

Regulatory brief

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Stress testing: Failures on the horizon?

Overview

On November 1, 2013, the Federal Reserve Board of Governors ("Fed"), along with the Office of the Comptroller of the Currency, released documents pertaining to the capital stress testing requirements under the Dodd-Frank Act ("DFA"). One set of documents contained the stress test macroeconomic scenarios (i.e., baseline, severe, and severely adverse) and instructions that outline the economic parameters to be used by bank holding companies ("BHCs") and by banks with over \$10 billion in assets.¹ Concurrently, the Fed issued the 2014 Comprehensive Capital Analysis and Review ("CCAR") guidance that outlines revised requirements for BHCs with over \$50 billion in assets whose capital plans would require Fed review.

Beyond the changes in the scenario parameters, these documents outline a number of other important updates, including accelerating the timeline for calculation of Basel III capital ratios.² Furthermore, BHCs and banks with \$10 billion to \$50 billion in assets will be conducting supervisory stress tests in 2014 for the first time, while the results of stress tests for certain BHCs with over \$50 billion in assets (i.e., those BHCs that were subject to capital plan review in 2013 but not to CCAR) will be publicly released. Taken together, these and others changes (discussed below) evidence our previously stated expectation that the stress testing bar will continue to rise for large BHCs and that more failing grades are likely in the future.³

Looking across the scenarios, the range of parameters and shocks appear to leave no BHC or bank unscathed regardless of size. For example, although the 2014 severely adverse scenario outlines a protracted domestic recession similar to that assumed in 2013 scenarios, there are notably large declines in the housing price index ("HPI"), commercial real estate index, and in the global economy generally. The modeled change to HPI would impact firms from the largest BHCs to the larger regional BHCs, while the commercial real estate index changes would have a greater impact on the smaller BHCs. The modeled slowdown in developing markets and recessions in the UK, Europe, and Japan will have a greater impact on the largest banks and BHCs with a global footprint.

¹ The firms' deadlines for submitting their stress tests are January 2014 for BHCs and banks with over \$50 billion in assets and March 2014 for BHCs and banks with between \$10 billion and \$50 billion in assets.

² For a review of the US Basel III capital rule, see PwC's *Financial Services Regulatory Brief, Basel III capital rules finalized by Federal Reserve: But much more to come for the big banks* (July 2013).

³ See PwC's *Financial Services Regulatory Brief, Stress testing: Midterm results improved, but it's all about the final* (September 2013).

The 2014 scenarios also introduce a counterparty default component that is required to be modeled by the eight largest BHCs⁴ with substantial trading or custodial operations. This component requires these BHC to estimate their net stressed losses as a result of an instantaneous and unexpected default of their largest counterparty. While it attempts to capture interconnectedness-related risks within the market, the component excludes intraday exposures, and excludes exposures to G-7 sovereigns and clearing counterparties deemed systemically important. We believe that the Fed's increasing focus on intraday credit risk and on Financial Market Utilities as a major source of systemic risk will drive regulators to eventually incorporate these risks in future supervisory stress tests.

Beyond the pain inflicted by the new scenarios on firms' capital levels, additional updates laid out in the Fed's CCAR guidance should not be overlooked. The first is that the Fed will publish the stress test results of BHCs with over \$50 billion in assets under the adverse scenario for the first time (in addition to the severely adverse scenario results). As the adverse scenario assumes a more severe rising interest rate environment and a steepening yield curve, it will reveal more information regarding the removal of the Accumulated Other Comprehensive Income ("AOCI") filter under Basel III and about firms' sensitivity to a rising interest rate environment.

⁴ The eight BHCs required to perform the counterparty default scenario include the six BHCs subject to the global market shock (i.e., Bank of America, Citigroup, Goldman Sachs, JP Morgan, Morgan Stanley, and Wells Fargo), and the two largest custodial banks (Bank of New York Mellon and State Street) which are not subject to the global market shock. Global market shock parameters will be provided by supervisors by November 15, 2013 to be applied to positions as of October 16, 2013.

The second major change is the phase-in of the Basel III capital rules which will accelerate firms' calculation of regulatory and risk-weighted assets ("RWAs") under Basel III. This will require greater reliance on manual capital calculation processes, pending updates to firms' systems.

