**TESTIMONY OF DR. SUJIT CHAKRAVORTI**
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**BEFORE THE**
**COMMITTEE ON FINANCIAL SERVICES**
**UNITED STATES HOUSE OF REPRESENTATIVES**
**"ENDING 'TOO BIG TO FAIL:' WHAT IS THE PROPER ROLE OF CAPITAL AND LIQUIDITY"**

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Chairman Hensarling, Ranking Member Waters, and members of the Committee, thank you for inviting me to testify today on the critical topic of bank capital standards. My name is Dr. Sujit Chakravorti, and I am a Managing Director and Chief Economist at The Clearing House Association L.L.C.

Established in 1853, The Clearing House is the oldest banking association and payments company in the United States. It is owned by twenty-four commercial banks that collectively hold more than half of all U.S. deposits and employ over one million people in the United States and more than two million people worldwide. The Clearing House Association L.L.C. (The Clearing House) is a nonpartisan advocacy organization that represents the interests of its owner banks by developing and promoting policies to support a safe, sound, and competitive banking system that serves customers and communities.

## Introduction

The strength and resilience of the American banking system are essential as banks serve as unique financial intermediaries between those who save and those who borrow; those who are unwilling to take risks and those who are willing to bear risk for a price; and those who make payments and those who receive payments. Our modern economy relies on banks to provide these critical financial intermediation functions. The recession following the 2008 financial crisis was an example of just how significant those economic consequences can be.

As members of this Committee are well aware, the financial crisis brought to light a number of fragilities in our financial system and highlighted the critical importance of maintaining sufficient loss-absorption in the banking system. In the years since the crisis, banks have responded by significantly increasing both the quantity and quality of capital they hold. In fact, between early 2008 and late 2014 the largest bank holding companies more than doubled the amount of their common equity Tier 1 (CET1) capital relative to risk-weighted assets from 5.6% to 12.3% and increased their CET1 relative to total assets from 5.9% to 8.8%, which is referred to as the leverage ratio.[1] U.S. regulators have similarly responded by rapidly overhauling the bank regulatory capital framework, including increased requirements for the quantity and quality of capital banks must hold; changes making the risk-weights used in our risk-based capital system more conservative; the introduction of capital stress-testing and a supplemental

[1] Based on Bank Holding Companies with assets above $50 billion. Source: Quarterly Trends for Consolidated U.S. Banking Organizations 2014Q4, Federal Reserve Bank of New York.

leverage ratio for larger banks; and the forthcoming introduction of a Total Loss Absorbing Capacity (TLAC) requirement, which will mandate that banks hold significant amounts of long-term debt that may convert into equity at resolution.

In light of these major changes, I commend the Committee for taking this opportunity to take stock of the existing state of bank capital regulation and evaluate the potential consequences, both intended and unintended, of all these recent changes. At The Clearing House, we have been extensively engaged, through comment letters, white papers, and empirical research, in providing our own views and analysis on these questions, and I appreciate the opportunity to share my own observations on bank capital today.

Robust capital requirements are clearly an essential tool for both promoting the safety and soundness of individual institutions and enhancing the stability of the financial system as a whole. Simply put, capital acts as a cushion that can absorb potential losses from all the activities in which banks engage, ultimately supporting their resiliency and solvency. This cushion is especially important for banks that, because of their unique deposit-taking and lending functions, are inherently more leveraged than nonfinancial businesses, and therefore more sensitive to potential losses.

At the same time, however, as we economists like to say, there is no such thing as a "free lunch." As I will talk about in more detail shortly, increasing the level of capital a bank must hold – at least above certain levels – necessarily entails costs. For example, increasing bank capital requirements may result in a reduction in key banking activities that support our economy, including certain types of mortgage and small business lending, commercial finance, market-making and other financial intermediation services. The key objective, from a policy perspective, is to strike the right balance.

The academic research, however, is inconclusive as to how to achieve an optimal level of bank capital that supports the stability and resiliency of banks without unduly constraining key lending and other bank services on which our economy depends. In other words, how do we calibrate our bank capital requirements to strike that appropriate balance between the potential benefits of enhanced bank safety and soundness and the potential costs to our economy? I wish there was a clear consensus around how much capital is the "right amount," but unfortunately academics and policymakers continue to disagree on this difficult question. What is clear, however, is that there is a tradeoff.

