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Fintech for Geo-spatial Transformation and Real Estate Management

Authors: Rapporteur: Mr. Manohar Velpuri, Denmark

TS01I: Technological Change in Land Administration, Valuation and Financial Technology

Commission: 9

Chair: Mr. Steven Nystrom, United States

Disclaimer: The findings, interpretations and conclusions expressed herein this presentation are those of the authors and do not necessarily reflect the view of the organisations, sponsors, its Board of Directors or the governments they represent







Introduction

INDUSTRY 4.0

- Global geospatial policy framework
- Policies Geospatial (global) Industry 4.0
- Fintech and Geography
- **UN system and FINTECH**
- IMF FINTECH (Tech timeline, Global Financial stability report, Fintech trends)
- Real estate markets Access to credit
- Policy implications FINTECH (Industry 4.0)
- Evidence of Fintech impacting Access to credit
- Blockchain -challenges and opportunities
- Enabling policies for FINTECH (UNECOSOC)
- Open and ISO standards Policy NWIP
- Geospatial readiness index modified

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Further work























The United Nations System



UN Principal Organs

General Assembly **Subsidiary Organs**

Main and other sessional committees Dispresent Commission

Human Rights Council

International Line Commission UNEP Gold Nation Comment Programme Stoneling committees and ad hot besies UNFPA United Nations Population Fund

> UNICEF United Notions Children's Fund WFP World Food Programme (UNVTACE)

Funds and Programmes

- UNV United Nictions Voluments

UNDP Linked Nations Development Programme

+ UNCDF United Nations Copied Development Fund

UN-HABITAT United Notions Human Selforments

Research and Training

UNIOR Circled Nations Institute for Dispresent Research

UNITAR United Nations Institute for Training

UNSSC United Notions System Shiff College **UNU** United Nations University

Other Entitles

ITC International Trade Cartie (UNIVATOR

UNCTAD 1.8 United Notions Conference on Voide and Development

UNHCR Office of the United Hartons High-Constitutore for Balugans

UNOPS Used Nations Office for Project

UNRWA * United Nations Balled and Works Agency for Polistine Balugess in the Neor East

UN-Women Linkel Nations Ently for Carolin Equality and the Empowement of Women

Related Organizations

CTBTO Preparatory Commission

Preparatory Commission for the Comprehension Nucleor Test Burt Frenty

IAIA 1-3 Sales along Along Every Agents

ICC International Criminal Court

ISA international Sociaed Authority ITLOS international followed for the law-

OPCW¹ Organisation for the Prohibition of Oreman Wespons

WTO 1.4 World Stude Organization

UNIDO United Nations Indicated

WHO World Hadh Organization

WIPO World intelleged frequety

UNWTO World Tourism Dispersation

Development Organization

UPU Driversal Franci Union

World Bank Group

and Development

Security Council

Subsidiary Organs

International Criminal Tribural for Re-onde (ICTR)

Functional Commissions

Science and Technology for Densispensor

Cites Freeman and Olessal Autor

Population and Development

United Nicolans Forum on Forests

DFS Department of Field Support

DM Department of Management

and Corbresco Management

DPA Department of Policial Affairs

DPI Department of Public Information

DSS Department of Solvy and Security

OCHA Office for the Coordination of

Novotic Drugs

Social Development

Status of Wilmess

International Commission February for the Survey Pageslares

Machinesian for International Criminal Triburals (MICT) Althory Stell Committee

Percebagging operations and publical missions Sonotons committees and hard

Stocking committees and sell but bodies

Pencabulding Commission

HSPF riigh level Political Forum on soutproble development

Economic and Social Council

Secretariat

International Court

of Justice

Trusteeship

Council

Departments and Offices

ECSG Executive Office of the Secretary General

DESA Department of Economic and Social Affairs

DOACM Department for General Assembly

DPKO Department of Perusingany Operations

Regional Commissions

SCA Economic Commission for Africa

BCE Common Commission for Language

ECLAC Economic Commission for Latin America. and the Corbbean

ESCAP Economic and Social Commission for Assa and the facility

ESCWA European and Social Community for Western Assis

OHOR Office of the United National High

OIOS Office of Internal Overaght Services

OSAA Office of the Special Advisor on Africa

Representative of the Secretory General for

Representative of the Secretary-Germal on

UNISOR United Nations Office for Discotor

Commissioner for Human Rights

PBSO People iding Support Office

SRSQ/CAAC Office of the Special

Oxiden and Arned Corflet

SRSG/SVC Office of the Special

Sexual Violence in Conflict

OLA Office of Legal Affairs

Permanent Forum on Indigenous Issue:

Committee for Development Policy

Committee of Experts on Public Administrations

Committee on Non-Governmental Ciryonipations

Other Bodies

UNAIOS Jose United Nations Programme on PBY/ACCS

UNGEGN Used Nations Group of Experts on **Geographical Names**

Research and Training

UNICES United Nations Interregional Crims and Arrive Research Institute

UNRISD (Arted National Research Stations for Social

UNODA United Notices Office for Dispresement Afficing

UNODC ! Usind Harriers Office on Drugs and Corns UNOG Livind Nations Office of General

UN-OHRLLS Office of the High Representative for the Great Developed Countries, Landocked Developing Countries and Social Marel Developing States

UNON Useed Nations Office of Nascole

UNOP? United Nations Office for Partnerships UNOV United Nations Office of Visions

Specialized Agencies

FAO Food and Agriculture Organization of

Advisory Subsidiary Body

ICAO International Civil Autotion Organization.

SFAD Intensional York for Agricultural Development

BO International Solour Organisation.

BMF International Homewy Punil

BMO International Montime Organization.

ITU International Telecommunication Union UNESCO United Nations Educational. Scientific and Cultural Organization

- IDA International Development

WMO World Mesonological Organisation

- IFC International Finance Corporation

IBRO International flurid for Recomptraction

All mampless of the biomed fractions by their Diad Sonichross Sound for Countries (CDS)

UNIONE to Personage 3.9409 is to UNI hard pure or or or to Gried Hoters Francisco. Inc.

