

REGTECH AND THE NEW ERA OF FINANCIAL REGULATORS: ENVISAGING MORE PUBLIC-PRIVATE-PARTNERSHIP MODELS OF FINANCIAL REGULATORS

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ABSTRACT

The rise of FinTech has not only advanced operational efficiency of the financial industry but also posed challenges to regulatory efficiency. There is a growing consensus on the importance and urgency for financial regulators to enhance their capacity through the use of RegTech. RegTech is widely considered as holding a great potential to facilitate the supervisory process and enhance the regulatory compliance. The current studies of RegTech, however, remains in its infancy. Most of the literature identifies and stock-takes different technologies and discusses how to apply them to facilitate financial regulation and supervision. These studies, in our view, mainly focus on the conduct aspect of RegTech. Of equal importance, yet largely overlooked, is the organizational aspect of RegTech, that is, how the organizational design and culture of a financial regulator affects its capability and suitability for applying RegTech to facilitate financial regulation and supervision.

This paper attempts to fill this gap by offering more insights on how to organize a financial regulator to ensure its accountability, flexibility, and

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adaptiveness in the era of RegTech. We argue that such a regulator requires the character of a public-private partnership, which should contain some public elements to ensure the unbiasedness of financial supervision and some private elements to adapt to rapid technological changes. This paper firstly conducts a comparative analysis of the worldwide organizational models of financial regulators, by which we identify four major types and compare the different public-private relationship between them. The paper then applies the analytical framework of the Transaction Cost Economics, particularly the Theory of Firm and the Comparative Institutional Approach, to theorize a spectrum of public-private-partnership for different organizational models of financial regulators, ranging from a firm-type of partnership to a contract-type of partnership. Based on this theorized spectrum, together with the comparative institutional approach, this paper identifies four more possible models of public-private-partnership that may help financial regulators streamline their organizational structure to promote the adoption of RegTech. These models include a mixed ownership RegTech corporation, a contracted RegTech supporter, a quasi-public financial regulator, and directly delegated gatekeepers. Policymakers and financial regulators across the globe can consider and choose a model that better suits its own regulatory and supervisory needs.

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INTRODUCTION

As financial technology, or “FinTech” enhances the efficiency of financial services and has become a fashion in the financial industry,¹

1. For studies that comprehensively discuss the FinTech and its regulatory issues, *see, e.g.*, Douglas W. Arner et al., *The Evolution of Fintech: A New Post-Crisis Paradigm*, 47 GEO. J. INT’L L. 1271 (2016) (arguing against FinTech’s too-early or rigid regulation at this juncture by analyzing the evolution of FinTech over the past 150 years); Dirk A. Zetsche et al., *Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation*, 23 FORDHAM J. CORP. & FIN. L. 31 (2017) (arguing for a new, smart regulatory approach in the financial market); J.W. Verret, *A Dual Non-Banking System? Or a Non-Dual Non-Banking System?* (George Mason Law & Economics Research Paper No. 17-05, 2017) (examining the Office of Comptroller of the Currency’s (OCC) proposal to grant special purpose national bank charters to rapidly emerging FinTech companies); Tom C.W. Lin, *Compliance, Technology, and Modern Finance*, 11 BROOK. J. CORP. FIN. & COM. L. 159 (2016) (analyzing challenges of financial cybersecurity, the integration of technology and compliance, and the role of humans in the future of modern finance); Brian Knight, *Federalism and Federalization on the Fintech Frontier*, 20 VAND. J. ENT. & TECH. L. 129 (2017) (discussing whether the states or federal government should take the lead in regulating FinTech); Lev Bromberg et al., *Fintech Sandboxes: Achieving a Balance between Regulation and Innovation*, 28(4) J. BANKING &

regulatory technology, or “RegTech,” has also received heightened attention in recent days. RegTech generally stands for the use of technological solutions to improve regulatory compliance,² which holds a great potential to disrupt the financial industry.³ By adopting the advanced technological innovations, such as robotics, artificial intelligence, biometrics, cryptography, blockchain and cloud computing, to facilitate financial regulation and supervision, RegTech can help both the financial institutions and regulators in carrying out the regulatory reporting, risk management, and even behavioral monitoring more effectively.⁴ Against this backdrop, financial regulators across the globe increasingly seek to understand how to use RegTech to advance their supervisory tools and deal with the regulatory challenges posed by the rise of FinTech.⁵

The current studies of RegTech, however, remains in its infancy. Most of them identify some technologies, such as artificial intelligence, big data analytics, cloud computing, distributed ledger technology, application programming interfaces, cryptography, biometrics, etc., and discuss how to

FIN. L. & PRACTICE 314 (2017) (examining differences between different sandbox regimes and discussing implications to regulators); William Magnuson, *Regulating Fintech*, 71 VAND. L. REV. 1167 (2018) (sketching out a variety of regulatory responses that well correspond to FinTech’s particular risks and rewards); Chris Brummer & Yesha Yadav, *Fintech and the Innovation Trilemma*, 107 GEO. L.J. 235 (2018) (providing a theoretical framework for understanding and regulating FinTech).

2. For the discussion of the definition of RegTech, see *infra* Part II.B.

3. For studies discussing the RegTech, see, e.g., Lawrence G. Braxter, *Adaptive Financial Regulation and RegTech: A Concept Article on Realistic Protection for Victims of Bank Failures*, 66 DUKE L.J. 567 (2016) (explaining how supervising of the modern financial institutions has become difficult); Douglas W. Arner et al., *FinTech, RegTech and the Reconceptualization of Financial Regulation*, 37:3 NW. J. OF INT’L L. & BUS. 371 (2017) (arguing that transformative nature of technology will only be captured by a new approach at the nexus of data, digital identity, and regulation); Luca Enriques, *Financial Supervisors and RegTech: Four Roles and Four Challenges*, 53 REVUE TRIMESTRIELLE DE DROIT FINANCIER (2017) (noting roles financial regulators can play with respect to RegTech), available at SSRN: <https://ssrn.com/abstract=3087292> [<https://perma.cc/HV4Z-JLK2>]; Nizan Gelslevich Packin, *RegTech, Compliance and Technology Judgment Rule*, 93:1 CHICAGO-KENT L. REV. 193 (2018) (arguing that society can benefit from RegTech but that it will require carefully tailored design of the technology).

4. See *infra* Part II.C.

5. TORONTO CENTRE, FINTECH, REGTECH AND SUPTECH: WHAT THEY MEAN FOR FINANCIAL SUPERVISION 2 (Aug. 2017) <https://res.torontocentre.org/guidedocs/FinTech%20RegTech%20and%20SupTech%20-%20What%20They%20Mean%20for%20Financial%20Supervision.pdf> (observing that “[f]inancial authorities are looking into how to keep their financial systems stable while harnessing the benefits of FinTech, and existing supervisory policies, procedures, and resources may no longer be adequate to address a fast changing landscape. In fact, several supervisory agencies are piloting or implementing new approaches based on technological solutions developed by two subsets of FinTech RegTech and SupTech.”).

apply technologies to facilitate the financial regulation and supervision. In our view, these studies mainly focus on the *conduct* aspect of RegTech.⁶ Of equal importance, yet largely overlooked, is the *organizational* aspect of RegTech, that is, how the organizational design and culture of a financial regulator affects its capability and suitability for applying RegTech to facilitate financial regulation and supervision. After all, technologies do not function on its own; instead, it is the financial regulators that apply these advanced technologies. To operate RegTech effectively and appropriately, the *quality and efficiency* of financial regulators thus matter. Designing an optimal organizational structure to help financial regulators adapt to the development of RegTech is thus crucial for the efficacy of financial regulation and supervision.

In this Article, we attempt to fill this gap by adopting a three-step analysis to provide more insights on how to organize a financial regulator in a RegTech era. We first conduct a comparative analysis of the organizational models of financial regulators around the world, in which we identify four major types and compare the different public-private relationship between them. We then apply the analytical framework of the Transaction Cost Economics, particularly the Theory of Firm put forward by Ronald Coase and the comparative institutional approach put forward by Oliver Williamson, to theorize a spectrum of public-private-partnership for different organizational models of financial regulators, ranging from a firm-type of partnership to a contract-type of partnership. Based on this theorized spectrum, together with the comparative institutional approach, we finally identify more possible models of public-private-partnership that may help financial regulators streamline their organizational structure to promote the adoption of RegTech.

We structure our Article in the following way. In Part II of the paper, we review the challenges facing financial regulators in this FinTech era to highlight the increasing importance of RegTech. We then review the current literature on RegTech, which mainly focuses on identifying the technologies that may facilitate financial regulation and supervision, including artificial intelligence, big data analytics, cloud computing, distributed ledger technology, application programming interfaces, cryptography, biometrics, etc. We emphasize that these studies focus mainly on the conduct aspect of RegTech yet overlook the organizational aspect of RegTech.

In Part III, we study the organizational aspect of RegTech through a public-private lens. We emphasize the need for an uncaptured yet flexible financial regulator in the RegTech era. We argue that such an entity requires

6. See *infra* Part II.C.

the character of a public-private partnership which contains some public elements to ensure the unbiasedness of the financial regulation and supervision and some private elements to adapt the financial regulation and supervision to rapid technological changes. Based on this understanding, we conduct a comparative analysis of the organizational models of financial regulators around the world and summarize them into four main categories based on which entity conducts the financial supervision: (i) the governmental agency model, which is adopted in most jurisdictions. Examples include the Office of the Comptroller of the Currency (“OCC”) in the United States, the Financial Service Agency (“FSA”) in Japan, etc. (ii) The governmental corporation model. Examples include the Federal Deposit Insurance Corporation (“FDIC”) in the United States, the Financial Conduct Authority (“FCA”) in the United Kingdom, etc. (iii) The self-regulatory organization model. Examples include the Financial Industry Regulatory Authority (“FINRA”) in the United States. (iv) The delegated gatekeeper model. Examples include the practice adopted in Taiwan, under which the governmental regulator mandates the supervisee to retain private yet independent gatekeepers (such as accounting firms) to certify the legal compliance of the supervisee. We compare these four organizational models based on their level of regulatory monopoly, the profit or non-profit nature, the rigorousness of the decision process, the pay packages, and the level of independence.

Based on the comparison, in Part IV, we attempt to theorize the organizational models of financial regulators to explore more possibilities in the RegTech era. We introduce the firm-contract dichotomy envisaged by the Transaction Cost Economics, in particular, the Theory of Firm and the comparative institutional analysis, to theorize a firm-contract spectrum to depict different models of financial regulators. Based on this theorized spectrum, we identify additional firm-type and contract-type models of public-private partnership between government regulators and non-government actors. We finally apply these new types to substantiate some additional organizational models of financial regulators that is worth considering in the RegTech era, including a mixed ownership RegTech corporation, a contracted RegTech supporter, a quasi-public financial regulator, or some directly delegated gatekeepers. Part V concludes.

II. REGTECH AND ITS CONDUCT ASPECT

In this Part, we briefly introduce the background of the rise of RegTech and clarify the concept and terminology of RegTech. Based on these understandings, we review the current studies of RegTech which center

mainly around the conduct aspect of RegTech. We finally highlight the importance of the organizational aspect of RegTech studies.

A. The Challenges in the Financial Sector and the Rise of RegTech

The financial industry is a regulated industry which calls for the regulator's involvement. While the rise of FinTech in the recent years potentially enhances the efficiency in the financial industry, it also poses at least the following three challenges to financial regulators around the world.

First, financial regulators increasingly need to deal with not only financial institutions but also nonfinancial firms providing technical services related to financial services. Due to the extensive use of innovative technologies and the frequent introduction of novel business and operational models, financial institutions now face a variety of new sources of risks, including cyber risks, third-party risks, data privacy risks, etc.⁷ To address these risks, financial institutions now turn to other FinTech companies (such as data analysis companies or cybersecurity companies) and third-party service providers (such as internet service providers, information technology supporters, etc.) more actively and frequently. These inter-industry, sometimes even cross-border, collaborations, in turn, pose additional informational asymmetry on financial regulators.⁸ Financial regulators now face the *known unknown* and the *unknown unknown* more frequently than before and thus urgently need *to learn as they regulate*.⁹ Accordingly,

7. FIN. STABILITY BD., FINANCIAL STABILITY IMPLICATIONS FROM FINTECH SUPERVISORY AND REGULATORY ISSUES THAT MERIT AUTHORITIES' ATTENTION 17-21 (Jun 27, 2017), <http://www.fsb.org/wp-content/uploads/R270617.pdf> [<https://perma.cc/7D3A-GZR8>] (last visited August 28, 2018) (summarizing a variety of risks that have the potential to undermine the financial stability).

8. For the related discussion, see generally Dirk A. Zetsche et al., *From FinTech to TechFin: The Regulatory Challenges of Data-Driven Finance*, 14 NYU J. L. & BUS. 393 (2017-2018) (describing the impact of new FinTech companies with their large pre-existing non-financial services customer bases); Lev Bromberg et al., *Cross-Border Cooperation in Financial Regulation: Crossing the Fintech Bridge*, 13(1) CAPITAL MARKETS L.J. 59 (2018) (noting that financial regulators now face challenges in achieving cross-border regulatory cooperation due to the rapidly evolving Fintech businesses and the globalization of financial services markets).

9. Unknown events and risks occur unexpectedly and frequently in a complex system. There is a growing literature that views the contemporary financial systems as a complex system, and therefore one should understand its regulatory implications through the lens of complexity science. See, e.g., Lawrence G. Baxter, *Internationalisation of Law — The 'Complex' Case of Bank Regulation*, THE INTERNATIONALISATION OF LAW: LEGISLATING, DECISION-MAKING, PRACTICE AND EDUCATION 3 (Mary Hiscock & William van Caenegem ed., 2010); Andrew G. Haldane & Robert M. May, *Systemic Risk in Banking Ecosystems*, 469 NATURE 351, 351-55 (2011). Some commentators, therefore, highlight the need to implement

financial regulators in this new era need to be able to accommodate more experimental attempts of regulatory actions and iterative process of supervisory decision-making to give rooms to the regulators to learn, try, and error.¹⁰

Second, financial regulators now face more challenges in balancing between the introduction of newcomer nonfinancial firms and the protection of the soundness of incumbent financial institutions. The technological advancement nowadays allows nonfinancial firms or startups to offer financial services at an affordable cost, which reduces their entry barriers to the financial market. This development enables FinTech innovators to bring financial services to the unbanked and underbanked populations, which promotes the financial inclusiveness.¹¹ Nevertheless, it could also dampen the competitiveness of the incumbents and thus jeopardize the safety and soundness of these incumbents as well as the whole financial system.¹² Under the current regulatory regime, financial regulators can control the competition in the financial market by adopting the licensing regime as a gatekeeping mechanism.¹³ It thus begs the question of whether and under what conditions the regulator should allow newcomers to enter the market and award them a financial service license.¹⁴ In reaching the answer,

an adaptive approach to financial regulation through which regulators can “learn from the dynamics of markets.” Lawrence G. Baxter, *Adaptive Regulation in the Amoral Bazaar*, 128 S. AFR. L. J. 253, 266 (2011).

