Financial Inclusion for the Elderly in Thailand: The Role of Information Communications Technology

Regional Conference on

The Health and Socioeconomic Well-Being of Older Persons in Developing Asia:

Role of Individual and Household Data

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1 Motivation

- Important role of financial inclusion (FI) in economic development (Aghion & Bolton, 1997; Galor & Zeira, 1993)
- FI as a vehicle to promote inclusive growth and reduce poverty (Loukoianova et al., 2018)
- Thailand: the Global Findex report in 2017
  - ranked 5th among the top quartile in FI in Asia Pacific,
  - 82% access to formal financial services ()
  - 97% in 2016 a household financial access survey (BOT, 2017)
  - very close gender parity in financial access, men (84%) and women (80%)

Why study FI? What problems?

- Who is excluded?
- World Bank (2019): not very good performance on the utilization and quality of financial service; only slight increase in share of HHs accessing financial services through mobile and internet banking

1 Motivation

- Fast aging in Asia and Thailand in 2005 (+60 yrs at 10.3%)
- Thai NSO in 2017 : 11,312,447 people aged +60
- aged society in 2022 (> 20% of +60), super-aged 2042
- role of financial services in aging society
- ratio of elder persons living alone has surged (10.8%)
- higher share of the elder living with spouse than with children

→ Need more independence in conducting financial transactions of this group

Meanwhile

- No studies on financial inclusion of the older persons in Thailand.
- Bank of Thailand surveys on financial access every 3 years at the HH level
- very small share (4%) the elderly with access to computers, the internet or social media (NSO, 2015).

1 Motivation

Objective:

- Examining the level of FI of different age groups in Thailand
- Identifying the main determinants of FI among the old age
- Exploring the potentials of digital financial technology such as mobile phone and mobile money/banking to promote FI Thai elderly

→ highlight the opportunities and challenges Fin services in the older age

1 Motivation

Preview of results:

Findex (2017):

- Elder account holders (+55 years) show an insignificant number of mobile money, but 84% own a mobile phone
- No significant gender difference in FI scores in general
- Labor force participation is a significant determinant of FI scores, gender difference in elder LFP
- Strong negative correlation between FI Score and Age: age groups and old age dummies

Thai ICT survey (2016)

- Low rate of Internet access among older persons, but substantial share of digital banking among elder internet users
- Main reasons: namely they don't know how to use Internet, and they don't see the need to use it
- High gender bias in Internet using toward women, rural people among the elderly
- 60-80% of the elderly (60-70%) finds mobile phones unnecessary; don't know how to use it
- Three forth of people using feature phones are the elderly

Outline

1	**Motivation**
2	**Empirical literature**
3	**Data, Financial Inclusion Scores & Empirical approach**
4	**Results**
5	**Result verifications with Thai ICT survey data**
6	**Concluding remarks**

2 Empirical review

FI in Thailand:

- FinScope (2013) 74% with bank account, with 23% other formal financial services → credit access in Thailand is inclusive and available
- financial inclusion: not for the whole adult population, not even across all levels of incomes (NSO, 2014).
- FinScope (2016) Thai households had better access to financial services with access level at 97.3% in 2016 (11.0% voluntarily self-excluded), from 95.8% in 2013 (BoT, 2017).
- non-banks and electronic payments (e-Payments) providers played increasing roles and decrease in the use of informal sector service providers.

Use of ICT:

- substantial difference between urban/rural areas and between age groups
  - Mobile phone users in urban area: 83.9% in 2014→91.5% in 2018 and in rural area: 71.8% → 87.9% (NSO, 2018).
  - 15-24 years old group used Internet most at 91.4%; age 50 years and over had the lowest at 21.2%

2 Empirical review

Digital payment : Prompay QR code, kicked off in 2018, official guideline of BoT in 4/2019

THAI QR PAYMENT

an open infrastructure and interoperability in payment and financial systems

ONE QR Code for

- ✓ ANY mobile applications
- ✓ MULTIPLE payment instruments
- ✓ ALL merchants
- ✓ OPEN infrastructure
- ✓ CROSS-BORDER payments

Source: Thailand's **Standardized QR Code for Payment (BoT, 2018)**

3 Data, Financial Inclusion Scores & Empirical Framework

3.1 2 datasets and 4 components of the analysis

1. Microdata from Global Financial Index database with a selection for Thai data in 2017
https://globalfindex.worldbank.org/

- Bill & Melinda Gates Foundation, by Gallup World Poll
- Over 160 countries, sample of 1,000 each, every 3 years (2011, 2014, **2017**)
- 2017 dataset: formal/informal financial services; use of mobile phones, internet for financial transactions
  - share of adults with an account (of which the percentage with financial institution account (formal) or mobile money account)
  - digital payment in the past year including made or received digital payment, used an account to pay utility bills, to receive private sector wages or government payments.
  - Use the internet to pay bills or to buy something online
  - Use a mobile phone or the internet to access an account
  - Use a debit or credit card to make a purchase
  - Domestic remittances, saving (at financial institutions, saving clubs) or credit (from financial institutions, used a credit card, borrowed from family or friends)

