

**Basel III Capital: A Well-Intended Illusion**

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The views expressed are those of the author and not necessarily those of the FDIC.

## Introduction

Aristotle is credited with being the first philosopher to systematically study logical fallacies, which he defined as arguments that appear valid but, in fact, are not. I call them well-intended illusions.

One such illusion of precision is the Basel capital standards in which world supervisory authorities rely principally on a Tier 1 capital ratio to judge the adequacy of bank capital and balance sheet strength. For the largest of these firms, each dollar of risk-weighted assets is funded with 12 to 15 cents in equity capital, projecting the illusion that these firms are well capitalized. The reality is that each dollar of their total assets is funded with far less equity capital, leaving open the matter of how well capitalized they might be.

Here's how the illusion is created. Basel's Tier 1 capital measure is a bank's ratio of Tier 1 capital to risk-weighted assets. Each category of bank assets is weighed by the supervisory authority on a complicated scale of probabilities and models that assign a relative risk of loss to each group, including off balance sheet items. Assets deemed low risk are reported at lower amounts on the balance sheet. The lower the risk, the lower the amount reported on the balance sheet for capital purposes and the higher the calculated Tier 1 ratio.

We know from years of experience using the Basel capital standards that once the regulatory authorities finish their weighting scheme, bank managers begin the process of allocating capital and assets to maximize financial returns around these constructed weights. The objective is to maximize a firm's return on equity (ROE) by managing the balance sheet in such a manner that for any level of equity, the risk-weighted assets are reported at levels far less than actual total assets under management. This creates the illusion that banking organizations have adequate capital to absorb unexpected losses. For the largest global financial companies, risk-weighted assets are approximately one-half of total assets. This "leveraging up" has served world economies poorly.

In contrast, supervisors and financial firms can choose to rely on the tangible leverage ratio to judge the overall adequacy of capital for the enterprise. This ratio compares equity capital to total assets, deducting goodwill, other intangibles, and deferred tax assets from both equity and total assets. In addition to including only loss-absorbing capital, it also makes no attempt to predict or assign relative risk weights among asset classes. Using this leverage ratio as our guide, we find for the largest banking organizations that each dollar of assets has only 4 to 6 cents funded with tangible equity capital, a far smaller buffer than asserted under the Basel standards.

## Comparing Measures

[Table 1](#) [see below] reports the Basel Tier 1 risk-weighted capital ratio and the leverage ratio for different classes of banking firms. Column 4 shows Tier 1 capital ratios ranging between 12 and 15 percent for the largest global firms, giving the impression that these banks are highly capitalized. However, it is hard to be certain of that by looking at this ratio since risk-weighted assets are so much less than total assets. In contrast, Column 6 shows U.S. firms' average leverage ratio to be 6 percent using generally accepted accounting standards (GAAP), and Column 8 shows their average ratio to be 3.9 percent using international accounting standards (IFRS), which places more of these firms' derivatives onto the balance sheet than does GAAP.

The bottom portion of Table 1 shows the degree of leverage among different size groups of banking firms, which is striking as well. The Tier 1 capital measure suggests that all size groups of banks hold comparable capital levels, while the leverage ratio reports a different outcome. For example, the leverage ratio for most banking groups not considered systemically important averages near 8 percent or higher. Under GAAP accounting standards, the difference in this ratio between the largest banking organizations and the smaller firms is 175-250 basis points. Under IFRS standards, the difference is as much as 400-475 basis points. The largest firms, which most affect the economy, hold the least amount of capital in the industry. While this shows them to be more fragile, it also identifies just how significant a competitive advantage these lower capital levels provide the largest firms.

These comparisons illustrate how easily the Basel capital standard can confuse and misinform the public rather than meaningfully report a banking company's relative financial strength. Recent history shows also just how damaging this can be to the industry and the economy. In 2007, for example, the 10 largest and most complex U.S. banking firms reported Tier 1 capital ratios that, on average, exceeded 7 percent of risk-weighted assets. Regulators deemed these largest to be well capitalized. This risk-weighted capital measure, however, mapped into an average leverage ratio of just 2.8 percent. We learned all too late that having less than 3 cents of tangible capital for every dollar of assets on the balance sheet is not enough to absorb even the smallest of financial losses, and certainly not a major shock. With the crisis, the illusion of adequate capital was discovered, after having misled shareholders, regulators, and taxpayers.