10. See Cheng-Yun Tsang, *Balancing the Governance of the Modern Financial Ecosystem: A New Governance Perspective and Implications for Market Discipline*, 40 HOUSTON J. INT’L L., 531, 610 (2018) (observing that “[a] balanced regulatory and market power has long been on policymakers’ agendas. Nonetheless, its realization is yet to be seen. The complex nature of today’s financial markets has suggested a need for more experimental, flexible and forward-looking measures for the making and implementing of regulations.”); see also James D. Cox, *Iterative Regulation of Securities Markets after Business Roundtable: A Principles-Based Approach* (July 24, 2014), available at http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=6032&context=faculty_scholarship [<https://perma.cc/L38P-3TSD>] (observing that “[b]y far the approach most within reach and worthy of consideration is that whenever regulation is considered it is advisable to do so incrementally with the level being dictated by the breadth and complexity of the area to be regulated.”).

11. See, e.g., McKinsey Global Institute, *DIGITAL FINANCE FOR ALL: POWERING INCLUSIVE GROWTH IN EMERGING ECONOMIES* ix (Sept. 2016) (finding that “[d]igital finance has the potential to provide access to financial services for 1.6 billion people in emerging economies.”).

12. See FIN. STABILITY BD., *supra* note 7, at 11 (observing that “[t]echnology, however, may reduce costs for new entrants, and help to level the playing field in terms of access to technology by competing firms, which may themselves be technology leaders. As a result, the threat of competition may reduce the pricing power of incumbents.”).

13. For a brief analysis of how the entry regulation is carried out through licensing requirements, see JOHN ARMOUR ET AL., *PRINCIPLES OF FINANCIAL REGULATION* 74 (2016).

14. See Zetzsche et al., *supra* note 1, at 96-98 (“[d]efining the boundaries of competition

however, financial regulators are plagued by the data availability.¹⁵ As the FSB has noted, “[w]hile the abundance of data is itself at the heart of FinTech developments, regulators often note having few official data sources to monitor the sector.”¹⁶ Unlike the full-licensed financial institutions, many nonfinancial firms have not fallen under the existing financial regulatory parameter and thus undertake no reporting obligations.¹⁷ The financial regulator thus has limited data and empirical evidence to decide whether approving new competitors in the market does benefit or harm to the entire ecosystem.

Third, financial regulators now face more challenges in understanding, monitoring, and regulating the financial services in the market as the technologies employed in the market have become more innovative and complicated. Since the Global Financial Crisis, we have witnessed that the information, capacity, and resource asymmetry between the regulator and the regulated increasingly enlarge. For example, financial institutions can retain the best talents from the market through attractive compensation packages, whereas the budget and fiscal resources severely constrain financial regulators.¹⁸ To address this gap, financial regulators often resort to lengthy and complicated regulations as well as enormous penalties for non-compliance.¹⁹ This strategy essentially shifts the burden of reducing such asymmetry to the regulated, hoping that they will respond to the heightened regulatory cost by advancing their compliance efficiency.²⁰ In

and innovation is a challenge for regulators. Regulatory sandboxes are an example of innovation in financial regulation in the context of seeking to balance these competing objectives.”); see also Rory Van Loo, *Making Innovation More Competitive: The Case of Fintech*, 65 UCLA L. REV. 232 (2018).

15. See Mark Fenwick et al., *Regulation Tomorrow: What Happens When Technology Is Faster than the Law*, 6 AM. U. BUS. L. REV. 561, 585-89 (2017) (suggesting that lawmaking and regulatory design needs to become more proactive, dynamic, and responsive as there are more complex and disruptive technological innovation).

16. FIN. STABILITY BD., *supra* note 7, at 59 (Annex H).

17. See *id.*

18. This gap is likely to be enlarged as banks are now attracting tech talents to help them undergo the digital transition. See Nicholas Megaw, *Banks Seek Tech Talent for Digital Shift*, FIN. TIMES (May 21, 2018), <https://on.ft.com/2IVqsuv> (detailing the efforts of banks to recruit tech talent in the current digital transition).

19. Some commentators referred to this phenomenon as “regulatory complexity” and argue that it will incur “complexity risk.” See Karen Shaw Petrou, Managing Partner, Fed. Fin. Analytics, Inc., Remarks Prepared for the Securities Industry & Financial Markets Association: *The Complexity-Risk Conundrum: Why SIFIs Can’t Be Both Bullet-Proof and Profit-Making* (Jan. 10, 2012) (transcript available at www.fedfin.com/~fedfin/images/stories/press_center/sifma_speech.pdf [<https://perma.cc/5BAY-PLTU>]).

20. For a related discussion, see generally James Fanto, *Dashboard Compliance: Benefit, Threat, or Both?*, 11 BROOK. J. CORP. FIN. & COM. L. 1 (2016).

response, the regulated financial institutions resort to RegTech solutions to deal with the growing regulatory complexity and compliance cost.²¹ This, in turn, poses further pressure on regulators as they now need to discern the adequacy and quality of the compliance outcomes generated by these RegTech solutions.²² Regulators thus need to level up their regulatory resources and capability by employing technological solutions to enhance their regulatory capacity and efficiency.²³ The burden to reduce the asymmetry now shifts back to financial regulators.

To respond to these regulatory challenges, financial regulators urgently need to upgrade their technology to improve the regulatory compliance and supervisory efficiency. RegTech, thus, arrives.²⁴

B. FinTech, RegTech, and SupTech

Although the term RegTech carries a beautiful vision, it has not had a commonly accepted definition.²⁵ The UK's Government Office for Science was arguably the first governmental agency in the world which tried to define RegTech and specified it as "technologies that can be applied to or used in regulation, typically to improve efficiency and transparency in regulatory systems."²⁶ Another UK regulator, the Financial Conduct Authority ("FCA"), somehow concurred this definition but focused on a narrower scope of technologies, that is, "technologies that may facilitate the delivery

21. Arner et al., *supra* note 3, at 388-89.

22. TORONTO CENTRE, *SupTech: Leveraging Technology for Better Supervision* 10-11 (Jul. 2018) (summarizing risks related to the use of RegTech that could impact the supervisor's effectiveness and reputation).

23. *Id.* at 11 (underscoring the need to have in place "infrastructure and organizational arrangements including computing and storage capacity and integration of data management and governance frameworks.").

24. TORONTO CENTRE, *supra* note 22, at 4-8 (highlighting a variety of potential benefits of SupTech and examples of uses); *see also* Dirk Broeders & Jermy Prenio, *Innovative Technology in Financial Supervision (Suptech) – The Experience of Early Users*, FSI INSIGHTS ON POLICY IMPLEMENTATION NO 9, Financial Stability Institute, 20 (Jul. 2018) (finding that "[i]nnovative technologies, together with increased data availability, create scope to strengthen financial supervision. Supervisory agencies around the world recognize this and are now either using or exploring a wide variety of innovative technologies to support their work.").

25. *See* TORONTO CENTRE, *supra* note 5, at 8 (observing that "there is not yet an agreed upon definition of RegTech and its typology.").

26. UK GOV'T CHIEF SCI. ADVISER, *Fin Tech Futures - The UK As A World Leader In Financial Technologies* 62 (Mar. 2015), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/413095/gs-15-3-fintech-futures.pdf [<https://perma.cc/J45F-Q97L>].

of regulatory requirements.”²⁷ Comparing these two definitions of RegTech, the former adopts a broader scope which conceptually encompasses all technological solutions that can advance the *overall regulatory system*, while the latter focuses primarily on technologies which facilitate the process of *regulatory communication* between the regulators and the regulated.

The nuances between these two definitions lead the current discussion of RegTech to two diverse paths. The first one underscores the need to improve the efficiency and quality of the supervisory process, rulemaking and legal compliance,²⁸ whereas the other one emphasizes the need to improve the ability of financial institutions to understand the regulatory position and interact with regulators during the compliance process.²⁹ According to the Financial Stability Board (“FSB”),³⁰ RegTech refers to “any range of applications of FinTech for regulatory and compliance requirements and reporting by regulated financial institutions.”³¹ This definition of RegTech generally coincides with the second definition of RegTech provided by FCA as mentioned previously. In addition to RegTech, the Basel Committee on Banking Supervision (“BCBS”) also came up with a separate concept, the Supervisory Technology, or SupTech, which refers to the “application of FinTech by supervisory authorities.”³² This understanding of SupTech generally coincides with the first definition of RegTech provided by the UK’s Government Office for Science as mentioned previously. The main difference between these two concepts lies in that SupTech enables financial regulators to “conduct supervisory work and oversight more effectively and efficiently”³³ whereas RegTech assists financial institutions in complying with laws and regulations.³⁴

The existing literature, however, does not always distinguish the use of these two terms.³⁵ Therefore, while our analysis focuses mainly on the

27. Feedback Statement, Financial Conduct Authority, Call for Input on Supporting the Development and Adopters of RegTech 3 (2016).

28. *Id.* at 10.

29. *Id.*

30. FIN. STABILITY BD., *Artificial Intelligence and Machine Learning in Financial Services - Market Developments and Financial Stability Implications* (Nov. 1, 2017), <http://www.fsb.org/wp-content/uploads/P011117.pdf> [<https://perma.cc/K348-89EA>] (last visited March 28, 2018) [hereinafter Artificial Intelligence].

31. *Id.* at 35.

32. *See, e.g., Sound Practices - Implications of Fintech Developments for Banks and Bank Supervisors*, BASEL COMM. ON BANKING SUPERVISION 4 (Feb. 2018), <https://www.bis.org/bcbs/publ/d431.pdf>.

33. *Id.* at 35.

34. *Id.*

35. Some literature uses “RegTech” to refer to technological solutions used by the regulators to carry out regulatory missions. *See, e.g., Arner et al., supra* note 3, at 373

broader scope SupTech, we use “RegTech” throughout this paper to facilitate future discussion considering that this is a relatively recognized term.³⁶

C. *RegTech Studies from the Conduct Aspect*

The current discussion of RegTech focuses mainly on its *conduct aspect*. By *conduct aspect*, we refer to the use of technological solutions to help financial regulators achieve their regulatory objectives. In a nutshell, this line of discussion examines the features and developments of different types of technologies and explores whether and how to apply these technologies to certain supervisory scenarios or processes. It focuses more on the *actions and measures* adopted by a regulator to enhance the supervisory efficiency and effectiveness. This is distinct from the organizational aspect of financial regulation and supervision, which instead focuses on how the organizational design and culture of a financial regulator affects its priority-setting, resource allocation, and choice of regulatory approaches.³⁷ We will discuss the organizational aspect of RegTech in the next Parts.

The studies of the conduct aspect of RegTech typically start from introducing a stock-take of technologies available for the financial regulator, identifying the current pain points plaguing the regulator, and then analyzing how a specific technological solution can address these pain points. Famous examples include an FSB report in 2017,³⁸ a RegTech report published by the Institute of International Finance (“IIF”) in 2016,³⁹ and another RegTech report published by the Toronto Centre in 2017.⁴⁰ According to these reports, the technologies that hold great potential for RegTech solutions may include artificial intelligence (including machine learning and deep learning

(defining RegTech as “compris[ing] the use of technology, particularly information technology (IT), in the context of regulatory monitoring, reporting, and compliance.”)

36. As indicated by the Toronto Centre, “RegTech can be divided into two sub-segments: RegTech for financial institutions and RegTech for supervisors and regulators, or SupTech.” TORONTO CENTRE, *supra* note 5, at 9.

37. Griffith, for instance, has noted that the culture of an organization may affect how this organization adopts technology to seek compliance. See generally Sean J Griffith, *The Question Concerning Technology in Compliance*, 11 BROOK. J. CORP. FIN. & COM. L. 25 (2016).

38. Artificial intelligence, *supra* note 30.

39. INST. OF INT’L FIN., *Regtech in Financial Services: Technology Solutions for Compliance and Reporting* 5-17 (March 2016).

40. TORONTO CENTRE, *supra* note 5. Toronto Centre is a world-renowned non-profit training facility for financial regulators and supervisors in emerging markets. See Toronto Centre, <https://www.torontocentre.org/About> [https://perma.cc/9KKM-VSA2] (last visited Aug. 30, 2018) (explaining the background of the Toronto Centre).

as its subsets), big data analytics, cloud computing, distributed ledgers (or blockchain), cryptography, applications programming interfaces (“APIs”), and biometrics. Each of these technologies provides the functionality that could address supervisory challenges or facilitate supervisory processes. Below we briefly introduce each technology.

a. Artificial Intelligence and Machine Learning

Artificial intelligence (“AI”) is a technology that gives a computer the ability to perform tasks that traditionally require human actions, such as problem-solving, speech recognition, visual perception, decision-making, language translation, etc.⁴¹ To achieve this function, AI typically employs the technology of machine learning, that is, the computer learning without being programmed for such.⁴² Specifically, machine learning is a “method of designing a sequence of actions to solve a problem . . . which optimize automatically through experience and with limited or no human intervention.”⁴³ Machine learning can analyze non-rational or non-program-coded data to recognize patterns that are usually unrecognizable to the human brain.⁴⁴ It can further facilitate the classification and regression analysis.⁴⁵ For example, classification algorithms can identify the probability of the data and group the data into a finite number of categories based on the identified probability.⁴⁶ Regression algorithms, in contrast, can progress the classification algorithm and estimate an infinite yet continuous set of possible outcomes with a confidence interval.⁴⁷ With these functions, financial regulators can apply machine learning to optimize and categorize the data as well as predict the outcome. To be noted, machine learning cannot infer the causality.⁴⁸ For example, machine learning can identify whether the debt of a company will reach specific investment grade or yield level, but it cannot identify what factors led to that grade or level.⁴⁹

We can classify machine learning algorithms into four categories based on the level of human intervention required for labeling the data. The first category is “supervised learning,” where the human supervisor labels the data before the algorithm processes the dataset. For example, the human

