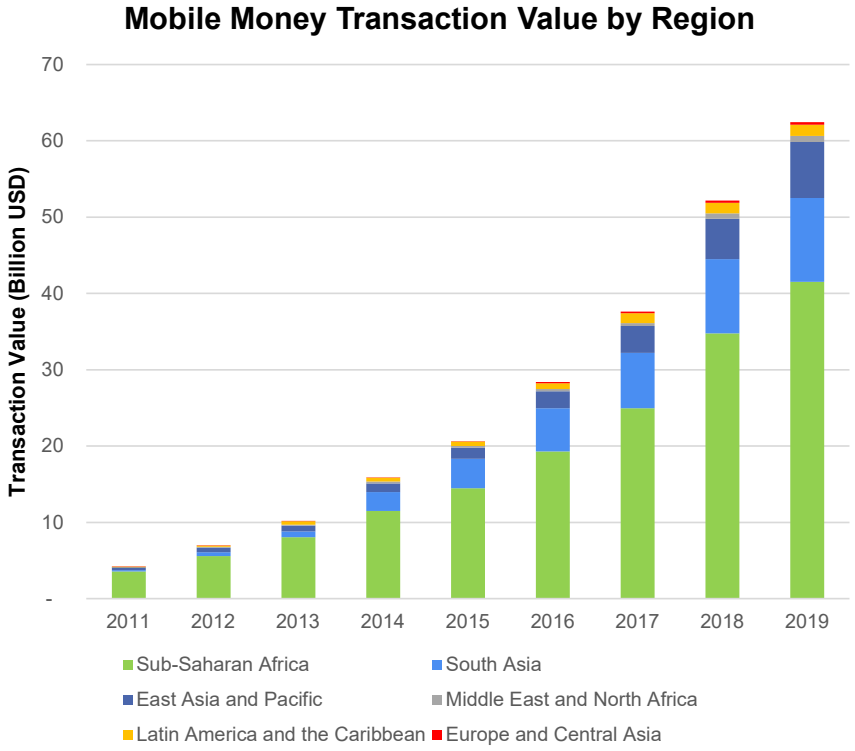




Sources: BIS (2018) and author's calculations.

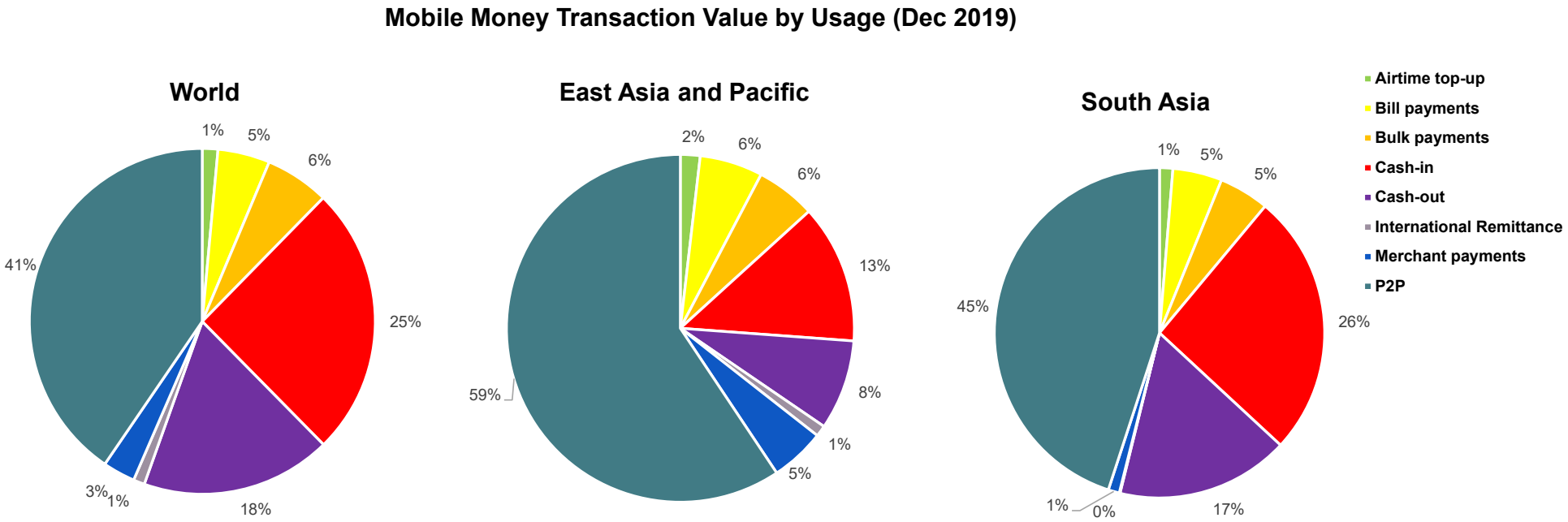
Mobile money most widely used in Sub-Saharan Africa, followed by South Asia and East Asia & Pacific





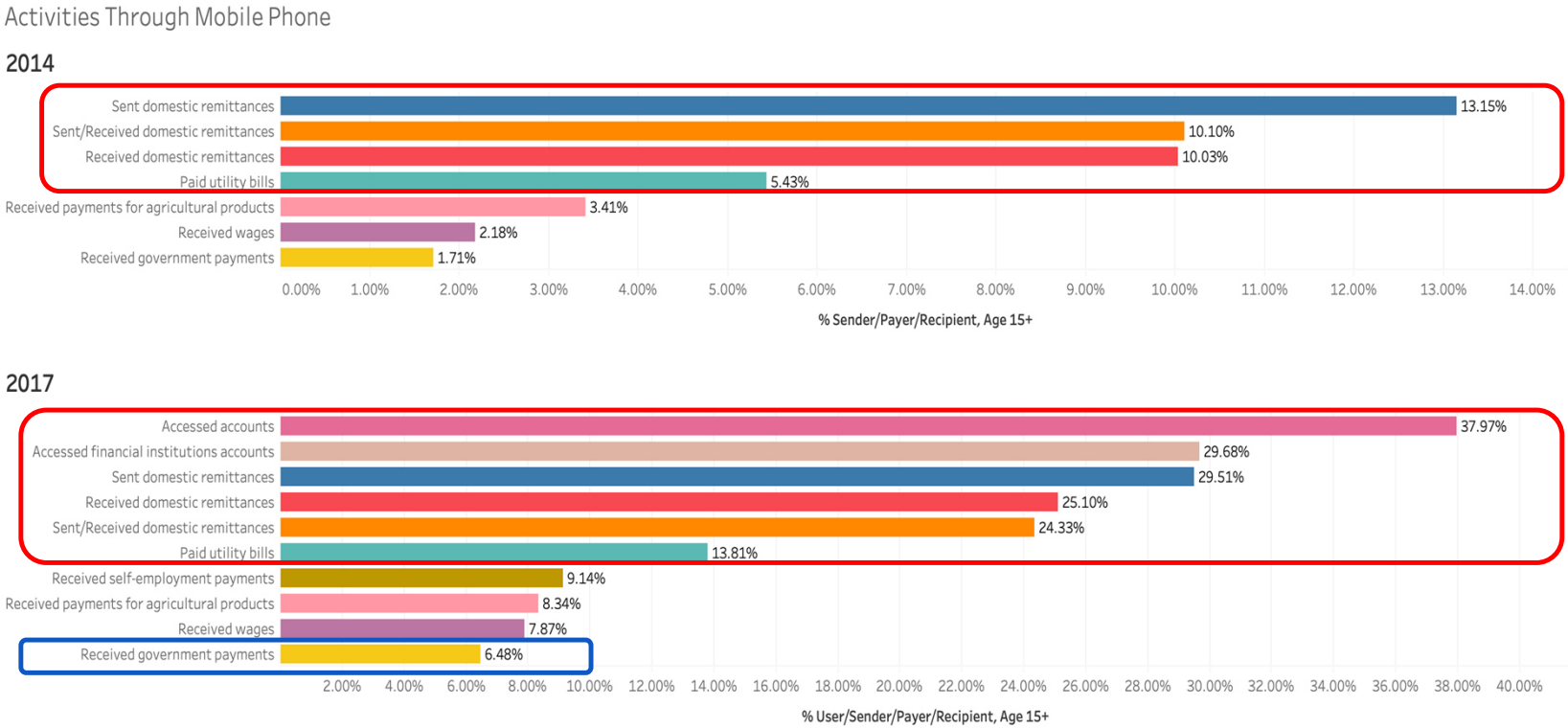
Source: GSMA (2020).

Mobile money transaction value highest for P2P, followed by Cash-in/Cash-out



Source: GSMA (2020).

Up to 2017, the top 3 activities of mobile phone penetration are access accounts, remittances, utility bills payment. Penetration in G2P/G2B rather limited.



Source: Global Findex Database (2014, 2017).

