



# **The Impact of the Recent Financial Crisis on the Capital Positions of Large U.S. Financial Institutions: An Empirical Analysis**

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## I. EXECUTIVE SUMMARY

Establishing capital requirements that are sufficient to support the banking system through a crisis is critical to preserving financial stability. In this paper we use the experience of the recent financial crisis which peaked in 2008 to analyze and measure the potential risk to capital at large U.S. financial institutions during a period of severe stress. Specifically, we perform a historically based analysis of the extent to which losses from financial institutions' risk exposures would have eroded their capital ratios under certain assumed constraints. We analyze financial data from 26 large financial institutions in the United States over the period from 2007:Q1 to 2012:Q2 to estimate the erosion of capital during each institution's most stressful period. We consider only large financial institutions, as critical levels of capital impairment at these institutions are more likely to have implications for the broader financial system.

Our study indicates that the capital depletion during the recent financial crisis at large U.S. financial institutions was extensive and often rapid. Specifically, of the 26 large institutions examined in this study, half had losses that would deplete capital ratios by at least 200 basis points. Of that number, 12 institutions had capital ratio erosion in excess of 300 basis points and eight institutions had capital ratio erosion in excess of 450 basis points. When our estimates of capital depletion at large U.S. firms are compared to the adopted and proposed Basel III capital standards for the largest U.S. firms, capital requirements do not appear excessive as some observers have alleged.

## II. METHODOLOGY

This paper estimates capital ratio erosion for a population of 26 large financial institutions in the United States. Our sample includes domestic bank holding companies (BHCs), independent domestic thrifts, and independent domestic broker-dealers with Total Assets in excess of \$100 billion as of our observation period.<sup>1</sup> In further detail, our sample includes the 2009 Supervisory Capital Assessment Program BHCs, representing 19 domestic BHCs with Total Assets greater than \$100 billion as of year-end 2008. To this core group, we add the five independent domestic broker-dealers with Total Assets greater than \$100 billion as of year-end 2006, the time immediately prior to the start of our observation period.<sup>2</sup> We also include the one independent domestic thrift with Total Assets greater than \$100 billion as of year-end 2006.<sup>3</sup> Finally, our sample includes Countrywide Financial Corp., which was a BHC with Total Assets in excess of \$100 billion as of year-end 2006, but became a thrift holding company in 2007, with Total Assets in excess of \$100 billion. The analysis utilizes publicly available data sourced from regulatory reports and Securities and Exchange Commission (SEC) financial report filings.

Discrete crisis periods are defined for each of the financial institutions in our sample. Our research determined that the time periods when the most substantial capital erosion occurred varied somewhat from firm to firm based upon their business activities and related accounting outcomes. Therefore, each firm's individualized peak crisis period is identified as the interval that brackets the maximum aggregate contiguous loss of capital within the 2007:Q1–2012:Q2 observation period.

To estimate each firm's capital loss, we aggregate contiguous quarterly net losses over the firm's individualized crisis period after adjusting those net losses for capital

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<sup>1</sup> Here, "independent" means not already owned by a BHC in the sample.

<sup>2</sup> Broker-dealer defined as SEC Financial and Operational Combined Uniform Single Report (FOCUS Report) Part II Filers.

<sup>3</sup> Thrift defined as Thrift Financial Report (TFR) Filers.

treatment consistency as detailed below. Our primary focus is on depletion of U.S. BHC regulatory capital, but the depletion of tangible common equity is also included to provide another important risk perspective. Our findings are presented as the basis point erosion of selected U.S. BHC regulatory and tangible common equity ratios; normalizing results in such a ratio format allows for the comparison of capital depletion across firms of different sizes.

This methodology is a companion approach to the existing body of Basel III capital-related research. It is similar to that found in the large bank analysis section in the October 2010 Basel guidance, “Calibrating Regulatory Minimum Capital Requirements and Capital Buffers: A Top Down Approach” (Basel 2010a). That paper assesses the erosion of banks’ capital cushions during the recent financial crisis for a sample of 73 financial institutions in 14 countries. The key difference between the two papers is one of granularity. The Basel III guidance paper (Basel 2010a) presents results at an anonymized aggregate level. In this paper, we specifically provide a more focused and in-depth evaluation of large financial institutions within one country (the United States). This granularity allows for a more tailored treatment of certain accounting issues impacting capital, and also allows the reader to place the results into the context of each institution’s particular crisis experience. Similarly, our analysis complements the current U.S. BHC regulatory stress test regime. Those evaluations are important forward-looking assessments of risk based upon macroeconomic shocks, associated loss estimates, and net revenue projections. We believe our study’s historical analysis of risk taking at large U.S. financial institutions provides an important context for forward-looking regulatory stress tests.

## **A. Overview of Major Assumptions**

Our study makes certain major assumptions in an effort to translate the historically based analysis into results that may more reasonably represent the risk to capital ratios for large U.S. financial firms going forward. For example, the effects of U.S. government support for financial institutions and markets during the recent financial

crisis are excluded when possible, acknowledging the uncertain ability and willingness of the U.S. government to provide the same level of support in the future. Thus, capital additions made by firms during the crisis period that were facilitated by government support are not reflected in our analysis. We hold RWA relatively constant throughout the individualized crisis periods except in cases where material mergers and acquisitions and/or accounting changes occurred. Additionally, of particular importance to our analysis is the inclusion of financial institutions that failed or were acquired during the financial crisis to ensure that the results do not exhibit a material survivor-bias. Each of the major assumptions highlighted here is discussed in more detail in Section II.D.

Furthermore, our study was undertaken during a period when capital regulations in the U.S. were in a state of evolution and to the degree possible we attempted to adapt our methodology to the framework that will be applied going forward. Much of our analysis occurred in the period in which the Basel III Notice of Proposed Rulemaking (Basel III NPR 2012)<sup>4</sup> was issued and under consideration. Therefore, to the extent possible, all major prospective changes to U.S. BHC regulatory capital requirements under the Basel III NPR 2012 are incorporated into the analysis; additionally, Basel III proxy adjustments were made to Risk-Weighted Assets (RWA) figures used in our analysis. More recently, U.S. federal banking regulators have adopted a final rule which revises the risk-based and leverage capital requirements for banking organizations (Final Rule 2013).<sup>5</sup> While there are differences between the Final Rule 2013 and the Basel III NPR 2012, we have reviewed these differences and believe they would not cause us to make meaningful changes to our methodology and would not result in material changes to our results. The most notable applicable difference in the

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<sup>4</sup> “Regulatory Capital Rules: Regulatory Capital, Implementation of Basel III, Minimum Regulatory Capital Ratios, Capital Adequacy, Transition Provisions, and Prompt Corrective Action,” Board of Governors of the Federal Reserve System, Federal Register / Vol. 77, No. 169 / Proposed Rules, August 30, 2012, pages 52,791-52,886.