This **Financial Services Regulatory Brief** provides our view of the following:

- The 2014 supervisory macroeconomic scenarios compared against prior years' scenarios
- The Fed's introduction of a counterparty default component for eight BHCs with substantial trading or custodial operations
- The incorporation of Basel III into firms' capital estimates which introduces additional complexity and challenges
- Additional implications of the 2014 supervisory stress testing framework

What's new for the 2014 scenarios?

There are many similarities between the 2014 scenarios and those of prior supervisory stress test cycles, namely significant declines in Gross Domestic Product ("GDP"), HPI, and equity indices, coupled with widening corporate bond spreads and high unemployment rates. However, the 2014 scenarios include several new factors that will impact test results depending on a BHC's balance sheet composition and geographical footprint.

The below table provides our view of the major changes with respect to the severely adverse and adverse economic scenarios (including the new counterparty default component).

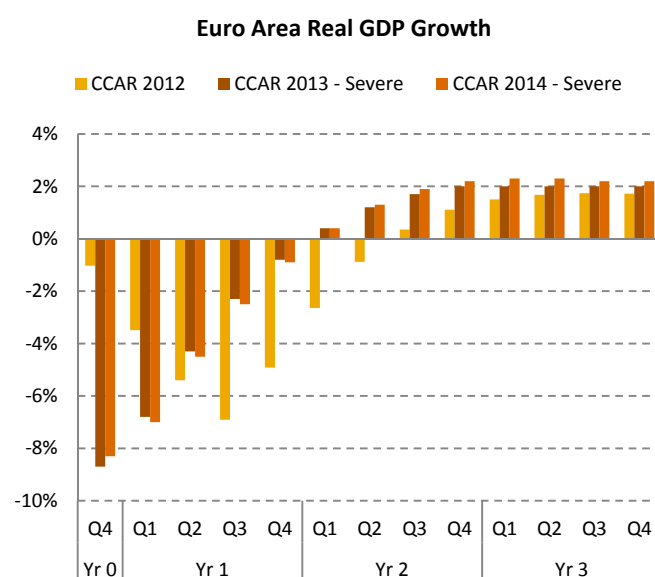
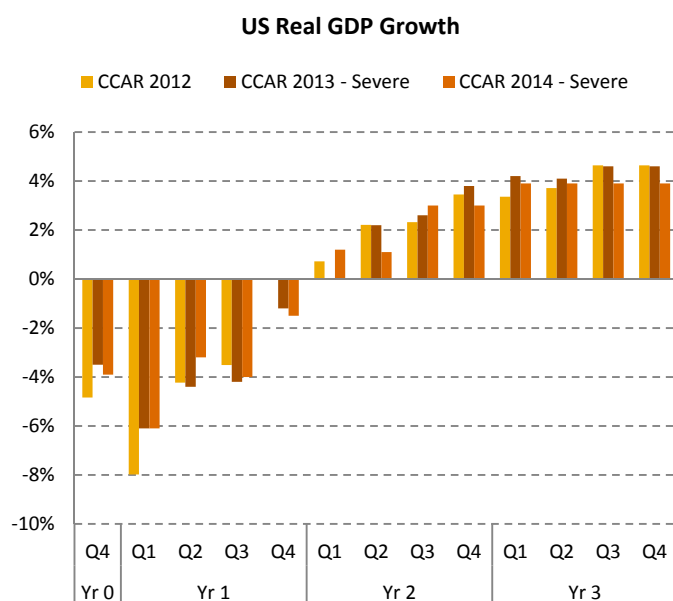
Scenario	Update for 2014	Intended impact of the update
Severely adverse	There is a more substantial slowdown in developing Asia	A more severe overall slowdown in developing Asia that is intended to represent a weakening in all emerging markets
Severely adverse	There is a larger decline in US housing prices and commercial real estate	Reversal of recent increases in real estate prices that will particularly impact BHCs with high exposures to states or metropolitan areas that have experienced brisk gains in real estate prices over the past year
Adverse	There is a global aversion to long-term debt instruments that results in a rapid rise in long-term rates and a steeper yield curve	Greater volatility in AOCI, which will now impact capital levels for Advanced Approaches BHCs

Scenario	Update for 2014	Intended impact of the update
Adverse	There is a substantial increase in corporate borrowing rates and mortgage rates	A widening of spreads across all corporate borrowing tiers and instruments that are presently experiencing historically narrow spreads
Counterparty default component	A counterparty default component that is based upon the default of a BHC's largest counterparty using the parameters of the global market shock	Significant impact on net stressed losses and levels of capital as a result of the major counterparty default

