Conference Proceedings

23rd Annual Hyman P. Minsky Conference on the State of the US and World Economies

Stabilizing Financial Systems for Growth and Full Employment

April 9–10, 2014
The National Press Club, Washington, D.C.

A conference organized by the Levy Economics Institute with support from the Ford Foundation

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These proceedings consist of edited transcripts of the speakers' remarks and summaries of session participants' presentations.

Foreword

I am delighted to welcome you to the 23rd Annual Hyman P. Minsky Conference, "Stabilizing Financial Systems for Growth and Full Employment," organized by the Levy Economics Institute with support from the Ford Foundation. As part of its monetary policy research, the Institute is partnering with the Ford Foundation to examine financial instability and the reregulation of financial institutions and markets within the context of Minsky's path-breaking work on financial crises.

Despite the appearance of greater stability in the US financial system since the 2008–09 global recession, the economic recovery remains fragile and uneven, and social conditions are expected to improve even more slowly. In Europe, the introduction of fiscal austerity to deal with the high government debt produced by crisis response measures has worsened the prospects for recovery in many countries—prospects that are unlikely to improve for years to come. Further, decoupling of the Asian and emerging-market economies has failed to materialize; these countries are also suffering from the sluggish recovery in the developed economies.

In this context of global uncertainty, with growth and employment well below normal levels, the 2014 Minsky Conference will address both financial reform and prosperity, drawing from Minsky's work on financial instability and his proposal for achieving full employment. Panels will focus on the design of a new, more robust, and stable financial architecture; fiscal austerity and the sustainability of the US and European economic recovery; central bank independence and financial reform; the larger implications of the eurozone debt crisis for the global economic system; the impact of the return to more traditional US monetary policy on emerging markets and developing economies; improving governance of the social safety net; the institutional shape of the future financial system; strategies for promoting an inclusive economy and more equitable income distribution; and regulatory challenges for emerging-market economies.

I look forward to seeing you again at future Levy Institute events.

Dimitri B. Papadimitriou
President, Levy Economics Institute, and *Jerome Levy Professor of Economics*, Bard College

Program

Wednesday, April 9

8:30–8:45 a.m.	**WELCOME AND INTRODUCTION** Dimitri B. Papadimitriou, President, Levy Institute
8:45–9:45 a.m.	**SPEAKER** Carolyn B. Maloney, US Representative (D-NY, 12) "A Prospective from Capitol Hill"
9:45–11:45 a.m.	**SESSION 1** **Financial Reregulation to Support Growth and Employment** *Moderator:* Deborah Solomon, News Editor, *The Wall Street Journal* Alex J. Pollock, Resident Fellow, American Enterprise Institute Andrew Sheng, President, Fung Global Institute Mercedes Marcó del Pont, formerly, President, Central Bank of Argentina Michael Greenberger, Professor, School of Law, and Director, Center for Health and Homeland Security, The University of Maryland
11:45 a.m. – 1:30 p.m.	**SPEAKER** Sherrod Brown, US Senator (D-OH)
1:30–2:45 p.m.	**SESSION 2** **Financial Regulation and Economic Stability: Was Dodd-Frank Enough, or Too Much?** *Moderator:* Binyamin Appelbaum, Business and Economics Reporter, *The New York Times* Anat Admati, Professor of Finance and Economics, Stanford University Jan Kregel, Senior Scholar, Levy Institute, and Professor, Tallinn University of Technology
3:15–4:15 p.m.	**SPEAKER** Charles L. Evans, President and Chief Executive Officer, Federal Reserve Bank of Chicago "Fed Communications and Goal-oriented Monetary Policy"

4:15–6:00 p.m.

SESSION 3

The Global Growth and Employment Outlook: Cloudy with a Risk of . . . ?

Moderator: James Politi, US Economics and Trade Correspondent, *Financial Times*

Bruce Kasman, Chief Economist and Managing Director of Global Research, J. P. Morgan

Willem H. Buiter, Global Chief Economist, Citi

Frank Veneroso, President, Veneroso Associates, LLC

7:00 p.m.

SPEAKER

Daniel K. Tarullo, Member, Board of Governors of the Federal Reserve System

Thursday, April 10

9:00–10:00 a.m.

SPEAKER

Peter Praet, Executive Board Member, European Central Bank

"The Financial Cycle and Real Convergence in the Euro Area"

10:00 a.m. – 12:00 p.m.

SESSION 4

The Euro and European Growth and Employment Prospects

Moderator: Tom Redburn, Economics Editor, *The New York Times*

Heiner Flassbeck, Director, Flassbeck-Economics; formerly, Director, Division on Globalization and Development Strategies, United Nations Conference on Trade and Development (UNCTAD)

Denis MacShane, European Policy Counsel; former UK Minister for Europe

Dimitri B. Papadimitriou, President, Levy Institute

12:00–2:00 p.m.

SPEAKER

Jason Furman, Chairman, Council of Economic Advisers, Executive Office of the President

"Is the Great Moderation Coming Back?"

2:00–3:00 p.m.

SPEAKER

Vítor Constâncio, Vice President, European Central Bank

"Growing Out of the Crisis: Is Fixing Finance Enough?"

3:15–5:00 p.m.

SESSION 5

What Are the Monetary Constraints to Sustainable Recovery of Employment?

Moderator: Jon E. Hilsenrath, Chief Economics Correspondent, *The Wall Street Journal*

Robert Barbera, Co-director, Center for Financial Economics, The Johns Hopkins University

Frank N. Newman, Chairman, Promontory Financial Group China; formerly, Deputy Secretary, US Department of the Treasury

L. Randall Wray, Senior Scholar, Levy Institute, and Professor, University of Missouri–Kansas City

Welcome and Introduction

DIMITRI B. PAPADIMITRIOU
President, Levy Institute

Let me welcome you to the Levy Economics Institute's 23rd Annual Hyman P. Minsky Conference. The theme of this conference is stabilizing financial systems for growth and full employment.

First and foremost, of course, I want to thank the Ford Foundation and especially Leonardo Burlamaqui, who have supported us over the years and continue to support us, especially in the Institute's program on reregulating the financial structure.

My sincere thanks also go to my partner in crime, who has been co-organizing this conference: Jan Kregel. He is a senior scholar at the Levy Institute and a long-time friend, and he directs the Institute's research program on monetary policy and financial structure, which he inherited from Hyman Minsky in 1996.

Every year we find that many more colleagues in the academy, the financial community, and the policymaking arena recognize Minsky's prescient contributions to economics that help us understand the workings of a sophisticated and finance-guided economy like our own.

This year we're holding the conference in Washington to make sure that Minsky's insights on the financial structure and its relationship to the real economy become better known to the policymaking constituency.

The Levy Institute continues to sharpen its focus on strategic issues of economic policy relating to achieving financial stability, long-term growth, and high employment in a period of low inflation and, unfortunately, high unemployment, inequality, and decreasing public spending on basic research, research and development, education, and physical infrastructure. We continue our research, writings, and international activities on current monetary and fiscal policies in the US, Europe, and the rest of the world; the systemic risks and lack of significant progress in reforming the financial services sector; and the structure and organization of regulation in concert with the advances of financial innovation.

The Levy–Ford Foundation project on reregulating financial markets and institutions offers policy proposals for reforming the financial structure that draw from Minsky's research and writings. Some of our publications are outside by the table. We invite you to take a look at them.

It has been almost four years since the Dodd-Frank Wall Street Reform Act was passed, with the struggle over its shape still ongoing. To our minds, Dodd-Frank was based on the idea that financial markets are normally stable, with the exceptional alarming event. The New Deal's

Glass-Steagall Act and the Clinton-era Gramm-Leach-Bliley Financial Services Modernization Act shared these assumptions. All these legislative corrections were conceived as system-wide overhauls. Dodd-Frank in reality was designed only to remedy random ad hoc crises, like the 2008 financial meltdown, that we have come to know as a "Minsky moment."

Ironically, Hyman Minsky actually believed that these moments were anything but random or ad hoc. The increasingly risky practices that fueled danger and instability in our economic system are still happening and being rewarded, and if allowed to continue will ultimately lead us to yet another financial crisis. Each new threat to stability is destined to be different than the last. Dodd-Frank aims at identifying the most vulnerable institutions and practices. This approach is too brittle to contain the disastrous effects of risks that are always morphing. Even constructive aspects of the Act can have perverse consequences, unless the rules are subject to sophisticated and ongoing reexamination as the world of finance develops.