41. TORONTO CENTRE, *supra* note 5, at 4; Artificial intelligence, *supra* note 30, at 4.

42. TORONTO CENTRE, *supra* note 5, at 4.

43. Artificial intelligence, *supra* note 30, at 4.

44. TORONTO CENTRE, *supra* note 5, at 4; Artificial intelligence, *supra* note 30, at 6.

45. Artificial intelligence, *supra* note 30, at 6.

46. *Id.*

47. *Id.*

48. *Id.*

49. *Id.* at 5.

supervisor chooses the sample data points of a dataset, classifies them into fraudulent and non-fraudulent ones, and provides the labelled sample data to the algorithm. The algorithm will then learn the classification from the labelled sample data, predict the labelling pattern, and finally complete the labels for the rest of the data.⁵⁰ The second category is “unsupervised learning,” where the algorithm can recognize the patterns in the data and discover the cluster in the data without assistance from human labelling.⁵¹ The third category is “reinforcement learning,” which takes the form between the supervised and unsupervised learning. The algorithm processes the unlabelled data first, and then it learns how to recognize the pattern based on the human feedback of its processing result.⁵² The fourth category is “deep learning,” which imitates the function of human brains through the algorithm and applies the supervised, unsupervised, or reinforcement learning.⁵³ In recent years, deep learning has made remarkable progress in image recognition such as recognizing cars and counting them based on a satellite image. It has also made significant progress in the field of natural language processing (“NLP”).⁵⁴

The RegTech literature generally believes that AI holds the potential to facilitate the regulatory compliance and supervisory process. The increased volume of data has plagued the current prudential regulations while the AI’s ability in analyzing a large volume of data helps resolve this challenge.⁵⁵ Specifically, AI can improve the accuracy of risk models by identifying complex and nonlinear patterns in large datasets and create models that enable more in-depth insights into the data.⁵⁶ Some financial regulators have applied AI in model validation to detect anomalous projections generated by its models of stress tests, while others have applied it to model the capital market business for bank stress testings.⁵⁷ Financial regulators can further use AI to estimate the market impact of prices and timing on trades more accurately to minimize trade costs.⁵⁸

AI can also assist in enforcing the regulatory compliance and conduct regulations. Financial regulators can apply machine learning, together with the NLP, to monitor and detect financial crimes, such as fraud, anti-money

50. *Id.*

51. *Id.*

52. *Id.*

53. *Id.*

54. NLP enables computers to read and produce written text. Further, NLP combined with voice recognition enables computers to read and speak.

55. Artificial intelligence., *supra* note 30, at 16.

56. INST. OF INT’L FIN., *supra* note 39, at 13.

57. Artificial intelligence, *supra* note 30, at 16-17.

58. *Id.* at 17.

laundering (“AML”), or counter-terrorism financing (“CFT”).⁵⁹ These technologies can analyze the unstructured data, such as phone conversations, emails, and documents, to efficiently monitor customer conduct.⁶⁰ They can further calculate risk scores to identify the customers that warrant further scrutiny by operating ongoing periodic checks on different sources of data, such as public registers of offenders, social media and online forums.⁶¹ It can also help financial institutions to conduct the suitability analysis to avoid mis-selling.⁶²

AI can further improve consumer protection by facilitating the communication between financial institutions and financial consumers. For example, it can help financial institutions to analyze customer complaints and identify the causes more efficiently, which can prevent potential consumer disputes.⁶³ Furthermore, chatbots, a machine learning software that provides customer service to solve consumer problems, can also help financial institutions understand their customers better.⁶⁴ For example, the current chatbots have been capable of not only providing simple information or alerts but also advising and prompting customers to act.⁶⁵

b. Big Data Analytics and Cloud Computing

Big data broadly refers to the vast amount of data, unstructured or structured, that traditional analytical tools cannot process.⁶⁶ We can apply other technologies to analyze the big data. For example, we can apply machine learning to analyze the big data to “find patterns in large amounts of data (big data analytics) from increasingly diverse and innovative sources.”⁶⁷ We can further apply cloud computing to big data to increase the “interconnectedness of information technology resources.”⁶⁸

Cloud computing is a data center on the Internet that stores and processes data, which can refrain from using the servers and computers owned and locally maintained by each user of the cloud.⁶⁹ It has advanced the ability of financial institutions to generate, store, manage, and use data

59. *Id.* at 23.

60. *Id.* at 20.

61. *Id.*

62. INST. OF INT’L FIN., *supra* note 39, at 13.

63. *Id.*

64. Artificial intelligence, *supra* note 30, at 14-15.

65. *Id.*

66. TORONTO CENTRE, *supra* note 5, at 4; Artificial intelligence, *supra* note 30, at 4.

67. Artificial intelligence, *supra* note 30, at 4.

68. *Id.* at 6.

69. TORONTO CENTRE, *supra* note 5, at 5.

with lower costs and higher flexibility.⁷⁰ It can also help financial institutions aggregate and manage their risk data to ensure the regulatory compliance.⁷¹ Financial institutions can also use cloud computing to integrate their different parts of businesses and optimize the data processing by, for instance, establishing a central data repository on the cloud.⁷² Furthermore, financial regulators can apply cloud computing to create a standardized and shared utility to standardize the data and share it with both financial institutions and the regulators to simplify compliance.⁷³

c. Distributed Ledger Technology

Distributed ledger technology, or DLT (often understood as “Blockchain”⁷⁴), is, in essence, a database shared between multiple parties to initiate, execute and record transactions based on some consensus mechanisms.⁷⁵ Specifically, the parties can create a smart contract, which is, in essence, a computer protocol that can self-execute the transaction automatically upon the satisfaction of pre-defined conditions.⁷⁶ Smart contracts can, in turn, increase the transparency of financial contracts, reduce settlement risks, increase the post-trade efficiency, and lockup capital through real-time settlement.⁷⁷

DLT has the advantage in preventing cyber attacks and data alteration because the data is not controlled by a central trusted party but distributed among all parties.⁷⁸ It also has immense potential to help financial regulators achieve real-time monitoring, automated supervisory reporting, and enforcement. It is also particularly suitable for building the infrastructures,

70. *Id.*

71. INST. OF INT’L FIN., *supra* note 39, at 12.

72. *Id.*

73. *Id.*

74. Blockchain is a type of DLT, which the ledger of transactions is as a series of blocks of data linked together through cryptography. TORONTO CENTRE, *supra* note 5, at 5. For the discussion of the blockchain technology and its application, *see, e.g.*, Catherine Martin Christopher, *The Bridging Model: Exploring the Roles of Trust and Enforcement in Banking, Bitcoin, and the Blockchain*, 17 NEV. L.J. 139 (2016); Dirk A. Zetzsche et al., *The Distributed Liability of Distributed Ledgers: Legal Risks of Blockchain*, U. ILL. L. REV. 1361 (2018); Carla L. Reyes et al., *Distributed Governance*, 59(1) WILLIAM & MARY L. REV. 1 (2017).

75. TORONTO CENTRE, *supra* note 5, at 4.

76. *Id.* at 4-5.

77. INST. OF INT’L FIN., *supra* note 39, at 15. For a discussion of the smart contract, *see, e.g.*, Jeremy M. Sklaroff, *Smart Contracts and the Cost of Inflexibility*, 166 U. PA. L. REV. 263 (2017) (explaining benefits of block-chain stored smart contracts in avoiding costs of traditional drafting, ambiguity in written language, and costly judicial intervention).

78. TORONTO CENTRE, *supra* note 5, at 4.

such as a digital identity regime, to further develop RegTech.⁷⁹

d. Application Programming Interfaces

Application programming interfaces, or APIs, are rules that guide software programs to interact with each other.⁸⁰ APIs are published publicly, which helps integrate the standards and innovate the functionality. They can facilitate the automation and standardization of data and thus streamline the compliance work for financial institutions.⁸¹ More specifically, they can help regulators build up a standardized communication of the supervisory data and promote industry-wide regulatory standards that can apply to many proposed RegTech solutions.

e. Cryptography

Cryptography is a technology that transforms information into a secure format; the most notable example is encryption.⁸² Cryptography can facilitate the compliance of data sharing regulations. Specifically, it can resolve the data security concern for big datasets by providing customized access control.⁸³ Financial regulators, for example, can establish a Data Storage Cell-Level Security, which is an application of the cryptography that only allows authorized parties (such as clients and regulators) to access permitted information on the shared data pool.⁸⁴ Cell-level security can further analyze the data and identify the property, object and access type of the data to accelerate the data search.⁸⁵

f. Biometrics

Biometrics is a technology that uses the computer to process and store unique human characteristics such as fingerprint, iris, voice, and face.⁸⁶ Combined with AI and machine learning, biometrics can provide new forms

79. For a discussion, see, e.g., Angela Walch, *The Bitcoin Blockchain as Financial Market Infrastructure: A Consideration of Operational Risk*, 18 N.Y.U. J. LEGIS. & PUB. POL'Y 837 (2015) (describing advantages of distributed ledger technology that can help develop RegTech).

80. TORONTO CENTRE, *supra* note 5, at 4; INST. OF INT'L FIN., *supra* note 39, at 15.

81. INST. OF INT'L FIN., *supra* note 39, at 15.

82. TORONTO CENTRE, *supra* note 5, at 5.

83. INST. OF INT'L FIN., *supra* note 39, at 12.

84. *Id.*

85. *Id.* at 16.

86. TORONTO CENTRE, *supra* note 5, at 5.

of identification, such as fingerprint and iris scanning, face recognition, remote passport recognition, and eIDs.⁸⁷ Financial institutions can use these new forms of identification to verify the identity of their customers more efficiently and securely. Biometrics can further help financial institutions to conduct the customer due diligence (“CDD”) to satisfy their Know Your Clients (“KYC”) obligations as required under the AML sanction or the counter-terrorist financing (“CTF”) sanction.⁸⁸ Moreover, the different language used in different jurisdictions often results in interpretation hurdles, which makes it difficult for financial institutions to conduct KYC compliance; biometrics can help overcome this barrier.⁸⁹

D. From the Conduct Aspect to the Organizational Aspect of RegTech

Admittedly, the technologies as mentioned previously possess a huge potential to fundamentally change the way of financial regulation and supervision and improve the regulatory efficiency. However, such an ideal scenario will not come true automatically.⁹⁰ Technologies do not function on their own; instead, it is the financial regulators that apply these advanced technologies. To operate RegTech effectively and appropriately, the *quality and efficiency* of financial regulators thus matter.

The quality and efficiency of financial regulators depend on many aspects, including the organizational design, regulatory model, and institutional culture of a financial regulator. It is crucial that these aspects of a financial regulator allow it to integrate technology into their policymaking and capacity building continually.⁹¹ As technologies upgrade quickly and frequently, financial regulators should also be adequately agile, forward-

87. INST. OF INT’L FIN., *supra* note 39, at 14.

88. For a discussion, see generally Douglas W. Arner et al., *The Identity Challenge in Finance: From Analogue Identity to Digitized Identification to Digital KYC Utilities*, EUR. BUS. ORG. L. REV. 1 (2019) (describing the importance of understanding client identity for financial institutions to protect against fraud and improve risk management).

89. INST. OF INT’L FIN., *supra* note 39, at 10.

90. To fully materialize the potential of RegTech, financial regulators face many challenges. See TORONTO CENTRE, *supra* note 22, at 8-10 (detailing multiple risks and challenges to expect when adopting SupTech); see also Broeders & Prenio, *supra* note 24, at 1 (finding that “[a]gencies face a number of challenges in developing or using suptech applications. Some of these issues relate to computational capacity constraints, increased operational risks, including cyberrisk, data quality, finding the right talent, management support and buy-in from supervision units, and rigid rules in project management.”).

91. See TORONTO CENTRE, *supra* note 5, at 15 (concluding that “[p]aradigm shifts can only succeed with the right mindset and leadership at regulatory and supervisory authorities, since they require a profound cultural transformation. Authorities need first to recognize that they must change and be strategic in reviewing existing approaches, organizational structures, IT systems, and technical skills.”).

looking, and technology-enabled. Importantly, financial regulators should be able to efficiently adapt to a new technology that can help improve regulatory efficacy. Specifically, to contain both the FinTech and RegTech, the organizational design, regulatory model, and institutional culture of a financial regulator should allow iterative regulatory experimentation, enable large-scale supervisory data-collection, and promote the technological literacy of regulators.

Accordingly, we need to rethink the organizational foundation of financial regulators on which the current financial system is built. The current RegTech studies, as illustrated above in II.C., mostly focus on how to apply various technologies to facilitate the financial regulation and supervision from a conduct aspect, which admittedly have merits in identifying the direction for *how* to implement RegTech in the future. Of equal importance, however, is the organizational aspect of RegTech; that is, *how* to implement RegTech and through what organizational design to employ RegTech solutions to regulate and supervise the modern financial system. This *organizational* aspect of financial regulation and supervision remains largely overlooked in the current RegTech literature. This paper attempts to fill this void.

III. A COMPARATIVE INSTITUTIONAL ANALYSIS OF THE ORGANIZATIONAL MODELS OF FINANCIAL REGULATORS

In this Part, we introduce a public-private approach for analyzing the organizational characteristics of a financial regulator. We emphasize the need for an accountable yet flexible regulator in the RegTech era. We also argue that such a regulator requires the character of a public-private partnership, which contains some public elements which ensure the unbiasedness of financial supervision and some private elements which adapt financial regulation and supervision to rapid technological changes.

The present is the foundation of the future. To explore an appropriate organizational model of financial regulators for implementing the RegTech, we start by reviewing the current organizational models adopted around the world. We identify four major models: (i) the government agency model, (ii) the government corporation model, (iii) the self-regulatory organization model, and (iv) the delegated gatekeeper model. By comparing the organizational characteristics of these models, we lay down an intellectual foundation for innovating other potential models of financial regulators in the RegTech era.

A. *A Public-Private Approach for Analyzing the Organizational Models of Financial Regulators*

To adopt RegTech to facilitate financial regulation and supervision competently, a financial regulator requires many complementary organizational characteristics. A financial regulator can play at least four different roles in RegTech: a developer of RegTech products, a buyer of RegTech products developed by others, a facilitator and coordinator of market developments, and the supervisor of RegTech firms.⁹² To assume these roles, a financial regulator needs to upgrade its technology persistently. This, in turn, requires it to be innovative and creative to design the needed RegTech products, or to at least keep up with the pace of private RegTech firms. A financial regulator also has to be adaptive and flexible to remain as evolving as the financial industry. It further has to recruit professional and sophisticated talents to ably supervise the complex financial market. In the meantime, the financial regulator has to be independent and unbiased to balance the interests of existing market players, prospective market entrants, the development of the overall financial industry, the stability of the financial system, and other public interests. All of these organizational characteristics are the premise conditions for a financial regulator to maneuver RegTech effectively.

