

Appendix: Data Sources and Definitions

This appendix contains the details concerning the construction of all the variables used in the construction of TCH Bank Conditions Index (TCHBCI). The aggregate index synthesizes data on 23 indicators grouped over the following six categories: Capital, liquidity, risk-taking, asset quality, interconnectedness, and profitability. This appendix details the construction of each of the 23 indicators across the six bank categories. All series are first aggregated across all banks, numerator and denominator separately. All bank-level data are obtained from the Consolidated Financial Statements for Bank Holding Companies (the FR Y-9C form) published by the Federal Reserve Board or the Consolidated Reports of Condition and Income (the FFIEC 031/041 form, or also known as the Call Reports) for commercial banks published by the Federal Deposit Insurance Corporation. Most series start in the first quarter of 1996 and end in the second quarter of 2016.

Note on International Holding Companies: In 2016:Q3, 11 institutions entered the sample as International Holding Companies. The change in entity type for these eleven institutions caused an artificial break in the series. As is such, in the 2016:Q3 update of the TCHBCI, they were dropped from the sample back in time:

Institution Name	RSSD ID
Credit Suisse Holdings (USA), Inc.	1574834
Barclays US LLC	5006575
DB USA Corporation	2816906
UBS Americas Holding LLC	4846998
BNP Paribas USA, Inc.	1575569
TD Group US Holdings LLC	3606542
HSBC North America Holdings Inc.	3232316
MUFG Americas Holdings Corporation	1378434
RBC USA Holdco Corporation	3226762
Santander Holdings USA, Inc.	3981856
BMO Financial Corp.	1245415

Capital

The **common equity tier 1 ratio** is defined as common equity tier 1 (Basel III definition) divided by risk weighted assets from 2014:Q1 to 2016:Q2. Prior to 2014:Q1 it is defined as tier 1 common divided by risk-weighted assets. The tier 1 common is defined as tier 1 capital, less perpetual preferred stock and related surplus, minority interests, qualifying restricted core capital elements. After the first quarter of 2014, risk-weighted assets are calculated as the maximum of risk weighted assets calculated under the standardized approach and risk-weighted assets calculated under the advanced approach for the advanced approaches institutions.

Series	Formula
Tier 1 common equity	BHCA8274 – BHCK3283 – BHCKG214 – BHCKG215 – BHCKG216 + BHCKB588 from 2001:Q1 to 2014:Q1
Common equity tier 1	BHCAP859 for advanced approach banks and Tier 1 Common Equity from 2014:Q1 to 2014:Q4. BHCAP859 after 2014:Q4
Risk-weighted assets	BHCKA223 from 1996:Q1 to 2014:Q4 and max(BHCAA223, BHCWA223) afterwards.

Tier 1 common equity (detailed version)	Schedule	Line Item	MDRM	Dates Used
Tier 1 Capital	HC-R	26.	BHCA8274	
Qualifying Class A noncontrolling (minority) interests in consolidated subsidiaries	HC-R	6.a.	BHCKG214	2009:Q1-present
	HC-R	6.a.	BHCKB589	1996:Q1-2008:Q4
Qualifying restricted core capital elements (other than cumulative perpetual preferred stock)	HC-R	6.b.	BHCKG215	2009:Q1-present
Disallowed goodwill and other disallowed intangible assets	HC-R	6.c.	BHCKG216	2009:Q1-present
Perpetual Preferred Stock and Related Surplus	HC	23.	BHCK3283	
Nonqualifying perpetual preferred stock	HC-R	5.	BHCKB588	2001:Q1-present
Common equity tier 1 capital (item 12 minus item 18)	HC-R	19.	BHCAP859	2014:Q1-present
Total risk-weighted assets (from Schedule HC-R, Part II item 31)	HC-R	40.a.	BHCAA223	2015:Q1-present
	HC-R	62.	BHCKA223	1996:Q1-2014:Q4
Advanced Approaches holding companies that exit parallel run only): Total risk-weighted assets using advanced approaches rule (from FFIEC 101 Schedule A, item 60)	HC-R	40.b.	BHCWA223	2015:Q1-present

Tier 1 capital ratio is defined as tier 1 capital divided by risk-weighted assets.

Name	Schedule	Line Item	MDRM	Dates Used
Tier 1 Capital	HC-R	26.	BHCA8274	2014:Q1-present
	HC-R	11.	BHCK8274	1996:Q1-2013:Q4

Total capital ratio is defined as total capital divided by risk-weighted assets.

Series	Formula
Total capital	BHCK3792 from 1996:Q1 to 2013:Q4 and max(BHCA3792 BHCW3792) afterwards.

Name	Schedule	Line	MDRM	Dates Used
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		Item		
Total capital (sum of items 11, 18, and 19, less item 20)	HC-R	35.a.	BHCA3792	2014:Q1-present
	HC-R	21.	BHCK3792	1996:Q1-2013:Q4
(Advanced approaches holding companies that exit parallel run only): Total capital	HC-R	35.b.	BHCW3792	2014:Q1-present

Leverage Ratio is defined as tier 1 capital divided by average total assets.

