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Dynamic Financial Markets, Static Regulatory Frameworks

James A. Haley



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About the Author

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From 2003 to 2006, he was research director of the International Department of the Bank of Canada. In this capacity, he advised the governor and deputy governor on international economic and financial market developments, external imbalances, IMF reform and related policy issues. From 1993 to 1996, he was a senior economist in the research and European departments of the IMF. He obtained his B.A. in economics from Carleton University in Ottawa, Ontario, and received his graduate training in economics at Queen's University in Kingston, Ontario. He has lectured on macroeconomics, international finance and international financial institutions at the McCourt School of Public Policy, Georgetown University, and the Norman Paterson School of International Affairs, Carleton University. His published work focuses on international financial issues, the IMF and sovereign debt restructuring.

Executive Summary

Financial ecosystems around the globe are in flux, driven by technological innovations that have spawned new products, services and financial market players. These changes offer the prospect of increased competition and lower costs, but also the potential for increased financial fragility. Recent innovations may also blur demarcations between different institutional groupings. Yet most prudential regulatory frameworks remain anchored in legally defined entities. This combination of dynamic markets and static regulatory frameworks could lead to increased risks of regulatory arbitrage, or the migration of risks to less-regulated players. An approach to regulation that focuses on the underlying risks of activities or functions, rather than on legally defined institutional groupings, could reap the enormous benefits that financial innovation offers while mitigating financial instability risks.

Introduction

Financial ecosystems around the world are constantly changing. New entrants exploiting technological innovations are introducing products and business models that connect borrowers directly with lenders. Large technology firms leveraging huge databases offer new services in competition with established firms. And incumbent firms are responding to changes in their operating environments by adopting new technologies and tailoring financial products and services to meet the demands of the evolving marketplace. The pace of developments is dizzying.

Yet in contrast to the rapid pace of ongoing change in financial systems, regulatory frameworks have remained largely unchanged, reflecting the financial system of the past rather than the system of the future. Some readers may question this assessment, pointing to the reforms introduced by the Basel Committee on Banking Supervision in response to the global financial crisis (GFC), which admittedly represent the most comprehensive regulatory initiative since the Great Depression. But these post-crisis reforms to bank regulation and supervision do not apply uniformly across the various players

in the financial system, nor do they reflect evolving practices and the growth of new firms operating outside the regulatory perimeter. And while post-crisis reforms were introduced across the financial system at the behest of the Financial Stability Board, the fact is that prudential regulation remains anchored to legally defined entities — institutions — at a time when the demarcation between different institutional types is increasingly blurred by new financial products and services.

This combination of dynamic markets and static regulatory frameworks is the source of two key policy challenges. The first challenge is large — potentially unparalleled — changes in the competitive environment that threaten not only to tilt the playing field but also to upset it entirely. The second looming policy challenge is an increased threat of systemic risk and financial instability in the new ecosystem. As outlined below, the existing approach to regulation based on institutional type encourages the migration of risks to less well-regulated and supervised institutions lacking the capital and liquidity buffers needed to absorb shocks. The financial market dysfunction in March 2020, at the outbreak of the COVID-19 pandemic, for example, shows the possible disruption that could result from regulatory frameworks that do not adequately address the changes under way in the financial system.

This paper addresses these policy challenges and proposes an approach to regulation that would reap the benefits that financial innovation can provide while minimizing the potential costs. It starts with a discussion of a financial regulatory trilemma, in which efforts to pursue one policy objective may make other objectives more difficult to attain. The paper then considers the technology-driven changes that are transforming the financial landscape and animating the policy challenges faced by policy makers and regulators. Two possible regulatory responses to these changes — the status quo approach based on entities, the other on activities — are identified next. Because there are operational and implementation issues associated with each tactic, a hybrid approach that retains entities-based regulatory frameworks but promotes greater consistency of regulation across the financial system and addresses new sources of systemic risks, is proposed.

