

To FinTech and Beyond

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FinTech is about the introduction of new technologies into the financial sector, and it is now revolutionizing the financial industry. In 2017, when the academic finance community was not actively researching FinTech, the editorial team of the *Review of Financial Studies* launched a competition to develop research proposals focused on this topic. This special issue is the result. In this introductory article, we describe the recent FinTech phenomenon and the novel editorial protocol employed for this special issue following the Registered Reports format. We discuss what we learned from the submitted proposals about the field of FinTech and which ones we selected to be completed and ultimately come out in this special issue. We also provide several observations to help guide future research in the emerging area of FinTech. (*JEL* G00, G21, G23, G28, L51, O31)

1. Why FinTech? And Why Now?

FinTech, as the name suggests, is the fusion of finance and technology. Of course, technology has always influenced the financial industry, with advancements changing the way the financial industry operates. Consider, for example, the introduction of ATM machines or the use of wire transfers as key innovations. So, what is so special about the current FinTech revolution? First, the pace at which new technologies are tested and introduced into

This editorial is written for a special issue of the *Review of Financial Studies* focused on FinTech. The authors served as the editors of the special issue of papers, which were curated using a registered reports editorial format and presented at a workshop event in May 2017 at Columbia University and at Cornell Tech in New York in March 2018. The presentations by the authors and the comments from plenary discussions at the workshop and conference were valuable in shaping the views shared in this editorial. We are grateful to all. We thank the members of the Scientific Review Committee who stepped up to help with this initiative. We also thank Campbell Harvey and Gerard Hoberg for their detailed comments. Editorial assistance was gratefully received from Jaclyn Einstein, Joanne Ferrier, Dawoon Kim, Alan Kwan, and Tuomas Tomunen. The workshop and conference events could not have happened without enormous effort of Christina Carter and Elisabeth Friedman and the financial support of the Society for Financial Studies, Columbia Business School, Cornell SC Johnson College of Business, and Tsinghua's PBC School of Finance's XIN FinTech Center. Of course, all errors are the responsibility of the authors.

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doi:10.1093/rfs/hhz025

finance is faster than ever before. But, even more importantly, this FinTech revolution is unique in that much of the change is happening from outside the financial industry, as young start-up firms and big established technology firms are attempting to disrupt the incumbents, introducing new products and technologies and providing a significant new dose of competition. Just step into a practitioner-oriented FinTech conference: with its audience composed largely of people in their twenties from Silicon Valley and Silicon Alley, there is clearly something new in the air.

The scope of activity in FinTech started from mobile payments, money transfers, peer-to-peer loans, and crowdfunding, spreading to the newer world of blockchain, cryptocurrencies, and robo-investing. Start-up firms with new technology are racing to fill the holes in the customer experience left by traditional firms on all these dimensions. According to a survey in CapGemini and LinkedIn's *World FinTech Report 2017*, customers are embracing new FinTech providers, with 50.2% reporting they do business with at least one non-traditional firm. Yet, some expert market-watchers are predicting that FinTech-related investment is now in decline. Indeed, the United Kingdom's October 2018 *FinTech Global* reported that while capital raised by FinTech companies increased year-over-year to reach \$54.4 billion in 2018, the actual number of deals completed declined from a peak of 2,291 in 2015 to 1,187 in 2018. Of course, one has to remember that many established financial institutions have started to invest more internally.

Notwithstanding the rise of FinTech innovation worldwide, it is striking that little research has been published to date in the mainstream finance journals. This dearth of published research on a topic that has clearly blossomed in the financial services industry around the world was recognized by the *Review's* editorial team back in 2016. The current volume, for which our article is the lead, reflects the outcome of a concerted editorial push to stimulate research on FinTech.

