Global Systemic Risk Regulation since the Financial Crisis
A framework for understanding the effectiveness, impacts, and harmonization of macroprudential regulation
Executive summary

The financial crisis of 2008-2009 sparked massive global legislative and regulatory responses to address perceived market and regulatory failures responsible for setting the crisis in motion. Few corners of the financial sector have been left unaffected by these regulatory efforts. Strengthening both the oversight of individual institutions (microprudential supervision) and the entire financial system (macroprudential supervision) are major objectives of global regulatory reform efforts. The challenge for policymakers and practitioners in light of the magnitude of financial regulatory efforts is to: (1) understand the effectiveness of specific regulations balanced against the need to maximize long-term social welfare and firm value; (2) understand the collective impact of regulation on firms and financial markets; and (3) assess the need for and the degree of harmonization of regulatory efforts globally.

This study makes an important contribution to the ongoing regulatory discussion by providing a framework for policymakers and practitioners to assess the effectiveness of these regulatory efforts and the potential for harmonization of reforms across various jurisdictions. In this regard, the value of this work lies in the concepts and themes that attempt to bring greater clarity to the vast amount of financial regulation established since the financial crisis. Specifically, the study establishes a set of focus areas for cataloging various regulatory efforts; outlines a set of broad criteria for assessing the effectiveness of regulation; provides a mapping of specific regulations to each focus area and a high level framework to assess regulatory impacts.
Overview

The scope of global legislative and regulatory responses to the financial crisis of 2008-2009 has been comprehensive. Significant focus has been given to mitigating the drivers of systemic risk, chiefly the need for better approaches for identifying emerging risks that pose danger to the financial system, mechanisms designed to limit contagion and procyclicality effects, factors insulating firms and the system from such events, and recovery and resolution planning in the event of firm failure. These regulatory efforts have entered a critical period that will decide their long-term effectiveness in preventing future financial crises and their impact on global markets.

The magnitude and scope of the global financial regulatory reform effort introduces a level of complexity requiring policymakers and financial service practitioners to carefully assess the direct and indirect consequences of regulation on financial institutions, nonfinancial organizations, consumers and the global economy at-large. With such a backdrop, the purpose of this study is to provide a framework and criteria for policymakers and practitioners to apply in thinking about the effectiveness and impact of financial regulatory reform on markets, firms and consumers. Specifically, the study differentiates the linkages between systemic risk regulation; i.e., macroprudential supervision, and oversight of individual financial institutions; i.e., microprudential supervision. Effective regulation in large measure successfully addresses market and regulatory failures and their contributing factors while maximizing social value from an economic perspective.

The financial crisis of 2008-2009 was marked by a number of breakdowns and distortions in the market leading to nonoptimal economic outcomes for society. From an economic perspective, market failures contributing to the financial crisis include information asymmetries, mispriced government guarantees and a regulatory focus on microprudential supervision at the expense of systemic risk regulation. Regulation is one potential remedy for addressing market failure. As it relates to mitigating market failure, the study’s primary focus is on macroprudential regulation. A better understanding of the effects such regulations have in addressing market failures can be accomplished by setting up a simple classification scheme for micro- and macroprudential regulation. Within each focus area a set of criteria used to gauge the effectiveness of various systemic risk regulatory efforts is then offered in this study.

With this classification scheme in place, specific regulations are mapped to each focus area with the intent of providing a simple typology to frame the various initiatives to date. This mapping exercise is conducted across several regulatory jurisdictions permitting comparison of the degree of potential regulatory harmonization across areas. Using the regulatory classification scheme is a framework for identifying important factors affecting the welfare of consumers, and value of financial and nonfinancial corporations. The intent of this exercise is to heuristically lay out potential direct and indirect impacts of regulation on individuals and companies.

A concern among policymakers, economists and the financial industry are a host of unintended consequences associated with regulations that are designed to mitigate market failures. Such outcomes manifest in a variety of forms, from constraining the availability of credit and raising the cost of credit and capital among market participants to encouraging regulatory arbitrage via a lack of

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cross-border regulatory harmonization. In addition, regulation can incent risky behavior among individuals and firms that was not envisioned by policymakers. An example of this was the risk weighting assigned under the Basel capital requirements between whole mortgage loans and mortgage securitization that facilitated the transformation of otherwise on-balance sheet assets into off-balance sheet assets.  

The regulatory classification scheme applied in this study provides a simple way of evaluating potential unintended consequences.

Armed with a classification scheme for macro- and micro-prudential regulatory objectives and associated economic impacts, policymakers and practitioners can then apply their informed judgment and experience to exploring tradeoffs between specific types of macro- and microprudential regulation to better achieve intended policy objectives while maximizing overall economic outcomes at a country or region level. The framework also allows the international policymaking and industry community to evaluate the need for greater harmonization among regulatory efforts in order to meet the intended regulatory and economic objectives at the broadest level.

A classification scheme for macro- and micro-prudential regulation

Regulatory responses to the financial crisis address both firm-specific and systemic risk-related issues with at times overlapping and divergent objectives. Thus, at the outset it is important to define these two regulatory areas, although the focus of this study is principally on macroprudential supervision. Gordon and Mayer, for example, define microprudential regulation as activities focusing on the risk of individual financial institutions, particularly the subset that pose risk to federal deposit insurance funds. Alternatively, macroprudential regulation focuses on addressing potential risks of the entire financial system. The Group of Thirty further identified two important sources of systemic risk in their assessment of macroprudential policy; namely contagion and inherent procyclicality in markets.

Over time, financial markets and institutions have become more interconnected domestically and globally, thereby increasing the transmission of financial shocks from one or multiple firms across the entire system, thus potentially subjecting financial markets to destabilizing events that can lead to financial crises as experienced in 2008-2009. A variety of factors may amplify these conditions including informational distortions with regard to the risks of market participants and impacts and incentive problems among management of financial institutions leading to moral hazard and other principal-agent problems.

Inherent procyclicality in policies and practices in banking may contribute to systemic risk in a variety of ways. Procyclicality arises by actions that reinforce behaviors and outcomes at different points in the economic cycle. During periods of economic expansion, actions that increase firm risk-taking may be viewed as procyclical. Conversely, activities that contribute to risk aversion during economic downturns would also be viewed as procyclical in nature. Examples of procyclical behavior contributing to systemic risk include increasing leverage among financial institutions as exemplified more recently by the extraordinary rise of securitization activity preceding the financial crisis and deposit insurance premium assessments that remained low during the period preceding the crisis and subsequently accelerated with the rise in bank failures.

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Macroprudential regulation focus areas

Macroprudential regulation is comprised of five focus areas;

- Identification of emerging risks leading to systemic risk events
- Immunization of critical market participants to systemic risk
- Containment of the system-wide contagion or transmission of risk
- Mitigation of factors contributing to procyclical behavior and outcomes
- Proactive resolution mechanisms

Using this construct, specific global macroprudential regulations can be assigned to one of these five focus areas which are described in greater detail later in the study. Each of the five focus areas in turn can be further refined with regard to specific requirements for addressing aspects of systemic risk and key criteria for establishing guideposts for effective macroprudential regulation.