Trade-Offs in the Regulatory Function

Canadians have long benefited from effective *micro-prudential* regulation that ensures *individual* federally regulated financial institutions have sufficient reserves to absorb credit losses. The system served the country well in the GFC, which erupted in the autumn of 2008, and in March 2020, when the risk of dysfunction once again threatened global financial markets at the outbreak of the COVID-19 pandemic.¹ The importance of and need for sound prudential regulation to promote financial stability are widely supported by the public and the regulated institutions themselves. Yet there are difficult trade-offs between three key objectives of regulatory frameworks: stability, competition and innovation.

→ **Stability:** The GFC demonstrated the importance of financial stability — the first element of the trilemma. Although Canada avoided the direct effects of bank failures owing to more prudent lending practices and a more cautious approach to regulatory policy, advanced countries at the epicentre of the crisis experienced the devastating effects of balance sheet deleveraging. These effects stemmed from the critical services that banks and other financial institutions provide, channelling savings into productive investment and fuelling growth. The crisis disrupted this function, and as banks in the United States, the United Kingdom and other advanced economies gradually rebuilt their balance sheets in its aftermath, the self-righting properties characteristic of a well-functioning market economy were impaired. The result was a prolonged, tepid recovery that was quickly dubbed the “Great Recession.”

→ **Competition:** The second objective of financial regulatory frameworks is competition. And just as effective prudential regulation that safeguards financial stability is needed for a well-functioning economy, so too is competition. In a financial system marked by an absence

of competition, productive investments that generate high payoffs in terms of growth and prosperity may go unfunded, while firms and households pay too much for financial services.

→ **Innovation:** The third objective is innovation — the development of new financial products that serve the evolving needs of the marketplace. Past gains from financial innovation have been truly remarkable, ranging from the increased ease and lower cost of accessing our savings through electronic payments to better wealth management resulting from improved access to investment products. Without appropriate regulatory frameworks, however, financial innovation can have unintended consequences. Recent episodes illustrate the point (see Box 1).

Financial Regulatory Trilemma

Although each of the stability, competition and innovation objectives are desirable on their merits, there may be potential conflicts between them. For example, while innovation that reduces the costs of financial services is unquestionably beneficial, absent the appropriate regulatory frameworks, it could increase the risk of financial instability or lead to higher concentration (and decreased competition) if it confers an unassailable competitive advantage to one player. Causation can also run in the opposite direction, as in the case where a decrease in competition stifles innovation. Meanwhile, an excessive focus on financial stability could severely decrease competition if, for example, prudential regulations create barriers to entry. The end result could be a financial system in which performance measured in terms of the quality, costs and variety of financial services falls further and further behind relative to that of its international peers, with adverse consequences for productivity and sustained prosperity.² Conversely, intense competition may undermine stability if profit margins are squeezed and competitive pressures force institutions to move further along the risk-return spectrum to maintain earnings. In short, there may be a

1 Other factors were also at play in limiting Canada’s exposure to the GFC, including — importantly — the nature of our residential mortgage market. One key difference from the US market, for example, was the absence of non-recourse mortgages that gave US borrowers with negative equity in their homes the put option to return the property to their lenders.

2 One anonymous reviewer has persuasively argued that competition in the Canadian financial sector has declined dramatically over the past two decades as the banking industry has increased its dominance in wealth management and residential mortgages, and that fintech can inject much-needed competition. While fintech innovations do indeed represent an important source of competition, as Thomas Philippon (2019) points out, the key challenge is to ensure that regulatory frameworks appropriately balance competition with stability.

Box 1: Innovation and Regulation

In hindsight, it is clear that the laissez-faire approach to financial engineering adopted by the regulatory authorities in key jurisdictions prior to the GFC facilitated excessive risk-taking. Advances in financial modelling in the late 1990s and early 2000s spawned a range of new assets. These financial derivatives* were marketed as a means to better spread risk and provide investors with a longer menu of investment products from which to choose. However, the complexity of some instruments, combined with gaps in regulatory frameworks, led to the inadequate appreciation of, and thus provisioning for, the tail risks associated with them, with near-catastrophic consequences for the global economy.**

More recently, regulators have focused on the potential risks from crypto-assets in the wake of several prominent failures in 2022, culminating in the spectacular collapse of the FTX crypto exchange in November of that year. Crypto markets are subject to many vulnerabilities familiar to traditional finance, including high leverage, liquidity and maturity mismatches, and the problem of information asymmetries. Moreover, the failure of FTX can be traced to self-dealing, which is the basis for a range of prudential regulations and supervisory oversight. And while it is still unclear as to whether crypto-assets would continue to be traded were crypto markets subject to comparable regulations, their proponents remain convinced that they provide important benefits.