2. Nationally representative Household Survey on the use of ICT in Thai households 2016
http://www.nso.go.th/sites/2014en/itu

- Limit sample to only respondents aged +15 years

3 Data, Financial Inclusion Scores & Empirical Framework

3.1 Four main components of the analysis

- descriptive analysis with Findex 2017
- the measurement of Financial Inclusion (FI) scores
- Multivariate regression analysis with FI scores
- Result verification using the household survey on ICT use 2016

3 Data, Financial Inclusion Scores & Empirical Framework

3.2 Construction of financial inclusion measures

- follow OECD/INFE (2016) financial inclusion index
- based on two components:

holdings of financial products	active consumption of financial products
(a) savings or retirement products (b) payment products current account or mobile money (excl. credit cards…) (c) insurance products (d) credit products (credit card or mortgages).	(a) aware of available financial products; (b) Making conscious choices among financial products; (c) family or friends to help them save money or make ends meet

3 Data, Financial Inclusion Scores & Empirical Framework

3.2 Construction of financial inclusion measures

- Findex 2017: only 5 criteria (binary variables 0-1), scores ranked from 0 to 5

Table 1: Computing Financial Inclusion (FI) indicators

Indicator	Name of variables used	Meaning
1. Have an account	account	Has an account at the financial institution or non-financial institution
2. Saved in the past 12 months	Saved, fin15, fin16, fin17a, fin17c	Savings in any forms or for any purposes
3. Borrowed in the past 12 months	Borrowed, fin19, fin20, fin21a, fin21b, fin21c	Any credit products such as credit cards, house/land mortgage, bank loans, etc. from any formal or informal institutions
4. Possible source of emergency fund from family or friends	fin26, fin28	Possible coming up with emergency fund and the main source of such fund comes from family or friends
5. Sent or received domestic remittances in the past 12 months	fin24, fin25	Either sent or received domestic remittances in the past 12 months

Source: Author's own compilation adopted from OECD/INFE (2016)

3 Data, Financial Inclusion Scores & Empirical Framework

3.3 Empirical models

- normalize FI scores into z-scores, Morgan and Trinh (2019)

$$FI\ z-score = \frac{FI\ score - mean(FI\ score)}{Std.\ Dv\ (FI\ score)}$$

- Basic model

$$FI\ z-score_i = \beta_1 + \beta_2 Gender_i + \beta_3 Educ_i + \beta_4 Income_i + \beta_5 LaborForce_i + \beta_6 Age_i + \varepsilon_i$$

- Extended model:

$$FI\ z-score_i = \beta_1 + \beta_2 Gender_i + \beta_3 Educ_i + \beta_4 Income_i + \beta_5 LaborForce_i + \beta_6 Age_i + \beta_7 Mobilephone_i + \beta_8 MobileMoneyAccount_i + \varepsilon_i$$