Focus Area 1: Systemic Risk Identification

Efforts to promote better detection of emerging risks including the assessment of asset bubble formation, overconcentration of risks and excessive interdependencies among financial institutions form the basis of the first focus area. This focus area may further be defined by the structures, data and measurement capabilities required to proactively identify potential systemic risks.

Given the scope of financial markets, participants and regulatory entities overseeing these activities, establishing appropriate organizational infrastructure is critical for performing the assessment of systemic risk, dissemination among the regulatory and industry community, and coordination of appropriate policy responses. This has led to the creation of new governing bodies overseeing systemic risk among key regulators as well as new organizations charged with the assessment of systemic risk.

A critical ingredient to successful identification of systemic risk is the data required in such efforts. One of the lessons learned from the financial crisis was the lack of critical information regarding firm risk concentrations, counterparty and liquidity risk profiles and an understanding of intertemporal shifts in asset correlations that would fundamentally alter modeled expectations of financial performance that were based on historically stable relationships. Aside from a relative lack of formal accountability among regulators over systemic risk identification, severe limitations on financial data available to key agencies before and during the crisis contributed to problems in identifying threats to the financial system and activities that could otherwise lead to precautionary actions prompting changes in market and firm behavior to mitigate such risks. The realization that data capture at the transaction level with appropriate identification and tagging to specific legal entities with greater frequency is critical to improving identification of emerging risks has led to a number of domestic and internationally-coordinated activities to develop such infrastructure.

Methods for detecting the existence, level and direction of systemic risk have long been the domain of academia before the financial crisis but have for obvious reasons accelerated in focus since that time. No single metric or analytical method exists by which to determine systemic risk and many are highly dependent upon available data, thus limiting their potential given data limitations described above. Despite the data issues and wide range of available methods, great potential exists for enhancement of techniques for systemic risk analysis and dissemination, particularly so as improvements in data development proceeds.

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Success Criteria

In determining the effectiveness of efforts to strengthen systemic risk identification capabilities, a suggested set of general criteria are presented. These criteria can be categorized by each of three specific activity areas: structure, data and methods.

Structure

Coordination among relevant regulatory agencies is crucial to the successful dissemination and policy response to identified systemic risks. Enhanced data and analytics are necessary conditions to effective systemic risk identification efforts; however, the organizational infrastructure to operationalize policy responses to this information is equally important. Recognizing that systemic risk is not confined to geographic borders requires systemic risk identification structures to be both domestic and global-oriented in design. This requires greater coordination among international regulatory agencies, however, a number of international entities coordinating regulatory efforts and engaging in information-sharing already exist today. Applied to systemic risk organizational design, some key success criteria include:

- Ability to provide real-time information feeds and analysis to systemic risk oversight bodies domestically and abroad
- Requisite that systemic risk oversight entities have clear authority to take action against emerging systemic risks
- Capacity to act decisively when events dictate based on systemic risk oversight bodies continuously monitoring risks and a sufficiently flexible structure

Data

Systemic risk measurement is critically dependent on data. Beyond ensuring the integrity of financial data and privacy of parties is preserved, a number of important characteristics of data required for systemic risk analysis include:

- Data be established with a fine level of granularity, captured at the transaction level ideally
- Transaction details be comprehensive including the financing terms and structure, legal entity identification and tagging, as well as counterparty arrangements
- Information be captured with greater frequency than quarterly or even monthly in order to reflect important shifts in market and firm risk profiles that can occur abruptly
- Industry-wide analysis of systemic risks be conducted based on consistent data across asset and liability types, markets and participants

Measurement

Measurement of systemic risk serves a critical role in providing regulatory bodies an effective early detection capability. Without it, regulators and practitioners would have little warning about potentially dangerous risks and would be rendered effectively impotent in taking action to guard against emerging systemic threats.

Selected success criteria for assuring adequate measurement of systemic risks include:

- Methodology development that accurately depicts the level and direction of emerging systemic risks
- Techniques that provide a comprehensive quantification of system-wide risks, including banking and nonbanking segments that may encompass activities otherwise known as shadow banking
• Measurement techniques that can be updated as new information becomes available; thereby incorporating real-time changes in market and firm conditions

• Models and measurements that are operationally tractable, appropriately validated and interpretable to nontechnical audiences

• Capabilities that permit triangulation of systemic risk along multiple dimensions, rather than reliance on a single method or metric

• Expert judgment incorporation, via model overrides and other approaches, that prevent over-reliance on pure analytical outcomes

Focus Area 2: Immunization of Critical Market Participants to Systemic Risk

Ensuring that important financial market participants are sufficiently protected against systemic risk events itself better insulates the entire system from contagion effects of the collapse of a systemically important institution or multiple financial organizations. Immunizing firms against systemic risks can be accomplished in a variety of ways such as through the imposition of buffers on firm leverage and liquidity levels. Alternative courses of action include the imposition of various restrictions on specific market activities, products, and related issues that, if not mitigated, may subject a firm to greater systemic risk.

Examples of systemic buffers include capital surcharges on institutions deemed systemically important and additional liquidity requirements for such firms. Alternatively, an example of a policy restriction to further reduce exposure of a systemically important firm to systemic risk includes limits to the use of over-the-counter (OTC) derivatives. Another example is the imposition of a ban on proprietary trading for such firms. The rationale for introducing such restrictions is, at least in part, to reduce the impact of potentially destabilizing structures that could pose excessive risk-taking and risk concentration among counterparties that in turn leads to systemic risk and/or exposes the firm to such risks.

Success Criteria

A number of criteria for successful implementation of policies to protect the financial system against individual firm systemic risks can be assigned to the following general categories of buffers and restrictions.

Buffers

Design of effective buffers on capital and liquidity to immunize firms from systemic exposures assures firm resilience to market shocks. This includes determining appropriate thresholds for buffers as well as the composition of underlying capital or liquidity in specific instances to satisfy the resilience criteria. Establishing a threshold for a buffer that accurately represents the firm’s exposure to systemic risks or conversely, the firm’s incremental contribution to systemic risk is critically important to avoid market distortions among individual firms. The application of consistent standards across firms is likewise important to avoid introducing unintended effects that put one set of firms at a competitive disadvantage against others.

Restrictions

Restrictions established to preclude certain firms from engaging in activities that may pose excessive risk to the firm and/or contribute to systemic risk also consider any countervailing benefits from such activities for designated firms. For example, consideration of diversification benefits include compensating factors to be weighed against the risk posed to the firm and the system if permitted to continue. As will be reviewed in a later section, an impact assessment on markets,
individuals and firms help policymakers to avoid potential unintended consequences and support efforts aimed at maximizing social welfare and firm value.

Focus Area 3: Containment of System-wide Contagion or Transmission of Risk

Elimination or at least significant disruption of activities that facilitate contagion or the transmission of systemic risk is a primary objective of macroprudential regulation that can be achieved in a variety of ways. Effectively such regulatory efforts aim to reduce contagion effects which may spread from firm to firm via specific markets and financial arrangements. For example, these include reforms in such markets as asset-backed commercial paper, money market mutual funds and tri-party repo arrangements that are designed to mitigate the transmission of systemic risk across the industry. Other possible regulatory efforts to address contagion include the development of stronger counterparty rules and exposure requirements. Other efforts to reduce contagion relate to increasing the transparency of available information in contracts to highlight the level of risk within a transaction or among counterparties.