Changes under the severely adverse scenario

Gross Domestic Product

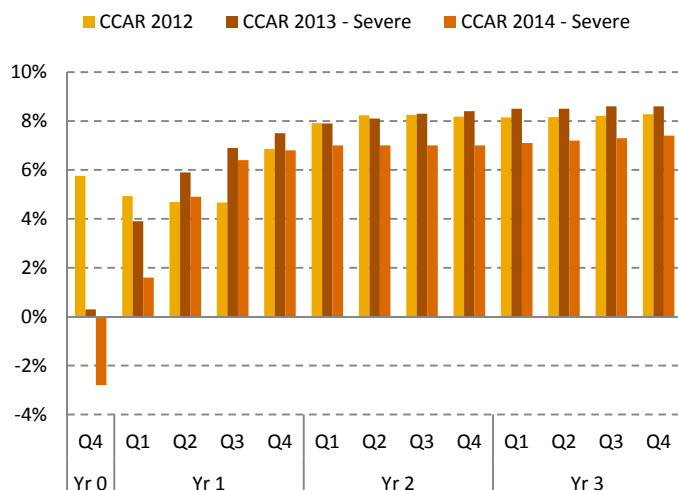
The following four graphs compare the trajectory of the GDP for four key regions over the past two supervisory stress test cycles (i.e., 2012 and 2013's severely adverse scenario) with 2014's severely adverse scenario. For the US and the Euro area, all three cycles assume a relatively severe recession in the US and Euro area, so the pattern is little changed in 2014.



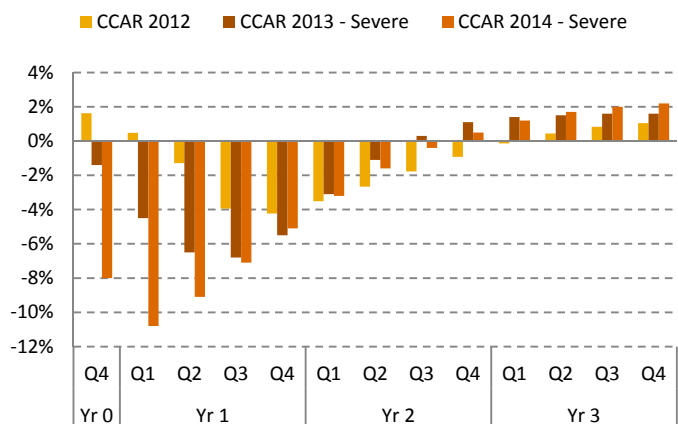
On the other hand, under last year's supervisory stress tests developing Asia experienced a temporary slowdown before quickly returning to high growth rates, which is quite different in the 2014 severely adverse scenario. Developing Asia now suffers an initial one-quarter 2.8% decline in GDP and only reaches sub-par growth rates in the next couple of quarters. This more severe slowdown in developing Asia is intended by regulators to be representative of a slowdown across all developing economies, which makes these lowered growth expectations even more significant.

Furthermore, Japan suffers a more severe contraction in the 2014 severely adverse scenario (over several quarters) than in previous years' stress tests. These changes in developing Asia and Japan will no doubt greatly impact those BHCs with large global footprints.

Developing Asia Real GDP Growth

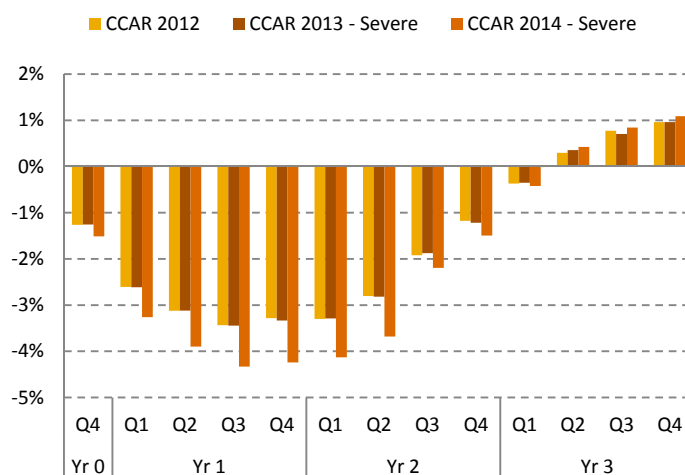


Japan Real GDP Growth



The below graph compares the 2014 scenario's more negative HPI assumptions with those of prior years.