<sup>5</sup> “Regulatory Capital Rules: Regulatory Capital, Implementation of Basel III, Capital Adequacy, Transition Provisions, Prompt Corrective Action, Standardized Approach for Risk-weighted Assets, Market Discipline and Disclosure Requirements, Advanced Approaches Risk-Based Capital Rule, and Market Risk Capital Rule,” Board of Governors of the Federal Reserve System, July 2, 2013.

Final Rule 2013 is the treatment of Accumulated Other Comprehensive Income (AOCI), which is discussed in more detail in Sections II.B.i(3) and II.D.

## **B. Capital Erosion Calculation**

### **i. Capital Erosion Calculation for BHCs**

To estimate capital erosion, we first calculate each firm's quarterly net losses, adjusted for consistency with U.S. BHC regulatory capital treatment as detailed below, over the observation period 2007:Q1–2012:Q2. We then determine each firm's peak crisis period, defined as the interval that brackets the maximum contiguous quarterly losses of capital within the observation period. The aggregation of these quarterly net losses during the peak crisis period is a firm's peak capital erosion. For the financial institutions that were BHCs at the time of their crisis, all data are sourced from the Board of Governors of the Federal Reserve System's Consolidated Financial Statements for Holding Companies - Form FR Y-9C (FR Y-9C). Quarterly capital erosion is calculated as follows:

(1) Net Income before Preferred and Common Dividends

(2) Less: (Amortization & Impairment of Goodwill and Other Intangibles)

(3) Add: Quarter-over-Quarter Change in Net Unrealized Gain/(Loss) on AFS Securities

**(1) – (2) + (3) = Equals: Tangible Common Equity (TCE) Erosion**

(4) Less: After-Tax Own Credit Risk (OCR) Gain/(Loss)

(5) Less: Quarter-over-Quarter Change in Disallowed Deferred Tax Assets

**(1) – (2) + (3) – (4) – (5) = Equals: Tier 1 Common Capital (T1C) Erosion**

(1) Net income before preferred and common dividends<sup>6</sup> is the starting point for analyzing quarterly net losses because theoretically a bank can defer common and preferred dividends to conserve capital. Additionally, it excludes the impact of U.S.

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<sup>6</sup> Form FR Y-9C dated June 2012 Schedule HI line item 14 (line item 13 in December 2008 and earlier versions) "Net income (loss) attributable to holding company."

government support via preferred share investments from the Troubled Asset Relief Program (TARP). Furthermore, note that there are no adjustments to net income before preferred and common dividends for extraordinary items, unless they are judged to be extremely anomalous.<sup>7</sup>

(2) Goodwill and other intangibles (excluding servicing assets and purchased credit card relationships (PCCR)) are excluded from U.S. BHC regulatory Tier 1 Capital (under both current rules and the Basel III NPR 2012) as well as from tangible common equity. Thus, changes to these accounts that flow through net income do not affect T1C or TCE. Therefore, the quarterly capital erosion calculations exclude the expense associated with impairment of goodwill and other intangibles as well as any amortization expense associated with other intangibles.

(3) Under current U.S. BHC regulatory capital rules, net unrealized gains/(losses) on available-for-sale (AFS) securities are excluded from Tier 1 Capital.<sup>8</sup> In contrast, under the Basel III NPR 2012 in the United States, it was proposed that unrealized gains/(losses) on AFS securities would impact capital levels. However, under the Final Rule 2013, a banking organization that is not a Basel II Advanced Approaches institution<sup>9</sup> may make a one-time election to exclude most elements of AOCI, including unrealized gains/(losses) on AFS securities, in the calculation of regulatory capital (AOCI opt-out election). Of our sample, at least 13 of 26 firms would have been considered to be Advanced Approaches institutions at year-end 2006. While not publicly disclosed, a number of the remaining firms in our sample are or would have been subject to Advanced Approaches or have chosen to opt-in to the Advanced

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<sup>7</sup> See Appendix for notes on Ally Financial.

<sup>8</sup> Unrealized losses on available-for-sale equity securities are included in the Tier 1 Capital calculation as per Line Item Instructions for Form FR Y-9C dated June 2012 (Schedule HC-R Line Items 2 and 3).

<sup>9</sup> Banks required to apply the Basel II Advanced Approaches (core banks) are those with consolidated Total Assets of \$250 billion or more, or with consolidated on-balance sheet foreign exposure of \$10 billion or more, or are a subsidiary of a core bank. Other banks (opt-in banks) may choose to adopt the Advanced Approaches if they meet applicable qualification requirements. See "Risk-Based Capital Standards: Advanced Capital Adequacy Framework – Basel II," Board of Governors of the Federal Reserve System, Federal Register / Vol. 72, No. 35 / Rules and Regulations, December 7, 2007, page 69,290.

Approaches. We cannot project how many of the currently non-Advanced Approaches firms will choose to exercise the AOCI opt-out election. Our methodology therefore continues to assume that all firms in the sample include AOCI in their Tier 1 Common calculations. We believe our results remain informative as this assumption would appear to be valid for the majority of firms in the sample and all of the largest firms in the sample.<sup>10</sup> Furthermore, regardless of the AOCI opt-out outcomes, we believe the market will continue to assess the potential significance of AOCI capital impacts. As such, we included the quarter-over-quarter change in net unrealized gains/(losses) on AFS securities in the quarterly capital erosion calculations.

(4) Own Credit Risk (OCR) represents the periodic gain/(loss) adjustment due to changes in the creditworthiness of an institution, where an institution has elected to measure its own financial liabilities at fair value. The cumulative after-tax effect of OCR gains/(losses) is excluded from both U.S. BHC regulatory Tier 1 Capital and T1C under the Basel III NPR 2012. Consequently, the quarterly capital erosion calculations exclude after-tax OCR gain/(loss).