Banks carry an urge to evolve in a way that maximizes revenue. We are frequently witnessing how quickly markets create newer, riskier, and more profitable instruments. It is the very nature of modern finance to transform its structure in response to the prevailing regulation, and to evade it successfully. Under Dodd-Frank, banks continue to function more or less as they did in the past. Their enormous size and multifunction operations are subject only to trivial changes. The Act's most significant measure has been diluted, and many of its other regulations are tied up in delays. Instead of fundamental changes that would cushion our fragile system from shocks, Dodd-Frank's centerpiece places a limit on the use of public funds to rescue failing banks. To be sure, it is an understandable response to the megacost of TARP, which recapitalized insolvent financial institutions because they were interconnected, while allowing failing and also interconnected households to fall into foreclosure. But limiting taxpayer exposure to the next bank breakdown is not the same as preventing a system-wide collapse from happening again.

Glass-Steagall contained features worth preserving, but reviving an outdated, unfeasible law will not help. Neither will blaming Gramm-Leach-Bliley, which, profound as it was, merely reflected the new status quo of its day: it institutionalized the changes that had already emerged in the markets. We need banks that can earn competitive rates of return while they focus, not on big risks, but on financing capital development. We need reforms that limit "profiting without producing," and instead promote enterprise and industry over speculation. They will have to be as innovative, flexible, and opportunistic as the markets they aim to improve.

Minsky proposed that the place to start would be for regulators to begin by breaking banks down into smaller units. Moreover, Minsky suggested different approaches to the supervision and examination of banks. And as Jan Kregel will detail in his contribution, Minsky articulated a framework of dynamic macroprudential regulation. A bank holding company structure with numerous types of subsidiaries, each one subject to strict limitations on the type of permitted activities, would be a valuable deterrent to risky behavior. Restrictions on size and function would allow a reasonable chance at understanding esoteric subsidiaries and an opportunity to react quickly to mutations.

These reforms are absolutely necessary, because, as Minsky long argued, there is a complementarity between financial stability and economic growth and employment. He extended his work on financial fragility to include the exploration of policies that ensure full employment by shifting the

emphasis from capital intensive investment growth to investment in jobs as a means of ensuring both stability *and* consumption, which we know is the most important contributor to GDP growth, and an equitable income distribution.

While private sector investment is crucial, government policy has little influence in stabilizing it. Stability of consumption, however, can be influenced by government policy that targets full employment; and Minsky proposed an employment policy that could ensure a level of full employment and thus stabilize consumption. Minsky argued that a direct, federally funded employment guarantee program, one providing a job opportunity to any individual willing and able to work, would act as an automatic economic stabilizer, enabling households to meet their financial commitments and substantially reduce the impact of financial shocks.

The purpose of this year's conference is to explore these issues and the linkages further. You may have undoubtedly noticed outside that there is a new publication by Minsky. . . . It includes Minsky's previously published and unpublished papers on the subject of full employment. We invite your close scrutiny of this work as well as our other published policy proposals, and we welcome your comments.

Thank you very much for coming. Enjoy the conference.

Speakers

CAROLYN B. MALONEY

US Representative (D-NY, 12)

A Prospective from Capitol Hill

Thank you so much for inviting me to join you today. And thank you very much, Dimitri Papadimitriou, for all the great work that you do. The Levy Institute is truly one of New York's great intellectual engines, and the topic that you've chosen for today's conference, "Stabilizing Financial Systems for Growth and Full Employment," is very timely.

The great debate over our financial system that followed the financial collapse in 2008 continues to rage here in Washington. In fact, we had a hearing on it yesterday and the day before, so it continues. In fact, later today, the House of Representatives will be voting on the Republican budget for the fiscal year 2015 written by Budget Committee chairman and former vice presidential candidate Paul Ryan.

This budget, known as the Ryan budget, touches every part of our federal government—investments in education, research, infrastructure, defense, you name it, including financial regulation. Financial regulation is included in this budget. More than almost anything else, this budget perfectly shows the stark differences between the two parties, especially in how they have evolved on financial issues.

The main change that the Ryan budget calls for in financial regulation is the repeal of Title 2 in Dodd-Frank. Dodd-Frank, as you know, is the Wall Street reform legislation Congress passed in 2010 to strengthen our financial system and help prevent another collapse. Title 2 is a central part of that reform, because that is where we established the Orderly Liquidation Authority, which gives the FDIC the authority to wind down large bank holding companies without damaging the broader markets. Remember that in 2008, when companies like Bear Stearns, Lehman Brothers, and AIG were on the verge of failing, regulators did not have the authority to deal with these companies the way the FDIC has long dealt with failed commercial banks, because the FDIC resolution powers only extended to commercial banks. But investment banks, insurance companies, or bank holding companies—Bear Stearns and Lehman were investment banks and AIG was an insurance company, so the FDIC's well-established resolution powers unfortunately did not apply to any of them. This forced regulators to choose between a chaotic bankruptcy, which happened with Lehman, or a bailout, which happened with Bear Stearns and AIG. Neither was a good solution.

I was at a conference at Princeton [in September 2008], and at the beginning of the conference I had something like 10 investment banks in my district. At the end of the weekend, there

wasn't one left standing. It was an incredible shock. Christina Romer [then chair of the Council of Economic Advisers] testified before the Joint Economic Committee that the financial crisis of 2008 was five times stronger than the shocks in the Great Depression.

After the AIG bailout, and to show how out of control it was—that no one understood what was happening—AIG appeared before our committee, the Financial Services Committee, and first testified that there was no need for a bailout. Then they came back and they needed $50 million. Then they came back and they needed $85 million. It ended up being roughly a $189 million bailout, but the fact that they had no understanding of what the financial crisis was shows what a mess our financial systems were really in. Afterward, when we did bail out AIG, they then turned around and hired the man who created the crisis out of the bank in London that was their risky products division. AIG's insurance area had no problem whatsoever, but it was only in the risky investment banking area. They had to hire him to unwind it, because no one else understood it—so, clearly, a system that needed some change.

After the AIG bailout, the chairman of the Federal Reserve, Ben Bernanke, and Treasury Secretary Hank Paulson came to Congress and asked for a $700 billion bailout for the entire banking industry. Facing an imminent and devastating collapse of the entire financial system, Congress passed the $700 billion bailout known as TARP, eventually. This was a very chaotic period. We at one point could not get the votes. The Democratic Party gave the votes to a Republican president. I consider it one of the most important votes that I ever cast and the most unpopular vote that I ever cast. The choice was, are you going to help stabilize the financial markets, or let them collapse? To this day, it continues to be a controversial vote.

Whatever the cause of the financial crisis, I can assure you that Congress did not want to be put in the position of voting on an immensely unpopular $700 billion bailout for Wall Street ever again. Title 2 of Dodd-Frank was Congress's response. The Orderly Liquidation Authority essentially extends the FDIC's longstanding resolution powers to large nonbank financial companies such as bank holding companies, major insurers like AIG and Prudential, and large broker-dealers such as Bear Stearns and Lehman, if they were still around. The idea of a new FDIC resolution authority for large financial institutions was popular at that time among both Republicans and Democrats. Senator Bob Corker, who is hardly a bleeding-heart liberal, worked very hard on Title 2 during the Dodd-Frank debate precisely because he believed so strongly in it. Two of the biggest proponents of Title 2 were then–FDIC Chairwoman Sheila Bair and then-Treasury Secretary Hank Paulson, both Republicans—and, not to mention, two people who, I might add, didn't always see eye to eye on these kinds of issues. So it's surprising, and I would say disappointing, that the Republican Party has turned so heavily against Title 2, which represents our best chance of avoiding another TARP-style bailout.

In discussing Title 2, the Ryan budget calls for, and I quote, "ending this regime, now enshrined into law, which paves the way for future bailouts." How exactly does Title 2's Orderly Liquidation Authority pave the way for future bailouts? According to the Republicans on the Financial Services Committee on which I serve, it's because Title 2 "grants the FDIC the authority to borrow from the Treasury in resolving a failed financial institution."

Now, back in 2009, when the Financial Services Committee was crafting Dodd-Frank, the Republicans were singing a different tune. The Democrats on the committee, myself included,

wanted to avoid the need for the FDIC to borrow from Treasury by creating an up-front resolution fund paid for through assessments on our largest banks, which would have been roughly $150 billion. We thought that that was the best way to avoid using taxpayer funds to resolve a large financial institution, because the FDIC would have access to $150 billion to use for what the bankruptcy called debtor-in-possession financing; that is, financing to keep the bankrupt company open during the wind-down. This financing is critical because it ensures that the wind-down of a company can take place in an orderly fashion that does not inject major damage on the broader financial markets.

