Finis origine pendet!

Digital impact across value chains

Davos, January 22-26, 2018

Location: Promenade 61, 7270 Davos

Free entry at all time!

Produced by Caspian Week

www.caspianweek.com

(FINAL Program Jan 17, 2018)

‘Finis origine pendet’

Content

'Finis origine pendet' Program

Monday 22		Tuesday 23	Wednesday 24	Thursday 25	Friday 26
	Finis Origine Pendet	Education & Healthcare	Global Trade & Finance	Urbanization & Mobility	Caspian Digital Forum
		Education 10.00-12.30	Fintech 10.00-12.30	Urbanization 10.00-12.30	Caspian Lead Panel 10.00-12.30
		Lunch Buffet 13.00			
			Global Finance 13.30-15.30		Decipher Caspian opportunities 14.00-15.30
Women: Digital leaders! 15.30		Healthcare 15.00-17.00	Bitcoin is Dead! Peak Debate© Showtime! 16.00-19.00	Energy & Mobility 15.00-17.00	Caspian Action plan 15.30-18.00
		Georgian Night! 20.00	Caspian Night! 20.00	Opera in the Alps! 21.00	Caspian Nights!

Date, Time	Panel	Panel Members
Jan 22, 3.30pm	**Women: Digital Leaders!**	**Taynaah Reis**. Moeda, CEO & Founder. Brazil **Preeti Sinha**. YES Bank Senor President. India **Sandra Tobler**. Futureae Technologies, CEO & Founder. Zürich **Samantha Zirkin**. Point 93, CEO & Founder. New York **Nataša Kozlevčar**. Money Rebel, Founder. Ljubljana, Slovenia **Olga Feldmeier**. Smart Valor, CEO & Founder. Zug **Katherine Hermans**, Director Global Change Maker **Simona Scarpaleggia**, IKEA, CEO, Switzerland **Moderator: Dr. Kaspar Bänziger**
Jan 23, 10am	**Digital technology will revolutionize education! Or not?**	**Prof. Peter Lorange**. Lorange Network, Chairman & Founder. Norway **Natasha Lance Rogoff**. Ingredients for Education, CEO & Founder. Boston **Prof. Cedric Dupont**. Director Graduate Institute. Geneva **Prof. Florin Baeriswyl**. Dean of brand-design faculty at DeTao Shanghai Institute of Visual Arts, Shanghai China **Noah Samara**. Yazmi, CEO & Founder. Washington D.C., Africa **David Shrier**. Associate Fellow, Oxford Saïd Business School. Creator & co-convener, Oxford Fintech and Oxford Blockchain Strategy **Moderator: Dr. Kaspar Bänziger**
Jan 23, 3pm	**Artificial intelligence, augmented reality = better healthcare for all! Really?**	**Prof. Ernst Hafen**, Prof. ETH Zürich, MIDATA President **Stephanie Bova,** Digital Innovation Director Los Angeles. Takeda, Japan **Richard Fritschi**, Chairman, Implantica MediSwiss , Switzerland **Prof. Dr. med. Walter Weder**, Director Thoracic Surgery-; Co-Director Hospital Board University Hospital Zurich **Prof. Dr. med. Andreas Trojan**, Senior Physician OncoCenter Zürich, Founder Mobile Health AG **Dr. Dr. med. Philippe Haas**, CEO & Chief Medical Officer, Synlab CH, Munich **Dr. Andreas Wespi**, IBM Research Scientist, Zurich **Yorke E. Rhodes III;** Microsoft. Principal Manager and Cofounder Blockchain **Dmitri Alperovitch**, CTO, Co founder, CrowdStrike **Moderator: Dr. Kaspar Bänziger**
Jan 24, 10am	**Lets financially include 3 billion people! Fintech! We embrace you!**	**Prof. Alexandre Swoboda**. Professor of Economics Emeritus. Graduate Institute, Geneva. **Prof. Alexander Pentland**. MIT Connection Science and Human Dynamics Lab, Director. Boston **Dr. Veronica Lange**. UBS. Head of Innovation. London **Prof. Srdjan Capkun**. Institute for Information Security, ETH, Director. Zürich **Dr. Nuria Oliver**. Vodafone; Pop Alliance, Director Data Science Research. London and Boston **Matthew Schwartz JD,** Partner Boies, Schiller, Flexner, New York **Moderator: Dr. Kaspar Bänziger**
Jan 24, 13.30	**Can developing nations rise more inclusively when economic reality meets future technologies?**	**Mary Ellen Iskenderian**. Women World Banking, President and CEO. New York. **Rana Kapoor**. YES Bank, Founder & CEO. India **Prof. Ugo Panizza**. Graduate Institute & Center for Finance and Development, Director. Geneva. **Taynaah Reis**. Moeda, CEO & Founder. Brazil **Idris Al Senussi**, Economic inclusion leveraged by democratic progress, Spain **Moderator: Dr. Kaspar Bänziger**
Jan 24, 4pm	***"Bitcoin is dead! Long live the Cybercurrencies!"*** **Peak Debate© Showtime!**	**It's all about trust: Prof. Alexandre Swoboda**. Professor of Economics Emeritus. Geneva. **Fiat will prevail: Michael Huttman**. Millenium Global Investments, Founder and Chairman. London. **Policy is key: Dr. Daniel Heller**. Peterson Institute, Fellow. Washington D.C. **Fiat is fraud: Jeffery Wernick**. Qtum. Investor and Advisor. Singapore & New York.

		Moderator: Dr. Kaspar Bänziger
Jan 25, 10am	**Smart! You + the future of your city!**	**Planner: Prof. Alfredo Brillembourg**. Urban Think Tank, ETHZ. Founding Partner, USA & Venezuela **Investor: Tamer Amer,** Founder, Managing Partner, REInvest Capital, Zurich, Madrid **Sharing spaces: Andreas Thors**, Partners Group, Zug **Builder: Dr. Walter Grüebler,** former CEO, Chairman SIKA **Policy: Prof. Hubert Klumpner**, Urban Design ETH, Director. Zürich **Data: Yorke E. Rhodes III;** Microsoft. Principal Manager and Cofounder Blockchain **Moderator: Dr. Kaspar Bänziger**
Jan 25, 3pm	**From macro- to micro grid, from carbon to renewable! Can digital technology accelerate the energy transformation?**	**Energy supply: David Cassidy**. Proman Group, CEO. Wollerau & Houston **Energy Conversion: Prof. Reza Abhari**, Laboratory for Energy Conversion, ETH, Director, Zürich **Investor Rehan Chaudhri**. Peak XV Advisors, CEO. New York **Digital energy: Steve Johanns**, Veriown Global, CEO. Chicago **Grid: Shaun Parvez**. SK E&S Americas, President. South Korea and New York **Moderator: Dr. Kaspar Bänziger**
Jan 26 10am	**Caspian Day Framing the Caspian opportunities for digital revolution**	**Regional policies: Kairat Kelimbetov,** Governor AIFC, Kazakhstan **Global Fintech Regulation: Matthew Schwartz JD,** Partner Boies, Schiller, Flexner, New York **Trade flow: Boris Eyker,** CEO Open Mineral AG **Legal aspects: Philip Prowse,** Partner, HFW, London **Audit is the key: Frederik Gregaard,** PWC, Switzerland **Moderator: Dr. Kaspar Bänziger**
Jan 26 1pm	**Caspian Day Strategies and Tactics Leveraging digital technology across the Caspian Region**	**Digital Banking on the rise: Mitja Vezovisek;** CEO, Founder Money Rebel **Digital Strategies: Assel Zhiyenbayeva,** Chief Digital, AIFC, Kazakhstan **Financing platforms: CEO Olga Feldmeier,** Smart Valor **Commodity trade efficiency: Boris Eyker,** CEO Open Mineral AG **Auditability of Trade flows: Pierre-Edouard Wahl,** Head of Blockchain, Director PWC, Zürich **Moderator: Dr. Kaspar Bänziger**
Jan 26 3.30pm	**Caspian Action Plan**	**Workshop**

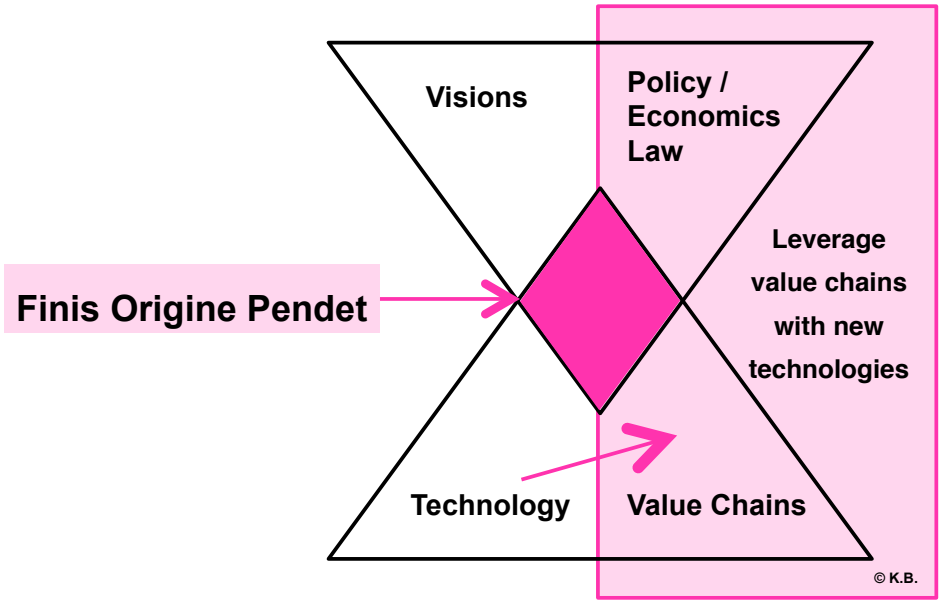
'Finis origine pendet' is our motto for Davos 2018!

Latin, it stands for **'the End depends upon the Beginning'**.

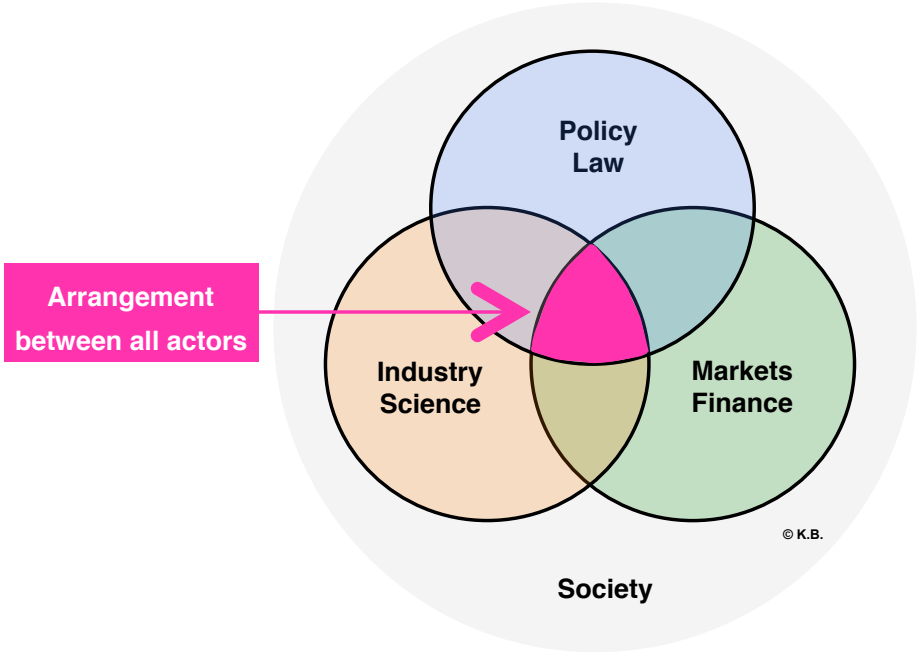
Let's join forces to shape the global digital future together! The second edition of the inclusive- and free access Caspian week will be held at Promenade 61, Davos from January 22-26. The Caspian Week Platform will be hosted and produced by Mr. Murat Seitnepesov and Dr. Kaspar Bänziger. Finis origine pendet is our motto and stands for 'the end depends upon the beginning'.

Our $75 trillion global economy is at the beginning of a massive digital transformation. Innovation will lead to structural improvements-, market disruptions and emergence of new business models across all value chains! New technologies such as distributed ledgers-, artificial intelligence-; smart-contracts and digital assets will enable 3.5 billion people to become financially included. Disintermediation will bring the principal economic actors closer together and enable over 200 million unbanked enterprises to gain access to financial markets.

However, the digital transformation is not a one-way street. Excitement in novel technologies tends to deviate our attention away from the real economic drivers.



Value chains are complex and can only be improved by carefully arranging the various parts collaboratively between industry- market- and policy participants, in an intelligent way, starting from the beginning. Our goal is to decipher the important points and develop successful digital strategies at the beginning towards a successful end for the benefit of all stakeholders!



Our 'Finis origine pendet' program is structured along the logic of a) analyzing how new technologies can impact value chains and b) how we can become active economic participants in respective sectors.

Each day contains participatory panels. Our panelists are global industry-, academic and policy leaders debating actively about how the digital transformation will change their value chain. We feel highly privileged and thankful to have been able to assemble such an outstanding selection of leading panel members from around the world for you! Our target audience is the engaged and forward-looking leaders from industry, finance, academia and policy makers.

Peak Debate© - Showtime! Jan 24, 4pm

"Bitcoin is dead! Long live the Cybercurrencies!"

On Wednesday, January 24, we will hold the second legendary debate whether the emerging Cybercurrencies, particularly Bitcoin, are a mere market anomaly or real rising alternatives to the fiat currency system.
The first debate was held during the annual IMF meeting in Washington D.C. in collaboration with Pictet Nord America Advisors on Oct 13, 2017. The debate was wildly successful with a massive turn out and an interesting one-sided outcome, which will be challenged on Jan 24!

Come join the exciting participatory Oxford style debate to discover who is able to sway your vote towards the desired direction based on rational but emotional arguments.

Peak Debate© Showtime 'Gladiators':

Prof. Alexandre Swoboda	**It's all about trust!**	Professor of Economics Emeritus. Geneva.
Michael Huttman	**Fiat will prevail!**	Millenium Global Investments, Founder and Chairman. London.
Dr. Daniel Heller	**Policy is key!**	Peterson Institute. Washington D.C.
Jeffery Wernick	**Fiat is a fraud!**	Qtum. Investor and Advisor. Singapore & New York.
Dr. Kaspar Bänziger	**Master of Ceremony & Matador**	

Women: Digital Leaders!

Leadership, Jan 22, 3.30pm

Come join us to learn from emerging women leaders who leverage new digital technologies for developing new businesses and solving the gender biased financial accessibility gap for personal and economic advancement. The day will also be the opening of our "finis origine pendet" program defining our Week in Davos.

The overall goal is to close the gender gap, which potentially could contribute an additional $10 trillion to the global economy. Women contribute to substantial value creation in the economy. Fortune 500 companies with more women on the board show a higher return on equity and start-ups with women in charge yield a 35% higher return. The Digitization across various value chains is therefore more than ripe for accommodating more women that are innovators and leaders in new technologies.

Women are crucial in the social-economic leadership fabric (Figure 10**)!**

Women are rising political leaders: Today, 20 world leaders are female. This is a record high. Although we represent only 7% of all political leaders in the world (only 20 of 315 heads of state and heads of government are women), this does represent progress. Today 15 women hold office of Head of State (8.4%) while only nine women were Heads of Governments in 2016 (4.3% of all).

Women are rising business leaders: Companies run by women leaders show greater returns for shareholders. One recent study showed that the top 20% of best-performing companies had 27% women in key leadership roles across the entire organizational structure. Another study has shown that companies with even one woman director outperform those with none. And having 30 percent female leaders could add up to 6 percentage points to an organization's net margin. Gender diverse leadership is proven to increase the skills businesses need to navigate the disruptive trends transforming their industries.

BUT

There are only a few female CEOs in large companies: 22 female CEOs

govern S&P 500 companies in the USA (4.4%). In Europe, the overall portion of women at the top is even lower, with 14 female CEOs at the top of Europe's largest companies (4%), up from just six in 2009. In India, 11% of the 240 largest companies have women CEOs. In Turkey, 13% of all Board Members of companies traded on the Istanbul Stock Exchange (417 companies) are women.

Women earn less: Women still earn only 81 cents per dollar that men earn (though this is an increase: in 1979, for example, women earned 63 cents for every dollar earned by a man). With this rate of progress, the WEF estimates that it would take until 2133 to close the gender gap.

This panel will address women and technology across all levels:

- Will technology lead to better inclusion of women in the economy?
- Can technology enable women to gain their financial control?
- Can technology help girls for better education?
- What are the policies required for better gender inclusion?
- What can men do to improve the working condition?
- How can corporate governance be improved to accommodate more women?
- Etc.

Our panel leaders for Women and Technology:

Preeti Sinha	YES Bank Senior President. India	***"The time has never been better for women to make a difference in the world by becoming creators of the technology that empowers and redefines our future as a more equitable and prosperous world"***
Taynaah Reis.	Moeda, CEO & Founder. Brazil	***"Through blockchain technology, we are able to provide a transparent way of doing microfinance and microloan."***
Sandra Tobler	Futureae Technologies, CEO & Founder. Zürich	***"Cybersecurity in constantly changing increasingly digital society"***
Samantha Zirkin	Point 93, CEO & Founder. New York	***"Digital technology democratizes our voices and enables us to wield them at scale."***
Nataša Kozlevčar	Money Rebel, Founder. Ljubljana, Slovenia	***"In the financial services industry, we are witnessing huge and fast steps toward mobile and artificial intelligence, but the banking sector is still lagging, especially in the EU."***
Olga Feldmeier	Smart Valor, CEO & Founder. Zug	***"Security used to be a privilege of the rich. Today anyone can buy Bitcoin. The technology behind it will transform banking and society."***
Katherine Hermans	Director, Global Changemakers	***"Digital technology allows for innovative solutions for sustainability across all industries."***

Moderator: Dr. Kaspar Bänziger, Kaspar.baenziger@gmail.com

FREE ACCESS, NO BADGE REQUIRED.

Details under www.caspianweek.com

RSVP: Katherine.hermans@gmail.com

Our Education Leaders' Background

Preeti Sinha

Senior President and Glocal Convenor. YES BANK. India.

"The time has never been better for women to make a difference in the world by becoming creators of the technology that empowers and redefines our future as a more equitable and prosperous world"

With my focus on research and innovation for development at YES Global Institute, digital technologies like Big Data in research can give substantive base for policy decisions. In innovation, I am coining a term 'DevTech' where new technologies like blockchain, AI, smart contracts and IoT can make our planet more equitable, sustainable and prosperous.

Ms. Preeti Sinha is the Senior President & Glocal Convenor of YES Global Institute; a practicing think tank at YES Bank. She is on Board of SIX (Social Innovation Exchange), UK and International Network of Bamboo and Rattan (INBAR), China. She has worked for the AfDB, World Economic Forum and for HSBC, Rabobank, Lehman Brothers and JP Morgan. Preeti has degrees from the Harvard Kennedy School of Government, World Economic Forum, MBA from Yale School of Management (SOM) and BA Honors from Dartmouth College

Contact: Preeti.sinha@yesbank.in / http://yesinstitute.in

Taynaah Reis

Founder and CEO, Moeda. Brazil.

"Through blockchain technology, we are able to provide a transparent way of doing microfinance and microloan."

By building the Moeda platform of microfinance, the lenders can now track all the movements that have been made on the loan by the borrowers. With this new way of interaction, we are able to build more trusts among people and enable a new way of peer-to-peer impact investment

Taynaah Reis is the founder and CEO of Moeda, a project that aligns with the Sustainable Development Goals of the United Nations to offer an alternative banking platform for the rural people who have no access to the conventional banking system in order to empower them for doing social good.
Taynaah has a self-learned software programing background with hands-on experiences in various sectors, which enables her to provide another layer of game-changing methods for handling governance, resources management and banking solutions.

Contact: taynaah@moeda.in / https://moeda.in/

Katherine Hermans

Director, Global Changemakers

"Digital technology allows for innovative solutions for sustainability across all industries."

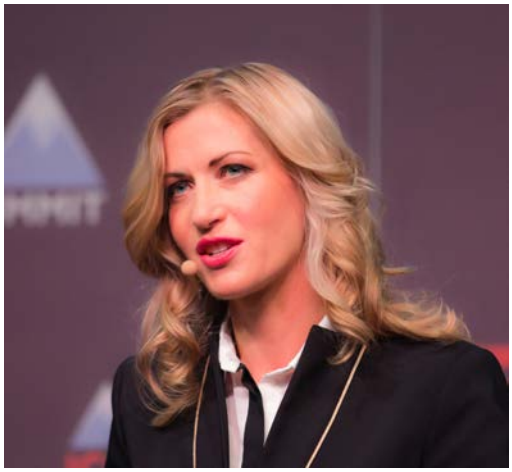
Digital disruption challenges 'business as usual' thus clearing the way to re-invent industries.

After receiving her MA in journalism, Katherine has worked in the field of sustainability with a focus on youth. Since 2008 she has been working for Global Changemakers, a Swiss based NGO that supports youth to design and implement sustainable solutions for issues ranging from unemployment to climate change. Last year, Katherine obtained a MSc from the Cambridge Institute for Sustainability Leadership.

Contact: katherine.hermans@gmail.com / http://www.global-changemakers.net

Olga Feldmeier

CEO, Smart Valor. Switzerland.



"Security used to be a privilege of the rich. Today anyone can buy Bitcoin. The technology behind it will transform banking and society."

Blockchain technology connects assets and investors in a seamless and simple way. It empowers a more inclusive governance and provides access for the broader society.

We are building a decentralized marketplace for tokenized alternative investments. Real world assets - such as stakes in VC funds, private equity portfolios, real estate development projects - are represented by digital tokens. Ownership of these assets can be easily transferred and shared while liquidity is increased through the fully on-chain settlement and real time execution.

Prior: Managing Partner at Xapo Switzerland; Executive Director UBS Wealth, Head of Eastern Europe Distribution. VP Corporate Strategy Barclays Capital. Project Manager Banking at the Boston Consulting Group (BCG), Munich.

Contact: olga.feldmeier@smartvalor.com / https://smartvalor.com

Sandra Tobler

CEO, Co-Founder Futurae

"Cybersecurity in constantly changing increasingly digital society"

In a world of ever-increasing digitalization and data generation, cybersecurity and data protection has to become a consideration of every senior management. Regulatory frameworks like GDPR and PSD2 are further accelerating this process. However, tomorrow's challenges cannot be solved with today's thinking. Futurae is part of a new generation of cybersecurity companies changes the classic product business in order to be on top of the latest threat exposures. Fast innovation lifecycles and large user adoption are major differentiators of Futurae. She will elaborate on her motivation to build an authentication company under these increasing challenges and how the industry is evolving.

Sandra is Co-founder and CEO of Futurae Technologies AG, that was born at ETH Zurich focusing on cybersecurity that is improving the customer experience via AI.

Sandra is an entrepreneur who worked in the IT space for many years. Sandra is a passionate ecosystem builder. She worked at the WEF, for IBM in international roles in project management, business development and change management. She then joined S-GE where she built the expertise for the IT industry and closely worked with the major IT associations to jointly organize delegations and events to promote Swiss IT technology abroad. In parallel, Sandra consulted Swiss IT companies with internationalization projects. In 2015, she opened an office in San Francisco for S-GE where she promoted Switzerland as a business location towards tech companies of the US Westcoast and helped Swiss companies with the market entry into the US. She founded Futurae together with two PHD from the System Security Group of ETH Zurich with the goal of bringing the next generation of user authentication to the finance and insurance industry. The core technology works entirely hands-off for the end-user to authenticate them securely with sound and ultrasound enriched with machine learning.

Contact: sandra@futurae.com / www.futurae.com

Samantha Zirkin

CEO Point 93

"Digital technology democratizes our voices and enables us to wield them at scale."

The most powerful technological disruption centers around identity and voice. At Point 93, we return personal data and voice to their rightful owners. With our self-sovereign individual identities, only you will have the power to share, wield, and monetize your personal data.

For all its advances and amazements, modern commerce does not yet allow for individualized communication at scale and in real-time. Point 93 changes that. By empowering individuals with their own blockchain identities, and a new mode of conversation that captures previously unknowable data and sentiment, our technology optimizes how we buy, price, and sell. We revolutionize communication and eliminate trillions of dollars of inefficiency and waste

Samantha Zirkin is the CEO and Founder of Point 93, which leverages self sovereign blockchain identities and a novel form of equitable pricing to enable a conversation between retailers and their individual customers. She designed and patented a universal, customer-facing platform to capture and analyze data that will allow for unique market insights and individual customer identities. She is focused on delivering effective revenue maximization strategies and allowing retailers to partner with their customers in evolving more ethical, sustainable business practice

Contact: Samantha@point93.com / www.point93.com

Nataša Kozlevčar — Co-founder Money Rebel

"We are witnessing huge and fast steps toward mobile and artificial intelligence. The banking sector is still lagging, especially in the EU. With the implementation of the PSD2 EU directive and furious growth of mobile first, this is about to change."

We partnered with a group of highly skilled tech individuals, AI specialists and crypto specialists to make managing money completely trivial. Our Platform is designed like a set of independent, well-connected products. We have previously developed and successfully introduced two of the products in our home market, Slovenia: My portfolio and My budget. We decided to spin-off the technology to pursue scaling opportunities for all independent financial advisors in Europe, and to upgrade and automate the feature-set and processes: from budgeting, insurance to wealth management as well as to provide all in one smart bank for users.

Natasa's specialty is development and implementation of sophisticated, long-term financial plans that are highly tailored to client's needs. She is the voice of being financially independent, Speaker, Educator and the Author of Independent woman with a whip.

With her long-term experience as a Director of consultancy in the Slovenian financial institutions she went on to become a partner in now to be the biggest Slovenian independent financial consultancy firm. She is one of the key advisors for building community for Money Rebel Platform as well as for creating AI MR Robo Advisor. The MR Robo Adviser will take care of your investment portfolio, tax loss harvesting, and periodic rebalancing – in the fiat and crypto worlds. Since technology is best exploited with a human touch, the MR Robo Adviser will work hand in hand with real adviser, which will tackle tasks that are more sophisticated and offer advice on request to final customers.

Contact: natasa@moneyrebel.com / https://moneyrebel.io/

Digital technology will revolutionize education! Or not?

Education, Jan 23, 10am

"Finis origine pendet", defines the educational strategy of the first incorporated high school in America, Phillips Academy, which is now the leading Preparatory College. Latin, it stands for the ***'end depends upon the beginning'*** and was crafted by its founder, a strict Calvinist Samuel Phillips Jr. stating ***"Youth is the important period, on the improvement or neglect of which depend the most important consequences to individuals and the community."***
The Caspian Week is grateful to the Phillips Academy for allowing us to use their noble Motto for our week in 2018 in the context of ***how important early collaboration between the different stakeholders is for achieving a successful outcome***. Today we take universal access to information as granted. However, this has not always been so. A quick excursion into the past helps us to understand and value the privilege to learn a universal language of numbers, words and to think independently, experiment-, exchange- and question exiting thought.