(5) Deferred tax assets (DTA) and liabilities (DTL) are the result of temporary differences between tax obligation recognition under book accounting (U.S. GAAP) and tax basis accounting (IRS). The differences are generated primarily by net operating losses and the timing of revenue/expense recognition. Net DTAs are included in current U.S. BHC regulatory Tier 1 Capital only up to a certain calculated threshold. Under the Basel III NPR 2012 the calculation is more restrictive, producing a lower threshold. Any balance of net DTAs over that threshold is disallowed and is

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<sup>10</sup> We analyzed the effects of this difference between the Basel III NPR and the Final Rule 2013 on our results by recalculating our T1C capital ratio erosion figures as per the Final Rule 2013 treatment of net unrealized gains/(losses) on AFS securities. We assumed that Advanced Approaches firms would include net unrealized gain/(losses) on AFS securities as required by Final Rule 2013, and that non-Advanced Approaches firms would elect to opt out. Under that scenario, there was no change in the number of firms with T1C capital ratio erosion greater than 200 bps, and no material change in individual firm results. For the firms with T1C capital ratio erosion less than 200 bps, while there were some firms that experienced material change in T1C ratio erosion due to the change in AFS treatment, all firms continued to exhibit less than 200 bps of T1C ratio erosion.



therefore subtracted from T1C. The quarter-over-quarter change in the disallowed DTA balance under current U.S. BHC regulatory capital rules is reflected in the capital erosion calculations.<sup>11</sup>

ii. Capital Erosion Calculation for Firms That Were Not BHCs

For financial institutions in our sample that were not bank holding companies (non-Y-9C filers) at the time of their crisis period,<sup>12</sup> quarterly capital erosion is calculated using the same equation as for the BHCs, reiterated below. However, absent comparable U.S. BHC regulatory reports, data are sourced from SEC financial report filings, which do not provide all the necessary data elements that are available in the FR Y-9C. Thus, for the non-Y-9C filing population, certain items are approximated in our analysis using publicly disclosed information.

- (1) Net Income before Preferred and Common Dividends
- (2) Less: (Amortization & Impairment of Goodwill and Other Intangibles)
- (3) Add: Quarter-over-Quarter Change in Net Unrealized Gain/(Loss) on AFS Securities
- (1) – (2) + (3) = Equals: Tangible Common Equity (TCE) Erosion**
- (4) Less: After-Tax Own Credit Risk (OCR) Gain/(Loss)
- (5) Less: Quarter-over-Quarter Change in Disallowed Deferred Tax Assets
- (1) – (2) + (3) – (4) – (5) = Equals: Tier 1 Common Capital (T1C) Erosion**

The primary items that are approximated for non-Y-9C filers include:

- (4) OCR gains and losses on an institution's financial liabilities measured under the fair value option. These are sourced from SEC filings. Although these figures are

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<sup>11</sup> It is not possible to proxy a deduction for disallowed DTA fully consistent with the Basel III NPR 2012, as certain pertinent historical information is not available. Our calculated deduction for disallowed DTA is instead consistent with current U.S. BHC regulatory rules, producing a smaller deduction from regulatory capital than would be calculated for the Basel III NPR 2012. Consequently, the treatment of DTA in our analysis is considered to be conservative in favor of the impacted financial institutions.

<sup>12</sup> Ally Financial Inc., Bear Stearns Companies Inc., Countrywide Financial Corp., Goldman Sachs Group, Inc., Lehman Brothers Holdings Inc., Merrill Lynch & Co, Inc., Morgan Stanley, and Washington Mutual Inc.

sourced from financial statement footnotes, these disclosures are not necessarily uniform. The pre-tax figures sourced from financial statement footnotes are then adjusted to reflect the after-tax impact using effective tax rates or a rate of 35 percent when the effective tax rate was outside a normal range (for example, in certain periods firms' effective tax rates could be negative). After-tax OCR gain/loss is then excluded from the quarterly capital erosion calculations, consistent with treatment for the BHCs.

(5) The amount of "disallowed" DTA. This is not disclosed in SEC filings; therefore, it was necessary to approximate "disallowed" DTA for non-Y-9C filers. Per current U.S. BHC regulatory capital rules, the amount of net DTA allowable for inclusion in Tier 1 Capital is generally limited to the lesser of the amount of DTAs that the institution expects to realize in the near future based on projections of taxable income, or 10 percent of the institution's Tier 1 Capital. However, projected taxable income is generally not publicly disclosed. As a result, we use net DTA in excess of 10 percent of a Tier 1 Capital test statistic as a proxy for the disallowed portion of DTA under current U.S. BHC regulatory capital rules. A Tier 1 Capital test statistic was created based on June 2012 FR Y9-C instructions; which was defined as:

Total Equity [Common Equity + Preferred Equity + Minority Interest]

Add: Trust Preferred Securities

Less: Total Accumulated Other Comprehensive Income (AOCI)

Less: Goodwill and Other Intangibles (excluding Servicing Assets and PCCR)

Less: Cumulative After-Tax OCR Gains/(Losses)

**Equals: Tier 1 Test Statistic**

This methodology is used to estimate a disallowed DTA figure for each quarter in the observation period for the non-Y-9C filers. Then, similar to the treatment of BHCs, the quarter-over-quarter change in the disallowed DTA balance is included in the capital erosion calculation.

### iii. Capital Erosion Calculation for “Transitioned” Firms

Another significant component of the capital erosion calculation involves what are termed “transitioned” firms. These are firms that were either acquired, failed, or entered bankruptcy or receivership during their crisis period.<sup>13</sup> For these firms, quarterly capital erosion is calculated using one of the two methods detailed above, depending on whether the firm was a BHC or a non-Y-9C filer at the time of its crisis period.

However, for the transitioned firms, the fact that many of them stopped reporting independent financial statements during their crisis period needed to be addressed. In one instance, the acquiring firm continued to report the acquired firm as a separately reported entity and therefore the data necessary to continue the quarterly capital erosion calculations post-acquisition were available. However, for most firms, discrete financial statements were not available after the transition. In these cases, an additional approximation of post-reporting capital erosion was needed commensurate with the residual crisis-related losses that were inherent at the time of transition but had not yet materialized in the reported financial results. For example, Lehman Brothers Holdings Inc. (Lehman), which had significant risk of losses entering its crisis period, failed so rapidly that Lehman’s last financial statements issued prior to failure did not capture the entirety of these losses. To adjust for this, we include an approximation of these sizable but unreported losses in our analysis in order to address any potential survivor bias in the data. We believe our approximation for transition loss, while not fully comparable with the core quarterly capital erosion calculation, provides a reasonable estimate of associated risk to capital, especially when considering the significance of the challenges that these transitioned firms experienced.

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<sup>13</sup> Bear Stearns Companies Inc., Countrywide Financial Corp., Lehman Brothers Holdings Inc., Merrill Lynch & Co, Inc., National City, Wachovia Corp., and Washington Mutual, Inc.

