Remarks of Richard Berner, Director, Office of Financial Research,
at the conference on New Research and Outlook on Credit Markets
hosted by S&P Global Market Intelligence, New York University Salomon Center and Stern School of Business, and S&P Global Institute
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Good morning and thank you, Doug, for that introduction. I am honored to join you here today — it's always a pleasure for me to be back here at Stern. I thank Ed Altman for inviting me and the Stern School, the Salomon Center and S&P Global for sponsoring this important conference on credit.

It's also a pleasure to follow Rob Engle on the program this morning. Rob is a friend and an original member of the OFR's Financial Research Advisory Committee. While his service on the committee has ended, he continues to be an invaluable resource for consultation on threats to financial stability.

In keeping with the theme of this conference, I plan to talk primarily about credit risk. In previous jobs, when I discussed this topic, I would assess the risks in credit — and related opportunities — from the investor's point of view. Much of the discussion at this conference will center on such a perspective.

Today, as OFR Director, I have a different perspective — that is, how credit risk affects the stability of the financial system. I will discuss how we measure and monitor credit and other risks, examine the interplay between credit and other types of risk, and assess some of the tools policymakers might use to mitigate those risks.

I should state now that the views I express here are my own, and do not necessarily reflect those of the Treasury Department.

What is Financial Stability?

Financial stability is about resilience. It occurs when the financial system can provide its basic functions, even under stress. We want to be sure that when shocks hit, the financial system will continue to provide those basic functions to facilitate economic activity.

In the OFR's first annual report, we identified six such basic functions: (1) credit allocation and leverage, (2) maturity transformation, (3) risk transfer, (4) price discovery, (5) liquidity provision, and (6) facilitation of payments.

Threats to financial stability arise from vulnerabilities in the financial system — failures in these functions that are exposed by shocks. Resilience has two aspects:

1. Does the system have enough shock-absorbing capacity so it can still function?, and
2. Are incentives, such as market discipline or transparent pricing of risk, aligned to limit excessive risk taking?

Both aspects matter. Shock absorbers are needed to buffer hits, while what I call guard rails — or incentives that affect behavior — are needed to increase the cost of — and thereby constrain — the risk-taking that can create financial vulnerabilities.

Resilience, or conversely, threats to financial stability are systemwide concepts. To measure, assess, and monitor them, we must examine institutions and markets across the financial system to appreciate how threats propagate from one institution or market to others. And we need to evaluate ways to mitigate those risks.

The financial crisis exposed critical gaps in our analysis and understanding of the financial system, in the data used to measure and monitor financial activities, and in the policy tools available to mitigate potential threats to financial stability. These gaps — in analysis, data, and policy tools — contributed to the crisis and hampered efforts to contain it. Filling those gaps is crucial to assessing and monitoring threats, and to developing what we call the macroprudential toolkit to make the financial system resilient.

We at the OFR help promote financial stability by developing tools to assess and monitor threats to financial stability; by improving the scope, availability, and quality of financial data to measure threats; and by evaluating policies designed to mitigate risks.

In the years since the crisis, federal financial regulators have taken important steps to make the financial system more resilient. They have put in place banks' new capital requirements, and agreed on key components of liquidity regulation and minimum requirements for firms' holdings of liquid assets. In addition, stress testing and a new regime to resolve large, complex, and troubled financial institutions in an orderly way have dramatically changed the approach to increasing resilience. And they have improved the quality and scope of financial data – essential to making good policy decisions.

Can we now conclude that the financial system is sufficiently resilient to withstand shocks to institutions and capital markets?

Volatility, Leverage, and Credit Risk

Despite the progress, risks and vulnerabilities that are neither immediately evident nor easily monitored in institutions or markets — including credit markets — make me less than sanguine.

By and large, signals from financial markets today are relatively benign, despite rumblings related to macroeconomic risks. And periods of relatively low volatility, low credit spreads in cash markets, low credit default swap spreads, and low repo haircuts are all traditionally viewed as signs of low financial market risks.