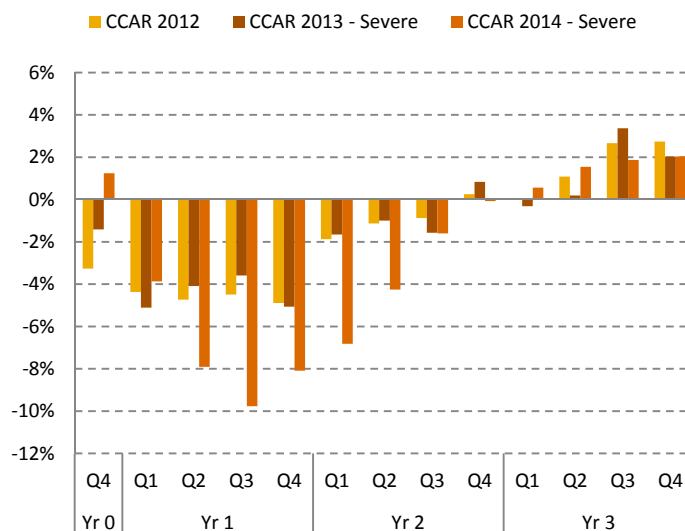
HPI



In addition, the 2014 severely adverse scenario provides for a much larger drop in commercial real estate prices than in previous stress tests. Although not explicitly stated by the Fed, the larger decline in commercial real estate probably coincides with the rationale for the larger decline in HPI, as the commercial real estate market continues to expand in the current environment.

The below graph compares the 2014 severely adverse scenario's more negative commercial real estate price assumptions with those of prior years.

Commercial Real Estate



Housing prices and commercial real estate

A significant decline in HPI has been a feature of all stress tests conducted to date, which is not surprising given that housing prices were a significant factor in the 2007 - 2009 global financial crisis.

The 2014 severely adverse scenario depicts an even larger decline in HPI than in prior stress tests, and importantly the Fed now wants BHCs to consider the impact of this decline on a more granular level. BHCs must apply this heightened stress to their mortgage portfolios while taking into consideration that certain US states and Metropolitan Statistical Areas have experienced large rebounds in housing prices. This emphasis on a differentiated analysis based on region will test the robustness of BHC loss forecasting models.

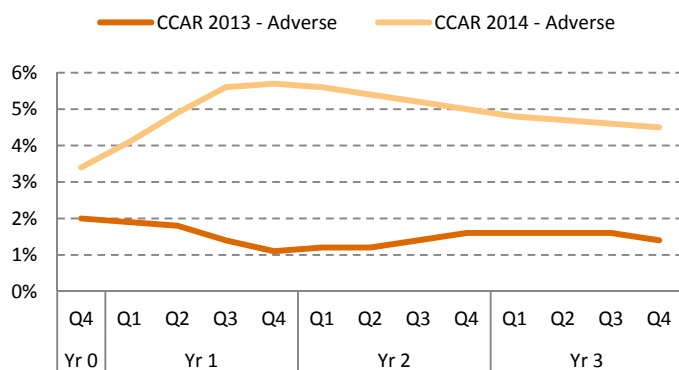
Changes under the adverse scenario

Treasury yield curve

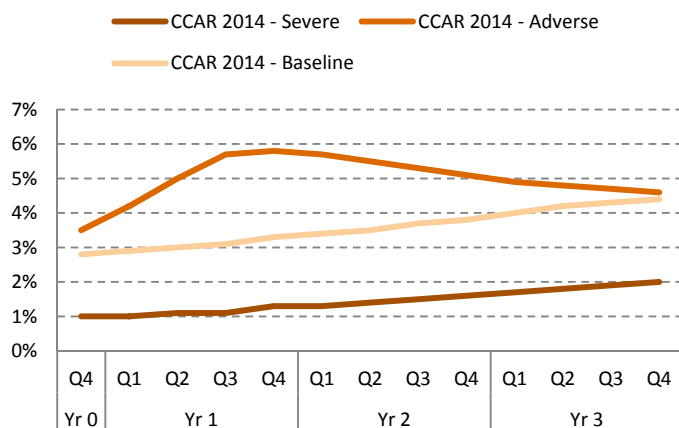
In prior supervisory stress test cycles, there was limited interest in the adverse scenario as it was largely seen as a milder version of the severely adverse scenario. However, the Fed has now decided to publically disclose, for applicable firms, the results of the 2014 adverse scenario and has added a new substantive component. The adverse scenario now includes a global aversion to long-term debt instruments, which leads to an approximately 300 basis point steepening of the US yield curve and equivalent increases across all sovereign debt globally.