In 1524, the prince of Humanism, ***Desiderius Erasmus from Rotterdam***, promoted the ***freedom of the will***, for making our own choices, thus converting humans from an object towards a dogmatic end to a ***self-determined subject***. This lay the base for universal access to the word, which was then, promoted ***general education*** as laid out by ***Jean Calvin*** in 1560s. It took 200 years until ***Jean Jacques Rousseau*** from Geneva published '***Emile, or on Education'*** in 1762, advocating the formation of the ***whole person for good citizenship***. Emile served as the foundation of what then became a new ***national system of education***. In 1866 Fredrick Maurice from King's College and Cambridge instilled the students with the ***habit to inquire and research and process of independent thought***, paving the way for what is known today as ***liberal education***. All these require mostly ***active physical presence*** in front of a teacher and content has not been made available for most, leaving them in darkness.

These educational innovations have been the ***base for modern science and technology and developing products and markets for making life better overall***.

Mobile telephony and cheap access to international data opened up radical new markets for education. Today, everybody with a computer and smart phone can learn from such online educational platform such as the ***Khan Academy*** for free. However, with the new gained possibility of universal distribution come also a possible danger of abuse and a new form of information distortions with the possibility of indoctrination of thoughts against humanity at large. Also, a perceived universal access to education seems to marginalize the access to higher Western quality education due to cost leaving many in debt for years to come. ***The United Nations have defined Goal 4 to promote inclusive-, quality education and a motivate life long learning.***[I]

This panel will address education across all levels:

- Nutrition is the key for better education!
- Will cost for quality education continue to rise or is digital the solution?
- Are we abandoning liberal education?
- How can we form professionals in a digital world?
- Can we keep up with the pace of technological progress?
- How can we steer a company in a increased volatile market?
- Can we deploy digital education for emerging markets efficiency?
- What policies are necessary to leverage the novel innovation in education?
- What is better? A vocational or liberal education for the future?
- How can we prevent 'silo' thinking and acting?

Our panel leaders for Education:

Prof. Peter Lorange	Lorange Network, Chairman & Founder. Norway	***"Digital technology shall lead to many new types of jobs/tasks."***
Natasha Lance Rogoff	Ingredients for Education, CEO & Founder. Boston	***"Digital technology and interactive learning to promote healthier behaviors can have the greatest impact in schools, afterschool and in community organizations where "digital-age" children have greater access to technology and are ready to adopt video, gaming and interactive engaging experiences as key components of educational content."***
Prof. Florin Baeriswyl	Dean of brand-design faculty at DeTao Shanghai Institute of Visual Arts, Shanghai China	***"We can change 'it' through education"***
Prof. Cedric Dupont	Director Graduate Institute. Geneva	***"Impacts the structure and regulation of the financial and banking industry as well as, eventually, central banking and monetary policy"***
David Shrier	Associate Fellow, Oxford Said Business School. Creator & co-convener, Oxford Fintech and Oxford Blockchain Strategy	***"Digital technology can change both how we collaborate and learn from each other, and how we learn at scale."***

Moderator Dr. Kaspar Bänziger, Kaspar.baenziger@gmail.com

FREE ACCESS, NO BADGE REQUIRED.

Details under www.caspianweek.com

RSVP: Katherine.hermans@gmail.com

Our Education Leaders' Background

Peter Lorange, Prof.

Chairman, Lorange Network. Norway

"Digital technology shall lead to many new types of jobs/tasks."

This shall imply that students must now learn different things. And, the pedagogy of learning is changing. New markets are created!

Lorange Network: "Our mission is to provide a unique learning and sharing platform for family office, principals and family business owners. The purpose: Improve performance".

Background: Ex President IMD (1993-2008). Ex, CEO, Lorange Institute (2009-2015). MA Yale University, PhD Harvard University. He holds Honorary Doctorates from Pecs University, Moscow State University, Copenhagen Business School, Estanian Business School, and Lund University and he is an Honorary Member of EFMD. Peter has served on the board of directors of several corporations including: Zaruma Resources, Preferred Global Health and Seaspan Corporation

Contact: peter@lorangenetwork.com / https://lorangenetwork.com/

Natasha Lance Rogoff

CEO & Founder, Ingredients for Education, Inc.

"Digital technology and interactive learning to promote healthier behaviors can have the greatest impact in schools, afterschools and in community organizations where "digital-age" children have greater access to technology and are ready to adopt video, gaming and interactive engaging experiences as key components of educational content."

Rates of obesity and type 2 diabetes are climbing rapidly, contributing to unsustainable increases in healthcare costs. 422 million adults have diabetes and 1.6 million deaths are directly attributed to diabetes annually. Families, as well as employers need creative and innovative solutions to prevent and manage chronic diseases in order to maximize worker

productivity and minimize healthcare costs. Research has shown that digital approaches to nutrition and wellness education offer innovative solutions. *KickinNutrition.TV* is an example of a prototype designed in collaboration with top nutrition experts to be a disruptive solution benefitting employers, healthcare providers, school-based educators and individuals. *KNTV* delivers engaging digital content (story-driven, comedy-based videos and interactive gaming) with the goal of revolutionizing the way children and families learn about food, cooking, nutrition and exercise. Digital approaches to health and wellness offer the advantage of scalability and cost-effectiveness to allow for sustainable improvements for *Whole-Family Health.*

Rogoff has produced and directed award-winning television, videos, news and documentaries around the world for PBS/Frontline, BBC, NBC, ABC and for Russian television. Rogoff founded the nonprofit, *Ingredients for Education*, a digital learning platform for health and wellness education. Formerly, Rogoff served as Executive Producer of *Sesame Street* internationally, creating an original Russian series. Rogoff is passionate about using technology for public education. Rogoff is an Associate of Harvard University's Visual and Environment Sciences

Contact: NLrogoff@fas.harvard.edu / http://ingredientsforeducation.org/

Florin Baeriswyl. Prof.

Dean of brand-design faculty at DeTao Shanghai Institute of Visual Arts, China

"We can change 'it' through education"

A master's is the new bachelor's. An online course for a master's degree is basically a requirement for advancement (and increasingly entry) into most professions. Any system that can shorten the time required to receive a graduate degree, while also significantly cutting costs, will prove to be extremely attractive to large numbers of potential applicants.

Florin Pierre Baeriswyl is Designer an innovator and a professor. He studied Software Engineering at Bern University of Applied Sciences and in 1987 he graduated from Zurich University of the Arts (ZHdK) in industrial design.
In 1987 he co-founded dai design Zurich. Dai is a design, architecture and identity services company with its business model based on identity integration from all aspects. In 1995, dai won its first iF Design Award which, among others, was soon to be followed by multiple Good Design and Red Dot Awards. In 2013, Baeriswyl launched Institute of Swiss International Branding (ISIB) in and the worldwide first 4-year bachelor for 'Brand Strategy and Management' at DeTao SIVA University in Shanghai. He received his professor and principal

title after creating the new curriculum and structure for this degree, certified by the Chinese ministry of education.
Contact: f.b@dai.ch / www.siva.edu.cn

Cédric Dupont

Professor and Director of Executive Education Graduate Institute of International and Development Studies, Geneva

"Digital technology impacts my educational horizon by disrupting the balance between skills and knowledge."

For education, recent developments in AI and big data open new perspectives and opportunities with expected improvements in the personalization of learning journeys and the optimization of teachers' role. Seizing those opportunities will disrupt the current set-up of higher education all the way from the students and teachers selection to the certification and will call for careful regulations to ensure data privacy for learners.

I was trained in international political economy in Switzerland and in the United States. I have been a Professor at the Graduate Institute since 1997 and held visiting appointments at the University of California, Berkeley, at Seoul National University and the University of Melbourne. My current research on international investment arbitration, international economic cooperation and global institutional transformation in the digital age. As a teacher/trainer, I have created and run a large range of programs and courses for government officials, civil society actors and private sector employees, using participatory methods such as simulations, role play, foresight, case based teaching, as well as learning tools.

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David Shrier

Chairman & co-founder, Riff Learning. Associate Fellow, University of Oxford
Lecturer, MIT

"Digital technology can change both how we collaborate and learn from each other, and how we learn at scale."

The simultaneous convergence of AI, big data, IoT and DLT is creating transformational change that will impact all of the education industry over the next two decades.

David Shrier is a seasoned growth catalyst with expertise in collaborative innovation, data/analytics, fintech, digital identity, and cybersecurity. He is a globally recognized authority on technology-driven innovation, and leads the University of Oxford's online programmes Oxford Fintech and Oxford Blockchain Strategy, as well as MIT's fintech class Future Commerce (the first graduate fintech class in North America), all of which he created. David has cofounded and is Chairman of MIT-spinout Riff Learning, providing distance collaboration at scale, as well as behavioral analytics fintech Distilled Analytics, where he is CEO. He has published multiple books on fintech, blockchain and cybersecurity.

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Artificial intelligence, augmented reality = better healthcare for all! Really?

Healthcare, Jan 23, 3pm

In medicine, we measure, we question, we decide and act. Then, we treat with knives, tools, drugs and machines and settle claims. We observe-, collect data- and leverage new knowhow for developing better options for diagnosis, treatment and public health. The healthcare value chain with a ***share of GDP of up to 20%*** *(*USA), is ripe for disruptive innovation for increasing patient compliance in order to reduce the suffering, cost and time. Today, data handling is highly inefficient and structured in silos. ***The majority of medical mistakes are based on data errors and incompatibility of such***[ii]. ***Digital technology disruption is revolutionary in all aspects from the patient's bedside to the development of new treatment options***.

Blockchain will enable to better store, distribute and manage data. ***"Trusted and open R&D processes and audible & secure transactions"*** are key to develop better means of treatments (Figure 11, Figure 13).[iii] New ***cloud data storage*** enables to empower the individuals to become owners of data vested with the decision making power. MIDATA.coop for example enables citizens to securely store, manage and control access to their personal data by helping them to establish cooperatives (Figure 12)[iv]. ***Artificial intelligence*** is increasingly being accepted across the healthcare value chain and helps care providers and patients alike to increase the speed and precision of diagnoses and enable personalized treatment strategies (

Figure 14).

This panel will address the digital impact of the healthcare value chain:

- Development of new diagnostics, drugs and medical technologies
- Application of novel technologies from lab to bedside
- Will AI increase patient safety or possibly decrease human judgment?
- Can distributed ledger technology solve the data-handling problem?
- Who is responsible for action at the patient when a robot decides?
- Will better diagnostics reduce or increase treatment costs?
- Can the cloud empower the individuals over the data gathering companies?
- Can a surgical robot be trusted?

Our panel leaders in digital revolution in healthcare are:

Prof. Ernst Hafen	Prof. ETH Zürich, President MIDATA President	***"MIDATA empowers citizens to aggregate and control access to their personal data for the benefit of health and society at large"***
Richard Fritschi	Chairman, Implantica MediSwiss AG	***"Digital technology impacts my industry in all areas we can think, develop and act."***
Prof. Dr. med. Andreas Trojan	Senior Physician OncoCenter Zürich, Founder Mobile Health AG	***"Digital Technology will provide structured, reliable and standardized Patient Reported Outcome Measures (PROMs) for doctors."***
Dr.med. Dr. phil.-nat. Philippe Haas	Chief Medical Officer SYNLAB Suisse SA	***"Digital technology connects and empowers healthcare professionals for clinical decision-making."***
Stephanie Bova	Digital Innovation Director. Takeda, Japan	***"Digital technology and analytics will allow us to create better health outcomes and advance the science in a more patient focused way."***
Yorke E. Rhodes III	Microsoft. Principal Manager and Cofounder Blockchain	***"Blockchain is a digital transformation catalyst in all it's forms from public ledgers like Ethereum and Bitcoin to private, enterprise, or consortium solutions.*** ***It is having an impact across industries and in a sustainability, humanitarian and identity landscape as well."***
Prof. Dr. med. Walter Weder	Director Thoracic Surgery-; Co-Director Hospital Board University Hospital Zurich	***"Robotics and Artificial Intelligence is increasing the surgical precision and reduce recovery time substantially"***
Dr. Andreas Wespi	Head Cyber security Research, IBM	***"Neuromorphic computing will deliver more compute power at much lower energy consumption close to the end user, opening up many new business opportunities for small players."***

Dr. Kaspar Bänziger, Moderator, Kaspar.baenziger@gmail.com
FREE ACCESS, NO BADGE REQUIRED.

Detail sunder www.caspianweek.com
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Our Healthcare Leaders' Background

Ernst Hafen

Professor ETH Zurich, President MIDATA Cooperative

"MIDATA empowers citizens to aggregate and control access to their personal data for the benefit of health and society at large"

Personal data are a unique new asset class that can be copied easily. Giving citizens a right to a digital copy of their personal data (EU GDPR) and a platform to store, aggregate and control access to their data generates a novel, citizen-controlled multi-trillion $ personal data economy. MIDATA.coop, a citizen-owned personal data platform cooperative, promotes the democratization of this new economy by enabling the generation of a new market for personal data services.

Ernst Hafen is professor for systems genetics at the Institute of Systems Biology at ETH Zürich and president of the Bio-Technopark Schlieren-Zürich. In addition to a successful career in research and teaching he also acted as president of ETH Zürich from 2005-2006 and has founded three companies.

Contact: hafen@imsb.biol.ethz.ch / www.midata.coop/

Richard Fritschi

Chairman, Implantica
MediSwiss AG

"Digital technology impacts my industry in all areas we can think, develop and act."

In the area of surgeon techniques, glasses with augmented realities are a game changer. In Rehabilitation, robotics combined with artificial realities improve the treatment possibilities.
In the area of future implants, small electronics are being implanted. These new technologies or so called smart implants will make a huge difference in the treatment of obesity and urinary incontinence.

Richard Fritschi is Board of Director and Investor at multiple private and public companies. After the army services, he continued his studies at the Swiss Institute for Economy in Zürich and later attended an advanced management program called "The General Manager" at the Harvard Business School.

In 1991, Richard joined SULZERMEDICA as financial controller and was appointed in 2001 as President for Europe, Asia and Latin America. In 2003, the US Group ZIMMER acquired CENTERPULSE and Richard became President for Europe and Australasia.

From 2006 - 2011 Richard was acting as the CEO of Ypsomed, a leading company in the diabetes drug delivery systems.

Contact: Richard.Fritschi@bluewin.ch / http://implantica.com

Andreas Trojan

Prof. Dr. med. Senior Physician
OncoCenter Zürich
Founder / mobile Health AG

"Digital Technology will provide structured, reliable and standardized Patient Reported Outcome Measures (PROMs) for doctors."

Facing demographic challenges and enormous medical costs, patients and caregivers shall make collaborative efforts to improve efficacy and safety of progressively complex and chronic treatments. Digital technology will thus provide relevant, reliable and standardized health related data for diagnostic and therapeutic platform use. In cancer, studies already demonstrated an improved patient wellbeing and reduction of emergencies upon digital recorded PROMs. Discovery of the novel empowerment in the patient- doctor relation and health related data analysis will not only drive the next decade of genomic, targeted and immunological therapeutic approaches, moreover, impact on clinical study conduct is expected.

Titular Professor at University Zürich medical faculty. Senior physician Breast- and OncoCenter Zürich. Mentor Wyss Zurich Associate Project. Chairman foundation Appsocial.org and Swiss Tumor Institute. Postdoc in Boston, Dana-Farber Cancer Institute. Medical Studies in Zürich.

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Stephanie Bova

Head of Takeda Digital Accelerator; CEO and co-founder of OSHI, Inc

"Digital technology and analytics will allow us to create better health outcomes and advance the science in a more patient focused way."

Digital technology presents a unique opportunity in healthcare to move from today's era of data analysis to using technology to predict outcomes. The ultimate promise of digital technology is to move beyond prediction into improving the ways we intervene in treatment and are expected to dramatically change the way healthcare is delivered and consumed.

Stephanie is currently the Head of Takeda Pharmaceutical's Digital Accelerator, is the co-founder and CEO of OSHI, Inc, a start-up created to improve the health outcomes of patients with chronic gastro-intestinal disorders, and serves as a board member of various start-ups in healthcare. Stephanie has held various senior positions at Takeda, Pfizer, and at Deloitte Consulting spanning roles within R&D, commercial, M&A, business development and supply chain.

Having earned recognition as Pharmaceutical Executive magazine's "Top 40 under 40" and Medical, Marketing, and Media's (MMM) Top Healthcare Transformer for 2016, Stephanie also serves on the board of Hoy Health, the Healthcare Business Women's Association, and BrainBoost, an accelerator from the Tel Aviv Graduate School of Neuroscience.

She holds a BS in International Business and Japanese language from the University of Buffalo, an MBA in finance from the University of Maryland, and has completed the Data Science for Executives course from Johns Hopkins and the Machine Learning for Big Data course at MIT.

Contact: stephanie.bova@takeda.com / www.takeda.com

Philippe Haas

Dr.med. Dr. phil.-nat. Chief Medical Officer SYNLAB Suisse SA

"Digital technology connects and empowers healthcare professionals for clinical decision-making."

Digital technology applications in healthcare have a strong potential for simplifying the relationship between patients and professional healthcare providers by providing more ad hoc actionable data for clinical decision making. The disruptive potential for certain businesses is considerable. New businesses will be created, while others will be threatened to disappear literally overnight.

Philippe Haas is a Medical Doctor and Physicist. Currently working as CMO of a Diagnostics Company after several years of training in various sub-disciplines like Molecular Pathology, Surgery, Traumatology and Orthopedics, as well as with a board certification in Internal Medicine, he obtained his PhD in Experimental Physics with a focus on nano-optical biosensors. As an active Colonel of the Swiss Armed Forces, he was also involved for several years in different international Information and Technology Transfer Programs for the Swiss Defense Department.

Contact: philippehaas@mac.com / www.synlab.ch

Dr. Andreas Wespi

Research Scientist, IBM Research - Zurich

"Neuromorphic computing will deliver more compute power at much lower energy consumption close to the end user, opening up many new business opportunities for small players."

More users and more applications will lead to more data. Most data will be processed where it originates. Deep learning technologies will be at the users' fingertips. Large volumes of data will no longer be confined to big organizations, opening up business opportunities for smaller players. While digital assistants will evolve everywhere, some legacy problems will remain, cyber security being the most prominent one. Being close to the humans, cyber security attacks will have more disruptive influence on our daily life.

Dr. Andreas Wespi is a Research Scientist at IBM Research – Zurich working on multiple Cyber Security research projects. From 2011 to 2013 he was with the CTO Office, IBM SWG Europe, supporting customers in Cyber Security and related areas. From 2002 to 2011 he was managing the Security and Privacy Research team at IBM Research – Zurich. He was leading projects in the areas of security analytics, intrusion detection, data security, cloud security, security policy management, and privacy. Previously he was a member of IBM's Global Security Analysis Lab (GSAL). The GSAL has made substantial contributions to IBM's security product and service offerings. Among others it has developed the technology behind the first commercial Security Information and Event Management (SIEM) product. Andreas Wespi is a steering committee member of the International Symposium on Research in Attacks, Intrusions and Defenses.

Contact: anw@zurich.ibm.com / ps://www.linkedin.com/in/andreas-wespi-2201a6/

Yorke E. Rhodes III

Principal Program Manager; Cofounder Blockchain at Microsoft

"Blockchain is a digital transformation catalyst in all it's forms from public ledgers like Ethereum and Bitcoin to private, enterprise, or consortium solutions. It is having an impact across industries and in a sustainability, humanitarian and identity landscape as well."

All of the above. We are seeing public and private blockchain implementations providing value to existing business processers, particularly where they are cross company and therefore lack the trust of a single enterprise solution. This leads us to many places where there are partners, counter parties, customer relationships, or an entire value chain like Supply Chain.

Yorke E. Rhodes III is a passionate technologist with broad interests, always drawn to the next shiny object. He earned a BS in Computer Science from NYU's Courant Institute of Mathematical Sciences. He has worked in industry for over 20 years, in enterprises such as Microsoft & IBM and startups in wireless, mobile, digital marketing & ecommerce. At Goldman Sachs Investment Bank he built their first wireless internet ingress and advised bankers in wireless, telecom and media. As a young developer he saw the beginnings of client server databases, obscure languages like ada, lisp & paradox and the birth of the internet. Blockchain piqued his interest in the summer of 2015 with the launch of Ethereum. He cofounded Microsoft's blockchain initiatives working in collaboration with the partner community and continues driving it today in his role on the Blockchain Engineering team. An Adjunct Professor at NYU, he has taught Digital Marketing, Ecommerce and Intrapreneurship and is currently developing a course on the user centric economy called #OurNextEconomy.

Contact: Yorke.rhodes@microsoft.com / twitter: @yorkerhodes / blockchain: uPort or onename

How Digital Technology shapes Global Finance.

Jan 24, all day

These panels decipher the fast emerging opportunities, challenges and intricacies of the fintech landscape, the nexus to economic reality and monetary governance. We address several topics around finance and innovation. How fintech impacts the economic value chains from a macro perspective of central banks and regulatory aspect as well as from a bottom up-, economic reality standpoint.

'Finis origine pendent' addresses three particular value chains in global economics:

1) Capital flows for financial inclusion,
2) Developing economies,
3) Digital currencies

10am	**Will 3 billion people become financially included thanks to fintech?** **Prof. Alexandre Swoboda**. Professor of Economics Emeritus. Geneva **Prof. Alexander Pentland**. MIT Connection Science & Human Dynamics Lab, Director. Boston **Dr. Veronica Lange**. UBS. Head of Innovation. London **Prof. Srdjan Capkun**. Institute for Information Security, ETH, Director. Zürich **Dr. Nuria Oliver**. Vodafone; Pop Alliance, Director Data Science Research. London, Boston **Matthew Schwartz**. Partner, Boies Schiller Flexner, Head of Global Investigations and Compliance Practice. New York **Moderator: Dr. Kaspar Bänziger**
1.30pm	**Can developing nations rise more inclusively when economic reality meets future technologies?** **Mary Ellen Iskenderian**. Women World Banking, President and CEO. New York. **Rana Kapoor**. YES Bank, Founder & CEO. India **Prof. Ugo Panizza**. Prof. Int. Economics. Pictet Chair in Finance and Development. Director, Center for Finance and Development. Graduate Institute Geneva. **Taynaah Reis**. Moeda, CEO & Founder. Brazil **Idris Al Senussi**, Economic inclusion leveraged by democratic progress, Spain **Moderator: Dr. Kaspar Bänziger**
4pm	***"Bitcoin is dead! Long live the Cybercurrencies!"*** **Peak Debate© Showtime!** **It's all about trust: Prof. Alexandre Swoboda**. Professor of Economics Emeritus. Geneva. **Fiat will prevail: Michael Huttman**. Millenium Global Investments, Founder and Chairman. London. **Policy is key: Dr. Daniel Heller**. Peterson Institute, Fellow. Washington D.C. **Fiat is fraud: Jeffery Wernick**. Qtum. Investor and Advisor. Singapore & New York. **Moderator: Dr. Kaspar Bänziger**

Moderator: Dr. Kaspar Bänziger, Kaspar.baenziger@gmail.com

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Detail sunder www.caspianweek.com

RSVP: Katherine.hermans@gmail.com

Our panel leaders for Finance and Economics:

Prof. Alexandre Swoboda	Professor of Economics Emeritus. Geneva	***"Impacts the structure and regulation of the financial and banking industry as well as, eventually, central banking and monetary policy"***
Taynaah Reis.	Moeda, CEO & Founder. Brazil	***"Through blockchain technology, we are able to provide a transparent way of doing microfinance and microloan."***
Prof. Alexander Pentland	MIT Connection Science & Human Dynamics Lab, Director. Boston	***"We are building systems that allow radically new ways to combine and monetize diverse collections of assets."***
Dr. Veronica Lange	UBS. Head of Innovation. London	***"While being doubtful whether cryptocurrencies will ever become a mainstream means of exchange, the underlying technology, blockchain, is likely to have a significant impact in finance."***
Prof. Srdjan Capkun	Institute for Information Security, ETH, Director. Zürich	***"Security technologies are becoming enabling technologies - they are starting to create new opportunities by changing trust assumptions and providing better protections for individuals and businesses."***
Dr. Nuria Oliver	Vodafone; Pop Alliance, Director Data Science Research. London, Boston	***"Our future depends on our ability to leverage Artificial Intelligence in a fair, accountable, transparent and ethical way."***
Matthew Schwartz	Partner, Boies Schiller Flexner, Head of Global Investigations and Compliance Practice. New York	**"*Blockchain and other distributed ledger/cryptocurrency technology is going to be central to settlement and payment systems in the future; global regulation and regulators are racing to catch up to the technology."***
Rana Kapoor	YES Bank, Founder & CEO. India	***"Digitization is proving to be the key differentiator and competitive advantage for the Banking sector, with rapid developments in payments sector; in the near future, the focus is likely to shift towards lending, trade finance, block chain amongst others"***
Prof. Ugo Panizza	Prof. Int. Economics. Director, Center for Finance and Development. Graduate Institute Geneva.	***"Cryptocurrency could be an answer to derisking, but we need to be careful because they could also become the new Poyais"***

Idris bin Abdullah al-Senussi	President, Iasco Consulting, Spain	***"Digital technology enables the biggest democratic step towards the inclusion of marginal citizens, to give them an identity and render them financially inclusive"***
Michael Huttman	Chairman & Founder, Millennium Global Investments Ltd. London	***"Cyber currencies will challenge banks and exchanges and render two billion people bankable"***
Jeffery Wernick	Qtum. Investor and Advisor. Singapore & New York.	***"Fiat is fraud! Trust peers and blockchain platforms that mitigate information asymmetry not institutions and agents who, supposedly for our benefit, profit from information asymmetries."***
Dr. Daniel Heller	Peterson Institute, Washington D.C. Former Head Financial Stability BIS, SNB and IMF	***"Initial coin offerings are valuable but need strong regulations"***

Our Education Leaders' Background

Alexandre Swoboda

Professor of Economics Emeritus
Graduate Institute of International and Development Studies, Geneva

"Impacts the structure and regulation of the financial and banking industry as well as, eventually, central banking and monetary policy"

Rather than any individual technology, it is the synergies between DLT, smart contracts, AI, and big data that will change the industrial organization (structure) of markets, the competitive position of existing firms and the emergence of new skill requirements and products. The application of these technologies will result first in process rather than product innovation. The potential economies of scale and network externalities inherent in the combination of these technologies raise major economic policy (e.g. regulation of natural monopolies) as well as democratic control issues.

Professor of Economics Emeritus and past Director, the Graduate Institute, Geneva. Founding Director of the International Center for Monetary and Banking Studies. Author of numerous publications on open economy macroeconomics, international monetary theory and policy, the international monetary and financial system. Advisor, consultant to central banks, international financial institutions and the private sector. Yale Ph.D.