When we proposed this commonsense solution, the Republicans on the committee immediately denounced it as a "permanent bailout fund." Given the fierce opposition to anything that was labeled a "bailout" back in 2009 and '10, the Republicans ultimately and unfortunately succeeded in stripping out their "permanent bailout fund." But the FDIC was still in charge of winding down large financial institutions, which meant that it still had to get "debtor-in-possession" financing from somewhere. Without an industry-financed resolution fund to tap, of course, the only other guaranteed source of financing in a crisis was—you guessed it—the Treasury Department. So that's what we did. We gave the FDIC the authority to borrow from Treasury to fund a resolution fund.

One way or another, however, we were determined to make the industry, and not taxpayers, pay for this; so we required the FDIC to recoup any and all money that it borrows from Treasury from the industry through after-the-fact assessments. It wasn't a perfect solution by any means, but it did at least ensure that in the long run the taxpayers would always be made whole, and large banks would have to pay the entire cost of the resolution authority. It was, sadly, all the taxpayer protection that the Republicans would allow us to provide. So the fact that House Republicans are saying that Title 2 "paves the way for future bailouts" because it allows the FDIC to borrow from Treasury is especially ironic given that it was the Republicans who forced us to abandon the only thing that would have avoided the need for the FDIC to borrow from Treasury in the first place: the up-front industry-financed resolution fund.

Unfortunately, this represents the worst of what has become known as "bailout politics." This is the swift knife of political attacks. It's a brutally effective, endlessly versatile attack that can be used in practically any context. If you oppose a government program, any government program, really the best way to kill it is to label it "a bailout." It's the final triumph of an attack ad over rational policy, and it has stifled the debate over practically all meaningful financial reforms.

The reason that I'm highlighting this issue today is because the topic of this conference is stabilizing financial systems, and in my opinion repealing Title 2 of Dodd-Frank is *the* most destabilizing thing that Congress could do to the financial markets. And secondly, I'm financing it because it is a prime target of the Republican Party. It's even included in the budget bill we'll be voting on today, and has been the subject, I would say, of at least 10 hearings before the Financial Services Committee—or many, many hearings; I shouldn't put a number on it.

Some people might say that the Ryan budget is just a partisan document, and we shouldn't worry about any efforts to repeal Title 2. But just remember that the Ryan budget essentially sets out the Republican Party's platform on the entire range of issues, and repealing Title 2 is one of the only financial reforms that the Ryan budget calls for. So if the Republicans win the Senate this year, and then win the presidency in 2016, this might be one of the very first financial issues that

they take up. And this scares me, quite frankly, and I believe it should scare anyone who cares about financial stability.

The other main financial reform issue that the Ryan budget addresses is housing finance reform. Nowhere has the debate been stifled by "bailout politics" more than housing finance reform, unfortunately. In testimony before the Joint Economic Committee and the Financial Services Committee many economists rate housing as 20–25 percent of our economy, with the related industries and supportive businesses that support it. So until we get the GSE [government-sponsored enterprise] problem resolved so that there is stability, or investors know the future, I feel this is going to hold back investment. Housing has been one of the slowest areas to return, and it's one of the things that I believe is keeping our financial recovery from going forward.

Not surprisingly, the Ryan budget calls for "putting an end to taxpayer bailouts and housing finance," a typically subtle and nuanced position. In GSE reform, however, the Republicans' desire to use bailout politics has led them to endorse a proposal known as the PATH Act, which completely privatizes the secondary market for mortgages, removing the government guarantee that experts on both sides of the aisle agree is necessary. I do not know of any stakeholder in the industry or otherwise that supports the PATH Act. Without a government guarantee, middle-class families would no longer have access to the 30-year fixed-rate mortgage, which has long been the cornerstone of the US mortgage market—and I would say it's the cornerstone of the American Dream for American families to own their own home, and to make that affordable.

But the government guarantee is important more than for just the single-family housing market; it is equally important for the multifamily housing market as well. Without a government backstop, rents for middle- and lower-income families would skyrocket, reducing the amount of disposable income that they otherwise would spend productively and ultimately "harm our economic growth."

The reason that I chose to focus on multifamily housing and GSE reform is that in my district in New York City multifamily housing is *our* single-family housing. Multifamily housing is also the missing piece of the puzzle in GSE reform. Corker-Warner [the housing finance reform bill] and the PATH Act ignored it entirely, even though one-third of all Americans live in rental homes. That's why I'm focusing on it, to make sure that multifamily housing is not neglected or harmed in this process.

Fannie and Freddie's multifamily businesses were not the source of the problem. In fact, they propped up the single-family businesses during the crisis. The multifamily businesses didn't suffer any losses during the crisis, which allowed them to play a critical countercyclical role. They stepped in to provide liquidity just as private investors were fleeing. Most important, the multifamily businesses already require the private sector to take substantial losses before the taxpayer, which is exactly what we're trying to get the single-family businesses to do in GSE reform. Recognizing this, I believe that the successful formula for multifamily housing finance reform must first maintain an explicit government guarantee, while also ensuring that taxpayers are protected by preserving and building on the GSEs' successful risk-sharing programs with the private sector, thereby ensuring that the multifamily market continues to function in downturns.

With over 17 million households living in multifamily housing, it's important that we get this right. As someone who served on the Financial Services Committee and who represents the capital

of US financial markets, I know and I've seen how essential functioning and stable financial systems are to our economy. That's why I'm so passionate about ensuring that Congress doesn't roll back the essential reforms we passed just a few years ago, and it's why I'm knee-deep in the debate on housing finance reform, to make sure we don't pull the rug out from under homeowners and needlessly set back an enormous sector of our economy.

As I said at the beginning, the debate in Washington, D.C., on the future of our financial systems is raging, and it's not going to go away anytime soon. That's why these conferences are so important, and it's why the work that you are all doing is important. We rely on your analysis and assessments, and we take your opinions seriously. In fact, I see several people who have testified before the Financial Services Committee here today. So I look forward to having a chance to work with some of you as Congress moves forward with these debates, and thank you so much for inviting me to speak.

SHERROD BROWN

US Senator (D-OH)

It is a pleasure to be here, and thank you for what the Levy Institute does. The impact you make—starting with the speaker, I believe, at the lunch last year, when Mary Miller was here and sort of set off a whole new round of debate on too-big-to-fail—speaks to the stature of this organization and this meeting you do, and to both the stature and the activism of all of you individually. . . .

Because many of you are academicians, you have spent a lot of time thinking about the interaction of the private sector with regulators and with government, and what that means. The intellectual founder of this group, as you know, believed there was an ongoing role of government, because, as Dr. [Anat] Admati certainly knows so well, in a free society, in a capitalist society that has created great wealth and dynamism for our country and for many countries around the world, there's always risk built in, and the bias may be toward more risk; therefore, the role of government.

I would start with this: that from Dimitri's introduction talking about the round tables I do, I gather from around my state—I've done this for the seven-and-a-half, whatever, years [I've been] in the Senate—I gather 12 or 15 people in community after community—sometimes they're all veterans, and other times they're all farmers, sometimes there's a cross-section of people, sometimes they're all bankers—and I ask them questions for an hour and a half. It's where I learn. I think back [to] what Lincoln said—Lincoln apparently, according to Doris Kearns Goodwin, said this a number of times. He had a pretty great responsibility, obviously. His staff wanted him to stay in the White House, and win the war, and free the slaves, and preserve the Union. Lincoln said, of course, but I need to go out and get my public opinion bath. And he used to get his public opinion bath regularly. If I were to criticize my institution, the United States Senate—my wife, who is a Pulitzer Prize–winning writer, is writing her first novel, and her editor at Random House said, "No whining on the yacht," so I'm not going to complain about the Senate in that way—but if I were to criticize the Senate [it would be] in terms of that: we don't get out and get our public opinion baths enough. A more modern version of that is Francis I, our still relatively new pope, [who] exhorted his parish priests to go out and smell like the flock. Obviously, most of you, I assume, have read the Old Testament, the New Testament, and know all the sheep and shepherd allegories and metaphors; and what the pope said about going out and smelling like the flock is important for activists and important, I think, for United States senators, too.