To help visualize this debt aversion, the first graph below compares the assumed interest rate spread between 3-month and 10-year US Treasuries under the 2013 and 2014 supervisory stress test cycles for the adverse scenario (showing that the spread is much larger under the 2014 scenario). The second graph depicts the assumed 10-year Treasury yields under 2014's severely adverse, adverse, and baseline scenarios (showing that the adverse scenario has the highest yield).

Treasury Yield Spread (3 Mo. to 10 Yr.)



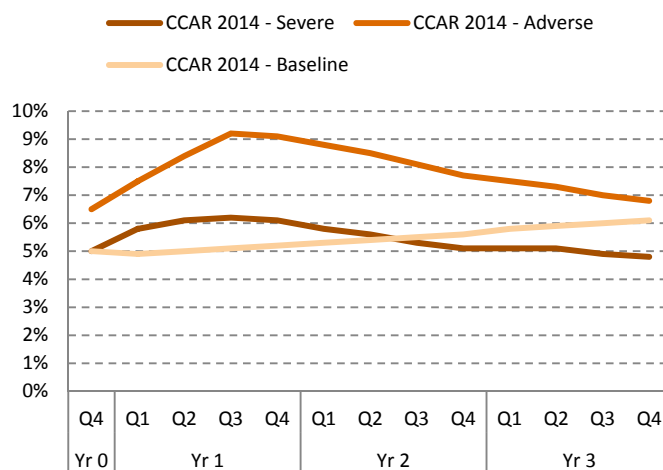
10-Year Treasury Yield



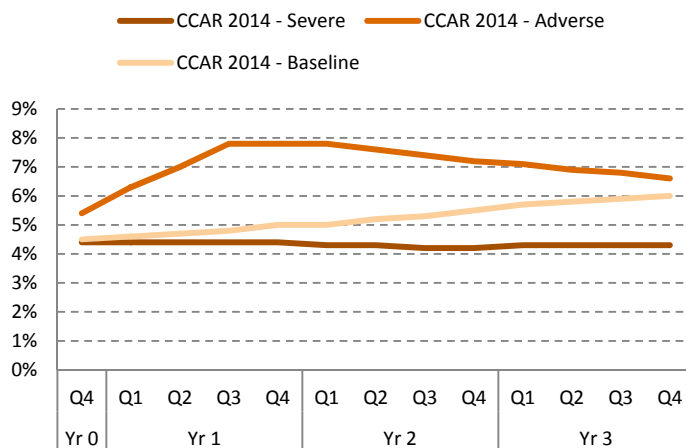
Borrowing rates

In addition, both corporate borrowing rates and mortgage rates increase significantly under the 2014 adverse scenario to reflect a rise in credit spreads on top of the rise in Treasury yields. It is noteworthy that although most currencies depreciate against the dollar as investors seek a flight-to-safety in this environment, the yen actually appreciates modestly against the dollar highlighting its safe haven status. The below two graphs depict the BBB corporate debt yields and mortgage rates under 2014's severely adverse, adverse, and baseline scenarios (showing that the adverse scenario has the highest rates in both instances).

BBB Corporate Yield



Mortgage Rates



Implications

Given the currently low interest rate environment and low net interest margin for BHCs, the rising rates and steepening yield curve in the 2014 adverse scenario could have a particularly large impact on AOCI. As interest rates rise, bond and loan positions marked as available-for-sale (“AFS”) will incur unrealized losses that will negatively impact AOCI. This will lower the amount of Common Equity Tier 1 (“CET1”) capital held by a BHC under the Basel III framework. Banks are likely to realize higher net interest margin on their loan portfolios which will likely more than offset these losses over time through higher pre-provision net revenues. Given the timing difference of these two offsetting impacts, BHCs will need to manage this volatility to ensure they have the necessary buffer in CET1 capital to stay above minimum CET1 capital thresholds.