For this purpose, we employed a novel editorial protocol—the Registered Reports format—including a competitive program for FinTech-related proposals that drew 156 submissions from scholars around the world. While our volume includes only the ten successful proposals that were selected and turned into papers, the protocol stimulated research projects that wound their way into working paper form, leading to a boost in FinTech submissions to finance conferences and journals today. In fact, the Social Sciences Research Network (SSRN) reports that FinTech-related research is now the fastest emerging research topic on the platform.¹

The remainder of this article outlines the editorial process in more detail. It describes what we received from scholars, and what ended up in this

¹ David Tucker, "New Analysis by Elsevier's SSRN Reveals That Financial Technology—Fintech—Is the Fastest Growing Area of Research on the Early-Stage Research Platform," October 8, 2018, <https://www.elsevier.com/connect/the-fast-moving-world-of-fintech-is-now-a-fast-growing-research-topic>.

special issue. These help to define the emerging field of FinTech. Perhaps more importantly, we close by providing thoughts for the future of research in FinTech.

2. The Editorial Process: Why Use Registered Reports?

If it is true that the financial services industry is advancing investments in FinTech and if we are correct to note that scholarship in finance has lagged behind those developments, it behooves those of us in editorial leadership positions in finance to understand why. One hypothesis for the research void is that scholars perceive it to be too risky a research project to undertake. Perhaps they think that the risk of “not getting a positive result” with new FinTech data sets, typically of short samples, is too large. Perhaps they see the dearth of publications on the topic as a sign that the top journal editors in finance have no appetite for FinTech, and they find it easier to place a paper in an existing literature. Perhaps they believe there would be too few qualified reviewers to judge the validity of research on FinTech even if the editors were eager to receive the work. There are few commercially available databases to which most finance departments subscribe that would have information on FinTech-related businesses and investments, thereby creating yet another hurdle to impede progress. It is also possible that finance departments are reluctant to provide necessary funding to help spawn creative research efforts into new domains such as FinTech. Some of these explanations are more credible than others.

Our working hypothesis was that scholars simply perceived the risks too high and the net benefits too low. With this hypothesis in hand, the *Review*'s editorial team brainstormed ways in which we could shift the perceived risk away from the scholars to us as editors. One potential risk-shifting mechanism we identified was Registered Reports (RRs), a new peer-reviewed editorial protocol developed in the cognitive sciences. In 2013, the journal *Cortex* launched RRs.² The idea behind RRs is simple: authors submit a plan that designs an experiment, outlines the data to be collected, and describes potential interpretations of what findings come to the journal for review. The editors solicit anonymous reviews from experts on the proposed study, and then, if successful, they pre-accept the study for publication no matter how the results turn out. The promulgators of RRs argue they eliminate the disincentives for authors to publish negative or “non-” results, better complying with the spirit of the scientific method and thus ameliorating publication bias. Many fields of scientific inquiry are tailored to the production of positive results and not the production of objective, well-executed research, they argue. Opponents of RRs

² See the May 8, 2013, editorial by Chris Chambers and Sergio Della Sala, entitled “Journal Cortex launches Registered Reports.” See also Chambers, Feredoes, and Muthukumaraswamy (2014). The authors are grateful to Chris Chambers for his advice and suggestions in our early planning.

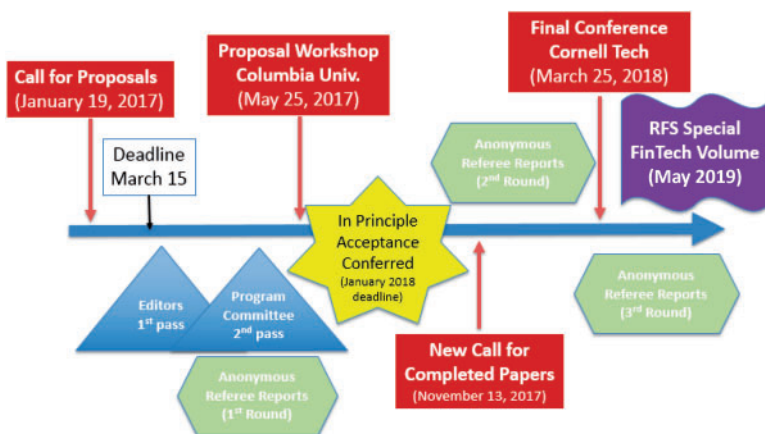


Figure 1
Timeline of the RFS FinTech Registered Reports editorial protocol

This figure outlines the key dates and the review cycles associated with the Registered Reports editorial protocol devised for the RFS FinTech initiative.

argue that conditional pre-acceptance of a paper limits post hoc exploratory analysis that is inherently organic in research, as an experimental procedure is often revealed to be flawed after results are tabulated.³ There are other criticisms of RRs, such as the fact that they create incentives for scholars to fish for positive secondary results by selecting among the most favorable post hoc outcomes for their paper to boost citations.