Success Criteria

Introduction of market reforms for securitization, derivatives contracts, mortgages and funding markets as described earlier, particularly across multiple markets, present significant challenges to assuring restrictions do not impose excessive regulatory burden, competitive distortions or inadvertently disrupt markets to the detriment of key market participants and downstream consumers. Therefore, consideration of the opportunity costs of introducing such reforms on firms and their reactions to regulatory changes is important to inform the regulatory implementation process.

Effective counterparty rules incorporate real-time information regarding positions between trade partners, including important changes in concentrations and buildups of particular positions by counterparties. Assuring institutions maintain adequate capital buffers reflecting counterparty risks is also crucial to reducing the exposure to the financial system from firms’ systemic risks.

Focus Area 4: Mitigation of Factors Leading to Procyclical Behavior and Outcomes

Regulators face challenges to address procyclical practices and policies owing to the diverse nature of various banking and regulatory activities and practices that promote such outcomes. Procyclicality arises from practices and policies that amplify and distort economic outcomes at different parts of the business cycle. Deposit insurance premium assessment is one example of how procyclical outcomes can manifest. Deposit insurance premiums historically tend to be low during favorable economic periods yet ramp up when losses mount for the insurance fund, reducing bank earnings and potentially stifling economic growth. In yet another example of procyclical policy, it is widely accepted that capital standards were at levels that may have given an inadvertent boost to the growth of bank balance sheets in the years leading up to the crisis. Moreover, the nearly universal use of credit ratings in securitization markets contributed to other underlying aberrant behavior or incentives in markets promoting contagion. During especially benign economic conditions, reliance on ratings methodologies can underrepresent risks that may amplify investment activity in certain assets, driving prices higher with subsequent shocks on the downside. Understanding the potential responses by market participants to regulation is critical in helping regulators avoid unintended outcomes. While further developments in this area are needed, the application of game theoretic approaches, for example, to understanding market participant reactions could be a promising direction to explore. Broadly, procyclical factors do not necessarily operate in isolation from each other but may in fact further amplify procyclicality beyond that of individual practices or policies.
**Success Criteria**

An important success factor in addressing procyclicality is the adoption of principles and policies that can moderate market distortions over a business cycle. Further, regulation designed to mitigate abnormal behavior such as herding activity by market participants that can lead to highly correlated responses to market signals resulting in pricing and asset valuation distortions is important to controlling procyclical outcomes. And importantly, efforts to understand reactions of market participants to regulation that could otherwise pose unintended deleterious effects can strengthen the effectiveness of countercyclical regulation.

**Focus Area 5: Proactive Recovery and Resolution Mechanisms**

Various reviews of regulatory efforts during the crisis have concluded that the lack of well-outlined recovery and resolution plans for troubled systemically important firms introduced considerable uncertainty into markets that subsequently contributed to amplifying systemic risks already present in the market at the time. Issues surrounding the Too-Big-To-Fail doctrine of the largest systemically important firms have during the crisis led to market internalization of federal assistance to select institutions in times of severe distress without any direct or indirect confirmation of this by a federal government. This in turn may promote moral hazard leading to excessive risk-taking that may ultimately require heavy taxpayer-funded assistance.

Advance planning for recovery and resolution of important market participants has been a mainstay of global systemic risk regulation. Such efforts require the designation of systemically important institutions, establishment of comprehensive resolution plans depicting the legal vehicle operating structure of the firms, counterparty relationships, and a strategy for disposition of the firm’s assets and liabilities, among other activities. In the case of recovery planning, considerations of how the firm would “de-risk” its various business activities, address capital and liquidity needs and address various stress scenario outcomes are among the critical steps that would be considered in such a process.

Designation of systemically important institutions may reduce uncertainty in markets over the Too-Big-To-Fail doctrine, providing important signals that such systemically important firms will be allowed to fail after other remedies have been exhausted with a well-coordinated resolution plan guiding an orderly liquidation process. This activity is intended to stabilize markets during such periods, and hence soften any associated systemic risk spillover effects of a large market participant failure. Still, a significant amount of debate over this issue persists among the regulatory community as to the market’s response to a failure under a period of severe stress such as the financial crisis of 2008-2009.

Finally, a related area of regulatory focus has been to establish an early remediation process to enable regulators to address emerging financial weakness at an institution. Under Section 166 of the Dodd-Frank Act, the Federal Reserve is to establish a set of forward-looking measures that would trigger a set of remediation activities that increase in their severity as an institution’s financial circumstances decline. Factors to be considered as criteria for triggering early remediation actions include capital levels, stress tests, other market indicators and identified weaknesses in a firm’s risk management and/or liquidity management. Similar activities have begun elsewhere such as the FSB’s efforts on resolution regimes. Among the critical factors highlighted by the FSB in establishing a credible resolution protocol is the need for institution-specific cross-border cooperative agreements, information-sharing and legal frameworks for such activities. Given the international scope of G-SIFI activities, the establishment of effective cross-border resolution arrangements is critical to addressing Too-Big-To-Fail issues of G-SIFI organizations.

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7 Financial Stability Board, Key Attributes of Effective Resolution Regimes for Financial Institutions, October 2011.
**Success Criteria**

Given the sheer complexity associated with resolving a systemically important institution, particularly one with a global presence, it is critical that resolution plans be operational and not simply an exercise in compliance. Operational plans include clearly outlined with sufficient detail regarding the positions of the firms and associated legal vehicles, cross-guarantees, pledged collateral and other contractual obligations. And for those institutions with cross-border activities, it is critical for planning to be aligned across regulatory jurisdictions.

In addition, while consistency in the resolution planning process across firms is desirable, operational plans also allow for sufficient flexibility to reflect the special features of individual institutions. Further, it is imperative that once resolution plans are in place that they be updated as important conditions affecting the institution change in the course of business. Additional resolution planning requirements such as periodic stress tests allow the leveraging other regulatory efforts in order to reduce regulatory burden and complexity.

**Microprudential regulation focus areas**

Activities associated with microprudential regulation can be assigned to the following broad categories:

- Assessment and Supervision
- Prevention
- Resolution and Liquidation

Consistent with the macroprudential regulation section, a set of specific regulatory activities are mapped to each of the above categories reflecting microprudential regulation. Making a distinction between micro- and macro-prudential supervision permits comparisons between specific sets of activities and their intended objectives to assess the additive effects of both types of regulation on markets and firms. In Kane's regulatory dialectic model describing the relationship between regulated firms and regulators, regulations placed on firms lead to activities by these companies to avoid regulation, potentially leading to risky behavior that may result over time in a financial crisis, eventually leading to more regulation. As an example of this, the legislative and regulatory response to the financial crisis of 2008-2009 has been expansive in its attempt to take corrective actions against perceived market failures.