Name	Schedule	Line Item	MDRM	Dates Used
Average total assets for leverage capital purposes (item 22 less items 23 through 26)	HC-R	27.	BHCAA224	2015:Q1-present
	HC-R	27.	BHCKA224	1996:Q1-2014:Q4

Market leverage ratio under stress is defined as in Acharya et al (2014) and is constructed as the ratio of the market capitalization to quasi market value of assets under NYU's V-Lab System Risk Analysis stress scenario. NYU's V-Lab website provides the long-run marginal expected shortfall (LRMES), leverage (LVG) and the book value of debt (D) for each bank.¹

Series	Formula
Market leverage ratio under stress	$\frac{MV(1 - LRMES)}{MV(1 - LRMES) + D}$

Liquidity

The following definition of the **maturity gap** is taken from English, Heuvel and Zakrasjek (2014) Section 4.1.1. Maturity Gap is the difference between average repricing/maturity period (in years) of assets and average repricing/maturity period (in years) of liabilities.

$$GAP_{it} = \sum_j m_A^j \frac{A_{it}^j}{A_{it}^{IE}} - \sum_k m_L^k \frac{L_{it}^k}{L_{it}}$$

The first part of the equation is the weighted-average repricing/maturity period of bank i 's assets, where j indexes the 26 interest-earning asset categories reported on the Call Report by remaining

¹ The sample of firms used to calculate the ratio consisted of: Bank of America Corp, BB&T Corp, The Bank of New York Mellon Corp, Citigroup Inc, Commerce Bancshares Inc, CIT Group Inc, Capital One Financial Corp, Fifth Third Bancorp, Goldman Sachs Group Inc, Huntington Bancshares Inc, JPMorgan Chase & Co, KeyCorp, Morgan Stanley, M&T Bank Corporation, New York Community Bancorp Inc, People's United Bank, PNC Financial Services Group, Regions Financial Corporation, Sun Trust Banks Inc, State Street Corp, U.S. Bancorp, Wells Fargo & Co, Zions Bancorp.

maturity or next repricing date.² The second part of the expression on the right-hand side of the equation is the weighted-average repricing maturity period of bank i 's liabilities, where k indexes the 11 liability items reported on the Call Report by remaining maturity or next repricing date. The quantities A_{it}^j and L_{it}^k are the dollar amounts in asset category j and liability category k , respectively, reported by bank i in quarter t . The terms A_{it}^{IE} and L_{it} denote bank i 's total interest-earning assets and total liabilities (calculated as total deposits), respectively. The variables m_A^j and m_L^k represents the estimated average repricing/maturity period (in years) for asset category j and liability category k , respectively. For assets or liabilities with fixed maturity, the Call Report captures the range of months (or years) remaining until the asset or liability matures; for assets or liabilities with floating rates or variable maturity, the Call Report records the range of months (or years) until the next repricing date. We set the average repricing/maturity period of each asset category j or liability category k to the midpoint of that category's maturity or repricing range on the Call Report.³

Item	Formula
Total liabilities ⁴ ($\sum L_{it}$)	sum(RCON2215m RCON2385) from 1997:Q2
Total interest-earning assets ⁵ ($\sum A_{it}^{IE}$)	sum(RCONA549 RCONA550 RCONA551 RCONA552 RCONA553 RCFDA554 RCONA555 RCONA556 RCONA557 RCONA558 RCONA559 RCONA560 RCONA561 RCONA562 RCONA570 RCONA571 RCONA572 RCONA573 RCONA574 RCONA575 RCONA564 RCONA565 RCONA566 RCONA567 RCONA568 RCONA569 RCON0343 RCON0344 RCON0345 RCON0347 RCON4544 RCON4545 RCON4551 RCON4552 RCON0348 RCON0349 RCON0356 RCON0357 RCON4554 RCON4555 RCON4561 RCON4564) from 1997:Q2

Interest Earning Assets⁶

Name	Schedule	Line Item	MDRM	Dates used
Securities issued by the U.S. Treasury, U.S. Government agencies, and state and political subdivisions in the U.S.; other non-mortgage debt securities; and mortgage pass-through	RC-B	M.2. a.(1)	RCONA549	

² The sample of firms used to calculate both the maturity gap and the proxy for the net stable funding ratio series is constructed based on the bank universe of the H.8 sample in terms of Call Report codes detailed in "Construction of Aggregate and Regional Bank data Using the Call Reports Data Manual" by den Haan, Sumner, and Yamashiro (2002).

³ Maturity/Repricing time of : less than 30 months was recorded as 0.125 years, 3 to 12 months was recorded as 0.625 years, 1 to 3 years was recorded as 2 years, 3 to 5 years was recorded as 4 years, 5 to 15 years was recorded as 10 years, greater than 15 years was recorded as 20 years, less than or equal to 3 years was recorded as 1.5 years, greater than 3 years was recorded as 5 years, less than 1 year was recorded as .5 years, greater than 1 year was recorded as 2 years, 1 to 5 years was recorded as 3 years, and greater than 5 years was recorded as 10 years.

⁴ Total weighted liabilities ($\sum m_L^k * L_{it}^k$) is the sum of the 11 liability items below (except for total deposits), where each item is multiplied by the corresponding midpoint maturity/repricing time

⁵ Total weighted interest-earning assets ($\sum m_A^j * A_{it}^j$) is the sum of each of the 26 asset items below (and as listed in the formula for total interest-earning assets), where each item is multiplied by the corresponding midpoint maturity/repricing time.