There are other, more recent, examples of how this arcane measure can be manipulated to give the illusion of strength even when a firm incurs losses. For example, in the fourth quarter of 2012, Deutsche Bank reported a loss of 2.5 billion EUR. That same quarter, its Tier 1 risk-based capital ratio increased from 14.2 percent to 15.1 percent due, in part, to "model and process enhancements"<sup>1</sup> that resulted in a decline in risk-weighted assets, which now amount to just 16.6 percent of total assets.

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<sup>1</sup> Deutsche Bank press release, 31 January 2013, "Implementation of new strategy with significant impact on 2012 results."

On Feb. 1, SNS Reaal, the fourth largest Dutch bank with \$5 billion in assets, was nationalized by the Dutch government. Just seven months earlier, on June 30, 2012, SNS reported a Tier 1 risk-based capital ratio of 12.2 percent. However, the firm reported a Tier 1 leverage ratio based upon international accounting standards of only 1.47 percent. This leverage ratio was much more indicative of the SNS's poor financial position.

The Basel III proposal belatedly introduces the concept of a leverage ratio but calls for it to be only 3 percent, an amount already shown to be insufficient to absorb sizable financial losses in a crisis. It is wrong to suggest to the public that, with so little capital, these largest firms could survive without public support should they encounter any significant economic reversals.

### **Misallocating Resources and Creating Asset Imbalances**

An inherent problem with a risk-weighted capital standard is that the weights reflect past events, are static, and mostly ignore the market's collective daily judgment about the relative risk of assets. It also introduces the element of political and special interests into the process, which affects the assignment of risk weights to the different asset classes. The result is often to artificially favor one group of assets over another, thereby redirecting investments and encouraging over-investment in the favored assets. The effect of this managed process is to increase leverage, raise the overall risk profile of these institutions, and increase the vulnerability of individual companies, the industry, and the economy.

It is no coincidence, for example, that after a Basel standard assigned only a 7 percent risk weight on triple A, collateralized debt obligations and similar low risk weights on assets within a firm's trading book, resources shifted to these activities. Over time, financial groups dramatically leveraged these assets onto their balance sheets even as the risks to that asset class increased exponentially. Similarly, assigning zero weights to sovereign debt encouraged banking firms to invest more heavily in these assets, simultaneously discounting the real risk they presented and playing an important role in increasing it. In placing a lower risk weight on select assets, less capital was allocated to fund them and to absorb unexpected loss for these banks, undermining their solvency.

### **A More Realistic Capital Standard Is Required**

Taxpayers are the ultimate backstop to the safety net and have real money at stake. In choosing which capital measure is most useful, it is fair to ask the following questions:

- Does the Basel Tier 1 ratio or the tangible leverage ratio best indicate the capital strength of the firm?
- Which one is most clearly understood?
- Which one best enables comparison of capital across institutions?
- Which one offers the most confidence that it cannot be easily gamed?

Charts 1 through 4 [*see below*] compare the relationship of the tangible leverage and Basel Tier 1 capital ratios to various market measures for the largest firms. These measures include: the price-to-book ratio, estimated default frequency, credit default swap spreads, and market value of equity. In each instance, the correlation of the tangible leverage ratio to these variables is higher than for the risk-weighted capital ratio. While such findings are not conclusive, they suggest strongly that investors, when deciding where to place their money, rely upon the information provided by the leverage ratio. We would do well to do the same.

Despite all of the advancements made over the years in risk measurement and modeling, it is impossible to predict the future or to reliably anticipate how and to what degree risks will change. Capital standards should serve to cushion against the unexpected, not to divine eventualities. All of the Basel capital accords, including the proposed Basel III, look backward and then attempt to assign risk weights into the future. It doesn't work.

In contrast, the tangible leverage ratio provides a simpler, more direct insight into the amount of loss-absorbing capital that is available to a firm. A leverage ratio as I've defined it explicitly excludes intangible items that cannot absorb losses in a crisis. Also, using IFRS accounting rules, off-balance sheet derivatives are brought onto the balance sheet, providing further insight into a firm's leverage. Thus, the tangible leverage ratio is simpler to compute and more easily understood by bank managers, directors, and the public. Importantly also, it is more likely to be consistently enforced by bank supervisors.

