

FACTORS IMPACT DIGITAL FINANCIAL CONSUMER PROTECTION IN 135 COUNTRIES FROM 2014-2018

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• Problem:

- (1) Digital finance consumers are facing many disadvantages due to <u>asymmetric information</u> [Complex terminology of documents for consumers (Burke & Fry, 2019); Difficulty of consumers in information processing and analysis (Jin & Wagman, 2020); Financial goods/services with new features, eg. winner-takes-all (Facebook), customer data mining (streaming platforms) (because of new technology) (OECD, 2016a; World Bank, 2015), domination of informal finance, etc]
- (2) Vulnerable groups (low income, poor, women, etc) could be at more disadvantage even excluded - <u>Inequality</u>.
- (3) The lack of protective mechanisms will undermine social trust then adversely impacts on long-term growth (transaction cost) (OECD, 2011a) – <u>Negative externality</u>
- \Rightarrow Need to know the state of DFCP in the world.
- \Rightarrow Draw some conclusions towards improving DFCP.

• Main contribution:

- (1) Quantify the DFCP index in 135 countries around the world in the 2014-2018 period.
- (2) Identify the main factors affecting DFCP.
- (3) Provide some policy implications for improving DFCP.

Research questions:

- How is the DFCP index measured and quantified?
- Which factor groups impact the DFCP index and which are the most important factors in the research period?
- How to improve DFCP in the future?

(DFCP measurement)

Author	Finding
Chen (2018)	Qualitative analysis of overall structure of FCP policies for 13 countries
OECD (2016b)	The financial literacy score developed through out doing survey
World Bank (2012)	Do survey about consumer complaint and resolution mechanism
Federation of German Consumer Organisation (2017)	Define DFCP index through 25 aspects belong to 8 dimensions and its proxy data.
World Bank	Financial Inclusion Index (<u>https://www.worldbank.org/en/topic/financialinclusion)</u>
	Global Findex (<u>https://globalfindex.worldbank.org/)</u>

(Federation of German Consumer Organisation (2017)



(Factors affecting the DFCP index)

Author	Factors	Finding
Lumpkin (2010); Robert (2013); OECD (2017b); Polat & Abdulsalam, (2014); Rösner et al., 2020)	Financial Education and Society (+)	 + Improving consumer understanding (financial education, financial literacy, easy access to information, etc.) + Social trust is an important factor in improving the financial Inclusion (protecting the vulnerable group)
Mishra & Bisht (2013); Mushtaq & Bruneau (2019); Sarma & Pais (2011)	Infrastructure and Technology (+)	+ Information & Communication Technologies (ICT) has an important impact on aspects of Digital FCP (eg access to banking services, digital banking development)
World Bank, 2018		Data transformation (from Bigdata) can effectively satisfy the diverse needs of consumers (higher security, improved financial goods/services)

(Factors affecting the DFCP index)

Author	Factor group	Finding
Thakor (2012) OECD (2009) OECD (2011)	Market Size (+)	 + The expansion of the market reflects the higher competition pressure of the economy. + Increased competition contributes to the improvement of financial goods/services, eliminating monopoly in the market
Aghion & Howitt (1992); Romer (1990; Pakes & Griliches (1980); Marcia & Greta (2014); Chen(2018) Oya, Joyce, & Nataliya (2011)	Institutional Innovation (+/-)	 + Innovation-promoting mechanisms (R&D investments, research activities in universities, etc.) contribute to long-term growth, reduce transaction costs, and quickly solve problems arising for financial consumers. + The uncertain relationship between institution and financial service system
Fishbein & Woodall, 2006; Mohanty, 2014	Gender Gap	gender discrimination

(Limitation)

- (1) There is no complete DFCP index in the world so far due to data limitations in the previous period.
- (2) Limited time and space and methodology.
- (3) There is no empirical model to evaluate factor groups impact DFCP index.