Digitalizing G2P/G2B Payments

- Covid-19:
  - PRC: Consumption coupons via AliPay and WeChat Pay
  - India: “JAM (Jan Dhan-Aadhaar-Mobile) Trinity”
  - Thailand: direct cash transfers via PromptPay
  - Chile: “Bono COVID-19”

- Mobile G2P to frontline workers in Sierra Leone during Ebola:
  - Estimated cost-saving >10 million USD (Bangura, 2016).

- More inclusive, targeted, safer, timelier and transparent distribution of funds.

Takeaways – Stylized Facts

1) FinTech payments are growing rapidly and revolutionizing retail payments, esp. for emerging economies.

2) Mobile money is most widely adopted in Sub-Saharan Africa, followed by South Asia and East Asia & Pacific.

3) Mobile money is most widely adopted for P2P and Cash-in/Cash-out.

4) The top 3 categories of activities of mobile phone penetration are account access, remittances, utility bills payment.

5) Covid-19 is likely to speed up the digitalization of G2P/G2B payments.

Related Literature

FinTech payments in PRC: Klein (2020); Huang, Wang and Xu (2020).

FinTech payments and the pandemic: Bangura (2016); Agur, Peria and Rochon (2020); Auer, Cornelli and Frost (2020); Huang, Wang and Xu(2020); Prady (2020); Una, Pattanayak and Suc (2020).

FinTech payments and the economy: Aron and Muellbauer (2019); CCAF, ADBI and FinTechSpace (2019); Bank for International Settlements (2020); GSMA (2020).

Agenda

- FinTech payment systems
- Country case study: People's Republic of China
- Cross-country analysis
- Policy recommendations

People's Republic of China

Exploit province-level variation in FinTech payment system to study its role on:

- E-commerce
- FinTech development

Data: PKU Digital Financial Inclusion Index of China (PKU-DFIIC), National Bureau of Statistics (NBS).

31 provinces, 2011-2018.

AliPay

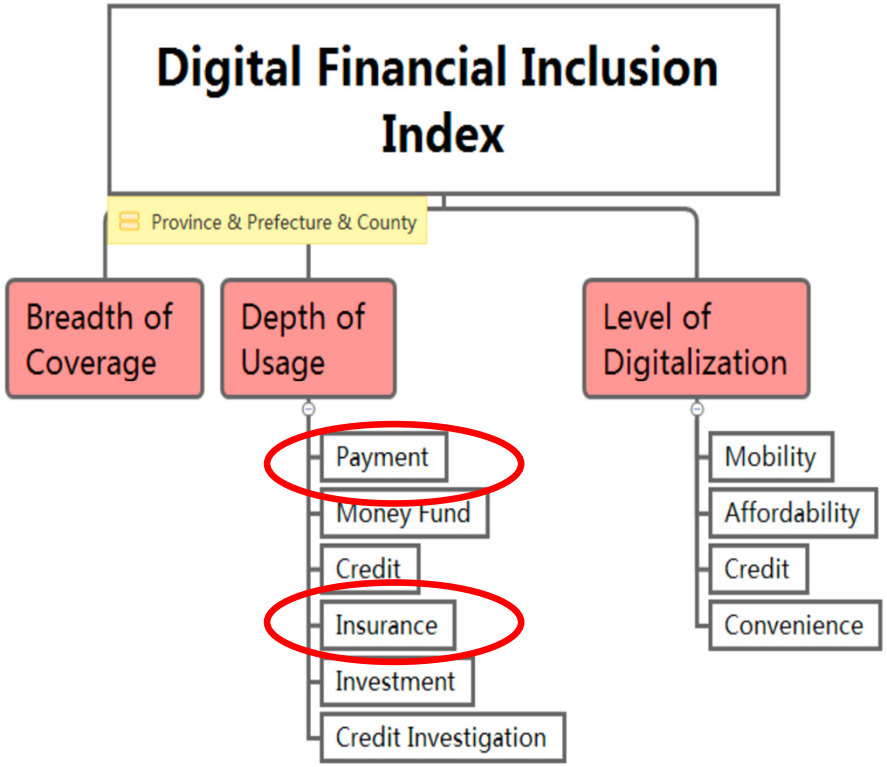
- AliPay is the leader of PRC's FinTech payments, capturing 55.4% of the market share in FinTech payments in 2020Q1 (iResearch, 2020), 1.2 billion users in 2019 (Klein, 2020).

- In 2004, Alibaba's e-commerce platform Taobao incentivized the introduction of AliPay. Alipay facilitates payments in e-commerce, thereby attracting more e-commerce customers. Approximately 85% of internet purchasers pay online (rather than in cash upon delivery) in 2017 in PRC.

- Ant Financial (provider of AliPay) introduced numerous other FinTech services:
  - Examples: Yu'e bao (saving, investment), Huabei/Ant Check (credit), Zhima Credit (credit scoring), Ant Fortune(wealth management).

- During Covid-19, AliPay is used for G2P in the distribution of consumption coupons to citizens.

PKU-DFIIC



Data: Ant Financial (2011-2018)

Main variable of interest: Log(payment index)

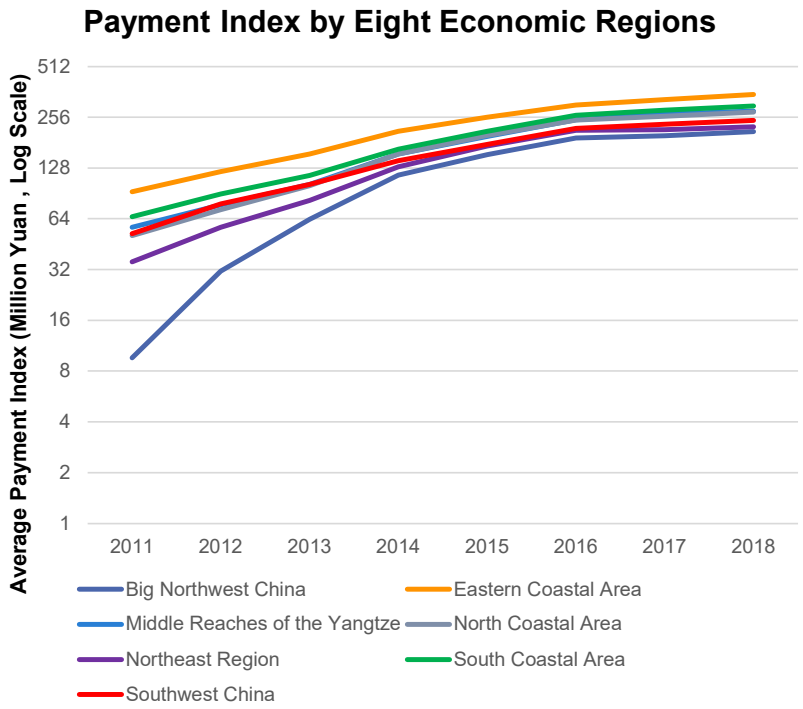
Payment	Number of payments per capita
	Amount of payments per capita
	Proportion of number of high frequency active users (50 times or more each year) to number of users with frequency of once or more each year

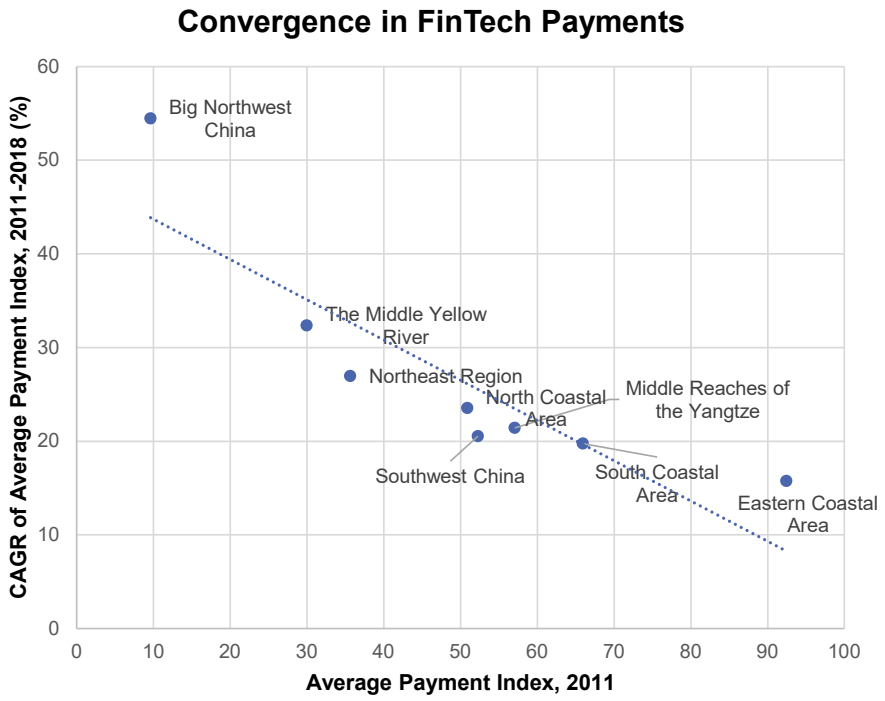
Instrumental variable: Log(insurance index)

Insurance	Number of insured users per 10,000 Alipay users
	Number of insurance policies per capita
	Average insurance amount per capita

Source: Institute of Digital Finance, Peking University (2019).

