

Article:

# Financial regulation of FinTech

EY Global Financial Services Institute

Winter 2015 | Volume 3 - Issue 3

# Financial regulation of FinTech



**Philip Treleaven**

Professor of Computing and Director of the Financial Computing Centre,  
University College, London

### **Abstract**

Effective financial regulation is clearly crucial to innovation and the future success of the financial services industry and, in specific, FinTech.<sup>1</sup> There are also unprecedented opportunities for reforming regulation and also creating new businesses in the process. Examples include: using “big data” regulatory online reporting and analytics to streamline reporting; and stimulating a new generation of “RegTech” companies to provide the regulatory/compliance software. This paper reviews the current regulatory pressures faced by the financial services industry, and discusses new “big data” approaches to regulating financial companies. Three actions are highlighted: a) an open-source platform for FinTech regulation, b) a regulatory XML to help standardize reporting and c) an overarching international standards body. Lastly, we examine responses by the U.K. Financial Conduct Authority (FCA), such as Project Innovate.<sup>2</sup>

---

<sup>1</sup> FinTech: Financial technology is a line of business based on using software to provide financial services, such as peer-to-peer and crowdsourced services.

<sup>2</sup> Financial Conduct Authority, Project Innovate, <https://innovate.fca.org.uk/>

### 1. Introduction

The popular Alex cartoon in the Daily Telegraph often focuses on Mega Bank and its battles with the Financial Demeanour Authority. This is reflective of the growing agreement across financial services and Government that the burden of (U.K.) financial regulation needs reform.

Financial regulation faces a myriad of pressures. These include political pressure to curb excesses (e.g., Libor, PPI); increasing E.U.-centric regulations (e.g., MiFID II); individual firms being simultaneously regulated in multiple jurisdictions and with multiple frameworks; institutions being asked to produce escalating amounts of financial, risk and compliance data (e.g., stress testing). The perception that regulatory data is being requested “speculatively” and not being analyzed by the regulators; the need to improve regulators’ tools and infrastructures. The requirement for flexible regulation of new global alternative finance entrants, such as PayPal, Apple, Facebook, Amazon, etc.; and importantly balancing FinTech innovation with regulation (e.g., payday loans, peer-to-peer, crowdsourcing).

This situation is both a challenge and an opportunity. A challenge to make financial regulation and reporting transparent, efficient and effective; but an opportunity to apply the innovative FinTech paradigms and big data analytics to regulation and compliance. It is also an opportunity as demonstrated by the FCA Project Innovate to engage with the FinTech community in automating regulation and compliance. Regulators also need state-of-the-art reporting and analytics infrastructures. They would also benefit from engaging with the academic community in regulatory and policy research, such as agent-based “policy modeling” of proposed regulations.

However, the situation in the U.K. is complicated by the reality that regulation is increasingly an E.U. and international process, based on the recent standards reform legislation and that capital flows generate cross-border risk.<sup>3</sup>

---

<sup>3</sup> E.U. financial regulation: [http://ec.europa.eu/budget/biblio/documents/regulations/regulations\\_en.cfm](http://ec.europa.eu/budget/biblio/documents/regulations/regulations_en.cfm).  
List of financial regulatory authorities by country: [https://en.wikipedia.org/wiki/List\\_of\\_financial\\_regulatory\\_authorities\\_by\\_country](https://en.wikipedia.org/wiki/List_of_financial_regulatory_authorities_by_country)

---

## **2. International regulatory standards, harmonization and reporting**

As discussed above, financial regulation is becoming increasingly complex and intrusive, with major financial institutions facing multiple regulatory jurisdictions, and regulators requesting increasing amounts of granular data from firms. This data will ultimately allow us to understand systemic risks – how entities in financial systems are exposed directly and indirectly to one another via similar exogenous factors and directly via financial instruments referencing those same institutions. Moreover, the data should allow analysis of the degrees to which institutions react to regulation and how these reactions propagate through financial markets.