Conventional financial regulators often lack many of these premise conditions, however. Instead of being innovative and creative, they often have less motivation to adopt changes. Instead of being adaptive and flexible to the financial environment, they are often risk-averse and suffer from the status quo bias. Instead of being as sophisticated and professional as market players, they are often outsmarted by market players, especially in respect of technology.⁹³ These realities inevitably hinder financial regulators from adopting RegTech efficiently.

Conventional financial regulators have these limits essentially due to their public nature. As a public entity, they are monopolies in the “market” of financial regulation and supervision, facing no competition from other service suppliers.⁹⁴ The lack of competition, in turn, leads to less motivation. Besides, as a public entity, they do not pursue profits from their activities. Since they reap no profit from their activities, they have less incentive to take the risk to make changes, because they gain little even when the changes pay off. Moreover, as a public entity, they possess the public authority and receive the mandate to exercise it in the interest of the public. Since they

92. Enriques, *supra* note 3, at 5.

93. *Id.* at 5-8.

94. *See infra* Part III.B.a.i.

face the scrutiny and pressure from the public as well as the due process mandate, their decision process is more rigorous and thus less adaptive to the changing environment. Last but not the least, as public entities, their pay system is often subject to the government budget, which prevents them from offering their staff a pay package as lucrative as that offered by private sectors.⁹⁵ Therefore, they often find it difficult to recruit top talents in the industry, which compromises their level of sophistication and profession.⁹⁶ In contrast, these missing pieces are often the relative advantages of private entities. Private sectors are competitive, profit-driven, less accountable to the public, and highly-paid, which generally make them more receptive to innovative ideas and adaptive to market and technological changes.

Nevertheless, financial laws refrain from assigning the task of financial regulation and supervision to private entities for a reason. Financial regulation and supervision involve the exercise of public authority for the interest of the public. It imposes discipline on the financial market to maximize the social welfare by mitigating the market failure problems in the financial market, such as the informational asymmetry, externality, etc. Private sectors, in contrast, are private-interest-concerned, concerning few, if any, interests of the general public. There is a real concern that if laws vest private entities with the regulatory and supervisory authority, these private supervisors will pursue their interest with little, if any, regard of other spillover effects.⁹⁷ Therefore, while private sectors are relatively equipped for adopting RegTech, they could have less incentive to adopt it in the public interest. We thus face a tradeoff between capability and incentive.

To be sure, this public-private dilemma is not unique to RegTech. It is instead an everlasting issue of financial regulation and supervision. The emergence of RegTech, however, highlights this dilemma to the extent that RegTech calls for a more innovative, adaptive, flexible, and professional financial regulator. To address this dilemma, the next question follows: is it possible to have new organizational models of financial regulators which carry both the public and private natures, and thus combine both the advantages of public and private sectors?

B. The Typology of the Organizational Models of Financial Regulators

A comparative institutional study of the current organizational models

95. See *infra* Part III.B.a.iv.

96. Enriques, *supra* note 3, at 5-8.

97. As will be discussed later, commentators have observed this phenomenon in the case of SROs which are comprised of private industries. See *infra* note Part III.B.c.

of financial regulators may shed us some light. The current studies of financial regulators mainly focus on the cost and benefit of a fragmented regulatory system, with the United States' model as the major research subject,⁹⁸ the relative relationship between the central bank and other financial regulatory bodies,⁹⁹ the independence of financial regulators,¹⁰⁰ etc. Relatively few studies discuss the organizational models of financial regulators from a public-private perspective.¹⁰¹

Major countries have developed different organizational models of financial regulators that go beyond a simple governmental agency model. In

98. See, e.g., Hadar Y. Jabotinsky, *The Federal Structure of Financial Supervision: A Story of Information-Flow*, 22(1) STAN. J.L. BUS & FIN 52 (2017); Adam J. Levitin, *The Consumer Financial Protection Bureau: An Introduction*, 32 REV. BANKING & FIN. L. 321 (2013).

99. See, e.g., Eddy Wymeersch, *The Structure of Financial Supervision in Europe: About Single Financial Supervisors, Twin Peaks and Multiple Financial Supervisors*, 8(2) EUR. BUS. ORG. L. REV. 237 (2007); Howell Jackson, *Learning from Eddy: A Meditation upon Organizational Reform of Financial Supervision in Europe*, in PERSPECTIVES IN COMPANY LAW AND FIN. REG. 523 (Michel Tison et al., ed., 2009); Donato Masciandaro & Davide Romelli, *Twin Peaks and Central Banks: Economics, Political Economy and Comparative Analysis* (Universita Bocconi Centre for Applied Research on International Markets, Banking, Finance, and Regulation Working Paper, No. 68, 2017); Andrew D Schmulow, *The Four Methods of Financial System Regulation: An International Comparative Survey* (University of Western Australia-Faculty of Law Research Paper, 2017).

100. See, e.g., Stavros Gadinis, *From Independence to Politics in Financial Regulation*, 101 CAL L. REV. 327 (2013); Kirti Datla & Richard L. Revesz, *Deconstructing Independent Agencies (and Executive Agencies)*, 98(4) CORNELL L. REV. 769 (2013); Donato Masciandaro & Davide Romelli, *Beyond the Central Bank Independence Veil: New Evidence* (Universita Bocconi Centre for Applied Research on International Markets, Banking, Finance, and Regulation Working Paper, No. 71, 2018).

101. Some studies on self-regulatory organizations touch upon this issue. See, e.g., William A. Birdthistle & M. Todd Henderson, *Becoming a Fifth Branch*, 99 CORNELL L. REV. 1 (2013) (providing a comprehensive account of the public-private difference in securities regulation); Benjamin P. Edwards, *The Dark Side of Self-Regulation*, 85 U. CIN. L. REV. 573 (2017). The New Governance scholarship also addressed the public-private relationship of financial regulations. See Saule T. Omarova, *Rethinking the Future of Self-Regulation in the Financial Industry*, 35(3) BROOK. J. INT'L L. 665 (2010); Saule Omarova, *Wall Street as Community of Fate: Toward Financial Industry Self-Regulation*, 159 U. PA. L. REV. 411 (2011); Cristie Ford, *Macro- and Micro-Level Effects on Responsive Financial Regulation*, 44 UBC L. REV. 589 (2011); Cristie L. Ford, *New Governance, Compliance, and Principles-Based Securities Regulation*, 45 AM. BUS. L.J. 1 (2008); Annelise Riles, *Is New Governance the Ideal Architecture for Global Financial Regulation?*, 31 MONETARY & ECON. STUD. 65 (2013). This thread of scholarship, however, focuses more on how to create regulation through the collaboration between public and private actors, as opposed to how to allocate the regulatory and supervisory roles between public and private actors. Our analysis in this Article fills this void. See Tsang, *supra* note 10, at 578-99 (providing a comprehensive analysis of the New Governance theory and its application in the context of financial regulation).

this subsection, we introduce and compare different organizational models of financial regulators around the world.

a. The Government Agency Model

Most financial regulators around the world are governmental agencies. In the United States, major financial regulators such as the Federal Reserve in charge of bank holding companies and state banks that are members of the federal system,¹⁰² the Office of the Comptroller of the Currency (“OCC”) in charge of national banks,¹⁰³ and the Securities and Exchange Commission (“SEC”) in charge of securities brokers and dealers, investment companies, and investment advisers,¹⁰⁴ etc. are all government agencies. Elsewhere, the Financial Services Agency (“FSA”) in charge of all financial institutions in Japan, the Monetary Authority of Singapore (“MAS”) in charge of all financial institutions in Singapore, and the Chinese Banking and Insurance Regulatory Commission (“CBIRC”) in charge of banks and insurers in China, etc. are also government agencies.

These government agency regulators typically possess some general characteristics, including the regulatory monopoly, non-profit-seeking nature, rigorous decision-making process, unattractive salary, and independence of industries as opposed to politicians.¹⁰⁵ These organizational characteristics are useful benchmarks for us to discuss other models of financial regulators.

i. *The Regulatory Monopoly*

Government agencies are mostly monopolistic in the sense that they barely have competitors.¹⁰⁶ Nowadays, many countries adopt the so-called integrated or unified approach for structuring their financial regulatory regime, under which only a single financial regulator is responsible for supervising all the financial institutions in its territory. Japan, Singapore, and Germany are all examples.¹⁰⁷ For example, in Japan, the FSA is

102. RICHARD SCOTT CARNELL ET AL., *THE LAW OF FINANCIAL INSTITUTIONS* 94-95 (6th ed., 2017).

103. *Id.* at 92-93.

104. *Id.* at 677-78.

105. To be sure, different government agencies exhibit difference in many aspects as well. For a discussion of the different organizational characteristics of the U.S. financial regulators, see Levitin, *supra* note 98, at 343.

106. The fragmented regulatory structure in the United States is instead an exception. For the related discussion, see Levitin, *supra* note 98, at 343.

107. For an introduction, see Schmulow, *supra* note 99, at 155-58.

responsible for ensuring the stability of finance in Japan, protecting depositors, insurers, securities investors, etc., and promoting finance.¹⁰⁸ To implement this mandate, the FSA is entitled to supervise all financial institutions in Japan.¹⁰⁹

Instead of adopting an integrated regulatory framework, some countries establish multiple agencies for supervising different financial institutions. In these countries, each government agency regulator remains a monopoly: since each of them is in charge of an exclusive group of financial institutions, each of their supervisory power within its mandate is unfettered by other regulators. For example, in China, it used to maintain a Three Commissions Model which established the Chinese Banking Regulatory Commission (“CBRC”), Chinese Securities Regulatory Commission (“CSRC”), and Chinese Insurance Regulatory Commission (“CIRC”) to share the supervision of Chinese financial institutions. Each Commission, however, had its mission: CBRC supervised banking financial institutions,¹¹⁰ CSRC supervised securities firms and securities markets,¹¹¹ while CIRC supervised insurance companies,¹¹² and each of them did not cross-supervise the financial institutions supervised by others. Therefore, within its mandate, each financial regulator was a monopoly. Such monopolistic status remains lasting after the restructuring in 2018 which merges CBRC and CIRC into a single regulator, the CBIRC.

Regulatory monopoly is advantageous to the extent that it prevents the regulated from arbitraging between different regulators, which, in turn, prevents the potential of a race to the bottom in regulation and supervision.¹¹³ It could also enhance the regulatory efficiency because of the economies of scale.¹¹⁴ The disadvantage, however, is that regulators have less incentive to improve their work quality and are thus less responsive to industrial needs.¹¹⁵ There is also a concern that regulatory monopoly might lead to regulatory capture by giant financial conglomerates at the expense of smaller specialized firms.¹¹⁶

108. FSA ESTABLISHMENT ACT, art. 3 (Japan).

109. *Id.* at art. 4.

110. BANKING INDUSTRY SUPERVISION AND ADMINISTRATION ACT, art. 2 (Ch).

111. SECURITIES ACT, arts. 7, 178, 179 (Ch).

112. INSURANCE ACT, art. 9 (Ch).

113. For the studies raising the regulatory arbitrage concern, see Eugene A. Ludwig, *Assessment of Dodd-Frank Financial Regulatory Reform: Strengths, Challenges, and Opportunities for a Stronger Regulatory System*, 29(1) YALE J. REG. 181, 189-90 (2012).

114. Jackson, *supra* note 99, at 526.

115. CARNELL ET AL., *supra* note 102, at 98-99.

116. Jackson, *supra* note 99, at 527.

ii. The Non-Profit Nature

Government agencies are not-for-profit entities and thus do not pursue maximized profits as their main priority. This point has two implications. On the one hand, government agencies typically operate under a given budget. They submit their estimated annual budget at the beginning of the fiscal year. After approval by the legislative or executive branch in charge of their budget, they operate and spend by this budget. On the other hand, government agencies do not possess a distribution mechanism that distributes their operational profits to anyone. Therefore, they face no need to minimize their budgetary spending. To the contrary, they are even encouraged to maximize their spending within this budgetary limit. This is because any under-spending might lead to a budget cut in the next fiscal year, and government agencies prefer to maximize their budgets to have more resources and discretion. Under this setting, the operation of government agencies tends to be budget-driven rather than profit-driven.

To be sure, although government agencies are not profit-driven, they do make profits. Many financial regulators create revenues from their activities. For example, they collect regulatory fees from the entities they oversee. Some financial regulators even finance their activities with these revenues rather than with appropriations.¹¹⁷ For example, OCC's revenue comes mainly from the assessments and fees paid by banks, the income on investments in non-marketable U.S. Treasury securities, and the rental income and reimbursable activities from other federal entities.¹¹⁸ The collected fund is not subject to apportionment, and the OCC also does not receive congressional appropriations to fund any of its operations.¹¹⁹ However, making profits is not the mandate of these government agencies, and the agencies generally remain unmotivated to make profits because they are not entitled to distribute the profits to, for instance, their management or staff. Therefore, they continue to operate under a given budget as determined by the assessment and fees; the major difference is merely that their operation is on a self-sufficiency basis. In sum, although these government agencies can *make* profits, they do not *pursue* profits.

The advantage of the non-profit nature of government agencies is that government agency regulators are less concerned with their own commercial interests; thus, they are more inclined to spend for the public's interest. After

117. For instance, OCC funds itself from the fees paid by national banks, and the Federal Reserve pays its expenses from the interest earned on its government securities portfolio. CARNELL ET AL., *supra* note 102, at 93.

118. 12 U.S.C. §16.

119. *Id.*

all, saving the budget in their pocket does them no good. Therefore, when they consider introducing the RegTech, commercial reasonability is less of a negative factor. The disadvantage, however, is that government agency regulators face budgetary constraints and motivational limits. First of all, introducing the RegTech requires a tremendous amount of investment in hardware, software, and human resources, which is not necessarily affordable for many government agency regulators. Moreover, introducing the RegTech invites disruptive innovation to the government agency regulator because they might face an unfamiliar regulatory method. Absent the profit motivation, government agency regulators might have less incentive to take the risks of changes to pursue such innovation. Therefore, unless they face substantial external pressure, they might be comfortable with the status quo and feel less inclined to introduce RegTech solutions even though their budgets permit it. Furthermore, many innovations require a sophisticated business model to make its research, development, and mass application cost-efficient, and a not-for-profit financial regulator might lack such a model.

iii. *The Rigorous Decision-making Process*

The decision-making process of government agencies is typically rigorous and stringent. As a government entity possessing public authority, government agencies have to abide by the constitutional requirement of due process. This may include hearing, notice-and-comment, and others. Recently, many financial regulators have begun to face an additional requirement: the cost and benefit requirement.¹²⁰ All of these factors render the decision-making process of government agencies inevitably lengthy.