⁶ For all Interest Earning Assets balance sheet items, calculations were made using the call report item with the largest value (RCON vs RCFD).

securities other than those backed by closed-end first lien 1-4 family residential mortgages with a remaining maturity or next repricing date of (Three months or less)				
Securities issued by the U.S. Treasury... [SEE PREVIOUS] : (Over three months through 12 months)	RC-B	M.2. a.(2)	RCONA550	
Securities issued by the U.S. Treasury... [SEE PREVIOUS] : (Over one year through three years)	RC-B	M.2. a.(3)	RCONA551	
Securities issued by the U.S. Treasury... [SEE PREVIOUS] : (Over three years through five years)	RC-B	M.2. a.(4)	RCONA552	
Securities issued by the U.S. Treasury... [SEE PREVIOUS] : (Over five years through 15 years)	RC-B	M.2. a.(5)	RCONA553	
Securities issued by the U.S. Treasury... [SEE PREVIOUS] : (Over 15 years)	RC-B	M.2. a.(6)	RCONA554	
Mortgage pass through securities backed by closed-end first lien 1-4 family residential mortgages with a remaining maturity of next repricing date of (Three months or less)	RC-B	M.2. b.(1)	RCONA555	
Mortgage pass through securities... [SEE PREVIOUS] : (Over three months through 12 months)	RC-B	M.2. b.(2)	RCONA556	
Mortgage pass through securities... [SEE PREVIOUS] : (Over one year through three years)	RC-B	M.2. b.(3)	RCONA557	
Mortgage pass through securities... [SEE PREVIOUS] : (Over three years through five years)	RC-B	M.2. b.(4)	RCONA558	
Mortgage pass through securities... [SEE PREVIOUS] : (Over five years through 15 years)	RC-B	M.2. b.(5)	RCONA559	
Mortgage pass through securities... [SEE PREVIOUS] : (Over 15 years)	RC-B	M.2. b.(6)	RCONA560	
Other mortgage-backed securities (include CMOs, REMICs, and stripped MBS; exclude mortgage pass-through securities) with an expected average life of (Three years or less)	RC-B	M.2.c . (1)	RCONA561	
Other mortgage-backed securities... [SEE PREVIOUS] : (Over three years)	RC-B	M.2.c . (2)	RCONA562	
Closed-end loans secured by first liens on 1-4 family residential properties in domestic offices (reported in Schedule RC-C, Part I, item 1.c.(2)(a), column B) with a remaining maturity or next repricing date of: (Three months or less)	RC-C	M.2. a.(1)	RCONA564	
Closed-end loans... [SEE PREVIOUS]	RC-C	M.2.	RCONA565	

S] : (Over three months through 12 months)		a.(2)		
Closed-end loans... [SEE PREVIOUS] : (Over one year through three years)	RC-C	M.2. a.(3)	RCONA566	
Closed-end loans... [SEE PREVIOUS] : (Over three years through five years)	RC-C	M.2. a.(4)	RCONA567	
Closed-end loans... [SEE PREVIOUS] : (Over five years through 15 years)	RC-C	M.2. a.(5)	RCONA568	
Closed-end loans... [SEE PREVIOUS] : (Over 15 years)	RC-C	M.2. a.(6)	RCONA569	
All loans and leases EXCLUDING closed-end loans secured by first liens on 1-4 family residential properties in domestic offices with a remaining maturity or next repricing date of: Three months or less	RC-C	M.2. b.(1)	RCONA570	
All loans and leases excluding closed-end loans... [SEE PREVIOUS] : (Over three months through 12 months)	RC-C	M.2. b.(2)	RCONA571	
All loans and leases excluding closed-end loans... [SEE PREVIOUS] : (Over one year through three years)	RC-C	M.2. b.(3)	RCONA572	
All loans and leases excluding closed-end loans... [SEE PREVIOUS] : (Over three years through five years)	RC-C	M.2. b.(4)	RCONA573	
All loans and leases excluding closed-end loans... [SEE PREVIOUS] : (Over five years through 15 years)	RC-C	M.2. b.(5)	RCONA574	
All loans and leases excluding closed-end loans... [SEE PREVIOUS] : (Over 15 years)	RC-C	M.2. b.(6)	RCONA575	

Liabilities

Name	Schedule	Line Item	MDRM	Dates Used
Total deposits (Total Transaction Accounts Including Total Demand Deposits)	RC-E	7	RCON2215	
Total deposits (Nontransaction Accounts Including MMDAs)	RC-E	7	RCON2385	
Brokered deposits of less than \$100,000 with a remaining maturity of one year or less ⁷	RC-E	M.1. d.(1)	RCONA243	1996:Q1-2016:Q4
Brokered deposits of \$100,000 through \$250,000 with a remaining maturity of one	RC-E	M.1. d.(2)	RCONK219	2011:Q1-2016Q:4

⁷ Prior to 2011:Q1, the sum of RCONK219 and RCONK220 was the equivalent to RCONA244.