The complexity of regulation comes at a price, with financial institutions burdened by stringent and detailed requirements that discourage innovation in new financial products. (Consequently, firms may choose to relocate.) The added complexity and stringency in financial regulation also raise an important consideration in the continuing support for the U.K.'s new finance technologies (FinTech) – namely the challenge of balancing the need to encourage but also regulate the emerging new finance industry and the emerging technology industry designed to support financial markets. Examples are blockchain and digital currencies. Likewise, if the current trend in financial regulation continues, nonbank entities will spring up to do things that major institutions cannot or choose not to do.

There is general agreement<sup>4</sup> that U.K. financial regulation would benefit from the application of automated reporting and advanced analytics to compliance and risk measurement. Arguably, a key ingredient in moving forward is standards.

### **2.1 Open-source regulatory platforms**

In domains such as health care, open-source platforms are increasingly popular for sharing data and analytics tools. Healthcare examples include OpenMRS (<http://openmrs.org/>) and Open mHealth ([www.openmhealth.org](http://www.openmhealth.org)). In general, open source refers to any program whose source code is made available for use or modification as users or other developers see fit. Open-source software is usually developed as a public collaboration and made freely available.

---

<sup>4</sup> Financial futures, U.K. Government Office for Science Blackett Review. Also see, Houstoun, K., A. Milne, and P. Parboteeah, 2015, "Preliminary report on standards in global financial markets," working paper. <http://www.swiftinstitute.org/wp-content/uploads/2015/05/Report1-11th-May-2015.pdf>

---

## Financial regulation of FinTech

An open-source platform for financial regulation could be instrumental in establishing a new relationship between the regulators and the regulated. The open-source part might provide an XML-based system architecture and database infrastructure for streaming reporting data to the regulator, and software companies can provide commercial apps for analytics and visualization that would be available to all parties. A FinTech regulatory platform is a good starting point, given the requirement for flexible regulation of new and evolving entrants.

### 2.2 XML financial standards

Central to reporting are XML financial standards.<sup>5</sup> A key question is whether an existing XML is usable for regulatory reporting.

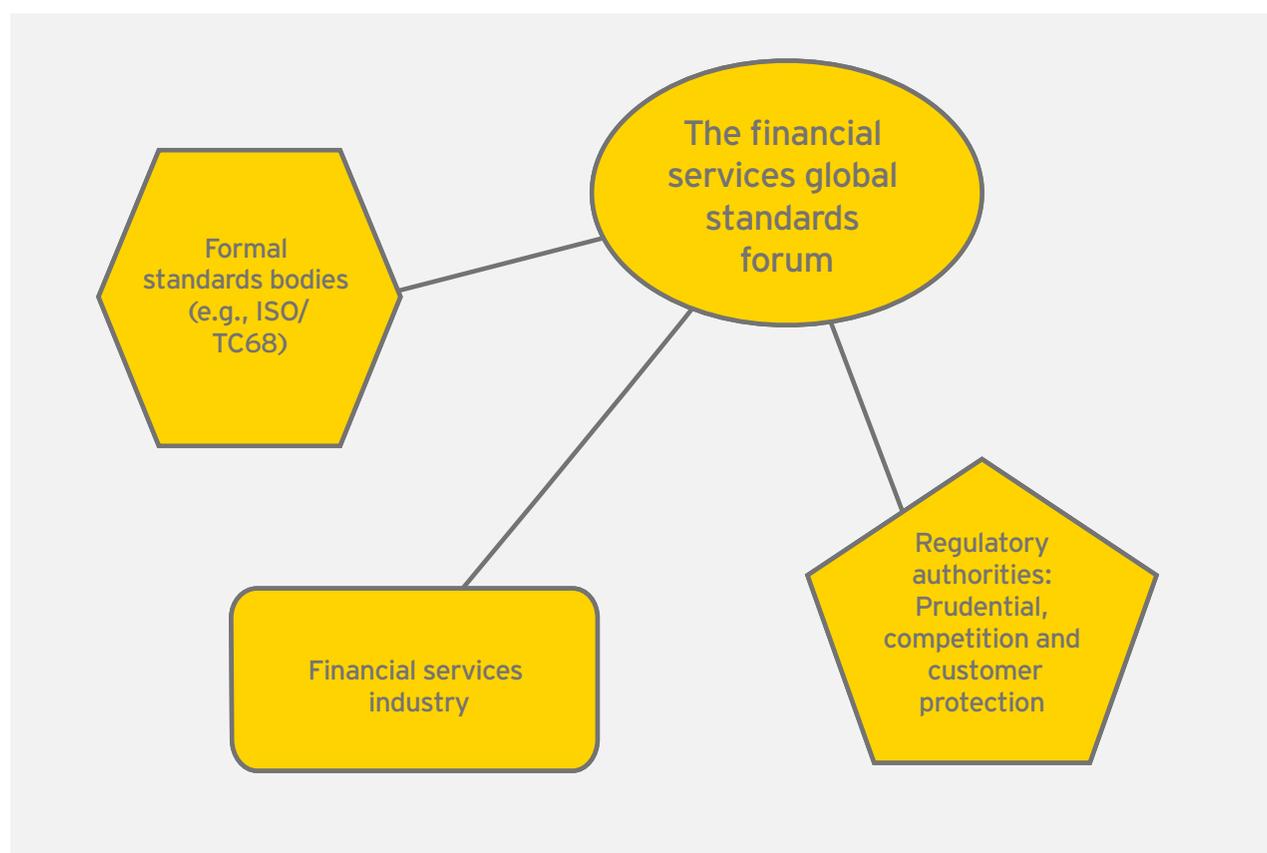
Financial XMLs include:

- ▶ **eXtensible Business Reporting Language (XBRL)** – XML specification that describes financial information for public and private companies and other organizations
- ▶ **Financial Information eXchange (FIX) Protocol** – XML specification for the real-time electronic exchange of securities transactions (e.g., Algorithmic Trading)
- ▶ **Financial products Markup Language (FpML)** – XML specification for swaps, derivatives and structured financial products
- ▶ **Interactive Financial Exchange (IFX)** – XML specification for electronic bill presentment and payment, business-to-business payments, business-to-business banking (such as balance and transaction reporting, remittance information), automated teller machine communications, consumer-to-business payments and consumer-to-business banking
- ▶ **Market Data Definition Language (MDDL)** – XML specification to enable interchange of data necessary to account for, to analyze and to trade instruments of the world's financial markets. MDDL seeks, through definition of common terms, to provide a standard vocabulary so that market data may be exchanged unambiguously between exchanges, vendors, redistributors and subscribers
- ▶ **Open Financial Exchange (OFX) XML Schema** – XML specification for the electronic exchange of financial data between financial institutions, businesses and consumers via internet

---

<sup>5</sup> [http://www.service-architecture.com/articles/xml/finance\\_xml.html](http://www.service-architecture.com/articles/xml/finance_xml.html)

**Figure 1: Recommended institutional structure to promote standard**



Source: Houstoun et al. (2015)

### 2.3 Standards body

Finally, in financial services, there are no overarching technical bodies playing a role in standards-setting [Houstoun et al. (2015)], like that played by the Internet Society and W3C, the IEEE or to GS1. There are cooperative arrangements, such as the FIX Protocol Ltd and SWIFT, but they are limited to particular aspects of financial transactions, mostly in trade execution, payments and settlement instructions. With regard to regulation, as discussed above, major international institutions have more than 60 individual “supervisors,” each with significantly different data and reporting frameworks.

A report for the U.K. Government Office for Science recommends an institutional structure (see Figure 1) to promote standards. This is an opportunity for the U.K.. However, it is important to factor in the role that E.U. legislation plays. Much of the data now required, and the templates and means for its transmission, are mandated in E.U. law. This means that any agenda for regulatory reform ultimately needs to take place at the E.U. and international level. There are reasons data has taken on the significance it has as a regulatory tool and the requests for data are only likely to expand to embrace FinTech, alternative and shadow banking. That said, the U.K. can still play a major role in promoting automated regulation.