Data Collection - DFCP measurement

(using PCA with 8 dimensions)

Variable	Describe	Source
	Denotes the percentage of respondents, ages 15-60+,	Global Findex database
Access	who report having an account (by themselves or together	(http://datatopics.worldba
	with someone else) at a bank or another type of financial	nk.org/financialinclusion/)
	The Network Readiness Index (NRI)	https://networkreadinessi
		ndex.org/#highlight
Economic	Getting credit: Distance to frontier (0-100). Denotes the	World Bank, Doing
interests	distance of each economy to the "frontier," which	Business
	represents the highest performance observed on the	(http://www.doingbusines
	getting credit indicator across all economies included in	<u>s.org/)</u> .
Product	It is a trusted reference that measures the commitment	ITU Global Cyber-security
safety and	of countries to cyber-security at a global level	Index
liability		
	Equal 1 if countries have a law about protection of	https://unctad.org/en/Pag
Privacy	personal database, equal 0 if otherwise.	es/DTL/STI and ICTs/ICT4
and data		D-Legislation/eCom-Data-
security		Protection-Laws.aspx

Information and transparency	Disclosure index (0-5). The sum of a variety of existing disclosure requirements. These are (a) law specifies disclosure requirements in plain language, (b) law specifies disclosure requirements in local language, (c) law specifies requirement for prescribed standardized disclosure format, (d) law specifies requirement for recourse rights and processes, and (e) law specifies disclosure requirement of annual percentage rate using standard formula for credit products.	World Bank, Global Survey on Consumer Protection and Financial Literacy.
Literacy and awareness	Adult literacy (25%) + School life expectancy (25%) + Mean years of schooling (25%) + Tertiary enrollment (25%)	GSMA Mobile Connectivity Index
Dispute resolution and redress	Dispute resolution index (0-1). Index reflecting the existence of formal internal and external dispute resolution mechanisms. Takes the value 1 if both resolution mechanisms are available, the value 0.5 if one of the mechanisms is available, and 0 if neither of the mechanisms is available.	World Bank, Global Survey on Consumer Protection and Financial Literacy.
Participation	Generic Top-Level Domains (gTLDs) and Country Code Top- Level Domains (ccTLD) per person (20%) + Online Service Index score for E-Government (20%) + Mobile social media penetration (30%) + Mobile apps developed per person (30%)	GSMA Mobile Connectivity Index

Factor groups affecting DFCP index

- **Panel data** is used with 135 countries in the 2014-2018 period.
- Four factor groups are considered to impact the DFCP index, including
- (1) Financial Education & Society: Regulation instruction, financial literacy rate, easy access to information, Government efficiency, Business impact of malaria/Tuberculosis/HIV-AIDS.
- (2) Infrastructure and Technology: Availability of latest technologies, Firm-level technology absorption, FDI and technology transfer, Individuals using Internet, Fixed broadband Internet subscriptions
- (3) Market size: GDP, Exports as a percentage of GDP, Domestic market size index, Foreign market size index
- (4) Institutional Innovation : Capacity for innovation, Quality of scientific research institutions, Company spending on R&D, University-industry collaboration in R&D, Gov't procurement of advanced tech products, Availability of scientists and engineers

All of them were collected from **Global Competitive Index and Global Findex** Control variable: Gender gap in social media use (**Mobile Connectivity index**)

Factor groups affecting DFCP index

• Research model:

 $\mathsf{DFCPI}_{\mathsf{nt}} = \alpha + \sum_{h=1}^{4} \beta_h X_{nht} + \gamma Z_{nt} + e_{nt} + \theta_t$

We use fixed effect model and:

+ Robust standard error was implemented following the method of Arellano (1987), HC3 by MacKinnon & White (1985) to restrict heteroskedasticity.

+ Tests to ensure the appropriateness of the model, such as the Hausman test (compared random-); time- fixed effects tesing, etc.

Symbol	Expectation
Financial Education &	β_1 >0
Society (X ₁)	
Infrastructure &	β ₂ >0
Technology (X ₂)	
Market Size (X ₃)	β ₃ >0
	-
Institutional Innovation	β_4 >0
(X ₄)	
Gender gap – Control	γ
variable (Z)	
е	Error term
θ	latent
N = 135	Countries
T = 5	2014-2018

Results

(DFCP index)