One way to think about regulatory efforts in the wake of the financial crisis is an oncology team faced with a patient where cancer has begun spreading from one localized part of the body to others, and where the chances of survival are low if a radical treatment is not administered quickly. But a real danger is that an aggressive treatment protocol may very well do irreparable harm or even kill the patient, thus great care is taken in building a treatment plan that is targeted to the areas posing the greatest risk while attempting to mitigate tissue damage. In a similar way, financial regulators determine what combination of micro- and macro-prudential supervision to administer to the financial sector to assure harmful market activities are eliminated while preserving and promoting the viability of market participants and the system.

Compounding the evaluation exercise is the blurring of lines at times between micro- and macroprudential regulation. This can be visualized in Figure 1. While historically, for example, capital buffers have been associated with protecting individual firms, the introduction of countercyclical capital charges and so-called SIFI capital surcharge adds a new dimension to capital requirements

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by focusing attention on systemic-related issues. Another example of potential overlaps between micro- and macroprudential regulation relates to resolution activities. The introduction of requirements for systemically important institutions to develop resolution plans in advance of problems highlights another blurring of lines between micro- and macroprudential regulation.

A potential concern with the scope of financial regulation relates to the compound effects of regulation on markets and institutions as well as potential conflicts that could arise between regulations. Individual regulations aimed at addressing specific market failures without consideration of the collective regulatory effort could magnify firm and market effects and unintended consequences beyond expectations. For example, changes to bank capital requirements under Basel III need to take into consideration additional planned requirements such as capital surcharges and countercyclical buffers in order to ensure an appropriate level of capital exists to address both individual firm and systemic risk concerns without overcompensating. Moreover, it is possible that a regulation could lead to some conflict with another regulation. If for example in requiring specific types of derivatives transactions to be exchange-traded, market participants take these products off-shore and into markets not heavily regulated, it could conflict with other systemic risk regulations designed to bring greater transparency, consistency and controls into systemically-important market segments.

**Figure 1: Micro- and Macroprudential Regulation Activity Overlap**

Placing micro- and macroprudential regulatory activities side-by-side permits better insight into the cumulative effects of such regulation balanced against intended objectives, and maximizing social welfare and firm value.

**Focus Area 1: Assessment and Supervision**

The regulation of individual financial institutions from a safety and soundness perspective is dependent upon the assessment and supervisory capabilities of banking regulatory agencies.

**Assessment**

The assessment process entails activities designed to monitor and evaluate firms against a comprehensive set of criteria reflecting the firm’s specific sensitivities to various risks. This includes such activities as information gathering, analysis and dissemination as exemplified by the publication of Call Report data in the US and other industry condition information. And the use of classification schemes such as the CAMELS composite bank ratings process in the US provides regulators with an ability to assign specific ratings to banks based on their specific condition and risk profile.

**Supervision**

In turn, ongoing oversight of institutions in the form of regular examinations provides regulators with direct access to the management and operations of the institution, allowing them to validate bank processes and controls against supervisory guidance. How extensive this supervisory role should be
in the affairs of the bank is often debated, with some arguing that the supervisory process needs to act more like an umpire at a baseball game calling balls and strikes while others advocate a more aggressive supervisory role. Regardless of how active supervision may be, it is a critical function of microprudential regulation.

**Success Criteria**

In some respects, the success criteria for assessment of banking institutions align with that described for identification of systemic risk earlier. Such activities should provide accurate views of a bank’s condition and risk profile with advance warning and granularity on emerging risks across the institution. Consistency in the application of metrics for comparative bank assessment is critical, especially if it is forward-looking.

An important part of the supervisory process is to formulate best practices observed through regular examination of institutions and introduced in the form of various types of supervisory guidance. Such information not only provides the industry with specific expectations of supervisors but also provides firms with tools to strengthen internal processes and controls with the overall goal of continuous process improvement for the industry as a whole. While debate continues over how prescriptive bank supervisors should be in communicating their examination findings, articulation of clear and specific issues is helpful for shaping effective responses by banks to examination findings. Balanced against the benefit of clear communication is finding an engagement model with institutions that promotes interactive constructive discourse with management while upholding the responsibilities of the management team to direct the firm.

**Focus Area 2: Prevention**

Securing the safety and soundness of individual institutions can be achieved in a variety of ways, but broadly can be characterized by the use of regulatory capital and liquidity buffers and restrictions, similar to that describing the macroprudential activities surrounding immunization of firms from systemic risks.

**Buffers**

The application of capital requirements to the banking industry remains a powerful tool by regulators to insulate banks against excessive risk-taking and with the evolution of the Basel capital requirements framework, has expanded the design of capital requirements along major risk types such as credit, market and operational. Further, the imposition of such requirements has recognized the need to apply differential methodologies depending on the size and complexity of the institution. The latest Basel proposals include additional requirements on minimum firm liquidity ratios.

**Restrictions**

Again, as in the discussion on the same topic for macroprudential supervision, restrictions aimed at the activities for individual firms forms a complementary regulatory mechanism for protecting firms against excessive risks. Examples of such restrictions include product concentration limits or related activity prohibitions. Such restrictions can be thought as guard rails limiting bank activities to areas either determined to pose excessive risk to firms and/or touch on a variety of legal matters such as consumer protections and national security risks.

**Success Criteria**

As will be detailed separately below, balancing the application of buffers and restrictions is critical to ensuring effective microprudential regulation. The imposition of macroprudential buffers and restrictions thus complicates this effort. Beyond this high level consideration, other desirable criteria for design of effective buffers include the consistent application of buffers across the industry in...
order to avoid possible market dislocations. Clearly, setting capital requirements that reflect the underlying risks of the firm is critical and do not, in their application, promote market responses that lead to inadvertent risk-taking. Likewise, design of effective restrictions on bank activities entails a broad view of how they differentially impact markets and participants.

Focus Area 3: Resolution and Liquidation

Resolution activities falling under the umbrella of macroprudential supervision take on a form focused on addressing issues surrounding the Too-Big-To-Fail phenomenon. As such they differ from traditional resolution activities that have been in place at the FDIC largely distinguished by the focus of macroprudential resolution policies on systemically important firms. This gives rise to a focus on preemptive strategies such as establishing advance resolution plans for designated systemically important firms. While the existence of Prompt Corrective Action (PCA) promotes a proactive approach to dealing with troubled institutions before their capital is entirely exhausted, resolution activity for the balance of the industry has been on a case-by-case basis, though with a high degree of responsiveness by the FDIC in conducting the receivership and liquidation process. Only for completeness in the exposition of activities falling under the umbrella of microprudential supervision is the topic of resolution planning described herein. For the purposes of this study, however, differences in the application of resolution planning activities framed in terms of their macroprudential and microprudential objectives, are confined to the establishment of defined resolution plans for systemically important institutions. Consequently, existing resolution capabilities by FDIC are not a focus of this study and hence discussion of success criteria for design of effective resolution activities associated with nonsystemically important firms is put aside.