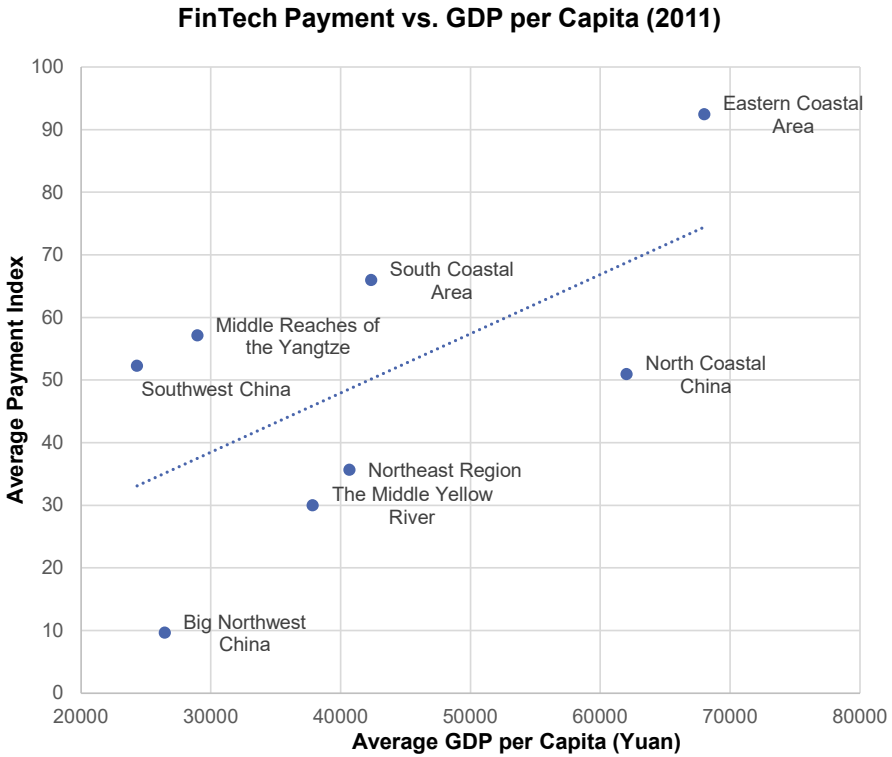
Less penetrated regions are catching up in FinTech payments

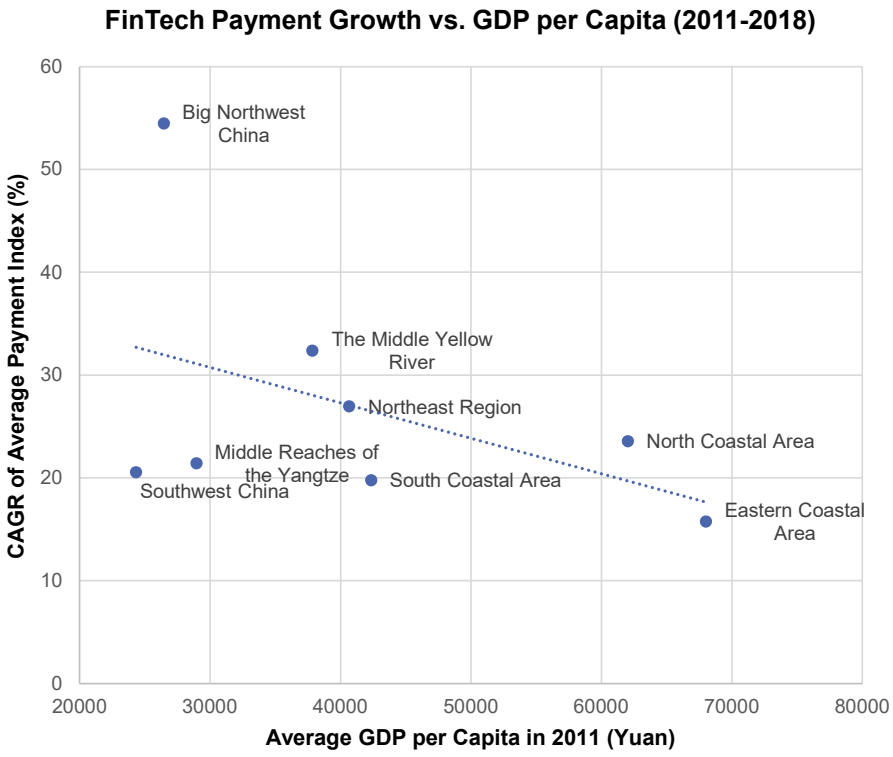




Sources: PKU-DFIIC (2019) and authors' calculations.

FinTech payment (FinTech payment growth) positively (negatively) correlated with GDP per capita





Sources: PKU-DFIIC (2019), National Bureau of Statistics (2019) and authors' calculations.

E-commerce - OLS

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

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log of payment index	1.502***	0.641***	0.696***	0.761***	0.758***	1.548***	0.695***
	(0.136)	(0.131)	(0.124)	(0.126)	(0.129)	(0.268)	(0.114)
Log of GDP per capita		1.704***	0.652**	0.619**	0.619**	0.519**	0.328
		(0.144)	(0.266)	(0.261)	(0.262)	(0.251)	(0.227)
Share of rural population			-3.680***	-3.952***	-3.954***	-3.600***	-4.610***
			(0.769)	(0.750)	(0.753)	(0.715)	(0.660)
Share of population aged 65+				-3.517**	-3.627*	-3.165	-1.760
				(1.772)	(2.050)	(2.006)	(2.286)
Log of broadband subscribers					0.00485	-0.0400	-0.0189
					(0.0475)	(0.0493)	(0.0521)
Constant	1.028	-12.97***	-0.277	0.219	0.220	-2.715	3.947*
	(0.689)	(1.307)	(2.863)	(2.804)	(2.815)	(2.781)	(2.385)
Time fixed effects	No	No	No	No	No	Yes	No
Region fixed effects	No	No	No	No	No	No	Yes
Observations	186	186	186	186	186	186	186
R-squared	0.367	0.715	0.760	0.765	0.765	0.781	0.837

Robust standard errors in parentheses

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

E-commerce – IV

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

FinTech Development – Pooled OLS

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

Takeaways - PRC

- Regional inequality: FinTech payment penetration is also higher for regions with higher GDP per capita.

- Less penetrated regions are catching-up.

- FinTech payment is an **enabler:**
  - E-commerce
  - FinTech and financial development
  - Financial inclusion
  - Digital G2P/G2B during crisis time ⟶ Inclusion & Resilience

Agenda

- FinTech payment systems
- Country case studies: People's Republic of China
- Cross-country analysis
- Policy recommendations

Cross-country Analysis

Use cross-country data in digital payment system to study its relationship with:

- E-commerce
- Domestic remittances transfers
- Informal economy

Data: Global Findex Database (2014, 2017), Euromonitor Passport (2019), Medina and Schneider (2019).

Main variable of interest: share of population aged 15+ who has made or received a digital payment in the past year (Global Findex Database).

E-commerce

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

Summary – Remittances and Informal Economy

Domestic remittances transfer

- Decreasing (increasing) share of domestic remittances transfer conducted in cash/in person (through financial accounts/mobile phone).
- The share of population engaged in domestic remittances transfer is negatively (positively) associated with cash/in person (accounts) transfer.
- Digging deeper into accounts transfers, the positive association is mostly driven by transfers through mobile phone rather than financial accounts.

Informal economy

- Digital payments negatively associated with the share of the informal economy, both worldwide & in Asia.
- Controlling for income group, suggestive evidence of digital payments reducing the size of the informal economy.

Takeaways – Cross-country

Suggestive evidence of digital payments:

- Increase e-commerce
- Positively associated with the share of population engaged in domestic remittances transfer
- Decrease the share of the informal economy

Agenda

- FinTech payment systems
- Country case study: People's Republic of China
- Cross-country analysis
- Policy recommendations

Taking Stock

- Financial inclusion
- G2P/G2B in Covid-19
- E-commerce
- FinTech and financial development
- Domestic remittances transfers
- Informal economy

→ Inclusion

→ Efficiency/convenience

→ Transparency

→ Security

Network effect

“Double-Edged Sword”

- Efficiency/convenience:
  - The “payment divide”
  - Digitalize payments =/= Abolish cash
- Transparency:
  - Electronic record-keeping (+)
  - Expand access of credit services to the unbanked (+), better target the most vulnerable individuals/SMEs in crisis times (+)
  - Big data vs. privacy
- Security:
  - Electronic record-keeping (+)
  - Covid-19: virus transmission risk (+)
  - Cyber-attacks, network disruption
  - New forms of illegal activities (e.g.: identity theft, cross-border crimes, cyber-attacks)
- Network effect:
  - Platform nature: big data, broad user base and multi-purpose technology (+)
  - Excessive market power

Policy Recommendations

What POLICY MAKERS can do

- Regulation
  - Data privacy
  - Anti-trust
  - Cybersecurity
  - Identity theft
- Interoperability
- Financial/ICT literacy, infrastructure
- Regional cooperation in cross-border crimes and payment systems integration
- Government-related payments & Central Bank Digital Currencies (CBDC)
- Provision of cash & CICO

What PAYMENT PROVIDERS can do

- Cyber-security
  - 5G
  - Blockchains
  - Digital ID/biometric ID/KYC
- Compliance
- Knowledge sharing and standardization

G20 Initiative on Enhancing Cross-Border Payments

- The G20 at is February 2020 Finance Ministers and Central Bank Governors meeting asked the FSB to coordinate a three-stage process to develop a roadmap to enhance cross-border payments:

Stage 1 - Assessment (Stage 1):

FSB coordinating with relevant international organizations and standard-setting bodies to assess existing arrangements and challenges. Technical report in April 2020: https://www.fsb.org/wp-content/uploads/P090420-2.pdf.