The advantage of such a rigorous process is that it helps to ensure that regulatory decisions are unbiased and comprehensive. Under the due process mandate, different interest groups may have more procedural opportunity to voice their concerns. Through conducting the cost-benefit analysis, the final rule promulgated by the regulators might consider and reconcile conflicting interests more. The disadvantage, however, is that this prolongs the decision process, which jeopardizes the adaptability and flexibility of regulatory decision-making. In the rapidly-changing world of finance, “better late than never” does not always hold true.

120. For studies related to the cost and benefit analysis of financial regulations, see John C. Coates IV, *Cost-Benefit Analysis of Financial Regulation: Case Studies and Implications*, 124 YALE L. J. 882 (2015); Jeffrey N. Gordon, *The Empty Call for Benefit-Cost Analysis in Financial Regulation*, 43(2) J. LEG. STUD. 351 (2014).

iv. The Uncompetitive Pay Package

The budget limits and rigid pay rules further result in the under-staffing problem of financial regulators, which, in turn, leads to under-enforcement. Because of budget constraints, government agencies typically offer less than lucrative pay to their staff. For instance, a financial regulator requires a professional staff composed of lawyers, but a government agency can hardly pay its staff as generously as a private law firm does.¹²¹ This problem is expected to become even more acute in the era of RegTech, which requires professional staff composed of engineers or even data scientists.¹²²

For example, in principle, the OCC fixes the compensation and number of all its employees, subject to additional compensation and benefits per relevant laws.¹²³ According to OCC's 2018 Base Salary Structure, the basic annual salary band of an OCC attorney is between USD 51,119 and USD 183,492, while that of an OCC manager and executive is between USD 78,572 and USD 282,500, with other potentially applicable salary increases such as merit pay increase, merit bonus, special increase, promotional increase, and Step 2 increase.¹²⁴ While these figures are decent in and of themselves and are significantly higher than that of ordinary federal civil agency officials of in the United States,¹²⁵ they are nowhere close to the annual income of a private attorney or a private executive in the United States.

In the absence of competitive pay packages, government agency regulators generally find it difficult to recruit or retain the top talent in their staff and management team. Absent an adequate amount of top talent, they can hardly be as innovative or sophisticated in adopting the most high-end RegTech, especially when compared to the private financial institutions that can afford more appealing compensation and benefits packages to attract top talent.

121. Enriques, *supra* note 3, at 5-6 (noting, while the salary package is unattractive, the implicit benefits that government agency staff could procure, such as the network and the supervisory training, may be more than humble).

122. *Id.* at 6-8.

123. 12 U.S.C §482.

124. *OCC Salary Structure*, <https://careers.occ.gov/pay-and-benefits/salary/index-occ-salary-structure.html> [<https://perma.cc/SNZ7-7ZFY>] (last visited June 25, 2018).

125. See Salary Table 2018-GS, <https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/pdf/2018/GS.pdf> [<https://perma.cc/LHG4-WLA7>] (last visited June 25, 2018). According to the OCC, the maximum annual salary of a federal civilian agency official in 2018 is USD 136,659.

v. *The Political Capture*

Last but not least, government agencies are often subject to more political capture in at least two aspects: budget and personnel. As mentioned previously, the budget of many government agency regulators is part of the government's overall budget and is subject to the legislative branch's approval. Because government agency regulators fear that the government or the legislative branch might cut its budget, they tend to be less resistant to politicians' comments or suggestions.

Regarding personnel, the heads of government agencies are often politically appointed, subject to endorsement by the executive branch or even the legislative branch. For example, Japan designs its FSA as an independent agency that exercises its power independently.¹²⁶ That said, the Japanese FSA is a commission composed of the FSA chairperson and two commissioners,¹²⁷ who are appointed by the Premier as approved by the House of Councillors and House of Representatives.¹²⁸ Therefore, the personnel of the FSA remains highly susceptible to political pressure. The primary mechanism for ensuring its political independence is the three-year term protection awarded to the chairperson and commissioners.¹²⁹ Such term protection, however, has two caveats. First, notwithstanding the term protection, the Premier can dismiss the FSA chairperson and/or commissioners if he/she is found psychologically or physically incapable of performing his/her duties, in breach of his/her obligations, *or involved in any other circumstances where he/she is found inappropriate to continue serving the position.*¹³⁰ Considering that the reasons for dismissal are quite abstract and flexible, the term protection awarded to the FSA chairperson and commissioners is less reliable than it appears. Second, the chairperson and commissioners can be reappointed,¹³¹ subject to the same appointment process. Therefore, the chairperson and commissioners who are interested in reappointment will need to consider the preference of the Cabinet and the Diet even after their appointment.

We wish to emphasize that even independent financial regulators are subject to a significant degree of political influence. There are recurring debates about the cost and benefit of independent agencies¹³² and whether

126. FSA ESTABLISHMENT ACT, ch. 3, art. 9 (Japan).

127. *Id.* ch. 3, art. 10.

128. *Id.* ch. 3, art. 12.

129. *Id.* ch. 3, art. 13.

130. *Id.* ch. 3, arts. 14-15.

131. *Id.* ch. 3, art. 13.

132. For a discussion of the difference between independent agencies and executive agencies, *see generally* Kirti Datla & Richard L. Revesz, *Deconstructing Independent*

financial regulators should be independent.¹³³ Independent agencies are more independent to the extent that their heads are entitled to term protection¹³⁴ and their operation is often self-financing. Nevertheless, the heads of these independent financial regulators often remain politically appointed. Japan's FSA has provided a good example. Therefore, the political influence still remains, albeit to a lesser degree.

The relative budgetary freedom does not entirely ward off political capture either. For example, as illustrated above, the OCC possesses relative budgetary autonomy. Its Comptroller is also entitled to five-year term protection.¹³⁵ That said, OCC is not immune from political capture. For one thing, the Comptroller of the OCC is appointed by the President with the advice and consent of the Senate.¹³⁶ Moreover, the OCC is essentially a bureau of the Department of the Treasury¹³⁷ and its operation depends upon the Treasury to a significant extent. Although in principle, the Treasury shall not delay or prevent the issuance of any rule or regulation by the OCC and shall intervene in any matter before the OCC, the OCC and its Comptroller remain obliged to perform their duties under the general direction of the Secretary of the Treasury.¹³⁸ Therefore, the OCC remains significantly susceptible to political influence.

The political capture of government agency regulators could be advantageous to the extent that it prevents these regulators from being captured by a single interest group, especially the financial institutions they regulate. This mitigates the potential bias in financial regulation and supervision. It also ensures the accountability of government agency regulators to the general public welfare. However, it could be disadvantageous to the extent that the regulator has to navigate different interests in the political branches. These political influences might slow down the regulator's decision-making process and obstruct them from pursuing a single direction at full speed. Regulators might further have to compromise their expert judgment to respect and harmonize with other non-expert, yet politically popular opinions.

Agencies (and Executive Agencies), 98(4) CORNELL L. REV. 769 (2013).

133. *See supra* note 97.

134. Such as the case of FSA as illustrated above.

135. 12 U.S.C. §2.

136. *Id.*

137. 12 U.S.C. §1.

138. 12 U.S.C. Code §2.

b. The Government Corporation Model

While most financial regulators around the world adopt the government agency model, some of them differ by adopting the government corporation model, under which the financial regulator is a corporation wholly owned by the government.¹³⁹ Famous examples include the FDIC in charge of state banks that are not members of the Federal Reserve System in the United States¹⁴⁰ and the FCA in charge of conduct regulation of financial institutions in the United Kingdom.¹⁴¹

In general, government corporation regulators possess similar organizational features with government agency regulators in various aspects. First, similar to government agency regulators, government corporation regulators often enjoy the regulatory monopoly as well. For example, the FCA is the financial conduct regulator that regulates consumer protection, integrity, and competition in relevant financial markets in the United Kingdom.¹⁴² Within this mandate, it faces little or no competition from other financial regulators, which is similar to the case of Japan's FSA.¹⁴³

Second, similar to government agency regulators, government corporation regulators do not pursue profits because they do not have a distribution mechanism in place. That said, they generally maintain self-sufficient budgets thanks to the corporate structure. For example, the FDIC operates on a self-sufficiency basis. The banking industry in the United States fully funds the FDIC's operation; thus, taxpayers need not bear any costs of running the FDIC.¹⁴⁴ The FDIC will also assess the cost of

139. For a general discussion of government corporations, *see generally* A. Michael Froomkin, *Reinventing the Government Corporation*, 1995 U. ILL. L. REV. 543 (1995). *See also* Yueh-Ping (Alex) Yang, *Government Ownership of Banks: A Curse or a Blessing for the United States?*, 10 WM. & MARY BUS. L. REV. (forthcoming 2019).

140. Federal Deposit Insurance Act, §9(a) (U.S.). *See also* CARNELL ET AL., *supra* note 102, at 93-94.

141. Financial Services and Markets Act, Chapter 1, §1A (U.K.) (noting that FCA is a corporate body).

142. *Id.* Chapter 1, §§1B & 1F.

143. The FDIC, in contrast, is a different case due to the United States' fragmented regulatory structure. The FDIC is in charge of state banks that are not members of the Federal Reserve System. Since there are other multiple financial supervisors in the United States that are in charge of different types of banks, a bank's founders in the United States can choose whether to incorporate their banks as state banks and whether to join the Federal Reserve System in order to choose the financial supervisor. This introduces the supervisory competition in the United States. Therefore, the FDIC is less monopolistic. That said, this is due to the United States' unique supervisory structure, not the government corporation nature of the FDIC.

144. American Bankers Association, *Who Pays Deposit Insurance* (Mar. 2016), <https://>

conducting any regular or special examinations of depository institutions from the examined institution to meet the expenses in carrying out such examinations.¹⁴⁵ Similarly, the FCA also finances its operations using the fees collected from its chartered firms.¹⁴⁶ Although government corporation regulators do not pursue profits, their operation is inevitably limited by their operating revenue.

Third, the decision-making process of government corporation regulators is generally as rigorous as that of government agency regulators. Government corporations are functionally equivalent to government agencies. The FDIC itself acknowledges that it is “an independent *agency* created by the Congress to maintain stability and public confidence in the nation’s financial system.”¹⁴⁷ The FCA also acknowledges that it is “an independent financial *regulator*, accountable to the Treasury and Parliament.”¹⁴⁸ That said, to the extent that government corporation regulators are corporations that are organizationally independent of other agencies, they retain more autonomy in their decision-making process. Still, as quasi-agencies, they have to maintain a rather rigorous decision-making process.

Fourth, similar to government agency regulators, government corporation regulators can hardly offer a competitive pay package. After all, they are quasi-agencies that tend to benchmark their salary bands to that of government agencies. For example, the basic annual salary band for FDIC corporate managers and/or executives is between USD 115,635 and USD

www.aba.com/Tools/Economic/Documents/WhoPaysDepositInsurance.pdf [https://perma.cc/Y6PJ-PM39] (last visited June 25, 2018).

145. Federal Deposit Insurance Act, §10(e)(1) (U.S.).

146. FCA, *Fees and Levies*, <https://www.fca.org.uk/firms/fees> [https://perma.cc/U46E-FXH5] (last visited June 26, 2018). It is worth noting that the FCA’s executive board members and senior executives are eligible to be considered for a significant amount of performance-related award. According to the most recent FCA annual report, “from 1 April 2016 to 31 March 2017, the executive board members and senior executives were eligible to be considered for a performance-related award up to a maximum of 35% of average base salary applying during the previous year.” FCA, ANNUAL REPORT AND ACCOUNTS 2016/17, 96 (July 2017), available at <https://www.fca.org.uk/publication/annual-reports/annual-report-2016-17.pdf> [https://perma.cc/6KW4-HKCL] (last visited June 30, 2018). Whether such a performance-based remuneration for senior executives incentivizes profit-seeking behaviors remains empirically untested, but it is probably fair to say that even present some profits-driven activities within the government corporation, the legal mandate which legitimizes their activities still constrains them based on which of their activities are legitimized.

147. FDIC, *Mission, Vision, and Values*, <https://www.fdic.gov/about/strategic/strategic-mission.html> [https://perma.cc/Z6ZT-DDP2] (last visited June 26, 2018).

148. FCA, *Reporting to Treasury and Parliament*, <https://www.fca.org.uk/about/reporting-treasury-parliament> [https://perma.cc/RP4W-VL38] (last visited June 26, 2018).

291,065, according to the FDIC's 2018 Base Salary Structures.¹⁴⁹ This is just slightly above the salary band for OCC's managers and/or executives (which is between USD 78,572 and USD 282,500). Therefore, government corporation supervisors face similar disadvantages when competing for talent with the private sector.

Last but not least, government corporation regulators also face a significant degree of political pressure. They generally possess relative budgetary autonomy because they operate on a self-sufficient basis.¹⁵⁰ With regards to personnel, the major positions of government corporation regulators remain politically appointed. For example, the FDIC's board of directors consists of five members¹⁵¹ who are entitled to six-year term protection.¹⁵² That said, these five members consist of the Comptroller of the OCC, the Director of the CFPB, and three other members appointed by the President and confirmed by the Senate.¹⁵³ The composition of the FDIC's board of directors does not differ significantly from other government agency regulators in the United States. The FCA is similar in that the Treasury appoints its board of directors.¹⁵⁴ In general, government corporation regulators resemble independent government agency regulators in that their budget is relatively independent of politics yet their personnel remains profoundly captured by the politics.

The above illustration seems to suggest that the government corporation model is not much different from the government agency model. Nevertheless, the form of corporations *per se* still produces some meaningful differences. For one, the corporate form helps government corporation regulators retain some operational flexibility. In general, government

149. FDIC, *2018 FDIC Base Salary Structures*, <https://www.fdic.gov/about/jobs/2018cgc-mcxem.pdf> [https://perma.cc/TKM2-XYQQ] (last visited June 26, 2018).

150. To be sure, the budget of government corporation supervisors still faces some level of political scrutiny. For example, the FCA still needs to "report to the Treasury on our progress through our Annual Report. The Treasury then submits a report to Parliament that examines our performance against our statutory objectives, and how we have dealt with major regulatory cases." FCA, *Reporting to Treasury and Parliament*, <https://www.fca.org.uk/about/reporting-treasury-parliament> [https://perma.cc/RP4W-VL38] (last visited June 26, 2018). The FDIC is also required to annually submit a full report of its operations, activities, budget, receipts, and expenditures for the preceding 12-month period to the President of the Senate and the Speaker of the House of Representatives, who shall cause the same to be printed for the information of Congress. FEDERAL DEPOSIT INSURANCE ACT, §17(a)(1) and (2). The FDIC is further required to file other reports to the Treasury and the Office of Management and Budget. FEDERAL DEPOSIT INSURANCE ACT, §17(b) and (c).