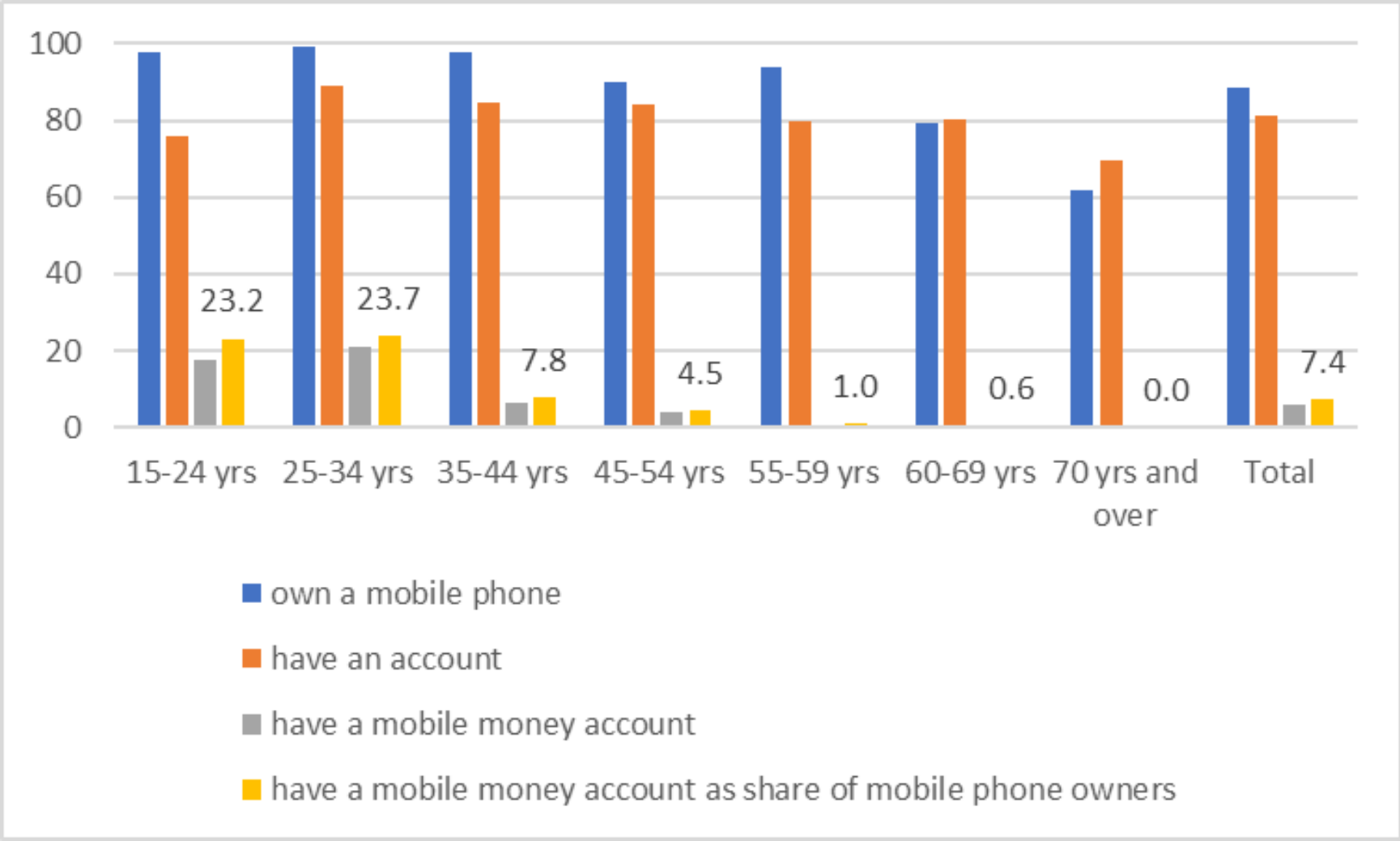
4 Discussion of results

4.1 Descriptive analysis on the financial inclusion for the elderly

- large proportion having account (almost exactly at financial institutions, 812 vs. 809 respondents)
- only 57 people (7%) own a mobile money account
- Among 188 respondents without an account, 50.5% are the elderly aged 55+ and 36.7% are 60+ years old

4 Discussion of results

Figure 1: Shares of having an A/C, money mobile A/C and a mobile phone



4 Discussion of results

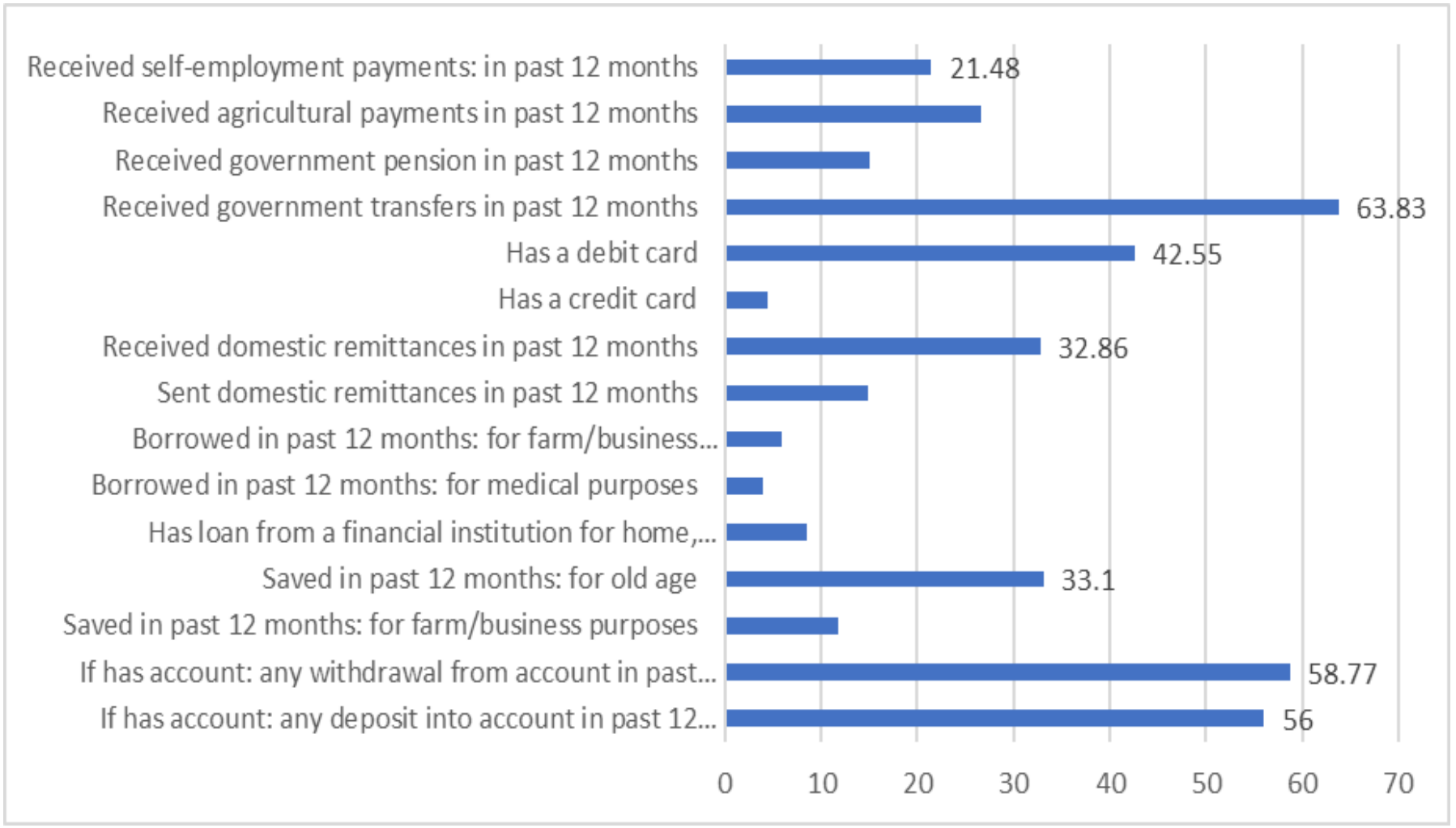
- Gender and labor force participation (LFP):
  - *63% are female in the sample, but fair share of elderly in each group 29%*
  - *74% in labor force, but less older women in LF than older men, gap 20-30%*