Let me talk about a number of things. . . . I know you've heard from really smart, interesting people this morning, and will hear from more this afternoon. When Mary Miller, the Treasury

under-secretary, came in and spoke to you a year ago, she said that Dodd-Frank worked. I would say that Dodd-Frank is working. I would say that things like the Volcker rule are not yet—many things from Dodd-Frank aren't complete, in part because of bank lobbying. They lobby, they slow it down, and then it gets more complicated, the rules get longer, and then they say, "These rules are so complicated; when are you going to finish them?" Put that aside, but Mary Miller basically said, "Dodd-Frank's worked and solved the problem of too-big-to-fail." The secretary of the Treasury made a statement: . . . about a year ago he said, if we don't fix too-big-to-fail by the end of the year, then we have a serious problem. He said it was fixed by the end of the year, probably because he had sort of begged the question.

But in the end it doesn't matter what I think. Frankly, no offense to any of you, as erudite as so many of you are and as accomplished in these issues, it really doesn't matter what you think. It matters what the market thinks about too-big-to-fail, and all you need to do is look at a number of studies. The IMF [International Monetary Fund] just came out with a study that said that the largest six banks get about $70 billion in subsidies—if you will, advantages on the capital market, when they can borrow money at a less expensive rate than Third Federal and Cleveland, Ohio, can borrow it, or big regional banks can borrow it, or any company or anybody can borrow it. So we also know Bloomberg a couple of years ago said that the subsidies were over $80 billion. We've asked for reports from the General Accounting Office and seen the same kind of advantage on the capital markets. That says to me that the problems still exist. I think we're in a better situation than we were five years ago. But because of that natural tension—look, Wall Street behavior typically is to engage in risk. You make more money when you engage in risk. We've got to make sure people aren't betting other people's money as they play the market risk, if you will.

Let me back up and tell a little story: I was in Zanesville, Ohio, in September 2008. There was a presidential election going on, as you know, between Senators Obama and McCain. I got a call from the majority leader's office. I was a member of the Banking Committee—of what, when I got on the committee, in 2007, was deemed the "sleepy Senate Banking Committee." It's called a lot of things now, but that's not one of them. And, I remember, I got a call from the majority leader's office. He said that Secretary Paulson, President Bush's secretary of the Treasury, and Chairman Bernanke of the Fed wanted to talk to the members of the Banking Committee in a conference call. He said, "Be ready at 2:00." I remember calling at 2:00 and hearing about [the banking crisis]. My wife said, when I got home I looked as ashen as she remembers me looking anytime during our 10-year marriage because of what Paulson and Bernanke said on that September day. . . . Bernanke laid out the issues that were imminent and beginning to happen. Paulson said, "We need $700 billion. I have a three-page bill that we want you to pass by the beginning of next week."

Senators don't necessarily respond to threats quite like that—three-page bill, no strings attached, any of that. We moved quickly, more quickly than people expected, perhaps not too quickly, but perhaps without some of the strings attached that would have meant more of that money trickled down, if you will, to local lenders that could have put money into the economy in a better way. It's too late now. We can look at that, but we can't do much about that now.

When I'm faced with difficult votes, as the TARP vote was, difficult politically—put that aside, because the best political vote was a no vote, I knew that—but substantively difficult votes, I will often, just for my own use (I don't even show it to people), I'll write a list: reason to vote for it,

reason to vote against it. I remember at the top of this list I just wrote: "Best vote I'll ever cast. Worst vote I'll ever cast." And it was the most necessary vote I've ever cast. This all came as a result, as Dr. Admati will attest, as she's written about and talked about it, [of the] decade of deregulation of the financial industry [that preceded it], clearly; and the CEO of one of the biggest megabanks [Citigroup's Charles Prince] said, "As long as the music is playing, you've got to get up and dance." That's what was happening on Wall Street in leading up to that. And here's why, in part.

There are 3,000 lobbyists representing financial services. That's six for every member of Congress—six for every member of the House and Senate. When the bill was signed—this tells you all in a sense—when Dodd-Frank was signed later by President Obama (I was going to say TARP by Bush), . . . one of the major financial service lobbyists said, "Now it's half-time. The bill's done. Now it's our turn to start helping to write the regulations." And then listen to this number: 18 years ago, the six largest banks in this country, their combined assets were about 18 percent of GDP. So roughly 20 years ago, the six largest banks' combined assets [equaled] 18 percent of GDP. The combined assets of the six largest banks today? Sixty-three percent of GDP. So it's a duty for Congress, when we're looking at GSE reform, at what we do with Fannie and Freddie, what we do with the secondary markets, what we do in housing—it's always our duty to think, first of all, what is it that we're doing? Is it an improvement on the status quo a year out? Five years out? But the other thing, when it's banking issues, we should also be thinking, is this going to accelerate, or contribute to or add to the consolidation of financial services in fewer and fewer hands?

We've always been a country that's looked askance, not at people's ability to make money—we were a great country in terms of wanting people to be able to achieve and get rich. It's the American Dream—but not for people to corner markets and not for people to concentrate wealth. And that's sort of what we move to if we're not careful in all of this. It's not just financial; it's not just the economic power that these six institutions have because of their size and because they get that $80 billion subsidy, or that $70 billion [according to the] IMF—whatever the numbers are. They get tens of billions of dollars in subsidy because of their size, because they're too big to fail, according to the markets. It's not just their economic power; it's their political power. Again: 3,000 lobbyists. They don't all work for the big six but a lot of them do, and they're very influential—far too influential on the Banking Committee and the Finance Committee in the Senate, on the Financial Services Committee in the House, on the Ways and Means Committee in the House.

And it's not just this financial industry, these six large banks—and I'm not just exactly picking on them, but in many ways they're too big to understand, they're too big to regulate, and they're frankly, as we've seen, too big to manage. No human being, as much as we laud some of the most brilliant banking executives in the country, is able quite to understand what the reach of these really large institutions is and how to run them and how to make sure they comply with rules and laws.

I had breakfast with Tom Curry, the comptroller of the currency, a couple of weeks ago, and he talked about how important it is in every one of these institutions to change the culture so there's not just a compliance officer to make sure they're following the rules that we [set] as government and as people who care about government in this country; but they also have someone, a top executive, in terms of risk management. He pointed out that the culture in these banks typically is that the risk manager is a lower-level person who perhaps doesn't have the stature. It's a little bit like, when I do a round table, if I go to almost any company, even in the year 2014, I'll sit around the table

with 10 people, the managers, and often there's only one woman, and she's almost always . . . in HR, and she's never nearly the highest-paid person. Because she didn't bring in revenue: HR didn't bring in revenue. Neither does the compliance officer. Neither does the risk management person. So until the banks understand that you want as your risk manager—and I was at Standard & Poor's in New York this past week just talking to their management team, and their CEO understood that. He actually has put, he says—and I don't know this person—someone who's very well paid as their top risk manager, who has the stature, has been in sales, has been in other revenue-producing parts of the business that is now doing risk management. But as long as they're not as well paid, they don't have the stature, they're not really at the table as much as the sales person and the finance person, and the others at some of these institutions. That's part of what the comptroller of the currency is trying to do in [terms of] changing the culture, which is so important as risk—the risk taking at these large institutions—becomes what it is.

Michael Lewis always makes news, from his baseball books to his Wall Street books. Some of you saw him on *60 Minutes* with his discussion about exposing abuse of high-speed trading practices. He said the ultimate goal should be to create institutions so dull, so easy to understand, that when a young man who works for them walks into a publisher's office and offers to write up his experience, the publisher looks blankly at him and asks, "Why would anybody want to read that?"

I mentioned Third Federal in Cleveland. My wife and I just moved into the City of Cleveland. We live in the zip code that for, I believe, three years running had the highest foreclosure rates in the United States. There's one bank that's really kind of saved that part of the community, Third Federal, which I mentioned. The CEO of Third Federal, from an old Polish family that's kind of handed this bank down for soon to be the third generation, an $11 billion bank, said to me one day, "Banking should be boring." He's stayed in business in a really troubled, difficult time, in an area of a city that's been really hit hard by foreclosures, and he's done it because he sees banking as boring. It's not boring to study it, but boring perhaps to do this.