WASH and CIPCHY report to the Security Council and the CA.

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International Control for Seffenced of Investment Disjoins. SCSES and Multiblened Investment Coloration Agency (MCAS) are

not granifeled agencies but are part of the May'd Bank Group in accordance with Articles 5° and 60 of the Charter The secondary of these origins are part of the URI Secretarial

No. Cheef is a reflection of the furnished organization of the timed Nation. System and for tale perspects only it does not noted all offices as positive of the Deletel Nations System.

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Global development policy framework					
The agenda for	2030 SD	Sendai Framework for Disaster risk reduction 2015-2030	SIDS accelerated modalities of action (SAMAO) pathway	Paris agreement on climate change	Habitat III Urban agenda

Geospatial policy framework ::

2017-2021 Strategic Framework

CONTEXT	VISION	Positioning geospatial information to address global challenges						
	MISSION	Operating within agreed policies and institutional arrangements, and as an interconne community of practice, the Committee of Experts will ensure that geospatial informatives resources are coordinated, maintained, accessible, and able to be used effectively and effectively and effectively and effectively and effectively and effectively and effectively manner.						
	MANDATED STRATEGIC OBJECTIVES	Provide leadership in setting the agenda for the development of global geospatial information and to promote its use to address key global challenges	Provide a forum for coordination and dialogue with and among Member States and relevant international organizations on enhanced cooperation	Provide a platform for the development of effective strategies to build and strengthen national capacity and capability concerning geospatial information, especially in developing countries	Propose work-plans, frameworks and guidelines to promote common principles, policies, methods, standards and mechanisms for the interoperability and use of geospatial data and services	Make joint decisions and set the direction for the production and use of geospatial information within and across national, regional and global policy frameworks		

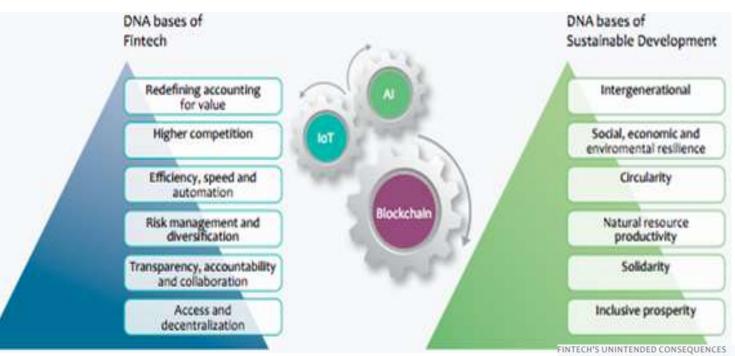
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Policies - Geo spatial China's geospatial policy is in parliament for approval

- USA submit- National geospatial bill (2018) parliament with higher maturity.
- Geospatial policies in place USA, Canada, European Union (Norway, The Netherlands (Spatial planning Environmental protection Act), Finland, Sweden),
 Thailand, South Korea, New Zealand, Philippines, Nigeria, Ghana
- Japan, Indonesia, Switzerland, Germany, Russia geospatial legislation/rules regulations aiming for more maturity. (Sanjay 2017).
- UK announced for Geospatial Data commission in 2017.
- India has 2 draft bills -
 - 1) ISRO's space activities bill 2017 2) Geospatial information regulation bill 2016.
- Malaysia proposed National Geospatial Master plan 2018.
- HLPF, Mexico (Nov 2017) 64% of countries need policies on ppp for commercial adoption of ecospatial information & technology for economic

FINTECH AND GEOGRAPHY





~ 15 unintended consequences that can be grouped into eight structural and seven transitional types

DNA double helix analogy - fundamental attributes of fintech sustainable development, as information is coded, processed, interpreted and stored in the 2-way interactions between the real economy and the financial system.

FINTECH Disruptions - core functions (financial systems)

- Moving value - Storing value - Lending value - Exchanging value - Funding and investing in value creation - Insuring value and managing risk







Proof of Concepts and Scale up WFP UNCTA Events and Workshops UNICR	Remittances, Car Blockchain backl AD Teamed up with A DMEN Blockchain Hacke Emerging Technology						
and Scale up WFP UNCTA Events and Workshops UNWO	Blockchain backl Teamed up with A Blockchain Hacks Emerging Technology	Alibaba Group co-founder for planned "e-Trade for All" application					
Events and WNWO Workshops	Teamed up with A DMEN Blockchain Hack	Alibaba Group co-founder for planned "e-Trade for All" application					
Events and UNWO Workshops	Blockchain Hack	kathon event					
Workshops	Emerging Technol						
		ology & Security					
	Consulted Assessed	Emerging Technology & Security					
ITU	Security Aspects	s of Blockchain					
DESA	RemTech Awards	s					
UNOD	C Cryptocurrency I	Investigation Train-the-Trainers					
Publication UNEP	Fintech and Sust	tainable Development Assessing the Implications					
Investments	E Blockchain White	e Paper					
UNOPS	S Unite all UN Ager	Unite all UN Agencies, Funds and Programmes working on their own Blockchain projects					
ОСНА	Prospects for Blo Caribbean Financ	ockchain-based Settlement Frameworks as a Resolution to the Threat of De-risking to cial Systems					
	How Can Cryptod	currency and Blockchain Technology Play a Role in Building Social and Solidarity Finance?					
UNICE Organized	# 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Iumanitarian Sector: Future Opportunities					

















06-11 MAY 2018 EMBRACING OUR SMART WORLD WHERE THE CONTINENTS CONNECT:

ENHANCING THE GEOSPATIAL MATURITY OF SOCIETIES







GLC30 (China) & ISRO - India

National Land Use / Land Cover mapping on 1:50,000 scale program, the third cycle of mapping of Land Use Land Cover at Source: ISRO Annual report 2016-2017