151. FEDERAL DEPOSIT INSURANCE ACT, §2(a)(1).

152. *Id.* §2(c)(1).

153. *Id.* §2(a)(1).

154. FCA, *Reporting to Treasury and Parliament*, <https://www.fca.org.uk/about/reporting-treasury-parliament> [https://perma.cc/RP4W-VL38] (last visited June 26, 2018).

corporations are independent legal entities instead of organs of the government, which allows them some discretion in settling disputes, making contracts, holding property, borrowing, and issuing debts.¹⁵⁵ Some government corporations may further retain their annual earnings.¹⁵⁶ Moreover, some civil service laws do not apply to their staff in certain cases, which, at least, enhances the flexibility and attractiveness of their employment package.¹⁵⁷ This might partly explain why the FDIC can offer a slightly better pay package than the OCC. While government corporation regulators generally resemble government agency regulators in many aspects, they enjoy an enhanced operational autonomy. The price is such that enhanced autonomy might compromise the accountability of government corporation regulators to political pressure.¹⁵⁸

c. The Self-Regulatory Organization Model

Self-regulatory organizations (“SROs”) also play a key role in the financial world.¹⁵⁹ SRO typically refers to a non-governmental organization that has the power to create and enforce industry regulations and standards. They are particularly active in securities regulations such as listing and disclosure regulations: many stock exchanges are SROs incorporated by private industry participants rather than the government, and they regulate and supervise the listing process and the public companies listed.¹⁶⁰ Some SROs further assume the role of financial regulators and supervise financial firms. The most notable example is FINRA, a non-profit membership corporation which serves an industry association of brokers and dealers and

155. Froomkin, *supra* note 139, at 553.

156. *Id.* at 554.

157. *Id.* at 553-54.

158. For a discussion of the unclear accountability of the FDIC, *see generally* Adam Shajnfeld, *An Identity in Disarray: The Federal Deposit Insurance Corporation’s Government-Agency Status*, 128 BANKING L. J. 36 (2011).

159. There are four types of SROs in the securities markets of the United States: the national securities exchanges, the national securities association, registered clearing agencies, and the Municipal Securities Rulemaking Board. Securities Exchange Act of 1934, 15 U.S.C. §3(a) (26) (2018). For a discussion of the SROs in the securities industry, *see, e.g.*, Jonathan Macey & Caroline Novogrod, *Enforcing Self-Regulatory Organization’s Penalties and the Nature of Self-Regulation*, 40 HOFSTRA L. REV. 963 (2012) (providing a theoretical framework for understanding self-regulation and then discussing the court’s role in effectuating this process; Birdthistle & Henderson, *supra* note 101; Edwards, *supra* note 101; John I. Sanders, *Break from Tradition: Questioning the Primacy of Self-Regulation in American Securities Law*, 7 MICH. BUS. & ENTREPRENEURIAL L. REV. 93 (2017) (outlining the history of American securities laws).

160. For a discussion of how the SRO stock exchanges evolved in the United States, *see generally* Sanders, *supra* note 159

is now in charge of disciplining securities firms and brokers in the United States.¹⁶¹

Compared to government agency regulators and government corporation regulators, the organizational features of SRO regulators are relatively unique. Firstly, SRO regulators are not monopolistic. For example, there are currently twenty-one registered national securities exchanges registered in the United States competing for the market of listing supervision.¹⁶² Even FINRA, the sole SRO regulator in charge of disciplining brokers and dealers in the United States, faces the other parallel broker-and-dealer regulator, the SEC.¹⁶³ That said, the number of SRO regulators remains limited due to the prior approval requirement; thus, SRO regulators are mostly oligopolistic and face a limited level of competition.¹⁶⁴ The absence of a sufficient level of competition may trigger the race to the bottom concern.¹⁶⁵

Second, SRO regulators may or may not be profit-oriented. Some SRO supervisors, such as certain stock exchanges like the NYSE, are for-profit corporations that are permitted to distribute dividends to their stockholders. To maximize their profits, these SROs may have more incentive to consider the needs of the potential pool of regulated firms, which makes their regulatory activities better received by the regulated industry. That said, many SRO regulators are non-profit corporations. FINRA, for instance, is a non-profit corporation that does not allow the distribution of its earnings to any private individual.¹⁶⁶ It also funds its activities by industry fees without the support of any taxpayer dollars.¹⁶⁷ These non-profit SRO regulators more resemble government corporation regulators, which maintain self-sufficient budgets and do not pursue profits.

161. FINRA, *Rules and Guidance*, <http://www.finra.org/industry/rules-and-guidance> [<https://perma.cc/DDK5-2DLN>] (last visited June 26, 2018). For an introduction of the evolution of FINRA, see generally Birdthistle & Henderson, *supra* note 101.

162. U.S. SEC, Fast Answers: *National Securities Exchanges*, <https://www.sec.gov/fast-answers/divisionsmarketregmrexchangesshtml.html> [<https://perma.cc/4JND-UZB9>] (last visited June 26, 2018).

163. SEC still retains an independent regulatory power over brokers and dealers although it delegates most of its power to FINRA and takes a relatively deferent stance. JAMES D. COX ET AL., *SECURITIES REGULATION: CASES AND MATERIALS* 1026-27 (8th ed. 2017).

164. Some observers even observed that the market power of an SRO regulator is positively correlated with its enforcement power. “As market power goes up, so too does its power over the entities it regulates.” See generally Macey & Novogrod, *supra* note 159.

165. For a critic of the SRO regulator model, see, e.g., Sanders, *supra* note 159.

166. FINRA, *Restated Certificate of Incorporation*, art. Fourth (July 2, 2010) (providing that FINRA “is not organized and shall not be conducted for profit, and no part of its net revenues or earnings shall inure to the benefit of any individual, subscriber, contributor, or member.”)

167. FINRA, *FINRA 2018 Annual Budget Summary* (2018).

Third, the decision-making process of SRO regulators can be less rigorous. On the one hand, SRO regulators mainly represent the industry's overall interest, which streamlines the decision-making process. While SRO regulators are also concerned with the public interest in general, they are more prone to the interest of the regulated industry than government agency regulators or government corporation regulators.¹⁶⁸ This narrower focus, in turn, streamlines their decision process. SRO regulators are also led by industry leaders who experience a smaller informational gap with industry practices. Their enhanced experience with the industry helps shorten the information-gathering process and enhances decisional quality and efficiency. On the other hand, the due process requirement on SRO regulators is less stringent. Admittedly, SRO regulators still need to observe the basic fairness requirement when proceeding with their disciplinary processes. FINRA, for example, is required to "provide a fair procedure for the disciplining of members and persons associated with members"¹⁶⁹ This fairness requirement, however, is subject to a relatively modest level of judicial supervision and due process requirements.¹⁷⁰

Fourth, SRO regulators generally offer more attractive pay packages to their employees. For one thing, the staff of SRO regulators are not public officials; thus, their pay is not subject to the salary grade for public officials. This allows a more flexible pay structure. For example, FINRA maintains a somewhat competitive compensation program that includes base salary, incentive compensation, and benefits.¹⁷¹ Such flexible pay structure, in turn, increases the overall pay to the staff of SRO regulators. In FINRA's case, their top executives reportedly received one million to one and a half million U.S. dollars in 2016,¹⁷² which surpasses the salary received by the executives of OCC and FDIC by a significant amount. Admittedly, this salary level might remain incomparable to the pay for private executives. It does,

168. To be sure, the industry interest here refers to not only the short-term self-interest of the industry but also the long-term reputational interest of the industry. To the extent that SRO regulators concern the latter, they would not narrowly focus on relaxing the regulatory burden of the supervisees, but would instead streamline the regulatory process to strike a more delicate balance of the cost and benefit of financial supervision.

169. Securities Exchange Act of 1934, 15 U.S.C. §15A(b)(8) (2018).

170. COX ET AL., *supra* note 163, at 1025-26 (introducing the *First Jersey Securities Inc. v. Bergen* case, in which the court dismissed the respondent broker-dealer's claim that the disciplinary process breaches due process because the disciplinary panel is made up of its business competitors).

171. *Compensation*, FINRA, <https://www.finra.org/about/compensation> [<https://perma.cc/2KJG-GWZU>] (last visited June 27, 2018).

172. Mason Braswell, *FINRA Freezes Executive Pay as Revenue Declines*, ADVISORHUB (July 5, 2017), <https://advisorhub.com/finra-freezes-executive-pay-revenue-declines/> [<https://perma.cc/X7X4-58PL>].

however, represent a significant increase when compared to government agency regulators and government corporation regulators.

Last but not least, SRO regulators are more independent of the politics than of the industry. Regarding the budget, as mentioned previously, SRO regulators rely on its finance instead of government appropriations. More importantly, their budget is not subject to further governmental scrutiny. In FINRA's case, it was not until 2018 that they published their annual budget to the public for the first time.¹⁷³ Regarding personnel, the major positions of SRO regulators generally consist of industry representatives whose appointment is not subject to any political approval. In FINRA's case, its board of governors consists of ten industry members representing different industrial sectors, fourteen public members determined by the board of governors, and the chief executive officer.¹⁷⁴ The government does not intervene in the appointment of any board member. Due to this relative autonomy in budget and personnel, SRO regulators are more independent of politics. Therefore, they can be less disturbed by the different political interests represented by politicians and exercise their expert judgment unfettered by some populist voices. The price, in contrast, is the reduced accountability to the general public. SRO regulators could prioritize the industry interest over public interests.¹⁷⁵

The above illustration suggests that the SRO model is more market- and industry-oriented, facing less public scrutiny and holding less public accountability. Inevitably, this model triggers the concern that the regulated industry might capture the SRO regulators and compromise the quality of regulation and supervision. The SRO model builds in two mechanisms to mitigate this concern. The first one is a public mechanism. SRO regulators remain subject to the supervision of a public regulator. Taking the FINRA for example, the SEC possesses the power to supervise FINRA by, for instance, chartering FINRA and reviewing FINRA's rulemaking.¹⁷⁶ To some extent, one can say that the SEC delegates its regulatory power to FINRA and shifts its mission from directly supervising broker-dealers to

173. News Release of *FINRA Publishes Budget Summary and Financial Principles for First Time*, FINRA (Jan. 18, 2018), <http://www.finra.org/newsroom/2018/finra-publishes-budget-summary-and-financial-principles-first-time> [https://perma.cc/WZG8-JU8N].

174. *FINRA Board of Governors*, FINRA, <https://www.finra.org/about/finra-board-governors> [https://perma.cc/NW6X-YK2C] (last visited June 26, 2018); *Restated Certificate of Incorporation*, art. Eighth, FINRA, (July 2, 2010) http://finra.complinet.com/en/display/display.html?rbid=2403&element_id=4589 [https://perma.cc/YFE2-VVEG].

175. Edwards, for instance, observed this phenomenon in the FINRA practice. See generally Edwards, *supra* note 101 (alleging that FINRA's structure is such that FINRA is more aligned with the industry rather than with the public).

176. Securities Exchange Act of 1934, §15A(b), 15 U.S.C. §78(o-3) (2018).

indirectly supervising FINRA. Naturally, such a mechanism risks the potential that the SEC over-defers to FINRA.¹⁷⁷ The second one is a market mechanism. SRO regulators regulate the industry for the benefit of the industry, including the short-term and long-term benefits. Therefore, they should consider not only the interest of individual firms but also the long-term development of the whole industry. If SRO regulators egregiously ignore its mandate, the whole industry might lose the public's trust, which jeopardizes the industry's long-term development. Worse than that, the legislative branch or the government regulator might take back the regulatory power delegated to the SRO regulators. While this market mechanism is not perfect as well, it more or less prevents SRO regulators from outrageously abusing their power.

d. The Delegated Gatekeeper Model

The above three models, in general, adopt a centralized model which leaves the task of financial regulation and supervision to a single, or several, entities. This is unsurprising; after all, centralization is the standard feature of financial regulation and supervision. That said, world financial regulators, in practice, also adopt decentralized ways to streamline their mandate. When examining the compliance of the regulated financial institution, many financial regulators delegate its examination power to private gatekeepers. In some cases, financial regulators even allow the regulated financial institutions to select the examiner, such as external auditors. We term this model as a “delegated gatekeeper model” because the power of the examiner is delegated from the financial regulator.¹⁷⁸

We use the law and practice in Taiwan as an example as we observe an interesting shift. Since 1992, Taiwan's banking regulator, the Ministry of Finance, may appoint private professionals, especially accountants, to examine the business and finance of banks on the regulator's behalf, and the examined banks undertake the examination fee.¹⁷⁹ In the implementation, however, the banking regulator largely delegated this appointment power to

177. For this observation, *see, e.g.*, Sanders, *supra* note 159, at 114 (describing the shift in the balance of power away from the SEC and towards FINRA).

178. For related studies, *see, e.g.*, THE WORLD BANK CENTRE FOR FINANCIAL REPORTING REFORM, BANKING SUPERVISORS AND EXTERNAL AUDITORS: BUILDING A CONSTRUCTIVE RELATIONSHIP (2015) (presenting the findings of a survey on external auditors and banking supervision); Donato Masciandaro & Davide Romelli, *Banking Supervision and External Auditors: What Works Best?* (BAFFI CAREFIN Centre Research Paper Series, No. 2017- 46, 2016) (examining the advantages and disadvantages of using external auditors in banking supervision).

179. BANKING ACT, art. 45 (Taiwan).

each examined bank, under which each bank may designate qualified accountants, subject to the regulator's consent, to examine its business and finance.¹⁸⁰ The banking regulator and the accountant would negotiate the examination fee based on the hourly rate as negotiated between the examined bank and the appointed accountant.¹⁸¹ When paying the fee, the examined bank must pay the fee to the banking regulator for the latter to pay the appointed accountant.¹⁸² Under this design, the examined banks are entitled to, first, select the examining accountant, and second, negotiate the hourly rate of the examination fee. Therefore, they possess considerable leverage. The banking regulator, however, retains some counterbalance tools. For example, it can disapprove the accountant selected by the examined bank *ex-ante*, negotiate the final amount of examination fee *ex-post*, and control the final payment of the examination fee. This model is more like a "supervisee-supervisor gatekeeper" one, under which the regulated banks and the regulator co-appoints the delegated gatekeeper.