A couple of things we're doing: one, the Brown-Vitter bill. David Vitter—who is as different politically from me as, I don't know, anybody in the Senate perhaps—[and I] have come together on Brown-Vitter to address too-big-to-fail. Bipartisan ensures the biggest banks have enough shareholder equity to back up sometimes-risky practices so taxpayers don't need to. The bill did not pass. The bill never got out of committee. But like much in the Senate, because we introduced it, because we talk about it, because people write about it, because people debate it, and the swirl of information around it, we see—I'm not taking credit for this, but it's a contribution to it—the OCC [Office of the Comptroller of the Currency], the Fed, and FDIC [have] come forward with higher capital standards.

We also did a hearing not too long ago. About a year ago, there was an article in *The New York Times* that you may have seen about the Detroit warehousing—the warehousing in Detroit of aluminum, and that was controlled by a large Wall Street firm. We did hearings on the largest banks being in a commodities market, and should a large institution, a financial institution, be . . . in the electricity market? Should they own an oil tanker? Should they buy and sell metals? We know three things can happen. We know that in the case of metals, Coca-Cola and one of the big breweries said that it added to the price of aluminum that people pay because the institutions ran it with a competitive advantage. Second, it can bring risk to the financial system if a big financial

system has an oil tanker and there's a huge oil disaster off the coast of a very expensive place like Santa Barbara. What would that do to that bank's financial stability, and would that have an effect on the financial market?

And third, they always say there's a wall between traders and the commodities section of a part of a bank, but that wall only goes so high, because at some point some executive can see both sides of the wall and there's potential conflict. I'm not accusing them of doing any of this, but there are potential conflicts of interest when the trading desk can get information that other traders that they're trading with can't get. They get information that other traders can't get.

So those are all reasons that we should be debating whether or not these firms are in the commodities business. We have seen at least one firm exiting the commodities business. . . . There were federal rules banning them from being in the business until 15 years ago, and now those federal rules—we're thinking about what we do about this, what kind of role they have in commodities.

My state's a manufacturing state. We make everything. Ohio's the third-largest manufacturing state in the country. Only California, three times our population, and Texas, twice our population, make more than we do, so this really matters to my state. A top administration official in this administration with whom I'm in agreement most of the time, but not always, . . . when I said we should pay more attention to manufacturing, this high-ranking official—whose name you know, whom I will not mention—he said, "Sherrod, you can't pick winners and losers. You can't pick manufacturing over financial services or whatever." And I said our government's had a bias in both parties toward financial services. That's why, what, 30 years ago—these numbers are not precise, so I'll be general—30 years ago, . . . manufacturing was something like 25 percent of our GDP; today, it's about 10 or 11 percent, and financial services has sort of much gone the other way. That doesn't matter, maybe, to people like us, but it really matters if you're a working class kid and manufacturers in your community really give you a ticket to the middle class that you might not have otherwise. You've gone to a tech school. You don't want to get a PhD. You don't even want to get a master's degree; you may not even want a BA or BS. But you have a skill and a trade, and you're very good at what you do, but you can't get a job worth more than $12 or $13 an hour. . . .

Let me close with this: I want to make one callout to Dr. Admati. I'm not sure we would have had our Brown-Vitter bill without her input. As soon as [Senator Phil] Gramm walked in and talked about banking stuff, Dr. Amati jumped up and they went back in the corner and started talking about stuff that people like them talk about anyway. But I appreciate so much of what you did that way. She just challenged the misleading arguments that we hear all the time in this town, all the time in some newspapers, and it really did matter.

So let me tell you a story, and I'll close with this. Two decades ago—you all remember Barings [Bank]. Remember the Singapore trader, whose name I don't recall . . . it doesn't really matter. What was his name? [*From someone in the audience:* Nick Leeson.] Thank you. I like audiences like yours. The average audience would not have known that, but thank you. Maybe you're the only person here who knew it, but thanks for shouting it out. . . . So two decades ago, Barings was destroyed by fraud committed by one of their traders. I mean, I think you know that generally. In reality, there were no profits, just big losses that he managed to conceal. And here's what he said later. It's an interesting debate to wade into because of the complexities of this whole field, but also the way that people talk about it—that are actors in this field, if you will. He wrote in his memoir,

"Luckily for my fraud, there were too many chiefs who would chat about it at arm's length but never go further. They never dared to ask any basic questions since they were afraid of looking stupid about not understanding futures and options." Just keep that in mind.

When it comes to the media, when it comes to regulators, when it comes to members of the House and Senate, even those of us in the Senate or House that work on banking issues a lot, the art of obfuscation, the art of using concepts and words, and the art of the language itself can be pretty overwhelming to people on the other side of these arguments. In many ways, that's one of the ways we got into this situation, in that it is pretty obtuse, it is pretty difficult, it is pretty complex, and the language often obfuscates beyond the understanding of highly educated people, but people that aren't part of the business necessarily. Just a good lesson to remember from the Singapore trader and how he knew what he was doing. He'd even sit in rooms with people as smart and as knowledgeable as he, his own partners and his subordinates, and he would say things that they didn't understand, but they just never really wanted to challenge it because they didn't want to look stupid. Most of us don't want to look stupid very often, so that's a pretty good rule of thumb. . . .

Thank you.

CHARLES L. EVANS
President and Chief Executive Officer, Federal Reserve Bank of Chicago

Fed Communications and Goal-oriented Monetary Policy

Introduction

Before proceeding with my comments today, I need to remind you that the views I express are my own and are not necessarily shared by my colleagues on the Federal Open Market Committee (FOMC) or within the Federal Reserve System.

The US Congress created the Federal Reserve System 100 years ago, largely as a way to provide an elastic currency that could mitigate the banking panics and other disruptions that impaired economic activity and contributed to deflations in the late 1800s and early 1900s. That mission has evolved into what is now known as our dual mandate—the Federal Reserve's directive to help foster conditions that achieve both stable prices and maximum employment. Over the Fed's 100-year history, three major historical episodes continue to provide lessons for today. First, in the 1930s, the US economy experienced a severe credit contraction and deflation during the Great Depression. Milton Friedman and Anna Schwartz argued persuasively that inept monetary policy failed to combat these destructive deflationary forces.[1]

Second, in the 1970s, US monetary policy tried to do too much to stimulate growth and reduce unemployment when unrecognized structural factors stood in the way. Overly accommodative policy led to soaring rates of inflation. Third, the Treasury Accord of 1951 reminds us that an essential feature of good monetary policy is an independent central bank—one that is autonomous enough to make tough policy decisions. But, democratically elected authorities don't just grant autonomy to unelected central bankers, nor should they. The price of autonomy is accountability. In order to maintain autonomy, we need to say what we are trying to accomplish and then honestly evaluate our progress in a way that the public and their representatives can judge clearly.

The FOMC has recently made great strides in this direction by explicitly expositing a strategy that reflects the three key lessons of its history. The Committee's "Statement of longer-run goals and monetary policy strategy,"[2] was first made in January 2012 and has been reaffirmed each year since. In it, the Committee indicates that price stability is understood to mean 2 percent inflation in the long run as measured by the annual change in the price index for total personal consumption expenditures (what we refer to as the PCE price index.) The 1930s' deflation and the 1970s' double-digit inflation clearly indicate that the nation is well served by the Fed having a long-run inflation objective and making sure it achieves that objective within a reasonable period of time.

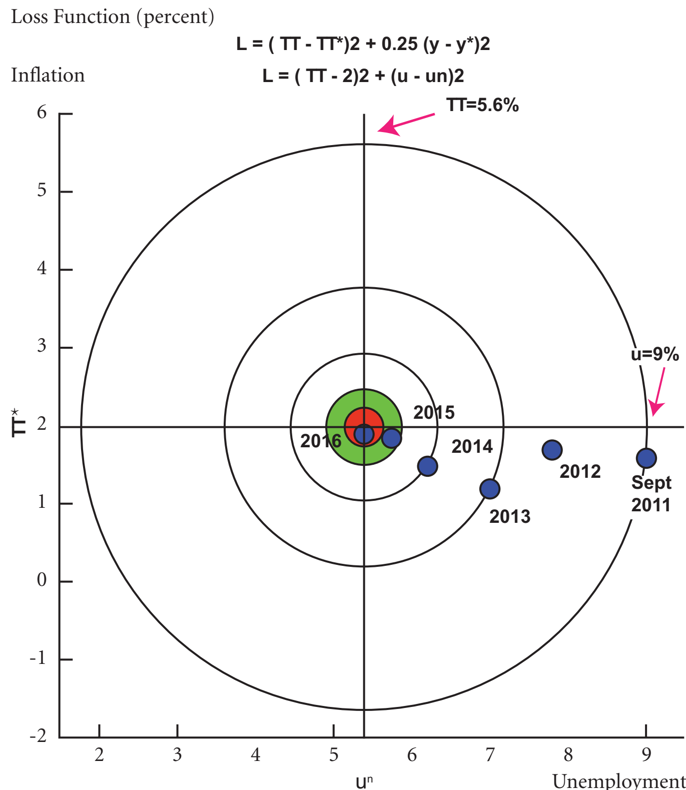
The employment mandate is more nuanced. Because maximum employment is determined by nonmonetary factors that affect the structure of the labor market, we can't have a simple,

time-invariant goal. We do, however, project where we think the longer-run normal, or "natural rate," of unemployment is currently. Today, our estimates for this rate generally range between 5.2 percent and 5.6 percent. Such assessments can vary over time. However, the most important determinants of the natural rate change only slowly, so today's assessment is an important input into policy. Being explicit about it contributes greatly to our accountability.