A more difficult challenge may be to determine an appropriate minimum leverage ratio. Chart 5 [*see below*] provides a history of bank leverage over the past 150 years for the U.S. banking system and gives initial insight into this question. It shows that the equity capital to assets ratio for the industry prior to the founding of the Federal Reserve System in 1913 and the Federal Deposit Insurance Corporation in 1933 ranged between 13 and 16 percent, regardless of bank size. Without any internationally dictated standard or any arcane weighting process, markets required what today seems like relatively high capital levels.

In addition, there is an increasing body of research (Admati and Hellwig; Haldane; Miles, Yang, and Marcheggiano) that suggests that leverage ratios should be much higher than they currently are and that Basel III's proposed 3 percent figure adds little security to the system.

Finally, and importantly, some form of risk-weighted capital measure could be useful as a backstop, or check, against which to judge the adequacy of the leverage ratio for individual banks. If a bank meets the minimum leverage ratio but has concentrated assets in areas that risk models suggest increase the overall vulnerability of the balance sheet, the bank could be required to increase its tangible capital levels. Such a system provides the most comprehensive measure of capital adequacy both in a broad context of all assets and according to a bank's allocation of assets along a defined risk profile.

## **Tangible Leverage Ratio and the Myth of Unintended Consequences**

Concerns are often raised within the financial industry and elsewhere that requiring the largest and most complex firms to hold higher levels of capital as defined using a tangible leverage ratio would have serious adverse effects on the industry and broader economy.

It has been suggested, for example, that requiring more capital for these largest banks would raise their relative cost of capital and make them less competitive. Similarly, there is concern that failing to assign risk weights to the different categories of assets would encourage firms to allocate funds to the highest risk assets to achieve targeted returns to equity. These issues have been well addressed by Anat Admati and Martin Hellwig in their recently published book, *The Bankers' New Clothes*. The required ROE and the ability to attract capital are determined by a host of factors beyond the level of equity capital. These include a firm's business model, its risk-adjusted returns, the benefits of services and investments, and the undistorted, or non-subsidized, costs of capital. A level of capital that lowers risk may very well attract investors drawn to the more reliable returns. Table 1 shows many of the banks with stronger leverage ratios also have stock prices trading at a higher premium to book value than the largest firms that are less well-capitalized.

There also is a concern that requiring a stronger, simpler leverage ratio would cause managers to place more risk on their balance sheet. While possible, the argument is unconvincing. With more capital at risk and without regulatory weighting schemes affecting choice, managers will allocate capital in line with market risk and returns. Furthermore, risk-weighted measures and strong bank supervision can be available as a back-up system to monitor such activity. Moreover, given the experience of the recent crisis and the on-going efforts to manage reported risk assets down, no matter the risk, it rings hollow to suggest that having a higher equity buffer for the same amount of total assets makes the financial system less safe.

In addition, there is a concern that demanding more equity capital and reducing leverage among the largest firms would inhibit the growth of credit and the economy. This statement has an implied presumption that the Basel weighting scheme is more growth friendly than a simpler, stronger leverage ratio. However, having a sufficient capital buffer allows banks to absorb unexpected losses. This serves to moderate the business cycle and the decline in lending that otherwise occurs during contractions.

If the Basel risk-weight schemes are incorrect, which they often have been, this too could inhibit loan growth, as it encourages investments in other more favorably, but incorrectly, weighted assets. Basel systematically encourages investments in sectors pre-assigned lower weights -- for example, mortgages, sovereign debt, and derivatives -- and discourages loans to assets assigned higher weights -- commercial and industrial loans. We may have inadvertently created a system that discourages the very loan growth we seek, and instead turned our financial system into one that rewards itself more than it supports economic activity.

If risk weights could be assigned that anticipate and calibrate risks with perfect foresight, adjusted on a daily basis, then perhaps risk-weighted capital standards would be the preferred method for determining how to deploy capital. However, they cannot. To believe they can is a fallacy that puts the entire economic system at risk.