Stage 2 - Building Blocks:

The Committee on Payments and Market Infrastructures (CPMI) leading the work on creating building blocks/focus areas of a response to improve the current global cross-border payment arranngements. Provide an update to the G20 in July 2020: https://www.bis.org/cpmi/publ/d193.pdf.

Stage 3 - Roadmap:

FSB coordinating with CPMI and other relevant international organizations and standard-setting bodies, in the development of a roadmap to pave the way forward. In particular, the FSB will report to the G20 on practical steps and indicative timeframes needed to do so.

- The three-stage process will be submitted as a combined report to the G20 in October 2020.

Thank you!

Appendix

FinTech Payment Systems: Service Providers

Mobile

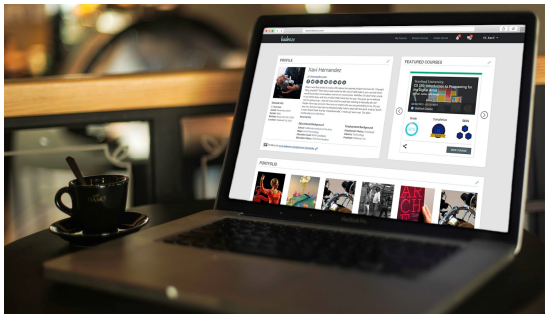
M-PESA

(POSSIBLY) UNBANKED

Technology

BANKED

Finance



Online Platforms

PayPal

Apps

微信支付 WeChat Pay

UBER

Banks

VISA

MasterCard

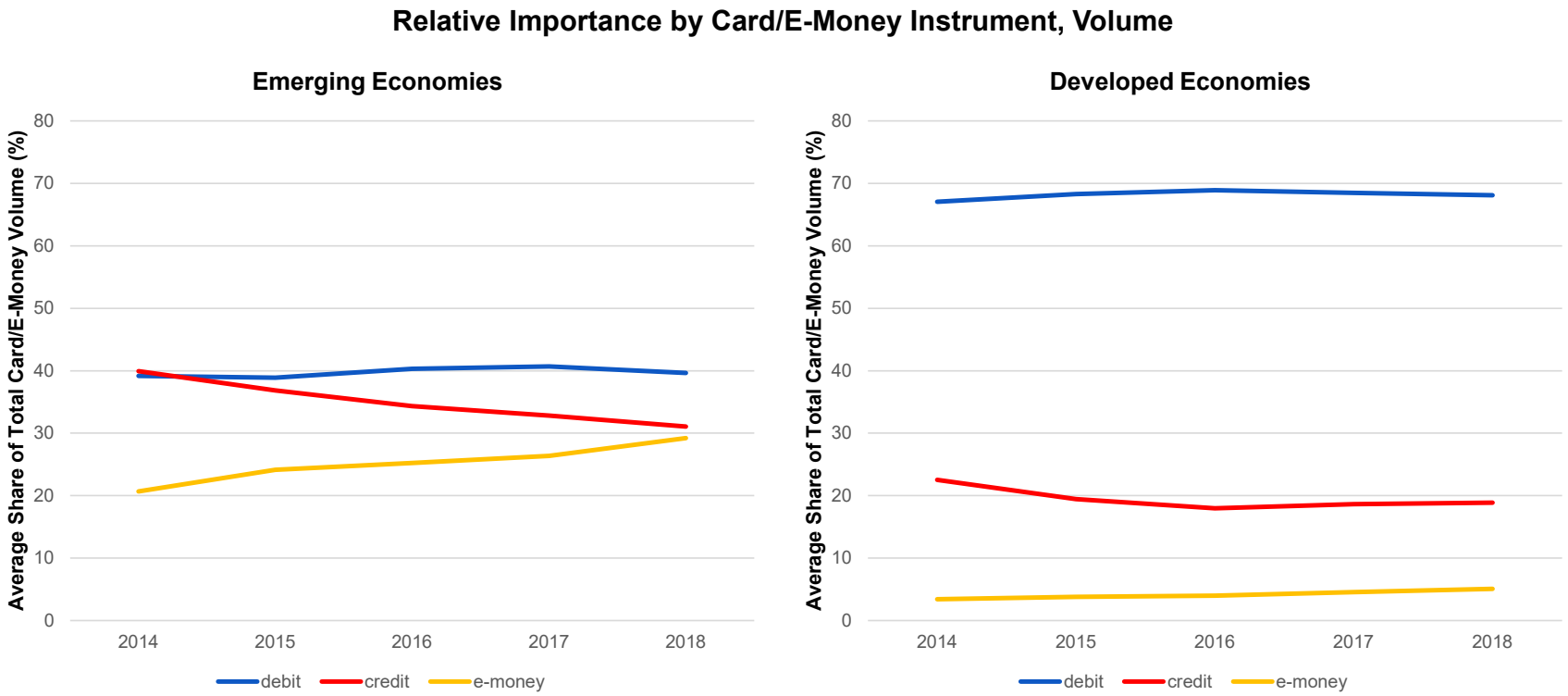
AMERICAN EXPRESS

DISCOVER NETWORK

Card Networks

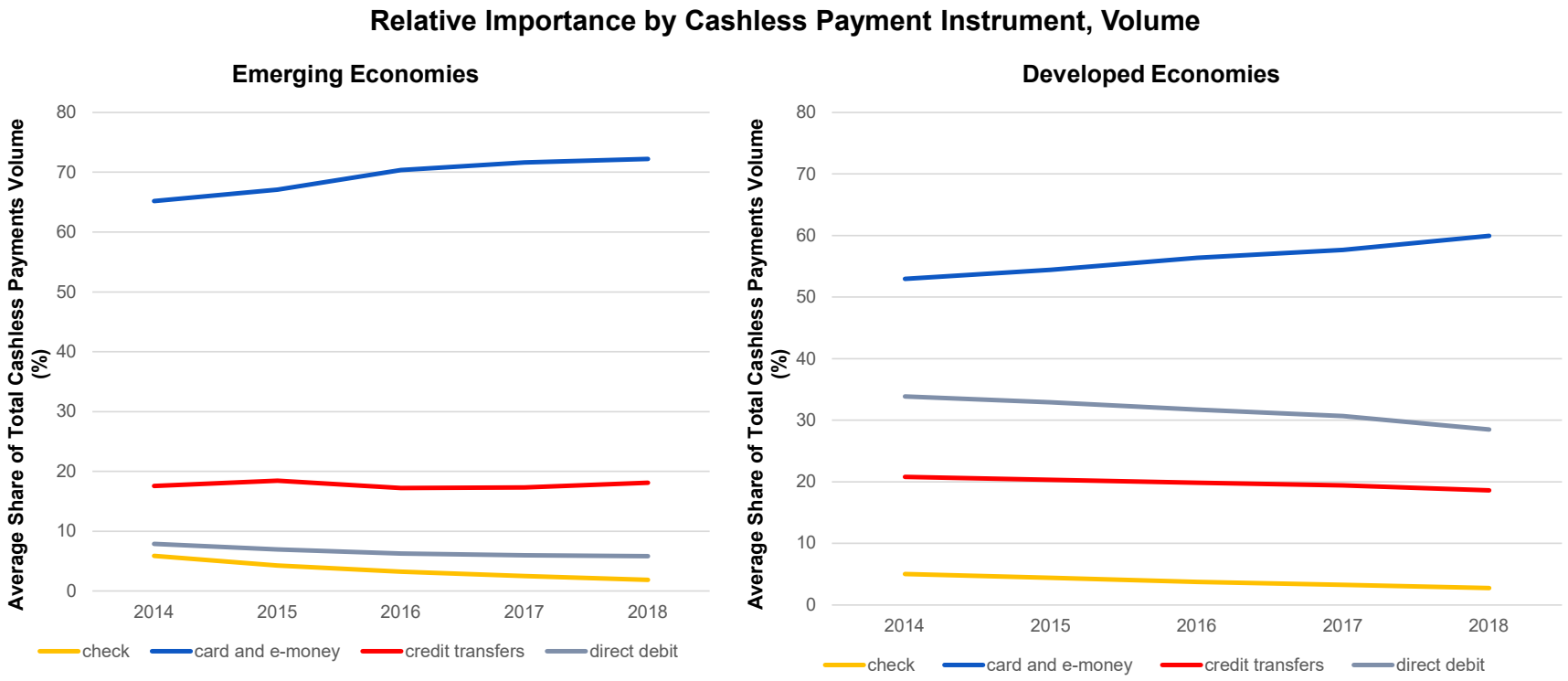
Source: Author's illustration.