Accountability is key. Much as corporations require corporate scorecards and earnings calls to explain quarterly performance, the Fed needs to regularly communicate its policy strategy and evaluate how it's doing. And, when we are missing our policy goals, the public needs to know what we are doing about it. We need to decide on the appropriate actions to achieve our objectives and communicate them to the public. To that end, in our longer-run strategy statement we've said that when the economy deviates from price stability or maximum employment, we'll take a balanced policy approach that achieves both goals within a reasonable period of time.

A clear articulation of the FOMC's goals and an explanation of how it views its policy misses and plans to correct them help the public better anticipate the Fed's policy actions. In turn, the public's improved understanding of FOMC policy actions increases their efficacy by reducing uncertainty over future financial conditions and how those actions might evolve with changes in the economic environment. So, what we clearly need is a scorecard that communicates our accountability in a straightforward manner.

Bull's-Eye Accountability for Fed's Dual Mandate



*2014–2016 values are FOMC participants' Summary of Economic Projections midpoints, March 19, 2014.

Keeping Score When There Are Two Goals

I like to illustrate our balanced approach to achieving our dual-mandate goals with what I refer to as a bull's-eye scorecard. The bull's-eye in the center illustrates where we would like to be. In this case, the goals are 2 percent inflation over the medium term and unemployment at its natural rate, taken here to be 5¼ percent, which is my long-run projection. The scorecard shows an equal weighting of policy misses around our inflation and unemployment objectives; that is, each circular ring is a collection of unemployment and inflation rates that should be equally uncomfortable for FOMC participants.[3] For example, it tells us how the 9 percent unemployment rate we faced back in September 2011 can be depicted in "inflation-loss equivalent units" by showing the inflation rate that gives an equivalent loss when unemployment is at its sustainable rate. The answer is 5½ percent inflation! The greater the distance the circle is from the center of the target, the greater are our policy misses. And the greater our policy misses, the greater are the social gains from aggressive monetary and other public policy actions to correct them.

The bull's-eye scorecard approach has three benefits. First, it provides accountability by clearly describing success and failure to achieve our mandated goals. Second, it renders operational the concept of the FOMC's intent to take a balanced approach in achieving our goals. Third, the bull's-eye guides the public's judgment of the FOMC's likely response to current economic conditions. While we have made considerable progress toward our goals since 2011, we still have some ways to go to reach the bull's-eye.

Missing on the Full Employment Mandate

That's certainly clear in the case of our employment mandate. While we've made much progress since the onset of the Great Recession when unemployment reached a high of 10 percent, 6.7 percent is still well above the 5¼ percent rate I think is the longer-run normal. Indeed, 6.7 percent is higher than the 6.3 percent peak unemployment rate in the previous recession.

Moreover, we have to ask ourselves if this gap is a good measure of the current degree of slack in the labor market. For example, some of the decline in the unemployment rate over the past four years reflects people dropping out of the labor force instead of finding jobs. Of course, certain demographic factors such as the increasing number of baby boomers reaching retirement age mean we should have expected to see a substantial drop in labor force participation for reasons unrelated to cyclical job prospects and the health of the labor market. But, when you take a detailed look, it appears that the labor force participation rate has recently declined more than can be accounted for by demographic trends and other such structural factors alone. In addition, the end of extended unemployment insurance benefits and other factors likely have decreased the natural rate of unemployment that is our target. So, the decline in the unemployment rate likely overstates to some degree the reduction of slack in the labor market over the past year.

This discussion illustrates how difficult it is to judge where the labor market stands relative to our full employment mandate. A while back, this wasn't such a critical issue: When the unemployment rate stood at 9 or 10 percent, it obviously far exceeded the natural rate of unemployment. Now, as the unemployment rate falls closer to its natural rate, disentangling structural from cyclical changes becomes more important. Thus, at this juncture, it is prudent to consider a wide range

of indicators of labor market activity to better gauge the overall health of the labor market. In the press conference following the March FOMC meeting, Chair Janet Yellen indicated that, in addition to focusing on the official unemployment rate, the Committee considers a wide range of data in assessing labor market conditions.[4] These include quit rates, layoffs, and a variety of wage measures, as well as broader measures of unemployment that include discouraged workers and those who would like to work more hours.[5] Generally, the evidence points to a still weak labor market. We still have some ways to go to reach our employment mandate.

Below Target on 2 Percent Inflation Goal, Too

Let's now turn to our price stability mandate. No one can doubt that we are undershooting our 2 percent target. Total PCE prices rose just 0.9 percent over the past 12 months; that is a substantial and serious miss. And, as the bull's-eye chart shows, this undershooting has persisted for several years. Compounding these difficulties, below-target inflation is a worldwide phenomenon and it is difficult to be confident that all policymakers around the world have fully taken its challenge onboard. Persistent below-target inflation is very costly, especially when it is accompanied by debt overhang, substantial resource slack, and weak growth.

In the United States, the challenge of below-target inflation continues to be underappreciated in public commentary. Mistakenly, many greatly exaggerate the risks of overly high inflation. Before turning to inflation risks, let me mention one reason for some confusion. That is, some commentaries minimize the current below-target inflation experience by citing the slightly higher increases of the Consumer Price Index, or CPI. The CPI is the best-known single measure of inflation, and its underlying trend currently is running at a bit above 1½ percent. Many commentators compare the CPI against our 2 percent inflation objective. Unfortunately, this is an apples and oranges comparison: The CPI tends to run about a quarter to a half of a percentage point higher on average than the PCE index because of its different market-basket composition and statistical construction. Accordingly, it is much more accurate to describe the

Fed's inflation objective in terms of the CPI to be roughly 2½ percent. So, against this 2½ percent benchmark, CPI inflation also is quite low relative to target. In any event, the PCE price index is the preferred inflation measure on a number of theoretical grounds and the one chosen by the FOMC as its policy target; therefore, we should judge the Committee's ultimate inflation performance using that index relative to its 2 percent goal.

So, what is the inflation outlook in the current environment? Despite current low rates, I still often hear people say that higher inflation is just around the corner. I confess that I am somewhat exasperated by these repeated warnings given our current environment of very low inflation. Many times, the strongest concerns are expressed by folks who said the same thing back in 2009, and then in 2010 and . . . well, you get the picture. Okay, five years later we still need to carefully assess this very serious question. Let me offer five reasons why I still see the economic environment as pointing to below-target inflation for several years.

First, many commentators see rising commodity prices as a harbinger of rising inflation pressures. Certainly, back in 2008 and 2010 there were instances when energy and commodity prices rose to high levels. This put pressure on inflation and also reduced aggregate demand. There is a

lot of evidence that these types of relative price increases result in only transitory increases in consumer price levels.[6] At the moment, even these transitory upward pressures are absent, and the current weak state of global demand contributes to downward pressures. Until something unexpected, and frankly positive, happens with the world economy, commodity prices seem like an even more unlikely propellant for strongly rising inflation than they usually would be.

Second, some say a classic warning sign of inflation is the enormous size of the Fed's balance sheet and the greater than $2.5 trillion of excess reserves sitting on commercial banks' books. Surely, they say, enormous increases in the monetary base are likely to be accompanied by substantial price level increases. The problem with this story is that the banks have not been lending these reserves nearly enough to generate big increases in broad monetary aggregates. And even if they did, as an indicator of inflation, the monetary aggregates lost their predictive content many decades ago. The evidence, again, is that inflation remains low. But what if? What if lending picks up? Well, that would be really terrific. Dramatically higher bank lending would surely be associated with higher loan demand and a generally stronger economy. Strong growth and diminishing resource slack would be part of this story, and a rising rate environment would be a natural force diminishing the rising inflation pressures. In the meantime, monitoring the entire state of the economy along with inflation seems like a sensible and appropriate safeguard against this currently low probability scenario.