- Education level and income level: higher shares of having mobile money AC, using internet banking*:*
  - *2 top quintiles 40% account for +70% of all mobile money AC)*
  - *More 53% using internet banking completed secondary education, 30% tertiary*

- Mobile banking and internet banking:
- *Small share 16.8% using of mobile phones or internet to access FI account, 19.5% check account balance*
- *higher among in the labor force 18.4%, only 11.6% among non-labor force participants*
- *elder people +60 years, only 5% and 3.2% respectively, even lower 2% for non-LFP*

4 Discussion of results

Figure 2: the use of financial transaction among the elderly in Thailand



4 Discussion of results

Table 2: The elderly borrowed and saved through different channels

		Channels		
	No. of elderly	Formal FIs	Informal Savings clubs	Family and Friends
Borrowed in the past year	154	76	14	71
	36%	*49%*	*9%*	*46%*
Saved in the past year	192	124	40	
	45%	*65%*	*21%*	

Table 3: The elderly received payments with different methods

		Received through		
	No. of elderly	Formal FIs	Mobile phones	Cash/MTO
Received government transfer	270	164	1	96
	64%	61%	0%	36%
Received agricultural payments	113	28	1	82
	27%	25%	1%	73%
Received self-employment payments	55	4	0	48
	13%	7%	0%	87%
Received wage payments	76	25	0	47
	18%	*33%*	*0%*	*62%*
Received domestic remittances	139	86	3	50
	33%	*62%*	*2%*	*36%*

4 Discussion of results

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Table 4: The elderly made payments with different methods

		Sent/paid through		
	No. of elderly	Formal FIs	Mobile phones	Cash/MTO
Paid utility bills	369	22	0	344
	87%	6%	0%	93%
Sent domestic remittances	63	46	1	16
	15%	*73%*	*2%*	*25%*

4 Discussion of results

4.2 Calculation of Financial Inclusion scores

Table 5: Financial Inclusion Score by different categories

				Quantiles				
Categories	Obs	Mean	Std.Dev.	Min	25th per	Median	75th per	Max
By gender								
Male	368	2.56	1.29	0	2	3	4	5
Female	632	2.47	1.34	0	2	3	3	5
By education level								
completed primary or less	594	2.21	1.28	0	1	2	3	5
secondary	328	2.82	1.29	0	2	3	4	5
completed tertiary or more	76	3.45	0.97	0	3	4	4	5
By income quintile								
poorest 20%	199	1.99	1.27	0	1	2	3	5
second 20%	202	2.39	1.24	0	2	2	3	5
middle 20%	186	2.47	1.38	0	1	3	4	5
forth 20%	191	2.63	1.36	0	2	3	4	5
richest 20%	222	2.99	1.17	0	2	3	4	5
By labor force participation								
out of workforce	263	1.94	1.24	0	1	2	3	5
in workforce	737	2.7	1.29	0	2	3	4	5
By age group								
15-24 yrs	91	2.64	1.4	0	2	3	4	5
25-34 yrs	109	3.15	1.22	0	2	3	4	5
35-44 yrs	167	2.8	1.25	0	2	3	4	5
45-54 yrs	210	2.68	1.26	0	2	3	4	5
55-59 yrs	128	2.38	1.38	0	1	2	3	5
60-69 yrs	196	2.11	1.24	0	1	2	3	5
70 yrs and over	99	1.74	1.12	0	1	2	3	4
Overall	**1000**	**2.5**	**1.32**	**0**	**2**	**3**	**3**	**5**