Increased relative importance of e-money in emerging economies



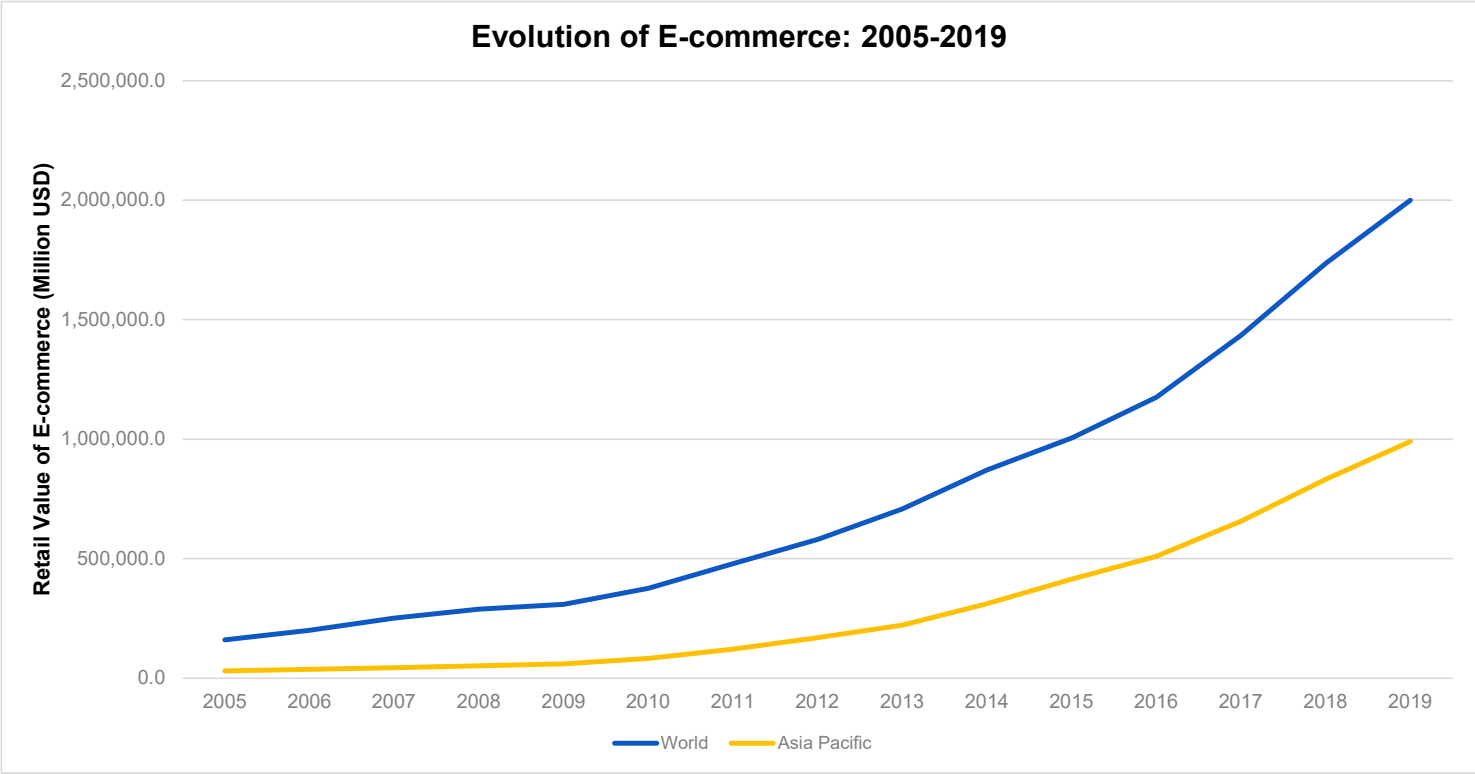
Sources: BIS (2018) and author's calculations.

Large and rising relative importance of card and e-money payments



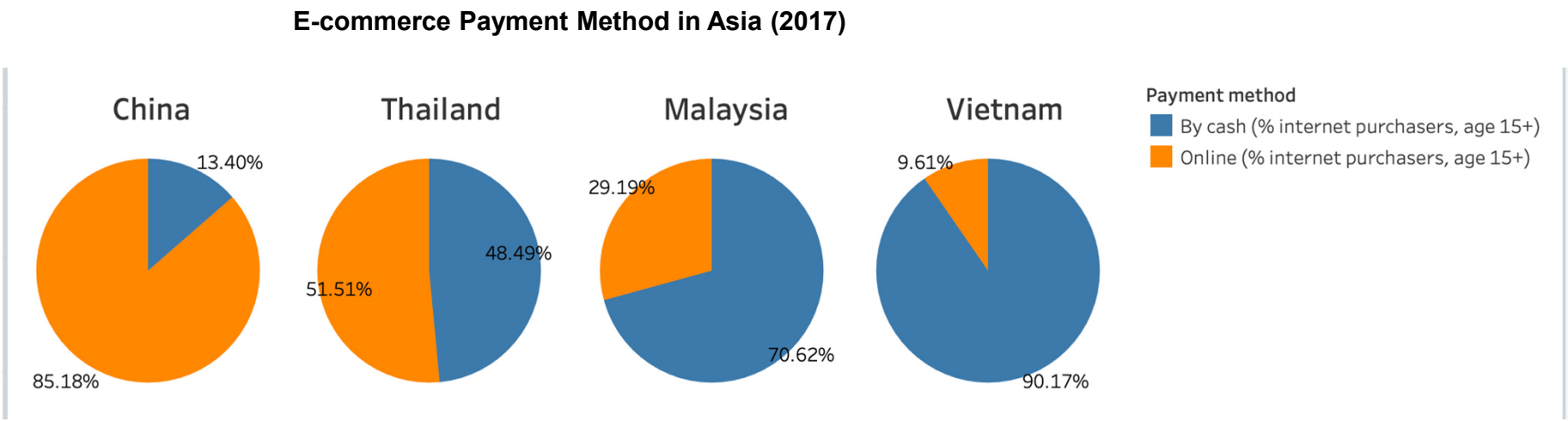
Sources: BIS (2018) and author's calculations.

E-commerce is growing exponentially



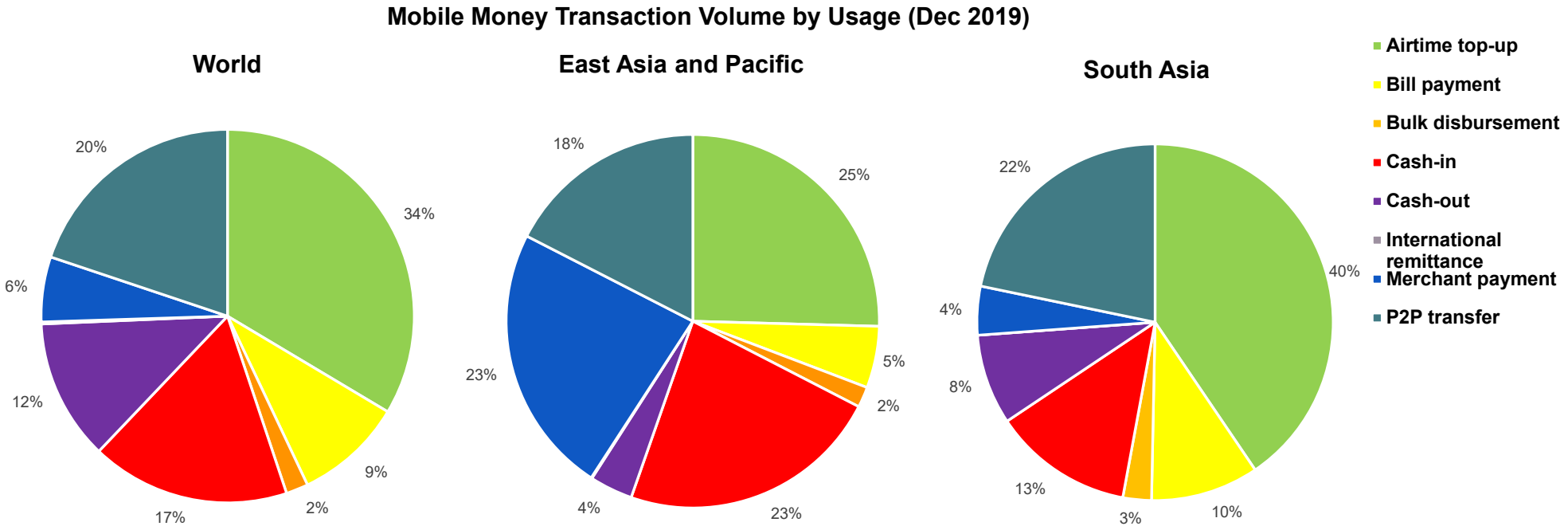
Source: Euromonitor (2019).