Creating a System of Systems

Evaluate
The Civil Society and Citizens

Evaluate
Enhance & Scale

Coperating
Copability

Coperating
Copability

Evaluate
Enhance & Form Internal Team
Archhemens
Distributed
System
Coperating
Copability

Enhance & Form Internal Team
Archhemens
Distributed
System
Coperating
Copability

Enhance & Form Internal Team
Archhemens
Compy
ID Data Gaps
Distributed
System
Spatial Data

Enablement
Configuration
Spatial Data

Enablement
Configuration
Spatial Data

Assess & Plan

Driven By Participating Member States
... Country Owned and Country Led



IMF - Fintech



Crypto-assets exemplify why policymakers and international institutions must coordinate more closely than ever. Cooperation and coordination are needed to meet every aspect of the fintech challenge

Crypto-assets / cryptography, cloud computing, and AI/ML offer opportunities to improve financial services ("regtech"), financial supervision ("suptech"), financial inclusion ("edtech"), and central banking

The market capitalization of crypto-assets reached more than \$900 billion early this year – a five-fold increase over the last year.

There are now about 1,600 types of crypto-assets being traded worldwide. In 2017, there were 880 Initial Coin Offerings, which raised about \$6 billion—a vast increase over the previous year, when there were only 43 ICOs, which raised just \$95 million. (Tobias Adrian, 2018)









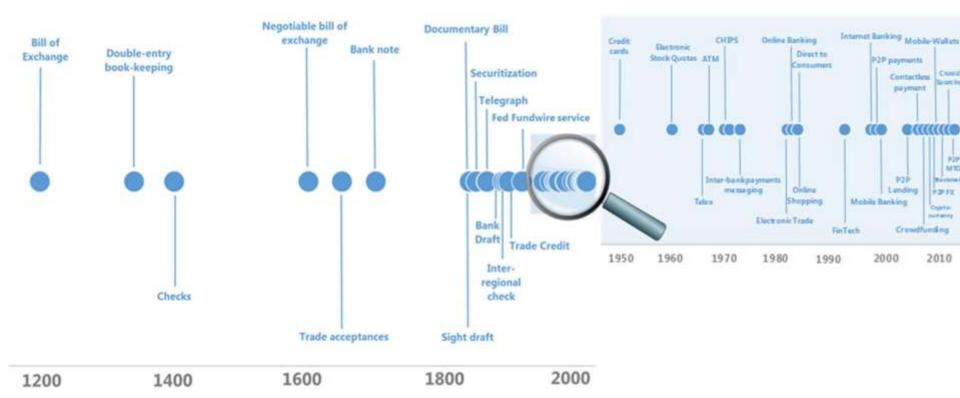








Innovations - Inclusion



Fintech and Financial Services: Initial Considerations, IMF staff discussion note 17/05



















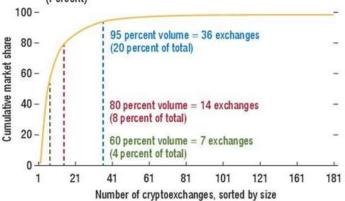


Crypto Assets (Curency)

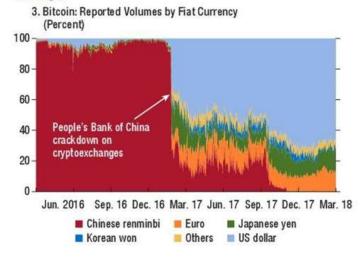
Figure 1.14. Share of Trading Volumes across Exchanges, Crypto Assets, and Fiat Currencies

Trading volume is highly concentrated, with 80 percent of volume traded on just 14 exchanges.

 Cumulative Market Share across the Various Cryptoexchanges, March 2018 (Percent)

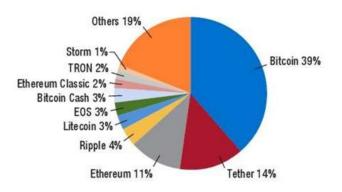


Composition of reported volumes has shifted away from the Chinese exchanges.



Volume share across crypto assets is led by Bitcoin, Ethereum, Ripple, and Tether.

2. Reported Volumes by Cryptocurrency, March 2018 (Percent)



Bitcoin futures volumes remain low.

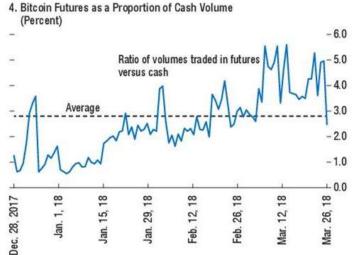




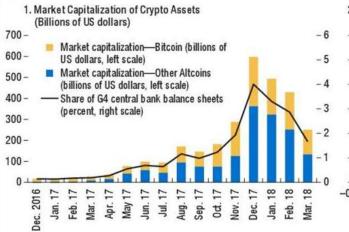


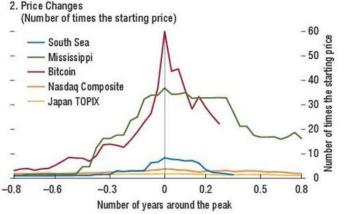


Figure 1.13. Crypto Assets: Size, Price Appreciation, Realized Volatility, and Sharpe Ratio

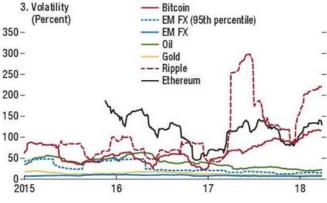




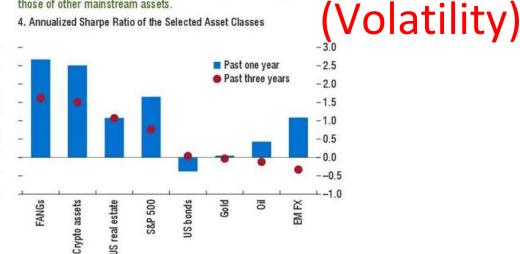




Bitcoin's realized volatility is much higher than that of other asset classes.