Regulatory and market tradeoff considerations

Design of an effective regulatory framework includes consideration of the following:

- The combination of buffers and restrictions applied to institutions and markets
- The additive effects of micro- and macro-prudential policies
- Domestic effects of policy on overall social welfare and firm value
- Global effects of policy misalignment

Turning to the first consideration, a simple regulatory model consisting of a series of microprudential buffers and restrictions provides a simple way of thinking about alternative regulatory scenarios.

Table 1: Microprudential Regulatory Scenarios

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<tr>
<th>Buffers</th>
<th>Restrictions</th>
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<tbody>
<tr>
<td>Low</td>
<td>Scenario 1: Strong Growth/High Volatility</td>
</tr>
<tr>
<td>High</td>
<td>Scenario 3: Moderate Growth/Moderate Volatility</td>
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</tbody>
</table>

At one extreme, regulators could choose to impose a low impact regulatory regime characterized by low buffers (e.g., low capital requirements) and limited restrictions on banking activity. Such an environment could be described by significant financial innovation and competition, characterized by strong growth in most years but with a reasonable chance of experiencing a major financial crisis every decade or so. Alternatively, a regulatory regime could feature relatively tight buffers and restrictions, limiting growth potential of the banking sector and consequently products, services and
credit available to the broader economy. Such an environment might be described as low growth, low volatility with a major financial crisis an extreme event. A third regulatory scenario could allow for limited restrictions coupled with high buffers resulting in a level of growth somewhat more restrained than the first regulatory scenario but also less volatile due to the existence of strong buffers insulating firms from excessive risk. A fourth scenario comprises a high restriction/low buffer regulatory environment, leading to moderate growth and low volatility due to limitations imposed on banking activity. An infinite number of combinations of buffers and restrictions can be conceived, illustrating the complexity of the regulatory problem. Further, assigning empirical estimates to each scenario’s impact on growth and volatility would be extremely difficult; however, conceptualizing the regulatory task in this simple framework clarifies some of the important tradeoffs to be made.

Compounding this exercise is the overlay of macroprudential regulation into the regulatory mix. Conceivably, a similar table could be constructed for macroprudential regulation as depicted for microprudential supervisory activities, with similar outcomes described. However, the additive effects of micro- and macro-prudential regulation create a level of complexity worth further discussion. For example, consider an initial and end-state regulatory environment described by the following micro- and macro-prudential regulatory regime and changes in regulation in Figure 2.

**Figure 2: Illustrative Regulatory Responses to Financial Crisis**

<table>
<thead>
<tr>
<th>Initial Regulatory Regime</th>
<th>End-state Regulatory Regime</th>
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<tbody>
<tr>
<td>Microprudential</td>
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<tr>
<td>Buffers Low</td>
<td>Buffers High</td>
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<td>Restrictions Low</td>
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<td>Macrophrudential</td>
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<tr>
<td>Buffers Low</td>
<td>Buffers High</td>
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<tr>
<td>Restrictions Low</td>
<td>Restrictions High</td>
</tr>
</tbody>
</table>

While this scenario is intended to illustrate the potential for negative economic impacts from isolated regulatory implementation efforts, other research arrives at a different conclusion. A study by the Basel Committee on Banking Supervision (BCBS) of the long-term impacts of enhanced capital and liquidity requirements estimated that a major financial crisis occurs with an annual probability of 4.6%. Further they reported that a 4 percentage point increase in bank capital ratios lowered the annual probability of a crisis to less than 1%. This reduction in the likelihood of a crisis was estimated to generate a .6% savings in lost output.9 This discussion of the compound effects of regulation in this study does not suggest that a tighter regulatory framework generally makes society worse off, but rather provides some conceptual structure around thinking about micro- and macro-prudential regulatory tradeoffs.

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In this example, it is assumed that a financial crisis has occurred leading to significant damage to the banking sector as well as the economy at-large. The regulatory response is to quickly address perceived contributing regulatory deficiencies to the crisis. Along both regulatory fronts; i.e., micro- and macro-prudential regulation, a migration to stronger buffers and restrictions occurs. At first glance, the desired regulatory objectives of increasing the safety and soundness of individual institutions and mitigating systemic risk events may be achieved by raising buffers and restrictions. However, decoupled from each other these actions could have long-term deleterious effects on markets and economic growth that while dramatically lowering the possibility of a future financial crisis, may lower long-term expected growth rates. This is illustrated by Figure 3 depicting a distribution of economic growth outcomes for a country (solid curve). Regulators observe that conditions leading to large declines in economic growth occurring at point A or lower (to the left) are unacceptable and hence introduce systemic risk policies that limit the occurrence of such risks to the system. But in doing so, the impacts on financial markets may reduce growth rates for all other possible outcomes leading to a new distribution of growth rates shown by the dashed curve. The outcome from this exercise is lower long-term expected growth rates under the new policy regime (point C) than under the prior regulatory framework (point B).

The above example clearly highlights the importance of regulation on markets and the economy which merits a more detailed discussion. While a technical economic discussion of the socially optimal level of welfare and value maximization of firms is beyond the scope of this study, a general framework to describe potential impacts on consumers and firms is appropriate.

**Figure 3: Systemic Risk Prevention and Long-term Expected Growth Example**

The total welfare of society is comprised of the utility of three primary market participants; consumers, nonfinancial organizations and financial institutions.

Consumers derive utility from consumption of goods and services that are financed by income and investments. From this perspective when the cost of goods exceeds the individual’s income and investment resources, they may require additional financing in the form of loans. Loans and other products and services such as savings and investment vehicles as made available by financial institutions thus provide consumers with utility-enhancing products. In this framework, the availability and cost of financing directly affects consumer utility. For example, higher costs and lower availability of financial and nonfinancial products reduces consumer utility. For consumers, the availability of credit can be affected at times by nonpecuniary effects such as discrimination.
Corporations derive value from the availability of financial services to support the production of goods and services they provide. Similar to consumers, corporations require at times access to credit and capital markets. The availability and cost of these products, as in the case of consumers, directly affects the value-derived by corporations. A similar value maximization framework exists for the third group in this simple economy; namely financial institutions. In performing their financial intermediation role, banks maximize value based on such considerations as the price of their products and services and the costs associated with financing these activities as reflected by the liability side of the balance sheet. Financial institutions also face regulatory costs associated with compliance with both micro- and macro-prudential regulations.

To summarize, precipitating events such as financial crises tend to enliven regulatory efforts aimed at addressing perceived market failures. In developing regulatory responses, these efforts may entail both micro- and macro-prudential reforms. These reforms pose direct and indirect impacts on consumers, nonfinancial organizations and financial institutions. These effects can be traced back to both sides of the balance sheet for these market participants as depicted in the following table.