The failure of Silicon Valley Bank (SVB) and Signature Bank in March 2023, meanwhile, featured massive deposit runs that played out over a remarkably short period. These runs were triggered by the digital herd, which can quickly stampede, driven by bad news or rumours circulating on social media, and were facilitated by advances in payment and settlement technologies that allowed depositors to make instantaneous real-time transfers between banks. The sudden loss of deposits unleashed a self-fulfilling prophecy that led US authorities to invoke the systemic risk exception, which authorizes the Federal Deposit Insurance Corporation to extend insurance to uninsured deposits in order to quell panic and safeguard financial stability.*** In the end, the failed banks, which had been viewed as an important source of competition — and which had adopted an aggressive strategy of rapid growth — were taken over by larger banks, thereby increasing concentration in the banking system.

* The term “derivatives” reflects the fact that the value of these instruments is derived from the underlying assets on which they are based.

** Although a critical lesson of the 2007–2009 GFC is the importance of differentiating financial innovations that facilitate better risk-sharing and risk management, which promote more efficient financial markets, from innovations that facilitate regulatory arbitrage, undermining effective prudential regulation, other factors were at play. In this regard, legal scholars have pointed to legal frameworks that attach primacy to shareholders over other stakeholders, including the public treasury, in corporate governance. (See the discussion of fiduciary obligations later in this paper.)

*** Although supervisory oversight and corporate governance failures also played a part in the demise of the two banks, the catalyst for the deposit runs was the recognition of large — and growing — losses on the banks’ bond portfolios in an environment of rising interest rates, which were driving bond prices down. If SVB had been able to hold its portfolio of bonds “to maturity,” it could have avoided writing down the value of the bonds. But news of the decline in the underlying market value of the bonds, and of the bank’s efforts to raise capital to close the gap in its balance sheet, triggered deposit outflows, forcing the bank to sell bonds to fund deposits being withdrawn.

financial regulatory trilemma in which efforts to achieve one objective jeopardize one or both of the other objectives, resulting in unintended

effects that exacerbate the challenge of designing an effective approach to financial regulation.³

3 Steven L. Schwarcz (2024) provides a comprehensive discussion of recent financial innovations and the challenging legal issues involved in regulating them. His work underscores the fundamental need to integrate legal analysis into regulation to answer the question of “what” should be done and not just “how” to regulate within existing legal frameworks.

Risk Migration

One manifestation of the trilemma is the migration of risk from regulated financial institutions to unregulated players in the financial system. As capital requirements are raised on banks and other regulated entities, they may de-risk their balance sheets by shedding their riskiest assets, “optimizing” their use of regulatory capital.⁴ Shifting such risks from regulated institutions with the balance sheet capacity and risk-management expertise to prudently manage and mitigate them to unregulated entities may reduce risk in one sector of the financial system but at the expense of increasing systemic risk and the threat of financial instability. To put it bluntly: the benefits of imposing stricter regulations on some players are likely to prove transitory if risks are transferred to unregulated balance sheets that lack adequate capital and liquidity buffers and the necessary risk-management capacity.

Recent experience with global banking reforms provides a timely example of this effect. While post-GFC reforms led to more resilient global banks, they may have unintentionally contributed to the disruption of financial markets in March 2020. This is because higher capital and liquidity buffers led to the migration of risks from banks to unregulated entities engaged in non-bank financial intermediation (NBFI). With banks in advanced economies at the epicentre of the financial crisis rebuilding balance sheets to meet higher capital and liquidity buffers, unmet demand for credit could be filled by these rapidly growing players (Darolles 2016).⁵ As the volume of NBFI grew, systemic risks accumulated in a sector with too little capital and insufficient liquidity to absorb shocks. The result was more resilient banks

populating a less stable financial system.⁶ But in contrast to the financial meltdown in the autumn of 2008 that unleashed the GFC, global banks were not the source of the dysfunction in financial markets at the onset of pandemic lockdowns, which was triggered by the panicked rush out of NBFI to traditional investor safe havens, an episode widely known as the “dash for cash.” In fact, banks were a source of stability in the pandemic, rather than a propagator or amplifier of shocks.

