FINANCE VERSION 2.0?

Andrew G Haldane

Joint Bank of England/London Business School Conference on “Is there an industrial revolution in financial services?”
7 March 2016
The “FinTech” Phenomenon

Source: Google Analytics. Notes: Chart shows an index of the number of google searches for the term “FinTech”.

Index 2016=100
Selected Recent FinTech Reports

• World Economic Forum:
  – “The Future of Financial Services: How disruptive innovations are reshaping the way financial services are structured, provisioned and consumed”

• Government Office for Science:
  – “FinTech Futures: The UK as a World Leader in Financial Technologies”

• European Central Bank
  – “Virtual Currency Schemes – a further analysis”

• ECUREX with Deutsche Bundesbank
  – “Digital Currencies: Principles, Trends, Opportunities, and Risks”

• Committee on Payments and Market Infrastructure:
  – “Digital Currencies”

• McKinsey:
  – Annual Global Banking Reviews 2014 and 2015

• Accenture:
  – “The Future of Fintech and Banking: Digitally disrupted or reimagined?”

• Ernst and Young (commissioned by UK Trade & Investment)
  – “Landscaping UK Fintech”

• BNY Mellon
  – “Innovation in Payments: The Future is Fintech”
The “FinTech” Problem

“The most important financial innovation that I have seen the past 20 years is the automatic teller machine.”

➤ Paul Volcker, December 2009
New Financial Technologies

• Finance is a market in information – information technology should matter!

• Distributed/peer-to-peer model
  – world wide web, second-hand goods, publishing, music, taxis, accommodation etc
  – massive productivity improvements in cutting out the middle person
  – reduced trading times, cutting costs, widening access

• Big data in this distributed network
  – pricing/marketing using granular data
Cost of Bank IT Systems

Total IT spending as % of revenues or gross output

IT costs as % of revenues for European Banks

The “Sharing Economy” - AirBnB

- Averages 425,000 guests per night, totaling more than 155 million guest stays annually — nearly 22% more than Hilton Worldwide.

- Valuation exceeds well-established global hotel chains like Hyatt.

- 76% of Airbnb properties are actually outside the main hotel districts, suggesting complementarity of their offering.

- Although also likely to have an impact on hotel industry. Recent study suggested an 8-10% impact on other hotels’ revenues in Texas.

The “Sharing Economy” - Uber

– Over one million rides on a daily basis. Market valuation now higher than Ford and General Motors

– Cheaper than conventional taxi’s in most US cities, even excluding tips

– Surge pricing algorithm to equilibrate supply and demand

– Several taxi firms copied their business model – “Uberification”

– Key feature in both is the ability to harness consumer feedback and build trust in the system.

Uber’s Surge Pricing

Surge Pricing in Action - March 21, 2015
Ariana Grande sold out show at Madison Square Garden

Changing the Nature of Work

Data from 1 million US Chase bank accounts show a large rise in income generated from online platforms, such as Uber, AirBnB, Ebay.

Why it Might Matter for Finance

• **Stability** of financial system
  – New entrants = diverse ecosystem

• **Efficiency** of financial system
  – Lower margins + higher volumes = higher productivity

• **Democracy** of financial system
  – Greater access + lower cost = social value
Stability of Financial System

Incidence of Banking Crises

Global Banks – Scale and Complexity

<table>
<thead>
<tr>
<th>Size of Balance Sheet</th>
<th>Nominal Value of Derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Legal Entities</td>
<td>Trading Assets (% of Total Assets)</td>
</tr>
</tbody>
</table>


Sources: SNL Financial, FDIC, bank annual reports, Bank calculations. Notes: For further details please see Haldane (2015), “On microscopes and telescopes”.

Notes: For further details please see Haldane (2015), “On microscopes and telescopes”.
Efficiency of the Financial System

UK Labour Productivity

- Finance & Insurance
- Whole-economy (ex-finance)

Index 2012=100

Source: ONS; Bank calculations.
Efficiency of Financial System

US Finance Income and Intermediated Assets over GDP

US Unit Cost of Financial Intermediation

Democracy of Finance

World population with a bank account

- Around 2 billion adults worldwide without a bank account.
- 10 million US households, and 1.5 million UK adults are also unbanked.

Future Of Finance?