For transitioned firms that ceased reporting discrete financial data, the following equation approximates the post-reporting transition loss:

(6) Purchase Price of Acquired Firm

(7) Less: Shareholders' Equity of Acquired Firm at Their Last Reported Quarter-End

**(6) – (7) = Equals: Transition Loss**

(6) Purchase price of the acquired firm inclusive of transactional goodwill, as sourced from SEC financial statement footnote disclosures of the acquirer, was deemed to be the most representative estimate of the fair value of the firm at the time of transition.

(7) Shareholders' equity the quarter before acquisition/failure represents the net book value of the firm the quarter before it was transitioned.

For Lehman, which went into bankruptcy, and Washington Mutual, Inc. (Washington Mutual), which went into receivership before its sale to JPMorgan Chase & Co., an assumption was made that the transition loss equaled the full loss of shareholders' equity. The rationale for this treatment was that, to date, the equity holders of Lehman and Washington Mutual have not recovered material value subsequent to the bankruptcy/receivership.

### **C. Capital Ratio Erosion Calculations**

In order to make the capital erosion figures calculated in Section II.B comparable across institutions of differing size, we express our findings on a ratio basis instead of a dollar-value basis. Our study focuses on capital erosion expressed as two ratios: T1C/RWA and TCE/Tangible Assets. Therefore, in addition to the estimate of the peak dollar-value of capital erosion detailed in Section II.B, our analysis also requires baseline and ending values for RWA, Tangible Assets, T1C, and TCE. The baseline period is defined as the quarter before the onset of an institution's crisis period. The ending period is defined as the last quarter of an institution's crisis period.

i. Baseline Capital Ratios for BHCs

For BHCs, baseline RWA and Total Assets are sourced directly from Form FR Y-9C. Baseline TCE and T1C are calculated as below, with data sourced from Form FR Y-9C.

**Common Equity<sup>14</sup>**

Less: Total Goodwill and Other Intangibles (excluding Servicing Assets and PCCR)

**Equals: Baseline Tangible Common Equity**

**Common Equity**

Less: Accumulated Gains/(Losses) on Cash Flow Hedges

Less: Disallowed Goodwill and Other Intangibles

Less: Cumulative Change in After-Tax OCR Gains/(Losses)

Less: Disallowed Servicing Assets and PCCR

Less: Disallowed Deferred Tax Assets

Other Additions/(Subtractions)

**Equals: Baseline Tier 1 Common Capital (T1C)**

Note that in contrast to the current U.S. BHC regulatory definition of Tier 1 Common Capital,<sup>15</sup> the baseline T1C calculation includes net unrealized AFS securities gains/losses as discussed in Section II.B.i(3).

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<sup>14</sup> Common equity is defined as shareholders' equity minus preferred stock and related surplus. Note that common equity also excludes other noncommon elements of regulatory capital, such as minority interests in consolidated subsidiaries, trust preferred securities, and mandatory convertible preferred securities.

<sup>15</sup> Tier 1 Common Capital as defined is consistent with the Federal Reserve definition for regulatory stress testing, Tier 1 Capital less the noncommon elements of Tier 1 Capital; in other words, common equity minus U.S. BHC regulatory Tier 1 deductions. This is consistent with the Federal Reserve's Final Rule on Capital Plans, Federal Register / Vol. 76, No. 231 / Rules and Regulations, December 1, 2011, page 74,636.

ii. Baseline Capital Ratios for Non-Y-9C Filers

Baseline TCE for non-Y-9C filers is calculated in a consistent manner with that used for Y-9C filers. However, baseline T1C has to be approximated for non Y-9C filers using data from SEC filings. Certain items in the baseline T1C capital calculation require approximations for regulatory disallowed amounts, which were calculated using a methodology consistent with the DTA discussion above in Section II.B.ii(5).

**Common Equity<sup>16</sup>**

Less: Total Goodwill and Other Intangibles (Excluding Servicing Assets and PCCR)

**Equals: Baseline Tangible Common Equity**

**Common Equity**

Less: Accumulated Gains/(Losses) on Cash Flow Hedges

Less: Disallowed Goodwill and Other Intangibles

Less: Cumulative Change in After-Tax OCR Gains/(Losses)

Less: Disallowed Servicing Assets and PCCR

Less: Disallowed Deferred Tax Assets

Other Additions/(Subtractions)

**Equals: Baseline Tier 1 Common Capital (T1C)**

Finally, non-Y-9C filers' SEC financial disclosures generally do not contain RWA figures. Therefore, in order to derive a baseline RWA amount, RWA for non Y-9C filers is approximated using the average ratio between RWA and Total Assets for the firms that became BHCs subsequent to the financial crisis, and thus had to file Y-9C

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<sup>16</sup> Common equity is defined as shareholders' equity minus preferred stock and related surplus. Note that common equity also excludes other noncommon elements of regulatory capital, such as minority interests in consolidated subsidiaries, trust preferred securities, and mandatory convertible preferred securities.

forms and report RWA data. In the absence of that information, we applied an average ratio of RWA/Total Assets from peer firms to non-Y-9C filers.

iii. Ending Capital Ratios and Capital Ratio Erosion for All Firms in Sample

From the data and calculations described above, each institution's baseline T1C and TCE ratios are calculated. We then apply the capital erosion figures calculated in Section II.B to the baseline capital and asset figures from Section II.C in order to calculate ending T1C and TCE ratios. The capital ratio erosion for each institution is expressed as the basis point difference between the baseline and ending ratios as detailed below.

**Erosion of T1C Ratio**

- (1) Baseline Tier 1 Common (T1C) Capital (\$)
- (2) Baseline RWA (\$)
- (3) = (1)/(2) Equals: Baseline T1C Ratio (%)
- (4) Estimated Tier 1 Common Capital Erosion (\$)
- (5) = (1) – (4) Equals: Ending Tier 1 Common Capital (\$)
- (6) = (2) – (4) Equals: Ending RWA (\$)
- (7) = (5)/(6) Equals: Ending Tier 1 Common Capital Ratio (%)
- (8) = (7) – (3) Equals: T1C Ratio Erosion (bps)**

**Erosion of TCE Ratio**

- (1) Baseline Tangible Common Equity (\$)
- (2) Baseline Tangible Assets (\$)
- (3) = (1)/(2) Equals: Baseline TCE Ratio (%)
- (4) Estimated TCE Erosion (\$)
- (5) = (1) – (4) Equals: Ending TCE (\$)
- (6) = (2) – (4) Equals: Ending Tangible Assets (\$)
- (7) = (5)/(6) Equals: Ending TCE Ratio (%) (7)
- (8) = (7) – (3) Equals: TCE Ratio Erosion (bps)**

## **D. Discussion of Major Assumptions**

As noted in Section II.A, increases to capital for our sample firms that resulted from U.S. government-related actions are not reflected in our analysis; for example, the equity issuances by financial institutions that followed the 2009 Supervisory Capital Assessment Program regulatory stress tests. These issuances were made possible by extraordinary supportive actions by the government, as most firms were essentially unable to issue capital during their individual crisis periods on their own (beyond issuance related to acquisitions, which we took into account), without expressed or perceived government back-stopping support. Moreover, we believe any analysis of capital sufficiency that allows for the assumption that additional capital can be sourced during a severe crisis is problematic—if capital can be readily and efficiently raised in a crisis, then essentially no level of capital is inadequate.