Approaches to Financial Regulation

Mitigating the risks associated with NBFI is an important policy priority for international rulemakers.⁷ And although reforms on this front are coming, the “dash for cash” dislocation at the outset of the pandemic is symptomatic of a wider challenge faced by international regulators: changes to the financial ecosystem that make the regulatory perimeter more porous and more prone to regulatory arbitrage, and that could make the financial system more unstable if not effectively addressed. The driver of recent changes is technological innovations in payment and settlement systems, data analytics and machine learning. These forces are likely to accelerate with the application of artificial intelligence to financial engineering and asset management.

Meeting the challenges associated with the changing financial landscape may thus require a change in regulatory perspective no less dramatic than the technological changes sweeping

4 Regulated entities may also avoid new business, creating space for unregulated entities to expand market share. Some of this business could reflect financing for innovative ideas with the potential to boost productivity. Such innovation will be needed to drive economic growth going forward in the context of slowing labour force growth (as the population ages) and to deal with climate change and other challenges.

5 See the discussion on the growth of fintech firms in the United States in the wake of the GFC in the US Treasury (Mnuchin and Phillips 2018). The GFC may account for demand-side effects whereby bank clients questioned the capability of traditional banks to effectively manage risks; this erosion of trust provided an opening for financial services tailored to the individual client using advanced data analytics.

6 While the volume of NBFI grew rapidly in Canada in this period, its share of the financial system remained broadly stable. This result could be explained by the fact that because Canadian banks largely eschewed the toxic assets that triggered the GFC, they were not subject to the balance sheet deleveraging by large banks in countries closer to the epicentre of the crisis and could therefore meet post-crisis credit demand. Moreover, Canadian banks developed in-house fintech capabilities to provide the innovative financial applications demanded by a growing number of bank clients, thereby filling a niche that might otherwise be occupied by fintech competitors. These causal factors are supported by Stijn Claessens et al. (2018), who found that fintech firms made the biggest inroads in the United States and United Kingdom, where the financial crisis originated and whose banks were severely affected by it, and China, whose financial system was relatively nascent with a huge unbanked population offering enormous opportunities for growth.

7 See Financial Stability Board (2023).

through the financial services industry. This proposition reflects the fact that the current regulatory approach based on institutional form is becoming increasingly anachronistic in a world in which new technologies blur institutional distinctions, allowing new players to skirt regulatory perimeters defined in terms of entities.

Ideally, financial regulation frameworks should ensure that a given risk is properly assessed and managed, with adequate liquidity and capital buffers, regardless of institutional type. At the same time, to ensure a level playing field on which various financial sector players compete, frameworks should be neutral with respect to their effect on competition. These notions are captured by the “same risk, same regulation” maxim, under which two institutions underwriting the same risk should be subject to the same (or comparable) regulatory requirements.

Institutions-Based (Case-by-Case) Approach

One approach to achieving “same risk, same regulation” would be to update existing institutions-based regulatory frameworks on a case-by-case basis to better reflect the realities of the current financial ecosystem. This approach has the advantage that it preserves the status quo and minimizes potential distortions resulting from ongoing changes in the financial system. And it would be readily understood and easily communicated — both of which are important considerations for promoting compliance, maintaining confidence in the financial system and preventing market disruptions. But it would be difficult to move at a uniform pace with legislative amendments to all elements of the regulatory framework while simultaneously introducing the new legislation needed to address emerging technology-driven innovations and new players. The result could be an unbalanced process that confers competitive advantage to some institutions while disadvantaging others, tilting the playing field rather than levelling it. Those at risk of losing competitive position have an incentive to impede reforms, raising the political costs of reform and leading to a status quo bias.⁸

⁸ This scenario underscores the point that because regulations not only define prudential standards but may also allocate rents, governments are often loath to open such debates. This is clear with respect to regulations that constitute entry barriers and limit competition, which generate economic rents (profits exceeding those under free entry) for incumbents.