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Ugo Panizza, Prof.

Prof. Int. Economics. Pictet Chair in Finance and Development. Director, Center for Finance and Development. Graduate Institute Geneva.

"Cryptocurrency could be an answer to derisking, but we need to be careful because they could also become the new Poyais"

Large international banks play a key role in small countries as they serve as "Correspondent" banks that clear smaller banks' foreign-currency transactions. However, higher compliance costs linked to Anti-Money Laundering/Combating the Financing of Terrorism ("AML/CFT") are pushing international banks away from countries where compliance costs surpass potential profits. This process, known as "de-risking" has left many countries without a correspondent bank or with just one correspondent bank. De-risking limits financial inclusion and entrepreneurship in countries that need it the most and increases the cost of sending remittances to these countries. Can cryptocurrencies help? What are the opportunities? What are the challenges? More in general, what is the role of cryptocurrencies in promoting financial inclusion and financial stability in the poorest countries?

Ugo Panizza is Professor of Economics and Pictet Chair at the Graduate Institute, Geneva. He is also the Director of the Institute's Centre on Finance and Development, and a CEPR Research Fellow. Prior to joining the Institute, he was the Chief of the Debt and Finance Analysis Unit at the UNCTAD. He also worked at the Inter-American Development Bank and the World Bank and taught at the American University of Beirut and the University of Turin.
Master in Economics, Coripe Pemonte, Turin, Italy. PhD and M.A. in Economics, The Johns Hopkins university, Baltimore, MD

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Taynaah Reis

Founder and CEO, Moeda. Brazil.

"Through blockchain technology, we are able to provide a transparent way of doing microfinance and microloan."

By building the Moeda platform of microfinance, the lenders can now track all the movements that have been made on the loan by the borrowers. With this new way of interaction, we are able to build more trusts among people and enable a new way of peer-to-peer impact investment

Taynaah Reis is the founder and CEO of Moeda, a project that aligns with the Sustainable Development Goals of the United Nations to offer an alternative banking platform for the rural people who have no access to the conventional banking system in order to empower them for doing social good.
Taynaah has a self-learned software programing background with hands-on experiences in various sectors, which enables her to provide another layer of game-changing methods for handling governance, resources management and banking solutions.

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Alex Pentland, Prof.

Professor, MIT. Director Trust: Data Consortium. USA.

"We are building systems that allow radically new ways to combine and monetize diverse collections of assets."

We have constructed a dramatically more secure, GDPR compliant, platform for digital transactions of all sorts. It allows large numbers of diverse asset owners to create extremely large, liquid, and efficient financial pools.

Background: Professor MIT, co-creator of MIT Media Lab, one of worlds' most-cited scientists, Board member ATT, UN Sec General, Am. Bar Asso, and serial entrepreneur.

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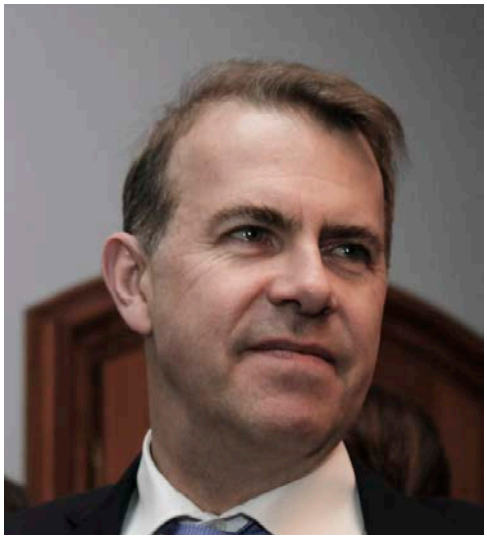
Daniel Heller

Peterson Institute for International Economics Visiting Fellow



"Improvements to digital technology will lead to the emergence of more non-bank service providers in the financial sector."

DLT has the potential to decentralize important financial markets and Infrastructures such as exchanges, securities settlement systems and credit markets. This would also entail the creation of tokenized money Denominated in sovereign currencies. These tokens would be issued by central banks or private sector consortia.

Daniel Heller has been associated with the Peterson Institute for International Economics since January 2017. Previously, he was head of financial stability at the Swiss National Bank, head of the Secretariat of the Committee on Payment and Settlement Systems at the Bank for International Settlements, and executive director for Switzerland, Poland, Serbia, Azerbaijan, and four Central Asian republics at the International Monetary Fund.

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Iris bin Abdullah al-Senussi

President, Iasco Consulting, Spain

"Digital technology enables the biggest democratic step towards the inclusion of marginal citizens, to give them an identity and render them financially inclusive"

Blockchain and smart contracts are probably the single most powerful tools to establish true democracies. The distributed ledger technology enables the individual sovereigns to be transparently and directly connected to the administration, thus a direct social contract which is tamper proof. Furthermore, mobility, big data and cloud platforms empowers each individuals to become principals over their own finances, establish a nexus to the global market place and circumvent inefficient and costly agents.

Prince Idris bin Abdullah al-Senussi is a member of the Libyan Royal family and a leader of the Sanussiyah movement. Idris continues the work started by his father to reunite Libya based on the constitution of 1951. Prince Idris al Senussi has been playing a diplomatic role to help balance the differences between Libya and Africa, the Arab World, Europe, the United States, Latin America and Asia.

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Veronica Lange da Conceição, PhD.

Head of Innovation, Group Chief Technology Office at UBS. UK.

"While being doubtful whether cryptocurrencies will ever become a mainstream means of exchange, the underlying technology, blockchain, is likely to have a significant impact in finance. "

It is possible that blockchain will be adopted faster in other sectors, as it is sometimes difficult to collaborate as quickly in the highly regulated area of financial space. Nonetheless, the progress so far in financials has been impressive. At the moment, the most popular areas include supply chain finance, where blockchain help create efficiencies and help solve the double spending problem, or in areas like liquidity management and capital efficiency. For example, tokenization in a fully regulatory-approved environment could help traditionally illiquid assets become more liquid, and be

more attractive as collateral. Post-trade is another interesting area of development. A lot of people are excited about DLT potential for clearing and settlement, but we believe financial assets have to be fully digitized and managed on a blockchain network, with regulators on board, before any real efficiencies can be realized

Possibly blockchain will be adopted faster in other sectors, as it is sometimes difficult to collaborate as quickly in the highly regulated area of financial space. Progress so far in financials has been impressive. At the moment, the most popular areas include supply chain finance, where blockchain help create efficiencies and help solve the double spending problem, or in areas like liquidity management and capital efficiency. For example, tokenization in a fully regulatory-approved environment could help traditionally illiquid assets become more liquid, and be more attractive as collateral. A lot of people are excited about DLT potential for clearing and settlement, but we believe financial assets have to be fully digitized and managed on a blockchain network, with regulators on board, before any real efficiencies can be realized

Contact: Veronica.lange@ubs.com

Jeffrey Wernick

Lead Investor and Advisor, Qtum Inc

"Fiat is fraud.
Trust peers and blockchain platforms that mitigate information asymmetry not institutions and agents who, supposedly for our benefit, profit from information asymmetries"

Bitcoin is the best rule based store of value. Fiat is application of Gresham's Law. Bad money circulating.

Bitcoin and Blockchain chain platforms are the only platforms people engage in agnostic to borders by choice. Not coercion. Not only borderless but without barriers to entry.

Recapture your identity. Your personal autonomy. Your ownership of you. And share based upon explicit pricing and voluntary exchange in full transparency with respect to what is important to know with respect to the exchange of value.

More important than sovereign nation. Which is artificial construct. But sovereign individual.

Entrepreneur/Private Investor. Bitcoin investor since 2009.

Started career trading options and futures on the CBOC, CBOT and the CME while being a college student. After working at Salomon Brothers and later the National Bank of Detroit in senior positions for quantitative research, capital trading, risk management and loan pricing,

he ran his own company AVI Portfolio Services Company, Inc. specialized in risk management in tailored and exotic derivative products, which was sold in 1984 to the largest insurance company in diversified financial interests. Ever since, he has been managing money, including his own personal wealth, and is highly experienced with investing in distressed and bankrupt companies, as well as in other domestic and international investment opportunities, including seed capital, angel investing, venture capital, real estate, currencies, commodities, mining, all forms of derivatives and structured financial products, sharing economy, lending platforms, bitcoin, blockchain, biomedical, human genome project and payment systems. Governments
Undergraduate, graduate and postgraduate studies at The University of Chicago

Contact: jeffreywernick@gmail.com / https://qtum.org/en/

Matthew L. Schwartz

Partner, Boies Schiller Flexner LLP
Head of the Firm's Global Investigations and Compliance Practice

"Blockchain and other distributed ledger/cryptocurrency technology is going to be central to settlement and payment systems in the future; global regulation and regulators are racing to catch up to the technology."

I represent financial institutions, digital currency companies, and investors in a wide variety of regulatory issues relating to blockchain and cryptocurrency technology. The changes in and swift adoption of technology is a challenge to regulators, who are competing to occupy the space. Because the entire purpose of this technology is to eliminate friction by working outside of the existing settlement and payment processing networks, it by definition is acting in gaps in the regulatory scheme. This creates extraordinary opportunities, but also vulnerabilities.
Matthew currently leads the Global Investigations and compliance practice at Boies Schiller Flexner, a global law firm. Previously, he served for a decade in the U.S. Department of Justice, investigating and prosecuting violations of banking laws, cybercrimes, securities

violations, and other financial crimes.

Undergraduate: Columbia University, B.A. in physics and philosophy, Graduate: Columbia University, J.D. (with honors)

Contact: mlschwartz@bsfllp.com / www.bsfllp.com

Nuria Oliver, PhD

Director of Research in Data Science, Vodafone
Chief Data Scientist, Data-Pop Alliance

"Our future depends on our ability to leverage Artificial Intelligence in a fair, accountable, transparent and ethical way."

Artificial Intelligence has the potential to profoundly transform society and to enable us to tackle fundamental global challenges including the aging of the population, financial inclusion, access to education, and climate change. To realize this potential we need to invest in (1) nurturing, attracting and retaining diverse talent to this field; (2) offering opportunities for constant learning and adaptation to professionals whose jobs might be affected by AI and increasing our education efforts to citizens; (3) developing data-driven cultures in governments and companies; (4) tackling key technical and legal challenges such as bias in algorithms, lack of transparency and unclear accountability; and (5) developing and acting according to well defined ethical frameworks that place humans at their core and that are aligned with fundamental

human values

Expert in AI research for over 20 years; Fellow of the ACM, of the IEEE and of the European Association of AI; advisor to the Spanish Government and several research institutes; author of 150+ scientific papers and featured in 100+ press articles; inventor of 40 patents; speaker in scientific and technology conferences; advocate for women in tech and closing the technology knowledge gap.
MSc Electrical Engineering, UPM, Madrid. PhD in perceptual Intelligence, Media Lab, MIT, Hon. PhD, University Miguel Hernandez. Winner of Spanish National Award for Electrical engineering.

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Rana Kapoor

Founder & CEO, YES BANK

"Digitization is proving to be the key differentiator and competitive advantage for the Banking sector, with rapid developments in payments sector; in the near future, the focus is likely to shift towards lending, trade finance, block chain amongst others"

Technology disruptions are reshaping enterprises and providers are focusing on building technology-led platforms that can redefine how their services are delivered. The use of technologies such as AI, Big Data, IoT is on the rise not only in companies from the IT industry, but also across sectors as they help eliminate inefficiencies, enable innovation, enhance productivity and profitability.
While we have seen technology being adopted across financial sector, healthcare, education, governance and infrastructure domains, it is also being heavily adopted in manufacturing industry.

As a professional entrepreneur, since 2003, Rana Kapoor, Managing Director & CEO of YES BANK has progressively established a high quality, customer centric, service driven, private Indian Bank with a vision of building the "Building the Finest Quality Bank in India by 2020".

Under his leadership, YES BANK has emerged as India's fifth largest private sector Bank, with exemplary business and financial results, highest profitability, and the best asset quality amongst leading Public and Private Banks in India.
He is spearheading digital transformation at YES BANK by embracing technology and innovation to create a 'Digital First' Bank and aid the ongoing transition to a 'less-cash' economy.
Mr. Kapoor has pioneered new paradigms in Digital Banking through an 'Alliances, Relationships & Technologies (A.R.T)' framework to foster entrepreneurship through YES FINTECH Accelerator and YES Head-Startup programs at YES BANK.

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‘Finis origine pendet’, Chapters:

1. Good finance is the core of a healthy society
2. What is fintech?
3. 1 in 3 persons has no bank account
4. Digital currencies
5. Central Banks and Cryptocurrencies
6. Are digital currencies an option for central banks?
7. What do consumers want from financial services?
8. Various topics around fintech (Trust, Role of regulation, compliance, Distributed ledged technology. Artificial intelligence, Mobile Devices, Digital tokens, cross border transactions, cloud computing, online payment, fast payment)
9. Bitcoin

Good finance is the core of a healthy society

Finance lies at the core of our economy and society and its relevance cannot be understated. The ability to exchange value efficiently, to borrow, invest and lend and to manage assets effectively enables society to progress economically and develop resilience across generations. Accelerating innovation and development in digital technologies are fundamentally changing financial services, creating new opportunities and challenges for customers, service providers and regulators[v]. Digital innovations and ubiquitous mobile data access enables emerging nations to become financially included and provide small businesses, the backbone of economies, the necessary means to operate and build value.

However, novel financial opportunities also open up new risk factors, which need to be addressed by a collaborative governance effort for financial stability and integrity for the benefit of all. The size of the financial system is enormous and reaches in some OECD countries between 50- to 100 times the size of domestic GDP (Figure 19).[vivii] The financial system can be seen as a series of interconnected balance sheets that links the buyer with a seller where somebody's asset is a counterpartys liability and links corporations and individuals in the economy (Figure 20). While the complex interconnectedness of the financial actors enables efficient transactions, it also poses risks for financial stability. Risks can emerge from different sources, such as pro-cyclical trends in leverage as we have seen before the 2008 real estate crisis. Today, large financial corporations are particular exposed to potential risk concentration (Figure 18). New technologies might enable to not only decipher risk aggregation earlier but also to mitigate such in anticipation.

What is fintech?

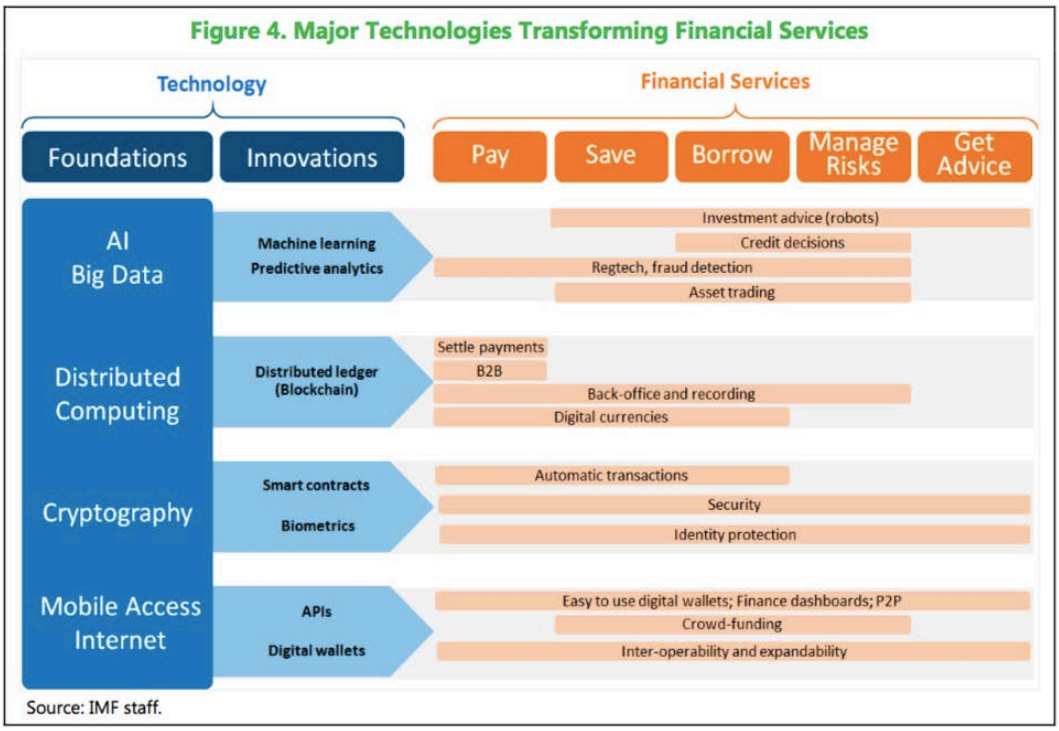
The Financial Stability Board (FSB) defines fintech as "***technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions and the provision of financial services"***.[viii] Four product categories; credit markets-, deposits-, payment systems- and investment services along with their respective market infrastructure reflect the enabling technologies, which support these innovative products (Figure 34). Most fintech innovation occurs in the realm of payments, clearing and settlement system (40% of all) as well as market support services (Figure 35).[ix]

The ***confluence of big data, Artificial Intelligence, distributed ledger technology, smart contracts, cloud computing, cryptography and ubiquitous data access is accelerating*** (Figure 1; Figure 16). These

technologies lead to an explosion of novel financial applications and products for asset management, value transfer, loan provisions, investment banking, insurance and advisory among others. Fintech holds the promise to increase efficiency in the financial sector, increase speed and accuracy in value transfer.

Banks are well aware of the power of fintech and most have now an embedded digital strategy. It ***"....leads to fundamental changes within organizations that revolutionize the customer experience."***[ix] The nexus between existing and novel financial service providers and customers becomes increasingly complex and intertwined (Figure 36)

Figure 1: Fintech Transformations (IMF)

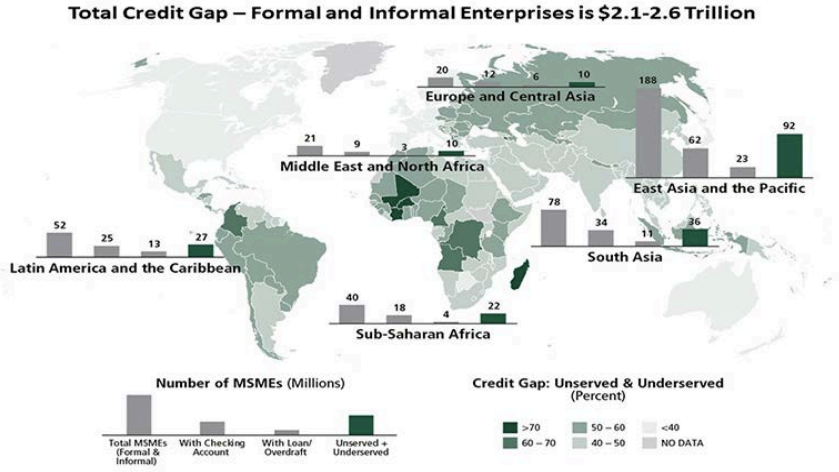


1 in 3 persons has no bank account

What means financial exclusion?

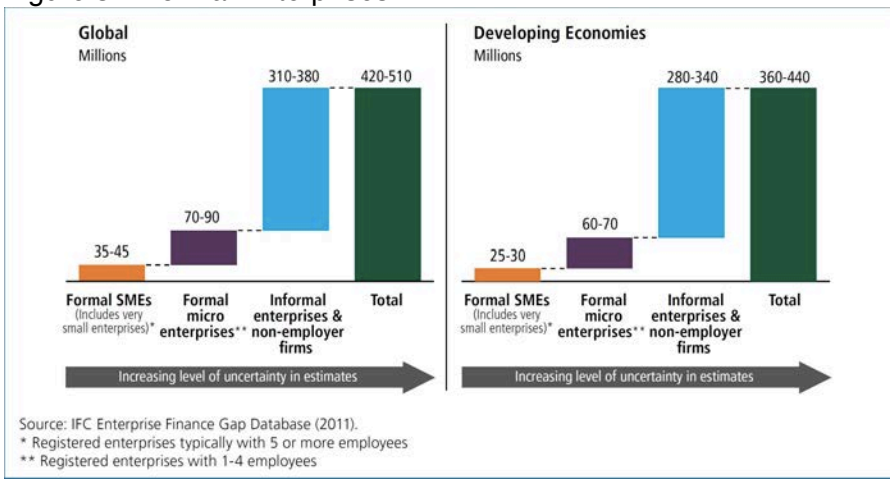
Financial exclusion leads to a global ***credit gap of between $ 1 trillion to $3 trillion*** (Figure 2). ***Small and mid size enterprises (SME) are the backbone of most economies and contribute*** *up to 60% of total employment and up to 40% of national income (GDP) in emerging economies*. ***SME's create 4 out of 5 new jobs***. Around 600 million jobs will be needed over the next decades to absorb a growing workforce, mainly in Africa and Asia. Accommodation the informal SME's (ca. 350 million) can have considerable advantages to the overall economy (Figure 3).

Figure 2: Total Credit Gap[xi]



The current credit gap for formal- (30 million) and informal SME's is estimated to be between $1.2 trillion and $2.6 trillion[xii]. 50% of small and mid size enterprises are financially excluded and have no access to formal credit. Overall, approximately ***70% of all micro, small and medium-sized enterprises (MSMEs) in emerging markets lack access to credit***.

Figure 3: Informal Enterprises



What means financial inclusion?

Today, ***2 billion people have no account*** (Figure 21). Most business in emerging markets lack adequate financing!

"Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way. Financial access facilitates day-to-day living, and helps families and businesses plan for everything from long-term goals to unexpected emergencies. ... people are more likely to use other financial services, such as credit and insurance, to start and expand businesses, invest in education or health, manage risk, and weather financial shocks, which can improve the overall quality of their lives."[xiii]

Financial inclusion is enabler in 7 out of the 17 sustainable development goals[xiv]. The G20's focus on financial inclusion directly contributes to its core goal of achieving strong, sustainable, and balanced growth.[xv]. Digital technology and particular mobile phones facilitated the access to financial services to marginal populations and businesses at low cost and risk[xvi]. The world Bank Group (WBG) and its partners set the ambitious ***target to achieve Universal Financial Access by 2020*** (UFA, Figure 22)[xvii]. To achieve this goal, The World Bank Groups implemented the strategies as outlined in Table 1:

Table 1: World Bank Group Universal Financial Access 2020

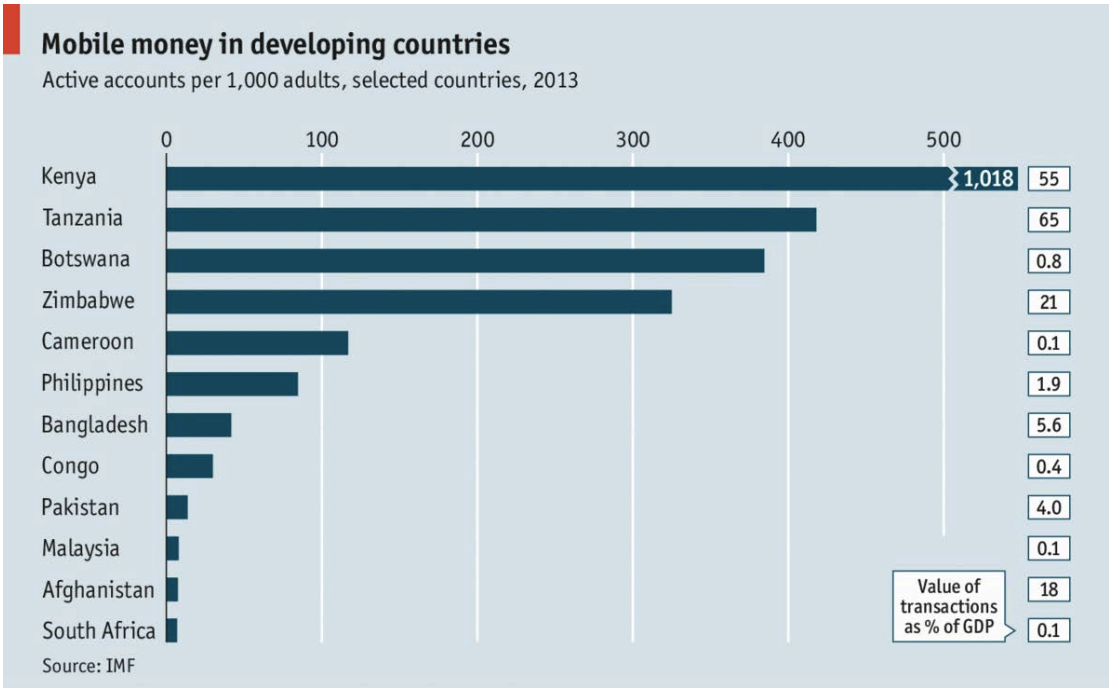
Payment, clearing and settlement systems[xviii]	Improve the safety and efficiency of payment systems via financial and technical assistance and policy advice to client governments.
Global Standard-Setting[xix]	Standard-setting initiatives led by the Committee on Payments and Market Infrastructures (CPMI) of the Bank for International Settlements (BIS) and the International Organization of Securities Commissions (IOSCO). "Payment Aspects of Financial Inclusion." Notable examples being Real Time Gross Settlement (RTGS) Systems[xx]; national payments laws; legal and regulatory framework for e-money and mobile money, and agent based models; and national payments system oversight.
Credit Infrastructure[xxi]	Set of laws and institutions that enables efficient and effective access to finance, stability and socially responsible economic growth. Expertise on credit reporting, secured transactions and collateral registries – as well as creditor/debtor rights and insolvency and debt resolution processes – are the main elements of the World Bank Group's Credit Infrastructure services.
Small and Medium Enterprises (SMEs) finance[xxii]	About half of formal SMEs don't have access to formal credit. Overall, approximately 70% of all micro, small and medium-sized enterprises (MSMEs) in emerging markets lack access to credit. The current total credit gap for both formal and informal SMEs is as high as US$2.6 trillion. Moving informal SMEs into the formal sector can have considerable advantages for the SME (for example, better access to credit and government services) and to the overall

	economy (for example, higher tax revenues, better regulation).

Has progress been made regarding financial inclusion?[xxiii]

Yes!