### **3. Regulatory barriers to financial innovation**

A number of reports have been published addressing regulatory barriers to innovation,<sup>6</sup> putting innovation at the heart of regulation<sup>7</sup> and the requirement for regulatory toolkits.<sup>8</sup> Most of these focus on FinTech and regulatory support for innovation. As discussed below, the FCA has responded very positively by launching Project Innovate and calling for input. FCA ideas under consideration include “financial sandboxes” to test new financial concepts with the general public.

Many financial institutions and FinTech companies are discouraged from innovation and entrepreneurship firstly by the time and cost of registering and complying with regulations; and secondly by the potential consequences if they don't [Houstoun et al. (2015)]. This is especially onerous for FinTech start-ups that need to complete registration before they have properly developed and road-tested their business model. In response, the FCA is providing “fast-track” registration schemes for start-ups with whom it is engaged.

In a wider context, the U.K. Government has launched a number of digital services and is still building others in the context of its Digital Transformation Project. HM Treasury is working on developing an open standard API for banks. In May 2015, the European Commission launched a Digital Single Market Strategy.

---

<sup>6</sup> Financial Conduct Authority, call for input: Regulatory barriers to innovation in digital and mobile solutions, <http://www.fca.org.uk/static/fca/documents/call-for-input-regulatory-barriers-to-innovation.pdf>.

<sup>7</sup> Regulatory barriers to FinTech innovation, <http://fsregulation-risk.com/2015/06/19/regulatory-barriers-to-fintech-innovation-our-response-to-the-fcas-call-for-input/>

<sup>8</sup> PayPal, 21st Century Regulation putting innovation at the heart of payment regulation, [https://www.paypalobjects.com/webstatic/en\\_US/mktg/public-policy/PayPal-Payment-Regulations-Booklet-US.pdf](https://www.paypalobjects.com/webstatic/en_US/mktg/public-policy/PayPal-Payment-Regulations-Booklet-US.pdf).

#### 4. RegTech vision

Rapid improvements in technology are enabling financial services' business models that were simply not possible 15 to 20 years ago. However, these innovations in finance operate within a regulatory system that is struggling to keep pace.<sup>9</sup>

In response, regulators, such as the FCA, are starting to establish a new relationship with the financial services industry, including FinTech companies, telling them what they wish to achieve. Then the companies can respond with how they will deliver the regulatory requirements. This is likely to involve the better use of technology to support people processes, including the real-time analysis of transactions: online registration, international standard data formats, standard (risk-weighted) asset indices, automated reporting, open-source compliance systems and "big data" analytics.

PayPal advocates the use of a new decision-making model – which it calls **SMART Governance** – to better deliver the goals underlying (payments) regulation in a manner that benefits government, consumers and industry. SMART Governance combines the use of technology and data with a collaborative and iterative process to measure performance of covered entities, creating a better-informed regulatory development process.

To quote PayPal, "Technology and data make up the engine of this new model, but collaboration, innovation and experimentation are the key to unlocking insights from the data; it is the application of these insights that will result in better regulation. We are calling for the application of **Dynamic Performance Standards**, regulatory policies that measure results, that iterate based upon new data and new insights arrived at through a collaborative process. Performance standards have failed to become the dominant regulatory paradigm in part because industry found them overly static and carrying too much regulatory risk in exchange for too little real-world flexibility. Dynamic Performance Standards utilize modern data analytics techniques, iteration and collaboration to overcome the traditional shortcomings of performance standards."

---

<sup>9</sup> Financial futures, UK Government Office for Science Blackett Review.

What they and others are all proposing is applying the online, FinTech and big data revolutions to regulation, risk and compliance. Most organizations consider “big data” as collecting comprehensive data on “customers” and applying analytics to improve customer service. In fact, what we should be seeking is “data-driven” regulation. By analogy, “if Google was asked to manage regulation, how would they operate?”

### **5. 21st century regulatory toolkits**

Besides new forms of thinking about today’s regulatory approaches, especially for FinTech companies, regulators also need new approaches that automate online reporting and analytics. Hence, the proposal above of an open-source regulatory platform.

Brummer and Gorfine (2014)<sup>10</sup> contrast rules-based vs. principles-based regulatory (PBR) regimes (see Table 1).