Moreover, given the political and logistical challenges of updating legislation, such efforts are usually episodic or periodic (for example, the Bank Act five-year reviews) and made in response to a crisis. As a result, an entities-based approach would likely remain static. While it may align regulations with the realities of the financial system at a given point in time, reducing *existing* opportunities for regulatory arbitrage and financial stability risks, a case-by-case approach is unlikely to address ongoing innovations that create both opportunities and incentives for regulatory arbitrage. It would clearly not have the flexibility to respond to emerging innovations. In other words, an approach based on institutional pillars defined in legislation would likely not respond in a timely fashion to the dynamic reactions of institutions exploiting differences in regulatory requirements to develop market niches, nor would it anticipate regulatory requirements that may be needed in the future. As such, it would likely remain vulnerable to arbitrage.

At the same time, while an institutions-based, case-by-case approach may be intuitively appealing because it can be pursued within existing regulatory frameworks, efforts to implement it may be thwarted by interactions between the asset side of the balance sheet and the liability side — how the firm is funded and by whom — as well as by differences in the legal frameworks governing different institutions. These interactions reflect a web of regulatory and institutional constraints that create an ecosystem in which firms with greater restrictions on asset holdings, for example, face lower liquidity requirements, or in which some firms have stringent constraints on their leverage but fewer asset restrictions. Some financial firms, meanwhile, have access to central bank liquidity, the deposit insurance system or critical market infrastructure, such as the payment and settlement system and clearing houses, while other firms do not. Taken together, these restrictions, constraints and access to backstops and infrastructure segregate financial firms into institutional “pillars,” each with its own set of regulatory parameters, creating incentives and opportunities for regulatory arbitrage, with implications for financial stability. Untangling this web to finesse the financial regulatory trilemma may be a Sisyphean task.

Activities-Based Approach

An alternative approach to financial regulation has been proposed, one based on activities (functions) rather than entities or institutional pillars (Schwarcz 2016). Under this approach, regulations would establish prudential requirements to each unique function (activity) on both the asset and the liability sides of the balance sheet, such that every prudential requirement is mapped to an activity, independent of the institution engaged in that activity. Individual firms could engage in the combination of activities best matching their managerial expertise, technology and shareholders' risk tolerances.⁹

An activities-based approach has two key advantages over the status quo. First, it would minimize distortions that currently exist — or that may emerge as technology advances — introduced by differences in regulatory treatment across various institutional groupings. For example, with the automation of investment decisions, small differentials in offered rates of return, which reflect differences in institutions-based regulations, could generate enormous swings in deposit bases from more regulated firms to less regulated entities, with serious implications for financial stability. In an activities-based approach to regulation, all institutions undertaking an equivalent activity — for example, whether it is called a demand deposit, say, or a short-term cashable annuity — would be subject to equivalent requirements and/or access to public backstops.

The second advantage of an activities-based approach is that it would allow for the *timely* technical calibration of existing regulations or

the introduction of new prudential standards to address new activities, assets or financial practices. With institutions free to optimize by choice and level of activities undertaken, the allocation of rents associated with the existing institutional pillars (for example, entry requirements) would become moot. Moreover, because the financial system is constantly changing, discretion to adjust activity-specific prudential requirements would be delegated to regulatory bodies with the technical capacity to analyze and evaluate the financial stability effects of financial innovations, as is currently the case with respect to some prudential measures, such as countercyclical capital buffers.¹⁰ The result would be a more dynamic regulatory framework that reflects innovations in the marketplace and reduces the scope for regulatory arbitrage.

A functions-based framework also has disadvantages, however. For example, it may not adequately reflect interactions or economies of scope within existing institutional forms, leading to possible inefficiencies or the loss of services that are deemed uncompetitive when unbundled (for example, bank branches in rural communities or lending to certain sectors). This could lead to concerns regarding equity versus efficiency — in effect, that some sectors of the economy bear a disproportionate burden for the benefits resulting from financial innovation. Another issue is the possibility of financial stability in the transition from the status quo to a functions-based approach. Removing barriers between existing institutional pillars could entail large losses to some firms and their exit from the marketplace. And because of the importance of confidence and trust in financial markets, this “creative destruction” could engender near-term financial stability risks, regardless of whatever long-term benefits in terms of lower costs it may bring to consumers. Such risks could be magnified by the unique challenges posed by big tech firms stemming from their access to big data and network externalities (see Box 2). While the level of financial activities currently offered by these firms is modest in comparison to their potential, their capacity to dominate the playing field under an activities-based regulatory framework should not be overlooked.