4 Results

Figure 3: Correlation between FI Score & Age

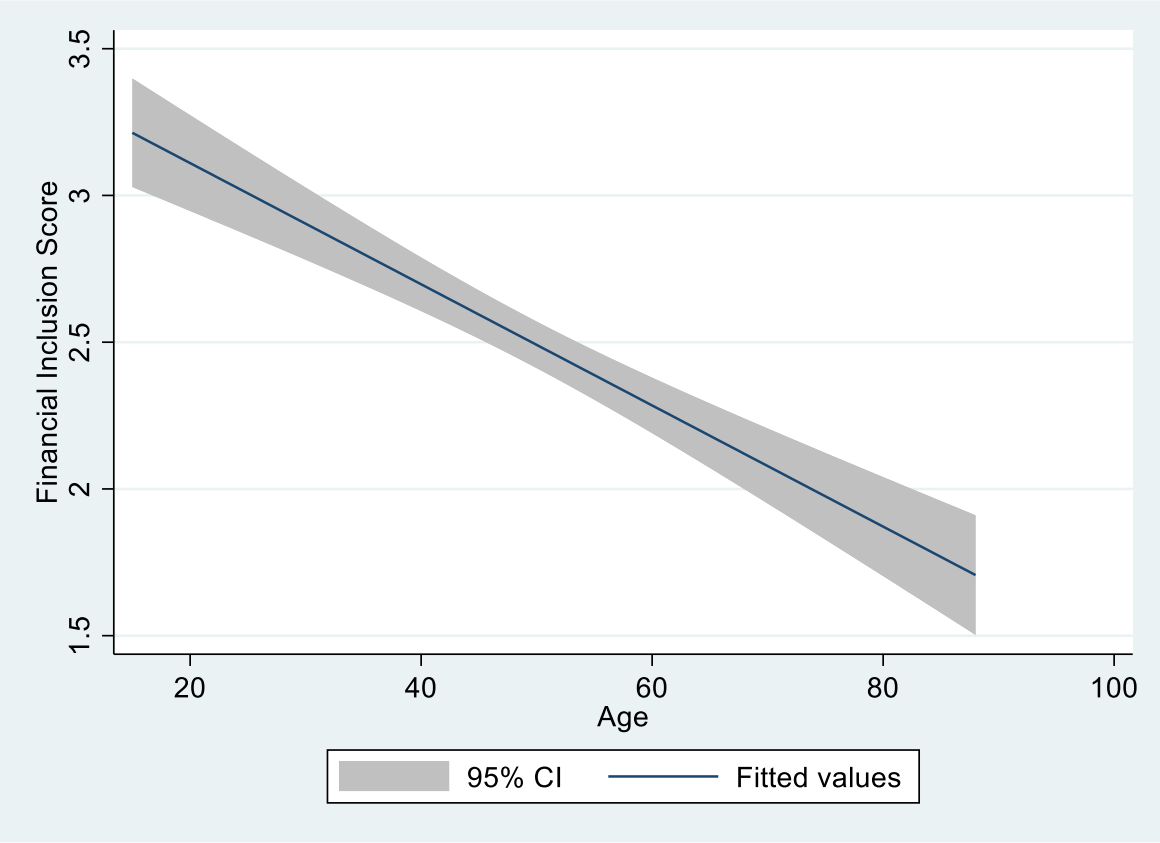
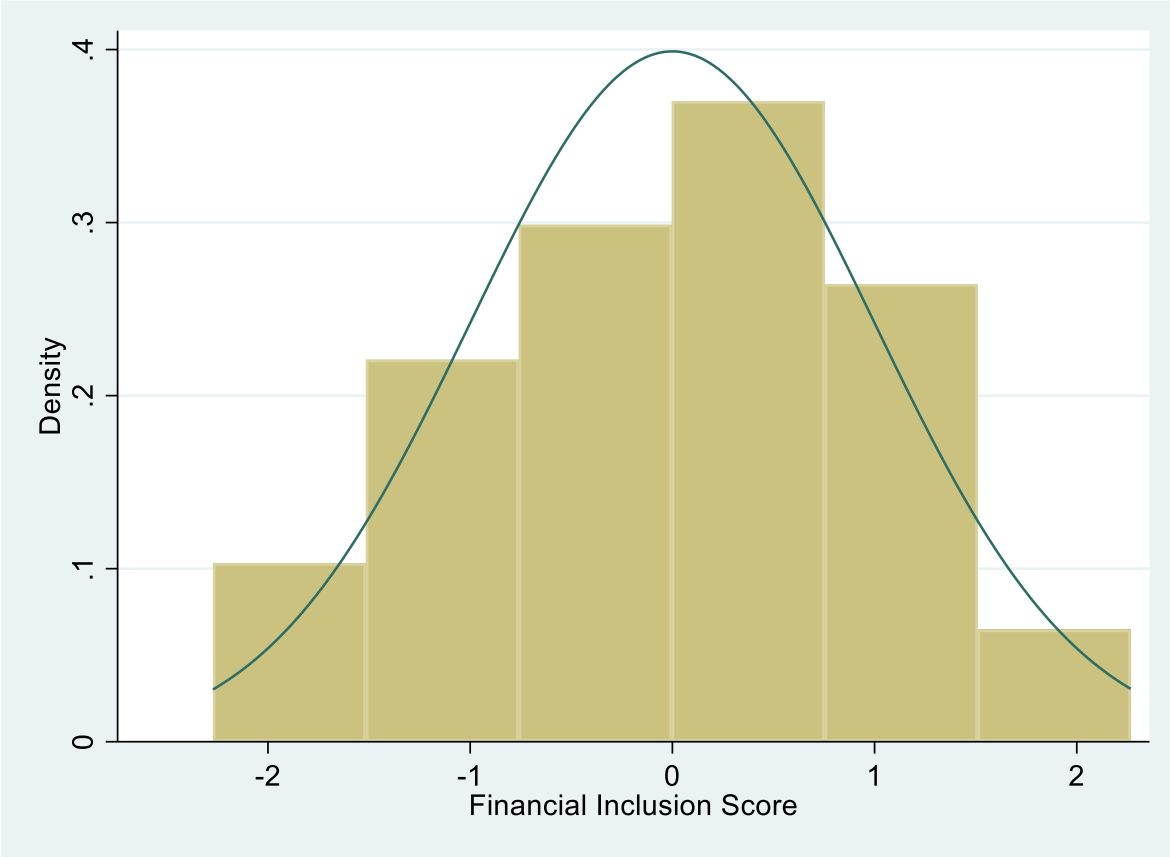