- “Payments”
- Lending
- Insurance
Payments Architecture – “Spaghetti Junction”

- Security Depositories
- High Value
- Retail
- FX
Payments as a Source of Profit

Payments Revenue to Banks


Share of total banking revenue by region:
- APAC: 2011 = 0.5, 2012 = 0.6, 2013 = 0.7, 2014 = 0.7, 2019F = 0.5
- EMEA: 2011 = 0.4, 2012 = 0.4, 2013 = 0.4, 2014 = 0.5, 2019F = 0.3
- LatAm: 2011 = 0.1, 2012 = 0.2, 2013 = 0.2, 2014 = 0.2, 2019F = 0.3
- North America: 2011 = 0.3, 2012 = 0.3, 2013 = 0.4, 2014 = 0.4, 2019F = 0.5

Growth in payments revenue over time:
- 2011: $1.4 trillion
- 2012: $1.5 trillion
- 2013: $1.5 trillion
- 2014: $1.7 trillion
- 2019F: $2.3 trillion

Share of total banking revenue by region:
- 2011: 37%
- 2012: 38%
- 2013: 38%
- 2014: 40%
- 2019F: 40%
Three Models of Payments

Separate Ledgers

Central Ledger

Distributed Ledger

• Common ledger: “money is memory” (Kocherlakota (1996)).
Opportunities and Threats

• “Smart contracts” – money, payments, FX, commodities, etc?
• Common standards/language – interoperability, lessons from the web?
• Cyber risks – greater or lesser?
• Privacy - public v private goods, open v closed networks?
• Digital currencies - private or public?
Real World Examples

- Payments/money – Coinbase, PayPal, Circle, M-Pesa
- Securities – ASX with Digital Asset Holding, SETL
- FX – Stellar, TransferWise, Ripple
- Derivatives – US Commodity Futures Trading Commission
- Invoicing – IDA Singapore with Ripple and Standard Chartered
- Commodities – itBit, GFT
- Equities - NASDAQ
The Existing Architecture of Lending

Total stock of bank lending (secured and unsecured) to **households**

- **B6** loans: 71%
- **Non-B6** loans: 29%


Total stock of debt to **businesses**

- **B6** loans: 64%
- **Non-B6** loans: 32%
- Bonds: 37%
- Asset finance and ICPFs: 16%
- Alternative sources: <1%

Sources: ABFA, FLA, Nesta, ONS, Bank of England. Notes: Non seasonally adjusted. Share in the stock. Data are to end-December 2015, with the exception of Bonds and ICPFs which are to end-September 2015. Excludes equity finance. Alternative sources includes Peer to Peer finance and crowdfunding.
Growth of P2P

Opportunities and Threats

• Can critical mass be attained? Bad apple risks

• P2P v “Handelsbanken” model? Hard v soft data

• How “alternative” is alternative finance?

• Information barriers to entry - credit registers and Big Data?

• Regulation of new banks and non-banks
  – when is there a systemic threat?
Insurance Industry

- Car insurance
- Health/Life insurance
Driverless Cars

• In 2020, Google plans to launch a self-driving car which:
  – has already driven nearly one million miles
  – doesn’t get tired and irritable
  – doesn’t swerve into lamp posts or require a driving test
  – has an in-built chauffeur - in the form of a rotating laser taking 1.3 million recordings per second
  – can drive better than you!

• Will anyone own a car in future?
  – Reduced car demand through pooling?

• By eliminating the element of human blunders, driverless cars are forecast to reduce motor accidents by up to 90%.


BANK OF ENGLAND
Impact on Car Insurance Market

- 90% fall in premiums?
- Impact on distribution of premiums - equalise quotes across ages/genders/risk types?
- Insurance for car companies rather than drivers?
- How to deal with cyber-security issues?
- Important legal implications for liability – who to blame when/if there is a crash?
Health/Life Insurance and Big Data

• Can Big Data make inroads into adverse selection and moral hazard problems?

• Telematics - more information from customers’ wearable devices
  – 63% of insurer executives believe wearable technologies will be adopted broadly by the insurance industry by 2017 [Accenture (2015)]
  – But less than 1 in 4 consumers are willing to share their health information [PWC (2014)]

• Calibrating existing insurance risk models with richer human behaviour data
  – Tailored premiums by tracking lifestyle habits and social networks?

• Improved ability to detect fraud by mining unstructured Big Data?
  – For example anomaly detection, developing predictive models, network analysis to facilitate effective investigations.

• Re-evaluating individual risk vs risk pooling. If you could perfectly predict health outcomes from DNA data, would everyone self-insure?
Conclusion

.... Finance Version 2.0?

.... time to remove the question mark? ....