### **Changing the Debate**

The tangible leverage ratio is a superior alternative to risk-weighting schemes that have proven to be an illusion of precision and insufficient in defining adequate capital. The effect of relying on such measures has been to weaken the financial system and misallocate resources. The leverage ratio deserves serious consideration as the principal tool in judging the capital strength of financial firms. The Basel discussion would be well served to focus on the appropriate levels of tangible capital for banking firms to hold and the right transition period to achieve these levels.

Finally, we should not accept even comforting errors of logic which suggest that Basel III requirements will create stronger capital than those of Basel II, which failed. Instead, past industry performance and mounting academic and other evidence suggest that we would be best served to focus on a strong leverage ratio standard in judging a firm and the industry's financial strength. No bank capital program is perfect. Our responsibility as regulators and deposit insurers is to choose the best available measure that will contribute to financial stability.

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### **References**

Admati, Anat and Martin Hellwig. 2013. *The Bankers' New Clothes*. Princeton, NJ: Princeton University Press.

Haldane, Andrew G. 2012. *The Dog and the Frisbee*. Available at [www.kcfed.org/publicat/sympos/2012/ah.pdf](http://www.kcfed.org/publicat/sympos/2012/ah.pdf)

D. Miles, J. Yang and G. Marcheggiano, *The Economic Journal*, vol 123, issue 567, March 2013. Available at <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0297.2012.02521.x/abstract>

