

Fintech impact on banks & the implications for central bank policy

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Agenda

1. Wholesale Banks
2. Fixed Income
3. Central Banks
4. The Digital Currency debate & Central Banks

But first, what is Fintech?

A

- **-“A list”**: large, well-established financial institutions; the incumbents e.g. large American banks
- *e.g. large American banks*

B

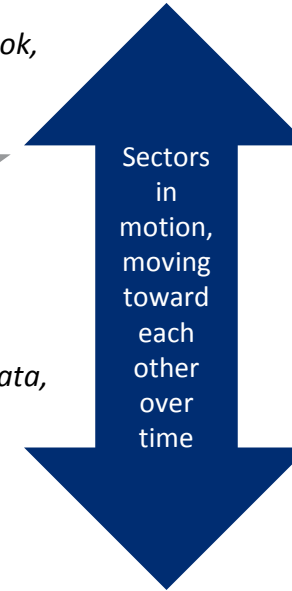
- **-Big Tech companies** that are active in the financial services space but not exclusively
- *e.g. Apple, Google, Facebook, Twitter*

C

- **-Companies providing infrastructure/technology** facilitating financial services transactions.
- *Broad group including MasterCard, Fiserv, First Data, various financial market utilities, & exchanges like NASDAQ*

D

- **-Disruptors**: fast-moving companies, often startups, focused on a particular innovative technology or process.
- *Includes Stripe (mobile payments), Betterment (automated investing), Prosper (peer-to-peer lending), Moven (retail banking), Lemonade (insurance)*



- *e.g. financial institutions becoming more tech focused*
- *& big tech companies offering P2P payment solutions over email & social networks*
- *& disruptors proving services typically available only from banks*

1. Wholesale Banks

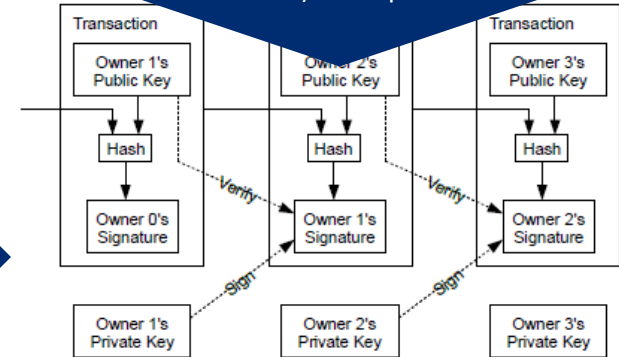
- Challenger models focus on **retail**, which was linked to mobile transformation
- But Fintech can help incumbent **wholesale banks** become efficient
- Significant focus on:

Back end

- Distributed Ledger

- Trading is (& is becoming increasingly) efficient...
- But post-trade still relatively labour intensive in some markets (arguably outside of FX, custody clearing)
- Scope for improvements = Settlement **Blockchain?**

Distributed digital ledger that maintains a continuously growing list of ordered records called blocks. Each block contains a timestamp and a link to a previous block. Transactions made in cryptocurrency (e.g. bitcoin) & are public

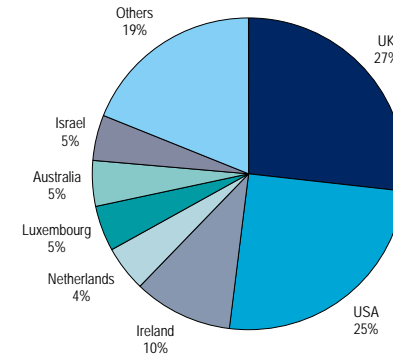


Regulation

- Artificial Intelligence

- RegTech = area to watch in 2017
- 10% of bank's total spend*
- 30,000+ staff in main US banks
- The US & UK are leading in **RegTech** globally
- Key benefits
 - Artificial Intelligence** and Deep Learning enable greater level of automation eg. IBM Watson
 - KYC** could become an industry utility