year or less [1]	RC-E	M.1. d.(2)	RCONA244	1996:Q1-2010:Q4
Brokered deposits of more than \$250,000 with a remaining maturity of one year or less	RC-E	M.1. d.(3)	RCONK220	2011:Q1-present
	RC-E	M.1. d.(2)	RCONA244	1996:Q1-2010:Q4
Time deposits of less than \$100,000 with a remaining maturity or next repricing date of: Three months or less[2]	RC-E	M.3. a.(1)	RCONA579	1996:Q1-2016:Q4
Time deposits of less than \$100,000 with a remaining maturity or next repricing date of: Over three months through 12 months	RC-E	M.3. a.(2)	RCONA580	1996:Q1-2016:Q4
Time deposits of less than \$100,000 with a remaining maturity or next repricing date of: Over one year through three years	RC-E	M.3. a.(3)	RCONA581	1996:Q1-2016:Q4
Time deposits of less than \$100,000 with a remaining maturity or next repricing date of: Over three years	RC-E	M.3. a.(4)	RCONA582	1996:Q1-2016:Q4
Time deposits of \$100,000 or more with a remaining maturity or next repricing date of: Three months or less	RC-E	M.4. a.(1)	RCONA584	1996:Q1-2016:Q4
Time deposits of \$100,000 or more with a remaining maturity or next repricing date of: Over three months through 12 months	RC-E	M.4. a.(2)	RCONA585	1996:Q1-2016:Q4
Time deposits of \$100,000 or more with a remaining maturity or next repricing date of: Over one year through three years	RC-E	M.4. a.(3)	RCONA586	1996:Q1-2016:Q4
Time deposits of \$100,000 or more with a remaining maturity or next repricing date of: Over three years	RC-E	M.4. a.(4)	RCONA587	1996:Q1-2016:Q4
Brokered deposits of \$250,000 or less with a remaining maturity of one year or less (included in Memorandum item 1.c above)	RC-E	M.1. d.(1)	RCONHK06	2017:Q1-present
Time deposits of \$250,000 or less with a remaining maturity or next repricing date of three months or less	RC-E	M.3. a.(1)	RCONHK07	2017:Q1-present
Time deposits of \$250,000 or less with a remaining maturity or next repricing date of over three months through 12 months	RC-E	M.3. a.(2)	RCONHK08	2017:Q1-present
Time deposits of \$250,000 or less with a remaining maturity or next repricing date of over one year through three years	RC-E	M.3. a.(3)	RCONHK09	2017:Q1-present
Time deposits of \$250,000 or less with a remaining maturity or next repricing date of over three years	RC-E	M.3. a.(4)	RCONHK10	2017:Q1-present
Time deposits of more than \$250,000 with a remaining maturity or next repricing date of	RC-E	M.4. a.(1)	RCONHK12	2017:Q1-present

three months or less				
Time deposits of more than \$250,000 with a remaining maturity or next repricing date of over three months through 12 months	RC-E	M.4. a.(2)	RCONHK13	2017:Q1-present
Time deposits of more than \$250,000 with a remaining maturity or next repricing date of over one year through three years	RC-E	M.4. a.(3)	RCONHK14	2017:Q1-present
Time deposits of more than \$250,000 with a remaining maturity or next repricing date of over three years	RC-E	M.4. a.(4)	RCONHK15	2017:Q1-present

The **Net stable funding ratio (NSFR)** is defined as the ratio of a banking organization’s “available stable funding” (ASF) to its “required stable funding” (RSF).

$$ASF = \frac{\text{Tier1 Capital} + 0.9 \times \left(\text{total deposits} \times \left(1 - \frac{\text{wholesale deposits}}{\text{total deposits}} \right) \right) + 0.5 \times \left(\text{total deposits} \times \left(\frac{\text{wholesale deposits}}{\text{total deposits}} \right) \right) + 0.3 \times (\text{other liabilities})}{\text{total assets}}$$

$$RSF = \frac{(0.75x \text{ loans} + 0.0 \times \text{cash} + 0.25 \times (\text{securities} + \text{fed funds sold \& repos}) + 0.25 \times \text{trading assets}) + 1 \times \text{other assets}}{\text{total assets}}$$

Series	Formula
ASF	$RCFD8274 + 0.9 * ((RCONB549 + RCONB550) * 1 - (\text{sum}(RCONP775, RCONP757, RCONP759) / RCONB549 + RCONB550)^8) + 0.5 * ((RCONB549 + RCONB550) * (\text{sum}(RCONP775, RCONP757, RCONP759) / RCONB549 + RCONB550) + 0.3 * (RCON2930) / RCON2170$
RSF	$[(0.75 * (RCON5369 + RCONB529) + 0 * (RCON0081 + RCON0071) + 0.25 * (RCON1754 + RCON1773 + RCONB987 + RCONB989 + RCON1350) + 0.25 * (RCON3545) + 1 * (RCON2170 - (RCON0081 + RCON0071 + RCON1754 + RCON1773 + RCONB987 + RCONB989 + RCON1350 + RCON5369 + RCONB529 + RCON3545))] / RCON2170$
NSFR	$(ASF/RSF) * 100$

ASF

Series	Schedule	Line Item	MDRM ⁹	Dates Used
Deposits: In domestic offices	RC	13.a.	RCON2200	
Deposits: In foreign offices, Edge and Agreement subsidiaries, and IBFs	RC	13.b.	RCFN2200	
Total time deposits of \$100,000 or more ¹⁰	RC-E	M.2.c.(1)	RCON2604	1996Q1-present

⁸ Prior to 2014:Q1, the share of wholesale deposits was estimated using deposits in 2014:Q1 as a proxy, adjusted for the gap between large time deposits and foreign deposits

⁹ RCFD indicates consolidated data on the call report and was used where possible. In some cases commercial banks reported either domestic or foreign data.

Total time deposits of \$100,000 through \$250,000	RC-E	M.2.c.	RCONJ473	2010Q1:present
Total time deposits of more than \$250,000	RC-E	M.2.d.	RCONJ474	2010Q1:present
Total deposits in all other transaction accounts of individuals, partnerships, and corporations	RC-E	M.6.c.	RCONP755 ¹¹	2014:Q1-2016Q4
Components of total nontransaction account deposits of individuals, partnerships, and corporations (sum of Memorandum items 7.a.(1), 7.a.(2), 7.b.(1), and 7.b.(2) plus all time deposits of individuals, partnerships, and corporations must equal item 1, column C, above): Deposits in all other MMDAs of individuals, partnerships, and corporations	RC-E	M.7.a.(2)	RCONP757	2014:Q1-present
Other savings deposit accounts of individuals, partnerships, and corporations (sum of Memorandum items 7.b.(1) and 7.b.(2) must be less than or equal to Memorandum item 2.a.(2) above): Deposits in all other savings deposit accounts of individuals, partnerships, and corporations	RC-E	M.7.b(2)	RCONP759	2014:Q1-present
Deposits of: Individuals, partnerships, and corporations (Column A Total transaction accounts)	RC-E	1.	RCONB549	2014:Q1-present
Deposits of: Individuals, partnerships, and corporations (Column C Total nontransaction accounts)	RC-E	1.	RCONB550	2014:Q1-present
Total other liabilities	RC-G	5.	RCON2930	
Total other liabilities	RC-G	5.	RCFD2930	
Total liabilities	RC	21.	RCFD2948	
Total assets	RC	12.	RCFD2170	
Tier 1 capital ¹²	RC-R	26.	RCFD8274	
Time deposits of \$100,000 or more with a remaining maturity or next repricing date of: Over one year through three years	RC-E	M.4.a.(3)	RCONA586	