They review a number of proposed PBR approaches:

- ▶ **Dynamic Performance Standards** – a collaborative approach combines the use of technology and data to measure the performance of regulated entities
- ▶ **Algorithmic regulation** – a similar approach to Dynamic Performance Standards focusing on outcomes that use data science to analyze impact
- ▶ **Lean regulation** – inspired by the “learn start-up” model popular with entrepreneurs, this approach might be described as regulators and FinTech collaborating to deploy iterative regulations through pilots and trials

---

<sup>10</sup> Brummer, C., and D. Gorfine, 2014, “FinTech: building a 21st century regulator’s toolkit,” Center for Financial Markets, Milken Institute.

**Table 1: Rule-based versus principles-based regulatory regimes**

Rules-based regulatory regimes		Principles-based regulatory regimes	
Potential positives	Potential negatives	Potential positives	Potential negatives
Certainty and predictability, including with respect to future enforcement	Check-the-box forms of compliance that strategically evade the underlying purpose of the regulation	Executive-level management involvement in incorporating regulatory principles into business models	Uncertainty and the risk of unpredictable post hoc application or arbitrage
Clear communication of steps for compliance	Higher internal costs of compliance	Flexibility and innovation in the face of “rapidly changing environments”	Concerns over fairness/ bias in application
Ensures specific behavior	Deterrence with respect to innovation	Speed in the regulatory process	Inadequate deterrence of specific problematic behavior or activities
Uniform treatment of regulated entities	Frequent disconnect between the purpose of the regulation and the actual regulatory outcomes	The centrality of guidance and evolving norms/best practices	Over-reliance on current norms and practices
	Obsolescence		

Source: Brummer and Gorfine (2014)

In summary, all of these approaches lead to:

- ▶ **Agile regulation** – a collaborative and PBR approach to regulation, where the regulator says what they wish to achieve, and the financial or FinTech community responds with how they propose this is achieved
- ▶ **Automated regulation** – the RegTech online, big data and data science paradigms are applied to regulation, starting with FinTech
- ▶ **Open-source regulatory platform** – the open-source part might provide an XML-based system architecture and database infrastructure for streaming reporting data to the regulator, and software companies can provide commercial apps for analytics and visualization that would be available to all parties

## 6. FCA Project Innovate

The FCA is to be congratulated on launching Project Innovate<sup>11</sup> to ensure that their regulatory regime supports the development of innovative products and services that can improve the lives of consumers. Quoting from their website: Regulatory barriers, both in the U.K. and at E.U. level, can distort competition and discourage new entrants to the market, denying consumers the benefits of both new services or improved services from current providers. Project Innovate seeks to identify barriers to innovation and works to resolve these without compromising the standards of consumer protection.

So far, the FCA has pursued:

- ▶ The **Innovation Hub** that helps new innovative businesses gain access to fast, frank feedback on the regulatory implications of their concepts, plans, and choices
- ▶ The FCA has tackled **structural issues** that innovators told them impede the progress of their propositions toward the market

Next steps for FCA FinTech support are:

- ▶ **Fast-track authorization** – businesses that have engaged with the FCA Innovation Hub will subsequently be assisted through a fast-track authorization process with help to internationalize their business
- ▶ **Themed support** – the FCA will launch a series of (technology) themed support weeks for their stakeholders
- ▶ **RegTech** – encouraging the adoption of new technologies (and new companies), to support the delivery of regulatory requirements
- ▶ **Regulatory “sandboxes”** – as set out in the Budget, the FCA is exploring the feasibility of regulatory “sandboxes” (cf. Phase III clinical trials) where new products, services and delivery models can be safely tested with customers

---

<sup>11</sup> Financial Conduct Authority, Project Innovate feedback from consultations ([www.fca.org.uk/static/documents/feedback-statements/fs-14-2.pdf](http://www.fca.org.uk/static/documents/feedback-statements/fs-14-2.pdf)) and next steps (<https://innovate.fca.org.uk/innovation-hub/project-innovate-next-steps>).