E-commerce payment methods vary in Asia



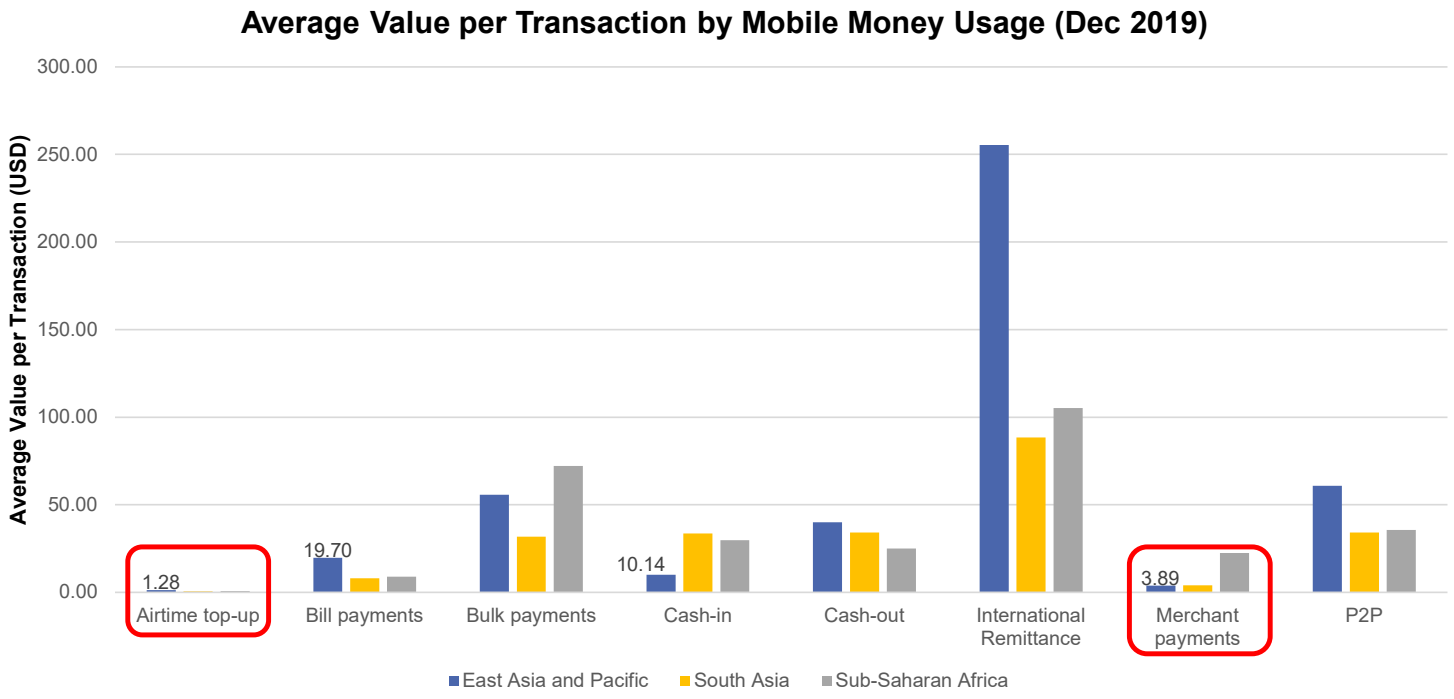
Source: Global Findex Database (2017).

Mobile money transaction volume highest for airtime top-up, followed by P2P and Cash-in/Cash-out. Mobile money also used frequently for merchant payment in East Asia



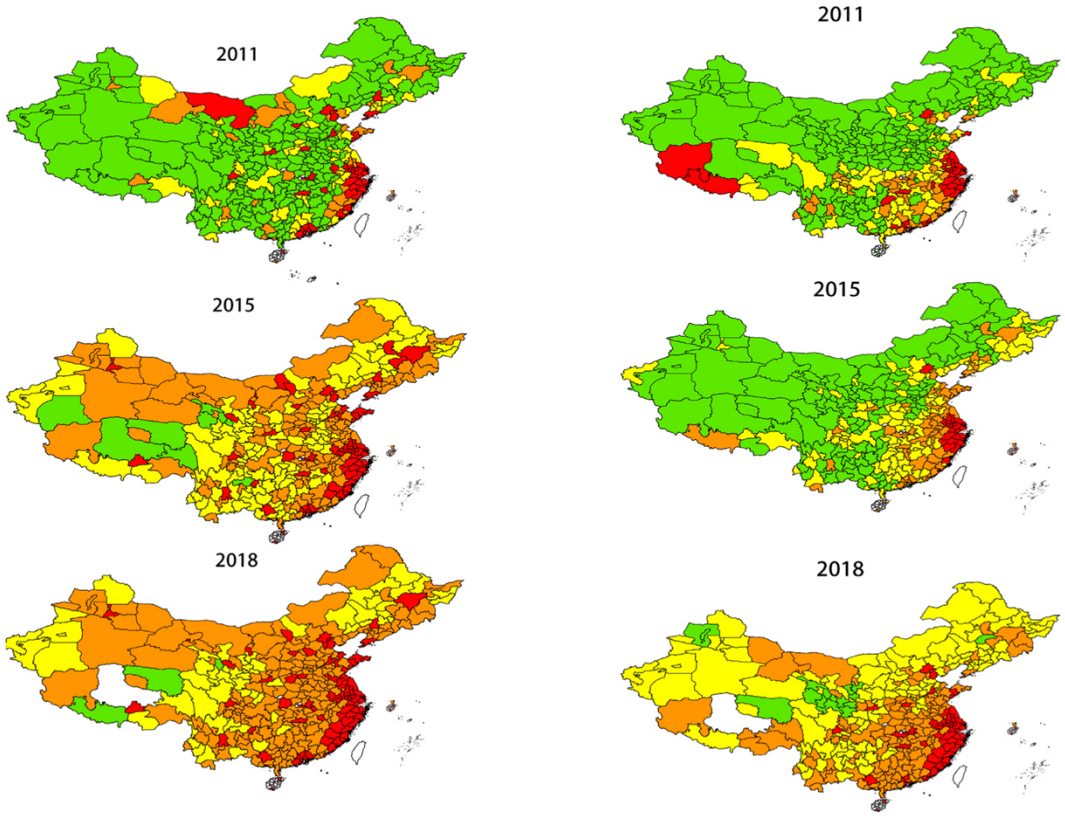
Source: GSMA (2020).

Average value per transaction very small for airtime top-up and merchant payments in Asia



Source: GSMA (2020).

PKU-DFIIC Relative Ranking



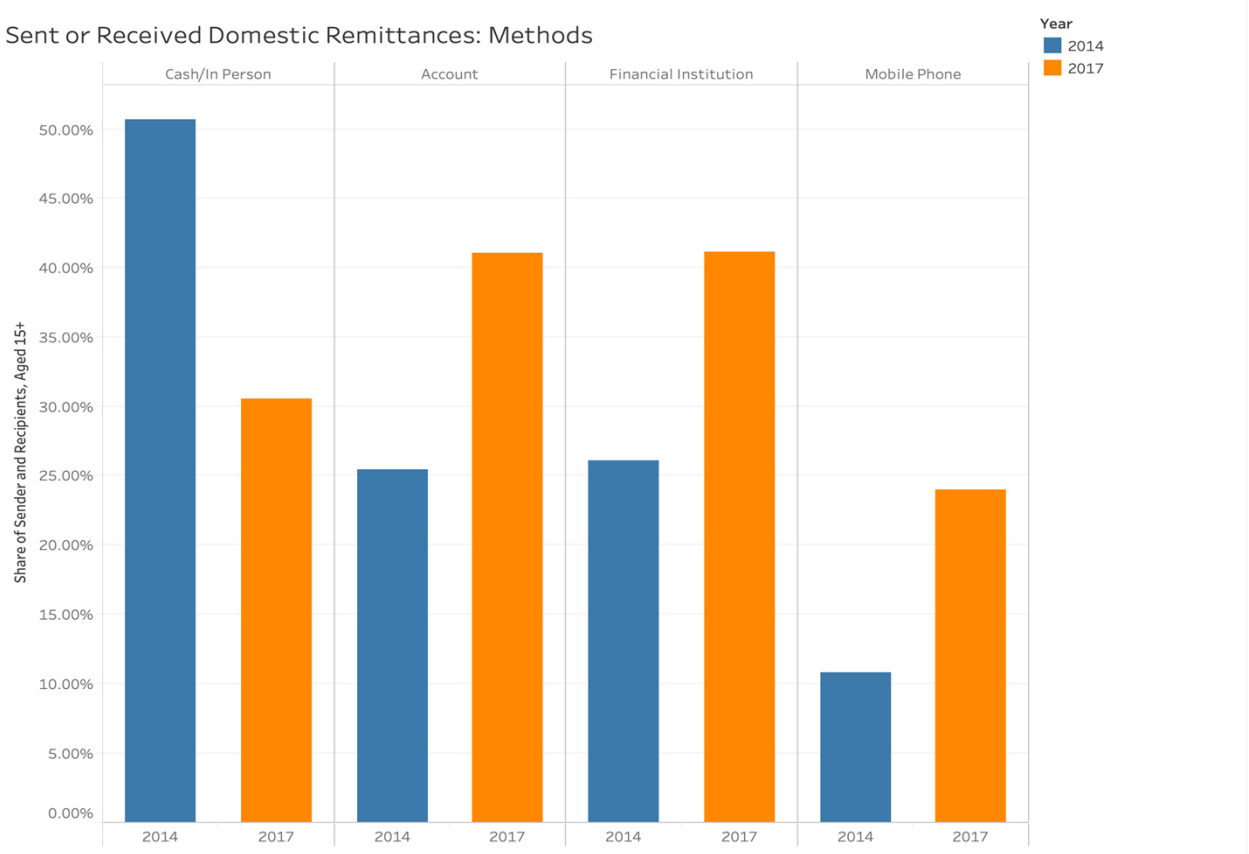
(a) Overall Index **(b) Depth of Usage Index**