RSF

Series	Schedule	Line Item	MDRM	Dates Used
Cash and balances due from depository institutions (from Schedule RC-A): Noninterest-bearing balances and currency	RC	1a	RCFD0081	

¹¹ RCONP755 discontinued after 2017Q1; definition used going forward is RCONB459-(RCONP753+RCONP754)

¹² Tier 1 Capital restructured to RCOA8274 and RCFA8274 post 2014:Q1

and coin				
Cash and balances due from depository institutions (from Schedule RC-A): interest-bearing balances	RC	1b	RCFD0071	
Securities: Held-to-maturity securities	RC	2.a.	RCFD1754	
Securities: Available-for-sale securities	RC	2.b.	RCFD1773	
Federal funds sold and securities purchased under agreements to resell: Federal funds sold in domestic offices	RC	3.a.	RCONB987	
Federal funds sold and securities purchased under agreements to resell: Securities purchased under agreements to resell	RC	3.b.	RCONB989	
Federal funds sold and securities purchased under agreements to resell: Securities purchased under agreements to resell	RC	3.b.	RCFDB989	
Federal funds sold and securities purchased under agreements to resell ¹³	RC	3.	RCFD1350	
Federal funds sold and securities purchased under agreements to resell	RC	3.	RCON1350	
Loans and lease financing receivables: Loans and leases held for sale	RC	4.a.	RCFD5369	2001:Q1-present
Loans and lease financing receivables: Loans and leases, net of unearned income and allowance	RC	4.d.	RCFDB529	2001:Q1-present
	RC	4.d.	RCFD2125	1996:Q1- 2000:Q4
Trading assets	RC	5.	RCFD3545	
Total assets	RC	12.	RCFD2170	

Short-term wholesale funding (STWF) is calculated as the sum of other borrowed money, commercial paper, federal funds (purchased, and agreements to repurchase), other borrowed money with remaining maturity of 1 year or less, and brokered and time deposits with remaining maturity of 1 year or less. STWF is divided by total assets. Breakdown of deposits by maturity is unavailable before 1996:Q1 and is approximated using the share of deposits with remaining maturity of 1 year or less in 1996:Q4.

Series	Formula
<i>Level</i>	
Short-term wholesale funding	BHCK2309 + BHCT3190 + BHDMB987 + BHCKB989 + BHCK2332 + BHDMA242 + BHFNA245 + BHDMA243
<i>Share</i>	
Short-term wholesale funding/total assets	$((\text{BHCK2309} + \text{BHCT3190} + \text{BHDMB987} + \text{BHCKB989} + \text{BHCK2332} + \text{BHDMA242} + \text{BHFNA245} + \text{BHDMA243}) / \text{BHCK2170}) * 100$

¹³ Aggregate federal funds purchased and repos only available on 2010 call reports

Name	Schedule	Line Item	MDRM	Dates Used
Federal funds purchased and securities sold under agreements to repurchase in domestic offices of the bank holding company, of its Edge and Agreement subsidiaries, and in IBFs: Federal funds purchased	HC	14.a.	BHCK0278	
Federal funds purchased and securities sold under agreements to repurchase in domestic offices of the bank holding company, of its Edge and Agreement subsidiaries, and in IBFs: Securities sold under agreements to repurchase	HC	14.b.	BHCK0279	
Total Assets	HC	12	BHCK2170	
Other borrowed money: Commercial paper	HC-M	14.a.	BHCK2309	
Other borrowed money (includes mortgage indebtedness and obligations under capitalized leases) (from Schedule HC-M) ¹⁴	HC	16	BHCK3190	
Federal funds purchased and securities sold under agreements to repurchase: Securities sold under agreements to repurchase	HC	14.b.	BHCKB995	
Deposits: In domestic offices (from Schedule HC-E): Noninterest-bearing	HC	13.a.(1)	BHDM6631	
Deposits: In domestic offices (from Schedule HC-E): Interest-bearing	HC	13.a.(2)	BHDM6636	
Brokered deposits less than \$100,000 with a remaining maturity of one year or less	HC-E	M.3.	BHDMA242	
Time deposits of \$100,000 or more with a remaining maturity of one year or less	HC-E	M.1.	BHDMA243	1996:Q1-2016:Q4
Federal funds purchased and securities sold under agreements to repurchase: Federal funds purchased in domestic offices	HC	14.a.	BHDMB993	

¹⁴ Prior to 2001:Q1 BHCK3190 is calculated as the sum of BHCK2309, BHCK2332, and BHCK2333 from Schedule HC-M