The FCA is also working closely with the new U.K. payment systems regulator (PSR), which has a statutory objective to promote innovation in payment systems. The PSR is currently in the process of setting up a “payments strategy forum.” The forum will deliver strategies for industry collaboration to promote innovation for the benefit of service users. In its spring policy statement, the PSR also outlined measures to improve both direct and indirect access to payment systems, which should benefit smaller, innovative payment service providers.

### 7. Conclusions

As discussed above, the challenge is to apply in an agile fashion the online and big data paradigms to regulation and compliance.

#### Regulation and compliance

Harmonizing financial regulation across multiple jurisdictions, and creating new automated reporting and analytics standards has the potential to improve the financial services industry efficiency, reduce systemic risk and deliver economic benefits:

- ▶ **Regulatory policy modeling** – use of emerging techniques such as agent-based modeling to simulate the likely impact of new policies before legislation (e.g., MiFID II, EU FFT) and the practical impact of existing regulation, including conflicts between regulators
- ▶ **Reporting standards** – developing common (XML) compliance tagging and reporting standards across multiple jurisdictions so as to support calls for the mandatory sharing of information between regulators with overlapping jurisdictions
- ▶ **Harmonization** – integration of national, European and global financial monitoring systems
- ▶ **Systemic risk tools** – encouraging the U.K. academic community to investigate a range of mathematical techniques for risk, which could yield important tools for the regulators

#### Grand challenges

- ▶ **Open-source regulatory platform** – Open-source software is a popular vehicle for supporting innovation. One possible initiative that should be beneficial for the FinTech community would be an automated registration and open-source regulatory reporting system supported or certified by the FCA that would speed up registration and reporting for new start-ups in financial services

---

## Financial regulation of FinTech

- ▶ **Financial “weather forecasting” system** – Another suggestion is the development (for the BoE/PRA) of a national financial monitoring system for forecasting systemic risk in the U.K. banking system. (cf. the data network and forecasting models operated by Met Office in Exeter or the European Centre for medium-range weather forecasts in Reading.) In fact, the feasibility of such a system has been shown, albeit on a small scale, by the Bank of Mexico, which does the clearing for Mexican financial institutions and has developed a system for monitoring systemic risk based on “principle components analysis” (PCA)
- ▶ **Financial data research facility** – Finally, the academic community need access to real-world financial data to support their research. Three classes of financial data are required: **Public domain data sets** – this comprises publically accessible data (e.g., social media, economic) and contributed anonymized data.
- ▶ **Commercial data** – a U.K. WRDS,<sup>12</sup> a secure centralized U.K. data facility (a U.K. equivalent of the excellent Wharton Research Data Services) comprising commercial data from key data providers (Thomson Reuters, Bloomberg, Markit). **Proprietary data sets** – most important is highly secure access to sensitive data sets and streamed real-time data owned by regulatory and industry partners; initially on-site.

In summary, individually our regulators, financial institutions, FinTech companies, training companies and universities are world-class; the challenge is in getting them all to work together to improve financial regulation.

---

<sup>12</sup> Wharton Research Data Services (WRDS) <http://wrds-web.wharton.upenn.edu/wrds/>.

---

# Editorial

---

## Editor

**Shahin Shojai**  
EY UAE

---

## Advisory Editors

**Dai Bedford**  
EY U.K.  
**Shaun Crawford**  
EY U.K.  
**David Gittleson**  
EY U.K.

**Michael Lee**  
EY U.S.  
**Bill Schlich**  
EY U.S.

---

## Special Advisory Editors

**H. Rodgin Cohen**  
Sullivan & Cromwell LLP  
**J. B. Mark Mobius**  
Franklin Templeton  
**Clare Woodman**  
Morgan Stanley

---

## Editorial Board

**John Armour**  
University of Oxford  
**Emilios Avgouleas**  
University of Edinburgh  
**Tom Baker**  
University of Pennsylvania  
Law School  
**Phillip Booth**  
Cass Business School  
**José Manuel Campa**  
IESE Business School  
**Kalok Chan**  
The Chinese University  
of Hong Kong (CUHK)  
**David J. Cummins**  
Temple University  
**Allen Ferrell**  
Harvard Law School  
**Thierry Foucault**  
HEC Paris  
**Roland Füss**  
University of St. Gallen  
**Giampaolo Gabbi**  
SDA Bocconi School  
of Management