World DFCP index, G20 countries, developing countries in 2014-2018 period

	World			G20 countries				Developing countries				
	Min	Max	Mean	Sd	Min	Max	Mean	Sd	Min	Max	Mean	Sd
2014	-3.45	2.61	-0.23	1.53	0.42	2.18	1.37	0.53	-3.11	1.35	-0.88	1.18
2015	-3.38	2.67	-0.14	1.52	0.54	2.2	1.44	0.53	-3.38	1.45	-0.8	1.2
2016	-3.29	2.79	-0.02	1.51	0.62	2.23	1.52	0.5	-3.29	1.61	-0.67	1.19
2017	-3.19	2.89	0.09	1.51	0.73	2.26	1.6	0.48	-3.05	1.77	-0.55	1.16
2018	-2.97	2.94	0.3	1.5	0.81	2.46	1.83	0.46	-2.9	1.88	-0.34	1.16

To consider the reasonableness of the results we perform:

- (1) Comparison with previous studies about DFCP (e.g. Chen, 2018)
- (2) Compare between G20's DFCP index and DFCP index of developing countries (t-test)
- (3) Compare with some relevant indicators (financial Inclusion; Global Findex)

Digital Financial Consumer Protection 2014



DFCP index is shown on the world map:

NDFCP index is shown correspondingly by color scale.

> North America,
> Western Europe, Asia
> Pacific and Japan have the highest DFCP index (Chen, 2018; Zhao, 2020)
>
> Africa & ASEAN
> (Vietnam,Lao, Campodia, etc) have the lowest DFCP index (OECD, 2018b)

The color shift (from dark blue to yellow) indicates a change of DFCP index

> E.g. Canada, Some countries belong to Sub-Saharan Africa, Russia and China

Results

(Regression)

Dependent variable: Digital Financial Consumer Protection Index (panel 135 countries in the 2014-2018 period)								
	(1) Fixed	(2) Fixed	(3) Fixed	(4) Fixed	(5) Random	(6) Fixed		
Financial	0.3143***				0.2365***	0.1799***		
Education &	(0.0613)				(0.0399)	(0.0458)		
Society								
Infrastructure &		0.6433***			0.5601***	0.4677***		
Technology		(0.0394)			(0.0348)	(0.0379)		
Institutional			0.6037***		0.1291***	0.1929***		
Innovation			(0.0667)		(0.0495)	(0.0560)		
Market size				1.0755***	0.4120***	0.7601***		
				(0.0869)	(0.0410)	(0.0728)		
Gender Gap					0.0070***	0.0055***		
(Control variable)					(0.0012)	(0.0015)		
Intercent					-6 0887***			
mercept					(0.2205)			
Observations	651	651	651	651	651	651		

*, **, *** - statistically significant at the 10, 5, and 1%.

Results

(Regression)

Dependent variable: Digital Financial Consumer Protection Index (panel data with 135 countries in the 2014-2018 period)

	(7) Fixed - Arellano	(8) Fixed – HC3	Rösner et al., 2020		
Financial Education &	0.1799***	0.1799***	Polat & Abdulsalam, 2014		
Society	(0.0554)	(0.0566)			
Infrastructure –	0.4677***	0.4677***	 > Sarma & Pais, 2011 > Shamim, 2007 		
Technology	(0.0425)	(0.0435)			
Institution -	0.0425***	0.1929**	Mushtaq & Bruneau		
Innovation	(0.0735)	(0.0746)	2019)		
Market size	0.7601***	0.7601***	Chen, 2018		
	(0.0836)	(0.0882)	The strongest effect		
Gender Gap	0.0055	0.0055	 OECD, 2009; OECD, 2011a 		
(control variable)	(0.0038)	(0.0049)			
Observations	651	651	 Fishbein & Woodall, 2006; Mohanty, 2014 		

*, **, *** - statistically significant at the 10, 5, and 1%.

Conclusion

- Improve DFCP due to the increasing and exacerbating of asymmetric information and inequality for digital financial consumers (compared to agencies).
- Quantifying DFCP index through 8 dimensions, including: access; economics interests; Product safety and liability; Privacy and data security; Information and transparency; Literacy and awareness; Dispute resolution and redress; Participation then provides the overview of DFCP status in the 2014-2018 period over 135 countries.
- Four key factors affecting DFCP index: *Financial Education & Society; Infrastructure & Technology; Market Size; Institutional Innovation →* Market size has the strongest impact

Conclusion

(How to Improve DFCP)



• THANKS FOR YOUR ATTENTION!