Deposits: In foreign offices, Edge and Agreement subsidiaries, and IBFs: Noninterest-bearing	HC	13.b.(1)	BHFN6631	
Deposits: In foreign offices, Edge and Agreement subsidiaries, and IBFs: Interest-bearing	HC	13.b.(2)	BHFN6636	
Foreign office time deposits with a remaining maturity of one year or less	HC-C	M.4.	BHFNA245	
Time deposits of more than \$250,000 with a remaining maturity of one year or less	HC-E	M.3.	BHDMHK32	2017:Q1-present
Brokered deposits \$250,000 or less with a remaining maturity of one year or less	HC-E	M.1.	BHDMHK06	2017:Q1-present

HQLA (high quality liquid assets) is the numerator of the LCR (liquidity coverage ratio) and is comprised of assets that can be quickly converted to cash with little or no loss of value. In general, these assets have low risk and low volatility. The proxy for HQLA from 1994 to 2016 used in the analysis is defined as:

$$HQLA = Level\ 1\ Assets + 0.85 \times Level\ 2A\ Assets$$

The ratio of Level 2A Assets to HQLA must not exceed 40% at the bank level.

Level 1 Assets¹⁵

Name	Schedule	Line Item	MDRM	Dates Used
Interest-bearing balances (in U.S. offices)	HC	1.b.(1)	BHCK0395	
Interest-bearing balances (in foreign offices, Edge and Agreement subsidiaries, and IBFs)	HC	1.b.(2)	BHCK0397	
MBS: Residential pass-through securities guaranteed by GNMA (HTM, fair value)	HC-B	4.a.(1)	BHCKG301	2009:Q2-present
	HC-A	M.8.a.(1)	BHCK1699	1996:Q1-2009:Q1
MBS: Residential pass-through securities guaranteed by GNMA (AFS, fair value)	HC-B	4.a.(1)	BHCKG303	2009:Q2-present
	HC-A	M.8.a.(1)	BHCK1702	1996:Q1-2009:Q1
U.S. Treasury securities (HTM, fair value)	HC-B	1.	BHCK0213	
U.S. Treasury securities (AFS, fair value)	HC-B	1.	BHCK1287	

¹⁵ Securities received in repo (which is not negligible for some banks) are not reported on the balance sheet and could not be included in the proxy for HQLA.

To account for sovereign debt as a Level 1 Asset, sovereign debt was estimated using:

$$0\% \text{ risk weight securities} - (\text{government issued securities}^{16}) \\ + \text{securities guaranteed by GNMA})$$

Series	Formula
Sovereign debt	(BHCKD962 +BHCKD967) -(BHCK1295+BHCK1293+BHCKG301+BHCKG303)

Name	Schedule	Line Item	MDRM	Dates Used
Held-to-maturity securities (0% risk-weight)	HC-R	2.a.	BHCKD962	2015:Q1-present
	HC-R	35	BHC01754	2001:Q1-2014:Q4
Available-for-sale securities (0% risk-weight)	HC-R	2.b.	BHCKD967	2015:Q1-present
	HC-R	36	BHC01773	2001:Q1-2014:Q4

Level 2A

Name	Schedule	Line Item	MDRM	Dates Used
MBS Residential pass-through securities Issued by FNMA and FHLMC (HTM, fair value)	HC-B	4.a.(2)	BHCKG305	2009:Q2-present
	HC-A	M.8.a.(2)	BHCK1705	1996:Q1-2009:Q1
MBS Residential pass-through securities Issued by FNMA and FHLMC (AFS, fair value)	HC-B	4.a.(2)	BHCK307	2009:Q2-present
	HC-A	M.8.a.(2)	BHCK1707	1996:Q1-2009:Q1
MBS: Other residential mortgage-backed securities (include CMOS, REMICs , and stripped MBS) Issued or guaranteed by U.S. Government agencies or sponsored agencies (HTM, fair value)	HC-B	4.b.(1)	BHCKG313	2009:Q2-present
	HC-A	M.8.b.(1)	BHCK1715	1996:Q1- 2009:Q1
MBS: Other residential mortgage-backed securities (include CMOS, REMICs , and stripped MBS) Issued or guaranteed by U.S. Government agencies or sponsored agencies (AFS, fair value)	HC-B	4.b.(1)	BHCKG315	2009:Q2-present
	HC-A	M.8.b.(1)	BHCK1717	1996:Q1- 2009:Q1
MBS: Other residential mortgage-backed securities (include CMOS, REMICs , and stripped MBS)	HC-B	4.b.(2)	BHCKG317	2009:Q2-present

¹⁶ Domestic only

Collateralized by MBS issued or guaranteed by U.S. Government agencies or sponsored agencies (HTM, fair value)	HC-A	M.8. b.(2)	BHCK1719	1996:Q1- 2009:Q1
MBS: Other residential mortgage-backed securities (include CMOS, REMICs , and stripped MBS)	HC-B	4.b.(2)	BHCKG319	2009:Q2-present
Collateralized by MBS issued or guaranteed by U.S. Government agencies or sponsored agencies (AFS, fair value)	HC-A	M.8. b.(2)	BHCK1732	1996:Q1- 2009:Q1
U.S. government agency obligations (exclude mortgage-backed securities): Issued by U.S. government agencies (HTM, fair value)	HC-B	2.a.	BHCK1290	
U.S. government agency obligations (exclude mortgage-backed securities): Issued by U.S. government agencies (AFS, fair value)	HC-B	2.a.	BHCK1293	
U.S. government agency obligations (exclude mortgage-backed securities): Issued by U.S. government-sponsored agencies (HTM, fair value)	HC-B	2.b.	BHCK1295	
U.S. government agency obligations (exclude mortgage-backed securities): Issued by U.S. government-sponsored agencies (AFS, fair value)	HC-B	2.b.	BHCK1298	

Risk-Taking

Changes in lending standards is the net percentage of banks that reported tightening standards on commercial & industrial loans to large and middle market firms. This variable uses data from the Senior Loan Officer Opinion Survey on Bank Lending Practices, a survey of large domestic banks (and US branches of foreign banks) conducted by the Federal Reserve on a quarterly basis.