RegTech – UK and US Dominate



Number of companies

Source: Citi Research, Based on 127 RegTech companies identified by Jan-Maarten (JM) Mulder, General Partner at Middlegame Ventures

*Citi research

(i) AI: Banking industry already started piloting & implementing

Area	Consumer	Corporate	Markets
Real time analytics	<ul style="list-style-type: none"> •Paypal uses real time payment fraud analytics •Bank uses RTA for customer engagement 	<ul style="list-style-type: none"> •Bank uses real time analytics for small business loan approvals 	<ul style="list-style-type: none"> • Bank uses real time analytics to monitor trade fraud
Predictive analytics	<ul style="list-style-type: none"> •2 Banks use ML-based techniques for card fraud, and for targeted customer offers 	<ul style="list-style-type: none"> •Bank uses ML techniques for funds flow analytics 	<ul style="list-style-type: none"> • Bank uses ML techniques for real time trade risk management
Machine Learning	<ul style="list-style-type: none"> •Bank uses ML-based techniques for payment spend analytics and personalized coupons/alerts 	<ul style="list-style-type: none"> •Bank uses Machine Learning in its “AppBank” to automate corporate systems management 	<ul style="list-style-type: none"> • 2 Banks have deployed ML-based high frequency trading platforms
Deep Learning	<ul style="list-style-type: none"> •LendingClub/ Kabbage report use of ML for credit scoring and risk management •PayPal uses deep learning techniques in discovering payment fraud 	<ul style="list-style-type: none"> •Multiple banks: Tracking of corporate accounts to notifying banks for assistance, Automated sanctions compliance management 	<ul style="list-style-type: none"> • 2 Banks deploying robo-advisors with ML-functionality • State Street uses ML based analytics for portfolio and asset management
Video / Image Analytics	<ul style="list-style-type: none"> •4 Banks use facial and voice-based biometrics for identity •Mastercard testing “Selfie Pay” in North America 	<ul style="list-style-type: none"> •2 Banks use face and voice recognition to validate corporate users 	<ul style="list-style-type: none"> • Charles Schwab utilizes image pattern recognition to identify trading patterns
Graph analytics	<ul style="list-style-type: none"> •Bank uses graph analytics for customer 360 profile generation 	<ul style="list-style-type: none"> •Bank uses graph analytics for cyber intrusion detection 	<ul style="list-style-type: none"> • Bank uses graph analytics for compliance and fraud analytics
Natural Language Processing & Generation	<ul style="list-style-type: none"> •2 Banks working on Amazon Echo based applications – for account management and payments initiation •DBS uses NLP to review customer chat logs to enhance quality of customer interactions 	<ul style="list-style-type: none"> •State Street piloting use of Natural language based techniques in its custodian tools 	<ul style="list-style-type: none"> • 2 Banks piloting use of NLP based techniques to generate research advisories for wealth management customers • Bank uses news sentiment analytics for financial forecasting
Virtual Assistants / Bots	<ul style="list-style-type: none"> •Bank uses virtual agent technology for consumer Q&A in its DigiBank App •Bank’s web-based virtual agent app uses NLP •Bank uses “Luvo”, its virtual agent chatbot to help mortgage customers chose the best fit loan 	<ul style="list-style-type: none"> •Bank uses virtual assistants to help business customers navigate through product detail 	<ul style="list-style-type: none"> • E*Trade uses virtual agents to assist trading with market Q&A • Multiple banks undertaking pilots for use of virtual agents to support traders with real time information
Robotic Process Automation	<ul style="list-style-type: none"> •Bank uses RPA for mortgage processing and reconciliations •Bank uses RPA for ledger reconciliations •Bank uses RPA to automate reconciliation of ATM declined transactions & disputes 	<ul style="list-style-type: none"> •Bank uses RPA for reconciliations and technology support. •Bank uses RPA in quality assurance and ledger reconciliations 	<ul style="list-style-type: none"> • Bank uses RPA for market reconciliations • Bank uses RPA to automate trade ledger reconciliations, testing automation and for FX account and ledger mgmt.