# Table 1: Capitalization Ratios for Global Systemically Important Banks

Data as of Fourth Quarter 2012

Institution <sup>1</sup>	Basel Risk-Based Capital			Tangible Capital				Components of Tangible Capital				Price-to-Book	
	Tier 1 Capital <sup>2</sup> (\$Billions)	Risk-Weighted Assets (\$Billions)	Tier 1 Capital Ratio <sup>3</sup> (Percent)	GAAP		IFRS ESTIMATE <sup>4</sup>		Total Equity <sup>6</sup> (\$Billions)	Goodwill (\$Billions)	Other Intangibles (\$Billions)	Deferred Tax Assets (\$Billions)	Price-to-Book Ratio <sup>7</sup> (Percent)	Price-to-Adjusted Tangible Book Ratio <sup>7</sup> (Percent)
				Total Assets (\$Billions)	Leverage Ratio <sup>5</sup> (Percent)	Total Assets (\$Billions)	Leverage Ratio <sup>5</sup> (Percent)						
<b>U.S. G-SIBs</b>													
Bank of America	155	1,206	12.89	2,212	5.79	3,540	3.55	237	70	13	33	0.57	1.22
Bank of New York Mellon	17	111	15.02	359	4.02	381	3.77	36	18	5	0	0.85	2.40
Citigroup	137	971	14.06	1,865	5.61	2,878	3.57	189	26	8	56	0.64	1.24
Goldman Sachs	67	400	16.75	939	7.07	1,707	3.87	76	4	1	5	0.88	1.03
JPMorgan Chase	160	1,270	12.59	2,359	5.89	3,947	3.48	204	48	10	11	0.86	1.33
Morgan Stanley	54	307	17.72	781	5.79	1,749	2.55	62	7	4	8	0.62	0.89
State Street	14	72	19.13	222	5.78	228	5.64	21	6	3	0	1.06	1.82
Wells Fargo	127	1,077	11.75	1,423	8.13	1,485	7.78	158	26	20	0	1.24	1.82
<b>Average U.S. G-SIBs</b>	<b>730</b>	<b>5,415</b>	<b>13.49</b>	<b>10,160</b>	<b>6.17</b>	<b>15,914</b>	<b>3.88</b>	<b>983</b>	<b>204</b>	<b>63</b>	<b>113</b>	<b>0.85</b>	<b>1.28</b>
<b>Foreign G-SIBs</b>													
Banco Santander (Spain)	80	716	11.17			1,631	2.97	108	32	4	25	0.84	2.35
Bank of China Limited (China)	121	1,149	10.54			2,009	6.53	136	0	2	3	0.94	0.98
Barclays (UK)	82	611	13.35			2,354	3.08	89	8	4	5	0.60	0.75
BBVA (Spain)	46	423	10.77			819	4.04	56	9	3	13	0.91	1.67
BNP Paribas (France)	97	709	13.63			2,451	3.47	111	14	3	10	0.67	0.92
BPCE Group (France)	60	491	12.17			1,474	4.27	70	5	2	0	...	...
Crédit Agricole Group (France)	79	617	12.85			2,580	2.72	98	19	2	7	...	...
Deutsche Bank (Germany)*	65	458	14.19			2,734	1.47	72	20	0	12	0.50	0.92
HSBC (UK)	151	1,124	13.44			2,693	5.16	175	21	8	8	1.13	1.44
ING Bank (Netherlands)	51	358	14.35			1,074	4.11	48	2	1	2	...	...
Nordea bank (Sweden)	31	276	11.17			870	3.65	36	3	1	0	1.03	1.18
Royal Bank of Scotland (UK)	90	726	12.43			2,073	3.72	103	0	21	5	0.53	0.71
Société Générale (France)	52	416	12.50			1,607	2.84	61	7	2	7	0.48	0.66
Standard Chartered (UK)	41	302	13.45			637	5.77	44	7	1	1	1.36	1.65
UBS (Switzerland)	44	205	21.29			1,343	2.52	49	6	1	9	1.17	1.71
UniCredit (Italy)	63	549	11.44			1,191	5.57	85	15	5	n/a	0.34	0.46
<b>Average Foreign IFRS</b>	<b>1,151</b>	<b>9,129</b>	<b>12.61</b>			<b>27,540</b>	<b>3.70</b>	<b>1,342</b>	<b>168</b>	<b>61</b>	<b>106</b>	<b>0.84</b>	<b>0.98</b>
<b>Other Foreign G-SIBs</b>													
Credit Suisse (Switzerland; CHF, U.S. GAAP)	37	239	15.56	986	3.69			45	9	0	n/a	...	...
Mitsubishi UFJ FG (Japan; JPY, Local GAAP)	136	1,114	12.22	2,672	5.07			151	0	13	4	0.68	0.79
Mizuho FG (Japan; JPY, Local GAAP)	81	633	12.75	2,064	3.66			86	0	6	5	0.85	1.06
Sumitomo Mitsui FG (Japan; JPY, Local GAAP)	84	654	12.81	1,692	4.76			95	0	10	5	0.81	1.06
<b>Average All Foreign G-SIBs</b>	<b>1,489</b>	<b>11,769</b>	<b>12.65</b>	<b>34,954</b>	<b>3.85</b>			<b>1,719</b>	<b>177</b>	<b>90</b>	<b>121</b>	<b>0.83</b>	<b>1.02</b>
<b>Average U.S. BHC by Size Group<sup>8</sup></b>													
U.S. G-SIBs	730	5,415	13.49	10,160	6.17	15,914	3.88	983	204	63	113	0.85	1.28
Ten Largest Non-G-SIBs <sup>9</sup>	171	1,499	11.41	1,913	8.21	1,927	8.15	226	57	12	6	0.94	1.59
Ten Largest Less Than \$50 Billion <sup>10</sup>	24	191	12.85	293	7.91	293	7.91	33	8	1	2	1.07	1.51
Ten Largest Less Than \$1 Billion <sup>10</sup>	1	7	13.40	10	8.67	10	8.67	1	0	0	0	...	...

Source: Bankscope (Data updated as of April 4, 2013), Bloomberg LP, Federal Reserve Y-9C Reports, International Monetary Fund, and 10-Q reports.



# Table 1 (continued): Capitalization Ratios for Global Systemically Important Banks

## Notes:

<sup>1</sup> Global systemically important banks (G-SIBs) are defined by the Financial Stability Board and include eight U.S. bank holding companies (BHC).

<sup>2</sup> Tier 1 Capital is equity capital less unrealized gains on available-for-sale debt securities, unrealized losses on available-for-sale equity securities, disallowed preferred stock, disallowed goodwill, disallowed servicing assets, disallowed deferred tax assets, and other tier 1 capital components.