Risk-adjusted returns of crypto assets have not dramatically exceeded those of other mainstream assets.



Sources: Bloomberg Finance L.P.; CoinDance; CoinMetrics; European Central Bank; Haver Analytics; national central banks; Yale International Center for Finance; and IMF staff estimates.

Note: Panel 3 is based on 90-day realized volatility. In panel 4, crypto assets is an average across Bitcoin, Ethereum, Litecoin, and Ripple. The Sharpe ratio is the average return earned in excess of the risk-free rate per unit of total risk. EM = emerging market; FANGs = equal-weighted index of highly traded stocks of technology and tech-enabled companies such as Facebook, Amazon, Netflix, and Alphabet's Google; FX = foreign exchange; G4 = Group of Four (euro area, Japan, United Kingdom, United States); TOPIX = Tokyo Stock Price Index.

Excerpts: Global Financial Stability Report April 2018: A Bumpy Road Ahead (IMF World bank Spring meetings 2018)

Crypto Assets



Factors contributing to Real estate markets





Factors contributing to better property

Source: International property markets scorecard methodology by Center of International Private Enterprise (CIPE) and International Real Property Foundation (IRPF)









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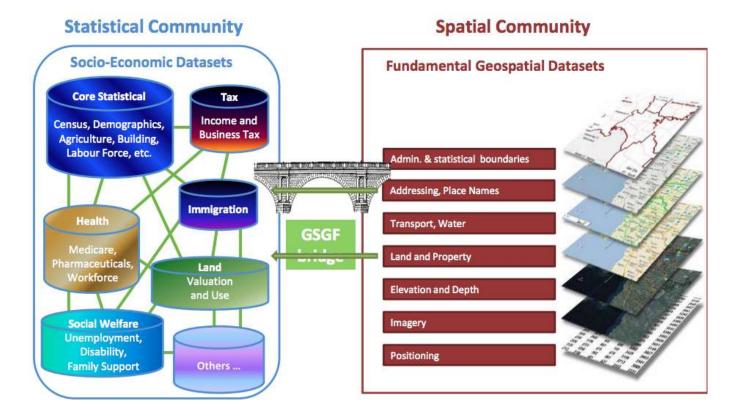








Bridging between two communities



Source: UNECE summary report of workshop on integrating statistics and geospatial standards and models Martin Brady Co-Chair UN Expert Group for the Integration of Statistical and Geospatial Information

















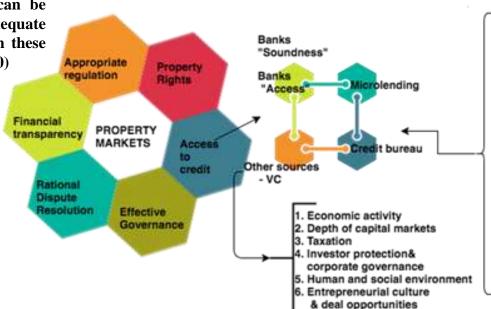






Parameters of Access to Credit

The credit gap is very high in the regions Africa and Asia with over-59% requirement and this can be also correlated to lack of adequate number of credit bureaus in these regions (Stein, Peer et al 2010)



Credit score parameters

- 1. Status of existing checking account
- 2. Duration in month
- Credit history dues currently, paid back, other banks credit history
- 4. Purpose
- Credit amount
- 6. Size of savings account
- 7. Current employment duration
- 8. Instalment rate as % of disposable income
- 9. Personal status and gender
- 10. Current residence duration
- 11. Type of property
- 12. Age
- 13. Other instalment plans bank/store
- 14. Housing Rented/Free/Own property
- 15. Other debtors/guarantors
- 16. Number of existing credits at this bank
- 17.Job type unemployed/ Unskilled Employee /self employed/management
- 18.number of persons with Maintenance liability
- 19. Telephone registration on applicant
- 20. Foreigner or Local









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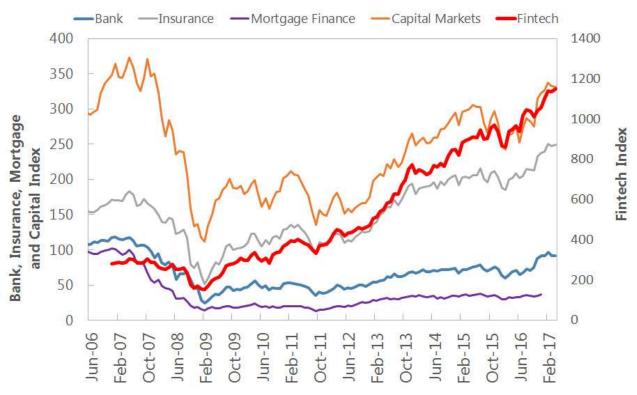






Fintech vs Capital markets

Stock Market Index of Financial Services



Source: Fintech and Financial Services: Initial Considerations, IMF staff discussion note 17/05



















Fintech Firms and Services

Services		Financial institutions	Central Banks	Fintech firms
Regulation				
Back-office operations	>			
Currency and payments				
Lending				
Insurance	>			
Savings	>			
Advice				

Source: Fintech and Financial Services: Initial Considerations, IMF staff discussion note 17/05