Weighing these pros and cons of RRs, the *Review’s* editorial team believed the core element of RRs, that authors are offered in-principle acceptance before final results are known, could be just the incentive needed to draw out hesitant scholars who might be inclined to take on a new research project on FinTech. It was imperative to follow a competitive process by which proposals would be evaluated, and with this in mind, we recruited a distinguished scientific review committee to help us. To manage the potential risk that scholars would retrofit a completed paper as an “as-if” proposal, we initiated a very short timeline for the proposals to be submitted. The editorial team secured the needed endorsement of the executive and board of the Society for Financial Studies and their financial support.⁴

³ An example of Registered Reports in economics is the call for papers for the 2015 Journal of Accounting Research (JAR) Conference (<https://www.ssrn.com/update/fen/fenann/ann15137.html>). JAR’s special volume was published in early 2018. The authors are grateful to Rob Bloomfield, one of the guest editors of the JAR conference volume, for helpful discussions. According to the Center for Open Science, as of January 2019, there were 152 papers that were published using the Registered Reports format, and 124 journals have adopted RRs as a regular submission option or as part of a single special issue.

⁴ Additional financial support was received from Columbia Business School, the Cornell SC Johnson College of Business, and Tsinghua University’s PBC School’s XIN FinTech Center.

The original call for proposals was issued on January 19, 2017, with a deadline of March 15, 2017.⁵ Figure 1 shows the timeline of the protocol. The editors conducted a first-pass review and sent a subset of those proposals to a twelve-member review team for anonymous review reports. Each proposal was reviewed by two members. Ultimately, ten successful proposals were selected for defense of their plans at Columbia Business School on May 25, 2017, with selected, expert discussants and active plenary discussion. Inputs from the conference, in addition to the initial review, were drawn toward granting of the in-principle acceptances that were issued in June. A relatively short period was extended for the authors to render the first draft of their completed studies (eight months with a January 2018 deadline). These completed reports were then anonymously reviewed by either the original reviewers or de novo reviewers. Part of the agreement for in-principle acceptance was that each author team would present its findings at a second conference on March 25, 2018, at Cornell Tech's campus on Roosevelt Island in New York.⁶ More feedback was secured by the editors from the plenary discussion at this conference toward a third round of reviews by anonymous reviewers.

3. The New Field of FinTech: What Did Our Call for Proposals Deliver?

As editors, we had modest expectations on the number of proposals that we would receive at a time with hardly any papers on FinTech in sight. These expectations were dramatically exceeded when 156 arrived! The full set of authors was large and diverse. The research teams collectively represented 409 authors from 183 different universities and 22 research organizations or government agencies. Figure 2 illustrates that 63% of the authors were either assistant professors or Ph.D. students, indicating that the idea of risk-shifting via RRs resonated in a special way with younger scholars. Almost 46% (or 188 out of the 409) of co-authors were from universities or organizations outside North America, representing 20 other countries in addition to the United States and Canada, most prominently from China, Germany, the United Kingdom, Australia, Italy, and India (Figure 3).

In our January 2017 call for proposals, we proposed several topics of particular interest, but we did not restrict researchers to those topics. The topics included were: innovations in payments (peer-to-peer systems, cryptocurrencies); lending and equity investment (crowdfunding); big-data analytics; blockchain and distributed ledger technologies for clearing, settlement, and trading; digital financial advice and wealth management (robo-advising); insurance models and products; financial inclusion via technology; and regulatory challenges imposed by disintermediation of

⁵ See <http://rfsfs.org/news/fintech-a-call-for-proposals/>.

⁶ For details on the conferences, see <http://rfsfs.org/rfs-fintech-initiative/>.