Taiwan's banking regulator further delegates its supervisory power after introducing the internal control of banks since 2000.¹⁸³ Banks in Taiwan now must retain external accountants to audit its internal control annually and report to the regulator the internal control, legal compliance, etc. of the audited bank.¹⁸⁴ Taiwan's banking regulator can further require a bank to retain accountants to audit the personal data protection and anti-money laundering mechanism of the bank.¹⁸⁵ The audit fee is, again, undertaken by the audited bank and negotiated between the audited bank and the auditing accountant.¹⁸⁶ Notwithstanding the above, the banking regulator retains the discretion to change the auditing accountant *ex-post* and request a re-audit.¹⁸⁷ Under this design, the audited banks possess even more leverage. They now dominate the appointment process because the regulator is no longer involved in the appointment of auditing accountants, and they now dominate the auditing fee because the regulator is no longer involved in the negotiation of the fee as well. The banking regulator, instead, can only counterbalance the delegated gatekeepers by reviewing the audit results and changing the auditing accountant *ex-post*. This model is more like a

180. REGULATION ON THE MINISTRY OF FINANCE'S APPOINTMENT OF ACCOUNTANTS FOR EXAMINING FINANCIAL INSTITUTIONS, art. 6(2) (Taiwan).

181. *Id.* art. 22(1) and (2).

182. *Id.* art. 22(3).

183. BANKING ACT, art. 45-1 (Taiwan).

184. IMPLEMENTATION RULES FOR THE INTERNAL CONTROL AND AUDITS OF FINANCIAL HOLDING COMPANIES AND BANKS, art. 28(1) (Taiwan).

185. *Id.* art. 28(2).

186. *Id.* art. 28(3).

187. *Id.* art. 29.

“supervisee gatekeeper” one, under which the regulated financial institution appoints the delegated gatekeeper generally at its discretion.

Compared to the government agency model, the government corporation model, and the SRO model, the delegated gatekeeper model is undoubtedly more private. To begin with, it is not monopolistic at all. All private gatekeepers, such as all accounting firms, are eligible to compete for this supervision market. Specifically, they compete for the supervisee’s appreciation of their examination or auditing service because it is the supervisee that primarily decides the appointment and compensation. They, however, also compete for the financial regulator’s affirmation because the regulator still retains the right to consent to the selection *ex-ante* or to cancel the selection *ex-post*. Therefore, they adapt to the needs of the regulated financial institutions on the one hand but are concerned with the financial regulator’s perception of them on the other hand.¹⁸⁸

Second, these gatekeepers are relatively profit-driven. They are business organizations that pursue profits from their operation. To maximize their business profits, they have more incentive to improve their examination service to adapt to the regulatory needs of the industry, including adopting or even developing new RegTech solutions. They also maintain a flexible budget that can expand their staff size to ensure their examination or auditing quality as long as it is cost-efficient. Therefore, these gatekeepers can overcome the under-staffing and under-enforcement problems that plague government regulators. On the other hand, their profit motive, combined with the appointment and compensation power of the supervisee, would inevitably misalign these gatekeepers’ interest with the supervisees’ interest instead of the public interest. To mitigate this concern, the government regulator inevitably has to play the fireproof wall here.

Third, the decision process of the delegated gatekeepers can be less rigorous. On the one hand, their decision involves less public concern. After all, they are private entities that do not apply the due process mandate, and their accountability to the public derives mainly from their accountability to

188. This is similar to the problems of credit rating agencies as exposed in the Global Financial Crisis. For a discussion of the credit rating agencies, *see generally* Nina Dietz Legind & Camilla Horby Jensen, *The European Regulation of Credit Rating Agencies*, 30 L. CONTEXT: A SOCIO-LEGAL J. 114 (2014) (examining the advantages and disadvantages of Europe’s attempts to regulate credit agencies after the financial crisis); Frank Partnoy, *What’s (Still) Wrong with Credit Ratings*, 92 WASH. L. REV. 1407 (2017) (addressing three areas of concern with credit rating agencies after the financial crisis and proposing reduced reliance on credit ratings and more oversight of these agencies to solve these problems); Lawrence J. White, *Markets: The Credit Rating Agencies*, 24:2 J. ECON. PERSPECTIVES 211 (2010) (discussing the history of credit rating agencies leading up to the financial crisis and proposing two possible policy changes in response to the credit rating industry).

government regulators. On the other hand, they take a relatively limited amount of time. They are typically paid by the hour, and they negotiate their fees with the supervisees; thus, the time they devote to the examination depends on the supervisees' budget. Accordingly, the decision process of gatekeepers is generally more flexible and more adaptive to the examined financial institution rather than the public. The advantage is that this can formulate a more efficient examination or auditing process that can deal with a more massive amount of cases, while the disadvantage is that the examination or audits made under this model might be less comprehensive.

Fourth, the delegated gatekeepers possess more top talents. They are private business entities that attract top talents in the industry through attractive pay packages. By delegating the supervision to these gatekeepers, the government regulator indirectly retains top talents in the private sector to conduct financial supervision while the examined financial institution undertakes the cost.

Last but not least, gatekeepers are generally less independent of the examined financial institution. The examined financial institutions generally dominate the appointment and pay of gatekeepers, which makes gatekeepers more adaptive to their needs.¹⁸⁹ Although legally speaking, the government regulator can control this potential capture by imposing reputational and/or actual sanctions on the misbehaved gatekeepers, such threat of sanction is less credible because the government regulator itself faces serious informational asymmetry and budget restraint. The debate over credit rating agencies, especially the movement away from the regulatory reliance on credit rating agencies after the Global Financial Crisis,¹⁹⁰ is telling of the potential limits of the delegated gatekeeper model.

189. For example, the New York State Department of Financial Services has repeatedly found auditing and consulting firms acceded to the examined financial institutions' demands and compromised their professional standards. *See, e.g.,* N.Y. ST. DEPT. FIN. SERVICE. *Settlement Agreement In the Matter of PricewaterhouseCoopers LLP*, 3 (2014) (finding that "[t]he Department and PwC agree that PwC's work as a consultant for the Bank in this matter did not demonstrate the necessary objectivity, integrity, and autonomy that is now required of consultants performing regulatory compliance work for entities supervised by the Department. At BTMU's request, PwC removed from a draft of the HTR Report a statement that, had it known from the outset of the HTR about BTMU's written instructions to strip wire messages, PwC would have recommended that BTMU undertake a forensic review of its wire transfers. PwC should have included such an express statement of its views in the HTR Report to ensure complete disclosure to the Department of potential serious limitations on the HTR process in light of the written instructions. Furthermore, PwC repeatedly acceded to the Bank's demands and redrafted the HTR Report in ways that omitted or downplayed issues of material regulatory concern.")

190. For a discussion of the regulatory reliance problem of credit rating agencies, *see generally* Partnoy, *supra* note 188 (discussing how regulated institutions continue to rely on credit ratings despite Congress's attempts to remove credit rating agency regulatory licenses).

C. Summary

Based on the above illustration, we can sum up the different organizational models of financial regulators into the table below.

Table 1: Comparison of the Current Organizational Models of Financial Regulators

	Government Agency	Government Corporation	Self-regulatory Organization	Delegated Gatekeeper
Competition	Monopolistic	Monopolistic	Oligopolistic	Competitive
Profit Orientation	No	No	Low/Moderate ¹⁹¹	High
Decision Process	Rigorous	Rigorous	Less than Rigorous	Flexible
Pay	Low	Low	Moderate	High
Public Accountability	Strong/High ¹⁹²	High	Moderate	Low/Little ¹⁹³

There are three notes worth highlighting here. First, we can further subdivide the category of Government Agency into non-independent ones and independent ones. The former are subject to greater scrutiny from politics and are thus more accountable to the public. Second, we can also subdivide the category of Self-regulatory Organization into profit SROs and non-profit SRO. The latter is less profit-oriented than the former. Third, we can subdivide the category of Delegated Gatekeeper into supervisee-supervisor ones and supervisee ones. The latter incurs more capture from individual supervisees and are thus less accountable to the public than the former.

IV. INNOVATING THE ORGANIZATIONAL MODELS OF FINANCIAL REGULATORS FOR THE REGTECH ERA

The above comparison lays down a foundation for us to theorize the organizational models of financial regulators. Specifically, we can depict a public-private spectrum, ranging from a pure public-dominated model (like the government agency model) to a relatively private-dominated model (like

191. "Low" is used for non-profit SROs while "Moderate" is for for-profit SROs.

192. "Strong" is used for non-independent government agencies while "High" is for independent government agencies.

193. "Low" is used for supervisee-supervisor gatekeepers while "Little" is for supervisee gatekeepers.

the delegated gatekeeper model). Based on this theory, we can innovate more potential public-private partnership models of financial regulators that may suit the RegTech era.

A. Theorizing the Public-Private Spectrum of Financial Regulators

As mentioned previously, to use RegTech effectively and efficiently, a financial regulator needs to be flexible and adaptive in its operation on the one hand and accountable to the public interest on the other hand. This, however, seems to be a Gordian knot for both public and private regulators. As illustrated previously, public regulators, such as government agency regulators and government corporation regulators, are generally more accountable to the public, but they are poor in operational efficiency due to their low competition, non-profit nature, due process mandate, and low pay packages. In contrast, private regulators, such as SRO regulators or private gatekeepers, are more flexible and adaptive in their operation yet less accountable to the public. No one is perfect. We might have to recognize that there is an inevitable tradeoff between the operational flexibility and the public accountability, or more specifically, a tradeoff between private elements and public elements. The real question, then, is how to strike a delicate balance between the two.

a. The Transaction Cost Economics and Comparative Institutional Analysis

Each organizational model of financial regulators possesses some public and private elements interacting with each other. To simplify the analysis, we may posit the government (which represents the public elements) at the center and observe how the government interacts with other non-governmental actors (which represent private elements). In this way, we boil down the question into the choice of *forms* for the government to transact for the services from non-governmental actors to conduct financial regulation and supervision.

The Transaction Cost Economics have long studied this choice of transaction form question and have developed a sophisticated theory for it. Tracing back to the famous Theory of the Firm developed by Ronald H. Coase in 1937, Coase explained that firms exist because it is a *centralized* form of transaction that can save the transaction costs typically involved in the decentralized contracting relationships, including the search and information costs, bargaining and decision costs, policing and enforcement

costs.¹⁹⁴ According to Coase's theory, "firms will emerge to organize what would otherwise be market transactions whenever their costs were less than the costs of carrying out the transactions through the market."¹⁹⁵ Accordingly, the choice between a centralized or decentralized form of transactions, that is, firms or contracts, primarily depends on the relative transaction costs involved.

To further elaborate the Theory of the Firm, the Transaction Cost Economics, contributed significantly by Oliver E. Williamson, developed a theoretical framework for comparing different forms of transactions.¹⁹⁶ Specifically, Williamson depicted a spectrum for conducting a comparative institutional assessment of discrete institutional alternatives, "of which classical market contracting is located at one extreme; centralized, hierarchical organization is located at the other; and mixed modes of firm and market organization are located in between."¹⁹⁷ This spectrum analysis illustrated more possible forms of transactions.¹⁹⁸ More importantly, Williamson offered a theory for explaining the conditions under which different forms of transactions work more efficiently. In particular, he identified asset specificity as the most decisive element for choosing between contracts and firms; when the transacted asset is more specific in the sense that the investment in such asset is less re-deployable, transacting it through the form of firms are more favorable than the form of contracts.¹⁹⁹ On the other hand, Williamson also identified the limits of firms; for example, the form of firms may involve incentive problems, with the agency problem as the notable instance, as well as other bureaucracy costs.²⁰⁰ Williamson's theory thus further boils down the choice between different forms of transactions into a calculation of the factors of asset specificity, incentive problems, and other bureaucracy costs.

We may apply the above theories to conduct a comparative institutional analysis of the different organizational models of financial regulators. To do

194. See generally R.H. COASE, THE FIRM, THE MARKET, AND THE LAW 33-55 (1988) (examining how firms and markets respond and act in regard to transaction costs).

195. *Id.* at 7.

196. See generally OLIVER E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM (1985) (studying economic organization through the lens of transaction costs and applies the theory of transaction cost economics to various institutions and public policy arguments).

197. *Id.* at 42.

198. See *id.* at 72-79 (explaining which transactions require either trilateral, bilateral, or unilateral governance).

199. *Id.* at 90-96.

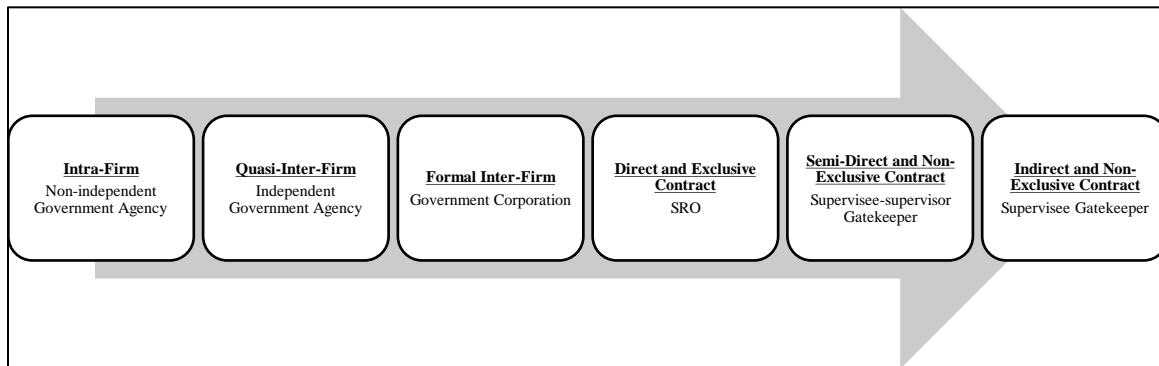
200. *Id.* at 131-47; WILLIAMSON, *supra* note 196, at 148-53. For a discussion of the agency problem and incentives, see generally Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3:4 J. FIN. ECON. 305, 305 (1976) (pioneering the study of the agency problem).

it, it may be useful to first reflect on how the current organizational models of financial regulators are situated.

b. **Depicting a Firm-Contract Spectrum based on the Current Models**

To facilitate the analysis, we use a spectrum such as that depicted below to illustrate the different forms of transaction made between the government and non-governmental actors in the context of financial regulation and supervision. Interaction in the form of firms suggests a control and command relationship, under which the government more strongly dominates the non-governmental actors, whereas an interaction in the form of contracts suggests an equal and autonomous relationship, under which the government less strongly dominates the non-governmental actors. The chart below depicts our observation of the current organizational models of financial regulators, with the left-most one referring to the most firm-type relationship while the right-most one refers to the most contract-type relationship.