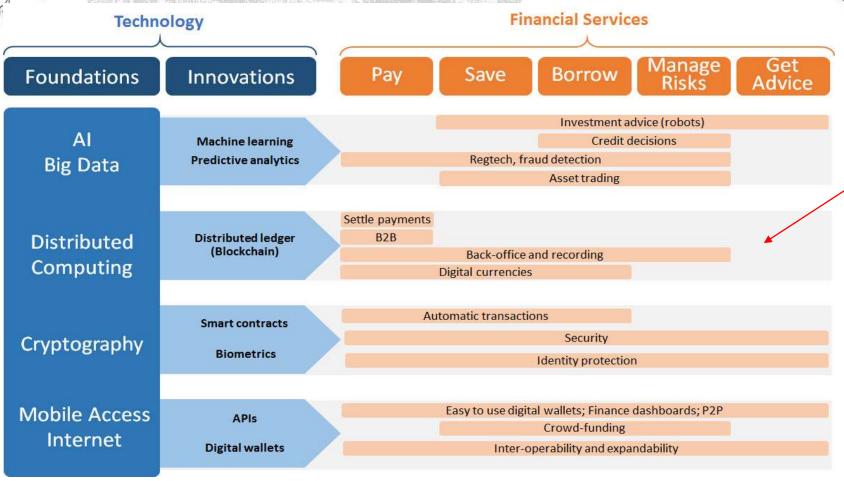






Fintech vs Financial services























Fintech initial considerations

Technological Innovation

Capturing/Disbursing

(grey) indicates changes to service attributes

(orange) indicates changes to market structure

Messaging

Settlement

Services

Back-end processes (DLT)

- · Better payments tracking
- SWIFT can also implement
- · Automated info sharing & risk management
- · Partnerships with DLT firms; replacement of legacy systems
- · Easier entry in correspondent banking (lower scale economies/ fixed costs)
- But size still matters (liquidity and credit risk)
- · Barriers to entry from private/permissioned DLT

- Potential New Attributes of
- · More transparent/traceable payments Better invoice reconciliation
- · Cheaper (but correspondent banking may remain oligopolistic)

Compliance (DLT, Big Data, Al, biometrics)

· Easier info sharing and lower compliance costs

Legend

- · Easier entry in remittance market (lower sunk costs) but sunk costs to build trust remain
- · New compliance-focused entrants become partners

- · Lower compliance costs
- · Easier entry in correspondent banking
- · But size still matters (liquidity and credit risk)
- · Cheaper
- · Greater financial inclusion
- · Lower switching costs
- · Potentially more control over use of personal information
- · Privacy and security issues

Means of payment (DLT)

Hub-and-spoke

- · Wallet into virtual currency
- · No independent messaging
- No additional cross border
- Faster

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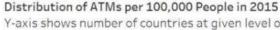
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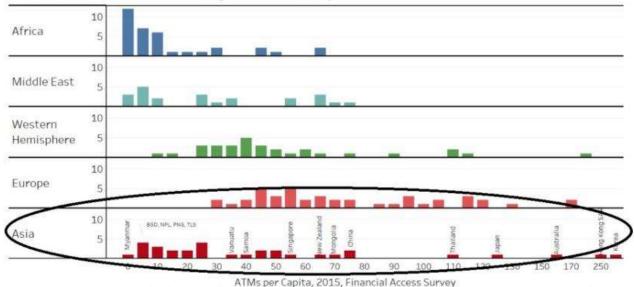
Source: Fintech and Financial Services: Initial Considerations, IMF staff discussion note 17/05

Wide disparities across Asia-Pacific...



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Y-axis shows number of countries at given level of ATMs / Financial Inclusion

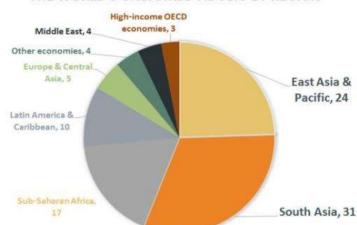


But many remain unbanked.

Adults who are excluded from the financial system

2 Billinn

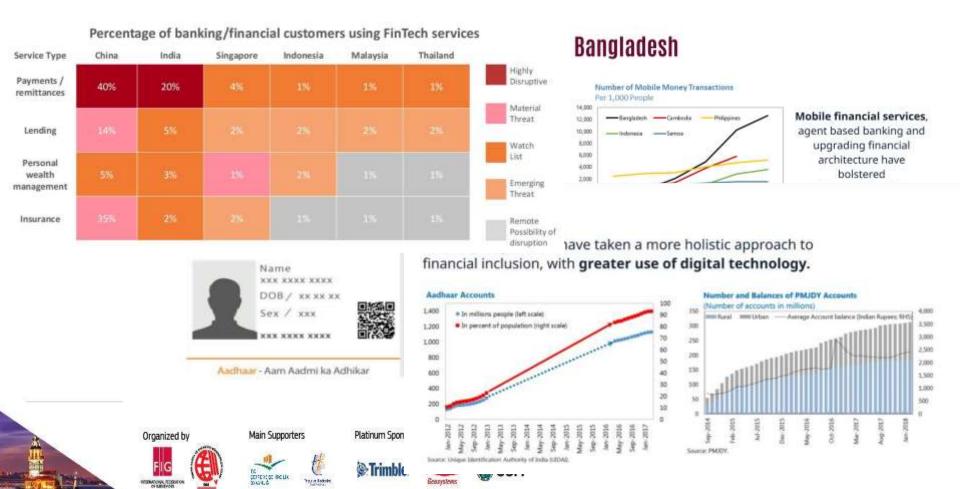
THE WORLD'S UNBANKED ADULTS BY REGION







Chinese fintechs have reached a disruptive tipping point





Industry 4.0 - Policy

implications

Policy Implications











Social experimentation

between public & private sector to innovate and solve

local problems.