For the OFR and others who monitor financial stability, however, these developments often signal rising market vulnerabilities, because they give investors and risk managers incentives and wherewithal to take on leverage.

Although analysts traditionally view such indicators as *exogenous* barometers of risk, they more likely are *endogenous* indicators of risk appetite and investor sentiment. They are co-dependent: The capacity of intermediaries to take on risk exposures depends on the volatility of asset returns. In turn, volatility depends on the ability of intermediaries to take on risky exposures.

You might say that anyone who has spent a week on a trading desk could have told you that. But recognition of that dynamic in either academic or policy analysis is recent. A recent paper by Danielsson, Shin, and Zigrand argues that leverage and volatility are endogenously co-determined, and that low volatility promotes increased leverage and risk.[1]

Similarly, former Federal Reserve Governor Jeremy Stein observed in 2013 that low volatility gives market participants incentives to write deep, out-of-the-money puts to enhance returns, and in ways that hide risk.[2] That's because one can, and I quote, "beat the benchmark simply by holding [it] and stealthily writing puts against it, since this put-writing both raises the mean and lowers the *measured* variance of the portfolio." By stealthily, Governor Stein meant that our measurement systems generally don't adequately capture the low-probability future risks that such strategies introduce.

This volatility paradox should change our thinking about early warning indicators, asset allocation, and our macroprudential toolkit. It should also change our thinking about risk management. As my former colleague Rick Bookstaber puts it, "[Treating such indicators as exogenous means that] higher leverage and risk taking in general will be apparently justified by the lower volatility of the market and by the greater ability to diversify as indicated by the lower correlations."[3]

The volatility paradox has important implications for our work. One key implication, stemming from the nature of optionality, is that the distribution of outcomes is asymmetric. The pricing of all securities with embedded options will be affected by volatility. That's a natural consequence of option pricing. The inherent asymmetry in options means that put writing, or selling insurance, when uncovered may have limited upside, but unlimited downside. As you all are aware, that's especially important for credit risks, as lending involves selling puts on the probability of default.

Measuring Risk: Improving the Quality, Scope, and Accessibility of Financial Data

This discussion of volatility, leverage, and credit risk is fine in theory, but how should we put it into practice? Measurement of leverage and risk on the balance sheet is tricky enough, but measuring off-the-balance-sheet leverage and risk is trickier still. Measurement must go back to basics.

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[1] Jon Danielsson, Hyun Song Shin and Jean-Pierre Zigrand, "Procyclical Leverage and Endogenous Risk," October 2012.

[2] "Overheating in Credit Markets: Origins, Measurement, and Policy Responses," at the "Restoring Household Financial Stability after the Great Recession: Why Household Balance Sheets Matter" research symposium sponsored by the Federal Reserve Bank of St. Louis, St. Louis, Missouri, February 7, 2013.

[3] "The Volatility Paradox," December 12, 2011.

Good policymaking and good risk management depend on good analysis and good data. Solid, reliable, granular, timely, and comprehensive data are the foundation for success in our work and for effective risk management in financial companies.

Three aspects of financial data are important. First, data must be high quality to underpin the integrity of our work. Second, they must be comprehensive for a broad view across the financial system, as well as granular to help us identify tail risks during periods of stress. Third, they must be accessible to those who need to look at risk systemwide.

To achieve our shared data goals, we must take an approach that is collaborative, cross-border, and global.

Tools to Monitor Risks

Consistent with our financial stability mandate, we at the OFR developed a tool for measuring and summarizing risks systemwide. Our Financial Stability Monitor depicts a framework with five categories of risk: macroeconomic, market, credit, funding and liquidity, and contagion. This risk-based approach aligns with the financial system's basic functions and enables us to look across the financial system rather than focusing piecemeal on institutions or market segments. The monitor enables us to track and measure risks in banks, shadow banks, other nonbanks, and markets. We update it and its supporting data semiannually on our website.

This monitor is part of a larger suite of OFR monitors and risk assessment tools we are creating for each of the five risk categories, including credit. Taken together, these tools help us examine the interplay among risks and analyze related developments across asset classes.