Figure 4: Distribution of the FI z-score



4 Results

4.3 Econometrics analysis of FI score determinants

Table 6: Determinants of Financial Inclusion score – basic model

	Model 1	Model 2	Model 3	Model 4
Gender (Female as reference)				
Male	0.0262	0.0165	0.0258	0.0244
	(0.0617)	(0.0616)	(0.0615)	(0.0615)
Education level (primary or less as reference)				
Secondary	0.216***	0.223***	0.248***	0.226***
	(0.0790)	(0.0818)	(0.0710)	(0.0733)
Tertiary or higher	0.593***	0.622***	0.635***	0.615***
	(0.127)	(0.129)	(0.122)	(0.123)
Income quintile (poorest group as reference)				
second quintile	0.175*	0.150	0.149	0.168*
	(0.0933)	(0.0937)	(0.0937)	(0.0931)
middle	0.178*	0.137	0.136	0.164*
	(0.0961)	(0.0974)	(0.0970)	(0.0960)
forth quintile	0.249***	0.213**	0.210**	0.233**
	(0.0966)	(0.0979)	(0.0977)	(0.0967)
richest	0.393***	0.351***	0.362***	0.371***
	(0.0982)	(0.0990)	(0.0987)	(0.0984)
Labor force participation (out of labor force as reference)				
in the work force	0.434***	0.383***	0.415***	0.424***
	(0.0688)	(0.0713)	(0.0692)	(0.0687)

4 Results

4.3 Econometrics analysis of FI score determinants

Table 6: Determinants of Financial Inclusion score – basic model (cont.)

	Model 1	Model 2	Model 3	Model 4
Age	-0.00613***			
	(0.00224)			
Age group (young group 15-24yrs old as reference)				
agegroup2 (25-34 yrs)		0.218		
		(0.133)		
agegroup3 (35-44 yrs)		0.0414		
		(0.122)		
agegroup4 (45-54 yrs)		0.134		
		(0.124)		
agegroup5 (55-59 yrs)		-0.0430		
		(0.135)		
agegroup6 (60-69 yrs)		-0.152		
		(0.129)		
agegroup7 (70 yrs and over)		-0.287**		
		(0.146)		
aging60			-0.254***	
			(0.0729)	
aging55				-0.240***
				(0.0684)
_cons	-0.352**	-0.582***	-0.551***	-0.537***
	(0.169)	(0.141)	(0.105)	(0.107)
R-square	0.155	0.165	0.159	0.159
No. of observations	998	998	998	998

t statistics in parentheses ** p<0.05, ** p<0.01, *** p<0.001*

4 Results

Table 7: Effects of mobile phones and mobile money accounts on financial inclusion – extended model