⁹ This represents an entirely new regulatory framework, one that requires careful consideration and which should only be implemented following comprehensive consultations. Admittedly, such a review may conclude that a functional approach to regulation is infeasible. But given the importance of the financial system to ensuring the sound economic performance needed to address the significant challenges ahead, it would nevertheless be of considerable value. In Canada, the last *comprehensive* review of the financial system and the interactions between the various players in it was conducted four decades ago. It was triggered by the failure of two small banks and other institutions, and by structural changes in the financial system that blurred the lines between institutional groupings, similar to the forces at work today. Although the outcomes of that process, including the statutory mandate requiring periodic review of key regulatory legislation, have served Canadians well, it is, arguably, time for a more holistic review of the regulatory landscape. Because some regulatory responsibilities are shared between the federal and provincial levels, such a review should include a federal-provincial dimension. At the very least, a thorough review of financial regulation could provide important insights regarding how to promote stability, competition and innovation using the “same risk, same regulation” approach.

¹⁰ Such discretion would have to be subject to accountability and within prescribed limits, similar to the constrained-discretion inflation-targeting regimes under which most central banks operate (Tucker 2018).

Box 2: Network Effects

The term “network effects” (or network externalities) refers to situations in which the value or usefulness of a good or service to an individual increases the more ubiquitous or widely used that good is. The network of telephone users is an iconic example. The value of a telephone depends upon the number of other telephones in use. In the limit, a “network” of one telephone has zero value to the user. Concerns have arisen that network effects may provide big tech with unique advantages, generating specific policy challenges. Researchers at the Bank for International Settlements have described the advantages in terms of a positive feedback loop within big tech’s DNA — data, network and activities (Shin 2021). In brief, the heuristic loop is formed by the vast amount of *data* generated by big tech non-financial activities, which, given their extensive *networks* connecting millions of individual users, forms the basis of powerful predictive algorithms that are used to hone *activities* targeting specific populations. Increased demand for these activities generates more data, and machine learning hones the data analytics, enlarging the network and facilitating the further refinement of existing activities or the development of new activities that repeats the DNA loop.

Evaluating the Proposed Approaches and a Hybrid Approach

It is clear that neither of the two approaches to closing regulatory gaps opened up by financial innovation fully addresses the issues associated with balancing financial stability and competition. Because an institutions-based approach retains existing institutional pillars, allowing authorities to tightly control entry, it may facilitate the balancing of efficiency with equity. But this advantage could result in a loss of competitive efficiency, added regulatory complexity with unintended consequences, and a system that is insufficiently nimble to effectively respond to changes in the financial environment in a timely fashion. Similarly, while an activities-based approach endowed with substantial discretion is likely to be consistent with timely recalibration of prudential requirements and may be less prone to regulatory complexity and unintended consequences, including risk migration, it could be vulnerable to domination by big tech firms benefiting from network effects. In such a scenario, it may be virtually impossible to achieve a felicitous balance between efficiency and equity.

This assessment is unsatisfying but not surprising. Polar approaches are unlikely to finesse the subtleties of the various issues involved. The solution may therefore require a hybrid approach

that retains existing institutional frameworks, but which seeks to harmonize prudential standards on specific activities or functions across entities.¹¹

In brief, such an approach would retain existing entities-based regulations, preserving financial institutions’ point of contact and relationships with current regulators, but harmonize regulatory treatment of activities on both sides of the balance sheet that collectively constitute the underlying functions of financial intermediation. For example, credit to a non-financial business, or residential mortgage lending, would be treated comparably, whether it is extended by a bank, trust, insurance or money market mutual fund (for example, Basel III risk-based capital weights could be applied on a consistent basis across different institutional types). Liabilities would be treated in like fashion by applying comparable liquidity requirements (for example, the Basel III Net Stable Funding Ratio). Where strict comparability of requirements across different institutions is not possible, regulations would be adjusted to reflect applicable institution-specific variations.