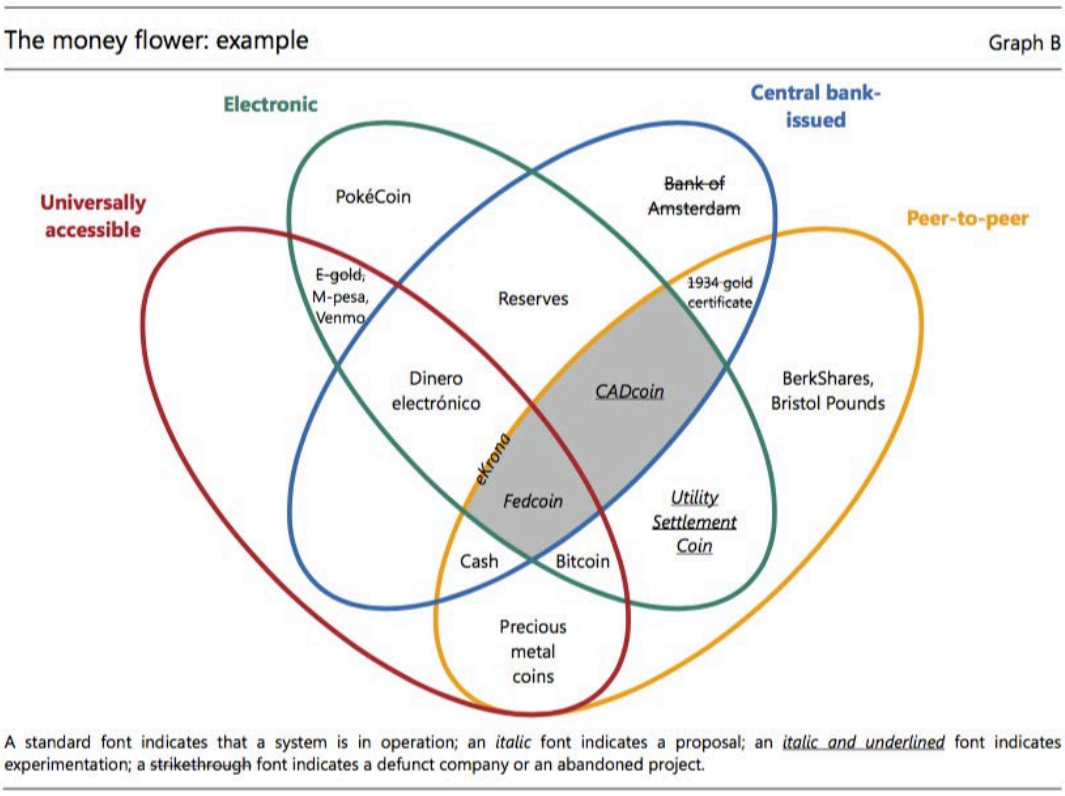
700 million more people could open an account over the past five years. 62 percent of the world's adult population has an account today; up from 51 percent in 2011. Three years ago, 2.5 billion adults were unbanked. Today, 2 billion adults remain without an account. This represents a 20 percent decrease. Mobile money accounts can drive financial inclusion. While just 1 percent of adults globally say they use a mobile money account and nothing else, in Sub-Saharan Africa, 12 percent of adults (64 million adults) have mobile money accounts (compared to just 2 percent worldwide); 45 percent of them have only a mobile money account.



Digital currencies

Today there are over 1'300 different digital currencies with a combined market cap of $590 billion as of December 2017 (Figure 43). The top 10 claim 85% of the total market cap with Bitcoin as the absolute leader with around 45% market share ($270 billion Dec 2017), followed by Ether (13% market share), Bitcoin cash (8%) and Ripple (7%). [xxiv] Most are very illiquid. The purpose of issuance a digital currency can be manifold, including the provision of an alternative means of exchange or for sourcing of new funds (Figure 4; Figure 30). Whether these currencies are de facto accepted as such by definition and function in a broader economic context remains to be seen. Building a sustainable business model in the long term might be a particular challenge for some digital currency schemes. In some cases, the incentives for certain actors that support the scheme (eg by verifying transactions and incorporating them into the ledger) are directly related to the issuance of the currency, which might be capped or decrease over time. Issues around Digital currency schemes include security, Transaction cost and speed, usability, acceptance as payment method, volatility, legal aspects.

Figure 4: Different monies (BIS)



Central Banks and Cryptocurrencies

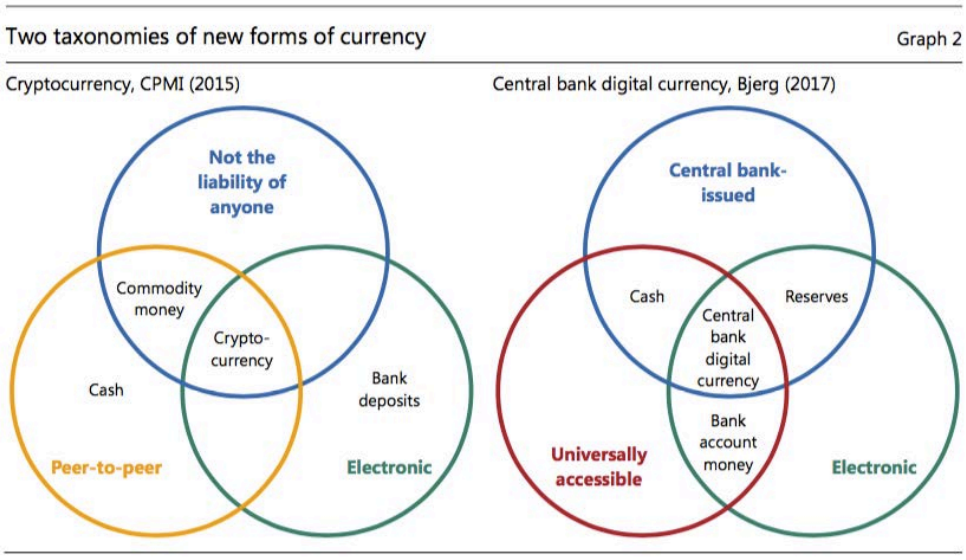
According to the BIS, there are two types central bank cryptocurrencies (CBCC), – retail and wholesale – and differentiates them from other forms of central bank money such as cash and reserves[xxv] (Figure 5; Figure 29; Figure 42).

"The taxonomy defines a CBCC as an electronic form of central bank money that can be exchanged in a decentralized manner known as peer-to-peer, meaning that transactions occur directly between the payer and the payee without the need for a central intermediary. This distinguishes CBCCs from other existing forms of electronic central bank money, such as reserves, which are exchanged in a centralized fashion across accounts at the central bank. Moreover, the taxonomy distinguishes between two possible forms of CBCC: a widely available, consumer-facing payment instrument targeted at retail transactions; and a restricted-access, digital settlement token for wholesale payment applications"[xxvi].

According to the BIS the present taxonomy of money is based on four key properties:

- **issuer** (central bank or other);
- **form** (electronic or physical);
- **accessibility** (universal or limited);
- **transfer mechanism** (centralized or decentralized).

Figure 5: New forms of money



Are digital currencies an option for central banks?

Observing the enormous rise in digital currencies, several central banks are reflecting whether to issue their own digital currencies. The rational for doing so could be many including the possibility to bypass the banking supply chain for reaching the economy in times of market distress. Sweden for example, is already moving towards a cashless society (Figure 40). A major weakness, however, in using this type of currency is the vulnerability to hacking. Even decentralized Blockchain digital currencies like Ether and Bitcoin have been subject to hacking. Countries that work constructively towards a proper digital currency are China, Singapore ('Fedcoin') and Japan (J-coin). [xxvii]

Some central bank's reflections and standpoints:

- China: ***opts to introduce its own state backed digital currency***[xxviii] 'The proposed currency would be treated as cash and used in digital wallets managed by commercial banks. Digital currency could then be used directly for payments. This would greatly reduce transactions costs, since payments could be directly transferred from buyers to sellers. Use of a state-backed digital currency would also make transactions more transparent in order to reduce the incidence of money laundering and tax evasion.' Digital payments are used daily to make payments through WeChat or Alipay, reaching $5.5 trillion in 2016. This indicates that there is demand for digital payment services as well as an understanding of how to use them.

- New York Federal Reserve Bank: In November, William Duddly, President and CEO of the Fed Reserve Bank of NY stated that they are in an ***exploratory phase of issuing a proper digital currency***[xxix].

- Swiss National Bank Chairman Thomas Jordan stresses the importance of ***"...who has access to central bank money and in what form."*** And that "...***central banks are working on the issue of crypto currencies very intensively***,"[xxx]

- Bank of International Settlement (BIS): From a global perspective, Agustin Carstes, the new Chief of the BIS is ***fully embracing the challenge and sees the emergence of digital currencies as an opportunity***. He well deploy lots of resources "to virtual assets, which traditionally are called crypto-currencies, but we don't believe that they are currencies"[xxxi]

- The European Central bank took a difference stance and appealed to the private sector by stating "***Banks need to implement instant payments as soon as possible and provide an alternative narrative to the***

ongoing public debate on the alleged innovation brought by virtual currency schemes,"[xxxii]

- **Japan**: In April 2017, Japan the Payment Service Act was amended to ***allow "virtual currencies" as legal form of payment***. It also ***approved the operations of 11 cryptocurrency exchanges*** officially in September 2017 and ***17 crypto currencies*** including Bitcoin, Ether, Ripple, Litecoin and Monacoin.[xxxiii] Japanese Banks under the lead of Mizuho Financial Group is leading the effort to ***launch their own cryptocurrency called the J-Coin***[xxxiv].

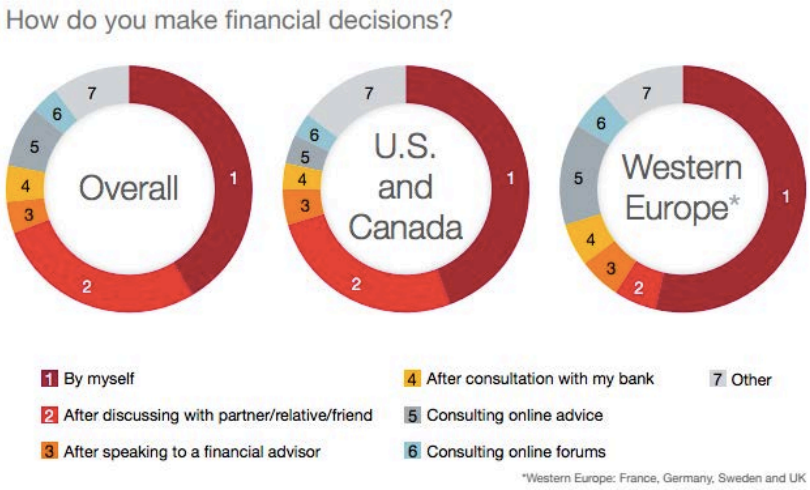
What do consumers want from financial services?

According to a representative survey by CGI in 2014, consumer desire a reward for their business, have instant access to their accounts at all times (Figure 6). Over 60% of the clients make their financial decisions by themselves and or after having discussed with their partners, friend or relative (Figure 7; Figure 15) [xxxv].

Figure 6: What does the financial consumer want?[xxxvi]

1	Reward me for my business	81%
2	“Anytime, anyplace” access to my balance	61%
3	See me as a person	58%
4	Provide me with wealth-building advice	55%
5	Tell me what I am spending money on and how I can save	52%
6	Give me access to independent experts when I need them	50%
7	Allow me to borrow up to an agreed limit at any time	49%
8	Allow me to pay for goods and services instantly using whatever device	49%

Figure 7: How to make financial decision?[xxxvii]



Various topics around fintech

Below a description of some important aspects around fintech. These are by all means neither complete nor detailed:

Trust

'Finance involves creating added value through transferring assets and claims among entities (e.g., payer and payee) as well as over time (e.g., lending and borrowing). It requires trust among all entities involved, and toward the asset being transferred. A lack of trust in financial intermediaries and processes can hamper the functioning of the service and may induce market participants to look for alternatives. In the future, networks and new types of service providers will need to find ways to gain the trust of users. Effective regulation will have a critical role to play in this process' (Figure 17).

Market imperfections require trusted intermediaries. They can reduce asymmetric information, facilitate transactions and reduce costs. Fintech can alter barriers to entry for new intermediaries to compete against incumbents. DTL can increase transparency but at the same time trespass privacy. To strike the right balance is a fundamental aspect of gaining trust of a new system.

Role of regulation

Regulators need to carefully ***balance to maintain financial stability and integrity while not stifling- but rather promoting safe financial products- and service innovation.*** Monetary policy effectiveness and trust in the financial system could be jeopardized. Governance needs adjustments to ensure the integrity of data, algorithm and enabling platforms. Key issues are the mitigation of cyber attacks; money laundering and terrorist financing. Several countries have taken a light stance on new fintech in order to promote innovation such as 'Sandbox' regulations (Figure 38).

Cross Border transactions: Due to the borderless distributed ledger set up, digital currencies may be difficult to be regulated under existing definitions and structures. There are no correspondence banks, which channel and verify transactions; counterparties and manage liquidity issues. Law enforcement on digital currencies is difficult, if not arranged on a global coordinated way. The regulatory key points involve the protection of the consumer, the organizational arrangement of different stakeholders and the rules of payment and settlement mechanism. For example, future exchanges which launched bitcoin derivatives are difficult to regulate and don't need the approval of the Commodity Futures Trading Commission (CFTC) in the US. However, the CFTC can halt trading of futures in emergency situations nut has used this measure only three times in the past 43 years. Another way of indirect

regulation is to impose limit on leverage to the market participants that lend leverage to traders[xxxviii].

Compliance

Regulatory technology ('Regtech') holds the promise to automate processes and reduce time and cost for compliance and client validation. They include the utilization of big data, AI, DLT, cloud computing, Biometrics. Of particular interest are ***'know your customer'*** ('KYC') procedures where digital identity and Biometrics can facilitate the process substantially.

Distributed ledger technology (DLT) is a key technology supporting multiple applications. Records of value or ownership transactions can be securely validated (updated) from a distributed network instead of a central authority (Figure 41). This will lead to cost savings, peer- to peer transactions while bypassing intermediaries, with the distributed log entry methodology likely to be safer than conventional account keeping methods.

Artificial intelligence (AI) and big data

Enables the development of ***sophisticated algorithm to capture behavior patterns*** for better investment decision-making and also to facilitate regulatory procedures, automate credit approvals and detection of fraud.

Internet access and mobile devices

The portal to an increasing supply of financial services via application programming interfaces (API's). This ***massive decentralization enables peer-to-peer transactions*** and crowd financial services such as funding and will evolve into a massive financial inclusion for many for the first time in many countries.

Digital Tokens: Ownership rights and obligations

There has been an enormous rise in issuance of initial coin offerings (ICO's) during the past year (Figure 27). A token is a ***representation of something else*** and can either have an intrinsic value (such as Bitcoin), or is a digital representations of an asset that exists outside the ledger (an "asset-based token"). The ***legal status of digital tokens is not clear.*** The international framework is being developed to clarify the legal status of tokens, which is essential for a well functioning economy.

Cross border transactions

Today cross border transactions require intermediaries to verify identities of third parties and value streams. However, these have a high fixed cost and require substantial back offices in addition to manage the liquidity issues, counterpart risks and settlement complexities. ***Distributed ledger (DLT) could be applied to various processes in cross-border transactions***. For example, ***SWIFT is aiming at using DLT to improve the speed***, transparency, and end-to-end tracking of cross-border payments, including reconciliation with invoices [xxxix] . Furthermore, DLT platforms could be deployed to automate the tracking of payments, and to optimize liquidity and risk management.

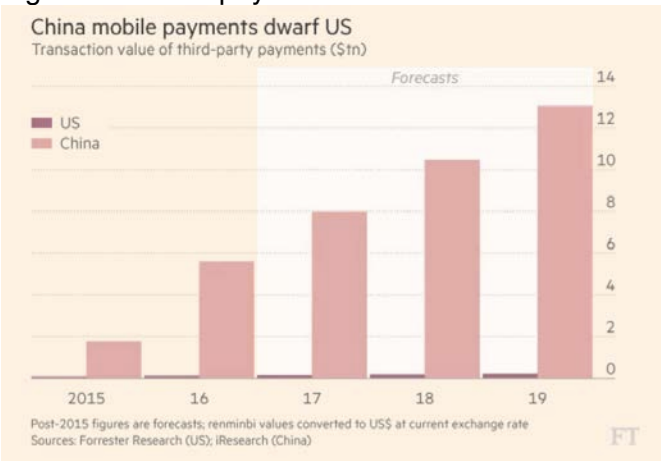
Cloud computing

Cloud computing allows the sharing of on-demand computer processing resources in a way that promotes efficiencies and economies of scale. Such cost-cutting is attractive for banks, but concerns over safety and privacy initially inhibited banks from using cloud computing infrastructure. Now, however, many banks are experimenting with public cloud operations. For fintech companies, cloud solutions often allow easier access to back office infrastructure that incumbents spent decades building, helping to engage in operations at a lower cost. Cloud-based services can take many forms, ranging from infrastructure only to fully-fledged software solutions (including white-labeled banking solutions), as shown in below. Cloud computing as a service provider to banks can act as an enabler in all fintech-related scenarios, and need not in itself cause business models to be disrupted. However, while cloud computing helps both incumbent banks and new players, it is more of an enabler for new players (Figure 37)

Online payment

Thanks to mobile payment platforms, the direct payment transactions have skyrocketed. China is the absolute leader and dwarfs the USA in terms of value transacted via mobile platforms (Figure 28). Today, China is a highly concentrated mobile payment market and in the controlled by two company's which processes over $3 trillion in payments through Alibaba ($2 trillion in 2016 compared to $70 billion in 2012), Tencent's WeChat processed around $1.2 trillion up from $12 billion in 2012 etc. Together they control around 90% of the mobile market. Between 2012 and 2015 digital payments in China went from 3.5% of all retail transactions to 17%[xl]. Mobile payments in China increased by 281% in 2016 and are expected to grow by 70% annually for the next years. Mobile payments are 74% of all online payments and 42% of in store purchases are done via non-cash payment[xli]

Figure 8: Mobile payments. China vs. USA

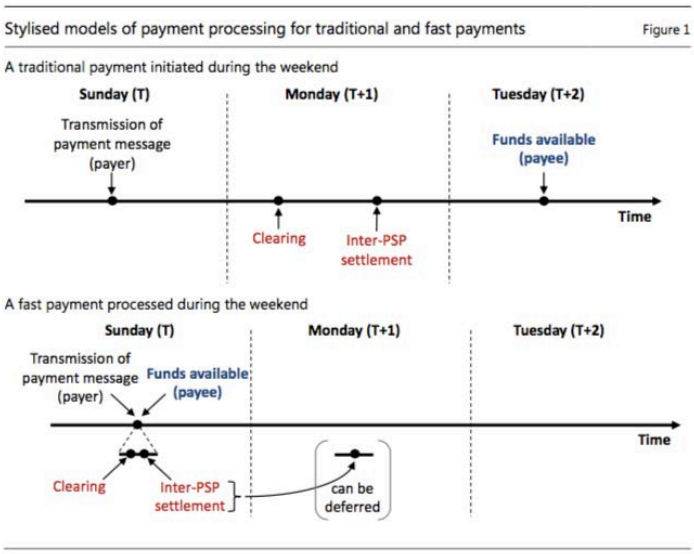


What is a fast payment?

"fast payment" is defined as a payment in which the transmission of payment and the availability of "final" funds to the payee occur in real time ...and a 24-hour and seven-day (24/7) basis".[xlii]

Fast payments consist of speed and continuous availability. These require fast transactions and clearing systems and availability funds on a 24/7 basis. The biggest benefit for consumer of fast payments is the ability to complete payments quickly, wherever and whenever necessary. A "*fast payment scheme can be considered as a set of procedures, rules and technical standards governing the execution of fast payment orders"* (Figure 9*)*. Several countries have installed the financial infrastructure to enable fats payments, starting with Korea in 2001 (Figure 31)

Figure 9: Fast payments



Bitcoin

"The degree to which economists have ignored Bitcoin is surpassed only by the extent to which Bitcoin enthusiasts have ignored economics"[xliii]

Is Bitcoin a technological phenomena or a fundamental change of how value can be stored and transacted? Bitcoin has been built originally based on a white paper from a mysterious author Satoshi Nakamoto in 2008 and evolved into an intricate industry of digital exchanges, digital wallet services, mixers, bitcoin miners, sundry services and a bitcoin foundation. The bitcoin ecosphere claims for itself to be a decentralized monetary system, free of central authority that regulates the monetary base. However, it is self-explaining that all these actors are linked to the real world of economies and jurisdictions. There are real energy supply issues for the mining companies; there are real transaction issues when conversion into Fiat currency occurs; there are real economics applied when excessive demand meets limited supply or vice versa leading to substantial volatility (Figure 39); there are real issues when value is being transacted across different legal sovereign territories and there are real issues when different fiscal regimes are present. Therefore, Bitcoin, against what many enthusiasts claim, may be a self-regulated and independent currency, but is not free from a fiat and or regulated reality.

The question is whether bitcoin, and other virtual currencies, is money or not? According to most, Bitcoin is not money in the sense of unit of account due to the excessive volatility, and can therefore also not be used efficiently as medium of exchange. In terms of store of value, it could be considered by some as a commodity type, as de facto officially defined by the CFTC in 2015[xliv]. Bitcoin can be perceived at maximum a new form of currency, which is, linked into multiple economic and legal realities. The Internal Revenues Service (IRS) in the US recognizes virtual currencies

as “convertible” virtual currency that can be “digitally traded between users” and converted into fiat- and or other real and virtual currencies. According to the IRS is a “digital representation of value that can function as medium of exchange, a unit account and/or store of value”[xlv]. Others reject bitcoin as a currency outright such as Agustin Carstens , BIS and William Dudley, President FED NYC[xlvixlvii].

Is bitcoin a sustainable currency scheme?

There are several aspects in the arrangement of bitcoin reality that makes sustainability a challenge. Some of these include:

Transaction costs: Besides many questions surrounding the inner workings of the DTL based Bitcoin cyber currency lies the challenge on how to supply the increasing computing power, which require an increasing amount of energy, in order to validate transactions and also, on how the these miners and service providers will be remunerated in a declining margin environment (Figure 24). The Bitcoin DTL promised fast and cheap transactions of value. However, due to the inherent inefficiency, the cost of transaction has increased exponentially. Alone in December 2017, the transaction fees in creased by 24'000%! It has become so costly, that certain digital exchanges switched from a decentralized Blockchain based transaction model to a centralized onexlviii.

Mining cost: The cost to validate the transactions are being rewarded by bitcoin, however in a declining manner. That means, the miners have to increasingly solve complex mathematical problems, which require increased computing power and energy to be rewarded with fewer and fewer bitcoin. Eventually the reward will no longer justify the investment into new mines and then the result is likely to be increase transaction costs and decreased in speed of transaction. Today, the bitcoin system requires around 30 TWh of energy, the same amount as entire Denmark, a country with 6 million people producing $324 billion in GDP per year. This compares to the market cap of bicoin of around $270 billion in December 2017 (Figure 25) [xlixl]. Most mines are located where energy is cheap and China supplies lots of subsidies electricity to such mines. However, as a further step of cracking down on bitcoin, some provinces have started to cut subsides energy to mines such as in Sichuan province [li]

Concentrated ownership: While in a Fiat environment, central banks and regulatory bodies are monitoring currencies; bitcoin is largely a black box. However, according to Bloomberg, there seems to be an enormous concentration of ownership where around 1'000 people hold 40% of the bitcoin market[lii.] This seems rather a monopolistic currency scheme than a 'democratic' set up as promised. This concentration of power can lead to excessive valuation swings as have been seen over the past months.

Bitcoin supply: According to standard economics, supply meets demand. That is not so easy with Bitcoin as the supply has been pre defined at 21 million bitcoin (Figure 23). There is no elasticity in the currency to address changing socio-economic realities. Demand for Bitcoin can come from speculative demand, true believers, demand from commercial transactions for goods and services[liii]. When a currency is inelastic, it can lead to very unstable economic outcomes as has been experiences under gold standards in the 19th century and beyond.

Acceptability as payment methods: Are countries tolerating a Bitcoin as legal tender? This depends. Some, as Japan seem to fully embrace the bitcoin a legal tender and its utilization is increasing fast. Others, such as China or Israel etc have limited Bitcoin utilization for fear of abuse and money launderingliv. “Nobody knows what stands behind this. Regulation is necessary because the public is unprotected” Shmuel Hauser, the chairman of the Israel Securities Authority. Therefore, China shut down bitcoin exchanges in fall 2017 which led to sharp drop volumes traded in CNY (Figure 26).

‘

“Bitcoin is dead! Long live the Cybercurrencies!”

Peak Debate© - Showtime! ‘Finis origine pendet’

Date	Thursday, January 24, 2018
Time	4 pm - 7pm
Location	Promenade 61, Davos ‘Caspian Week’

Overview

We will hold the second legendary debate whether the emerging Cybercurrencies, particularly Bitcoin, are a mere market anomaly or real rising alternatives to the fiat currency system.

The first debate was held during the annual IMF meeting in Washington D.C. in collaboration with Pictet Nord America Advisors on Oct 13, 2017. The debate was wildly successful with a massive turn out and an interesting one-sided outcome, which will be challenged on Jan 24

Come join the exciting participatory Oxford style debate to discover who is able to sway your vote towards the desired direction based on rational but emotional arguments.

Peak Debate© Showtime 'Gladiators':

Prof. Alexandre Swoboda	**It's all about trust!**	Professor of Economics Emeritus. Geneva.
Michael Huttman	**Fiat will prevail!**	Millenium Global Investments, Founder and Chairman. London.
Dr. Daniel Heller	**Policy is key!**	Peterson Institute. Washington D.C.
Jeffery Wernick	**Fiat is a fraud!**	Qtum. Investor and Advisor. Singapore & New York.
Dr. Kaspar Bänziger	**Master of Ceremony & Matador**	

Moderator Dr. Kaspar Bänziger, Kaspar.baenziger@gmail.com

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How Digital Technology impacts Urbanization & Mobility

Jan 25 2018, all day

10am Smart! You + the future of your city! Jan 25, 10am

3 pm From macro- to micro grid, from carbon to renewable! Can digital technology accelerate the energy transformation?

The world population will grow by around 2 billion people over the next decades and by 2030, 60% of the global population will live in urban areas (Figure 44, Figure 48). This represent an overall **30% increase in migration from rural to urban centers** over the next decades. 80% of that transition will take place in Africa and Asia but also the USA will add another 100 million residents of the next decades. There will be over 660 cities with more than one million residents and 41 megacities with over 10 million inhabitants[lvlvi].

These urban centers are economically very powerful and generate **over 50% of global GDP**[lvii]. However, emerging urban hubs coupled with population increase are challenged by climate change, migration, family structural adaptation and rapid technological change[lviii]. Current design and planning have reached their limits to manage the increasingly dynamics of the modern city. The ability to absorb, recover and prepare for future shocks is key. Therefore, the development of **resilient cities** can only be achieved by an active structured collaboration between all stakeholders.

This massive shift necessitates the smart planning and implementation of sophisticated nexus between life and work (Figure 45)[lix].

Information and communication technologies lead to rapid transformation of urban infrastructure. **Intelligent infrastructure** enables adaptive city planning and response in real time to the contextual work and living spaces. The smart nexus between information, energy, sustainability, transportation and housing and social practices is key for the future of urban development[lx].