Similarly, as previously noted, we generally hold a sample firm's RWA constant throughout its crisis period. The rationale for keeping RWA relatively constant is that we believe that in considering policy for establishing optimal capital sufficiency levels, the analysis should not be influenced by a reduction in RWA to improve capital ratios. A reduction of RWA during a crisis to meet capital thresholds constitutes a pro-cyclical impact that strains credit intermediation. However, it should be noted that in our analysis adjustments are made for material acquisitions that occurred during a firm's crisis period. In addition, RWA were adjusted to reflect the adoption of new accounting rules related to the consolidation of variable interest entities that were material to the firm's crisis period. One minor adjustment we also make to RWA is to deduct the capital erosion figure from baseline RWA to arrive at ending RWA.

Regarding another major assumption, in order to make this historical analysis relevant for forward-looking conditions, to the extent possible our methodology incorporates significant elements of the Basel III capital framework as outlined in the Basel III NPR 2012 which were not in effect during the recent financial crisis. For this



reason, Tier 1 Common Capital is approximated, consistent with the Basel III NPR 2012 to the extent possible. We considered differences between the Basel III NPR 2012 and the Final Rule 2013 and concluded these differences would not materially impact our analysis (see discussion in Section II.B.i(3) and footnote 10).

Lastly, there is an effort to align the historical Basel I RWA metrics used in our analysis with Basel III through translating the historical Basel I RWA figures into Basel III proxy RWA figures. This was achieved by using firms' publicly disclosed Basel III RWA estimates to date, comparing these estimates to disclosed Basel I RWA of the same time period, and applying the resulting ratio to the historical Basel I RWA figures. Peer group average ratios are used for firms where Basel III RWA estimates were unavailable.

### III. RESULTS

As detailed in Sections II.B and II.C, each institution's baseline and ending T1C and TCE ratios are calculated over a crisis period that represents the maximum loss to capital under assumed constraints for that individual institution during a 2007:Q1–2012:Q2 observation period. The capital ratio erosion data for each institution, expressed as the basis point difference between the baseline and ending ratios, are provided in the table below.

Institution	Crisis Period	Capital Ratio Erosion (in Basis Points)	
		Tier 1 Common Capital	Tangible Common Equity
Washington Mutual, Inc.	2007:Q4 - 9/25/08	(1,202)	(1,032)
Countrywide Financial Corp.	2007:Q3 - 7/1/08	(769)	(547)
Merrill Lynch & Co., Inc.	6/30/07 - 12/31/08	(756)	(407)
National City Corp.	2007:Q4 - 12/31/08	(751)	(796)
Ally Financial Inc.	2007:Q3 - 2009:Q4	(636)	(621)
Lehman Brothers Holdings Inc.	3/1/08 - 9/15/08	(610)	(460)
Wachovia Corp.	2008:Q1 - 12/31/08	(590)	(521)
State Street Corp.	2007:Q4 - 2009:Q2	(527)	(283)
Citigroup Inc.	2007:Q4 - 2008:Q4	(380)	(150)
Bear Stearns Companies Inc.	9/1/07 - 5/30/08	(358)	(309)
Capital One Financial Corp.	2010:Q1	(327)	(106)
MetLife, Inc.	2008:Q1 - 2009:Q1	(315)	(205)
KeyCorp	2008:Q2 - 2010:Q1	(242)	(215)
Morgan Stanley	9/1/07 - 12/31/08	(145)	(24)
Regions Financial Corp.	2008:Q4 - 2011:Q1	(140)	(101)
American Express Co.	2010:Q1	(96)	(79)
Fifth Third Bancorp	2008:Q2 - 2008:Q4	(93)	(111)
Bank of New York Mellon Corp.	2008:Q1 - 2008:Q4	(90)	(101)
PNC Financial Services Group, Inc.	2008:Q1 - 2008:Q4	(87)	(85)
Wells Fargo & Co.	2008:Q3 - 2008:Q4	(81)	(44)
SunTrust Banks, Inc.	2008:Q2 - 2010:Q1	(69)	(89)
Bank of America Corp.	2010:Q4 - 2011:Q3	(66)	7
Goldman Sachs Group, Inc.	8/30/08 - 12/26/08	(36)	(25)
BB&T Corp.	2010:Q4	(10)	(9)
JPMorgan Chase & Co.	2008:Q3	(4)	0
U.S. Bancorp	--	--	--

In order to frame the results and gain perspective on the magnitude of risk that was inherent in the system during the recent financial crisis, we highlight the number of financial institutions that experienced capital ratio erosion greater than 200, 300, and 450 basis points. These thresholds relate to expected regulatory guidelines for the Tier 1 Common Capital Ratio (or a similar ratio such as Common Equity Tier 1 Capital Ratio). The Basel III T1C/RWA ratio minimum plus the conservation buffer is 7.0 percent, which provides one fundamental regulatory threshold. Furthermore, current expectations are that an additional buffer ranging from 1.0 percent to 2.5 percent (with an empty bucket up to 3.5 percent) will be assessed against financial institutions that are considered globally systemically important (G-SIFI).<sup>17</sup> This creates two more regulatory thresholds for the Tier 1 Common ratio, at 8.0 percent and 9.5 percent. In order to determine an appropriate erosion buffer, we must make an assumption about the floor below which capital may not fall without breaching regulatory limits or risking a serious decline in market confidence. While the Basel III minimum capital level is established at 4.5 percent, the current U.S. regulatory stress test threshold is set at 5.0 percent. As the Comprehensive Capital Analysis and Review (CCAR) guidance states:

*A key benchmark in the analysis was whether a bank holding company's adjusted Tier 1 Common Capital ratio exceeded a supervisory reference level of 5 percent on a pro forma, post-stress basis in each quarter over the planning horizon. This reference level reflects a supervisory assessment of the minimum capital needed for a banking company to continue to function and meet its obligations throughout the stress period and on a post-stress basis, based on an analysis of the historical distribution of earnings by large U.S. banking organizations.*<sup>18</sup>

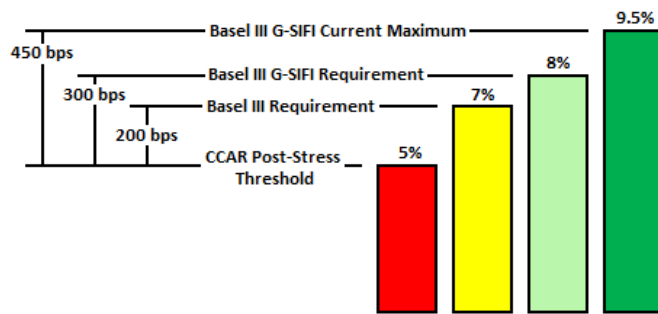
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<sup>17</sup> The Basel Committee on Banking Supervision in the consultative document "Global Systemically Important Banks: Assessment Methodology and the Additional Loss Absorbency Requirement" (Basel 2011) designates that "an empty bucket will be added on top of the highest populated bucket to provide incentives for banks to avoid becoming more systemically important," page 11.

<sup>18</sup> "Comprehensive Capital Analysis and Review: Objectives and Overview," Board of Governors of the Federal Reserve System, March 18, 2011, page 15.

Therefore, if we presume a 5 percent floor on Tier 1 Common Capital ratio and the various Basel III requirements of 7.0 percent, 8.0 percent, and 9.5 percent, depending upon the financial institution's size, complexity, and interconnectedness, this provides us with the 200, 300, and 450 basis point buffers or vantage points.

**Proposed Basel III Tier 1 Common Ratio Buffer Capacity**



Our results find a sizable number of firms in our sample where capital eroded by a magnitude that would exceed the proposed Basel III cushions.

- Eight institutions had capital ratio erosions in excess of 450 basis points.
- 12 institutions had capital ratio erosions in excess of 300 basis points.
- 13 institutions had capital ratio erosions in excess of 200 basis points.

In addition to these significant magnitudes, it is worth noting how quickly some of these capital losses occurred. For example, six of the seven transitioned firms in our study experienced just four quarters or fewer of modeled capital depletion before failure or acquisition. Both Lehman and Bear Stearns Companies Inc. (Bear Stearns) experienced just two quarters of modeled capital depletion before the failure of Lehman and the necessitated acquisition of Bear Stearns.

We believe our model's results are generally intuitive from a macro perspective, given the magnitude of the recent financial crisis. It is possible that our estimate of losses may even understate the losses that could occur in a different crisis, given the extraordinary level of government intervention and backstopping of firms and markets. As a result, some crisis-related losses were mitigated and others were stretched out over many periods and even into post-crisis profitable periods. This might not have been possible without government support of these institutions, and

it seems unlikely that the government will have the latitude to react with similar levels of support in future crises. This understatement has occurred with certain crisis-related lawsuits. Recognizing crisis losses in periods of positive earnings mitigates the intensity of the crisis for those firms that adopt this practice. Hence, accounting perspectives of risk often lag market perspectives. This asynchronous relationship heightens the importance of maintaining accounting-based capital requirements that are sufficient to provide comfort to market counterparties.

## IV. CONCLUSIONS

The results of our analysis underscore how much capital can be depleted during an unusually severe financial crisis. The extent of capital depletion during the recent financial crisis is especially notable given the significant direct support that the government provided the large institutions included in our analysis. Many regulatory changes have been and are being implemented to respond to the systemic vulnerabilities identified during the financial crisis. These changes include BHC status for holding companies of the major remaining broker-dealers, resolution plans, stress testing, and enhanced liquidity and capital planning requirements. One of the most significant post-crisis developments has been the global effort to increase the required capital levels of financial institutions. In Final Rule 2013, U.S. federal banking regulators have adopted higher capital thresholds, strengthened the definition of what constitutes capital, and generally increased RWA requirements in line with guidance from the Basel Committee on Banking Supervision.<sup>19</sup> In summary, regulators have undertaken a multi-pronged approach to minimizing the probability of future crises, with major “prongs” involving changes to capital, liquidity, and structural requirements.

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<sup>19</sup> “Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems,” Basel Committee for Banking Supervision, December 2010 (revised June 2011).

While the multi-pronged enhancements to regulation should mitigate some future risk, the adequacy of these enhancements is unknown, as these policies are untested. In particular, while the evolving approach to capital regulation for the largest financial institutions is a significant improvement over the pre-crisis approach, our empirical evidence indicates that it could nonetheless benefit from further enhancement. We believe this view is not materially inconsistent with views expressed by policymakers. For example, Tarullo (2013), while favoring completing the existing Basel III rulemaking as soon as possible, acknowledged that “there is a good case for additional measures to increase the chances that large financial institutions remain viable financial intermediaries even under stress.” Among the measures Tarullo suggested are higher leverage ratios and increased risk-based capital surcharges. Stein (2013) has also pointed to higher risk-based capital surcharges, suggesting “an increase in the slope of the capital-surcharge schedule that is applied to large complex firms” could be one tool to reduce their systemic impact.

This analysis underscores the continued importance of pursuing implementation of the Basel III capital agenda in the United States. Final Rule 2013 has been adopted; however, key elements related to the largest financial institutions remain in the proposal stage. Our results highlight the importance of the continued progress of capital requirements including considering additional options such as implementing a meaningful supplementary leverage ratio minimum and G-SIFI buffers, as well as the proactive use of the countercyclical buffer.

## APPENDIX

Ally Financial, Inc.