The rest of my testimony will provide further detail on each of the key points I have touched upon: *first*, by summarizing the state of the economic literature on the costs and benefits of capital regulation; *second*, by describing in more detail the enormous changes that we have seen post-crisis in the bank capital regulatory landscape and the ensuing improvements to both the quality and quantity of bank capital; and *third*, by exploring reforms made in areas other than capital regulation that impact banks' financial intermediation activities. My ultimate conclusion is that given the recent and very significant reforms to the regulatory capital framework, as well as the relative uncertainty regarding the potential consequences – both intended and unintended – for banking activity and the economy, we should pause, and closely monitor and evaluate the

new capital framework to better understand these consequences before we consider further changes to it.

**The Academic Debate on Capital Regulation**

The fundamental purpose of imposing minimum bank capital requirements is to mitigate the risk of bank failures and the potential negative implications for the financial sector and the economy. Some have proposed that banks be required to hold so much capital that their probability of default would become negligible. Indeed, the work of Modigliani and Miller (1958) shows that, in theory, capital structure has no impact on the cost of capital relative to debt, a conclusion some have invoked in suggesting there is no reason banks should not face significantly higher capital requirements from pre-crisis levels (Admati et al, 2013). However, when modifying the stylized conditions in Modigliani and Miller to capture the economic realities of our financial system (for example, taxes and asymmetric market information), the capital-debt mix becomes important in determining the relative price of funding through capital, making such proposals so costly as to be unworkable. Indeed, recent empirical evidence suggests that raising capital requirements increases the weighted average cost of capital (Baker and Wurgler, 2013). The economic literature suggests several key questions that should be considered in the setting of capital standards. If capital is indeed more expensive relative to debt, what are the implications of requiring banks to hold more capital? Would these heightened regulatory capital standards have any effect on their critical intermediation activities? If so, would potential borrowers be left without credit or would they seek and obtain credit elsewhere? And if so, what does it mean for financial stability if credit disintermediates into the less regulated financial sector? The present debate about the optimal level of capital focuses on the tradeoffs between the benefits for increased financial stability at the expense of the potential drag on economic growth.

Changes in bank capital requirements may affect lending in two ways. First, if a bank's cost of capital exceeds the rate of return derived from cash flows from a new loan, the loan may not be made or the bank will increase the rate charged for the loan to cover its cost of capital. In the case of a rate increase, regulatory capital costs may be reflected in the cost of financial intermediation.

Alternatively, note that capital requirements are typically measured relative to either total assets – that is, through a leverage ratio approach - or to risk-weighted assets – that is, through a risk-based capital ratio approach. Faced with increasing capital requirements, banks may simply choose to respond by shrinking their assets, which they might accomplish by making fewer loans, selling loans or other assets, or reducing market making activities, to name just a few approaches. If asset shrinkage is limited to a subset of banks, then other banks might potentially pick up the slack without major implications for aggregate intermediation activity. However, there are likely to be serious consequences if many banks respond to higher capital requirements by reducing the flow of credit to the economy. Moreover, asset shrinkage by regulated banks may push borrowers to seek credit from non-bank lenders that are subject to less regulation, with potentially negative consequences for financial stability.

There is a substantial universe of economic literature exploring the implications of higher capital requirements for lending and economic activity. This research typically takes one of three alternative approaches. The first approach looks at banks that are subject to different capital requirements and seeks to determine whether banks with higher capital requirements or that face a larger shortfall in meeting required capital levels have different lending patterns. Assuming that raising additional capital is costly, banks with a larger capital shortfall should respond by reducing lending relative to their peers. Alternatively, if the cost of capital does not exceed the cost of debt, the lending patterns across banks with different capital profiles would be expected to be similar.

Haubrich and Wachtel (1993) follow this approach in analyzing the response of U.S. commercial banks to the 1988-89 announcement and implementation of higher capital requirements. They find that relatively undercapitalized banks shifted the composition of their portfolio in response to the new capital requirements, effectively shrinking their risk-weighted assets. Their results are consistent with the findings of Bernanke and Lown (1991) and Francis and Osborne (2009), as well as Aiyar, Calomiris, and Wieladek (2014) who identified a similar pattern of asset shrinkage among U.S. and U.K. banks in response to increased regulatory capital requirements.