<sup>3</sup> Tier 1 capital ratios and underlying data are calculated and reported under Basel I standards for U.S. Banks, under the China Banking Regulation Commission regulations for the Bank of China, under Basel II for Banco Santander, BBVA, ING Bank, Mitsubishi UFJ FG, Mizuho FG, Nordea Bank, Royal Bank of Scotland, Standard Chartered, Sumitomo Mitsui FG, and Unicredit, and under Basel 2.5 for Barclays, BNP Paribas, BPCE Group, Credit Agricole, Credit Suisse, Deutsche Bank, HSBC, Societe Generale and UBS.

<sup>4</sup> Differences in accounting requirements for netting and offsetting of assets and liabilities result in significant differences in banks' total assets. The ability to offset under International Financial Reporting Standards (IFRS) is limited in comparison with Generally Accepted Accounting Principles (GAAP), especially for derivatives traded with the same counterparty under an International Swaps and Derivatives Association (ISDA) Master Netting Agreement. U.S. GAAP permits the netting of derivative receivables and payables, and the related cash collateral received and paid when a legally enforceable master netting agreement exists between a firm and a derivative counterparty. U.S. GAAP discloses gross derivative assets and liabilities and the offset amount applied to derivatives in the notes to the consolidated financial statements rather than in the consolidated balance sheet. To narrow the difference in total assets between IFRS and U.S. GAAP reporting institutions, the U.S. G-SIBs IFRS estimates follow the methodology used by ISDA in its Netting and Offsetting Report (May 2012, <http://www2.isda.org/functional-areas/research/studies/>) and adds the disclosed offsetting amount applied to derivatives back to total assets in order to calculate total assets. Total assets are as reported in the consolidated balance sheet while the offset applied to derivatives is as reported in the notes to the consolidated financial statements on derivatives in each firm's 10-Q report.

<sup>5</sup> The Leverage Ratio is the ratio of adjusted tangible equity to adjusted tangible assets. Adjusted tangible equity, adjusted tangible assets, and adjusted tangible book subtract goodwill, other intangibles, and deferred tax assets.

<sup>6</sup> Equity Capital is the basic GAAP measure of net worth, defined as total assets minus total liabilities.

<sup>7</sup> Median price-to-book ratios and price-to-adjusted tangible book ratios are used instead of averages for subgroups and for U.S. BHC size groups. Data are not available for six bank holding companies with assets less than \$1 billion, as well as for BPCE Group, Credit Agricole Group, and ING Bank.

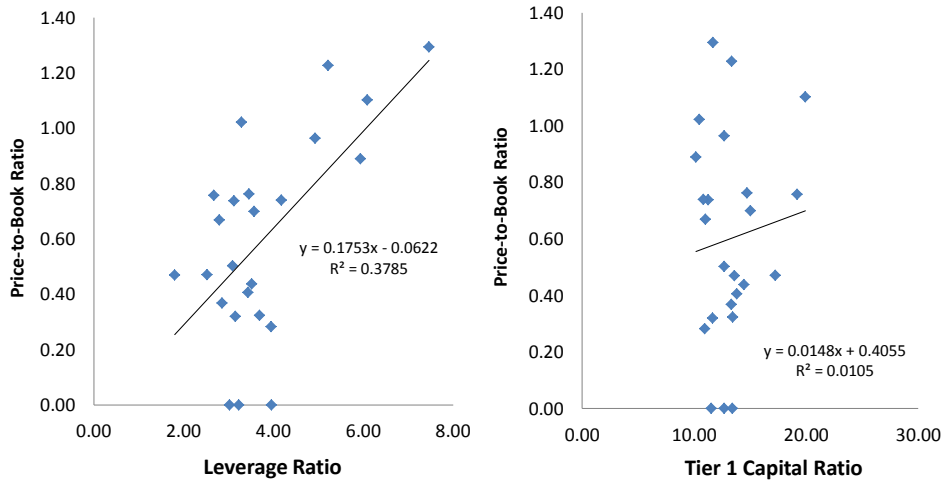
<sup>8</sup> Bank holding companies that are owned by a foreign parent or reported a net loss in fourth quarter 2012, and thrift holding companies that did not file a full FRY-9C report as of fourth quarter 2012 were excluded.