We supplement our financial stability analysis at the OFR with market intelligence. Last year, we launched a Financial Markets Monitor that summarizes major developments and emerging trends in global capital markets. Like many of you, we derive enormous benefit from our conversations with market participants.

In our judgment, overall threats to financial stability remain at a moderate level. Our Financial Stability Monitor shows that macroeconomic, market, funding, and credit and contagion risks are not excessive, though a number of risks within those categories have increased in the last six to twelve months.

Focus: Credit Risks Continue to Rise

Indicators of corporate credit risk in our monitoring tools have been flashing warning signs for some time. Exceptionally narrow corporate bond spreads for much of 2014 promoted increased risk-taking by investors and issuers. Corporate America broadly leveraged its capital structure by issuing debt to return cash to shareholders through dividends and share buybacks. Wider spreads have recently reduced those incentives and risks somewhat. Still, fueled by highly accommodative credit and underwriting standards, and a persistent reach for yield by investors, credit continues to grow at a rapid pace.

However, we see evidence that the credit cycle is turning. In 2016 so far, new speculative grade bond issuance has dropped 70 percent compared with 2015, along with an increase in "fallen angels." Lower-rated bonds and energy-specific debt issuances now have higher financing costs. Higher volatility and higher rates have slowed the issuance of BBB-rated debt to about half of last year's pace. At the same time, volumes have jumped for higher-quality credits rated single-A or better.

Clearly, some of the stress in credit markets resulted from the plunge in commodity prices over the past two years. Many small- and mid-sized firms borrowed heavily from 2009 to 2015 in the wake of the U.S. shale oil revolution. Commodity borrowers account for about 20 percent of high-yield debt. However, the issues in credit extend beyond stress in commodities.

The broader interplay of credit risks with other risks, such as macroeconomic risks, is also important. The combination of higher corporate leverage and the slowdown in global growth — especially in emerging markets — has produced a broad-based deceleration in the growth of revenue and earnings, and exposed the diminished capacity of corporations to service their debts at home and abroad.

But it's not just the quantity. The quality of new debt issued by companies has been weaker than in previous cycles. High-yield debt accounts for 24 percent of total corporate debt issued since 2008, compared with 14 percent during past cycles. Lending standards eroded during this cycle. Two-thirds of loans to companies have been covenant-lite (lacking strict legal covenants), compared with 33 percent during previous cycles.

In addition, debt cushions for covenant-lite loans are eroding, and bank debt-only structures are increasing significantly. As the credit cycle turns, these trends are likely to lead to lower recovery rates on defaulted credit instruments, especially unsecured debts.

For example, the latest data from Moody's show a trailing 12-month recovery of 24 cents on the dollar for unsecured bonds in the United States; that figure is below the crisis low of 28 cents. And Ed Altman's data indicate that for the three months ending in March, recovery rates were historically low at 13.9 percent — well below the historical average of 46 percent and the rate of 34 percent at the end of 2015.

Policy Tools

Although policy changes since the crisis have made the banking system stronger, vulnerabilities remain outside the banking perimeter. Analyzing and measuring these emerging vulnerabilities is essential to developing tools to address them. That becomes increasingly important as financial activity migrates to more opaque and potentially less resilient parts of the financial system.

To identify risks in nonbanks, we focus on activities that can cause vulnerabilities. Use of derivatives, secured funding, illiquid asset concentrations, counterparty credit concentrations, and obligations of membership in central counterparty — or CCP — clearinghouses may all contribute to the interconnectedness — and potential vulnerability — of these firms.

To monitor activity across the financial system, we need to continue to improve our toolkit to assess the fundamental sources of instability in the financial system; to become more forward-looking; and to test the resilience of the system to a wide range of events and incentives. In addition, we must continue to promote parallel improvements in financial risk management.

I think regular stress testing is one of the best tools for assessing potential sources of vulnerabilities and for calibrating microprudential requirements, such as for capital based on firms' idiosyncratic risks. Stress tests might also be used to calibrate macroprudential tools, including those aimed at building resilience across the system.