The second approach looks at unexpected shocks to bank capital and follows trends in lending among banks subject to the capital shock before and after its occurrence, attributing the resulting changes in lending to the capital shock. One of the leading examples of this approach is the work by Peek and Rosengren (1997, 2000) who estimate that a significant decline in loan origination by U.S. branches of Japanese banks occurred as a result of a capital shortfall at their parent companies. In addition, they find that the decline in lending by these institutions was followed by a sharp decline in commercial real estate activity in the United States.

A third approach is based on Dynamic Stochastic General Equilibrium (DSGE) models that are designed to capture real-world data with tightly structured macroeconomic models. Given the theoretical foundations of the DSGE models, they are particularly suited for analyzing policy experiments and they can potentially circumvent the limitations of trying to predict a change in economic policy based on relationships observed in historical data, otherwise known as the Lucas Critique (see Lucas, 1976). One of the limitations of DSGE models, however, is their overly simplified assumptions that either intentionally or unintentionally exclude some of the relevant and critical components of financial markets such as a realistic interbank market. These models may understate the magnitude of the impact of capital regulation on GDP because they do not fully capture the effects of various banking products and services. A proper incorporation of the financial sector into the DSGE framework is essential for evaluating macro-prudential policies in both normal times and times of financial stress. Until further research is conducted and the financial sector is properly analyzed through this DSGE prism, caution should be exercised when using DSGE models to guide financial policy decisions.

The implications of higher capital adequacy standards for financial stability are not clear-cut. On the one hand, higher capital requirements reduce an institution's probability of default by forcing shareholders to absorb a larger fraction of losses in times of distress before passing on losses to bondholders and by mitigating moral hazard concerns associated with excessive risk

taking. On the other hand, as noted above, when faced with heightened capital requirements banks may respond by shrinking their assets which can have negative consequences for long-term economic growth (Rosengren, 2011).

Furthermore, increasing evidence suggests that regulatory burden and capital requirements are resulting in the migration of some traditional banking activities to the shadow banking sector (see, e.g., Aiyar, Calomiris, and Wieladek, 2014). With less supervisory oversight and more uncertainty about the quality of this non-bank lending, the growth of shadow banks raises concerns about allocation of credit, output growth, and financial stability.

**Capital Adequacy Today: Heightened Standards, More Resilient**

The new U.S. capital adequacy standards generally implement many aspects of the Basel III capital framework approved by the Basel Committee and also incorporate changes required by the Dodd-Frank Act. As a result, banks have substantially improved both the quality and quantity of the capital on their balance sheets.

For banks, there have been two major changes to capital adequacy standards. First, there is a new minimum 4.5% ratio of CET1 to risk-weighted assets. The previous standard under Basel I was 4% of Tier 1 capital, which includes instruments other than common equity and is therefore seen as a relatively lower quality type of capital, although the Basel III framework also tightens the definition of Tier 1 capital strengthening that measure as well. Second, regulators have adopted a new capital conservation buffer set at 2.5% of risk-weighted assets, which also must be comprised of CET1. Related reforms have made these requirements even stronger by improving the quality of what can be considered capital and heightened the standards of the risk weights applied to the assets used in the regulatory capital ratios. The United States has also adopted a capital floor (the Collins Amendment).[2]

Additional capital adequacy standards only apply to larger, more complex banks. For example, U.S. global systemically important banks (G-SIBs) will soon be subject to additional capital surcharges based on firm characteristics, which were updated by the Basel Committee in 2013 (Basel Committee on Banking Supervision, 2010) and finalized for U.S. banks earlier this week by the Federal Reserve. The Federal Reserve estimates that these surcharges on CET1 will range from 1 to 4.5 percent of risk-weighted assets according to the Federal Reserve's recently finalized standards implementing, with substantial changes, the international standards agreed upon by the Basel Committee (Federal Reserve System, 2015). The U.S. proposal is also more stringent than the final Basel G-SIB surcharge rule in several key ways, including (i) adoption of surcharge levels much higher for many U.S. G-SIBs than those agreed-upon by the Basel Committee, and (ii) incorporation of a measure of bank reliance on short-term wholesale funding as part of the calibration methodology. In addition, we also expect that a TLAC requirement will soon be introduced in the United States for G-SIBs. TLAC is intended as a measure of a firm's