Counterparty default component

For the first time in 2014, eight highly interconnected BHCs with substantial trading or custodial operations will be required to incorporate a counterparty default component into their stress scenarios. This component replaces the counterparty incremental default risk calculation from last year’s stress test and is intended to more accurately assess the potential losses and impact to capital of a counterparty default.

Specifically, these BHCs will have to project and report the impact of an instantaneous and unexpected default of their largest counterparty upon the BHC’s Securities Financing Transactions (“SFTs”, i.e., securities lending, repurchase agreements, and reverse repurchase agreements) and derivative exposures.⁵

⁵ The largest counterparty is the counterparty with which the BHC has the greatest net stressed losses for SFTs and derivatives exposure (accounting for legal netting agreements), excluding sovereign entities that are members of the G-7 (e.g., state-owned enterprises backed by the sovereign’s full faith and credit) and systemically important clearing counterparties. Intraday transactions are also excluded.

Net stressed losses are calculated by:

- Revaluing collateral and exposures after applying the Fed’s global market shock (the components of the global market shock will be provided by November 15, 2013); and,
- Multiplying the resulting stressed net current exposure (after accounting for any single name CDS hedges in the case of derivatives) by Loss Given Default (“LGD”) of 90%.

The eight BHCs will also be required to submit a supplemental template and documentation to the Fed detailing their SFTs and derivative activities related to the counterparty default scenario component. Finally, the smaller group of six BHCs that are additionally subject to the global market shock will have to make changes to credit valuation adjustments (“CVAs”) charges and single name CDS gains in their trading books in order to avoid double counting the exposures.

Implementation of Basel III

In their capital plan submissions for 2013, BHCs were mandated to include a Basel III transition plan that provided projections of their capital positions under the then-proposed Basel III regime.

For their submissions in 2014, banks and BHCs with over \$50 billion assets will be mandated to incorporate Basel III capital requirements into their stress test projections and capital plans, in accordance with the transition provisions. In its released guidance, the Fed identified that only those Advanced Approaches banking organizations that have exited parallel run (and have received notification from the Fed) will be required to use Basel III’s Advanced Approaches to calculate their RWAs. Since all Advanced Approaches banking organizations are currently still in parallel run, BHCs will only be required to calculate and disclose, where required, their RWAs and capital ratios under Basel III’s Standardized Approach for 2015.

As noted in the Fed guidance, capital adequacy thresholds at BHCs over \$50 billion will continue to be assessed against a minimum 5% Tier 1 Common (“T1C”) ratio calculated in the same manner as in previous submissions. The Fed decided to preserve the current method of calculating the T1C ratio and total RWAs to ensure consistency with previous capital plan cycles during the phase-in period of the new CET1 minimum capital requirement. Once CET1 ratio reaches its permanent level of 4.5% (excluding the Capital Conservation Buffer) in 2015, it is expected that this ratio will be used, in addition to the other regulatory capital ratios, to assess capital adequacy. Until then however, the Fed will still require BHCs over \$50 billion

to calculate their CET1 capital ratios for 2014⁶ and 2015 while meeting the minimum Basel III capital requirements.

The 2014 stress testing cycle will require BHCs and banks over \$50 billion to incorporate the revised Basel III framework into their capital estimates, using CET1 and Standardized Approach RWAs for the assessment of capital adequacy. This will pose operational challenges in forecasting elements of the Basel III capital adequacy ratios for baseline and stressed scenarios.

Namely, these firms will have to perform the following calculations related to their capital:

- Valuate and forecast unrealized gains and losses on AFS securities and on any held-to-maturity (“HTM”) securities that have experienced non-temporary impairments in order to determine the AOCI impact on their capital (Advanced Approaches BHCs only);⁷

⁶ Advanced approaches banks will project a CET1 ratio for the quarters in 2014 using a denominator of Basel 1 plus Basel 2.5.

⁷ 20% of AOCI is included in capital calculations for 2014, and 40% of AOCI is included in capital calculations for 2015. For the purposes of this stress test cycle, non-Advanced Approaches BHCs are assumed to opt-out of including AOCI in their capital calculations.

- Forecast Deferred Tax Assets (“DTAs”) net of associated Deferred Tax Liabilities (“DTLs”);⁸ and,
- Forecast mortgage servicing assets, net of DTLs, along with DTAs and significant investments in unconsolidated financial institutions that receive limited recognition in CET1, subject to 10% individual and 15% aggregate thresholds.