Digital technologies including **Internet of things** (IoT) mobile phones, coupled with big data analytics and **artificial intelligence** (AI) will help city planers, investors and managers to make better, more accurate and timely decisions[lxi]. Demand for smart buildings including the utilization of IoT's is revolutionizing on how buildings are managed. A market, which is expected to reach $120b by 2019 up from $68b in 2014. Also, the impact of IoT application holds to promise to reduce the energy cost by 10-25%. This is an enormous number considering that the Department of Energy in the US estimates that around 30% of energy consumed by commercial buildings is wasted[lxii]

Big data enables today to develop new frameworks for planning and managing the complexity based on evidence of multiple inputs. These include socio-economic trends, land management, infrastructure utilization, climate impact etc. [lxiii] For example, 3D mapping of the infrastructure including the underground is already impacting the planning of Singapore under the Smart Nation Initiatives [lxiv] . **Behavioral analytics** enable us to develop better ways to optimize the flow of traffic and facilitate the efficient use of energy, water and other utility requirements.

Real estate challenge and opportunities: The rapid urbanization is also accompanied by a structural mismatch of supply/demand of residential and commercial real estate[lxv]. The rapid growing cities require supply of higher quality office, retail and residential space. Global real estate **investment volumes reached $1.4 trillion in 2017**, with **Asia Pacific accounting for 44%** of the total, followed by 34% North America and 22% EMEA[lxvi]. Sophisticated investors will be presented with high margin growth opportunities if local know how is being applied[lxvii].

This panel will address the digital impact in urbanization:

- How will big data help policy makers to accommodate rising migration to cities?
- Can digital technologies help plan better urban centers?
- Are investors presented by better returns based on application of new technologies in real-estate finance?
- How will artificial intelligent and internet of things render the management of urban centers more efficient?
- Are micro grid the solution for better renewable energy supply?
- Can the sharing economy be a solution for mobility in urban centers?
- May behavioral sciences be applied in better maneuvering the traffic flow?
- Are driverless cars really safe and the future?
- Can pension funds profit from long-term real estate exposure in renewables?

Our panel leaders in digital revolution in urbanization & mobility are:

Prof. Alfredo Brillembourg	Urban Think Tank, ETHZ. Founding Partner, USA & Venezuela	***"By streamlining educational processes and the development of technical proficiency, digital technologies allow a greater number of people to seize agency in shaping the built environment around them; an architectural renaissance."***
Tamer Amer	Co-Founder & Partner REInvest Capital AG	***"Blockchain is changing the way property titles can be stored and managed, and smart contracts are facilitating transactions."***
Dr. Walter Grüebler	Former CEO and Chairman of Sika	***"Increasing efficiency by optimal use of all relevant data to steer the entire operation line"***
Prof. Hubert Klumpner	Professors ETH Zürich. Urban-Think Tank Chair	***"The success of digital technologies in our Empower Shack project - providing easy-to-use interfaces that give agency to multiple stakeholders in the planning process - convince us that we are at the beginning of an exciting digital revolution in architecture."***
Yorke E. Rhodes III	Microsoft. Principal Manager and Cofounder Blockchain	***"Blockchain is a digital transformation catalyst. It is having an impact across industries and in a sustainability, humanitarian way."***
David Cassidy	CEO Proman Group, Wollerau & Houston	***Darwin did not write a thesis on the theory of revolution.***
Prof. Reza Abhari	Professor, ETH Zurich Chairman, Director Global Power and Propulsion Society	***"Future developments will be accelerated by using digital technologies to better manage business and political risks"***
Steve Johanns	CEO, Veriown Global. USA	***"The worlds last mile...rural villages and invisible consumers."***
Andreas Thors	Partners Group, Zug	***"Digitalization and technical development is effecting every industry in every geography. There is a need for continued cultural change management, requirement of new skills and clear prioritization."***
Rehan Chaudhri	CEO Peak XV Advisors. New York	***"Global sustainable electricity prices will drop by 50% over the next decade***

		stimulating growth in emerging markets well beyond current expectations through 2030."
Shaun Parvez	President, SK E&S Americas	*"The energy industry is involved in a time of revolutionary change pitting old tech with new tech, the bridge for which will be digital technology for more diverse options for both suppliers and users"*

Dr. Kaspar Bänziger, Moderator, Kaspar.baenziger@gmail.com

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Detail sunder www.caspianweek.com

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Our Urbanization Leaders' Background

David Cassidy

CEO Proman

"Darwin did not write a thesis on the theory of revolution."

Making old technologies more efficient is as important as just trying to create disruption. The internal combustion engine and the liquid fuel distribution market 'baby' should not be thrown out with the car market 'bathwater'.

Chief Executive of the Proman Group, which is the 2nd largest producer of methanol in the world as well as one of the global leaders in the manufacture of liquid fertilizers.
Contact: www.proman.org

Grüebler Walter

PhD in Economics HSG
Former CEO and Chairman of Sika

"Increasing efficiency by optimal use of all relevant data to steer the entire operation line"

In industry it is more the improvement of raw material selection and combination, the improvement of the production-process efficiency and the quality of the product

Dr. oec HSG Hayek Engineering AG, Zürich, Lonza AG, Basel, Alusuisse AG, Zürich, Sika AG,Baar

Contact: waltig@me.com

Tamer Amr

Co-Founder & Partner
REInvest Capital AG

"Blockchain is changing the way property titles can be stored and managed, and smart contracts are facilitating transactions."

Dispurtive technologies are killing off long standing business and disrupting usage patterns for real estate – what will be needed tomorrow may not exist today, and what exists today may not be needed in the near future.

Tamer is director of numerous business lines including EDO, a €450MM German real estate fund, DMI, a $400MM Indian real estate lending business, and previously ran Lehman Brother's Swiss real estate business WTF from 2001-2007

Contact: www.reinvestcap.com

Reza Abhari

Professor, ETH Zurich
Chairman, Director Global Power and Propulsion Society

"Future developments will be accelerated by using digital technologies to better manage business and political risks"

We have developed EnerPol, a system-wide bottom-up integrated software tool to perform future based simulations of the geographically-indexed transformation scenarios in energy, transportation and urbanization on the scale of an entire continent. Using detailed physical, technical, demographics, regulatory, and financial data and models, future operation of the infrastructure, the needs for development, and economic impact are evaluated. For more information, please view the video at: www.aim.swiss

He is the Director of a multi-disciplinary center at ETHZ with 75 students and staff, where current research includes bottom-up digital modeling of economics, energy, transportation and urban systems. He is the Chairman of the Executive Board of Global Power and Propulsion Society. He has been a strategic and IP advisor to a number of multi-nationals and investment institutions in Europe, USA and Asia, focusing on risk management in; infrastructure investments, natural resources, energy, aerospace, and semiconductor industries. With over 300 peer-reviewed publications, he is a member of the Swiss National Academy of Engineering Sciences and has received numerous awards.

Contact: rabhari@ethz.ch / http://www.lec.ethz.ch/

Steve Johanns

CEO, Veriown Global. USA

"The worlds last mile...rural villages and invisible consumers."

A digital asset world allows convergence of services in areas of energy, finance, information, and commerce creating inclusive growth opportunities for the 1.2 billion 'invisible consumers' in the world. This new world begins in the most remote parts of the global value chain and what is learned is when you hyper-innovate for the 'invisible consumer' you innovate for the rest of the digital asset world. What was once considered Bottom of the Pyramid can now be thought of as *Nano Economies* with opportunity to deliver *Micro Services*…the precursor to a new distributed and sustainable world.

Steve Johanns has over 20 years of experience in energy, infrastructure, and innovation. As founder of Veriown Global he has proven a significant opportunity exist with the convergence of cleantech, fintech, and IoT to finance and deliver electricity, connectivity, and commerce to anyone, anywhere in the world.

Contact: steve@veriown.com / www.veriown.com

Yorke E. Rhodes III

Principal Program Manager; Cofounder Blockchain at Microsoft

"Blockchain is a digital transformation catalyst in all it's forms from public ledgers like Ethereum and Bitcoin to private, enterprise, or consortium solutions.
It is having an impact across industries and in a sustainability, humanitarian and identity landscape as well."

All of the above. We are seeing public and private blockchain implementations providing value to existing business processers, particularly where they are cross company and therefore lack the trust of a single enterprise solution. This leads us to many places where there are partners, counter parties, customer relationships, or an entire value chain like Supply Chain.

Yorke E. Rhodes III is a passionate technologist with broad interests, always drawn to the next shiny object. He earned a BS in Computer Science from NYU's Courant Institute of Mathematical Sciences. He has worked in industry for over 20 years, in enterprises such as Microsoft & IBM and startups in wireless, mobile, digital marketing & ecommerce. At Goldman Sachs Investment Bank he built their first wireless internet ingress and advised bankers in wireless, telecom and media. As a young developer he saw the beginnings of client server databases, obscure languages like ada, lisp & paradox and the birth of the internet. Blockchain piqued his interest in the summer of 2015 with the launch of Ethereum. He cofounded Microsoft's blockchain initiatives working in collaboration with the partner community and continues driving it today in his role on the Blockchain Engineering team. An Adjunct Professor at NYU, he has taught Digital Marketing, Ecommerce and Intrapreneurship and is currently developing a course on the user centric economy called #OurNextEconomy.

Contact: Yorke.rhodes@microsoft.com / twitter: @yorkerhodes / blockchain: uPort or onename

Rehan Chaudhri

CEO, Peak XV Advisors. USA.

"Global sustainable electricity prices will drop by 50% over the next decade stimulating growth in emerging markets well beyond current expectations through 2030."

The current individual automobile ownership model is highly inefficient. Shared autonomous electric vehicle (EV) mobility will improve the quality of urban living, increase societal safety, and lower environmental pollution levels.

Background: Rehan Chaudhri is a global investor in the energy and commodity sectors with Peak XV Advisors. Former principal and former CIO, at Altrinsic Global Advisors. Prior to Altrinsic, portfolio manager Lazard Asset Management, on $30 billion international select funds. Graduate of McGill University in Montreal, with M.B.A. from the Wharton School.

Contact: rc@peakxvadvisors.com

Hubert Klumpner

Professors ETH Zürich.
Urban-Think Tank Chair

"The success of digital technologies in our Empower Shack project - providing easy-to-use interfaces that give agency to multiple stakeholders in the planning process - convince us that we are at the beginning of an exciting digital revolution in architecture."

Although a veritable digital revolution has transformed the architecture profession in the last 20 years, with computer technologies literally re-drawing the map of working process and possibilities, we expect that the years to come will shift our paradigms to an ever-greater extent. Automation, AI, and the streamlined use of Big Data all promise to re-shape the way we live and shape cities. Preparing for this means therefore means preparing for the ways in which these technologies can also devastate. Discussing, testing, and reacting to these changes is paramount both within and outside of our profession.

Hubert Klumpner was born in Salzburg, Austria in 1965. He graduated in 1993 from the University of Applied Arts in Vienna in the Master Class of Prof. Hans Hollein. Klumpner worked with Enrique Miralles and Paul Rudolph before receiving a Master of Science in Architecture and Urban Design from Columbia University in 1995. He has been a member of the German Chamber of Architects since 1997. In 1998 Klumpner joined Alfredo Brillembourg as Director of Urban-Think Tank (U-TT) in Caracas. Starting in 2007, Klumpner became a guest professor at the Graduate School of Architecture and Planning, Columbia University, where he co-founded the Sustainable Living Urban Model Laboratory (S.L.U.M. Lab). Along with Alfredo Brillembourg, he received the 2010 Ralph Erskine Award, 2011 Gold Holcim Award for Latin America and 2012 Silver Holcim Global Award for their innovation in social

and ecological urban design.

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Shaun Parvez

President, SK E&S Americas

"The energy industry is involved in a time of revolutionary change pitting old tech (oil and gas) with new tech (EV's, renewables), the bridge for which will be digital technology that facilitates relationships that enable shorter contracts, faster transactions, lower costs, and more diverse options for both suppliers and users"

Digital technology has already changed the world. The move from analog to digital first occurred in the early 80's with telephony and the invention of Voice Over IP (VoIP) technology. This same technology led the way to the creation of the Internet, and new laws enabling a new telecom and IT industry to be born. Pricing of dial tone, previously a valuable monopoly service commodity, was driven to zero – this commodity became almost worthless. Similar changes are now happening in the energy industry. Which commodity will go up in value, and which will become worthless are yet to be seen. Electricity, nat. gas, crude oil, gasoline, and raw elements to create, transport of store each of these commodities will enter new frontiers in value.

Mr. Parvez is President of SK E&S Americas, the US-based arm of Korea's largest gas and power utility company. He is currently focused on the production and export of LNG with a $20 billion business he helped found in 2013. SK Group is Korea's 3rd largest company, ranked on Fortune's Global 100 list with more than $100 billion in revenue. Mr. Parvez has held several senior leadership positions at SK since joining almost 10 years ago.

Prior to joining SK, Mr. Parvez spent 11 years on Wall Street as both an Investment Banker and Equity Analyst.
MBA from Yale University and BS in Mechanical Engineering from NYU-Polytechnic.

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Alfredo Brillembourg

Professor, ETH Zürich.
Urban-Think Tank Chair

"By streamlining educational processes and the development of technical proficiency, digital technologies allow a greater number of people to seize agency in shaping the built environment around them; an architectural renaissance."

Although a veritable digital revolution has transformed the architecture profession in the last 20 years, with computer technologies literally re-drawing the map of working process and possibilities, we expect that the years to come will shift our paradigms to an ever-greater extent. Automation, AI, and the streamlined use of Big Data all promise to re-shape the way we live and shape cities. Preparing for this means therefore means preparing for the ways in which these technologies can also devastate. Discussing, testing, and reacting to these changes is paramount both within and outside of our profession.

Alfredo Brillembourg was born in New York in 1961. He received his Bachelor of Art and Architecture in 1984 and his Master of Science in Architectural Design in 1986 from Columbia University. In 1992, he received a second architecture degree from the Central University of Venezuela and began his independent practice in architecture. In 1993 he founded Urban-Think Tank (U-TT) in Caracas, Venezuela. Since 1994 he has been a member of the Venezuelan Architects and Engineers Association and has been a guest professor at the University Jose Maria Vargas, the University Simon Bolivar and the Central University of Venezuela. Starting in 2007, Brillembourg has been a guest professor at the Graduate School of Architecture and

Planning, Columbia University, where he co-founded the Sustainable Living Urban Model Laboratory (S.L.U.M. Lab) with Hubert Klumpner. He has over 20 years of experience practicing architecture and urban design. Along with Hubert Klumpner, he received the 2010 Ralph Erskine Award, 2011 Gold Holcim Award for Latin America and 2012 Silver Holcim Global Award for their innovation in social and ecological urban design. Contact: brillembourg@arch.ethz.ch / https://u-tt.arch.ethz.ch/about/alfredob/	

Caspian Digital Day

Jan 26 2018, all day

10am **Framing the Caspian opportunities for digital revolution**

1 pm **Strategies and Tactics. Leveraging digital technology across the Caspian Region**

3.30pm **Caspian Action Plan Workshop**

The Caspian Week 2018 is organizing under the motto ‘Finis Origine pendet’ a full day dedicated to the Caspian Region. The focus is to elaborate the many commercial opportunities that new digital technologies can bring to the

trade and logistics value chain. Our panelists include leading experts referring about regional economies-, policies-, international standard setting-, legal aspects, all on the back of a multitude of novel digital technologies. We assess how blockchain-, digital assets-, big data-, smart contracts etc. can improve the commercial flow across the region. We do understand that the diversity of economies need to be involved actively early on in order to structure a well functioning regional commercial positive outcome. We try to focus our attention on how to carefully craft functioning arrangements between all stakeholders and engage with global- and well as local leading companies to find the best solutions for all.

The Caspian digital day is structured in three main blocks on the logic of assessing the opportunities and challenges from top down with the aim of coming up with an action plan at the end of the day for seizing and building concrete digital business plans. Furthermore, the Caspian digital day 2018 will be the starting point of a trajectory of interdisciplinary collaboration.

Part 1 **Caspian Day**
10am **Framing the opportunities for digital revolution**

Part 2 **Caspian Day**
1pm **Strategies and Tactics, Leveraging digital technology**

Part 3 **Caspian Day**
3.30pm **Action Plan, Workshop**

Jan 26 10am	**Caspian Day** **Framing the opportunities for digital revolution**	**Regional policies: Kairat Kelimbetov,** Governor AIFC, Kazakhstan **Global Fintech Regulation: Matthew Schwartz JD,** Partner Boies, Schiller, Flexner, New York **Trade flow: Boris Eyker,** CEO Open Mineral AG **Legal aspects: Philip Prowse,** Partner, HFW, London **Audit is the key:** Frederik Gregaard, PWC, Switzerland **Moderator: Dr. Kaspar Bänziger**
Jan 26 1pm	**Caspian Day** **Strategies and Tactics** **Leveraging digital technology**	**Digital Banking on the rise: Mitja Vezovisek;** CEO, Founder Money Rebel **Digital Strategies: Assel Zhiyenbayeva,** Chief Digital, AIFC, Kazakhstan **Financing platforms: CEO Olga Feldmeier,** Smart Valor **Commodity trade efficiency: Boris Eyker,** CEO Open Mineral AG **Auditability of Trade flows: Pierre-Edouard Wahl,** Head of Blockchain, Director PWC, Zürich **Moderator: Dr. Kaspar Bänziger**

Moderator Dr. Kaspar Bänziger, Kaspar.baenziger@gmail.com
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The Caspian Region is developing into one of the most vibrant- and interesting economic regions in the World. The five countries Russia, Iran, Kazakhstan, Azerbaijan, Turkmenistan are the home of over 250 million citizens, generating a combined GDP of $ 2 trillion. The Caspian region is at the crucial social-economic nexus between East-West and North-South and provides over 60% of the global gas reserves and 20% of the global oil reserves. While natural resources define the backbone of most regional economies, the increasing diversifications into manufacturing and vertical linkages of value chains represent tremendous opportunities for economic growth.

Some Caspian statistics[lxviii]

	Population (m)	**GDP ($ b)**[lxix]	**Oil Reserves (mmbbl)**	**Gas Reserves (m^3)**
Russia	142	1'325	80'000	48'700b
Iran	83	388	157'000	33'600b
Kazakhstan	18	173	30'000	1'900b
Azerbaijan	9.8	54	7'000	2'600b
Turkmenistan	5.3	36	600	17'500b
Total	258.1	1'976	274'600	104'300b
% of the world			**20%**	**56%**

Our panel leaders for Caspian Digital Day:

Kairat Kelimbetov	Governor AIFC, Kazakhstan	***"Digital technology will reshape the financial world and will highly impact and influence the development of an International Financial Hub, such as AIFC"***
Matthew Schwartz	Partner Boies, Schiller, Flexner, New York	***"Blockchain and other distributed ledger/cryptocurrency technology is going to be central to settlement and payment systems in the future; global regulation and regulators are racing to catch up to the technology."***
Boris Eyker	CEO Open Mineral AG	***"Digitization as the game-changer as it allows the producers to automate many of their trading and supply chain activities."***
Philip Prowse	Partner, HFW, London	***"It impacts upon the whole global supply chain, including in relation to the financing of the same, as processes transition from analogue to digital."***
Mitja Vezovisek	CEO, Founder Money Rebel	***"In the financial services industry, we are witnessing huge and fast steps toward mobile and artificial intelligence, but the banking sector is still lagging, especially in the EU. With the implementation of the PSD2 EU directive and furious growth of mobile, this is about to change."***
Assel Zhiyenbayeva	Chief Digital, AIFC, Kazakhstan	***"Innovation and technology have brought about a radical change in traditional financial services, therefore fintech will play a crucial role in the future growth of this sector, taking new ideas and turning them into successful new businesses that create high-value, knowledge intensive jobs."***
Pierre-Edouard Wahl	Head of Blockchain, Director PWC, Zürich	***"Cryptographic ledgers are going to provide a new dimension of mathematically provable statements to audit."***

Our Education Leaders' Background

Kairat Kelimbetov

Governor of AIFC (Astana Int. Financial Centre). Kazakhstan.

"Digital technology will reshape the financial world and will highly impact and influence the development of an International Financial Hub, such as AIFC"

In today's world, digital technology plays an increasingly important role in the development of countries economy, therefore the Governmental supported program "Digital Kazakhstan" is one of the most important and priority areas of the State. AIFC, as a new financial hub, will become the leading center of expertise in the development of new financial technologies in the Central Asian & Caspian region. A strong digital country begins with a strong business fully integrated into the world of digital solutions. AIFC FinTech is aiming to develop, support and promote regional and global financial technology and financial innovation and build efficient ecosystem in Kazakhstan. We are working in four main directions: increasing financial inclusion and financial innovation, building regional capacity, establishing AIFC Fintech hub and Innovation Lab with global partners, and provide overall friendly environment with flexible regulation and in-house incubation and acceleration programs.

2013- 2015: Governor of the National (Central) Bank of Kazakhstan; 2012-2013: Deputy Prime Minister of Kazakhstan, Chairman of the Council of Eurasian Economic Commission; 2011-2012, Minister of Economic Development and Trade of Kazakhstan;
2008- 2011: CEO of the Sovereign Wealth Fund Samruk-Kazyna; 2008: Head of Administration of the President of Kazakhstan; 2006-2008 CEO of the Kazyna Sustainable Development Fund; 2002-2006: Minister of Economy and Budget Planning of Kazakhstan.

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Kairat Kaliyev

Managing Director, PR & Communications, FinTEch AIFC (Astana Int. Financial Centre). Kazakhstan.

"Innovation and technology have brought about a radical change in traditional financial services, therefore Financial technology (FinTech) will play a crucial role in the future growth of this sector, taking new ideas and turning them into successful new businesses that create high-value, knowledge intensive jobs."

Economist, experienced in Financial Services, Business Development and PR/Communications. Currently focused on FinTech development and Cryptonomics. Created the framework of FinTech Hub in AIFC.
Previous work experience: National Bank of Kazakhstan: Deputy director of international relations and public affairs Department. Government of The Republic Of Kazakhstan: Advisor to Deputy Prime Minister. Development Bank of Kazakhstan: In different years worked as Advisor to Chairman; Director of international relations and public affairs Department; Deputy head of investment projects department

Contact: k.kaliyev@aifc.kz / http://www.aifc.kz

Baurzhan Bektemirov

MD/Chief Economist AIFC (Astana Int. Financial Centre). Kazakhstan.

"Financial technology is one of five key pillars for the development of the Astana International Financial Centre; our goal is to create an ecosystem for new financial instruments."

The new wave of financial instruments disrupt the previous model and allows business and general public invest in the economy through a number of different risk-sharing models. Moreover, DLT and mathematical proof of data storage eliminates the need of a centralized trusted party, which allows direct b2b, b2c or c2c interaction. This significantly reduces the costs and creates a new community with a working financial system.

Having previously held managing positions at the Research Department of the National Bank of Kazakhstan and the government's Economic Research Institute, Baur is interested in macroeconomic analysis, economic modeling, public policy analysis, and international development. He was involved in setting up the transition to a new monetary policy regime at the National Bank of Kazakhstan and participated in designing long-term development strategy for Kazakhstan's sovereign wealth fund.

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Timur Onzhanov

Head of Asset Management AIFC (Astana Int. Financial Authority). Kazakhstan.

"Digital technology impacts the financial industry directly - Rise of FinTech has huge implications for the financial services industry"

Almost every type of financial activity — from banking to payments to asset & wealth management and more — is being re-imagined by startups, some of which have garnered blockbuster investments. Key areas of finance being disrupted by new technologies. We need to determine which are most vulnerable, which are still shielded from immediate disruption, and what that means for new entrants, startups and financial institutions

Since 2016 Timur Onzhanov is responsible for developing asset management and private banking markets at the Astana International Financial Centre Authority, an organization that is

responsible for the development and implementation of an International Financial Centre (IFC) in Kazakhstan.
Prior to that: Manager at Structured Trade & Export Finance, Deutsche Bank with particular focus on emerging markets.
Masters in Banking and Finance from the University of St.Gallen (HSG), undergraduate degree in Business Administration from the University of Bern

Contact: t.onzhanov@aifc.kz / http://www.aifc.kz

Assel Zhiyenbayeva

Chief Digital Officer, Astana International Financial Centre Authority

"Innovation and technology have brought about a radical change in traditional financial services, therefore fintech will play a crucial role in the future growth of this sector, taking new ideas and turning them into successful new businesses that create high-value, knowledge intensive jobs."

FinTech is a segment of companies that provides new financial solutions by leveraging technology and is currently considered as the fastest-growing sector.
FinTech is quickly gaining popularity and has become one of the main strategic directions activities for the development of the AIFC. The AIFC contributes to FinTech development in the Central Asia by creating the most favorable conditions for FinTech startups - including modern infrastructure, flexible regulations and investment promotion.

In Chief Digital Officer at Astana International Financial Center (AIFC). She also teaches Data management at Almaty Management University. 2016, CEO of country's largest IT- company Zerde. 2014 Advisor to head of National Bank of Kazakhstan. 2010-2013, Eurasian Natural Resources Group in London, head of cybersecurity . Bachelor's and master's degrees in Computer science from Cambridge University.

Contact: a.zhiyenbayeva@aifc.kz

Pierre-Edouard Wahl

Head of Blockchain, Director at PwC Switzerland

"Cryptographic ledgers are going to provide a new dimension of mathematically provable statements to audit."

On a cryptographic ledger you need to digitally sign any transaction taking place on the ledger, so it will be increasingly difficult in the future to make fraudulent transactions. Cryptographic signatures and timestamps will also provide a clear flow of goods through a commodity life cycle, allowing auditors to swiftly narrow down any discrepancies.

Pierre-Edouard is the blockchain head at PwC Switzerland and has ample experience with blockchain for business. He has been leading the blockchain practice for one of the world's leading banks and has worked on numerous implementations of DLT technologies, with a special focus on investment banking. Pierre-Edouard's passion is to help people take control of their own digital footprint, and build a fairer world by redistributing power. Power comes with responsibilities, hence distributing power reduces the risk of the misuse of centralized power.

Bs, University of Edinburgh, Electronics and Electrical Engineering. Then Pierre began working with virtual currency and has built a marketplace that used its own closed currency to facilitate trade while lowering the cost of transacting on the platform. He has spent over four years in India where he worked on outsourced projects mainly from the UK, during his last year in India he helped build a track and trace solution for the pharma industry targeted to the Indian market, which was launched successfully in early 2012.
He went on to become an integral part of the Bay Area Bitcoin community and further developed his expertise in Blockchain technology after moving to the Bay Area in 2012.
While in the Bay Area, Pierre-Edouard launched a B2B crypto-exchange that enabled developers to build solutions for their customers to purchase and sell Bitcoin without having to worry about jurisdiction, banking support or license.

More recently, Pierre-Edouard has worked for 3 years at Credit Suisse as Vice-President of Innovation and Blockchain Lead and started the bank's blockchain research initiative. Now joined PwC Switzerland as their Blockchain Head.