[2] Among its key features, the Collins Amendment (or Section 171 of the Dodd-Frank Act) requires that the minimum risk-based and leverage capital requirements generally applicable to U.S. banks serve as a floor for certain U.S. banks. The minimum ratios for most banks to be considered "well capitalized" are: risk-based CET 1 – 6.5%; risk-based Tier 1 Capital Ratio – 8%; risk-based Total Capital Ratio – 10%; and Leverage Ratio – 5%.

entire loss absorbing resources and, as a general matter, is comprised of regulatory capital and unsecured long-term debt that can be converted into equity.[3]

In addition to the minimum ratios stipulated by capital adequacy standards, any bank or bank holding company with more than $10 billion in total consolidated assets is required to conduct an annual company-run stress test designed to assess its ability to maintain adequate capital cushions under severely adverse economic conditions. Additionally, any bank holding company with more than $50 billion in total consolidated assets must participate in the annual Comprehensive Capital Analysis and Review (CCAR) process, which examines capital levels under forward-looking scenarios that incorporate their capital plans in a simulation of a severe recession in the United States and abroad; a significant decline in equity markets; and adverse movements in the yield-curve and foreign exchange rates. In addition, the largest bank holding companies must include a significant global market shock affecting their trading portfolios and a major counterparty default scenario as part of the CCAR stress test calculated by the Federal Reserve, making it even more difficult for such institutions to meet the quantitative measures.

The CCAR process differs from the traditional approach to capital regulation in that it is forward-looking and scenario-based, requiring banks to: (i) dynamically adjust to a changing macroeconomic climate; (ii) identify risks unique to their business model; and (iii) develop innovative quantitative methods to monitor their capital levels and streams of revenue, as well as potential losses across various asset classes over a nine-quarter time horizon. The supervisory stress testing framework, therefore, goes beyond traditional capital regulation and serves as a dynamic barometer of financial stability among individual banks as well as the banking system as a whole. As a result of the assumptions built into the CCAR regulatory scenarios, it is often the binding capital constraint for banks to which it applies. Relative to the first supervisory stress tests published in 2009, there is little doubt that the array of capital and other regulatory policies has resulted in a more resilient and stable banking ecosystem. In fact according to the 2015 Dodd-Frank Act Stress Test results, banks today would have 50% higher Tier 1 common capital ratios than in 2008, even after experiencing an economic downturn, in the stress test scenario, far more severe than the last financial crisis.

**How Much is Enough? Capital Regulation Considerations Moving Forward**

As you continue to wrestle with the question of how much regulatory capital is appropriate, I urge you to bear in mind that the full consequences of the aforementioned changes in regulatory requirements, and in particular their downstream impact to the real economy, have yet to be fully realized or analyzed. That said, it is already clear that the aggregate impact of these proposed and finalized capital rules on banks' – particularly large banks' – capital holdings has been quite significant.

Between 2008 and 2014, banks with over $500 billion in assets have realized a 6.1 percentage point increase in Tier 1 capital to 13.9 percent, a 3.0 percentage point increase in their leverage ratio to 8.5 percent, and a 5.0 percentage point increase in total capital ratio to 16.7

[3] Based on our analysis including the recently finalized G-SIB surcharge rule, the TLAC requirement is approximately 5 times more than the average capital depletion projected under severely adverse stress scenarios in U.S. stress tests.

percent. For banks with between $50 billion and $500 billion in assets, we have seen similar improvements with increases of 5.0, 2.7, and 4.1 percentage points, respectively. And for banks under $50 billion in assets, these increases are 3.4, 4.1, and 3.4 percentage points, respectively (Federal Reserve Bank of New York, 2014 ). In addition, it is important to note that because regulatory reforms have also strengthened the quality of the capital instruments that can be included in these measurements, these numbers actually underrepresent the improvements made to banks' capital.