<sup>9</sup> Six of the ten largest non-G-SIB (American Express, KeyCorp, Northern Trust, PNC, Suntrust and U.S. Bancorp) reported the fair value of their derivative positions in their 10-Q reports. The leverage ratio for these six banks is 8.53 percent under U.S. GAAP and 8.47 percent under the IFRS estimate. The 6 basis point difference is used to adjust the leverage ratio for the entire group from 8.21 percent to 8.15 percent and to estimate total assets under the IFRS estimate. The remaining four bank holding companies reported minimal derivative exposure.

<sup>10</sup> The ten largest U.S. bank holding companies with assets less than \$50 billion and the ten largest U.S. bank holding companies with assets less than \$1 billion reported de minimis derivative exposures. We assume that total assets and the adjusted tangible equity to adjusted tangible assets ratio are essentially the same under U.S. GAAP and the IFRS estimate.

## Chart 1: Price-to-Book Ratio for Global Systemically Important Banks

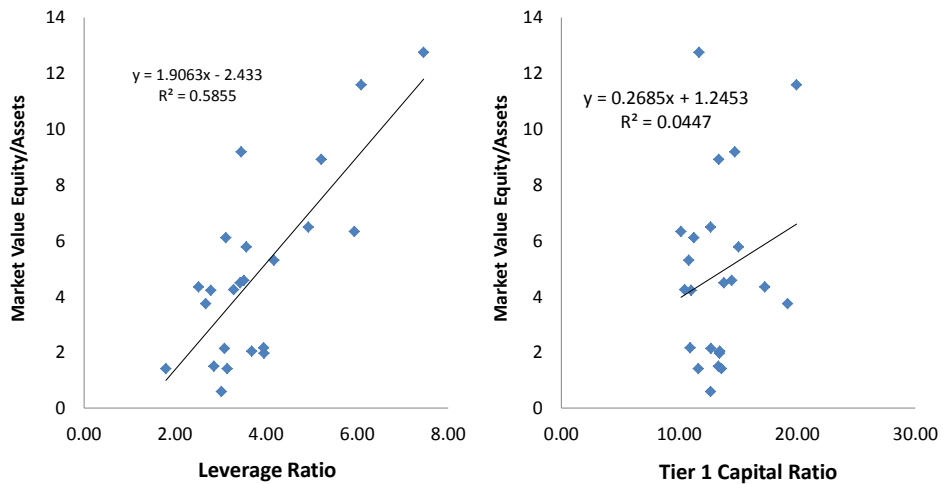
Leverage Ratio vs. Tier 1 Capital Ratio



Source: Moody's CreditEdge (Data as of June 2012).

## Chart 2: Market Value of Equity-to-Assets for Global Systemically Important Banks

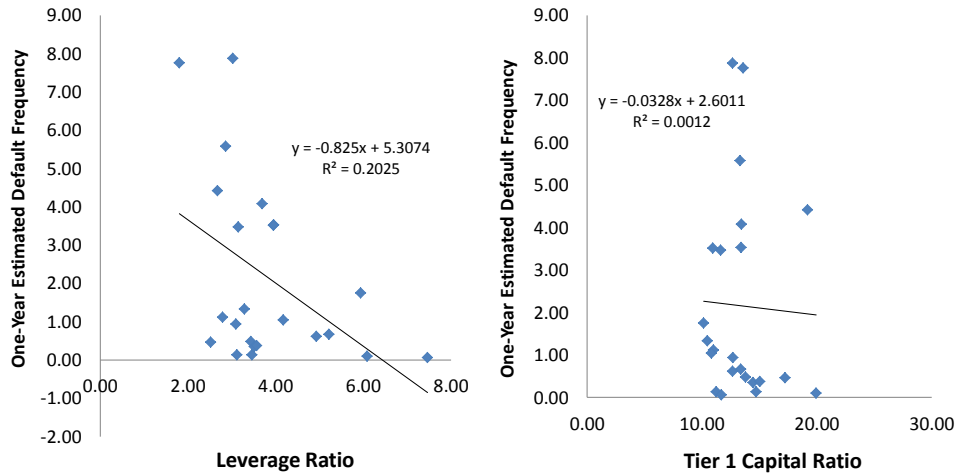
Leverage Ratio vs. Tier 1 Capital Ratio



Source: Moody's CreditEdge (Data as of June 2012).