Contacts: pierre-edouard.wahl@ch.pwc.com

Matthew L. Schwartz

Partner, Boies Schiller Flexner LLP
Head of the Firm's Global Investigations and Compliance Practice

"Blockchain and other distributed ledger/cryptocurrency technology is going to be central to settlement and payment systems in the future; global regulation and regulators are racing to catch up to the technology."

I represent financial institutions, digital currency companies, and investors in a wide variety of regulatory issues relating to blockchain and cryptocurrency technology. The changes in and swift adoption of technology is a challenge to regulators, who are competing to occupy the space. Because the entire purpose of this technology is to eliminate friction by working outside of the existing settlement and payment processing networks, it by definition is acting in gaps in the regulatory scheme. This creates extraordinary opportunities, but also vulnerabilities.

Matthew currently leads the Global Investigations and compliance practice at Boies Schiller Flexner, a global law firm. Previously, he served for a decade in the U.S. Department of Justice, investigating and prosecuting violations of banking laws, cybercrimes, securities violations, and other financial crimes.

Undergraduate: Columbia University, B.A. in physics and philosophy, Graduate: Columbia University, J.D. (with honors)

Contact: mlschwartz@bsfllp.com / www.bsfllp.com

Philip Prowse

Partner, Structured Commodities Trade Finance and Head of Digital Trade Group. HWF

"It impacts upon the whole global supply chain, including in relation to the financing of the same, as processes transition from analogue to digital."

Digital technology such as blockchain/DLT, smart contracts, IOT and cryptocurrencies have the potential to disrupt current market leaders and processes along the whole global supply chain by creating streamlining, efficiencies, and enhancement of data storage, sharing and validation systems, thereby enhancing risk analysis and mitigation, allowing for new business links to open up and providing new opportunities for those who are ready, willing and able to embrace them. The recognition of cryptocurrencies as payment systems, and the scaleability of them, will be crucial if they are to thrive and to show themselves as more than a bubble.

Partner in Structured Commodities Trade Finance (2015 to date) at HFW, London.
Philip specializes in commodities trade finance and in digital trade. He has acted for a wide range of clients up and down the global commodities supply chain including lenders, borrowers, suppliers, producers, processors, logistics entities, distributors, insurers and end-users / consumers. He also now advises on digital trade technologies including the application of distributed ledger technology, smart contracts, IOT and of digital currencies.
He frequently writes articles published on these matters and often speaks at international trade (finance) conferences.

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Boris Eyker

Open Mineral AG, CEO

"Digitization as the game-changer as it allows the producers to automate many of their trading and supply chain activities."

Open Mineral is an online Exchange that makes it easy to competitively tender metal concentrate and ensure efficient trade execution. Exchange directly connects producers globally and increases profitability of all the participants by excluding middlemen. Industry knowledge, powerful technology and analytics enable OME members to maximize their profit and efficiency.

Boris has more than 16 years of experience in management, commercial and financial roles. Before Open Mineral, Boris was with Glencore for 8 years in various functions, including CFO of Kazzinc, asset manager for base and precious metal mines and smelters, as well as a trader of copper, zinc, lead, gold, and silver concentrates. Prior to that, he worked in private equity and venture capital fields during his years at Pacific Corporate Group. Boris obtained MBA from Harvard Business School and B.S. from UC Berkeley.

Contact: Boris.eykher@openmineral.com / www.openmineral.com

Mitja Vezovišek

CEO, Founder Money Rebel

"In the financial services industry, we are witnessing huge and fast steps toward mobile and artificial intelligence, but the banking sector is still lagging, especially in the EU. With the implementation of the PSD2 EU directive and furious growth of mobile, this is about to change."

We partnered with a group of highly skilled tech individuals, AI specialists and crypto specialists to make managing money completely trivial. The MR Platform is designed like a set of independent, well-connected products. The foundation is pre-existing since the founders of the MR Platform have previously developed and successfully introduced two of the products in our home market, Slovenia: My portfolio and My budget.

Mitja Vezovišek is financial service professional helping clients manage their money. With more than 15 years of experience, he is recognized author, speaker on television and radio shows. He is also one of the key voices of financial industry when it comes to promoting financial literacy, personal financial planning as well as managing money. He is an author of bestseller Personal financial plan and several articles. Mitja Vezovišek is also the Ambassador of the Slovenian national project Youth and Money and the co-founder of Know I do not know Institute, which till today educated more than 5.000 adults about personal finances. The Institute conducted survey about Slovenian literacy in 2015 on more than 20.000 people and yes, Slovenians are financially illiterate as well.

Contact: mitja@moneyrebel.com / https://moneyrebel.io/

Caspian Week Organization

We thank the incredible team for realizing the amazing 'Finis origine pendet', Caspian Week 2018:

Murat Seitnepesov, Dr. Kaspar Bänziger	Production & Direction
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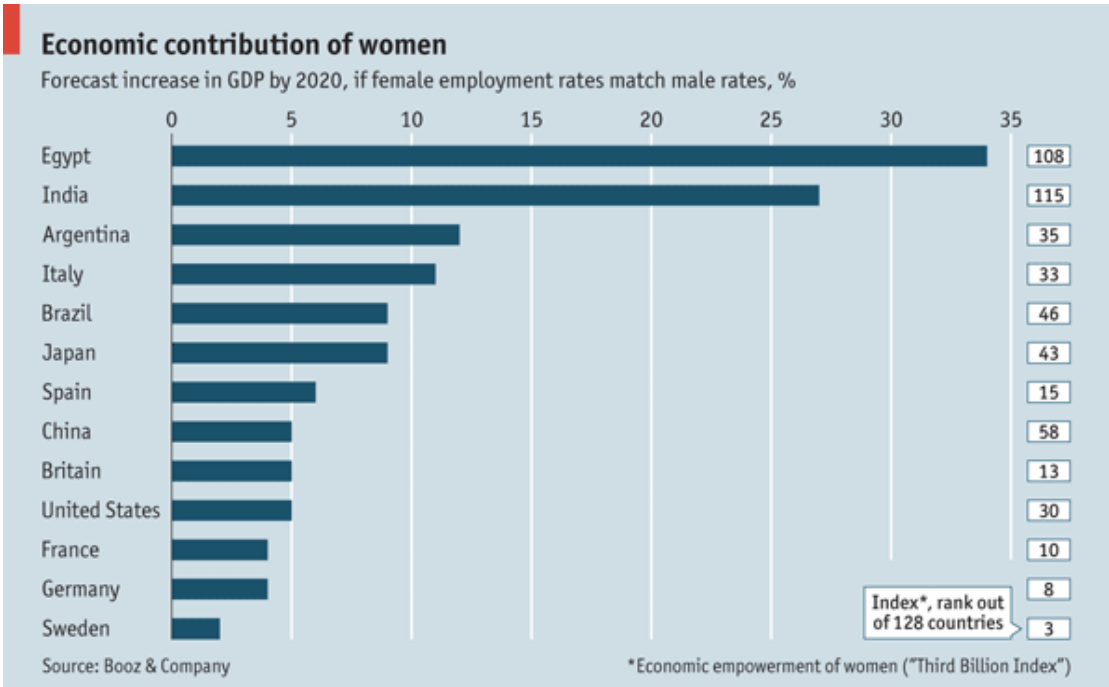
Raj Unnilrishnan	VIP Relations
Marina Pukhlikova	Sponsorship
Irina Sabato	Guest Relations
Victoria Bayramova	Human Resources

Annex

Figure 10: Economic contribution of women



Sources:

- SDG 5: Achieve gender equality and empower all women and girls - See more at:
- http://www.unwomen.org/en/news/in-focus/women-and-the-sdgs/sdg-5-genderequality#sthash.9ymxysjS.dpuf
- https://firstladies.international/2016/02/22/2016-women-and-political-leadership female-heads-of-stateand-
- heads-of-government/
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- "New research from The Peterson Institute for International Economics and EY reveals significant correlation between women in corporate leadership and profitability." EY website,
- http://www.ey.com/US/en/Newsroom/News-releases/news-ey-new-research-from-the-peterson-institutefor-international-economics-and-ey-reveals-significant-correlation-between-women-in-corporateleadership-and-

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- http://fortune.com/2016/09/28/europe-female-ceo-sp/
- http://www.indiamarks.com/indias-top-women-executives-their-academic-qualification/
- http://gazetesu.sabanciuniv.edu/en/2016-02/2015-report-woman-directors-publicly-traded-companiesturkey
- http://content.thirdway.org/publications/853/NEXT_-_Fatherhood_Motherhood.pdf
- http://www.forbes.com/sites/elenakvochko/2016/01/04/women-executives-in-tech/#129ff3904d16
- www.unwomen.org/en/news/in-focus/women-and-the-sdgs/sdg-5-genderequality#
- sthash.9ymxysjS.dpuf

Figure 11: Medical Blockchain application[lxx]

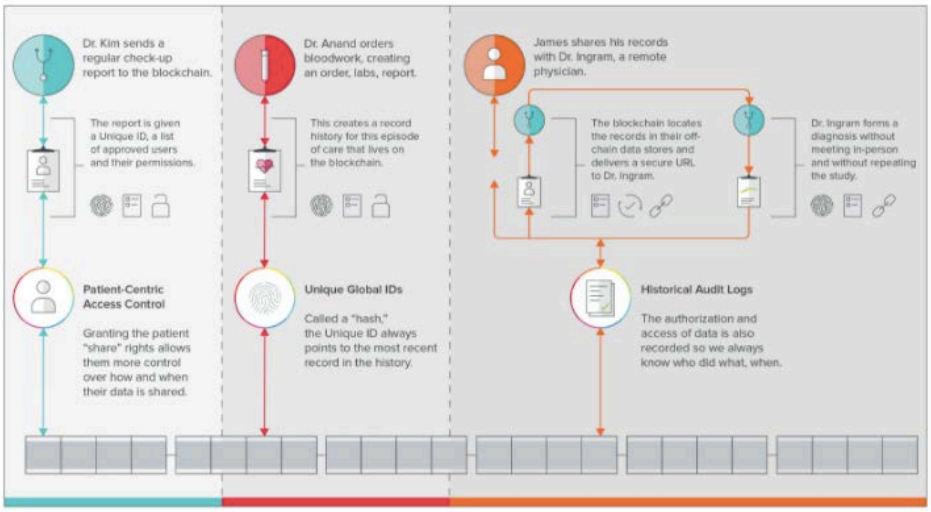


Figure 12: Data to the owners, MIDATA[lxxi]

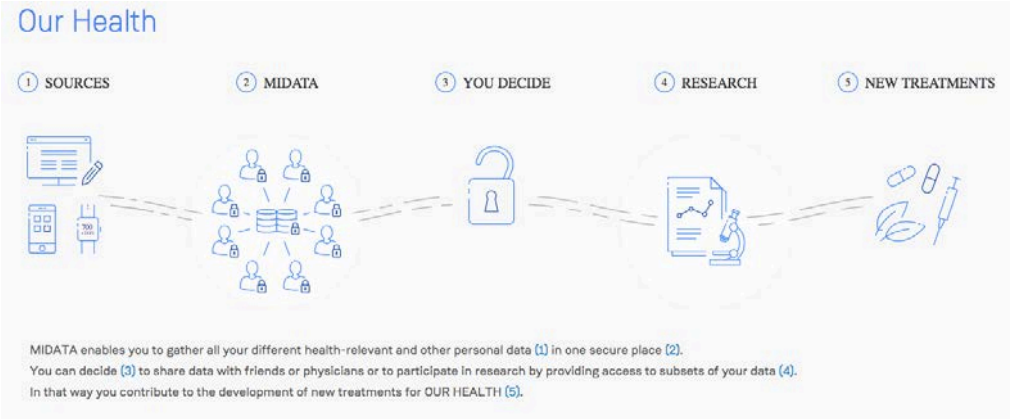


Figure 13: Blockchain explained[lxxii]

YouBase is a consumer-level technology and allows individuals to maintain their data and identity across various networks they use daily and share as they like. The platform combines blockchain compatible technologies which together deliver a secure and flexible container for data that is independent of any one single entity.

Figure 14: Artificial Intelligence in Healthcare[lxxiii]

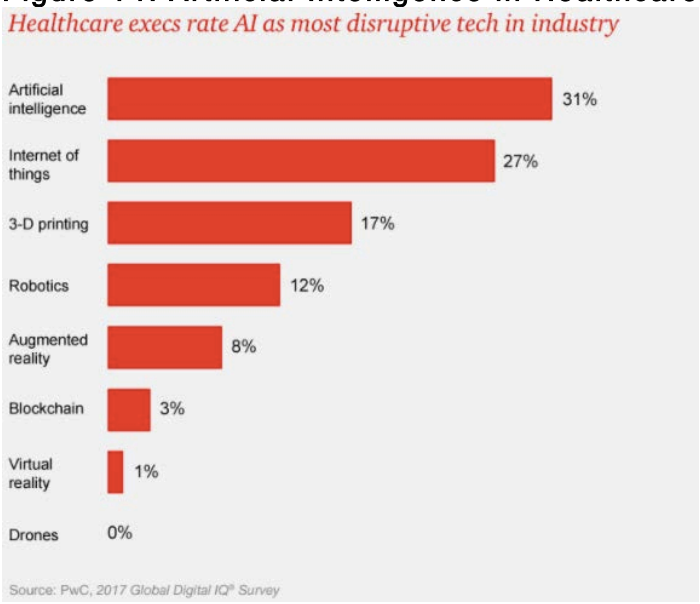


Figure 15: How would you like your services to be delivered?[lxxiv]

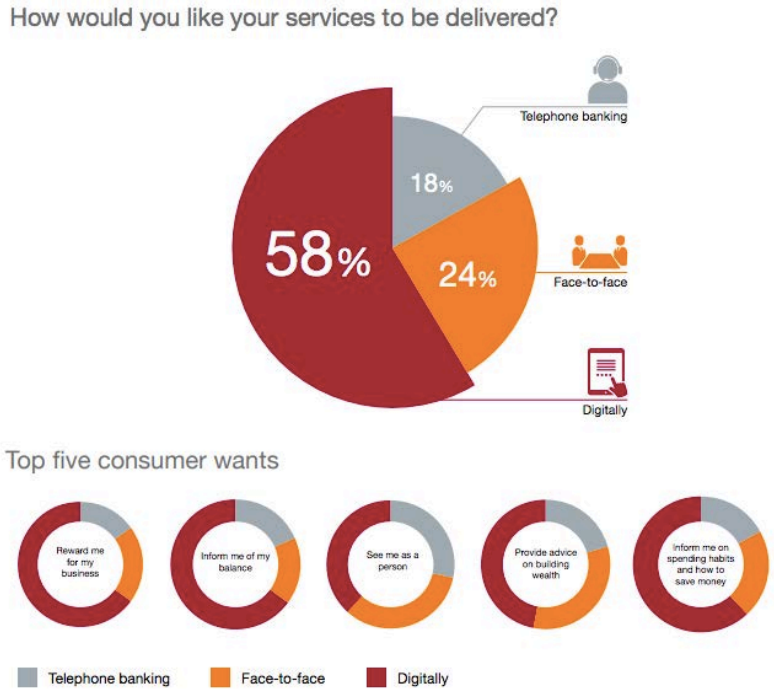
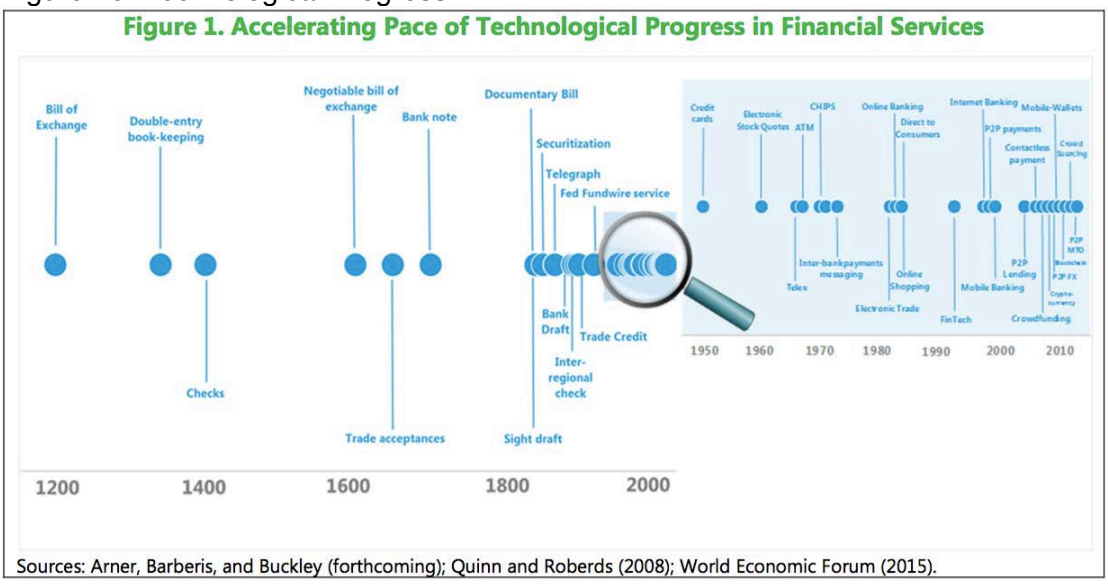


Figure 16: Technological Progress



Sources: Arner, Barberis, and Buckley (forthcoming); Quinn and Roberds (2008); World Economic Forum (2015).

Figure 17: Trust and financial systems (IMF 2017)

Box 3. The Role of Regulation in Supporting Trust in the Financial System

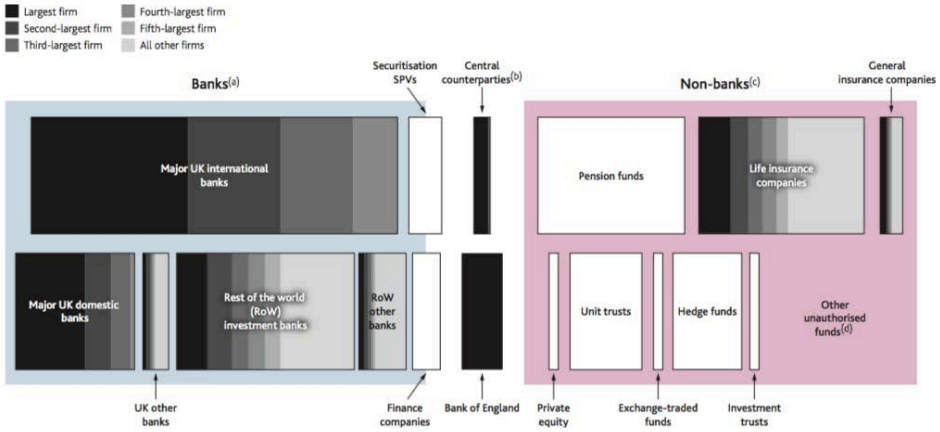
Finance involves creating value by transferring assets and claims among entities (e.g., payer and payee) as well as over time. Doing so requires trust among the entities, and toward the asset being transferred.

Trust is defined as "a meaningful expectation as to the future conduct of a person, an organization or as to the functionality of a system" (de Larosière 2009). Trust thus reduces uncertainty. It also reduces transaction costs by diminishing the need for costly legal and operational safeguards. Finally, trust mitigates risks arising from complexity.

How can trust be established and maintained? Legal certainty is key, as provided by a clear and predictable legal framework, both in the context of public law (namely regulation) and private law (contractual and property law). To some extent, trust also stems from private information (such as a long-term professional relationship), and a public track record (as in well-functioning payments infrastructure).

Finally, regulation plays a central role in establishing trust. The regulation of market participants ensures that their financial position is sound and accurately represented, and meets prudential standards, and that governance and management of risks meet regulatory requirements. Regulation may also signal the resilience of counterparties, markets, and infrastructure.

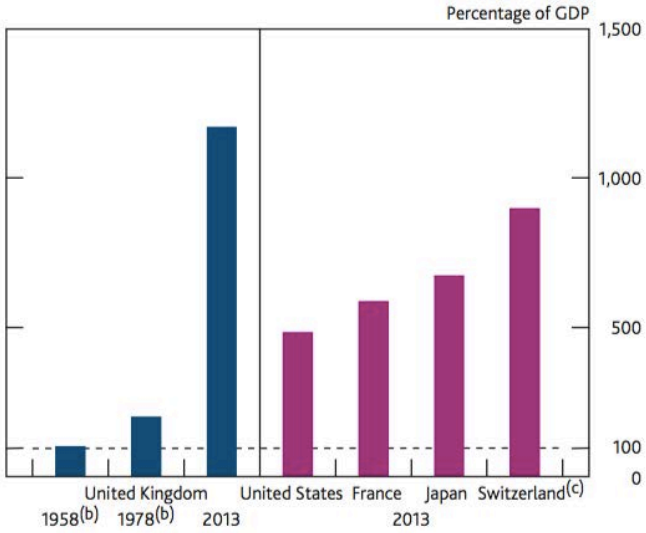
Figure 18: Concentration of financial corporations in the UK[lxxv]



Sources: Bank of England and Bank calculations.

(a) UK banks are measured on a global consolidated basis. Rest of the world banks include subsidiaries and branches, with cross-border assets/liabilities excluded for foreign branches. PRA-regulated investment firms are shown within the banking sector. Santander UK is shown within Major UK domestic banks. Finance companies and SPVs include both those consolidated into banks and others. SPVs covers vehicles with assets resident in the United Kingdom but does not include the Asset Purchase Facility, which is consolidated into the Bank of England's balance sheet.
(b) CCPs are measured based on consolidated accounts of UK-authorised CCPs.
(c) Insurance companies and pension funds are measured on a residency basis. Insurance companies includes all PRA-authorised insurers and reinsurance companies are included in the general insurance sector. Pension funds covers self-administered pension funds in the United Kingdom. In general, other non-banks are included if managed in the United Kingdom. The range of sources used to estimate non-banks may not report on consistent bases. Unit trusts includes authorised unit trusts and open-ended investment companies. Value for hedge funds is indicative only, based on estimates using a number of data sources and assumptions. Data for private equity and pension funds are as of 2013.
(d) No sector estimate is shown for other unauthorised funds.

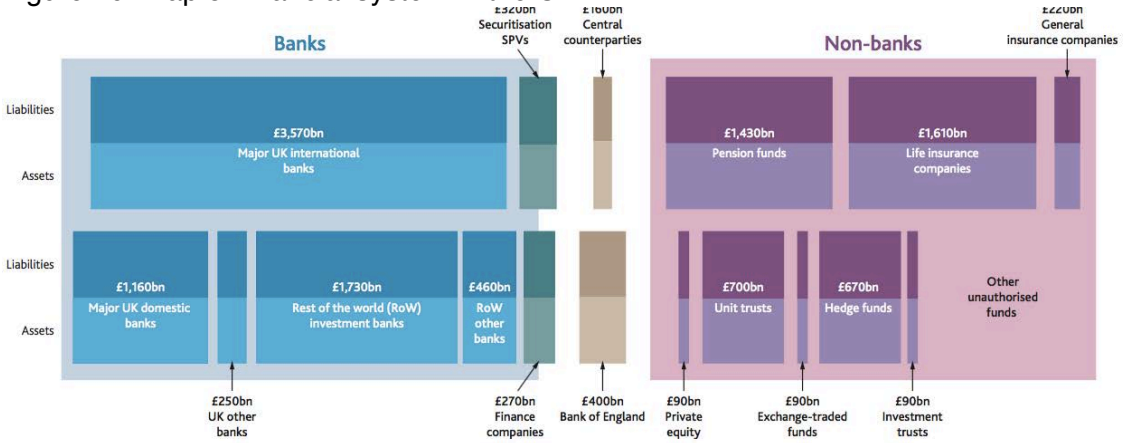
Figure 19: Size of financial systems



Sources: OECD, ONS, Radcliffe Report (1959), Swiss National Bank, Wilson Report (1980) and Bank calculations.

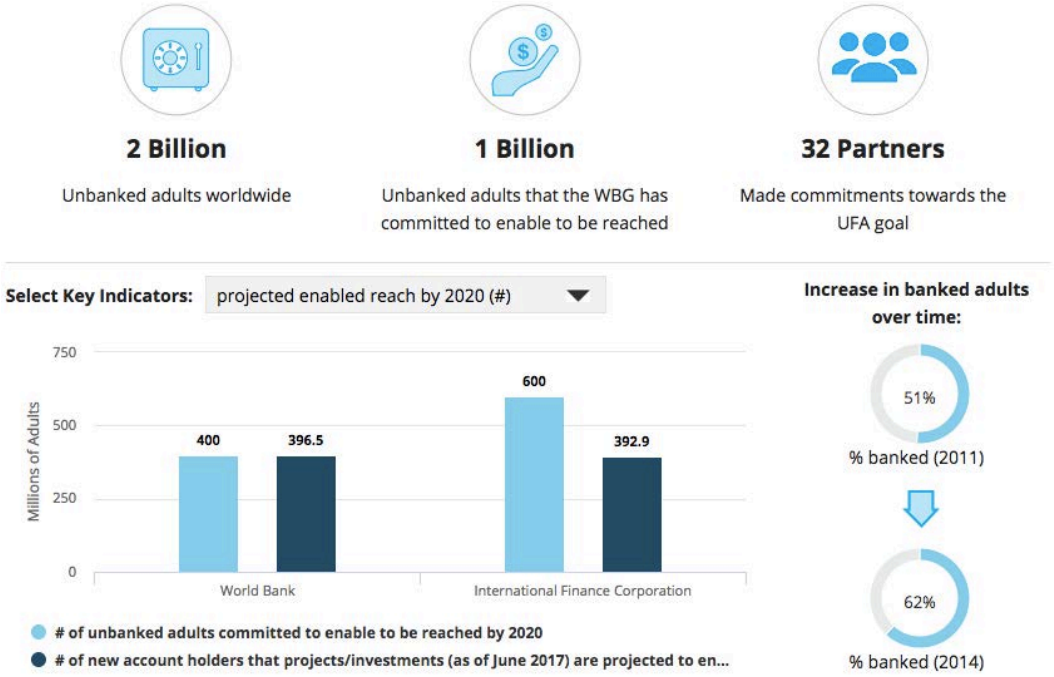
(a) 'Financial system' is defined as total assets of the financial corporations sector, measured on an unconsolidated basis, including derivatives.
(b) For 1958 and 1978, the total assets of the individual subsectors covered in the Radcliffe and Wilson Reports are summed to give an illustrative total for the financial system.
(c) Data for Switzerland are as of 2012.

Figure 20: Map of financial system in the UK[lxxvi]



(a) Sectors are sized in proportion to their total financial assets excluding derivatives and cross-border exposures of foreign-owned bank branches. For more detail on sectors and sources see main article text and footnotes to **Figure 3**.