In a sense, the proposed approach views the “same risk, same regulation” mantra as an operating philosophy rather than as a strict rule. By itself, however, a hybrid system would likely

¹¹ This conclusion reflects the multiple policy objectives — innovation, stability and competition — and resulting financial regulation trilemma. With different objectives, or policy targets, a single policy approach is unlikely to hit each target. A hybrid approach, which increases the number of instruments at the disposal of the authorities, is more likely to secure a felicitous balance among the various objectives.

be insufficient to deal with the emerging risks posed by NBFIs and the unique challenges of big tech firms.¹² The latter are especially acute given their potential to not merely tilt the playing field but also upend it entirely. From the perspective of public policy, a key concern should be the possible exploitation of network effects to entrench a few *quasi*-natural monopolies that are able to extract monopoly rents and practise an extreme form of price discrimination. Additional measures may therefore be required to balance financial stability and competitive objectives.¹³

Three complementary changes to legal and regulatory frameworks warrant consideration.

→ **Systemic designation:** To counter the effects of potential market power and systemic risks associated with big tech network effects, regulatory authorities could be given the capacity to designate any firm, whether a regulated financial institution or not, as systemically important, and thus subject to regulatory oversight, even if financial services represent a small share of their overall business. In the United States, the Financial Stability Oversight Council (FSOC), consisting of the Treasury Secretary, the chairperson of the Federal Reserve and the heads of federal regulatory bodies, was given this power under Dodd-Frank reforms.¹⁴ The tool is designed to contain systemic risks, whatever their source. Similarly, endowing regulatory authorities with the power to designate big tech firms as systemically important would address long-standing concerns regarding the separation of commerce and banking.

12 In some respects, big tech firms represent a special case in that they have the potential to engage in all key financial functions, yet to this point, at least, largely remain outside the regulatory perimeter in most jurisdictions. Most have started with payments, likely to support their core non-financial business lines. The next step is the provision of credit, insurance, and savings and investment products (Frost et al. 2019). And while systemic risks from these functions are currently limited by the small market share that big tech firms occupy and their existing institutional arrangements, these risks could grow rapidly given the possible network effects or positive externalities that create a feedback loop and reinforce a particular firm's competitive position.

13 Despite their clear importance, issues surrounding data privacy are not considered in this paper, which is narrowly focused on economic considerations.

14 While the powers of the FSOC were subsequently proscribed by a landmark Supreme Court ruling involving the Metropolitan Life Insurance Company, the underlying rationale for the systemic designation power is sound; the Biden administration may explore ways to deploy it subject to the court's ruling.

→ **Fiduciary obligations:** Recent crises underscore the critical role of public sector backstops in preventing destructive fire sales and confidence shocks that may lead to severe economic collapse. Regulation is the *quid pro quo* for access to backstops such as deposit insurance and central bank liquidity windows. Deposit insurance eliminates incentives for individual depositors to withdraw their funds in the face of possible insolvency shocks, or mere rumour of such shocks. And in the event of a panicked demand for liquidity, access to central bank liquidity facilities permits banks, in the words of Jean Tirole, “[to] calmly choose between selling assets at a reasonable price and reconstituting its own funds by issuing new equity” (Tirole 2017, 333). While the choice may, in fact, not always be “calm,” there is little question that public safety nets do limit the disruptive effect of panicked bank runs.

However, public backstops can create moral hazard when governments invoke systemic exemptions to provide deposit insurance to uninsured deposits, extend central bank liquidity facilities to non-bank firms, and keep interest rates low, buying distressed assets or injecting capital into firms that might otherwise fail.¹⁵ In effect, taxpayers become *de facto* shareholders of last resort: they are on the wrong side of a put option that is exercised when the firm's value is driven to, or very nearly to, zero (Kane 2014). Broadening fiduciary obligations to internalize this problem by requiring firms to balance the private interests of their shareholders with the public interest — so that management is responsible for the potential costs to taxpayers of bailing out failing institutions — could provide salutary effects in terms of financial stability. This approach is consistent with the intent of “bail-in” capital and other “too big to fail” regulatory measures applied to systemically important banks in the wake of the GFC.