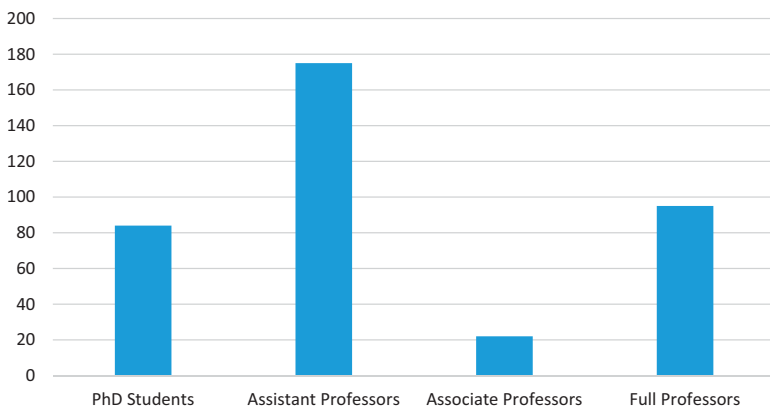


Figure 2
Composition of authors among RFS FinTech proposals submitted by academic rank

This figure reports the rank of the 409 authors among the 156 RFS FinTech proposals received by March 15, 2017, to the open call issued on January 15, 2017.

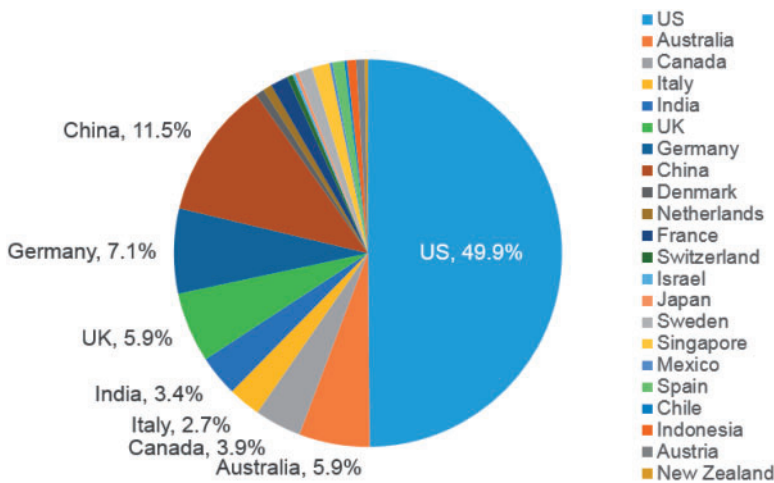


Figure 3
Composition of authors among RFS FinTech proposals submitted by geographic location

This figure shows the country of domicile of affiliated academic institution for the 409 authors among the 156 RFS FinTech proposals received by March 15, 2017, to the open call issued on January 15, 2017.

traditional institutions. As editors, we were excited about the possibility that our competitive call for proposals itself would constitute a giant “crowdsourcing” experiment from the community of scholars to help define exactly what the new research discipline of FinTech would be. Figure 4 furnishes an intriguing word cloud assembled from the abstracts of the 156 submitted proposals.



Figure 4
Word cloud from the abstracts for the 156 RFS FinTech proposals
 This figure is a word cloud compiled from the 100-word abstracts included among the 156 RFS FinTech proposals received by March 15, 2017, to an open call for proposals issued on January 15, 2017.

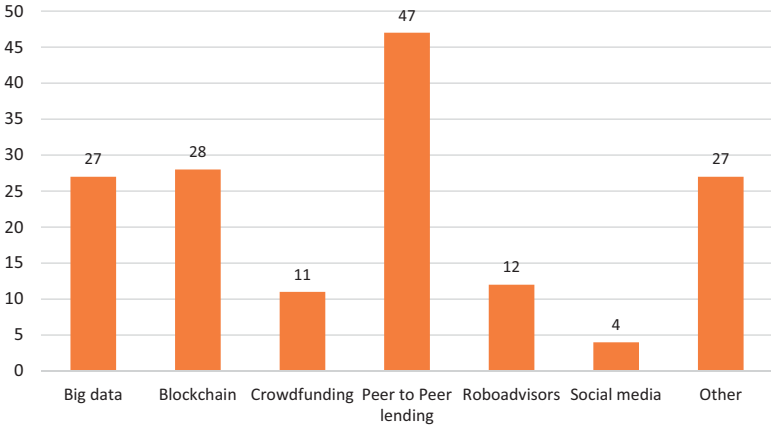


Figure 5
Main topic areas featured among the RFS FinTech Registered Reports proposals
 This figure reports the topic areas among eight major topic areas among the 156 proposals received by March 15, 2017, to the open call issued on January 15, 2017.