Figure 21: Financial Inclusion[lxxvii]



Note:

Country opportunities are calculated by segmenting unbanked financially active adults who can be reached through specific interventions. Interventions cannot always be added up simply to create the country opportunity, as the three interventions may overlap. However, WBG analysis discounts these overlaps for the Total Opportunity for each country, thereby the Total Opportunity may be less than the summation of the 3 interventions alone. The World Bank Group's **projected reach** is based on engagement activities linked to project targets, constraints of unbanked adults and attribution of financial inclusion strategies. **Actual reported** reach is used to update projections as that data become available. Please note that the **opportunities** are calculated with **2020 in mind as the end year**, taking into account population growth based on UN predictions, and therefore may exceed the current number of unbanked. All indicators are calculated using raw data from the Global Findex database unless otherwise noted.

Figure 22: Universal Financial Access (UFA) by 2020[lxxviii]

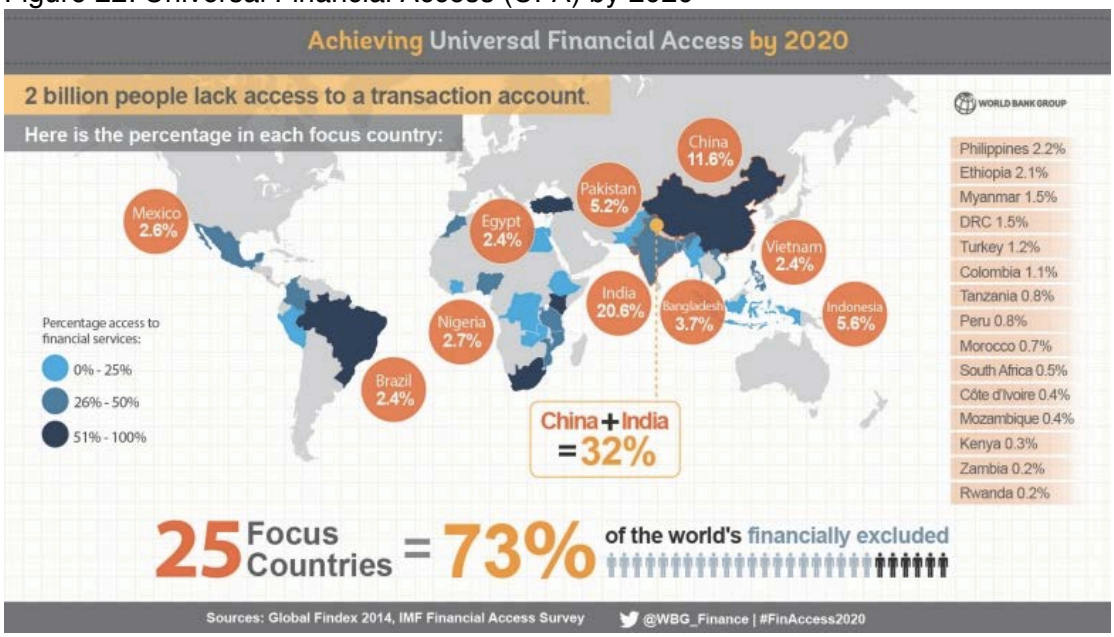


Figure 23: Bitcoin supply

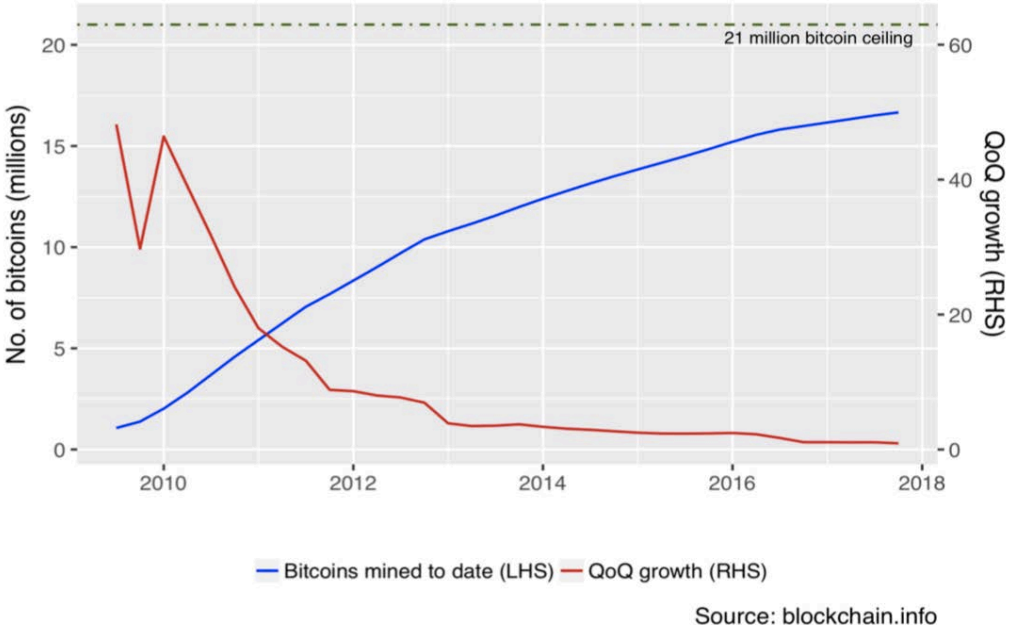


Figure 24: Bitcoin controlled supply

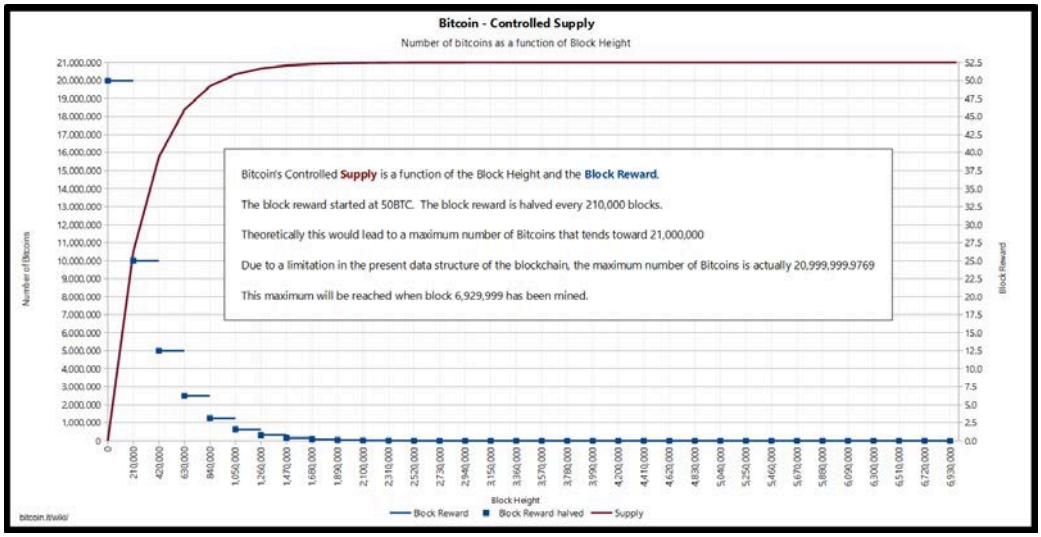


Figure 25: Bitcoin Energy consumption

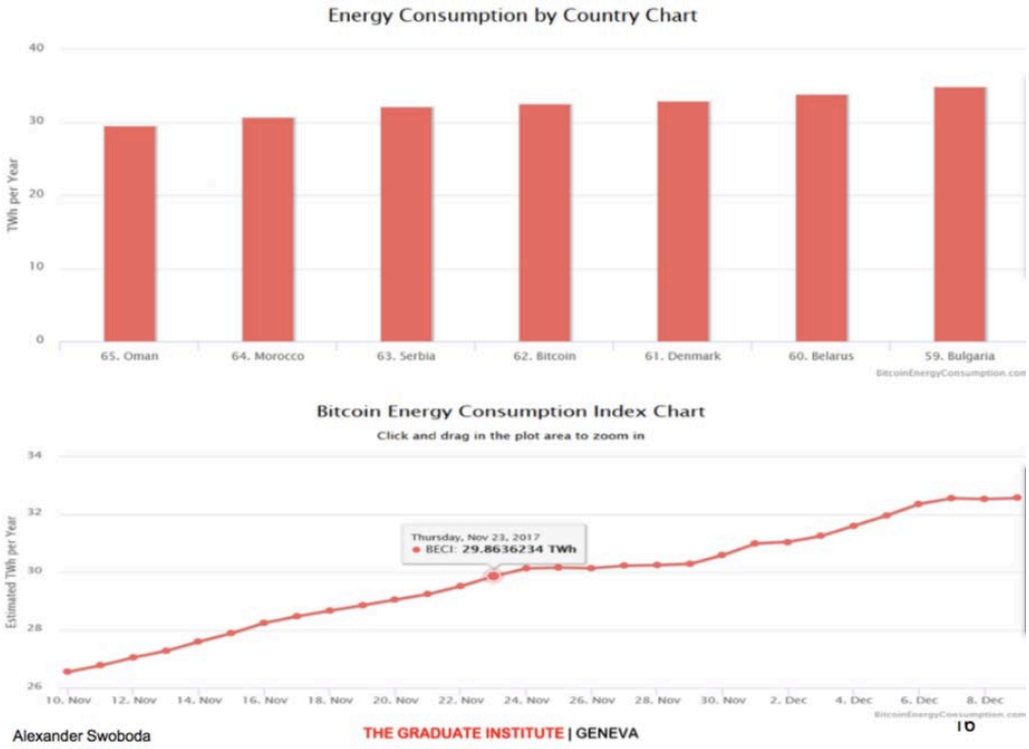


Figure 26: Bitcoin traded

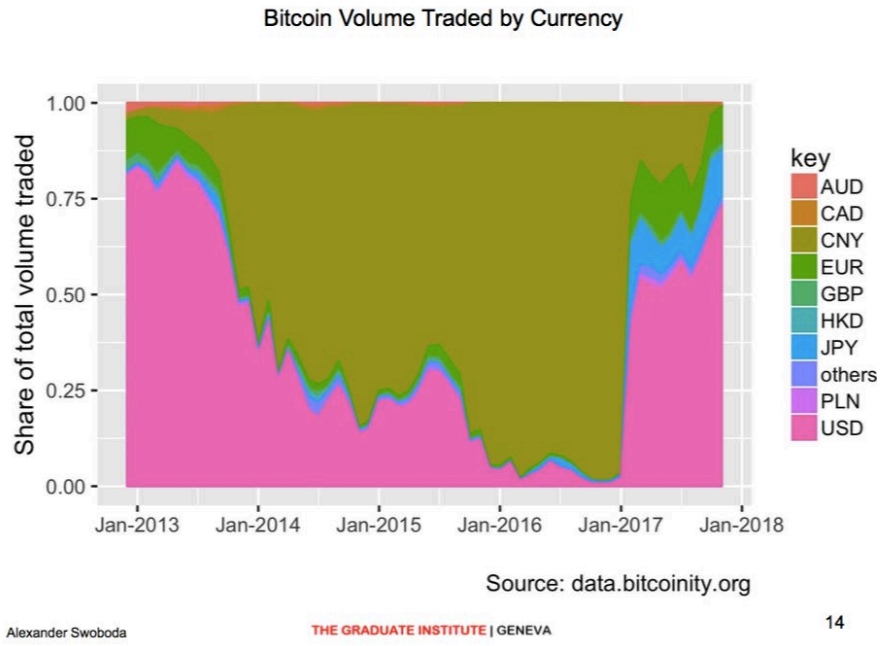


Figure 27: ICO 2016-2017 Nov[lxxix]

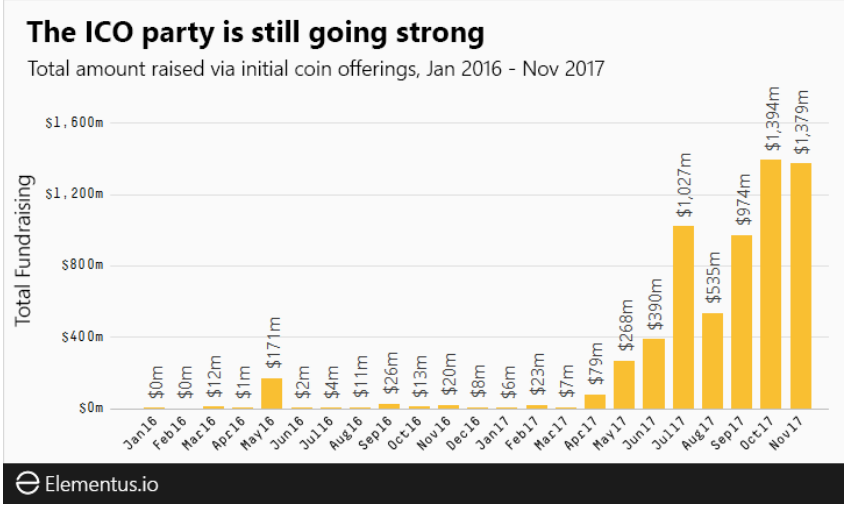


Figure 28: Digital payment China

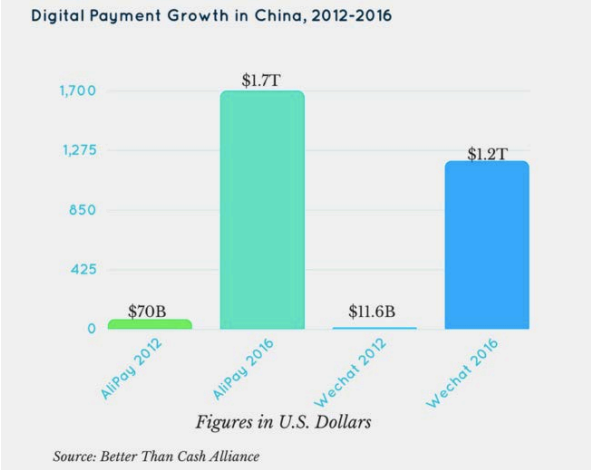


Figure 29: Definition of money

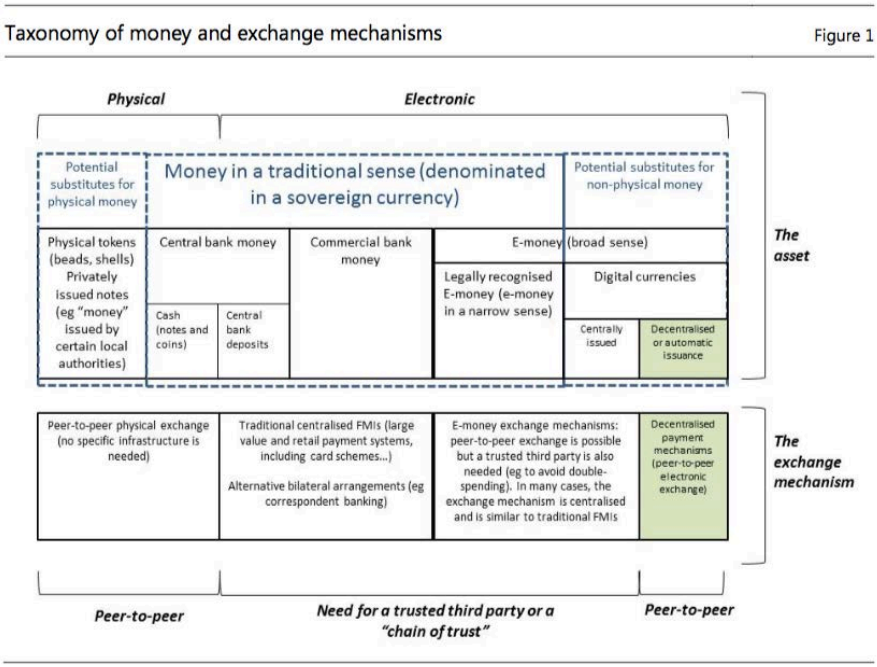
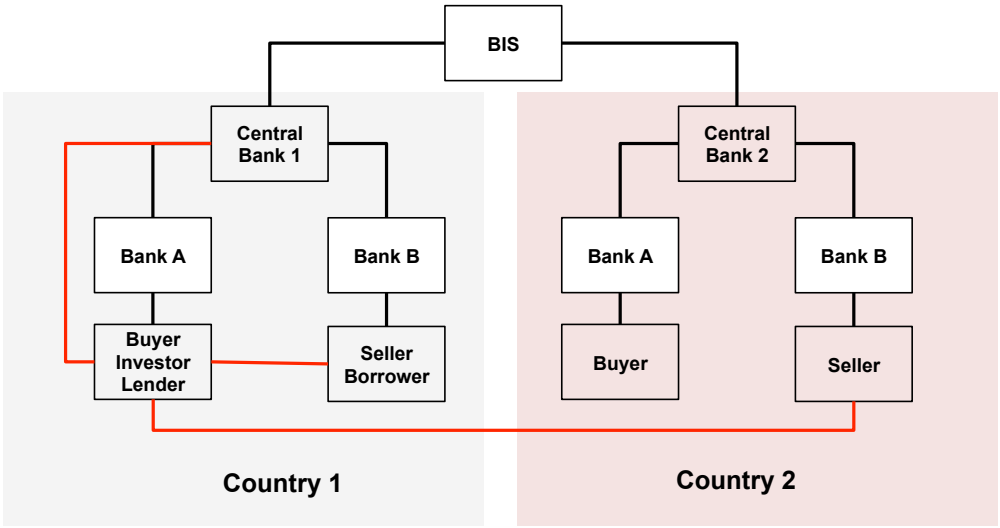


Figure 30: Digital Currency Markets



Digital Currency markets

- **Central Bank Issuing digital currencies directly to economy**
- **Peer-to-peer financial transactions (nation and cross border)**
- **Direct monetization of value streams**

Figure 31: Countries with fast payments

Fast payment implementations in CPMI countries[1, 2] Table 1

Existing fast payment implementations in CPMI countries

Country	Implementation	Year commenced[3]
Korea	Electronic Banking System (EBS)	2001
South Africa	Real-Time Clearing (RTC)	2006
Korea	CD/ATM System	2007[4]
United Kingdom	Faster Payments Service (FPS)	2008
China	Internet Banking Payment System (IBPS)	2010
India	Immediate Payment Service (IMPS)	2010
Sweden	BiR/Swish	2012
Turkey	BKM Express	2013
Italy	Jiffy – Cash in a flash (Jiffy)	2014
Singapore	Fast And Secure Transfers (FAST)	2014
Switzerland	Twint[5]	2015
Mexico	SPEI	2015[6]

Proposed fast payment implementations in CPMI countries

Country/geographical area	Implementation	Proposed year of commencement
Australia	New Payments Platform (NPP)	2017
SEPA[7]	Various implementations based on SEPA Credit Transfer instant (SCTinst) scheme including	2017
Netherlands	Instant Payments	2019
Belgium	Instant Payments	TBD
Saudi Arabia	Future Ready ACH (FR-ACH)	2017/18
Hong Kong SAR	TBD (name to be determined later)	2018
Japan	Zengin Data Telecommunication System	2018[8]
United States[9]	TBD	TBD

Figure 32: Fast payments Mexico

SPEI in Mexico

The Bank of Mexico is the owner and operator of SPEI, the Mexican fast payment system. SPEI clears operations every few seconds, and the results are settled immediately on participants' SPEI cash accounts.

Since November 2015, all mobile payments instructions in SPEI have been processed on a 24/7 basis and in short time frames. Originating banks must send to SPEI the payment instructions originated by their clients (payers) within five seconds after they make validations and accept payment instructions, and SPEI settles almost all payments instructions among participants within five seconds. In addition, receiving banks must post payments to beneficiaries' (payees') accounts within five seconds after they receive the corresponding settlement notice from SPEI. By the end of 2016, the 24/7 and short processing time frames will also apply to all SPEI low-value payment instructions initiated through electronic channels.

The process for fast payments through SPEI is as follows:

1. The payer sends the payment instruction to their bank.
   a. The payer's bank validates, among other things, the identity of the payer and resource availability in the payer's account. Additionally, it executes antifraud procedures before initiating the payment.
   b. If any of the validations fails, the payment instruction is rejected, and the payer is notified.
2. If validations are successful, the payer's bank debits the payer's account and sends the payment instruction to SPEI. This happens within five seconds after the payer's bank accepts the payment instruction.
3. The payment instruction is queued for clearing. The settlement process takes, on average, three seconds and almost all payments are settled within five seconds.
4. The SPEI account of the payer´s bank is debited, and the payee´s bank is credited.
5. The payer's bank and the payee´s banks are informed that the payment was settled.
6. The payee´s bank has to credit the payee´s account within five seconds from the moment it receives the central bank's settlement notification.

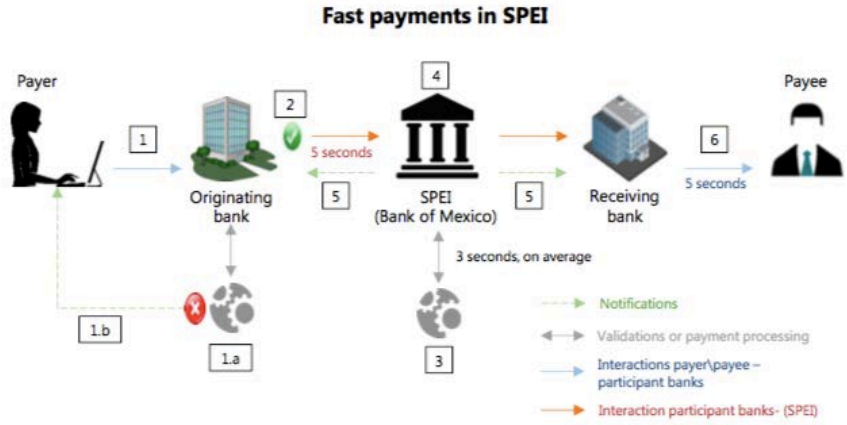
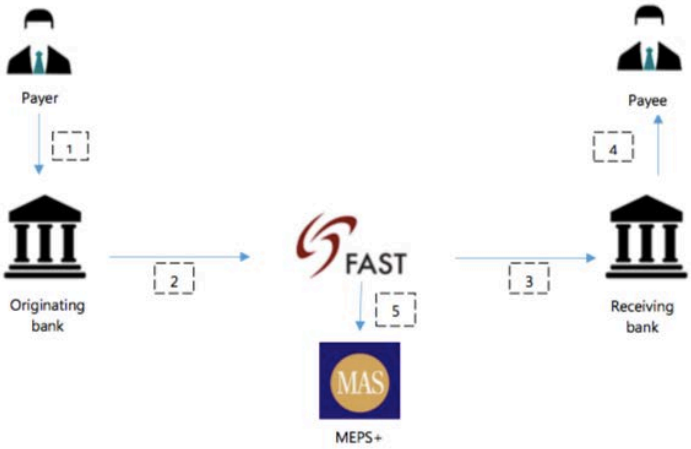


Figure 33: Fast payment Singapore

FAST in Singapore

FAST (Fast and Secure Transfers) was launched in March 2014. It allows for the secure and near-instantaneous electronic transfer of Singapore dollar funds between bank accounts held in the 20 participating banks in Singapore. FAST is available 24 hours a day, seven days a week, and customers can make interbank fund transfers of up to SGD 50,000 per transaction, subject to their daily or monthly withdrawal limits. Customers are able to initiate a FAST transaction through multiple channels, such as internet banking, ATMs, and mobile devices, as offered by their banks.



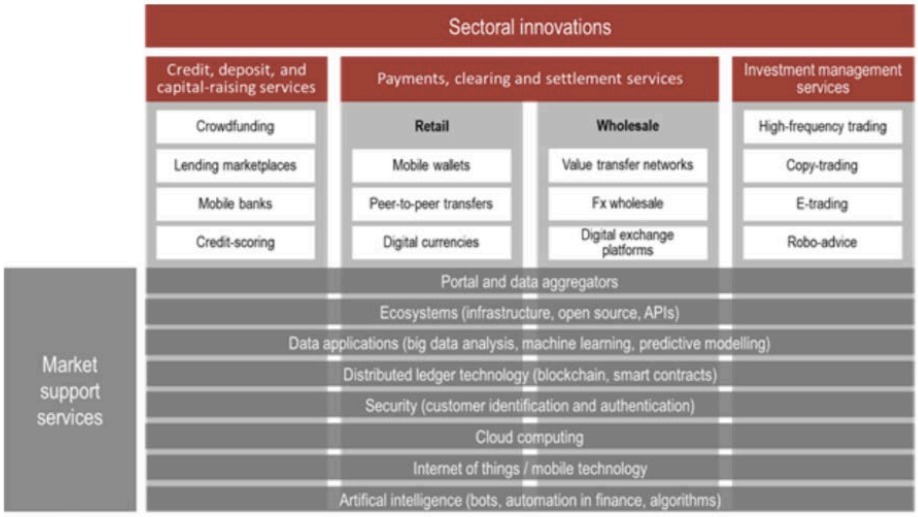
The payment flow for a FAST transaction is as follows:

1. The payer initiates the funds transfer to the payee's bank account. The funds are debited immediately from the payer's bank account.
2. The payer bank sends the transaction to FAST for clearing.
3. FAST, which is operated by the Banking Computer Services Pte Ltd ("BCS"), validates and routes the payment message to the payee bank.
4. The payee bank validates the bank account number and credits the payee's account immediately.[1]
5. FAST clearing obligations of all participating banks are transmitted by BCS to MEPS+ (Singapore's RTGS system operated by the Monetary Authority of Singapore) for interbank settlement on a multilateral net basis twice per working day.

[1] Availability of final funds to the payee.

Figure 34: Fintech Innovations

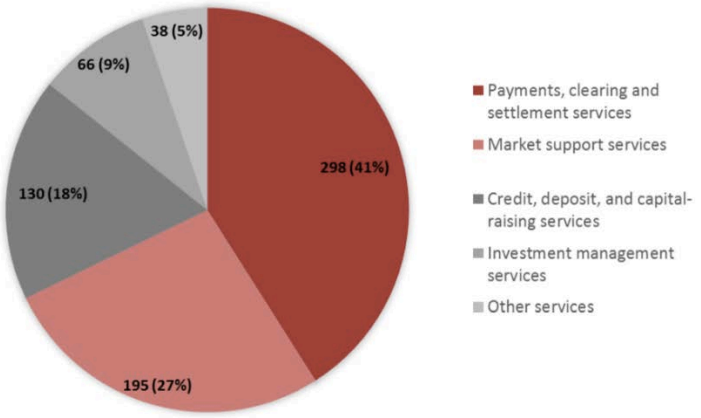
Graph 1: Sectors of innovative services



Source: BCBS.