→ **Competition policy:** As discussed above, ensuring that the regulatory framework secures a felicitous balance between competition

15 The consequences of these effects are enormous, as illustrated by two examples of this phenomenon a little more than a decade apart. The first example is the 2008 panic associated with the securitization boom and growth of shadow banking, as discussed above, which led to the financial bailout of AIG, while Goldman Sachs and other investment banks sought bank charters to secure access to safety nets. The second example of the moral hazard problem is the “dash for cash” in March 2020.

and stability is critical. This nexus has long been reflected in regulatory frameworks, in which regulation can form an entry barrier to prospective competitors. But because big tech firms present unique challenges, and financial intermediation may constitute only a fraction of their overall operations, a more catholic approach may be required. To the extent that network effects give these firms market power, using antitrust laws to limit divergences from competitive norms would be an appropriate policy response.¹⁶ The difficulties associated with the use of such legislation should not be discounted; in particular, it may be necessary to consider a proactive review of antitrust laws.

One possibility is to reverse the *onus* of proof in antitrust cases: rather than requiring the competition authority to prove that a merger, say, or a financial product, is harmful to competition, the onus could be on big tech firms to demonstrate that the proposed merger/financial product generates positive net benefits to society. Reversing the burden of proof would undoubtedly be contentious. It is not without precedent, however, since many products require licensing before they are marketed to the public. Moreover, the number of proposals for such an approach already in the US Congress, which enjoy rare bipartisan support, is evidence both of the perceived nature of the problem and that significant change may be coming.

Related to the onus of proof is the issue of appropriate *burden* of proof: the degree of certainty required for a particular finding in law. Under criminal law, the burden of proof is “beyond reasonable doubt,” consistent with the presumption of innocence. In civil litigation, the burden is the much less demanding “balance of probabilities.” Even if the onus is not reversed, for example, the burden could be modified such that establishing a presumption that a particular merger is harmful is sufficient to trigger antitrust action.

¹⁶ There is emerging evidence that big tech firms engage in predatory pricing and already extract consumers’ surpluses in their non-financial business lines using complex machine-learning pricing algorithms (Carstens et al. 2021). Such practices are traditional rationales for antitrust enforcement actions. However, the potential implications of these activities are even more troubling in the context of financial services: conceptually, big tech firms could gain access to an individual’s underlying preference structure and payment potential, giving them the power to fully exhaust consumers surplus and direct financial resources to related businesses. At the same time, there is a fundamental political question as to whether the concentration of such enormous economic power is consistent with a democratic society.

A further consideration with the proposed hybrid activities-based approach is the nexus between prudential regulation and competition policy. The antitrust implications of big tech are multi-faceted; sorting them out will clearly require considerable analysis and debate going forward. However, since the financial activities of big tech firms are likely to be secondary to the primary non-financial business lines, close coordination of prudential regulation and antitrust authorities’ analysis of big tech DNA would be required to successfully balance the need for competition and innovation with the financial stability objective.

Conclusion: A Path Forward

Financial ecosystems around the globe are undergoing rapid and potentially profound change driven by financial and technological innovations that are leading to the emergence of new services, new products and new players. These developments have the potential to drive down the costs of financial intermediation and expand choices, benefiting both borrowers and savers. But they also entail risks as the demarcations between traditional institutional pillars are blurred, resulting in the migration of risk from regulated to un- or less-regulated balance sheets, and financial services are mingled with non-financial business lines. And in contrast to the dynamism of financial systems, most regulatory frameworks rest on traditional institutional pillars. This disconnect between dynamic financial systems, on the one hand, and static regulatory regimes, on the other, creates a gap in regulatory perimeters and incentivizes regulatory arbitrage.

As the past 50 years of financial history shows, these gaps and this arbitrage can lead to the accumulation of systemic risks that threaten financial stability. The challenge for policy makers is to reap the benefits of financial innovation, while minimizing the costs of financial instability. Meeting the challenge requires that supervisors patrol the regulatory perimeter to ensure that new risks to financial stability are identified and properly managed; the hybrid activities-based approach to regulation proposed above could enhance the effectiveness of these efforts.

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