Series	Notes
Changes in Lending Standards	Net percentage of banks tightening standards on C&I loans to large and middle market firms

The **loans to GDP** series is constructed by dividing total loans with nominal gross domestic product. Data on total loans is taken from the Federal Reserve's H.8 aggregate balance sheet for all domestic commercial banks. Nominal gross domestic product data was taken from the St. Louis Federal Reserve's Federal Reserve Economic Data (FRED) database.

Series	Schedule	Line	MDRM	Dates Used
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		Item		
Total loans and leases, net of unearned income	RC-C	12	RCFD0081	

Series	Notes
Nominal gross domestic product	Gross Domestic Product, Billions of Dollars, Quarterly, Seasonally Adjusted

The **average risk-weights** series is risk-weighted assets divided by total assets. For the advanced approaches banks, risk-weighted assets equals the maximum value of risk weighted assets under the standardized approach and risk-weighted assets under the advanced approaches.

Name	Schedule	Line Item	MDRM	Dates Used
Total risk-weighted assets (from Schedule HC-R, Part II item 31)	HC-R	40.a.	BHCAA223	2015:Q1-present
	HC-R	62.	BHCKA223	1996:Q1-2014:Q4
Advanced Approaches holding companies that exit parallel run only): Total risk-weighted assets using advanced approaches rule (from FFIEC 101 Schedule A, item 60)	HC-R	40.b.	BHCWA223	2015:Q1-present
Total Assets	HC	12.	BHCK2170	

Loan to deposit ratio is total loans divided by total deposits. Total deposits are calculated as the sum of noninterest-bearing and interest-bearing deposits in domestic and foreign offices.

Series	Formula
Total Deposits	BHCDM6631 + BHCDM6636 + BHFN6631 + BHFN6636

Name	Schedule	Line Item	MDRM	Dates Used
Loans and leases, net of unearned income and allowance for loan and lease losses (item 4.b minus 4.c)	HC	4.d.	BHCKB529	
Total loans and leases (consolidated)	HC-C	12.	BHCK2122	
Deposits: In domestic offices (from Schedule HC-E) (1) Noninterest-bearing	HC	13.a. (1)	BHDM6631	
Deposits: In domestic offices (from Schedule HC-E) (2) Interest-bearing	HC	13.a. (2)	BHDM6636	
Deposits: In foreign offices, Edge and Agreement subsidiaries, and IBFs: (1) Noninterest-bearing	HC	13.b. (1)	BHFN6631	
Deposits: In foreign offices, Edge and Agreement subsidiaries, and IBFs: (2) Interest-	HC	13.b. (2)	BHFN6636	

bearing				
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Asset Quality

The **Net charge-offs** series is constructed by dividing net charge-offs by total loans. Net charge-offs is equal to charge-offs less recoveries.

Series	Formula
<i>Level</i>	
Net Charge-offs	BHCK4635-BHCK4605
<i>Ratio</i>	
Net Charge-offs/Total Loans	$(\text{BHCK4635}-\text{BHCK4605})/\text{BHCK2122} *400$

Series	Schedule	Line Item	Code	Dates Used
Total Loans and Leases (sum of items 1 through 8): Charge-Offs	HI-B	9.	BHCK4635	
Total Loans and Leases (sum of items 1 through 8): Recoveries	HI-B	9.	BHCK4605	
Total loans and leases (consolidated)	HC-C	12.	BHCK2122	

The **Reserves to loan ratio** is Allowance for Loan and Lease Losses (ALLL) divided by total loans.

Series	Schedule	Line Item	Code	Dates Used
LESS: Allowance for loan and lease losses	HC	4.c.	BHCK3123	
Total loans and leases (consolidated)	HC-C	12.	BHCK2122	

The **Non-performing loans ratio** is non-performing loans (NPL) divided by total loans. Non-performing loans is the sum of loan past due 30 through 89 days and still accruing, and nonaccrual loans.

Series	Formula
<i>Level</i>	
Non-performing loans	BHCK5526 + BHCK5525
<i>Ratio</i>	
Non-performing loans/Total Loans	$100 \times (\text{BHCK5526} + \text{BHCK5525})/\text{BHCK2122}$

Series	Schedule	Line Item	Code	Dates Used
Total (sum of items 1 through 9): (Column A)	HC-N	10.	BHCK5526	

Past due 30 through 89 days and still accruing				
Total (sum of items 1 through 9): (Column C) Nonaccrual	HC-N	10.	BHCK5525	
Total loans and leases (consolidated)	HC-C	12.	BHCK2122	

Interconnectedness

The **Herfindahl index** series is calculated by summing the square of the ratio of assets held by each of the top minimum bank holding companies divided by total assets. ‘Top minimum bank holding companies’ refers to the minimum number of bank holding in a quarter, from 1996:Q1 to the present quarter.¹⁷

Name	Schedule	Line Item	MDRM	Dates Used
Total Assets	HC	12.	BHCK2170	

Exposure to financial entities is calculated by dividing loans to financial depository institutions plus federal funds sold and securities purchased under agreements to resell as a percent of total assets with total assets. Loans to financial depository institutions include loans to U.S. banks and depository institutions, as well as to foreign banks.