Table 2: Potential Regulatory Impacts to Market Participants

<table>
<thead>
<tr>
<th>Products and Services</th>
<th>Credit</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>Price</td>
<td>Availability</td>
</tr>
</tbody>
</table>
| Consumers | ✓ | ✓ | ✓ | ✓*
| Nonfinancial Organizations | ✓ | ✓ | ✓ | ✓ |
| Financial Institutions | ✓ | ✓ | ✓ | ✓ |

*May include cost associated with discrimination

The discussion to this point has focused on the impacts from regulation ignoring cross-border differences in regulation. Generally, the consensus of most analysis of global financial regulation maintains that regulatory harmonization reduces inefficiencies associated with potential regulatory arbitrage and capital flight from one country to another. Importantly, alignment of regulations among countries is viewed as promoting the stability of the banking system; thereby lowering the potential for systemic risk events. The degree of regulatory harmonization achieved over time is dependent on a number of factors including political motivations to secure a competitive advantage over other countries, the special circumstances of individual countries in terms of specific products (e.g., nontraditional mortgages), markets (e.g., securitization) or other issues not otherwise observed in other countries. While the virtues of harmonization are many, it has been acknowledged that there may be limits to such alignment. For example, the Group of Thirty has noted that capital and liquidity requirements are most effective when developed and implemented domestically. Efforts to further align various policy interventions of individual country regulators such as for resolutions may be desirable, but limited due to structural and legal differences. Similarly, they maintain that adoption of countercyclical tools such as capital buffers may best be implemented at the country-level given the sensitivity of such buffers to financial cycles and lack of experience at the global regulatory level with such tools. Sorting out which policy tools merit further collaboration and alignment versus individual attention is difficult, however, in the section that follows some attempt to highlight differences in cross-border regulatory harmonization by specific regulatory activity is made.
Mapping macroprudential regulatory efforts to focus areas

The scope of systemic risk global regulation greatly challenges any effort to establish a comprehensive classification of all such efforts to date. Individual country and multinational efforts to implement a wide variety of systemic risk regulations span the globe and cross numerous markets, institution types and regulatory bodies. The focus areas of systemic risk outlined earlier can be used to map individual regulations into a coherent framework for assessing the degree of harmonization of regulations as well as serving as a basis for assessing the impact of such regulations on important market participants. The mapping effort that follows deliberately limits the focus of systemic risk regulation to four major geopolitical groups: global multinational efforts, the EU, UK and the US. While efforts at systemic risk regulation exist in other jurisdictions, the four under review in this study capture the vast majority of systemic risk regulatory efforts thus far. An additional limitation for the assessment is that specific regulations selected for review represent those having a significant potential impact on markets and participants in general. This criterion, while introducing some subjectivity is imposed to make the assessment process more manageable while ensuring that it offers a broad view of significant regulatory efforts.

A summary mapping of individual regulations within the four geopolitical regulatory areas is found in Table 3. The comparison of interest for this assessment is across four focus areas of systemic risk rather than by the four regulatory areas given the ultimate objective of evaluating the potential for harmonization across regulatory efforts. In the context of this evaluation, the potential for harmonization within a systemic risk regulation focus area (e.g., identification of systemic risk) and associated subclass (e.g., structure, data, measurement/monitoring) is defined as either High, Medium or Low. A High potential for harmonization indicates that there is considerable alignment of specific regulations across jurisdictions and/or that there is a high potential for future harmonization due to ongoing collaboration among regulators and/or great similarity in the approach to regulation. At the other end of the scale, a Low potential for harmonization indicates significant differences in regulation for that focus area exist. For example, one jurisdiction may have introduced a set of regulations designed to address a unique aspect of their financial markets where no such regulation exists elsewhere. Any focus area that does not meet the High or Low potential harmonization criteria is assigned a Moderate potential for harmonization.

Starting with the identification of systemic risk focus area, across the four regional regulatory groups there appears to be a high potential for harmonization for structure, data and measurement/monitoring subcategories. For example, efforts within the US to establish a governance structure creating clear oversight responsibilities for systemic risk issues established the Financial Stability Oversight Council (FSOC) and the associated Office of Financial Research (OFR). But similar structures have been set up in the UK (e.g., Financial Policy Committee and Prudential Regulatory Authority), EU (e.g., European Systemic Risk Board) and across jurisdictions as well (e.g., Financial Stability Board).

Data-related efforts to improve systemic risk identification across jurisdictions also appear to have a high potential for harmonization due to a number of comparable efforts to strengthen data requirements and establish common financial data identifiers. Examples of this are the cross-border efforts among regulators and industry participants to establish a legal entity identifier (LEI) standard that enables consistent and persistent tracking of contracts and transactions across institutions. The LEI effort has been international in scope. Beyond LEI, other systemic data initiatives have been established across jurisdictions. Likewise, efforts to develop measurement and monitoring capabilities for systemic risk across regulatory groups indicate a high potential for alignment in the pursuit of metrics and techniques for identifying emerging systemic risks.

10 For ease of exposition, two focus areas were combined; containment of transmission of systemic risk and mitigation of factors leading to procyclical outcomes. Liquidity buffers for example could be assigned to either category and so collapsing the two focus areas simplifies the discussion without any loss of generality.
### Table 3: Financial Regulatory Reform Criteria Effectiveness Mapping

