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Interdisciplinary Approaches to Financial Stability:
Managing systemic risks in a financial system with rapidly evolving technology

Hans Morris
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Do new technologies in financial services increase or decrease systemic risk?

- How is technology changing risk in the financial system?
- What can regulators and policy makers do to assess new risks and create policy frameworks when everything is changing so quickly?

The are dozens of categories of financial technology, and thousands of startups. Some new models and ideas are powerful; but why are they exploding now?

- Organizing principle of declining information costs impact on primary profit pools
- Access to new data sets and tools
- Much lower infrastructure cost due to AWS and similar cloud services
- The super computer in your pocket
- Consumer expectations of a curated technological experience reduces stickiness of incumbents

Many successes -- and lots of hyperventilating -- but material impact won't be evident for many years, and 99% of these companies will fail!

- Representative successes: PayPal, Square, Stripe, Financial Engines, Lending Club, Markit, Klarna
- The long haul: Blockchain applications, technology infrastructure, Robo investing
- Many spectacular failures: Cybercash, Mondex, Paybytouch, Nextcard

What explains the difference? And how should banks and regulators respond and think about these differences?

Categories of Financial Technology Investing

For this panel, we will focus on complex systems and specifically implications for wholesale markets – investing, lending, currencies, and operational risks.

Let's start with a brief survey of the main areas of interest for venture and FinTech investors to give you a sense for what the fuss is about…

First, much of historic venture / growth / LBO investing has focused on three main categories:

- Payment processing (e.g. Worldpay, First Data)

- Wall Street applications (e.g. Risk Metrics, Calypso, E*Trade, ECNs, market data, HFT)

- Core banking applications (e.g., iflex, Temenos)

What ideas are currently receiving venture funding?

1. **Payments:** remittances, consumer/mobile, mPOS, LOLLIPOPS, bill pay, B2B, prepaid

2. **Alternative Credit and Credit Marketplaces** – companies like Lending Club, Prosper, SoFi, On Deck

3. **Crowdfunding** – causes, art, equity (Jobs Act) gizmos

4. **Personal Finance Management (PFM) tools** – companies like Mint, Digit, Check

5. **Robo/digital investment advice** – companies like Financial Engines, Wealthfront, Schwab, Vanguard, SigFig

6. **Newish banking models / prepaid / "API Banking"** – companies like Simple, Level Money, Amex, Bluebird, Greendot

7. **Infrastructure:** security, risk, AML, vendor management

8. **Insurance:** online brokerage, data ideas, P2P insurance models

9. **Wall Street / securities:** platforms for addressing liquidity issues in the fixed income markets, research / data signals / targeting, FX marketplaces

10. **"Big Data":** applications in credit, risk, marketing, investing signals, supply chain management

11. **Digital currency and distributed ledgers:** 1.0 / 2.0 / 3.0?

Payments

Within Payments, we focus on merchant and business solutions:

- Evolution and complexity of mPOS, card-not-present dynamics, expense of cross-border transactions, tools to optimize for risk / cost / approval rates and complex hardware/software environment
- Managing and financing invoices and receivables, making mass payments to marketplace participants

Why not consumer payments?

- Nearly all of these fail due to extremely high table stakes (ubiquity, certainty, seamlessness)
- Lack of interest in merchants to pay for new devices or to train employees except when it's clear it's going to be successful; manifest fear of data breaches
- LOLLIPOPS (Linked-offers, Loyalty, Likes, Incentives and Promotions on Payment Systems) have also largely failed. Of more than 400 wallet schemes globally (including initiatives from Visa, Google, PayPal, Amex, and Apple), Starbucks is only major success

Key rule: only successes occur where this is NO solution (e.g. PayPal, Square, Stripe, mPesa, CUP)

Companies Nyca has invested in:

Payoneer® POYNT PayRange Align Commerce

BOOMTOWN ABRA goodworld avidxchange

Alternative Credit Models and Data

Description:

- New models for lending to credit worthy consumers and small businesses with highly predictable cash flows

- Data tools to improve insight into the behavior differences from harder-to-predict consumers and businesses

Nyca's key investment criteria:

- Fair and transparent terms that do not trick the borrower into a profitable relationship

- Seamless integration of the credit product into normal life for a consumer or business: offer it easily when it is needed and simple repayment when it is not

- The issuer must have competitive advantage of data in making underwriting decisions

- The issuer must have an enduring in loan origination (customer / SMB acquisition)

- The business model must eliminate funding risk; either though a traditional balance sheet with adequate capital, reserves, and a treasury plan built to withstand periodic liquidity crises, or though a marketplace or similar model

Alternative Credit Models and Data (cont'd)

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Bubble forming? Credit investing now has some bubble-like characteristics. Many new credit models will fail due to: inadequate underwriting experience leveraging models which haven't been tested in severe credit environments, unclear regulatory frameworks, poor risk-adjusted returns to investors, inadequate liquidity

Liquidity is correlated: Much of the liquidity in this space is correlated, and the operational risk is not well understood or reflected in investor behavior
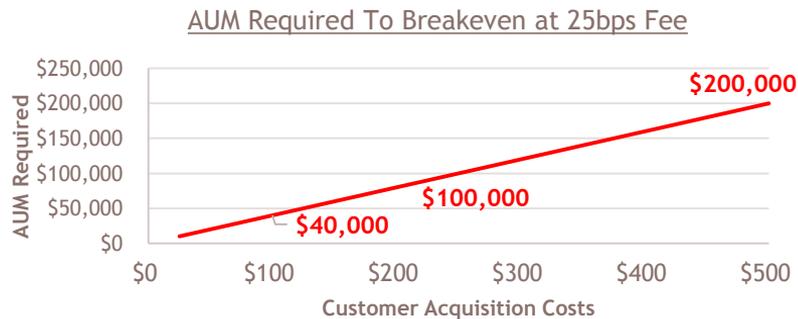
Companies Nyca has invested in:

LendingClub   Affirm   Orchard   REVOLUTION CREDIT

CardWorks   FUNDBOX   TrueAccord   CommonBond

Digital Advice

Benefits of the digital investing and advice category:

- There are many powerful applications of digital advice, to reduce complexity, cost, and behavioral bias.
- Digital investing / robot advisers will be a major part of investment assets because they do a better job than most humans and are never out of compliance
- Reduces costs for traditional and alternative assets
- Provides superior PFM

But to make Robo-advisor economics work, companies will either require a powerful brand or enterprise distribution:

AUM Required To Breakeven at 25bps Fee

Nyca has invested in:

Financial Infrastructure

The "core" problem:

- Most of the core applications run by banks are at least 20 years old; many are 40+ years old

  - If you want to understand existing process design, go back to when the manual process was automated in the 1960s-70s

  - These core systems change rarely and only under certain circumstances?

- This environment creates frustration for everyone: inability to get data, lack of flexibility and expense, uncaptured risks, customer confusion, regulator data insufficiencies – all clearly adding to systemic risks

- Replacing existing systems is often a 2-3 year decision, followed by a 2-3 year (or longer) implementation. Requires many consistencies to agree, and not all are controlled by the bank

- ROI is usually not supported by analysis; and big companies can't build software in an environment where everything is changing

- But if you don't replace the core, many new ideas and applications don't work well either. APIs help, but are a complete solution either.

- "New banks" haven't worked to date because potential revenue opportunities are low, distribution is very difficult (high CAC, low LTV). Exits have been acquisitions by traditional banks (Simple and Level Money)

Financial infrastructure solutions we like

- In many cases, we like data layers and containers to enable faster implementation on legacy systems (e.g. Blend Labs and Openfin)

- Blockchain and distributed ledgers are a potential means to a goal rather than the goal itself. After 2 years of close observation of developments, we have the following rules:

  - Bitcoin and digital currencies are not good stores of value for most of the world. This means it is not good as a transaction mechanism due to friction costs of getting into and out of the currency.

  - Blockchain and other shared ledgers are promising approaches (unique contractual terms incorporated and validated by the ledger rules) but it must be flexible, fast, secure, legal, and effectively governed

  - However, operational risks in blockchain protocols may be insurmountable in financial systems; *and* a principle of all financial system regulation is all participants are *known, not anonymous*.

  - Since none of it is built yet, will it actually be cheaper than existing products?

  - As a result, we look to invest in *experienced and mature* management teams, valuations that reflect these risks, and products that solve *narrowly defined* business problems where performance can be *targeted and measured*.

Companies Nyca has invested in:

Regulatory Implications

Regulatory and legal framework typically lags 5-10 years. What are the key issues in Washington and other policy centers?

First, there are many public benefits:

- Lower cost of investing

- Improvements to customer experience (eliminates redundant forms, navigate complexity, smarter authentication)

- Eliminate bad practices (e.g. illegal or unfair collections activity)

- Better real time data and settlement reduces systemic risk

- Reduction in behavior bias (investing, bill paying)

- Reduce search costs for seekers of capital and reduce authentication costs for lenders (small business credit)

- More efficient assessment and matching of credit risk to interest costs (reduced cross-subsidy)

- Lower transaction fees (P2P, real time payments, cross border payments) and faster payments for consumers and businesses

Trust is formed by experience, but banks -- which have decades of brand-building -- are not necessarily superior as brands; some new companies have very high NPS scores and customers are willing to give sign-on credentials to NEW companies!

Regulatory Implications (Cont'd)

Traditional concerns:

- AML/KYC, illicit use of banking system

- Cyber attacks and malicious activity, both internal and external

- Financial inclusion

- Data: fair use, fair lending, privacy

- Systemic risk, and capture of data to measure and manage

Emerging concerns:

- Better decisions with data – can it actually lower costs and increase capital to consumers and small businesses, or will it lead to potential abuse?

- Three big fears:

  - Fear of missing out, being usurped

  - Fear of operational risks we don't understand

  - Fear of a tech bubble

Regulatory Implications (Cont'd)

What could regulators do to encourage effective innovation?

- Neither favor nor disfavor banks and other incumbents vs. new companies

- Address high-friction regulatory impediments (e.g. state licensing of MT)

- Articulate principles (for data, for example)

- Impact of regulatory actions creates market gaps and big new opportunities (e.g., AML/KYC rules impact on SME's mean that banks shun legitimate companies); is this what we want?

- Vendor rules have similar impact; should consider a "lite" version.

- Encourage "Digital compliance" reengineering of a problem, versus layers of compliance rules, which seem to make bigger haystacks versus helping finding needles.

- Financial stability:

    - Reporting – size should matter

    - Liquidity guidance and testing

    - Opportunities in new systems to reduce risk (vendor management, "blockchain" principles)

    - Power to convene is significant and should be used more often (August 2015 Treasury session on marketplace lending)