- In 2008:Q4, GMAC LLC (GMAC), the predecessor to Ally, recorded an \$11.5 billion (B) pretax gain on debt extinguishment due to a private debt exchange and cash tender offer. This transaction facilitated the conversion of GMAC to a bank holding company and provided access to TARP funds. While other infrequent or unusual items were generally included in capital erosion estimates (for example, gains on asset sales), this particular extraordinary gain was conditioned upon receipt of TARP funding. Assuming that such funds would be available in a future stress period was judged to be unrealistic.
  - Note from GMAC Financial Services EVP Robert S. Hull to Neil M. Barofsky, Office of the Special Inspector General for TARP, March 5, 2009: “Becoming a bank holding company and thereby gaining access to TARP funding also facilitated the completion of GMAC’s fourth quarter 2008 private debt exchange and cash tender offers. While the cash used to settle the bond exchange was provided through the then existing liquidity portfolio and not from TARP funds, the bond exchange could not have been settled without the approval from the Federal Reserve to convert GMAC to a bank holding company and the U.S. Treasury’s TARP investment.”<sup>20</sup>
- Thus, the after-tax effect of this extraordinary gain was deducted from Ally’s 2008:Q4 results in calculating crisis losses. A 35 percent tax rate was applied.
- To estimate Ally’s baseline RWA, the average ratio of RWA/Total Assets during 2009:Q1–2012:Q2 (that is, after Ally became a BHC) was applied to the baseline period’s Total Assets.

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<sup>20</sup> Letter from Robert S. Hull, CFO, GMAC Financial Services to Neil M. Barofsky, Office of the Special Inspector General For TARP, dated March 5, 2009. <http://www.sig tarp.gov/Survey/GMAC.pdf>

## American Express Co.

- The 2010:Q1 crisis period for American Express corresponded with the company's adoption of SFAS No. 167 effective 1/1/2010, which revised U.S. GAAP guidance regarding the consolidation of variable interest entities (VIE). For American Express, the adoption of SFAS No. 167 resulted in the consolidation of the American Express Credit Account Master Trust (Lending Trust), a previously unconsolidated VIE. The consolidation of the Lending Trust resulted in a \$1.8B reduction in Shareholders' Equity as of 1/1/2010. This \$1.8B reduction was included in our capital erosion calculation.
- Note that no related adjustment was made to RWA for American Express as of 1/1/2010, as these Lending Trust assets had previously been included in RWA for regulatory capital purposes. Thus, the baseline RWA for our analysis was defined as the quarter-end before the onset of the firm's crisis period (that is, 12/31/2009), consistent with our general methodology.
- For Total Assets, however, the baseline for our analysis was defined as 3/31/2010, in order to reflect the Lending Trust consolidated assets and remain consistent with the capital erosion calculation.

## Bear Stearns Companies Inc.

- Bear Stearns was acquired by JPMorgan on 5/30/2008.
- Bear Stearns transition losses were defined as the difference between the purchase price paid by JPMorgan (\$1.5B) and the total shareholders' equity of Bear Stearns as of 2/29/2008 (\$11.9B).
- Transition losses also included a \$1.15B subordinated loan made by JPMorgan to facilitate the transfer of certain Bear Stearns assets, including mortgage-related securities, residential and commercial whole loans, and associated derivatives to the Maiden Lane LLC facility established by the Federal Reserve Bank of New York. It was assumed that this first loss position taken by



JPMorgan was, in economic terms, an estimate of the losses embedded in the transferred assets and in a sense a cost of acquisition.

- To estimate Bear Stearns baseline RWA, figures publicly disclosed by JPMorgan for Bear Stearns RWA were used to calculate an RWA/Total Assets ratio, which was then applied to baseline Total Assets to derive baseline RWA.

#### Capital One Financial Corp.

- The 2010:Q1 crisis period for Capital One coincided with the firm's adoption of SFAS No. 167 effective 1/1/2010, which changed U.S. GAAP guidance regarding the consolidation of VIEs. For Capital One, the adoption of SFAS No. 167 resulted in the consolidation of its credit card securitization trusts, one of its installment loan trusts, and certain option-ARM loan trusts. This generated a \$2.9B after-tax reduction of retained earnings as of 1/1/2010, which was reflected in Capital One's capital erosion calculation.
- For RWA and Total Assets, the baseline was defined as of 3/31/2010 (instead of 12/31/2009), as the inclusion of the previously unconsolidated assets of \$41.9B in 2010:Q1 impacted both RWA and Total Assets between 12/31/2009 and 3/31/2010.

#### Countrywide Financial Corp.

- Countrywide was acquired by Bank of America on 7/1/2008.
- Countrywide's transition losses were defined as the difference between the purchase price paid by Bank of America (\$4.2B) and Countrywide's total shareholders' equity as of 6/30/2008 (\$10.4B).
- For baseline Tier 1 Common Equity, the mortgage servicing rights deduction was approximated as per FR Y-9C instructions in effect at that time, using information obtained from public filings and other assumptions as needed. However, it should be noted that firms like Countrywide with high MSR balances often have significant deferred tax liabilities (DTLs) associated with

the MSRs. Under U.S. BHC regulatory capital rules, firms may net their MSR-related DTLs against their MSR balance in order to reduce any regulatory capital deductions of MSRs. It was assumed that Countrywide, which was in a net DTL position due to large MSR balances as of the baseline period, would have chosen to reduce its MSR regulatory deduction in this way. Since the data to perform this calculation were not available, a proxy for the calculated MSR deduction from capital was calculated using the effective tax rate as of the baseline period (6/30/2007). It should be noted that this adjustment is conservative in favor of Countrywide, as it reduces the regulatory capital deduction related to MSRs.

- To estimate Countrywide's baseline RWA, the average ratio of RWA/Total Assets from 2006:Q1 to 2006:Q4 (the last year Countrywide was a BHC before converting to a thrift) was applied to the baseline period's Total Assets.

#### Goldman Sachs Group, Inc.

- Goldman's crisis period is defined as the quarter beginning 8/30/2008 and ending 11/28/2008 plus the one-month ending 12/26/08. In converting to a bank holding company as of 1/1/2009, Goldman Sachs changed from its prior fiscal year reporting to calendar year reporting. Publicly available information on the "stub" period between the last quarter of fiscal year reporting and the first quarter of calendar reporting was made available in Goldman's 3/31/2009 SEC 10-Q filing.
- Gains/losses on own credit risk, including the effect of associated hedges as disclosed in SEC quarterly and annual filings, was used to determine the deduction for own credit risk.
- To estimate Goldman's baseline RWA, the average ratio of RWA/Total Assets during 2009:Q1–2012:Q2 (the periods after becoming a BHC) was applied to Goldman's baseline Total Assets.