As eye-catching as the largest-font words are—notably “Platform,” “Bitcoin,” “Blockchain,” or “P2P”—the smaller-font words are also noteworthy, such as “Trading Networks,” “Mining,” “Ambiguity,” “Trust,” and “Interventions.” To organize our review process, we created our own seven major categories by area that were undoubtedly influenced by the categories we had listed in the call for proposals (Figure 5). We received 47 proposals on peer-to-peer lending and investing platforms, by far the dominant category. Blockchain and big data were the next most popular categories, at just shy of 30 in each category.

4. The First Body of Knowledge on FinTech: What Is Included in This Special Issue?

The ten accepted papers that make up the FinTech special issue cover a wide spectrum of topics. For the purpose of summarizing and discussing them, we divide them here into three groups: (i) the applications of blockchain in business and finance; (ii) technology in financial services (including peer-to-peer lending, online lending, and robo-advising); and (iii) the use of big data in finance.

4.1 Blockchain mechanisms

Blockchains are distributed ledgers, operated within peer-to-peer networks to offer a decentralized way to verify ownership or to exchange ownership securely and efficiently. In finance, blockchains can be used for money transfer and distributed computing, as well as representing securities or other assets. Four papers, Biais et al. (2019), Chiu and Koepl (2019), Cong and He (2019), and Foley, Karlsen, and Putnins (2019), explore the theoretical and empirical applications of blockchains in business and finance. Biais et al. (2019) start with what they call a “Blockchain Folk Theorem” to illustrate the fundamental coordination problems among miners on the Bitcoin blockchain. Though mining the longest chain, without forking, is the intended equilibrium, in line with Nakamoto (2008), the Bitcoin blockchain protocols are prone to multiple equilibria with forks due to the strategic complementarities of miners’ actions. The authors derive conditions that generate forks, and they link forking to practical circumstances such as information delays and software upgrades.

The paper by Chiu and Koepl (2019) is closely related to that of Biais et al. (2019) in that they both identify forking as the biggest issue faced by blockchain applications; Chiu and Koepl focus on blockchain-based settlements of asset trading. On the one hand, a blockchain ensures delivery-versus-payment by linking the transfer of assets with payments via a proof-of-work protocol, expediting the speed and lowering the cost compared with traditional exchanges. On the other hand, participants may fork the chain to void trading losses. The authors identify conditions needed to deter forking, including minimum trading volume, sufficiently strong preferences for speed, and restricted risk positions. In the end, the authors are optimistic that blockchains will bring cost savings to the settlement systems despite the deadweight cost of mining amplified by excessive investment in the computing capacity, a problem analyzed in both papers.

Cong and He (2019) also explore coordination on blockchains in the landscape for smart contracts. Payments under smart contracts are triggered by tamper-proof consensus on contingent outcomes. The authors identify a fundamental tension between decentralized consensus and information distribution on the blockchain. Compared with traditional contracting, blockchains have the potential to produce a consensus that better reflects

the “truth” of contingencies that are highly relevant for business operations, thereby enhancing contracting efficiency. However, generating decentralized consensus also inevitably leads to greater knowledge of the aggregate business condition on the blockchain, which can foster tacit collusion among participants as deviations in any collusive equilibrium become observable. Overall, the study is a “cautionary tale” that smart contracts made feasible by blockchain will enhance contracting efficiency by mitigating information asymmetry and encouraging entry, but they can also lead to greater collusive behavior. Only time will tell if consumers will benefit in the end.

The final paper in this category, by Foley, Karlsen, and Putnins (2019), is an empirical analysis that calibrates the extent to which Bitcoin transactions are serving illegal activities, given the popular perception of cryptocurrency’s suitability for facilitating payments feeding illegal transactions. The paper develops a novel application of network cluster analysis to identify users who are involved in illegal activity (based on ex post law enforcement) and users who trade disproportionately with illegal communities. The authors estimated that about 46% of Bitcoin transactions are associated with illicit activities, but that the illegal share of Bitcoin activity declines over time with mainstream interest in Bitcoin and with the emergence of more opaque cryptocurrencies. The techniques developed in this paper have important applications for cryptocurrency surveillance.