Third, another potential source of inflationary pressures would be rising inflation expectations. Here, I mean a breakout of inflation expectations separate from any fundamentals that might accompany the previously discussed cases of rising commodity prices and stronger bank lending. One could think of this as the spontaneous combustion theory of inflation. The story goes like this: Households and businesses simply wake up one day and expect higher inflation is coming without any further improvement in economic fundamentals. Without appealing to esoteric economic theories of sunspots, these expectations don't seem sustainable in the current environment. Higher inflation expectations would presumably get priced into higher bond-market yields and higher financing rates generally. Until inflation actually rises—remember, this story has expectations rising first—ex post real interest rates would be higher and that would presumably result in a higher debt burden for borrowers. This would reduce aggregate demand. Lower demand and lower growth would further reduce cost pressures, strongly suggesting that higher inflation expectations would not be ratified by inflation experience, and thus, would not be sustained. Frankly, this story just seems very unlikely. Fourth, another, more direct measure of potentially rising costs and hence inflation might be stronger wage growth. The economic story here is a bit involved. Most economic research indicates that rising wages are not a leading indicator of rising inflation, so wages are rarely an early warning signal for future inflation. However, higher inflation would lead to higher nominal wage growth. And the double-digit inflation experience of the 1970s suggests that inappropriately accommodative monetary policy can amplify rising cost pressures, creating a wage–price spiral. Clearly, unsustainably strong nominal wage increases would very likely be symptomatic of rising inflation pressures. In terms of the current situation, there is good news and bad news. The good news is that currently, wage increases are low and not symptomatic of high inflation. The bad news is that, currently, low wage increases are symptomatic of weak income growth and low aggregate demand. Stronger wage growth would likely result in more customers

walking through the doors of business establishments and leading to stronger sales, more hiring and capacity expansion. During a normal and steady-growth business expansion, nominal wages would typically grow at the rate of productivity expansion plus compensation for inflation. If normal productivity growth is 1.5 percent and inflation is at our 2 percent target, this would suggest a steady labor compensation increase of 3½ percent is sustainable without building inflation pressures. At today's 2–2¼ percent compensation growth rates and labor's historically low share of national income, there is substantial room for stronger wage growth without inflation pressures building.

Fifth, do we really know that the public's expectations are for low inflation? Judging by today's Treasury yield curve, inflation expectations remain below our target. If anyone were expecting inflation to accelerate in the future, surely individual and institutional investors would demand to be compensated for growing inflation risk. However, our Chicago Fed affine term-structure model implies that the three-year-ahead average inflation expectations priced into the Treasury yield curve currently are below 2 percent and remain so for quite a number of years to come. Given today's unacceptably low inflation environment and the wealth of inflation indicators that point to continued below-target inflation, I think we need continued strongly accommodative monetary policy to get inflation back up to 2 percent within a reasonable time frame. After all, notice that the red and green regions of the bull's-eye chart show modest inflation above 2 percent is much more acceptable than even 6 percent unemployment. The FOMC should be anxious to get to that bull's-eye region as quickly as feasible given the long slow path to date.

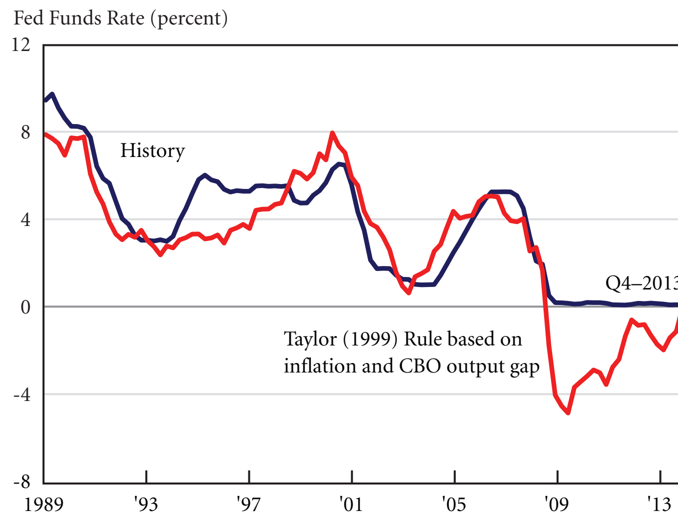
The Fed's Reaction Function

I've spoken so far about how we are missing on our policy objectives. Obviously, the aim of policy is to eliminate those misses. How do we hit the bull's-eye? What do we do operationally in terms of policy tools? In normal times, the FOMC moves its traditional policy tool, the federal funds rate, in order to influence aggregate demand and with it economic growth and inflation and disinflationary pressures.

Many economists have studied the relationship between actual Fed actions and sensible, explicit policy rules that might capture the Fed's policy reaction function. Historically, Fed policy moves have been reasonably well described by simple policy rules, particularly the 1999 version of the so-called Taylor rule,[7] that relate the federal funds rate to the differences of output (a proxy for employment) and inflation from their target levels and a constant term that is meant to capture the equilibrium real interest rate and the Fed's inflation target. However, this rule does not always describe policy well. For example, given judgmental, but reasonable, choices for the Fed's inflation objective before it adopted a 2 percent objective, the Taylor rule misses during the 1990s are big. Actually, in some cases they were bigger than those associated with the well-known and loud complaints lodged by John Taylor against the Fed for its 2003–06 deviations from the rule.[8]

Why do these misses occur? Well, the economy and the policies that optimally close deviations from our goals are more complicated than what can be captured by any simple rule. Taylor clearly recognized this in his 1993 article in which he stated: "While the analysis of these issues can be aided by quantitative methods, it is difficult to formulate them into a precise algebraic formula.

Policy Rate Constrained by Zero Lower Bound



In the period prior to the explicit inflation target set by the FOMC, the Taylor Rule was constructed using long-run inflation forecasts from the Survey of Professional Forecasters, or when available, from the Summary of Economic Projections.

Moreover, there will be episodes where monetary policy will need to be adjusted to deal with special factors. For example, the Federal Reserve provided additional reserves to the banking system after the stock-market break of October 19, 1987, and helped to prevent a contraction of liquidity and to restore confidence. The Fed would need more than a simple policy rule as a guide in such cases."[9]

In fact, during the most extraordinary times, such as the 2008 financial crisis and its aftermath, the Taylor rule completely breaks down. Its prescription would have been to set policy rates at something like –5 percent in 2009. Such rates are just not feasible for the simple reason that nominal interest rates cannot go below zero; that is, rates cannot breach what we refer to as the zero lower bound, or ZLB. Moreover, there is no emergency handbook that comes with the rule that says what to do in this event. An apparently unstated branch of the Taylor 1993 rule includes setting the federal funds rate to zero during these circumstances and then simply wait and presumably smile confidently in public while holding to zero rates. As a rigid policy prescription, we are thus left with inaction. And inaction looks like policy abdication because we are left doing nothing to try to make timely progress in reducing policy misses. This rule cannot be the be-all and end-all for monetary policy; for a policy rule that some say should be enshrined in the Federal Reserve Act explicitly to govern the implementation of US monetary policy, its prescriptions under the recent circumstances we've faced are an absolute failure.

Furthermore, given that the Taylor rule has failed so badly and done so for so long, how can we be confident that its prescriptions will still be a good policy to follow once the rule says that the fed funds rate should rise above zero again? Indeed, that's what many versions of the Taylor rule say today—that it's time now to begin to increase the fed funds rate. How can we know if the policy

prescriptions are from a reborn and healthy policy tool or perhaps instead from one still suffering from a zombie-like hangover in terms of its prescriptions?