## JPMorgan Chase & Co.

- JPMorgan's crisis period corresponded with its 2008:Q3 acquisition of Washington Mutual.
- JPMorgan's baseline RWA and Total Assets were defined as of 9/30/2008 (instead of 6/30/2008). For firms whose crisis periods corresponded with a major acquisition, baseline RWA and Total Asset figures were taken from the quarter-end after the acquisition rather than from the quarter before the onset of the crisis, consistent with our general methodology.
- Baseline capital figures were also adjusted to account for the acquisition. Specifically, while the baseline capital time period was still defined as the quarter end before the onset of the acquisition following our general methodology, this figure was adjusted in the following ways: i) any common equity issued during the acquisition quarter was included, and ii) the increase in goodwill that resulted from the acquisition was also included. Therefore, baseline T1C and TCE figures were sourced from 6/30/2008 financial statements, with the addition of \$11.5B in common equity issued on 9/30/2008. There was no adjustment for goodwill, as the Washington Mutual acquisition resulted in a bargain purchase gain.

## Lehman Brothers Holdings, Inc.

- Lehman filed for bankruptcy on 9/15/2008. For firms that went into bankruptcy or receivership, it was assumed that the full loss of shareholders' equity represented the transition loss because to date, equity holders of such firms have not received any material value from the bankruptcy/receivership. For Lehman, the shareholders' equity balance as of the quarter end before bankruptcy was \$28.4B.
- To estimate Lehman's baseline RWA, the average ratio of RWA/Total Assets of a broker-dealer peer group (Goldman Sachs, Morgan Stanley, and Bear Stearns) was applied to Lehman's baseline period Total Assets.

## Merrill Lynch & Co., Inc.

- Merrill Lynch was acquired by Bank of America on 1/1/2009. However, Bank of America continued to report Merrill Lynch on a standalone basis, so it was not necessary to calculate a transition loss.
- With the acquisition by Bank of America, Merrill Lynch changed from its prior fiscal year reporting to calendar year reporting. Its crisis period is defined as 6/30/2007–12/31/2008. Publicly available information on the “stub” period between the last quarter of fiscal year reporting and the first quarter of calendar reporting was made available in Merrill’s 3/31/2009 SEC 10-Q filing.
- For disallowed deferred tax assets, the disallowed portion of the deferred tax asset was approximated as detailed in Section II.B.ii.(5), as per FR Y-9C instructions in effect at that time, using publicly available information and assumptions as needed. It should be noted, however, that for 2008:Q2 and 2008:Q3, Merrill disclosed a disallowed DTA figure with its SEC Consolidated Supervised Entities footnote disclosure, which at the time required a calculation similar to regulatory capital under Basel II rules. Therefore, for those two quarters Merrill’s disclosed disallowed DTA estimates were used.
- To approximate Merrill Lynch’s baseline RWA, the average ratio of RWA/Total Assets of a broker-dealer peer group (Goldman Sachs, Morgan Stanley, and Bear Stearns) was applied to Merrill Lynch’s baseline period Total Assets.

## Morgan Stanley

- Morgan Stanley’s crisis period is defined as 9/1/2007–11/30/2008 plus the one-month “stub” period, December 2008. In converting to a bank holding company on 1/1/2009, Morgan Stanley changed from its prior fiscal year reporting to calendar year reporting. Publicly available information on the stub period between the last quarter of fiscal year reporting and the first

quarter of calendar reporting was made available in Morgan Stanley's 3/31/2009 SEC 10-Q filing.

- To estimate Morgan Stanley's baseline RWA, the firm's average ratio of RWA/Total Assets during 2009:Q1–2012:Q2 (the periods after becoming a BHC) was applied to Morgan Stanley's baseline period Total Assets.

#### National City Corp.

- National City was acquired by PNC on 12/31/2008.
- National City transition losses were defined as the difference between the purchase price paid by PNC (\$6.1B) and National City's total shareholders' equity as of 9/30/2008 (\$15.8B).

#### PNC Financial Services Group, Inc.

- PNC's crisis period, during 2008:Q1–2008:Q4, included its 2008:Q4 acquisition of National City.
- For PNC, baseline RWA and Total Assets were defined as of 12/31/2008 (instead of 12/31/2007). For firms whose crisis periods corresponded with a major acquisition, baseline RWA and Total Asset figures were taken from the quarter-end after the acquisition rather than from the quarter before the onset of the crisis, following our general methodology.
- Baseline capital figures were also adjusted to account for the acquisition. Specifically, the baseline time period for capital was defined as the quarter end before the onset of the acquisition, consistent with our general methodology. However, this figure was adjusted in the following ways: i) any common equity issued during the acquisition quarter was included, and ii) the increase to goodwill that resulted from the acquisition was included. Therefore, baseline T1C and TCE figures were sourced from 12/31/2007 financial statements with the addition of \$5.6B in common equity issued in

2008:Q4. Note that no adjustment was made for goodwill, as the National City acquisition did not create any goodwill.

#### Wachovia Corp.

- Wachovia was acquired by Wells Fargo on 12/31/2008.
- Wachovia's transition losses were defined as the difference between the purchase price paid by Wells Fargo (\$23.1B) and Wachovia's total shareholders' equity as of 9/30/2008 (\$50.0B).

#### Washington Mutual, Inc.

- Washington Mutual was acquired out of receivership by JPMorgan on 9/25/2008. Similar to the treatment of other firms that went into bankruptcy or receivership, it was assumed that the full loss of shareholders' equity represented the transition loss because to date equity holders of such firms have not received any material value from the bankruptcy/receivership. For Washington Mutual, shareholders' equity the quarter end before receivership was \$26.1B.
- Baseline T1C was approximated using information from publicly disclosed thrift regulatory metrics, such as Tier 1 Leverage.

#### Wells Fargo & Co.

- Wells Fargo's crisis period, during 2008:Q3–2008:Q4, included its 2008:Q4 acquisition of Wachovia.
- For Wells Fargo, baseline RWA and Total Assets were defined as of 12/31/2008 (instead of 6/30/2008). For firms whose crisis periods corresponded with a major acquisition, baseline RWA and total asset figures were taken from the quarter-end after the acquisition rather than from the quarter before the onset of the crisis, consistent with our general methodology.

- Baseline capital figures were also adjusted to account for the acquisition. Specifically, the baseline time period for capital was defined as the quarter end before the onset of the acquisition, following our general methodology. However, this figure was adjusted in the following ways: i) any common equity issued during the acquisition quarter was included, and ii) the increase in goodwill that resulted from the acquisition was included. Therefore, for Wells Fargo, baseline T1C and TCE figures were sourced from 6/30/2008 financial statements with the addition of i) \$27.0B in common equity issued in 2008:Q4; and ii) \$8.8B to reflect goodwill created by the Wachovia acquisition (as estimated in Wachovia's 12/31/2008 SEC 10-K filing).

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