4.2 How technology transforms and disrupts financial services

Technology is both transforming financial services and creating competitors outside the traditional sectors. Four papers, by Fuster et al. (2019), Tang (2019), Vallee and Zeng (2019), and D’Acunto, Prabhala, and Rossi (2019), offer related perspectives on this market disruption. The first three papers explore technology-based lending, and the last one analyzes technology-based investment advisory services.

Fuster et al. (2019) document that FinTech lenders, as opposed to universal banks or specialized mortgage banks, increased their market share of U.S. mortgage lending from 2% to 8% from 2010 to 2016. Using loan-level data, the authors show that FinTech lenders process applications 20% faster and are less likely to incur bottlenecks upon demand shocks. Surprisingly, the authors find that FinTech lenders do not target borrowers with low access to traditional finance, suggesting that they are mostly competing with the traditional mortgage lenders rather than broadening access.

This view is extended by the papers by Tang (2019) and by Vallee and Zeng (2019), each of which provides both theoretical and empirical analyses on the interaction between traditional banks and peer-to-peer (P2P) lending. Exploiting a regulatory change mandating banks to tighten lending criteria in 2010, Tang (2019) finds that P2P lending is a substitute for bank lending for serving infra-marginal bank borrowers but complements bank lending with respect to small loans. The focus of Vallee and Zeng (2019) is the

fundamental problem in the joint information production by the platform and investors, which challenges the traditional role of banks as being the exclusive information producer on behalf of investors. The authors focus on the trade-off between better screening by sophisticated investors and adverse selection among investors. Both their theoretical model and empirical tests show that as platforms develop, they optimally increase platform pre-screening intensity but decrease information provision to investors.

D'Acunto, Prabhala, and Rossi (2019) empirically analyze whether robo-advisors, or automated portfolio optimizers, improve investor performance. In their sample based in India, robo-adopters appear to be similar to non-adopters in their prior interaction with human advisors but most of them become better diversified and reduce portfolio volatility once they adopt robo-advising. Importantly, robo-advisory demonstrates a clear benefit in mitigating the most prominent behavioral biases, such as the disposition effect and momentum chasing. However, the authors warn that robo-advising should not be construed as a panacea. Its promises and pitfalls will, to a large extent, depend on the design of robo interventions tailored to the needs of different categories of investors.

4.3 Big data in finance

“Big data” refers to data sets that are too large or complex for traditional data-processing application software to deal with adequately, but that are powerful in revealing patterns, trends, and correlations. Two papers, Zhu (2019) and Chen, Wu, and Yang (2019), applied big-data techniques to provide new insights to FinTech-related research questions.

Recent technological and computing advancements have enabled collection of granular indicators of the fundamentals of firms, such as real-time transactions and satellite images of traffic in the parking lot of a big-box store. Such data are of interest to investment professionals, and the information may thus find its way into stock prices. Zhu (2019) shows that the introduction of this data increases price informativeness through decreased information acquisition costs, particularly in firms where sophisticated investors have higher incentives to uncover information. Importantly, the timely data appears to impose discipline on managers in that they reduce their opportunistic trading and increase investment efficiency as both price informativeness and managerial incentives improve.

The volume concludes with Chen, Wu, and Yang (2019), who estimate the value of FinTech innovation, the overarching subject of this special issue. The authors apply text-based machine-learning algorithms to identify and classify innovations according to their key underlying technologies based on a comprehensive dataset of patent filings covering 2003–2017. The valuation method combines stock price responses with estimated patent-filing count intensities. According to this measure, and for the financial sector as a whole, the Internet of Things (IoT), robo-advising, and blockchain are the most

valuable FinTech innovation types. The authors also document a disruption effect: FinTech innovations affect industries more negatively when they involve disruptive technologies that originate from nonfinancial start-ups. The authors give the incumbent market leaders an important lesson: they need to invest heavily in their own innovation in order to avoid much of the disruption by start-ups.