Infrastructure investment. particularly technology infrastructure

South Asia



...and gaps within countries

Worldwide

Gaps Between the Rich and the Poor

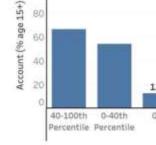


Better and broader data on fintech

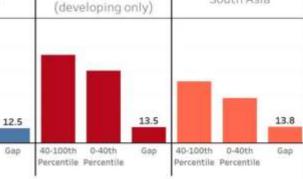
Improve financial literacy for technology to empower people with the benefits of technology







100



East Asia & Pacific







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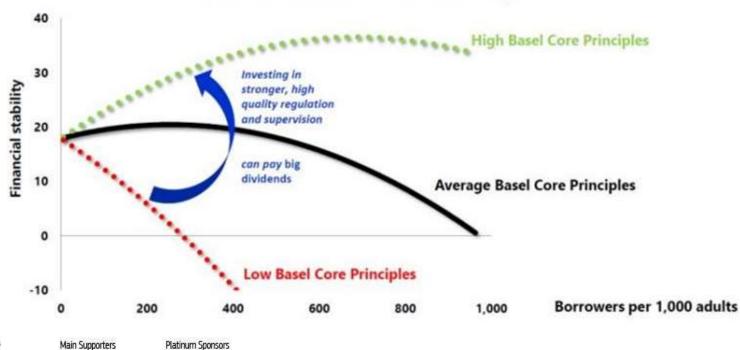






Policy Implications

Need right balance for FinTech regulations: Innovation & Stability



















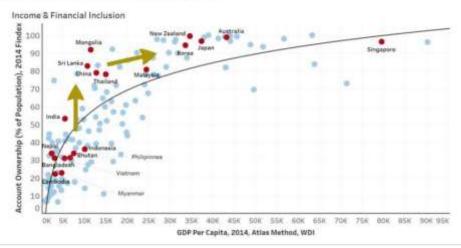




Rapid Progress Globally

80	Africa	Middle East	Western Hemisphere	Asia	Europe
70					6
60					11
50			1		
40					
:10				1	
20					
10		1			
98	97 99 31 32 3	1 00 TF TF TF TO	26 W. 10 31 32 35 W	8 97 99 31 38 3	9 00 07 00 11 1

Financial Inclusion Arc























Evidence

0.03

Bank loans

Sources FAS, WDI and Staff Estimates

Leapfrogging has a **positive impact** on traditional banking services in Pacific Island Countries (*green bars*).

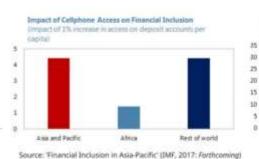
Technology Leapfrogging and Financial Inclusion (marginal impact of technological leapfrogging on Fi outcomes) 0.15 ■ Rest of World ■ Pacific Islands countries 0.12 0.09 0.06 0.03

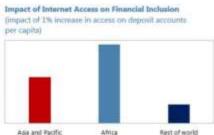
ATMs



Initial Evidence - Technology Supports Inclusion

Increased technology is linked with an increase in access to financial services





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Bank branches

Trimble

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Deposit accounts









Blockchain - Challenges

- A reduction in evidential quality or loss of access to blockchain records
- = >negative impact on transparency and public accountability
- = deprive entitlement to land.
 - Human rights may be violated if exposes personally identifiable information
 - Reliance upon volatile publicly traded cryptocurrencies for record keeping solutions => subject country to exchange rate & other financial risks.























Blockchain - Challenges

Financial risks:

- a departure from traditional centralized operating models (in-house DB) and costs to acquire or develop DB are amortized over years, or, alternatively, where a fixed price service contract has been negotiated with a service provider for a regular fee for service.
- Price fluctuations of cryptocurrencies relative to the national fiat currency
- Price may be subject to forces completely outside of national control(e.g., rapid price increases, price volatility, and periods of illiquidity).
- Challenge: network users will be to model the future expected value of any cryptocurrency underlying a solution, which may be difficult to do given current low levels of understanding about the factors affecting price (relative to other currencies)























- **Blockchain Opportunities**
- Standards to model the cost of supporting a given blockchain-solution (relative to the cost of more traditional approaches) at different exchange rates in order to identify relative costs and value.
- Standards to implement solutions that do not rely upon an underlying cryptocurrency for the recording of transactions, assuming they can achieve the same level of system functionality.
- Standards to allow if and how to integrate functionality for payments of deposits and fees, since the ability to handle such aspects of transactions natively would be lost - efficiency through DLT
- Standards to support payments that allow network participants to create their own "permissioned network use only token" representing and/or convertible at a rate fixed to the jurisdiction's fiat currency - reduce forex risk due to public trading of crypto currencies.





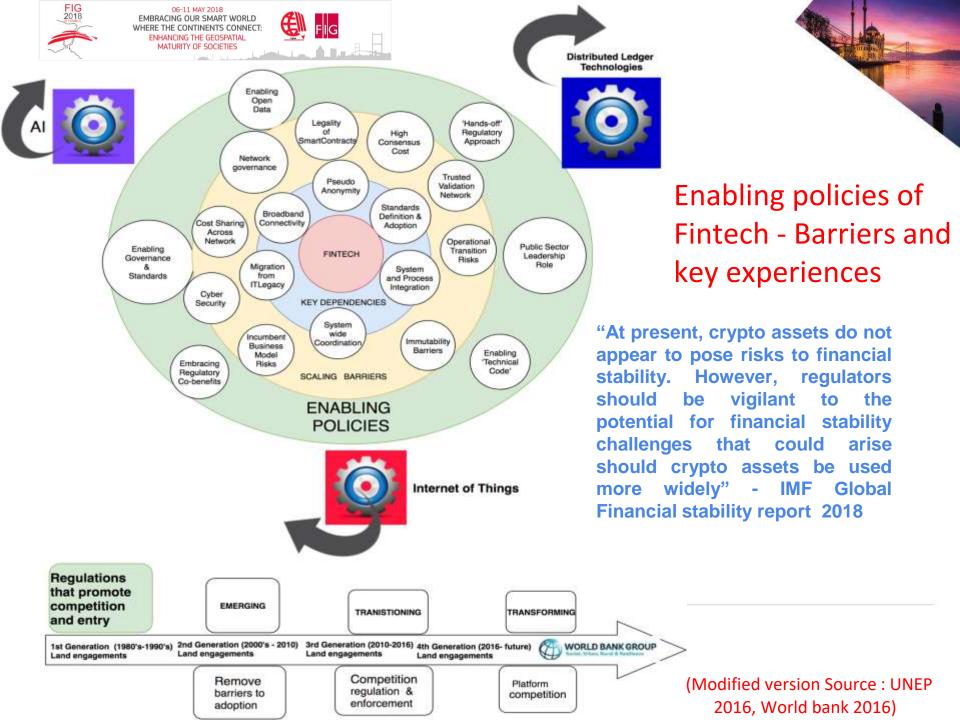














7th session of UN ECOSOC (Jul-Aug 2017)