Chart 1: The Firm-Contract Spectrum of the Current Organizational Models of Financial Regulator



The left three organizational models of regulators present a public-private interaction that adopts the form of firms. Non-independent government agencies feature an intra-firm interaction. They recruit private talents into the agencies and subject them to all civil official rules, due process mandates, personnel and budgetary control, etc. Private talents essentially become components of the government agency subject to the government's direct control and command. Thus, we categorize it as an "Intra-Firm" relationship. In contrast, government corporations feature an inter-firm interaction. Although the government can similarly exert control

and command over government corporations and their staff, the corporate form of government corporations has its merits. As mentioned previously, the corporate form at least preserves some autonomous space for government corporation regulators. The relationship between the government and government corporations resembles that between a parent company and its subsidiary company. Although the former can exert a significant level of command and control over the latter, it is different from the intra-firm command and control. Therefore, we categorize it as an “Inter-Firm” relationship.

Independent government agencies, lying somewhere in the middle, are somewhat tricky. In form, they are similar to non-independent government agencies and should feature an intra-firm relationship as well. In substance, however, since they generally retain budgetary autonomy and, in many cases, operational autonomy, they somehow cut off the private talents recruited into these agencies from the direct control and command from other agencies. To that extent, independent government agencies are essentially *separate firms* that are independent of other government agencies. Therefore, we categorize it as a “Quasi-Inter-Firm” relationship.

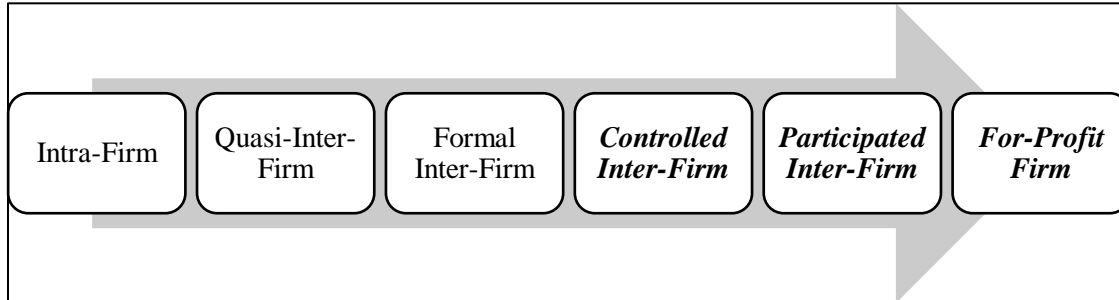
In contrast, the three right-most organizational models of regulators present a public-private interaction that adopts the form of contracts. Neither the SROs nor the gatekeepers are part of the government; instead, they exert the regulatory and supervisory authority due to the government regulator’s delegation, which is functionally a contract. Therefore, private talents in these regulators are subject to significantly less command and control from the government. Among these three regulators, the government exerts the most contractual control on SROs since it is in charge of chartering the SROs, reviewing the rules of SROs, and granting them an exclusive or nearly exclusive power to regulate others. Therefore, SRO regulators contract directly with the government for nearly uncontested regulatory power. In contrast, in the cases of supervisee gatekeepers, the government does not directly contract with these gatekeepers as it is the examined financial institution which retains these gatekeepers. Each private gatekeeper does not possess uncontested regulatory power as well considering that it has to compete for the examination or audit market with other private gatekeepers. Therefore, they contract indirectly with the government for a contested regulatory power. Finally, the supervisee-supervisor gatekeepers are in the middle. They generally resemble supervisee gatekeepers whose regulatory power is contested. The main difference is that, while the government does not select the gatekeepers in its initiative, it retains an *ex-ante* consent right. To that extent, they contract with the government in a rather semi-directly manner.

c. Detailing the Firm-Contract Spectrum

The firm-contract spectrum can undoubtedly contain more than these types of public-private interactions. In particular, many possibilities lie in the middle of the current firm-type and contract-type models. Below we attempt to detail the firm-contract spectrum and spot out a greater number of possible types of public-private interactions.

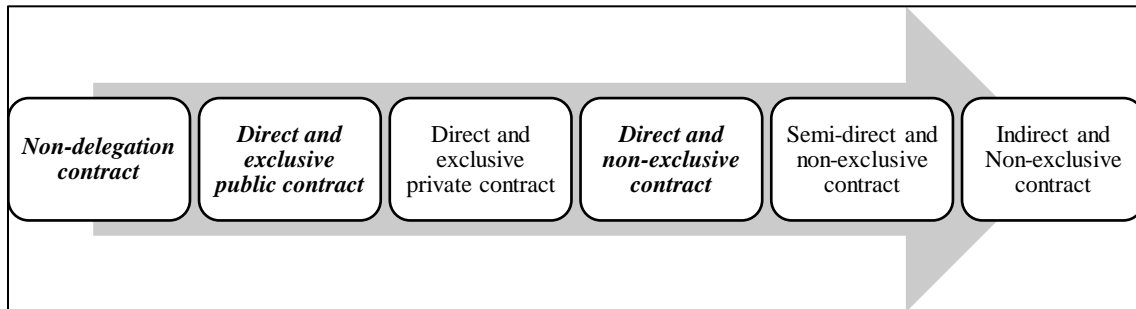
Let us start by expanding the form of firms. The current models of firm-type financial regulators are mostly non-profit entities that are wholly-owned or controlled by the government, which features dominant control and command by the government. There are, however, other possibilities, especially the ones with less governmental control and command. For instance, using a mixed-ownership structure can water down governmental control and command in the operation of the government corporation regulator. Instead of forming a government-wholly-owned corporation, the government owner can allow other investors to invest in this government corporation regulators. The government subsequently remains the controlling owner of this corporation and dominate its operation, but other investors might introduce some non-governmental elements causing different organizational chemistry. We term this model as the “Controlled Inter-Firm” model. The government can even let other investors dominate the operation of this government corporation and play merely the role of a block-holder or active shareholder by, for example, appointing public interest directors (who are not government officials) on the board. We term this model as the “Participated Inter-Firm” model. In addition to streamlining the ownership structure of a government corporation, we can also streamline the mandate of a government corporation. For instance, instead of forming a non-profit government corporation, a government can form a for-profit government corporation to undertake the regulatory mandate. We term this model as the “For-Profit Firm” model. Different mandates can also bring different chemistry to the quality of financial regulation and supervision. Chart 2 below illustrates these points, with the **bolds** and *italics* highlight the expanded types.

Chart 2: The Expanded Firm-Type Interaction



Now let us turn to the formation of contracts. To begin with, under the current contract-type models, the government generally delegates a large part of its regulatory power to private entities. The government, however, can also sign a non-delegation contract with private entities, under which the government only asks private entities to play a supportive role instead of delegating the regulatory power to private entities. Under this model, the government dominates the regulatory power or only “shares” its regulatory power with private entities in a limited scope, which ensures more public accountability but at the same time introduces some private elements. We term this model the “Non-delegation Contract” model. Alternatively, the government can delegate some of its regulatory power to another public or quasi-public entity, such as a public university, national laboratory, or national research institute, instead of a private entity like an industrial association or private gatekeeper. Public or quasi-public entities with strong research and technology capacity are potentially suitable for enabling RegTech-based regulatory and supervisory approaches as their organizational competence allows them to develop and validate RegTech solutions more effectively. Such delegation can also mitigate the public accountability concern. We term this model the “Direct and Exclusive Public Contract” model. Lastly, even though the government delegates to a private gatekeeper on a non-exclusive basis, it can contract directly with the private gatekeeper instead of indirectly through the supervisees. This can reduce the potential of supervisee capture. We term this model the “Direct and Non-Exclusive Contract” model. Chart 3 below illustrates these points, with the bold and italics highlight the expanded types.

Chart 3: The Expanded Contract-Type Interaction



To be sure, we do not claim the superiority of any model to the others. What we attempt to do here is merely to explore the potential organizational models of financial regulators as possible in a systematic way. We understand that it is nearly impossible to theorize a perfect model in abstract, and we do not even intend to judge the current models. In the end, an economy needs to assess which model is more suitable for itself based on its context and complementary institutions in light of the asset specificity, incentive, and bureaucracy costs as cautioned by Williamson.

B. Innovating the Potential Models of Financial Supervisors for the RegTech era

Based on the above discussion, we can identify some potential organizational models of financial regulators for the RegTech era.

a. A mixed-ownership RegTech corporation

Drawing reference from the Inter-Firm models as shown in Table 2, the government regulator can promote the adoption of RegTech solutions by founding a RegTech corporation. Besides, the regulator can consider co-founding it with some private entities such as information technology corporations, financial institutions, or even telecommunication firms. In designing the ownership structure of this corporation, the government regulator can be either the majority owner that controls its operation or a minority block-holder that plays an influential yet non-dominant role in its operation. Moreover, this corporation can be either for-profit or non-profit.

This approach is not without any precedents. Many stock exchanges around the world maintain a mixed ownership structure, under which the

government shares ownership with private investors.²⁰¹ Federal Reserve Banks in the United States might also fit in this category as their management power is shared between the public Federal Reserve Board of Governors and the private member banks.

b. A Contracted RegTech Supporter

Drawing reference from the Non-Delegation model as shown in Table 3, the government can promote the adoption of RegTech by signing a technical support contract with other technology providers. Under this approach, the government regulator remains to hold its regulatory power, but private entities can technically support its exercise of supervision. For instance, the government regulator can retain a private company to develop a privately-run RegTech-based platform through which the regulator receives real-time (or in close real-time) updates and alerts on the noncompliant activities and suspicious transactions of regulated financial institutions. Austria's Central Bank, Oesterreichische Nationalbank ("OeNB") provides a good example of this approach. In 2014, the OeNB collaborated with the Austrian banking industry to implement an innovative approach of regulatory reporting. They created a software platform which operates as a central interface between the OeNB and the banks to achieve standardization of data collection.²⁰² Through the creation of a company entity (Austrian Reporting Services GmbH ("AuRep")) co-owned by the seven largest banks in the country, the OeNB, in essence, retains a private company and utilizes the software platform operated by the company to facilitate automatic collection of granular bank data.²⁰³

The above example aside, this approach is also similar to government procurement of products and services from a functional perspective. Despite all these nuances, the critical point is that, under this approach, the

201. For instance, the major shareholders of Taiwan Stock Exchange consist of both state-owned companies and private companies in Taiwan. The former include the Bank of Taiwan (10.01% shareholding), Mega International Commercial Bank (8.00% shareholding), Taiwan Cement (6.63% shareholding), First Bank (3.00% shareholding), the Land Bank of Taiwan (2.99% shareholding), Taiwan Sugar (2.99% shareholding), etc. The latter include the CDIB Capital International (7.00% shareholding), Yuanta Securities (6.44% shareholding), Jihsun Securities (3.26% shareholding), Fubon Securities (2.06% shareholding), etc.).

202. See Maciej Piechocki & Tim Dabringhausen, *Reforming Regulatory Reporting - From Templates to Cubes*, IFC workshop on "Combining Micro and Macro Statistical Data for Financial Stability Analysis. Experiences, Opportunities and Challenges" Warsaw, Poland, 14-15 Dec 2015, 3, <https://www.bis.org/ifc/publ/ifcb41o.pdf> [<https://perma.cc/DRF6-UXPJ>] (last visited July 1, 2018) (examining a new method of regulatory reporting through a data-input model that involves the regulator and the regulated).

203. *Id.* at 3

government regulator remains the one that disciplines noncompliant activities or supervises regulatory reporting, but private companies can provide tremendous technical support to it.²⁰⁴

c. A Quasi-Public Regulator Employing RegTech

Drawing reference from the Direct and Exclusive Public Contract Model as shown in Table 3, if the government regulator intends to delegate part of its supervisory power to another entity, it can consider delegating it to a quasi-public entity. That is, instead of following the current SRO model and delegating the regulatory power to a private industry association, which invites the critics of industrial capture, the government regulator can delegate it to other entities with more public nature. Potential candidates may include universities, national research institutes, NGOs, or even social enterprises, among others, whose operation is more public-interest-oriented and less industry-oriented.

There can be some potential for this approach. For example, the Risk Management Institute of the National University of Singapore developed the Credit Research Initiative, which is a non-profit initiative that provides public credit rating information.²⁰⁵ The government regulator can, for instance, delegate the supervision of credit risks to such kind of entities.

d. Directly-Delegated Gatekeepers

Drawing reference from the Direct and Non-Exclusive Contract Model as shown in Table 3, if the government regulator intends to delegate the examination or audits to private gatekeepers, it can consider doing it on its own. That is, instead of allowing the examined financial institutions to select private gatekeepers to examine their books or records, which invites the critics of supervisee capture, the government regulator can select and pay private gatekeepers directly on its initiative. The fee to be paid, however, can remain undertaken by the examined financial institutions. This approach might play an increasingly important role in the era of FinTech as more supervisees will engage with third-party providers to deliver innovative

204. See Dou Shicong, *Tencent Partners Shenzhen Government to Regulate Financial Security*, YICAI GLOBAL (Dec. 19, 2017), <https://www.yicai.com/news/tencent-partner-s-shenzhen-government-to-regulate-financial-security> (describing when the Shenzhen Municipal Government Financial Services Office recently partnered with Tencent Holdings to develop a financial security big data platform to regulate financial security in Shenzhen).

205. See Credit Research Initiative, <https://www.rmcri.org/en/home/> [<https://perma.cc/7UAZ-ZHZK>] (last visited June 30, 2018) (advocating the usage of big data analytics to create credit ratings).

financial services and to develop technological solutions in order for ensuring regulatory compliance. The regulator, in response, will need to ensure that the supervisee has employed proper internal and external safeguards to mitigate third-party risk, cyber risk and the like. In that case, the regulator cannot rely merely on the supervisee to select and retain its private gatekeeper as potential conflicts of interests may arise and deviate the private gatekeeper from adhering to professional standards.

IV. CONCLUSION

In the era of RegTech, financial regulators need innovation in not only the ways of regulation and supervision but also the organizational models of those who carry out such regulation and supervision. The success of RegTech development depends not only on the technology and its application but also on the organization and people running the RegTech solution. To help figure out a proper organizational model of financial regulators in the RegTech era, in this paper, we summarize the experience of the current organizational models of financial regulators, theorize a public-private spectrum of financial regulators, detail this spectrum, and identify more potential models of financial regulator. While we do not claim the superiority of any model to others, the analyses of this paper delineate a theoretical foundation for financial regulators across the globe to consider a model that suits its own regulatory and supervisory needs.