These post-crisis improvements in bank capital have been accompanied by similarly substantial improvements in banking organizations' liquidity and risk management, which has been achieved as a result of changes in bank behavior and reflect a multi-faceted array of regulatory reforms in the area of bank liquidity. For example, in the United States, the Liquidity Coverage Ratio ensures that banks have sufficient high quality liquid assets to withstand 30-day periods of severe market stress (and is more stringent than the final Basel Committee standard). Once enacted in the United States, the Net Stable Funding Ratio will ensure that structural long-dated liabilities support less liquid assets. Larger banks must also now undertake liquidity stress tests at least monthly over a variety of time horizons ranging from overnight to one year at a minimum which provides greater certainty that our largest institutions have a better ability to spot issues with their liquidity positions before a severe economic shock occurs. The largest banks are also subject to an additional requirement of annual horizontal exercises in which their liquidity is evaluated by supervisors as part of the Comprehensive Liquidity Analyses and Review (CLAR).

In the context of the wide range of bank capital and liquidity reforms that I have been discussing, the consistent availability of market liquidity has recently become a key concern for market participants and policymakers alike. While these reform measures have increased the liquidity of banks' balance sheets, research on how the full set of new financial regulatory reforms interact to affect market liquidity in stressed and non-stressed periods is in its nascent stages and points to the costs of these regulations. Raising capital adequacy standards may reduce the supply of liquidity in markets sourced from banks by reducing the profitability of engaging in certain markets such as the overnight repurchase agreement (repo) markets and other security financing transactions. Although it appears difficult to attribute recent liquidity events in bond markets to any single factor, I agree with Federal Reserve Governor Daniel Tarullo's recent statements in which he noted that "something does seem to have changed" in the way the markets provide liquidity (Tarullo, 2015). More research is needed to understand how various factors, either individually or collectively, are contributing to this change, such as: (i) capital adequacy standards; (ii) liquidity rules; (iii) increased demand for high quality, liquid assets; (iv) new regulations governing bank market making activities; and (v) an increased role for nonbanks in liquidity provision.

Beyond market liquidity concerns, some have observed other negative impacts that may be attributable to the recent increase in bank capital requirements. For example, some small businesses have experienced an increased cost and reduced availability of credit, which puts them at a relative competitive disadvantage vis-à-vis larger firms that have access to alternative sources of finance (Strongin et al, 2015). In addition, some banks have recently exited or significantly shrunk their footprints in certain capital markets or wholesale businesses, thus

reducing competition in those markets. Banks that provide the operating cash accounts for investment funds and other institutional investors are finding it increasingly challenging to accept certain cash deposits from customers. Other market participants have responded to the demand for services that some banks can no longer profitably provide. Although little hard data is available, there is increasing anecdotal and other evidence that non-bank financial institutions, collectively referred to as the "shadow banking sector," are increasing their activities in certain market segments. Policymakers should remain vigilant in the face of this shift of some traditional banking activities to the less regulated shadow banking sector. Substantial academic research suggests that more stringent bank regulations produce heightened levels of non-bank intermediation.[4] Similarly, researchers at the IMF have found that stricter capital regulations are associated with increases in shadow banking activity (Valckx et al., 2014). With less supervisory oversight and more uncertainty about the quality of lending, the growth of shadow banking activities poses concerns about allocation of credit, output growth, and financial stability.

**Conclusion**

In closing, I want to thank the Committee for its focus on the critical policy issue of capital adequacy standards. Identifying and setting the optimal levels and types of capital for our nation's banks, big and small, is a critical yet challenging policy objective. Banks are vital to U.S. economic health, but as we witnessed in the recent crisis, they can also be vulnerable to risks. Accordingly, policymakers must balance the benefits to society of maintaining a stable banking system against potential costs of making the economy less vibrant and banking services more costly.

There is no clear answer to be found in the academic literature regarding exactly how much capital or liquidity is the "right amount." What is indisputable, however, is that since the financial crisis, banks of all sizes now hold a significantly higher quality and quantity of capital, and these requirements are projected to increase further as pending rules are finalized and implemented. These higher post-crisis capital levels clearly have made our banking system safer, but we need additional research in order to fully understand their consequences for future economic growth.

This is a good time for policymakers to pause and evaluate where we have recently landed in the tradeoff between financial stability and the banking system's contribution to the U.S. economy.

Thank you for the opportunity to testify before the Committee today. I look forward to answering your questions.

[4] See: Vlackx, et al. (2014) which cites: Kanatas and Greenbaum (1982); Bernanke and Lown (1991); Udell and Berger (1994); and Duca (1992, 2014).

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