Although the OFR does not make policy, we are required by statute to evaluate stress tests and similar tools, to conduct policy studies, and to provide advice on the impact of policies related to financial stability. We are obtaining access to the data used to conduct stress tests and we are suggesting ways to improve both the tests and the data, including for nonbank institutions and systemwide risk assessment. For example, a recent OFR working paper found that the indirect effects transmitted through the financial system of a counterparty failure may exceed the direct impact. Key areas of our research include finding better ways to gauge risk propagation or contagion in stress testing.

Focus: Credit Risks in Banks and Nonbanks

Measuring and monitoring credit risks and exposures across the financial system is challenging, especially as financial activity continues to migrate away from banks. Bank regulators have comprehensive data on such exposures at the institutions they supervise. And aggregate, high-level, flow-of-funds data are available on how insurance, pensions, and mutual funds are exposed to possible risks of corporate default. But more granular data are needed for assessing who is exposed and by how much, especially here in the United States, where about two-thirds of credit extensions are intermediated outside banks and through the capital markets.

The long-term trend of credit intermediation away from banks can be a good thing because diversity in the financial system can increase resilience. However, if credit intermediation migrates to institutions that are less resilient and less transparent, the financial system may be more vulnerable to shocks. In addition, opaque institutions may be connected to banks in ways that are not immediately apparent.

Leveraged loans — defined by regulators as loans with six times leverage or more — are good examples of these connections and how they may impede tools to limit risk-taking. Researchers at the Federal Reserve Bank of New York recently examined how lenders responded to regulatory guidance to reduce leveraged lending. They found that large banks cut their leveraged lending. However, nonbank financial companies increased both their extensions of leveraged loans and their borrowing from banks, possibly to finance their leveraged lending activity.[4]

[4] Matthew Plosser and Joao Santos, "Did the Supervisory Guidance on Leveraged Lending Work? *Liberty Street Economics*, FRBNY, May 16, 2016.

Likewise, OFR staff members also observed that leveraged lending guidance provided an opportunity for nonbanks not subject to the guidance to expand their participation in the riskiest deals, particularly in the middle-market segment.

Nonbank leveraged lending has grown rapidly — particularly from managers of collateralized loan obligations, or CLOs; mutual funds; private equity funds; and hedge funds — while bank lending has been sluggish. Although we observed a pullback in CLO formation in 2015, data gaps here limit our ability to know who invested in CLOs, and who owns the risk. The stock of outstanding levered corporate credit, which includes high-yield debt, is material; we estimate this market to be approximately $2.5 trillion.

Credit risk is also mounting in commercial real estate at banks and nonbanks. There is evidence of overvaluation in some apartment markets in some major U.S. cities. Regulators have issued guidance to lenders to tighten loan terms to property developers and to banks in approaching commercial real estate lending. Weaker loan terms and covenants, rising vacancies, and overbuilding in some cities all contribute to those risks. Here too, activity is migrating away from the banking system as such guidance takes effect. That blunts the impact of the guidance as a policy tool.

How We Frame Our Work at the OFR

Last year, we developed an OFR-wide initiative that extends from our strategic planning process and identifies core areas of concentration, or programs, that align our priorities to our mission. This programmatic approach initially encompasses eight programs for coordinating our work on data, research, and analysis. We expect that number to increase over time.

Three of those initial eight programs relate to improving the quality, scope, and accessibility of financial data. We also have a program to enhance our suite of monitors to assess, measure, and monitor risks across the financial system, and another to evaluate and report on stress tests for banks, nonbanks, and the financial system.

It’s hard to believe that the OFR is coming up on its sixth birthday. Yes, time flies when you are working to promote financial stability. In that time, we have all made a lot of progress, but we still have a lot of work to do. As we pursue it, I welcome your ideas, your counsel, and your support.

Thank you again for your attention. I’ll be happy to answer your questions, and I look forward to the rest of the discussion.