"GGIM Geospatial Societies thanks the standards community for their vitally important work in developing standards and fully supports the use of existing international standards applicable to the creation, management and use of geospatial information, infrastructures and delivery arrangements. GGIM Geospatial Societies would like to highlight the importance of accelerating the process of developing new international standards given the rapid development of new technologies applicable to the achievement of the SDGs. In this regard we wish to draw attention to the importance of the work of ISO/TC 307 dealing with Blockchain and Electronic Distributed Ledger Technologies. A technology which has been hailed by custodians as being the future of the real estate management industry with potential to streamline processes such as land and property registration, valuation of property and many more digital actions." FIG a 'member' of the GGIM Geospatial Societies is in liaison with both ISO TC 211 and ISO/TC 307 and FIG Commissions 3, 5, 7 and 9 express their interest in supporting this d

The Sustainable Development Goals Report 2017

"Implementation has begun, but the clock is ticking. This report shows that the rate of progress in many areas is far slower than needed to meet the targets by 2030"

"This report provides a snapshot of our efforts to date. It stresses that high-level political leadership and new partnerships will be essential for sustaining momentum. It also underscores the need for reliable, timely, accessible and disaggregated data to measure progress, inform decision-making and ensure that everyone is counted"





http://ggim.un.org/meetings/GGIM-committee/







Seventh Session of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM)

> United Nations Headquarters, New York 31 JULY - 4 AUGUST 2017



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Follow-up and review of the financing for development outcomes and the means of implementation of the 2030 Agenda for Sustainable Development E/FFDF/2018/2 Financing for development: progress and prospects - Note by the Secretary-General

Technological advances also pose risks in relation to illicit financial flows. The potential for anonymity with the use of new technologies, such as blockchain technology and digital currencies, can heighten the risk of illicit finance. Member States can strengthen regulations on markets that contribute to the illicit movement of resources. International cooperation on the return of stolen assets is mandated by the United Nations Convention Against Corruption. More investments could be made in the human and technical resources necessary to speed up the return of assets."





















ISO standards & Policy Jul-Aug 2017
From the report of the UN Secretariat - Implementation & adoption of standards for the GGI community,

From the report of the UN Secretariat - Implementation & adoption of standards for the GGI community, E/C.20/2017/8/Add.1 - "The Charter for the Land Administration DWG was presented at the side meeting of the Expert Group on LAM at the IV HLF on UN-GGIM in April 2016, Ethiopia. Following its approval at the OGC's 99th Technical Meeting in June 2016, the DWG has formed a direct liaison with ISO/TC 211 & Expert Group to ensure shared goals are developed and the work programs of both groups are synergistic. As a result of this liaison, a joint meeting was held in Delft, The Netherlands in March 2017.

The event consisted of a 2-day Expert Group meeting (http://ggim.un.org/Delft_Meeting.html) followed by 2 days of technical focus on the Land Administration Domain Model (LADM) with the following preliminary actions identified:

- (a) FIG to make a NWIP to ISO/TC 211 to initiate a review of the LADM;
- (b) ISO Stage 0 project, given potential broad scope;
- (c) OGC Innovation Program prototyping capabilities to potentially be utilized;
- (d) Global Land Tool Network (GLTN) support for developing countries; and
- (e) To be in collaboration with FIG, ISO/TC 211, OGC, World Bank, TUDelft, Kadaster, UNGGIM, GLTN, Royal Institute of Chartered Surveyors (RICS), and others ISO/TC 211, in collaboration with the OGC and FIG, has initiated the review of ISO 19152 Land Administration Domain Model (LADM).

The review will also take into account the requirements from the United Nations Division for the Ocean Affairs and the Law of the Sea (UN-DOALOS) and IHO. The use of Blockchain technology with geospatial information continues to strengthen, therefore ISO/TC 211 has established a liaison with ISO/TC 307 Blockchain and Electronic Distributed Ledger Technologies.



















ISO TC 307 - Need for NWIP

UN Secretariat - Implementation & adoption of standards for the GGI community, E/C.20/2017/8/Add.1 - "The Charter for the Land Administration DWG was presented at the side meeting of the Expert Group on LAM at the IV HLF on UN-GGIM in April 2016, Ethiopia.

- (a) FIG to make a NWIP to ISO/TC 211 to initiate a review of the LADM;
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Road Map for Open standards in the backdrop of ISO TC 30 Publicly available; **Unencumbered by patents &** Internet of Things other intellectual property; Anyone can download and use the standard (non-Artificial intelligence discriminatory); **Facilitators** Distributed ledger No license fees; Vendor neutral Standards **Technologies** Opendata Data neutral: Interconnected systems Agreed to in a consensus Cloud, Bigdata decision making process; No single entity controls the Wireless and Broadband standard. Dokument WD CD ISO **PWI** NP/NWIP DIS **FDIS** forkortelse: **Preliminary** New Work Working Committee Draft **Final Draft** International Dokument **Work Item** International International Standard Item Draft Draft navn: Standard Standard Proposal Modenhed Høj Tidndflydelse Lav 3 år

FIG **201** Geospatial readiness index (CGRI) Modified

The Indian NSDI story began with a directive issued by the Department of Science and Technology in 2000. Since then, the country has moved towards the formulation of a geoportal in 2008 which complies with OGC standards and hosts OGC compliant metadata. India's space agency, the Indian Satellite Research Organization (ISRO), has enabled a satellite-based regional positioning system called NAVIC and augmentation system called GAGAN. Bhuvan and Naksha platforms, geospatial data and information is made freely available to the citizens of the country" - Geobuiz 2018 report