In addition, firms will need to perform the following tasks related to their RWAs:

- Forecast many exposure types on a more granular level to calculate RWAs under the Basel III framework; and,
- Calculate RWAs for several exposure types previously not included (e.g., cleared derivatives and unsettled transactions).⁹

⁸ CET1 recognizes, with limitations, DTAs arising from temporary differences that could not be realized through net operating loss carry backs, net of any related valuation allowances and net of DTLs, subject to a 10% individual threshold and a 15% aggregate threshold (so called basket deduction). There are numerous other changes in the DTA rules which have a secondary impact on other capital computations and forecasting.

⁹ These exposures did not require a capital charge under the Basel I framework, but do so under Basel III.

The below table provides our view of the exposure types that will pose a challenge to capital forecasts resulting from changes in the Basel III framework.

Exposure type	Change in Basel III (standardized)	Challenge for running the stress test
Past due exposures	150% risk weight applies to the portion of an exposure that is not guaranteed or secured and that is not a sovereign exposure or a residential mortgage exposure if it is 90 days or more past due or on nonaccrual.	Forecasted past due exposures must be aggregated by exposure type to determine if the 150% risk weight applies.
Collateralized transactions	The Collateral Haircut Approach has been implemented. To determine the exposure amount of a securities financing transaction, eligible margin loan or collateralized derivative transaction, a banking organization may take into account the market value of eligible collateral securing the transaction, subject to haircuts (supervisory or own estimates if approved).	The market value of eligible collateral must be forecasted. In addition the collateral type must be categorized according to the Standard Supervisory Market Price Volatility Haircuts to determine the appropriate haircut percentage.
Cleared derivatives	A clearing member banking organization must calculate a capital charge for its default fund contributions to the central counterparty ("CCP").	Default fund contributions to CCPs must be forecasted and a capital charge calculated.
Securitization exposures	The ratings-based approach has been replaced by the simplified supervisory formula approach ("SSFA"). The SSFA factors in the risk weight applicable to underlying securities, the relative position of the securitization in the structure, and measures of delinquency and loss on the securitized assets.	The SSFA must be calculated for securitization positions to determine their forecasted risk weights. This will require the forecasting of delinquencies on underlying assets.
Equity exposures	Equity risk weight amounts are determined by the equity exposure type. Equity risk weights range from 0%-600%.	Equity exposures must be categorized by exposure type to determine the risk weight applied and forecasted capital charge.
Unsettled transactions	A capital charge for qualifying unsettled transactions has been implemented. The risk weights for delivery-versus-payment ("DvP") and payment-versus-payment ("PvP") transactions is dependent upon the number of days unsettled (risk weight ranges from 100%-1250%). Non-DvP and non-PvP transactions will also require a capital charge.	Unsettled transactions must forecasted and categorized by days unsettled. The positive current exposure and fair value of those deliverables owed must also be calculated to determine the capital charge.

Additional implications of the 2014 supervisory stress testing framework

With the release of the supervisory scenarios, the next six months will be critical for a wide range of supervised banks and BHCs as they introduce the stress parameters into their existing or still-developing models used to estimate the impact to their balance sheet, income statement, and regulatory capital levels. For some firms, particularly those between \$10 billion and \$50 billion, this cycle will represent their first submissions to regulators that will be closely followed by supervisory examinations. For others (i.e., those over \$50 billion), this cycle will introduce increasing supervisory

expectations and closer review by specialized examiners, along with public disclosures.

Beyond the direct implications for those firms discussed above in this cycle, the forthcoming finalization of the Enhanced Prudential Standards¹⁰ will bring a range of other institutions, namely foreign banking organizations'

¹⁰ We expect the proposed rule to be finalized around the end of this year. See PwC's *Financial Services Regulatory Brief, Basel & prudential standards: US moving faster than world* (August 2013).

Intermediate Holding Companies¹¹ and FSOC-designated Nonbank Financial Companies,¹² under similar regulatory requirements and supervisory expectations. For these firms, the documents released by regulators afford an opportunity to benchmark existing practices and implement or enhance stress testing and capital planning processes. The resource requirements and implementation timeframes to accomplish such tasks should not be underestimated.