	Model 5	Model 6	Model 7	Model 8
Gender (Female as reference)				
Male	0.0292	0.0328	0.0356	0.0362
	(0.0605)	(0.0611)	(0.0601)	(0.0602)
Education level (primary or less as reference)				
Secondary edu	0.219***	0.199***	0.171**	0.171**
	(0.0703)	(0.0717)	(0.0709)	(0.0709)
Tertiary edu or higher	0.639***	0.554***	0.558***	0.562***
	(0.121)	(0.123)	(0.122)	(0.123)
Income quintile (poorest group as reference)				
second quintile	0.142	0.160*	0.154*	0.155*
	(0.0923)	(0.0931)	(0.0917)	(0.0919)
middle	0.115	0.138	0.117	0.117
	(0.0961)	(0.0963)	(0.0954)	(0.0954)
forth quintile	0.200**	0.202**	0.193**	0.193**
	(0.0964)	(0.0970)	(0.0957)	(0.0958)
richest	0.339***	0.353***	0.331***	0.330***
	(0.0978)	(0.0981)	(0.0972)	(0.0973)
Labor force participation (out of labor force as reference)				
in the work force	0.394***	0.407***	0.386***	0.387***
	(0.0683)	(0.0687)	(0.0679)	(0.0679)

4 Results

Table 7: Effects of mobile phones and mobile money accounts on financial inclusion – extended model (cont.)

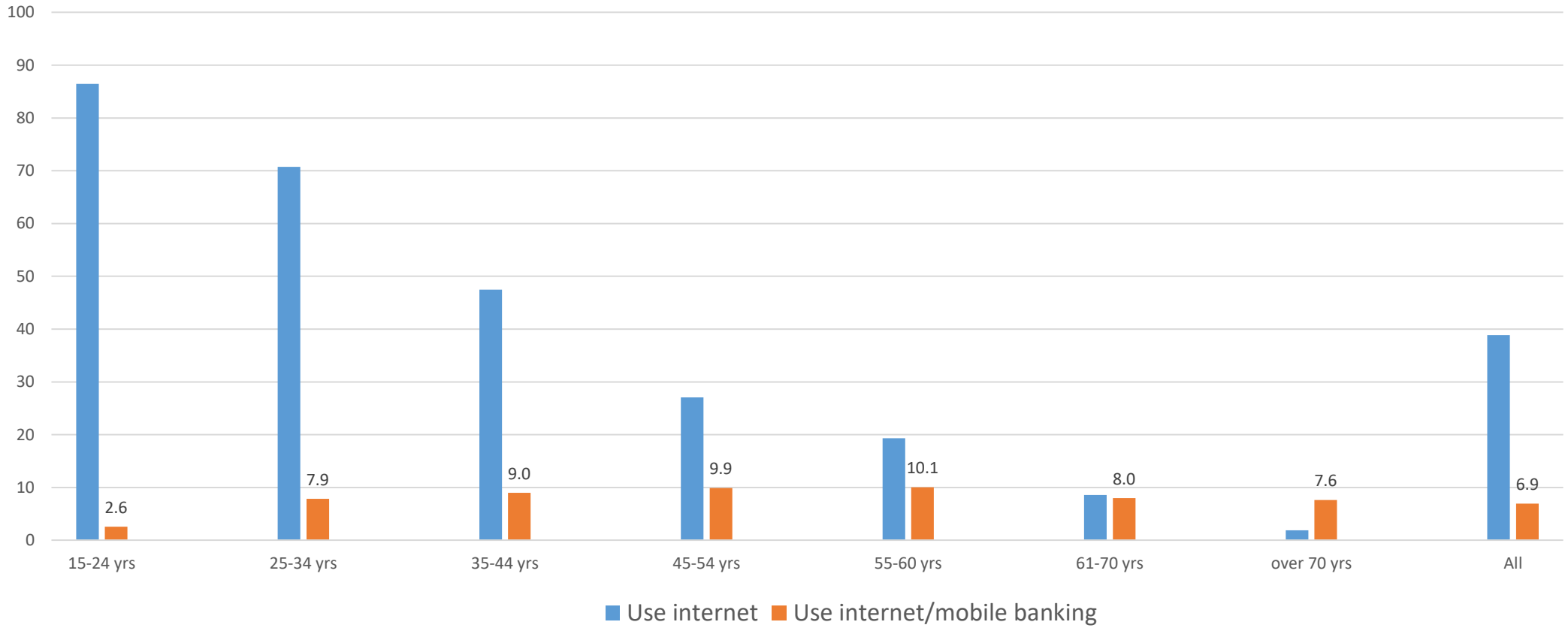
	Model 5	Model 6	Model 7	Model 8
aging60	-0.169**	-0.241***	-0.156**	-0.157**
	(0.0741)	(0.0725)	(0.0737)	(0.0738)
mobile phone	0.469***		0.470***	0.466***
	(0.0992)		(0.0985)	(0.0991)
mobile money A/C		0.489***	0.482***	0.198
		(0.127)	(0.125)	(0.914)
mobile*A/C interaction				0.288
				(0.920)
_cons	-0.956***	-0.560***	-0.965***	-0.963***
	(0.136)	(0.105)	(0.135)	(0.135)
R-square	0.180	0.171	0.192	0.192
No. of observations	991	998	991	991