### Chart 3: One-Year Estimated Default Frequency for Global Systemically Important Banks

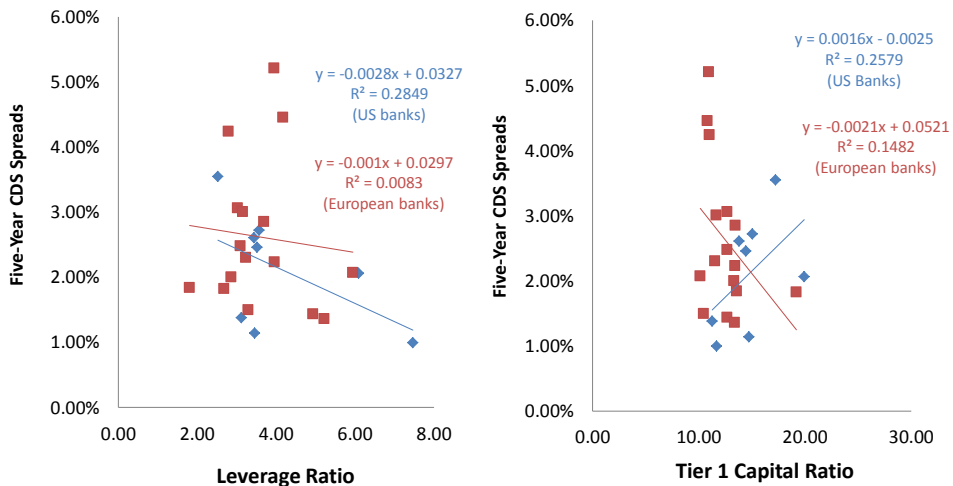
Leverage Ratio vs. Tier 1 Capital Ratio



Source: Moody's CreditEdge (Data as of June 2012).

### Chart 4: Five-Year Credit Default Swaps (CDS) Spreads for Global Systemically Important Banks

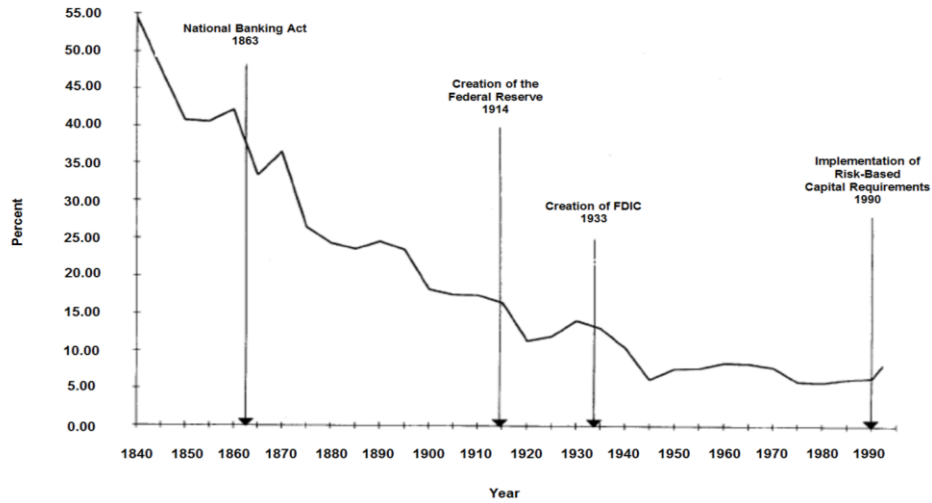
Leverage Ratio vs. Tier 1 Capital Ratio



Source: Moody's CreditEdge (Data as of June 2012).

## Chart 5: Equity as a Percent of Assets for U.S. Commercial Banks from 1840 to 1993

Ratio of Aggregate Dollar Value of Bank Book Equity to Aggregate Dollar Value of Bank Book Assets



Source: Statistical Abstracts through 1970, Report of Condition and Income thereafter. From Table 5 in: Berger, A., Herring, R. and G. Szegő, 1995, "The role of capital in financial institutions," *Journal of Banking and Finance* 19, 393-430.