Benchmark: highest index

- ≥ 80% benchmark
- 70-80% benchmark
- 60-70% benchmark
- ≤ 60% benchmark

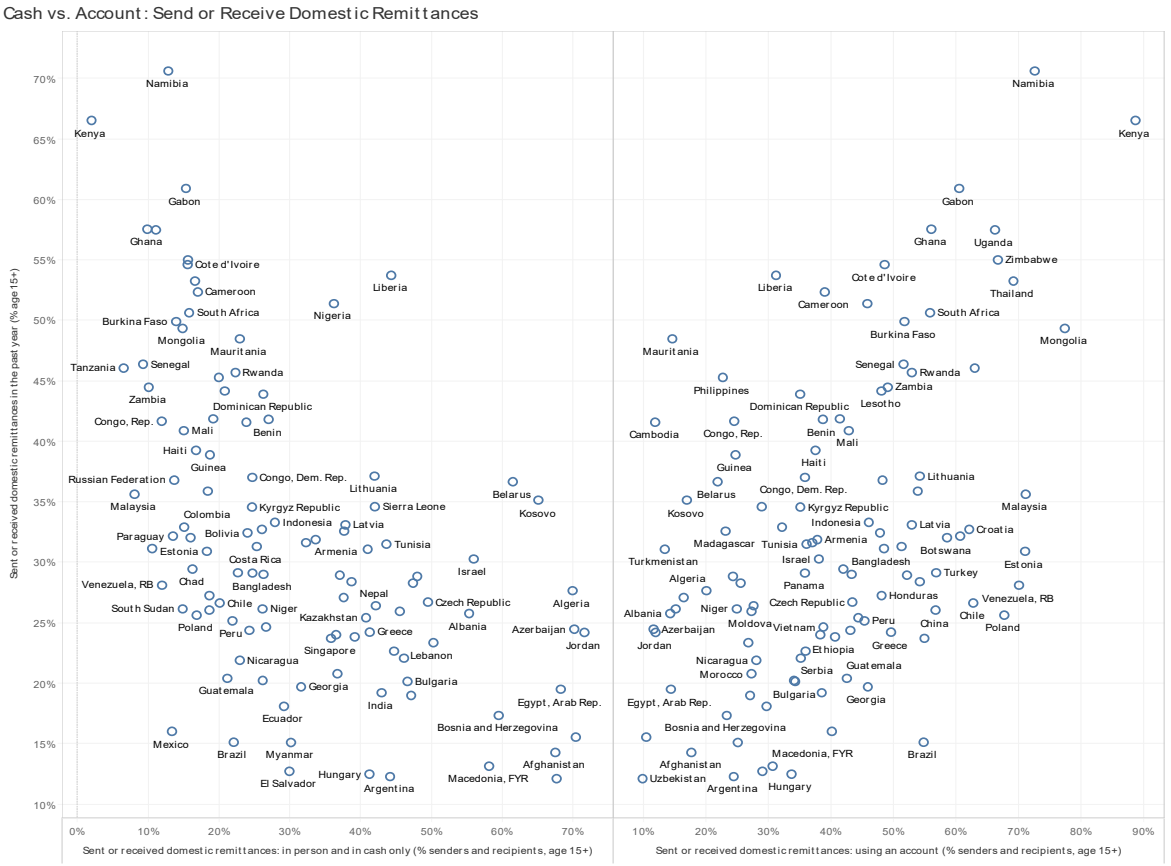
Source: Institute of Digital Finance, Peking University (2019).

Lower (higher) share domestic remittances transfers conducted in cash/in person (through financial accounts/mobile phone)



Sources: Global Findex Database (2014, 2017) and author's calculations.

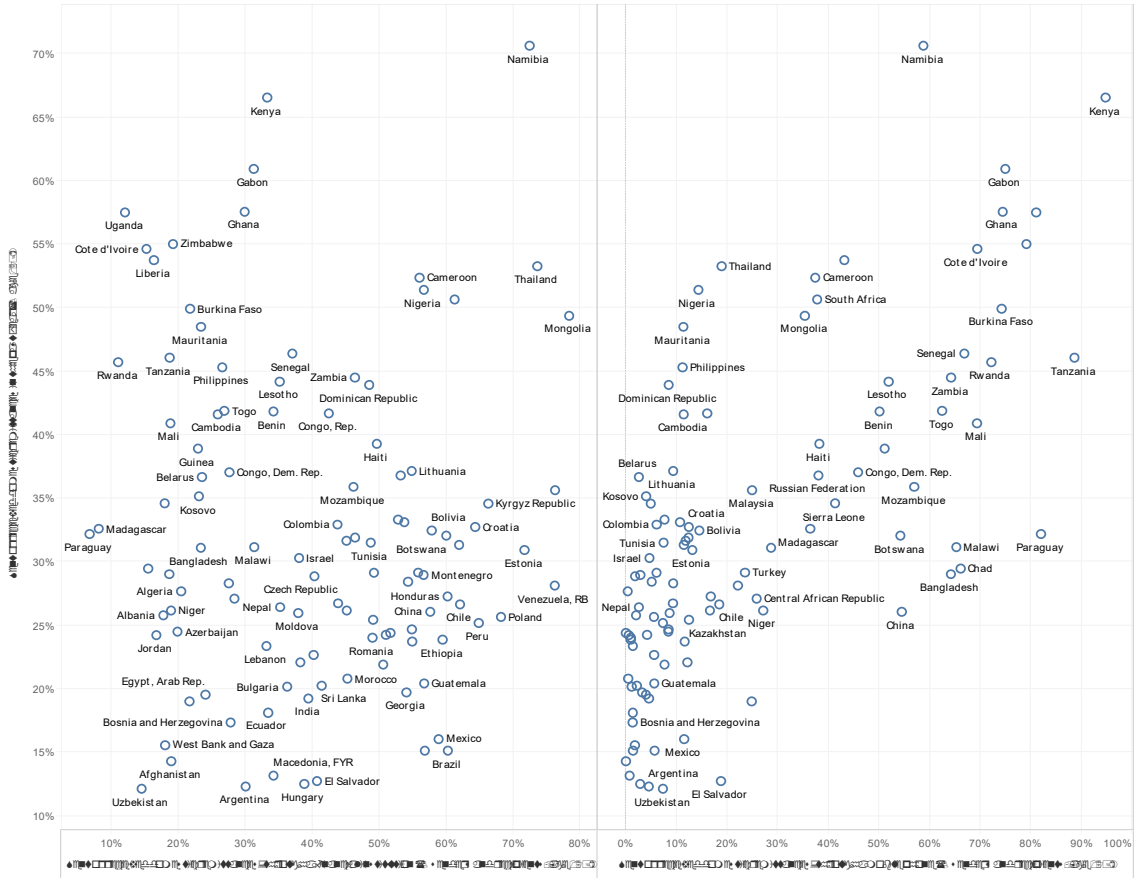
The share of population engaged in domestic remittances transfer and cash/in person (accounts) transfer are negatively (positively) associated



Sources: Global Findex Database (2017) and author's calculations.

The positive association with account transfer mostly driven by mobile phone rather than financial accounts.