**Scott E. Harrington**  
University of Pennsylvania  
**Paul M. Healy**  
Harvard Business School  
**Jun-Koo Kang**  
Nanyang Technological  
University (NTU)  
**Takao Kobayashi**  
Aoyama Gakuin University  
**Deborah J. Lucas**  
MIT Sloan School  
of Management  
**Massimo Massa**  
INSEAD  
**Tim Morris**  
University of Oxford  
**John M. Mulvey**  
Princeton University  
**Paola Musile Tanzi**  
SDA Bocconi School  
of Management  
**Richard D. Phillips**  
Georgia State University  
**Patrice Poncelet**  
ESSEC Business School

**Michael R. Powers**  
Tsinghua University  
**Philip Rawlings**  
Queen Mary University  
of London  
**Andreas Richter**  
Ludwig-Maximilians-  
Universität Munich  
**Roberta Romano**  
Yale Law School  
**Hato Schmeiser**  
University of St. Gallen  
**Peter Swan**  
University of New South Wales  
**Maronus (Marno) Verbeek**  
Rotterdam School  
of Management  
**Ingo Walter**  
Stern School of Business  
**Bernard Yeung**  
National University  
of Singapore Business School

---

---

**The EY Global Financial Services Institute** brings together world-renowned thought leaders and practitioners from top-tier academic institutions, global financial services firms, public policy organizations and regulators to develop solutions to the most pertinent issues facing the financial services industry.

***The Journal of Financial Perspectives*** aims to become the medium of choice for senior financial services executives from banking and capital markets, wealth and asset management and insurance, as well as academics and policymakers who wish to keep abreast of the latest ideas from some of the world's foremost thought leaders in financial services. To achieve this objective, a board comprising leading academic scholars and respected financial executives has been established to solicit articles that not only make genuine contributions to the most important topics, but are also practical in their focus. *The Journal* will be published twice a year.

[gfsi.ey.com](http://gfsi.ey.com)

---

---

## About EY

EY is a global leader in assurance, tax, transaction and advisory services. The insights and quality services we deliver help build trust and confidence in the capital markets and in economies the world over. We develop outstanding leaders who team to deliver on our promises to all of our stakeholders. In so doing, we play a critical role in building a better working world for our people, for our clients and for our communities.

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. For more information about our organization, please visit [ey.com](http://ey.com).

## EY is a leader in serving the financial services industry

We understand the importance of asking great questions. It's how you innovate, transform and achieve a better working world. One that benefits our clients, our people and our communities. Finance fuels our lives. No other sector can touch so many people or shape so many futures. That's why globally we employ 26,000 people who focus on financial services and nothing else. Our connected financial services teams are dedicated to providing assurance, tax, transaction and advisory services to the banking and capital markets, insurance, and wealth and asset management sectors. It's our global connectivity and local knowledge that ensures we deliver the insights and quality services to help build trust and confidence in the capital markets and in economies the world over. By connecting people with the right mix of knowledge and insight, we are able to ask great questions.

The better the question... The better the answer... The better the world works...

© 2016 EYGM Limited.  
All Rights Reserved.  
EYG No. CQ0316

## [ey.com](http://ey.com)

The articles, information and reports (the articles) contained within The Journal are generic and represent the views and opinions of their authors. The articles produced by authors external to EY do not necessarily represent the views or opinions of EYGM Limited nor any other member of the global EY organization. The articles produced by EY contain general commentary and do not contain tailored specific advice and should not be regarded as comprehensive or sufficient for making decisions, nor should be used in place of professional advice. Accordingly, neither EYGM Limited nor any other member of the global EY organization accepts responsibility for loss arising from any action taken or not taken by those receiving The Journal. The views of third parties set out in this publication are not necessarily the views of **the global EY organization or its member firms. Moreover, they should be seen in the context of the time they were made.**

Accredited by the American Economic Association  
ISSN 2049-8640

---