Series	Formula
Exposure to Financial Entities	$(\text{BHCK1292} + \text{BHCK1296} + \text{BHDMB987} + \text{BHCKB989})/\text{BHCK2170}$

Name	Schedule	Line Item	MDRM	Dates Used
Loans to depository institutions and acceptances of other banks to U.S. banks and other U.S. depository institutions	HC-C	2.a.	BHCK1292	
Loans to depository institutions and acceptances of other banks to foreign banks	HC-C	2.b.	BHCK1296	
Federal funds sold in domestic offices ¹⁸	HC	3.a.	BHDMB987	2002:Q1-present
	HC	3.	BHCK1350	1997:Q1-2001:Q4
	HC	3.a.	BHCK0276	1996:Q1-1996:Q4
	HC	3.b.	BHCK0277	1996:Q1-1996:Q4
Securities purchased under agreements to resell	HC	3.b.	BHCKB989	
Total Assets	HC	12.	BHCK2170	

¹⁷ The minimum number of BHCs per quarter from 1996:Q1 to 2016:Q2 was 601.

¹⁸ Prior to 1997:Q1, federal funds and repos were the sum of BHCK0276 and BHCK0277.

CoVaR is calculated as the average CoVaR of the 8 U.S. G-SIBs.¹⁹ A measure created by Tobias Adrian and Markus Brunnermeier, CoVaR captures the marginal contribution that an individual institution has to systemic risk; it is what happens to the financial system when an institution changes from “normal” to “stressed”.²⁰ We followed Adrian and Brunnermeier (2011) to calculate the CoVaR for each of the 8 U.S. G-SIBs, using weekly data from January 1, 1995 until the most recent quarter. Values for weekly data are taken from the Friday, or the Thursday before if the Friday is a holiday. Data on the independent and dependent variables was compiled from SNL Financial, while the macroeconomic state variables were compiled from the St. Louis Federal Reserve’s Federal Reserve Economic Data (FRED) database as well as equity market return data from Yahoo Finance.²¹ To aggregate CoVaR, we calculated quarterly data by averaged the weekly values of CoVaR across the 8 institutions.

Profitability

Return-on-assets (ROA) is measured as net income divided by total consolidated assets.

Series	Formula
Return on assets	BHCK4340/BHCK3368 *400

Name	Schedule	Line Item	MDRM	Dates Used
Total consolidated assets (HC-K)	HC-K	5.	BHCK3368	
Net income (loss) attributable to holding company (item 12 minus item 13)	HI	14.	BHCK4340	

Return-on-equity (ROE) is measured as net income divided by equity.

Series	Formula
Return on equity	BHCK4340/BHCKG105 *400

Name	Schedule	Line Item	MDRM	Dates Used
Net income (loss) attributable to holding	HI	14.	BHCK4340	

¹⁹ The 8 U.S. G-SIBs are Bank of America, Citibank, J.P. Morgan, Wells Fargo, Morgan Stanley, Goldman Sachs, Bank of New York Mellon, and State Street.

²⁰ Adrian, Tobias and Brunnermeier, Markus K., CoVaR (September 2011). FRB of New York Staff Report No. 348.

²¹ All state variables from Adrian & Brunnermeier (2011) were included except the short-term liquidity spread.

company (item 12 minus item 13)				
Total equity capital (sum of items 27.a and 27.b).....	HC	28.	BHCKG105	2009:Q1-present
	HC	28.	BHCK3210	1996:Q1-2008:Q4

Net interest margins is net interest income divided by average earning assets.

Series	Formula
<i>Level</i>	
Average Earning Assets ²²	BHCK0395 + BHCK0397 + BHCK1754 + BHCK1773 + BHDMB987 + BHCKB989 - BHCK3123 + BHCK3545 + BHCK2122 -BHCM3543
<i>Ratio</i>	
Net Interest Margins	BHCK4074/Average Earning Assets *400

Name	Schedule	Line Item	MDRM	Dates Used
Net interest income (item 1.h minus item 2.f)	HI	3.	BHCK4074	
Cash and balances due from depository institutions: Interest-bearing balances In U.S. Offices	HC	1.b.(1)	BHCK0395	
Cash and balances due from depository institutions: Interest-bearing balances In foreign offices, Edge and Agreement subsidiaries, and IBFs	HC	1.b.(2)	BHCK0397	
Securities: Held to maturity securities	HC	2.a.	BHCK1754	
Securities: Available-for-sale securities	HC	2.b.	BHCK1773	
Federal funds sold and securities purchased under agreements to resell: Federal funds sold in domestic offices	HC	3.a.	BHDMB987	
Federal funds sold and securities purchased under agreements to resell: Securities purchased under agreements to resell	HC	3.b.	BHCKB989	

²² Prior to 2009:Q1, derivatives (BHCM3543) was calculated as the sum of BHCK3543 and BHCK3543. Prior to 2002:Q1, the sum of BHDMB987and BHCKB989 was calculated as the sum of BHCK1350.

Loans and lease financing receivables: LESS: Allowance for loan and lease losses	HC	4.c.	BHCK3123	
Trading assets	HC	5.	BHCK3545	
Total loans and leases (sum of items 1 through 10 minus item 11) (consolidated)	HC-C	12.	BHCK2122	
Derivatives with a positive fair value (Consolidated)	HC-D	11.	BHCM3543	

Noninterest income to assets ratio is measured as noninterest income divided by total assets.

Series	Formula
Noninterest Income	$BHCK4079/BHCK2170*100$

Name	Schedule	Line Item	MDRM	Dates Used
Noninterest Income	HI	5.	BHCK4079	
Total Assets	HC	12.	BHCK2170	