t statistics in parentheses ** p<0.05, ** p<0.01, *** p<0.001*

5 Result verification with Thai HH survey data on ICT use

Internet use, mobile phones, digital banking among Thai elderly (HH survey on ICT use 2016)

Figure 5: Shares of internet users and Internet or mobile banking use by age group



5 Result verification

Table 10: Internet using experience by age group

age group	diff (men vs. women)	se	z	p-value	N
55-59	-0.042	0.007	-5.69	0.000	12939
60-69	-0.042	0.005	-7.97	0.000	21583
70 &over	-0.029	0.005	-5.97	0.000	17856
all 3 groups	-0.041	0.003	-12.40	0.000	52378
age group	**diff (urban vs. rural)**	**se**	**z**	**p-value**	**N**
55-59	-0.066	0.007	-8.99	0.000	12939
60-69	-0.067	0.005	-12.87	0.000	21583
70 &over	-0.024	0.005	-5.00	0.000	17856
all 3 groups	-0.041	0.003	-12.40	0.000	52378

5 Result verification

Table 11: The use of internet in different places

Place	All	55-60 years	61-70 years	over 70 years
1. home	68.9%	73.7%	75.8%	71.3%
2. work	37.3%	57.0%	17.8%	11.7%
3. school	17.8%	4.2%	0.9%	1.5%
4. Internet shop	7.8%	1.0%	1.0%	3.5%
5. ICT community centre	3.7%	2.7%	2.8%	5.0%
6. other's house	20.7%	14.5%	13.1%	12.9%
7. public place	3.9%	3.3%	2.6%	2.3%
8. any place (mobile device)	89.2%	87.8%	84.4%	78.9%
9. other	0.2%	0.3%	0.4%	2.3%
Min	1	1	1	1
Max	9	9	9	6
Average	2.53	2.48	2.01	1.92
No. of obs	66,738	3,102	2,032	341

5 Result verification

Table 12: Reasons for not using the Internet

Reason	55-59	60-69	70+	All 50+
2. not necessary	75.0	70.8	60.3	65.6
3. expensive device	3.3	2.5	0.9	1.7
4. expensive service	0.8	0.6	0.2	0.4
5. don’t know how to use	11.7	19.1	35.7	27.3
6. no network	0.4	0.4	0.1	0.2
7. poor signal	0.1	0.1	0.0	0.1
8. other	8.6	6.5	2.8	4.8
	100	100	100	100
No. of elder with no mobile phone	2,504	6,455	10,931	19,890
No. of elder	16,041	23,615	18,197	57,853
Share	15.6%	27.3%	60.1%	34.4%

5 Result verification

Table 13: Types of mobile phone owned by Thai elderly

Type of mobile phone	55-59	60-69	70+	All 55+	ALL
feature phone	11,857	20,102	17,205	49,164	64,301
	18.4%	*31.3%*	*26.8%*	*76.5%*	
Smart phone	6,914	10,104	11,962	28,980	76,152
	9.1%	*13.3%*	*15.7%*	*38.1%*	
Both	226	136	39	401	2,166
	10.4%	*6.3%*	*1.8%*	*18.5%*	

Other tables on:

most regular payment methods for online and offline shopping channels

- online shopping: mobile banking users account for over 90%; conventional methods of payments are more dominant among non-users
- offline shopping: negligible the difference

6 Concluding remarks

- progress in financial inclusion in Thailand, elderly is a group of concerns
- among those non-account holders, more than half are the elderly +55 yrs
- level of digital financial inclusion is still low 7%
- share of using mobile phones and internet access (5% and 3.2% respectively)
- The older the users, the lower their FI scores → negative effects
- strong correlation: labor force participation, mobile phones, mobile money accounts and FI scores

6 Concluding remarks

- not using the Internet; Lack of skills rather than lack of interest
- Elderly with feature phones vs. smart phones

→ *provision of devices, role for financial literacy, and digital technology to promote financial inclusion*

- *Internet service products for the elderly need coordination (policymakers and service providers); more custom-made financial products (financial institutions)*
- *Public-private partnerships for future financial environment for the old age*

Thank you for your attention!