Source: Global Digital Strategy, Media and Analyst reports

NON-EXHAUSTIVE



(ii) Making Distributed Ledger a Reality

Status

- **Bitcoin is an open, trustless network**
 - AML / KYC and other regulatory and security concerns preclude participation in such networks
- Entrepreneurs & Industry focused on **implementation of blockchain / distributed ledger solutions in a closed, trusted network**
 - Permissioned participation with known entities

Questions	Considerations
Critical mass	Network adoption
Technology choice	Need for standards (e.g. R3, HyperLedger)
Regulatory & Legal	<ul style="list-style-type: none"> i. How well does blockchain/distributed ledger fit within the current (very solid) legal & regulatory framework? ii. What happens when something goes wrong? Who is responsible? iii. Settlement finality? iv. Importance of regulated industry utilities
Flipping the switch	How will participants migrate from current processes/technology to this new technology?

Implications

- **Processing efficiency**
 - Real time settlement & collateral movement via ledger-to-ledger trade processing
- **Digital Assets**
 - Digital Token can be programmed to represent any asset or contract
- **Digital “Smart Contracts”**
 - Contract terms can be enforced by technology
 - Payments are programmed into the digital asset

2. Fixed Income: current reality

“Electronification is expected to increase 40 percent in the government bond space and 75 percent in corporate bonds between 2015 and 2020, with the biggest opportunity in U.S. and European corporate debt...” McKinsey Capital Markets Infrastructure: An Industry Reinventing Itself

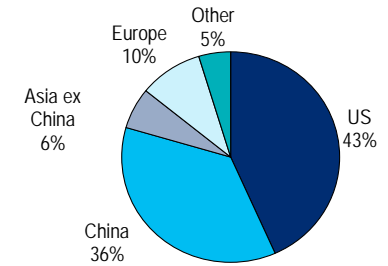
Market makers

- **Current** Market Makers challenged with need to lower costs & increased regulations together with regulatory complexity
 - Significant investments in trading efficiency e.g. automated trading; algos
- **Disruptors:** New breed of market makers = next step primary dealers?
 - Prevalent in US
 - But emerging active in Europe in IRS and Government bonds

Investors

- **Current** Asset Managers face similar cost & regulatory challenges
 - **Automated investment advice** e.g. Stock picking robo-advisors deployed by Vanguard & Charles Schwab; BlackRock purchased digital IM, FutureAdvisor; Invesco bought AI advisory platform Jemstep
 - Significant investments in **automating high touch workflows** – e.g. axes aggregation, compression, list trades
 - **Indirect disruptors?** Pushed industry to be creative about trading-related protocols to help “find the other side” – emergence of Algomi, Neptune, LiquidNet, all-to-all RFQs
 - “By 2020, technology will become mission critical to drive customer engagement, data mining for information on clients and potential clients, operational efficiency and regulatory and tax reporting. **By 2020 most global asset managers will have a chief digital officer (CDO)**” *PwC: Asset Management 2020: A Brave New World*
- **Disruptors:** could crowdfunding platforms steal investors from fund managers?

3. Central Banks



Source: CB Insights and Citi Research;

Competition

No pressure, little happening in Europe

- Of \$24bn total VC investments across all sectors globally, Europe captured only sub-10%
- But policy makers are embracing FinTech
London emerging as global FinTech hub. FCA initiatives include Project Innovate & Regulatory Sandbox¹

Attitude

Scepticism of financial inclusion

“people better connected, more informed & increasingly empowered”

- So far, no real enthusiasm from Central Bankers, however some resources committed
- BoE Governor wants to **balance financial inclusion with risk**
 - Implication: just because something is new doesn't necessarily mean it should be treated differently. Similarly, just because it is outside the regulatory perimeter doesn't necessarily mean it needs to be brought inside.
- View is that financial inclusion is an additional “concern”, not additional “value” & comes with many risks