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Global</th>
<th>US</th>
<th>Financial Reform</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Systemic Risk Identification</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structure</td>
<td>• Financial Stability Board</td>
<td>• DFA Financial Stability Oversight Council</td>
<td>• BoE — Financial Policy Committee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• DFA — Office of Financial Research</td>
<td>• European System of Financial Supervision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• European System of Financial Risk Board</td>
<td></td>
</tr>
<tr>
<td>Data</td>
<td>• Financial Stability Board</td>
<td>• DFA — Office of Financial Research Data Center</td>
<td>• BoE — Financial Policy Committee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• BoE — Legal Entity Identifier collaboration</td>
<td>• Legal Entity Identifier collaboration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• European Systemic Risk Board</td>
<td>• European Systemic Risk Board</td>
</tr>
<tr>
<td>Measurement/Monitoring</td>
<td>• FSIB, IMF and BIS proposal to G20</td>
<td>• DFA — Office of Financial Research Research Center</td>
<td>• BoE — Financial Policy Committee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• BoE/FSOC — SIFI Designation</td>
<td>• European Systemic Risk Board</td>
</tr>
<tr>
<td>Immunization Against Systemic Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buffers</td>
<td>• Basel III Countercyclical Capital Buffer</td>
<td>• FRB NPR — Countercyclical Capital Buffer</td>
<td>• FSA Basel III Implementation — CRD IV</td>
</tr>
<tr>
<td></td>
<td>• Basel III Capital Conservation Buffer</td>
<td>• FRB — Capital Conservation Buffer</td>
<td>• FSA Contingency Funding Plan rules</td>
</tr>
<tr>
<td></td>
<td>• Basel III Liquidity Coverage Ratio</td>
<td>• FRB NPR — Adoption of Basel 2.5 Market Risk Rules</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Basel III Net Stable Funding Ratio</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Basel 2.5 Market Risk Rules</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restrictions</td>
<td>• Proprietary Trading</td>
<td>• DFA — Volcker Rule</td>
<td>• Capital Requirements Directives — CRD II</td>
</tr>
<tr>
<td></td>
<td>• Consumer Financial Protection</td>
<td>• DFA — Consumer Financial Protection Bureau</td>
<td>• CRD III</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• CRD IV</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Committee of European Banking Supervisors liquidity buffer guidance</td>
</tr>
<tr>
<td>Containment of Systemic Risk Transmission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Reforms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hedge Fund Reform</td>
<td>• FSB Hedge Fund Reforms</td>
<td>• DFA — Hedge Fund Regulation</td>
<td>• European Securities &amp; Market Authority</td>
</tr>
<tr>
<td>Credit Rating Agency Reform</td>
<td>• BCBS Review of CRAs in regulation</td>
<td>• DFA — Credit Rating Agency Regulation</td>
<td>• Clearing Obligation</td>
</tr>
<tr>
<td>OTC Derivatives Reform</td>
<td>• G20 Statement of Derivatives</td>
<td>• DFA — OTC Derivatives</td>
<td>• EU Trading, Reporting, Capital rules</td>
</tr>
<tr>
<td>Insurance Industry Reform</td>
<td>• DFA — Federal Insurance Office</td>
<td></td>
<td>• Credit Rating Agency Reforms</td>
</tr>
</tbody>
</table>
Turning next to the immunization against systemic risk focus area, the two subcategories contained in this focus area; i.e., buffers and restrictions provide some contrast of potential harmonization activity. As mentioned earlier, development of buffers such as capital requirements or minimum liquidity standards is one important mechanism for protecting the system against firms’ risk shocks. Core to such efforts has been the effort to modify the Basel II Accord relating to capital adequacy to reflect various systemic-related concerns such as procyclicality, market liquidity events, contagion and Too-Big-To-Fail impacts. These new rules established by the Basel Committee on Banking Supervision (BCBS) arose out of what is referred to as Basel 2.5 and Basel III. Although the provisions of Basel 2.5 and Basel III are extensive and contain a number of new requirements relating to various aspects of systemic risk, of specific interest due to their direct linkage to systemic risk and liquidity risk are the capital conservation buffer, counter-cyclical capital requirement, SIFI capital surcharge and two new liquidity ratios. Much discussion over the implementation of these rules has focused on the impacts of differential implementation of Basel by individual countries and the potential for cross-border capital flow movement. Significant deviations in the implementation of Basel could introduce strategies resulting in movement of capital from areas implementing stricter Basel requirements to those areas with a more relaxed set of standards. Thus one interpretation of capital and liquidity buffers is that there is a high potential for divergence between countries on their implementation of Basel and thus a low
potential for harmonization. Instead, the view expressed in this study is that the set of buffers in Basel III establishes a baseline that mitigates extensive deviation among countries in the implementation of capital and liquidity buffers. While the existence of the Basel III standards acts as a potential catalyst for high potential harmonization over time, the fact that individual countries can implement buffers that vary from Basel III supports downgrading the assessment to moderate potential in order to draw attention to the need for cross-border alignment.

An area, however, where significant differences in regulation exist across jurisdictions relates to a number of financial market reforms and activity restrictions. The US response to the financial crisis of 2008-2009 was a massive legislative effort referred to as the Dodd-Frank Act (DFA). DFA was not solely focused on macroprudential regulation, but the scope of its legislative reach is extensive, resulting in substantial new regulations on markets and institutions. Of significance to the subcategory of market restrictions designed to mitigate systemic risk in specific markets and institutions, are the Volcker Rule which effectively bans banks from engaging in proprietary trading activities and the creation of a new federal agency, the Consumer Financial Protection Bureau (CFPB). Both of these components of DFA are unique to the US and therefore lead to this subcategory being designated low potential for harmonization.

The containment of contagion or systemic risk transmission effects is distilled into two broad areas of regulation; market reforms and counterparty regulation. In light of DFA’s expansive coverage of these regulatory areas, determinations of harmonization potential rely on DFA market reforms as the reference point against other jurisdiction activities on these specific markets. Under DFA, a number of new market reforms on hedge funds, the insurance industry, credit rating agencies, OTC derivatives, broker-dealers, mortgages, securitization and other important segments were enacted. A wide variation in regulation between jurisdictions in these markets exists owing to differences in markets, players and products in large part. As a result, the potential for harmonization is designated as moderate, reflecting this variation. In some markets, such differences may warrant alternative regulatory responses and thus a high degree of harmonization may not be desirable. Determination of whether greater or lesser harmonization may be preferred would be in part influenced by the degree to which specific markets have global reach. OTC derivatives or asset-backed securitization, are examples of where trading of such instruments is conducted at an international level, and hence greater regulatory harmonization would be beneficial, whereas mortgage market reforms may be specific to a particular country and thus require less harmonization. The other subcategory of this focus area; i.e., counterparty reforms are characterized by a moderate potential for harmonization as reflected by the various Basel III counterparty requirements. As in the case of capital and liquidity buffers, these benchmarks mitigate extensive deviations among jurisdictions in counterparty regulation, but do not preclude differences from arising between countries.

Finally, a number of common efforts aimed at proactive resolution planning and orderly liquidation have cropped up since the crisis across jurisdictions. In the US, efforts focusing on establishing “Living Wills” for the largest systemically important financial firms have been taking shape since the enactment of DFA. Similar efforts in the UK and EU have taken place and while not perfectly aligned, show potential for harmonization in the approaches taken and criteria used in designating firms for such planning activities. Care should, however be taken when addressing global systemically important institutions (so-called G-SIFIs) and the complexity of cross-border resolution issues.

11 In other words, the comparison was one-way; i.e., from DFA market reforms to those activities in other jurisdictions relating to the same market and not the other way around. This approach was taken to make the evaluation process more tractable.
Macroprudential Regulatory Impact Assessment

Having developed a classification scheme for thinking about systemic risk regulation and its implications for harmonization at a global level, attention now turns to an assessment of the potential impacts of systemic risk regulation on key market participants. A considerable body of empirical research exists that attempts to quantify the impacts of financial regulatory reform. Not surprising, there tend to be strongly diverging views on such impacts. For example the Institute of International Finance (IIF) estimates that the full implementation of financial regulatory reforms in the US, Euro region and Japan would subtract .6% of GDP each year from these countries over a 5-year period. Key drivers of these results are significant reductions in the availability of credit and higher lending rates. The IIF study also shows that regulatory reform not only has a depressing effect on economic growth but on employment as well.

In contrast, a number of macroeconomic studies have estimated that the social benefits from reducing the likelihood of a systemic risk event offsets the social costs of such regulation. A key result of the BCBS study of long-term economic impacts of regulation is that reform may significantly reduce the incidence of future systemic risk events leading to sustainable long-term economic growth. Other studies have corroborated the benefits of regulation such as Miles et al. that found only a modest 10-40 basis point increase in the cost of bank capital for a doubling of capital. Aligned with this research are findings by Kashyap et al. that the impact of regulation on loan rates is relatively small: 25-45 basis points higher for every 10 percentage point increase in capital. Again, the body of empirical evidence regarding the economic impact of regulation appears mixed with the degree of overall impact varying considerably across studies. However, even where the social benefit from lower incidence of a systemic risk event can be established, most studies still show that credit markets are adversely affected to some degree.