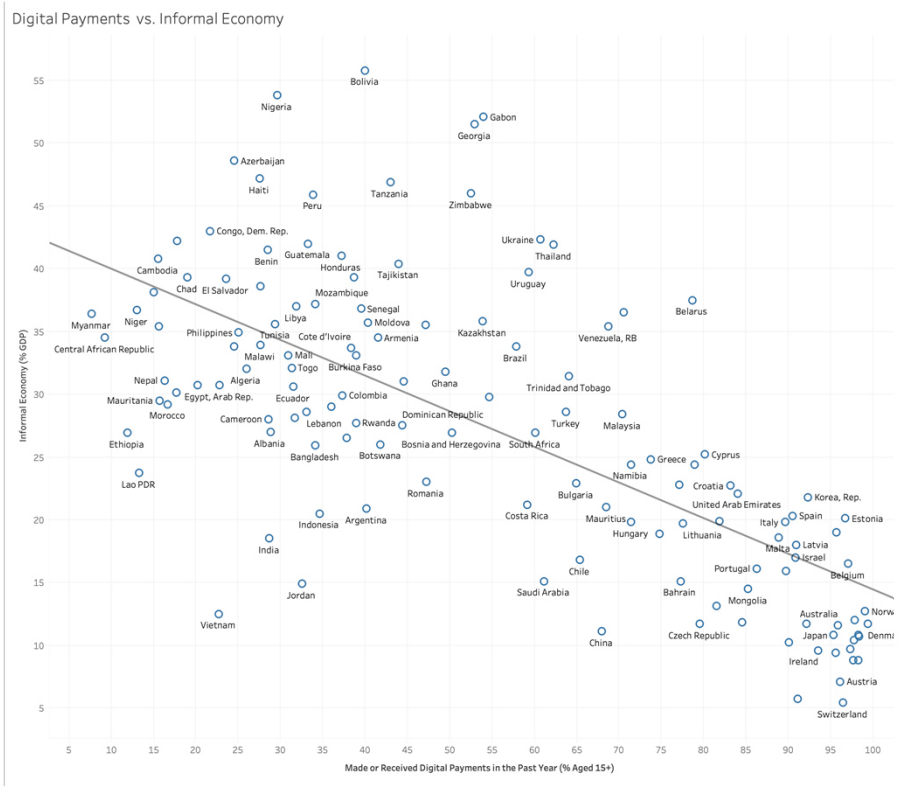
Financial Account vs. Mobile: Send or Receive Domestic Remittances



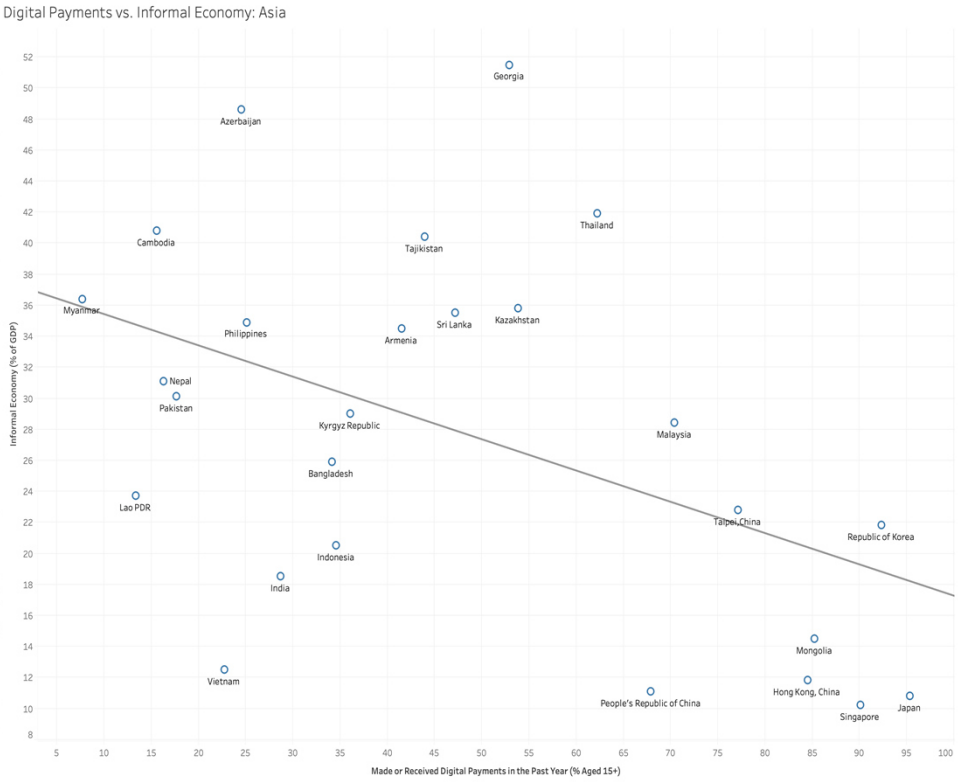
Sources: Global Findex Database (2017) and author's calculations.

Digital payments negatively associated with the share of the informal economy

World



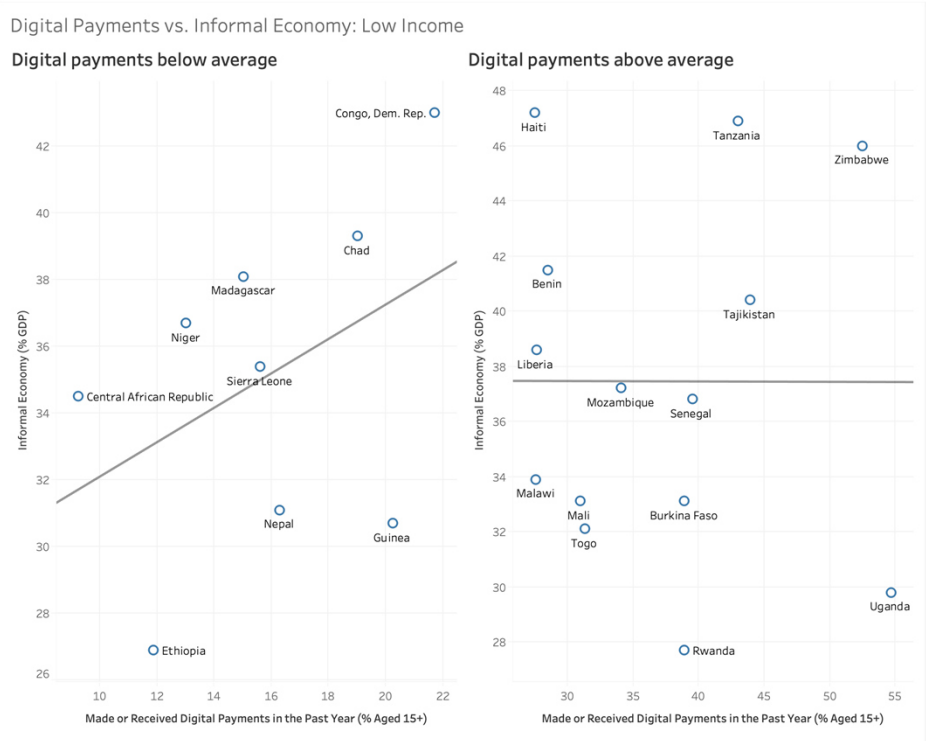
Asia



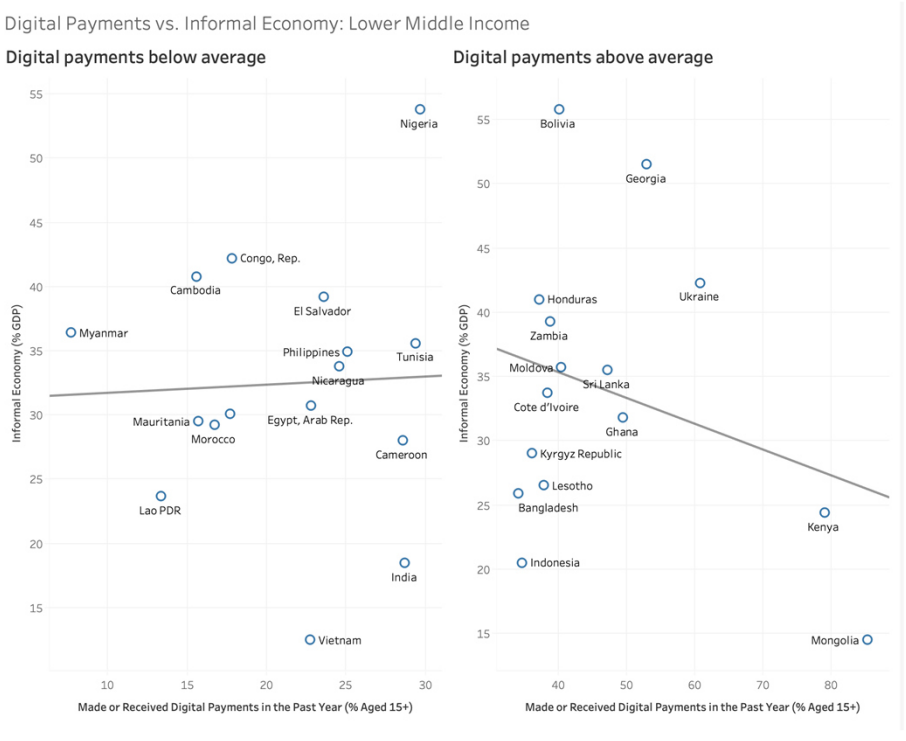
Sources: Global Findex Database (2017) and Medina and Schneider (2019).

Suggestive evidence of digital payments reducing the size of the informal economy

Low income



Lower middle income



Sources: Global Findex Database (2017) and Medina and Schneider (2019).