“What has been will be again, what has been done will be done again; there is nothing new under the sun”²

- Systemic associated with credit intermediation;
- Concern safety & soundness of existing firms?
- Impact to macroeconomic & macrofinancial dynamics?
- Impact to aggregate level of cyber & operational risks in financial system
- Which FinTech activities could become systemic because they provide new critical economic functions or market infrastructure [e.g. if certain digital wallets become dominant] & potentially merit higher standards of operational risk oversight

Opportunities

Recognising EU advantages

- **Artificial Intelligence** uses
 - RegTech and Automated back end
- **RegTech** Uses
 - Can add transparency and help central bankers

¹ <https://www.fca.org.uk/firms/fintech-and-innovative-businesses>

² From BoE Governor speech “The Promise of FinTech - Something New Under the Sun?”

3. Central Banks & Digital currency

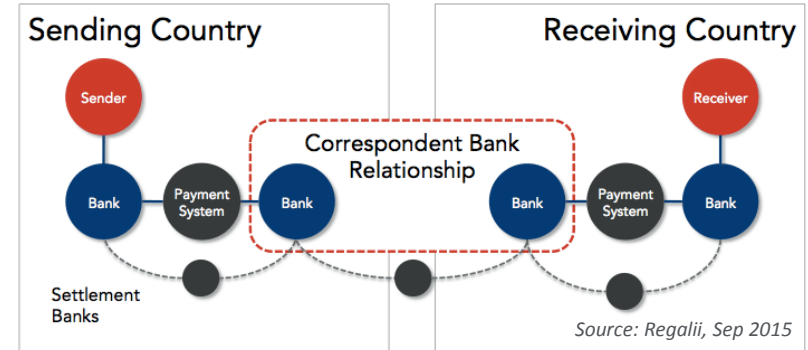
Hypothesis:
“Central Bank issues e-EUR”

- Banks could be dis-intermediated with respect to payments
- Negative rates: monetary policy can be passed through as no “lower bound” constraint
- Banks holding not needed



Cross-Border Payments: the Challenge

Payments executed through banks most typically require two transactions in two national payments systems



Wholesale banks
redundant?

- Positives: **Movement of money freer**
 - Today, inter-bank & cross-boarder payments are costly, slow, complex
- Negatives: **Lose capital allocation & multiplier effects**
 - Can central bank manage risks, & willingly? (substantial impact: capital/balance sheet)

Central Bank
Impact

- Would transmission mechanism of monetary policy become less or more effective?
- **Much debate & scepticism**, but bottom line, with digital currency:
 - Central banks will know where money is
 - And negatives can be mitigated by controlling who gets it e.g. limit to banks acting as multiplier & intermediary
- **Preserving key Central Bank roles:** (i) Lender of Last Resort (ii) Monetary Policy?

Agenda item

BMCG will discuss Fintech impact on banks and the implications for central bank policy. The discussion will include peer to peer lending, the emergence of alternative currencies (such as Bitcoin) and initiatives that can impact payments systems and settlements (such as block chain technology). The topic will also provide an update on trends on e-trading venues

Retail Banks

Tracing Fintech Origins

- When? 2015 tipping point for financial disruption
- Where? China
- Which sector? Consumer / Retail
- Who? Alibaba, Tencent

Alibaba	Tencent
<ul style="list-style-type: none"> • Full suite front to back financial services value chain from payments, microlending, banking, credit scoring to wealth management. • 400MM+ actively monthly users • could cross sell other financial services • affiliate = Ant Financial (originally Alipay, transferred away in 2011), valued \$60bn last funding round; <ul style="list-style-type: none"> ➢ Controls c80% of China's mobile payment market ➢ Yuebao AUM = \$100bn in a year! ➢ China credit bureau underdeveloped – Now Sesame Credit gives a credit score based on big data 	<ul style="list-style-type: none"> • Integrates finance with social life • WeChat = Over 1bn registered users and 600MM+ monthly active users • WeChat = [Whatsapp + Facebook + Finance] • P2P payments made easy • Gaining payment market share • Have a digital only bank: Webank • Invisible Finance: Integrates taxi hailing, rail tickets and holiday booking