Figure 35: Fintech activity

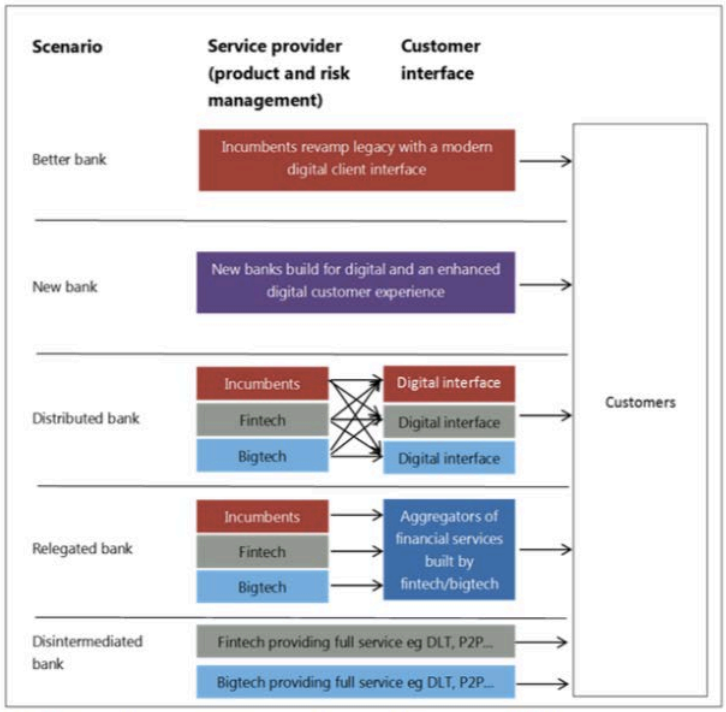
Graph 2: Survey of key providers per fintech activity[5]



Source: BCBS.

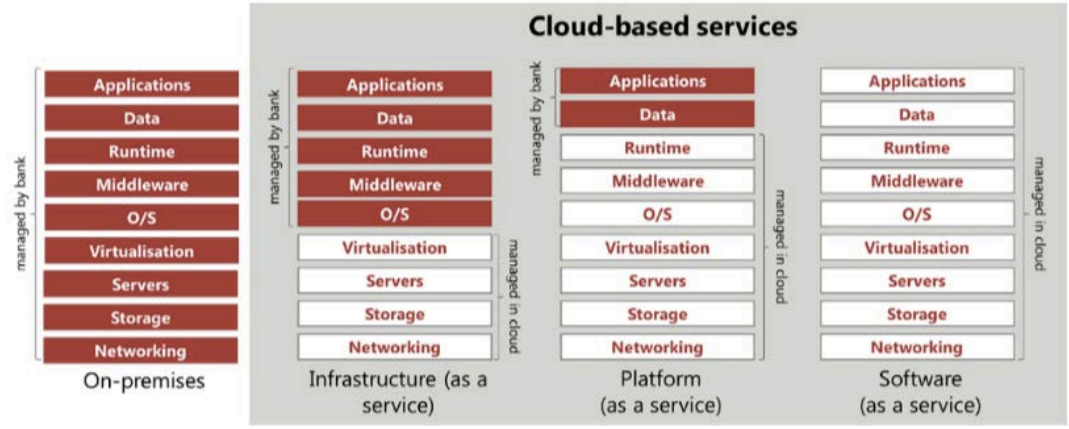
Figure 36: Nexus customer and financial service provider

Graph 5: Overview of the five scenarios and the role players



Colour code: maroon indicates incumbent banks; purple new players; grey fintech companies; and blue bigtech companies.
Source: BCBS illustration of scenarios based on the BankNXT study *The future of banking: four scenarios*, October 2015, https://banknxt.com/53478/future-banking-scenarios/.

Figure 37: Cloud based services



Source: Technet.

Figure 38: Sandbox approaches (IMF 2017)

Figure IV.1. The Sandbox Approach in Selected Jurisdictions

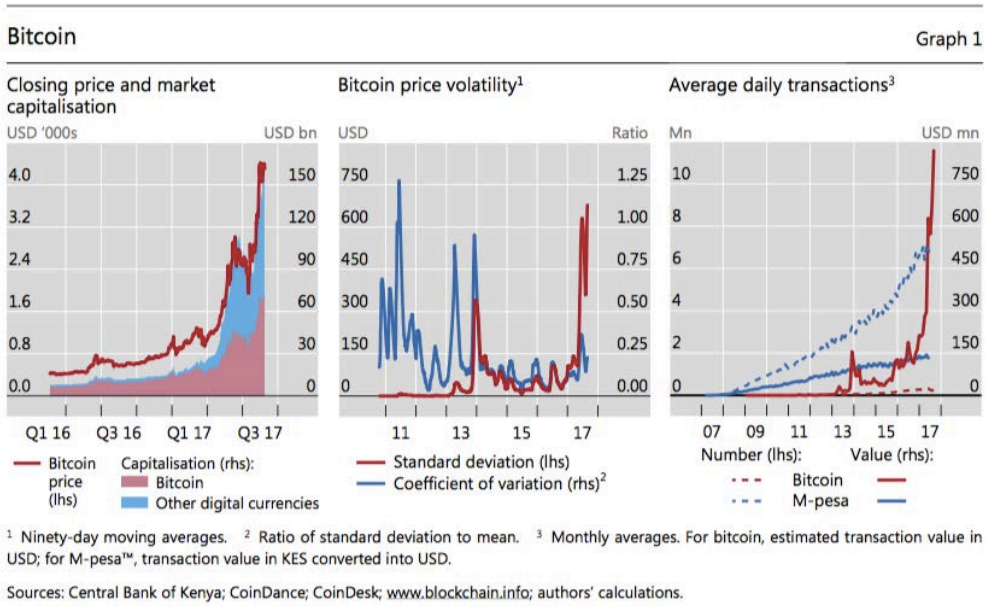
General Information		Type of Applicant		Benefits for Businesses			Safeguards			
Country	Regulator	Authorized/ Licensed/ Incumbents	Unauthorized/ Unlicensed/ Startups	Regulations relaxed or waived	Licensing requirements relaxed or waived	Clarifications on regulatory expectations	Limits on customers, value and/or duration	Additional reporting obligations/closer monitoring	Additional consumer protections/risk mitigation	Specified regulations that cannot be waived
Australia	ASIC	✗	✓	✗	✓	✗	✓	✓	✓	✓
Canada	CSA	✓	✓	✓	✗	✓	✗	✗	✓	✗
Hong Kong SAR	HKMA	✓	✗	✓	✗	✗	✓	✓	✓	✗
Malaysia	BNM	✓	✓	✓	✗	✗	✓	✓	✓	✗
Singapore	MAS	✓	✓	✓	✗	✗	✓	✓	✓	✓
Switzerland	FDF	✓	✓	✗	✓	✗	✓	✗	✓	✓
United Arab Emirates	ADGM	✓	✓	✓	✗	✗	✓	✓	✓	✗
United Kingdom	FCA	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ Explicitly mentioned in the regulatory authority's disclosure, staff analysis.

✗ Either not required or not mentioned in the regulatory authority's disclosure.

Source: IMF staff.

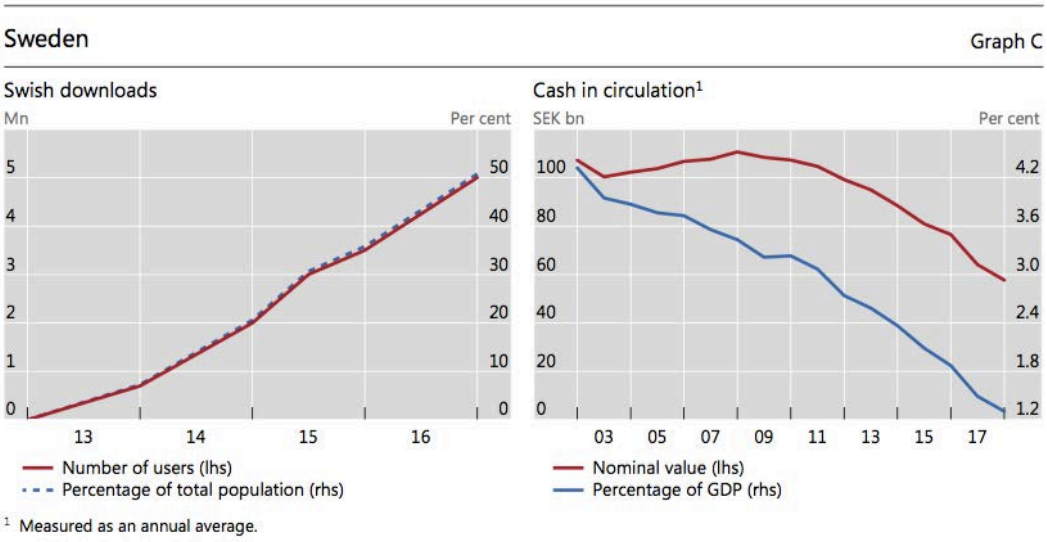
Figure 39: Bitcoin Volatility (BIS 2017)



[1] Ninety-day moving averages. [2] Ratio of standard deviation to mean. [3] Monthly averages. For bitcoin, estimated transaction value in USD; for M-pesa™, transaction value in KES converted into USD.

Sources: Central Bank of Kenya; CoinDance; CoinDesk; www.blockchain.info; authors' calculations.

Figure 40: Sweden going off cash



[1] Measured as an annual average.

Sources: IMF, *International Financial Statistics*; United Nations, *World Population Prospects*; www.getswish.se; national data; authors' calculations.

Figure 41: Distributed ledge technology

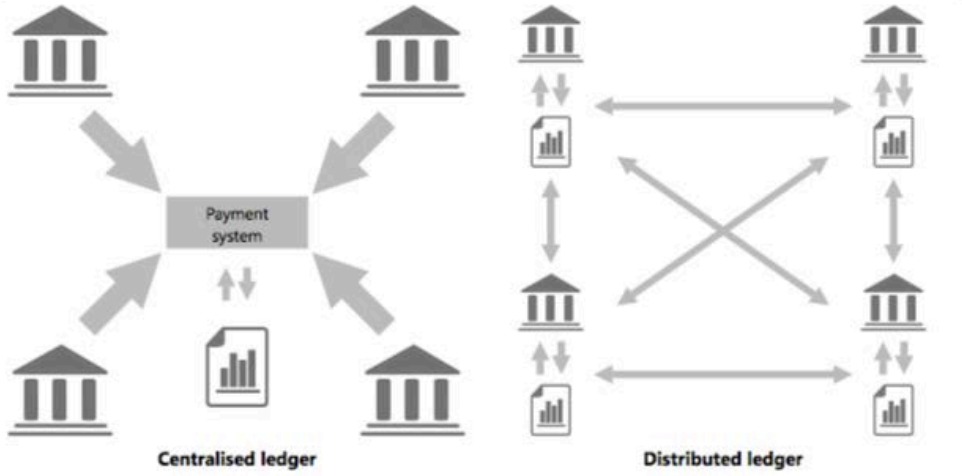
What is distributed ledger technology?①

Distributed ledger technology (DLT) refers to the protocols and supporting infrastructure that allow computers in different locations to propose and validate transactions and update records in a synchronised way across a network. The idea of a distributed ledger – a common record of activity that is shared across computers in different locations – is not new. Such ledgers are used by organisations (eg supermarket chains) that have branches or offices across a given country or across countries. However, in a traditional distributed database, a system administrator typically performs the key functions that are necessary to maintain consistency across the *multiple copies* of the ledger. The simplest way to do this is for the system administrator to maintain a master copy of the ledger which is periodically updated and shared with all network participants.

By contrast, the new systems based on DLT, most notably Bitcoin and Ethereum, are designed to function without a trusted authority. Bitcoin maintains a distributed database in a decentralised way by using a consensus-based validation procedure and cryptographic signatures. In such systems, transactions are conducted in a peer-to-peer fashion and broadcast to the entire set of participants who work to validate them in batches known as "blocks". Since the ledger of activity is organised into separate but connected blocks, this type of DLT is often referred to as "blockchain technology".

The blockchain version of DLT has successfully powered Bitcoin for several years However, the system is not without drawbacks: it is costly to operate (preventing double-spending without the use of a trusted authority requires transaction validators (miners) to employ large amounts of computing power to complete "proof-of-work" computations);② there is only probabilistic finality of settlement; and all transactions are public. These features are not suitable for many financial market applications. Current wholesale DLT payment applications have therefore abandoned the standard blockchain technology in favour of protocols that modify the consensus process in order to allow enhanced confidentiality and scalability. Examples of protocols currently being tested by central banks include Corda and Hyperledger Fabric. Corda replaces blockchain with a "notary" architecture. The notary design utilises a trusted authority and allows consensus to be reached on an individual transaction basis, rather than in blocks, with limited information-sharing.

Distributed ledger system — Graph A



Source: Santander InnoVentures (2015).

Figure 42: Taxomany of money (BIS)

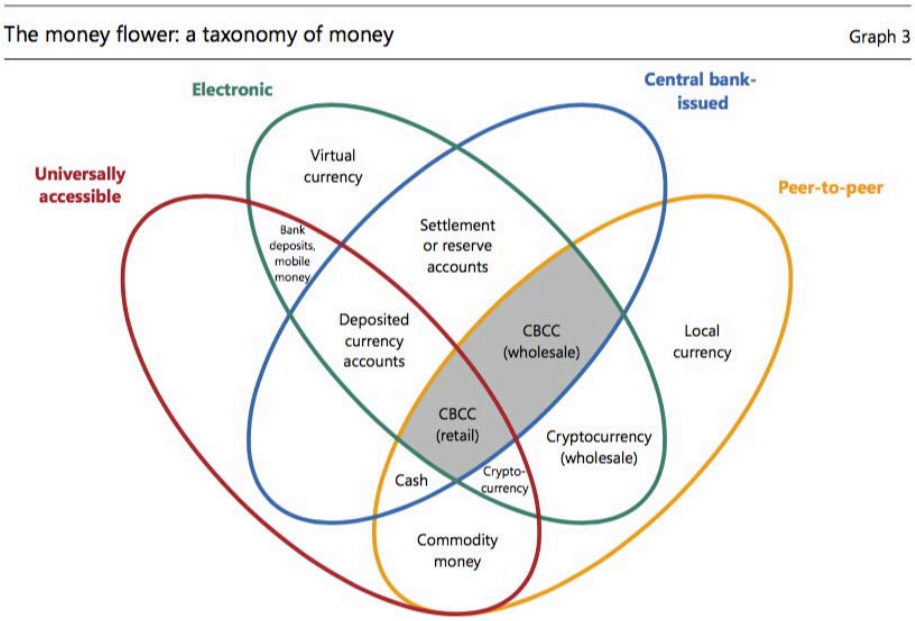


Figure 43: Crypto currency Market Cap (Dec 26 2017)[lxxx]

#	Name	Symbol	Market Cap ($)
1	Bitcoin	BTC	270,487,014,160
2	Ethereum	ETH	74,032,682,516
3	Bitcoin Cash	BCH	50,330,228,096
4	Ripple	XRP	42,399,219,252
5	Litecoin	LTC	15,624,010,515
6	Cardano	ADA	10,603,886,652
7	IOTA	MIOTA	10,006,447,995
8	Dash	DASH	9,308,764,922
9	NEM	XEM	8,385,200,999
10	Monero	XMR	5,815,499,890
11	EOS	EOS	5,477,719,521
12	Bitcoin Gold	BTG	5,145,147,009
13	Qtum	QTUM	4,162,319,744
14	NEO	NEO	4,054,836,500
15	Stellar	XLM	3,872,650,289
16	Ethereum Classic	ETC	3,198,683,354
17	Lisk	LSK	2,781,003,240
18	BitConnect	BCC	2,481,130,277
19	TRON	TRX	2,478,943,550
20	Verge	XVG	2,262,032,428
21	Zcash	ZEC	1,638,330,325
22	ICON	ICX	1,623,401,780
23	Ardor	ARDR	1,564,692,949
24	Nxt	NXT	1,535,862,510
25	OmiseGO	OMG	1,503,433,732
26	BitShares	BTS	1,486,237,000
27	Populous	PPT	1,465,829,416
28	Stratis	STRAT	1,395,910,679
29	Waves	WAVES	1,375,560,000
30	Tether	USDT	1,222,755,121
31	Hshare	HSR	1,202,657,567
32	Bytecoin	BCN	1,133,258,183
33	RaiBlocks	XRB	1,116,362,162
34	Komodo	KMD	1,032,833,690
35	Dogecoin	DOGE	973,678,167
36	Augur	REP	954,971,600
37	Binance Coin	BNB	865,225,918
38	Siacoin	SC	825,225,725
39	Steem	STEEM	804,285,170
40	Ark	ARK	770,632,597
41	Veritaseum	VERI	717,819,759
42	PIVX	PIVX	689,398,934
43	MonaCoin	MONA	645,712,237
44	SALT	SALT	640,384,574
45	DigiByte	DGB	583,134,571
46	Decred	DCR	577,243,834
47	Golem	GNT	543,185,485
48	ZCoin	XZC	473,837,356
49	Status	SNT	470,781,537
50	TenX	PAY	458,379,906
51	Byteball Bytes	GBYTE	433,427,914
52	Electroneum	ETN	423,883,086
53	VeChain	VET	405,145,251
54	Bytom	BTM	404,850,621
55	Aion	AION	392,544,661
56	Basic Attenti...	BAT	377,506,000
57	Syscoin	SYS	376,121,151
58	MaidSafeCoin	MAID	375,151,920
59	BitcoinDark	BTCD	368,858,180
60	Factom	FCT	364,275,475
61	Santiment Net...	SAN	360,157,189
62	ReddCoin	RDD	357,250,714
63	Aeternity	AE	336,211,258
64	DigixDAO	DGD	331,598,000
65	Power Ledger	POWR	326,714,970
66	Kyber Network	KNC	317,839,497
67	Dent	DENT	312,706,612
68	Vertcoin	VTC	307,783,271
69	QASH	QASH	306,370,750
70	Civic	CVC	302,715,820
71	0x	ZRX	284,959,267
72	Walton	WTC	277,004,679
73	GameCredits	GAME	270,799,599
74	Gas	GAS	243,275,323
75	Skycoin	SKY	240,476,135
76	FunFair	FUN	239,969,539
77	Substratum	SUB	226,204,495
78	Dragonchain	DRGN	224,167,169
79	Gnosis	GNO	223,519,309
80	Iconomi	ICN	218,766,919
81	Cryptonex	CNX	214,932,914
82	Monaco	MCO	212,737,028
83	GXShares	GXS	205,299,414
84	BitBay	BAY	204,320,871
85	Bancor	BNT	198,157,782
86	Raiden Networ...	RDN	197,939,355
87	Einsteinium	EMC2	197,732,824
88	Dentacoin	DCN	194,589,272
89	Ripio Credit ...	RCN	189,970,633
90	Request Network	REQ	189,826,835
91	Decentraland	MANA	189,731,494
92	Edgeless	EDG	180,731,563
93	NAV Coin	NAV	177,256,217
94	Nexus	NXS	177,215,805
95	Ethos	ETHOS	173,910,812
96	Ubiq	UBQ	172,142,270
97	AdEx	ADX	171,731,797
98	ChainLink	LINK	166,095,300
99	Blocknet	BLOCK	163,141,457
100	Storj	STORJ	159,375,741
1370		Total Market cap ($)	590,953,227,176

Annex

Figure 44: Urban shift of world population[lxxxi]

World's population by size class of settlement, 2016 and 2030						
	2016			2030		
	Number of settlements	Population (millions)	Percentage of world population	Number of settlements	Population (millions)	Percentage of world population
Urban	..	4 034	54.5	..	5 058	60.0
10 million or more	31	500	6.8	41	730	8.7
5 to 10 million	45	308	4.2	63	434	5.2
1 to 5 million	436	861	11.6	558	1 128	13.4
500 000 to 1 million	551	380	5.1	731	509	6.0
Fewer than 500 000	..	1 985	26.8	..	2 257	26.8
Rural	..	3 371	45.5	..	3 367	40.0

Figure 45: 4 areas that drive resilience (OECD)[lxxxii]

Economy
- A diverse number of industries
- A dynamic economy to generate growth
- Conditions allow innovation to take place
- People have access to employment, education, services, skills training.

Governance
- Clear leadership and management
- Strategic and integrated approaches are taken by leaders
- Public sector has the right skills
- Government is open and transparent

Society
- Society is inclusive and cohesive
- Citizens' networks in communities are active
- Neighbourhood is safe
- Citizens enjoy healthy lives

Environment
- Ecosystem is sound and diverse
- Infrastructure can meet basic needs
- Adequate natural resources are available
- Coherent policy towards land use

Figure 46: World's largest cities[lxxxiii]

Rank	City, Country	Population in 2016 (thousands)	City, Country	Population in 2030 (thousands)
1	Tokyo, Japan	38 140	Tokyo, Japan	37 190
2	Delhi, India	26 454	Delhi, India	36 060
3	Shanghai, China	24 484	Shanghai, China	30 751
4	Mumbai (Bombay), India	21 357	Mumbai (Bombay), India	27 797
5	São Paulo, Brazil	21 297	Beijing, China	27 706
6	Beijing, China	21 240	Dhaka, Bangladesh	27 374
7	Ciudad de México (Mexico City), Mexico	21 157	Karachi, Pakistan	24 838
8	Kinki M.M.A. (Osaka), Japan	20 337	Al-Qahirah (Cairo), Egypt	24 502
9	Al-Qahirah (Cairo), Egypt	19 128	Lagos, Nigeria	24 239
10	New York-Newark, USA	18 604	Ciudad de México (Mexico City), Mexico	23 865
11	Dhaka, Bangladesh	18 237	São Paulo, Brazil	23 444
12	Karachi, Pakistan	17 121	Kinshasa, Democratic Republic of the Congo	19 996
13	Buenos Aires, Argentina	15 334	Kinki M.M.A. (Osaka), Japan	19 976
14	Kolkata (Calcutta), India	14 980	New York-Newark, USA	19 885
15	Istanbul, Turkey	14 365	Kolkata (Calcutta), India	19 092
16	Chongqing, China	13 744	Guangzhou, Guangdong, China	17 574
17	Lagos, Nigeria	13 661	Chongqing, China	17 380
18	Manila, Philippines	13 131	Buenos Aires, Argentina	16 956
19	Guangzhou, Guangdong, China	13 070	Manila, Philippines	16 756
20	Rio de Janeiro, Brazil	12 981	Istanbul, Turkey	16 694
21	Los Angeles-Long Beach-Santa Ana, USA	12 317	Bangalore, India	14 762
22	Moskva (Moscow), Russian Federation	12 260	Tianjin, China	14 655
23	Kinshasa, Democratic Republic of the Congo	12 071	Rio de Janeiro, Brazil	14 174
24	Tianjin, China	11 558	Chennai (Madras), India	13 921
25	Paris, France	10 925	Jakarta, Indonesia	13 812
26	Shenzhen, China	10 828	Los Angeles-Long Beach-Santa Ana, USA	13 257
27	Jakarta, Indonesia	10 483	Lahore, Pakistan	13 033
28	Bangalore, India	10 456	Hyderabad, India	12 774
29	London, United Kingdom	10 434	Shenzhen, China	12 673
30	Chennai (Madras), India	10 163	Lima, Peru	12 221
31	Lima, Peru	10 072	Moskva (Moscow), Russian Federation	12 200
32			Bogotá, Colombia	11 966
33			Paris, France	11 803
34			Johannesburg, South Africa	11 573
35			Krung Thep (Bangkok), Thailand	11 528
36			London, United Kingdom	11 467
37			Dar es Salaam, United Republic of Tanzania	10 760
38			Ahmadabad, India	10 527
39			Luanda, Angola	10 429
40			Thành Pho Ho Chí Minh (Ho Chi Minh City), Viet Nam	10 200
41			Chengdu, China	10 104

Figure 47: OECD resilient cities[lxxxiv]

Figure 48: Global Population, UN 2017

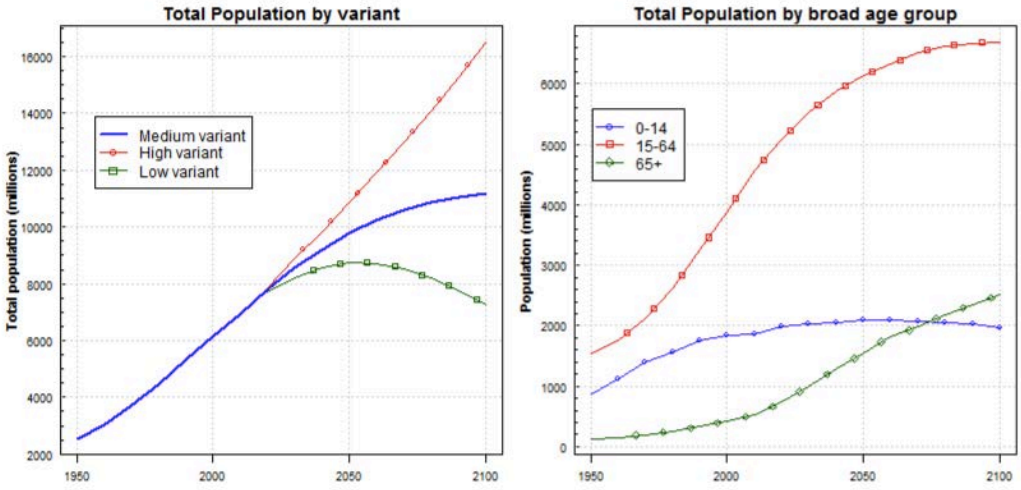
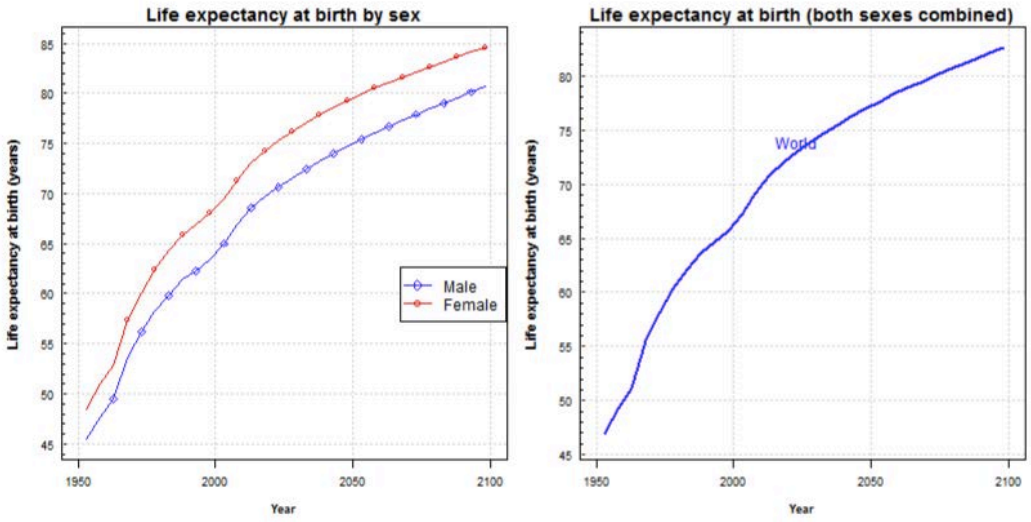


Figure 49: Increasing life expectancy, UN



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