Banks and BHCs between \$10 billion and \$50 billion

Starting this year, DFA requires banks and BHCs with assets between \$10 billion and \$50 billion to perform an annual stress test using the supervisory scenarios. These firms are required to perform three company-run stress tests based on the supervisory baseline, adverse, and severely adverse scenarios. Under DFA and subsequent supervisory guidance, these firms must submit their templates, stress test results, and required qualitative supporting documentation to supervisors by March 31, 2014. These firms are exempt from public disclosure of their stress test results until 2015.

Banks and BHCs over \$50 billion

For the banks and BHCs over \$50 billion that were not previously subject to CCAR or were granted stress test reporting extensions, the supervisory requirements will

be higher for the 2014 cycle as they will be required to perform company-run stress tests based on the three supervisory scenarios as well as two BHC-defined scenarios. For these firms, the formal acceptance of capital plans will be substantively similar to last year's with the exception that the Fed will publicly release the supervisory stress test results of these firms. Furthermore, these firms will be required to publicly release the results of their company-run stress tests by March 31, 2014 and September 30, 2014 as required under DFA.

Supervisory expectations – Grading on a curve

In their released guidance, the regulators denote their recognition of the challenges facing the new participants and signal that they would not hold these BHCs to the same heightened supervisory expectations as those who have already been subject to CCAR reviews in prior cycles. These assurances should not be viewed as a guaranteed “pass” on effective stress testing and capital planning processes but rather as an opportunity for continuing to enhance existing practices to conform with evolving supervisory expectations. For the largest or most complex BHCs, which are expected to have the most sophisticated, comprehensive and robust capital planning practices, it is clear that the bar has been raised.

Aligning Basel III and stress testing

Given the need to incorporate the Basel III framework into capital projections and stress testing, management should harness areas of potential alignment. The following table delineates our view of the key areas for leveraging processes for meeting both sets of regulatory requirements, by integrating frameworks and data elements to ease needed infrastructure enhancements.

¹¹ For an overview of the upcoming application of US Enhanced Prudential Standards to foreign banking organizations, see PwC's *Financial Services Regulatory Brief Foreign banks: Hope is not a strategy – Time to act* (July 2013).

¹² See PwC's *Financial Services Regulatory Brief, Nonbank SIFIs: FSOC proposes initial designations – more names to follow* (June 2013).

Areas for potential alignment		Basel III	Stress Tests	Opportunities for integration
Governance		Fed and management oversight of capital adequacy and risk appetite	Fed/management oversight and approval of capital planning process	Develop integrated governance framework
Analytics	Scenarios	Scenarios used for stressed VaR, stressed EPE, wrong-way risk, and operational risk	BHC-specific and supervisory scenarios	Develop consistent library of scenarios for trading exposure and operational risk
	PPNR	Not considered	Need to project revenue and expenses under stressed conditions	
	Retail & Commercial Credit	PD/LGD/EAD advanced credit risk models with Basel RWA formulas	PD/LGD/EAD based macro-economic loss estimation models	PD/LGD/EAD common data inputs to stress and RWA calculations
	Trading and Counterparty	Stressed VaR, IRC, Stressed EPE, CVA, and Securitizations	Market shock historical scenario that impacts trading P/L and CVA	Common scenarios/models for stress and RWA calculations
	Investments	Credit and equity RWA calculations	OTTI impairment stress analysis of AFS and HTM securities	Leverage common data fields
	Operational	Operational AMA models and risk management practices	Operational risk-based macro-economic loss estimation models	Leverage internal/external data and scenario analysis
Capital adequacy		Tier 1 Common, Tier 1, Total Capital, and leverage minimum ratios	Tier 1 Common post stress of 5% with Basel 3 forecasting add-on	Submissions require RWA Basel 3 forecasting
Reporting and Disclosures		Pillar 3 disclosure requirements for Basel 2, 2.5, and 3	Capital plan and FR-Y 14A, Q, and M data templates	Some common data elements
Data and IT Infrastructure		RWA and leverage calculations require on/off balance sheet data	Stress loss and financial forecasts require on/off balance sheet data	Common data sourcing, analytics, and reference data
Internal controls		Model risk controls, data controls, and internal audit	Model risk controls, data controls, and internal audit	Develop integrated internal control framework

Additional information

For additional information about PwC's Financial Services Regulatory Practice and how we can help you, please contact:

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