- Secret for success? Emergence of mass middle class; Under serviced retail customers
Under-developed retail banking; Consumer/tech savvy population
- Threat? International Expansion. Chinese going shopping at all levels:
 - Corporate: Alibaba expanding outside China / bought non-Chinese companies
 - Retail: Chinese tourists want to shop and use AliPay... in Harrods!

Retail Banks - How is the West competing?

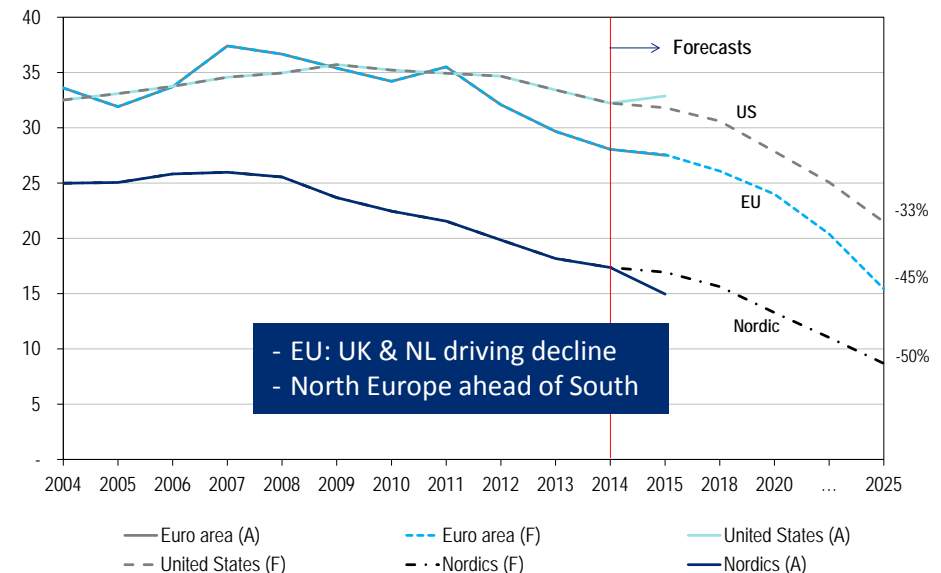
What is West doing?

- US/UK – very highly developed retail sector.
- Wide range of Fintech companies , especially US, but...
 - ...Challenge = customer acquisition cost: Value proposition not compelling vs shift seen in China
- So West **collaborating** as a way to grow Fintech sector
- Start-ups tapping into banks to get capital access e.g. Lending Clubs
 - P2P *wholesale* banks: Similar risk profile to banks = capital + lending risk
 - vs China = retail funding is person to person; more diversified

What should West do?

- Trend is set: shift to mobile phones
- Banks need to rethink **optimisation of distribution channel**
- 2007: Nordics started reducing branches, more tech savvy; so far halved number of banks
- US slightly behind: reduction started in 2014/2015
- Winners will be: (i) digitally savvy population; (ii) flexible labour laws → Nordics, Benelux, UK

Commercial Bank Branches per 100k Adults By Region



Source: World Bank, Citi Research; F stands for Forecast; A stands for Actual.

Can Bitcoin be a Global Digital Currency?

Too
soon?

Bitcoin...

- Value is demand vs supply; Amount of bitcoin is fixed
- Cross-border transfer – low value & low frequency
- Not suitable for large scale:
 - Too volatile
 - Very dark; no transparency
 - No KYC
 - Black market
- Need a currency more widely accepted and transparent

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