5. Lessons for the Future of Research in FinTech

So what does the future of research in FinTech entail? Where should it go? Based on our experience with this FinTech initiative and the special issue, we would like to offer eight observations that can help guide future research in this exciting topic.

5.1 Balancing theory and empirical work

Our special issue features both empirical work and theory. We insisted on including theory in the call for papers, even though the application of the concept of Registered Reports to theory papers is foreign and far from trivial. Our view now is strengthened that the future of research in FinTech has ample room for both. There is no doubt that the new data sets that are gradually becoming available through the FinTech revolution provide very attractive opportunities to empirical researchers to get their hands on new data and conduct fascinating studies. These data sets potentially include detailed information about new types of lending or transactions in markets with new structures. There is also the benefit of using extremely large data sets with new techniques to analyze them. But, it is important to remember that theory needs to develop at the same time to help us think through the predictions in new markets or different forms of intermediaries.

5.2 International dimensions

An important aspect of the FinTech phenomenon that we are observing right now is that a big part of it is taking place outside the United States. China is clearly at the front of financial technology, but other countries with less developed financial markets also see significant activity. This is not that surprising. The financial industry in the United States is among the most developed and has been at the forefront of for many years. It is also home to many entrenched players. As a result, it may offer fewer opportunities for innovation, as disrupting the equilibrium faces more resistance. Things are very different in China and other emerging economies; with less developed financial sectors, they are more prone to innovation, stage-skipping, and disruption in general. This presents an opportunity for researchers in finance. For many years, research in finance has been U.S.-focused, and now with the interest in FinTech there is another natural path to expand the target of research more globally.

5.3 Interdisciplinary collaborations

Research in FinTech calls for collaborations across different disciplines. As the name FinTech suggests, it is all about the combination of finance and technology. Some of the issues studied go deep into the territory of technology, in which mainstream finance scholars are not necessarily the experts at the frontier. Hence, collaborations with computer and data scientists can be fruitful. For example, blockchain is based on technological innovations that have been explored in depth in the computer science literature. Trying to understand the effect of blockchain on financial markets can benefit from the insights developed in this literature going forward, and this presents the need for collaboration. The theoretical articles on blockchain in this issue demonstrate nicely the potential for such synergy. Another interdisciplinary synergy can be expected with legal scholars, given that the FinTech innovations present many challenges to the law, such as whether the vast data available on borrowers can be used in light of privacy or anti-discrimination laws. Again, these are issues that legal scholars have been exploring, and they present opportunities for collaborations.

5.4 Links to existing research

While some people tend to think of FinTech as a completely new phenomenon, it is important to remember that many of the economic issues surfacing in FinTech echo phenomena that have been studied extensively before. For example, FinTech involves a lot of new information in financial decision making, which will clearly change the dynamics of the financial sector. But, there is already a huge body of literature on information in financial markets, exploring its implications for efficiency and welfare. Hence, it is important to draw on existing insights rather than rewrite everything in a new context. Similarly, the disruption experienced by some financial institutions due to FinTech resembles disruptions they faced before from disintermediation, shadow banking, and other entities. Learning from the past and from the existing work is important when we come to analyze the trends expected with FinTech.

5.5 Loss of trust in the current system

An important trigger for the emergence of FinTech has been the loss of trust in central banks and the financial system. It is no coincidence that FinTech came into prominence following the global financial crisis of 2008. Bitcoin (and blockchain technology more generally) was perceived as a way to take the power out of the hands of central banks and powerful intermediaries to a decentralized system for transactions and payments.⁷ Market-based lending also gained popularity as an alternative to traditional financial institutions with all their pitfalls. It is important to remember this as we come to analyze FinTech

⁷ See Eswar Prasad, "The Fed Should Seize Blockchain's Potential: Central Banks Must Embrace New Financial Technologies to Boost Market Stability," *Financial Times*, January 1, 2019.

and assess its future development. Important questions that come to mind include: Will new arrangements ease the concerns about trust in the financial system? Can investors and consumers put greater trust in blockchain, or will they find its opacity eventually more worrying? As the uses of blockchain grow, it becomes more apparent that the pseudo-anonymity and decentralization that were initially appealing are obstacles and can lead to new problems such as forking (as explored at least twice in this issue). At the end, it is possible that the original intentions will evolve and the technology will be used in other forms without giving up on the role of central banks or big financial intermediaries. Indeed, blockchain is now explored as a possible tool to create digital currency in central banks. These issues deserve much more research.