To remain consistent with the earlier discussion on market impacts, the assessment is confined to three primary participants: consumers, nonfinancial organizations, and financial institutions. No further decomposition of these groups is conducted for this study, although extensions of this work to encompass other subgroups could be envisioned for future analysis. In addition, the assessment leverages the concepts of social welfare and firm value developed earlier by focusing specifically on financial products and services, nonfinancial products and services, compliance costs and consumer protection. All other economic effects such as growth, employment, and inflation would be outcomes from the impacts on market participants’ access and costs to credit markets, availability and prices of products and services, as well as other costs or benefits imposed by regulation on these groups.

With this approach, a general qualitative impact analysis is provided below. While a quantification of these potential impacts would be of significant value, a number of unknown factors critical to such an analysis limit the feasibility of such an exercise at this time. Further, for scoping purposes, the focus of this section is on US-specific systemic risk regulatory impacts. A summary of expected impacts is presented in Table 4. The first two columns present the focus areas, their subcategories and specific US regulations mapped to these groups as seen in the previous table on regulatory harmonization. The last four columns feature the impact categories described above. Within each of these columns the impacts are described in several ways:

- First, the specific market participant (Consumer (C), Nonfinancial Organization (NF), and Financial Institution (F)) affected by a specific regulation is highlighted;

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• Second, an assessment of whether the impact is direct (D) or indirect (I) is noted for each participant;
• Third, the direction of causation is established for each impact category where applicable; and
• Finally the direction of impact for each participant by impact category (e.g., higher, lower, worsening, improving) is denoted.

As stated earlier, no attempt to differentiate the relative size of various impacts is made. A key assumption made in this assessment is that regulation imposes constraints and/or costs on business activity that may be reflected in the supply of products provided or the prices observed in the market, in part dependent upon the market power of the firm and other considerations. In sum, the objective is to provide a useful structure for cataloguing impacts as a first step for policy evaluation.

Referring to Table 4, the third column provides an assessment of regulatory costs of various DFA systemic risk-related regulations. Financial institutions face a variety of direct and indirect regulatory-related compliance costs under the new regulations ranging from additional staff and infrastructure required to address regulatory requests for new information to new processes for regulatory reporting, customer management and related activities. Compliance costs may or may not be passed along directly to other market participants but the direction of causation would be as shown toward potentially affecting the availability of and prices for products and services. Areas such as the creation of the FSOC or OFR may impose direct and indirect costs over time, and others such as capital and liquidity buffers could impose direct costs via some of the mechanisms described above. Generally, regulations also tend to reduce the availability of both financial and nonfinancial products and services while raising the costs and/or prices associated with them. The degree to which each regulation affects product and service delivery certainly varies by a number of factors. And tradeoffs between pricing and product availability are presumed to exist across categories as well. To illustrate how the outcomes in the table were developed, consider the impacts from capital and liquidity buffers designed to immunize the system against firms’ risk events. Higher capital requirements would potentially lead to constraints on the credit availability to all market participants and/or also apply upward pressure on credit costs, all things equal. Such indirect impacts could in turn constrain business activity with potential effects including limited product availability and/or higher prices of goods and services. In a similar way, various market reforms could not only introduce additional regulatory costs on financial institutions and other previously unregulated or under-regulated financial organizations, but also reduce availability of products and/or raise costs and prices. For example, restrictions applied in the OTC derivatives markets on swap market participants may limit the access to instruments used for hedging certain types of risk. By raising the costs associated with regulation on these markets, it introduces the potential for firms to pass costs along to customers in the form of higher prices or costs for credit. In the case of mortgage market reform, the impacts are deemed to be isolated to consumers and these impacts are expected to be direct. Taken into consideration of this assessment are provisions for qualified mortgages and related product restrictions as well as risk retention and qualified residential mortgage provisions outlined in DFA. Lastly, recovery and resolution planning activities have the potential for limiting firm activity if certain products and businesses are determined to pose risk to the firm requiring them to be sold. Such activities could potentially disrupt markets and lead to other dislocations at least temporarily. The study also highlights several consumer protection-related issues from systemic risk regulation. The first instance flagged in the table arises from potential privacy issues associated with data requests made by the OFR of financial institutions. While no specific requirements have developed on this matter thus far, the OFR’s powers to request transaction level data that may include personally identifiable information (PII) has the potential to create privacy issues for consumers. Other consumer-oriented impacts relate to the creation of the CFPB and its mandate to protect the interests of consumers regarding financial transactions. CFPB efforts surrounding better disclosure of mortgage terms, standardization of qualified mortgage features and other proposed reforms are noted in the table.
### Table 4: Potential Impact Assessment of Systemic Risk Regulation

<table>
<thead>
<tr>
<th>Criteria</th>
<th>US Examples</th>
<th>Compliance Costs</th>
<th>Banking Products &amp; Services</th>
<th>Nonbanking Products &amp; Services</th>
<th>Consumer Protection Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systemic Risk Identification</td>
<td>DFA Financial Stability Oversight Council</td>
<td>Improving</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>( F_1 )</td>
</tr>
<tr>
<td>Data</td>
<td>DFA — Office of Financial Research Data Center</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Measurement/monitoring</td>
<td>DFA — Office of Financial Research — Research Center</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Concentration Against Systemic Risk</td>
<td>DFA/OFR — Legal Entity Identifiers</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Buffers</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Countercyclical Capital Buffer</td>
<td>FRB NPR — Countercyclical Capital Buffer</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Capital Conservation Buffer</td>
<td>FRB — Capital Conservation Buffer</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Basel 2.5 Market Risk Rules</td>
<td>FRB NPR — Adoption of Basel 2.5 Market Risk Rules</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Restrictions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proprietary Trading</td>
<td>DFA — Volcker Rule</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Consumer Financial Protection</td>
<td>DFA — Consumer Financial Protection Bureau</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Containment of Systemic Risk Transmission</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Reform</td>
<td>DFA — Hedge Fund Regulation</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Credit Rating Agency Reform</td>
<td>DFA — Credit Rating Agency Regulation</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>OTC Derivatives Reform</td>
<td>DFA — OTC Derivatives</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Insurance Industry Reform</td>
<td>DFA — Federal Insurance Office</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Payment, Clearing &amp; Settlement Reform</td>
<td>DFA — Payment, Clearing &amp; Settlement Supervision</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Broker Dealer Reform</td>
<td>DFA — Broker Dealer Regulation</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Mortgage Reform</td>
<td>DFA — Mortgage Industry Reform</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Securitization Reform</td>
<td>DFA — Asset-backed Securitization Regulation</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Money Market Mutual Fund Reform</td>
<td>SEC Money Market Mutual Fund Rulemaking</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Counterparty Reforms</td>
<td>FRB NPR — Counterparty Credit Risk</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
</tr>
<tr>
<td>Resolution and Liquidation</td>
<td>DFA — Orderly Liquidation Authority</td>
<td>( F_2 )</td>
<td>C0, C1, FI, NFI, PF, PI</td>
<td>C0, C1, NFI, PI</td>
<td>C0</td>
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<tr>
<td>DFA — SIFI Living Will Process</td>
<td>( F_2 )</td>
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<td>C0</td>
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</tbody>
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References


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