TANDARDS - Interoperability, Redundancy & Evolution

Geospatial (GS) Data infrastructure:

- **GSDI**
- platforms and Portals
- Positioning infrastructure

Enabling Policy framework:

- GS
- **Open data**
- **Space-GNSS**
- **Science Tech**

User Adoption level:

- Mapping
- **Asset management**
- **System integration**
- **Enterprise**

Industry capacity:

- Capacity
- Incubation
- **Associations**











SDI 2.0 and Blockchain

Communities

Mobile, Analysis, **Situational Domain Data** Awareness, Real Time Models Future **Distributed** Tier 3 Maintenance & Catalog/ Use Discovery Spatially Tier 2 **Enabled IT** Infrastructure Visualisation Spatially Enabling & Portrayal the Nation Tier 1 (Multiple thematic Geospatial communities Information e.g. environment, Value transport, land cover Sharing **Partnerships** Improved performance (Single thematic and efficiencies information Community e.g. **Share Maps** transportation) Over the Web (Single agency spatial map Scale publication) Scale of initiative, number of stakeholders, Single enterprise Multiple Information

governance and management arrangements

Future - Distribution of the EO
Data sets as Blockchain and
DLT after the Spatially Enabled
IT infrastructure is created.
INTEROPERABILITY is the key

- Location is seen as the fundamental element of single logical geographical view
- Today's SDI is different from yesterday's SDI.
- SDI 2.0 allows distributed or centralized approaches to fit the needs of users through Web services & online catalogs, not file transfers & manual clearinghouses.
- It is more adaptable for place-based decision- making.
- The pace of change requires Distribution of Data ledgers and investments, and a commitment to interoperability based on open standards is essential in dealing with this transition.







Future works

A proposal for the Geospatial industrial council will be to be setup with a vision - to advance the geospatial industry globally.

The objectives are

- 1) to create collective shared value for entire ecosystem and network
- 2) Co-create and strengthen the geospatial value by partnership with governments, regional entities and civil society
- 3) Think laterally, position consciously and grow collectively to advance the role of geospatial industry.























- Regulation does offer an answer to Distortions, Market abuse, Excessive Arbitrage, Risk of contagion
- Regulation is essential Consensus, Consistent application and contain cross sector growth and cross border growth of crypto assets.
- consensus within the global regulatory community about what crypto assets are—for example, a security or a currency
- Nimble, Innovative, Collaborative.
- National authorities and international standard setters are encouraged to intensify cooperation on the monitoring of crypto assets and on the consistency of the regulatory approach
- "At present, crypto assets do not appear to pose macro critical financial stability risks Preventive measures such as reporting requirements, customer due diligence, and transaction monitoring could be employed to ensure that crypto assets provide similar safeguards to traditional money against money laundering and the financing of terrorism." - IMF

















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References

- Giacomo Brambilla, Michele Amoretti, and Francesco Zanichelli. (2016) "Using Blockchain for Peer-to-Peer Proof-of-Location"
 - Greg scott (2017), "Visioning an Integrative Data Ecosystem for the Future", Kunming Forum on UN-GGIM Cities of the Future: Smart, Resilient and Sustainable
- Manohar Velpuri, (2016) "Cadastre 4.0 as a paradigm towards a Fin-tech enabled Real estate management" FIG commission 7 annual meeting, Coimbra
- Manohar Velpuri, Anusha Pidugu, Maringanti Chetan, Aman Sharma Madhu. (2016) "Developing Sustainable Financing to Encourage Private Investment through Block Chain and Crowd Funding in Real Estate", High-Level Joint FIG / World Bank Conference Sustainable Real Estate Markets Policy Framework and Necessary Reforms
- Manohar Velpuri, Anusha Pidugu, Jyothsna Velpuri, Surya Bhamidipati, Madhu Aman Sharma, Chetan Maringanti (2017) "Enabling Formalising Of Informal Markets Through Block chain For Unregistered Real estate", Responsible land governance: Towards an evidence based approach Annual world bank conference on Land and Poverty.
- Manohar Velpuri, Madhu Aman Sharma, Maringanti Chetan, Anusha Pidugu and Jyothsna Velpuri (2017) "Improving Access to Credit in Property Markets using Blockchain", FIG working week, Helsinki
- Manohar Velpuri, India , Daniel Steudler, Switzerland: (2009) "Role of Land Administration in Sustainable Development Country Case Studies of India and Switzerland" FIG working week 2009.
- Rolando Ocampo (2017), "Geospatial Information and the SDGs in Mexico: institutional perspectives on urban resilience", Kunming.
- UFA2020 Overview: Universal Financial Access by 2020
- http://www.worldbank.org/en/topic/financialinclusion/brief/achieving-universal-financial-access-by
- World Bank. 2016. "Innovation in electronic payment adoption: the case of small retailers." Washington, D.C.: World Bank Group.
- Coastal and Marine Ecosystems Marine Jurisdictions: Coastline length". World Resources Institute. Archived from the original on 2012-04-19. Retrieved 2012-03-18.
- CIA World Factbook: Coastline
- A guide to the role of standards in geospatial information management: http://ggim.un.org/documents/Standards%20Guide%20for%20 UNGGIM%20-%20Final.pdf
- IMF Global Financial Stability Report, April 2018
- Dong He, Ross Leckow, Vikram Haksar, Tommaso ManciniGriffoli, Nigel Jenkinson, Mikari Kashima, Tanai Khiaonarong, Céline Rochon, and Hervé Tourpe Fintech and Financial Services: Initial Considerations, IMF staff discussion note 17/05 - International Monetary fund, Washington
- Fintech Building Trust Through Regulation IMF Fintech Roundtable Remarks by Tobias Adrian, IMF Financial Counsellor and Director of the Monetary and Capital Markets Department

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