5.6 Rightsizing regulation

FinTech poses many challenges to the regulation of the financial system. No wonder this is a central topic these days in regulatory circles in the United States and around the world. One immediate challenge is how to regulate new FinTech entities relative to traditional financial institutions. There is a sense in which banks are being put at a disadvantage relative to technology firms, which are not being regulated as tightly. Hence, it is desirable to try to regulate based on activities and not on entities, to level the playing field and to make sure different entities engaged in similar activities will be treated equally by regulation. More broadly, a central question is whether the new forms of financing introduced by FinTech pose the same need for regulation as the traditional ones. For example, market-based lending does not necessarily offer the same maturity transformation as traditional banking, and so perhaps the regulatory framework designed to reduce financial fragility has to be reevaluated. On the other hand, such lending might be prone to problems of lax screening in investments that are being distributed to masses of investors, of the kind that is thought to have contributed to the 2008 crisis. Finally, a new kind of risk that is becoming more prominent is the risk from the technologies themselves. A glitch in the systems behind blockchain, problems in market-based lending, or a security breach in the cloud where vast financial data are being stored could cause havoc in the financial industry that very few have even begun to imagine. These are all issues that future research should try to evaluate.

5.7 A new market equilibrium

A fascinating question going forward is what the new equilibrium in the financial industry will be. Will banks be completely displaced by the new FinTech firms and the big-data e-commerce firms, such as Alibaba? Certainly, this echoes the concerns of some banks that have been describing the situation they are in right now as an existential threat. Or, will the current players and the new players find a happy equilibrium of coexistence? On the one hand, if finance is moving more and more toward technology, banks might lose their comparative advantage and be displaced. But, on the other hand, they may

still have an advantage in some activities, such as providing safe assets via their deposit taking. So, a new equilibrium with special division of activities between traditional banks and technology firms may emerge. It is also possible that banks will completely master the technologies or acquire them, so that the structure of the industry will not change much, except that banks will be more technologically advanced than before. A strong worry among regulators is that if banks are completely displaced, the transition to the new equilibrium will be costly and damaging to the economy. As a result, they might take excessive risks and pose different negative externalities. These are all topics of first-order importance for new theoretical and empirical research given the ever-expanding data. Indeed, some of the papers in this issue explore related questions about the relations between traditional financial firms and new ones.

5.8 Welfare matters

Of course, it is important to remember that in evaluating the effects of FinTech, we ultimately care about overall welfare, not just the faith of the financial sector. This is complicated given how many different parties are involved, but this is also where research can be helpful. For example, if banks and FinTech lenders are competing on credit provision, we need to consider the implications for the final consumers as well as to the investors. How is credit provision affected? How is the provision of liquidity affected? How do these and other effects translate into welfare? One of the key promises of FinTech for welfare is the potential for greater financial inclusion. Estimates are that over two billion people worldwide are unbanked and can be included and see welfare improvements via FinTech. Modeling accompanied by empirical evidence can help us shed light on these issues.

6. Conclusion

We would like to close with a note on what we learned from the unique editorial process used for this special issue. There is no doubt that the Registered Reports protocol introduces additional challenges to the editors. It is more difficult to make decisions based on proposals when we try to envision how the paper will look than based on a completed paper. Indeed, the risk is transferred from the authors to the editors and the journal. The advantage is that it encourages authors to take a risk and approach new and underexplored areas. The *Review of Financial Studies* does not plan to move to Registered Reports as the main editorial protocol in the foreseeable future. We think the traditional protocol works well enough most of the time. However, when the goal is to encourage research in newly emerging topics, we think the Registered Reports protocol could be deployed effectively, as the outcome of this special issue demonstrates. Indeed, our follow-up initiative on another emerging topic—climate finance—was started shortly after the FinTech initiative and is also based on Registered

Reports. The special issue out of that initiative will be released in a few months. Stay tuned.

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