It's important to keep in mind that the Taylor rule's theoretical underpinnings are loose, especially compared with the seminal 1979 John Taylor article[10] on optimal monetary policy in a rational expectations model with sticky prices. Indeed, the Taylor rule parameters are not necessarily stable. In particular, consider the intercept term. The usual specification of the rule assumes that this intercept term is a constant 2 percent equilibrium level of the real interest rate. However, it is well known that equilibrium real rates of interest are not constant, and modern macroeconomic models of optimal monetary policy all take this into account. Assuming that the equilibrium real interest rate is constant is just as egregious an error as failing to account for the time-varying nature of the natural rate of unemployment. We all know that mis-specifying the natural rate of unemployment can lead to seriously inappropriate monetary policy outcomes like double-digit inflation in the 1970s. It certainly seems that the fallout from the financial crisis and persistent headwinds holding back economic activity are consistent with the equilibrium real interest rate being lower than usual today. Indeed, if you put any weight whatsoever on the secular stagnation hypothesis that Larry Summers and Paul Krugman have described,[11] an appropriate analysis would recognize lower expected real rates of interest. In any event, the FOMC's latest policy statement in March recognizes this possibility of lower real rates, as the Committee stated it currently anticipates that "even after employment and inflation are near mandate-consistent levels, economic conditions may, for some time, warrant keeping the target fed funds rate below levels the Committee views as normal in the longer run."[12]

Conclusion

During Ben Bernanke's eight years as Fed Chair, the FOMC worked hard to make the Fed's policy intentions clear; and I am confident that the FOMC under Chair Yellen will continue along this same path. When the federal funds rate got stuck at zero and goal-oriented monetary policy said to do more, we did more! We implemented the following: the first quantitative easing program, or QE1, in March 2009;[13] QE2 in fall 2010; the initial forward guidance on the federal funds rate in August 2011; Operation Twist in fall 2011; the open-ended QE3 in fall 2012; and the enhanced threshold forward guidance in December 2012. All of these were ways to go beyond the policy inaction that was the prescription of simple constrained policy rules, and do something to meet our policy mandates.

In conclusion, let me ask again, what is the accountability test? Much has been done; however, looking at the bull's-eye scorecard, I would argue, if anything, the FOMC has been less aggressive than the policy loss function calls for. And to me, in the current circumstances, accountability and optimal policy mean we should be maintaining a large degree of accommodation for some time. Policies that would instead place us on a slow glide path toward our targets undermine the credibility of our claim that we will do our job and meet mandated policy goals in a timely fashion. Timid

policies would also increase the risk of progress being stymied along the way by adverse shocks that might hit before policy gaps are closed. The surest and quickest way to reach our objectives is to be aggressive. This means, too, that we must be willing to overshoot our targets in a manageable fashion. Such risks are optimal if the outcome of our policy actions implies smaller average deviations from our targets over the medium term. We should be willing to undertake such policies and clearly communicate our willingness to do so.

Notes

1. Friedman and Schwartz (1963).
2. Federal Open Market Committee (2014c).
3. Putting equal weight on (squared) inflation and unemployment deviations is reasonably standard. Given Okun's law, this is equivalent to a formulation that weights inflation deviations four times more heavily than output deviations. In his seminal 1979 analysis, John Taylor noted that any heavier weight on inflation would reflect "extremely uneven concerns about inflation."
4. Federal Open Market Committee (2014b).
5. For example, the broadest measure of the unemployment rate, U-6, includes those workers who are marginally attached and those working part-time for economic reasons.
6. Evans and Fisher (2011).
7. Taylor (1999).
8. See, for example, Taylor (2013).
9. Taylor (1993), p. 197.
10. Taylor (1979).
11. See Summers (2013) and Krugman (2013).
12. Federal Open Market Committee (2014a).
13. For more about the quantitative easing programs (also referred to as large-scale asset purchases) and the rationale behind them, see Board of Governors of the Federal Reserve System (2013).

References

Board of Governors of the Federal Reserve System, 2013, "What Are the Federal Reserve's Large-scale Asset Purchases?," Current FAQs, December 19, available at http://www.federalreserve.gov/faqs/what-are-the-federal-reserves-large-scale-asset-purchases.htm.

Federal Open Market Committee, 2014a, press release, March 19, available at http://www.federalreserve.gov/newsevents/press/monetary/20140319a.htm.

———, 2014b, Transcript of Janet Yellen press conference, March 19, available at http://federalreserve.gov/mediacenter/files/FOMCpresconf20140319.pdf.

———, 2014c, "Statement on Longer-run Goals and Monetary Policy Strategy," as amended January 28, available at http://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf .

Evans, Charles L., and Jonas D. M. Fisher, 2011, "What Are the Implications of Rising Commodity Prices for Inflation and Monetary Policy?," Chicago Fed Letter, Federal Reserve

Bank of Chicago, No. 286, May, available at http://www.chicagofed.org/digital_assets/publications/chicago_fed_letter/2011/cflmay2011_286. pdf.

Friedman, Milton, and Anna J. Schwartz, 1963, *A Monetary History of the United States, 1867–1960*, Princeton, NJ: Princeton University Press.

Krugman, Paul, 2013, "Secular Stagnation, Coalmines, Bubbles and Larry Summers," *The New York Times*, opinion pages, November 16, available at http://krugman.blogs.nytimes.com/2013/11/16/secular-stagnation-coalmines-bubbles-and-larry-summers/?_php=true&_type=blogs&_r=0.

Summers, Lawrence, 2013, speech, Fourteenth Annual Research Conference in Honor of Stanley Fischer, International Monetary Fund, Washington, DC, November 8, available at http://larrysummers.com/imf-fourteenth-annual-research-conference-in-honor-of-stanley-fischer/.

Taylor, John B., 2013, "A Review of Recent Monetary Policy," testimony before the U.S. House Committee on Financial Services, March 5, available at http://financialservices.house.gov/uploadedfiles/hhrg-113-ba19-wstate-jtaylor-20130305.pdf.

———, 1999, "A Historical Analysis of Monetary Policy Rules," *Monetary Policy Rules*, Chicago: University of Chicago Press, pp. 319-341, available at http://www.nber.org/chapters/c7419.pdf.

———, 1993, "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Series on Public Policy*, Vol. 39, Vol. 1, December, pp. 195–214, available at http://www.sciencedirect.com/science/article/pii/016722319390009L.

———, 1979, "Estimation and Control of a Macroeconomic Model with Rational Expectations," *Econometrica*, Vol. 47, No. 5, September, pp. 1267–1286, available at http://www.jstor.org/sici?sici=0012-9682%28197909%2947%3A5%3C1267%3AEACOAM%3E2.0.CO%3B2-Q&origin=repec.

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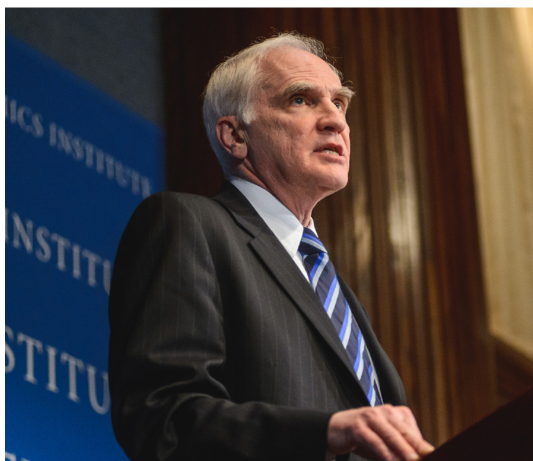

In the more than five years that I have been a member of the Board of Governors of the Federal Reserve System, it has been hard not to concentrate on near-term economic prospects. The severe decline in the economy precipitated by the financial crisis and the magnitude of job and production loss in the Great Recession that followed have made a focus on recovery both understandable and imperative. But as I have prepared for Federal Open Market Committee (FOMC) meetings every six to seven weeks by examining incoming data and the analyses of our own staff and of outside economists, I have been struck by the evidence of longer-term challenges to the American economy that poke through shorter-term discussions.

There is considerable ongoing debate about whether the financial crisis and recession amplified changes already afoot in the economy, accelerated them, or simply revealed them more clearly. Whatever one's view on that question, the confluence of some apparently secular trends raises important questions about our nation's future growth potential and our ability to provide opportunity for all of our people. Indeed, these changes reflect serious challenges not only to the functioning of the American economy over the coming decades, but also to some of the ideals that undergird the nation's democratic heritage. This evening I will address in some detail four particularly important developments:

1. Productivity growth has slowed. As a result, the overall economic pie is expanding more slowly than before.
2. Some indicators further suggest that workers have been claiming a smaller share of the overall economic pie during the past decade.
3. Inequality has continued to increase, meaning that a larger portion of overall economic resources is commanded by a smaller segment of the population.
4. Economic mobility across generations is not particularly high in the United States, and it has not been increasing over time.

After detailing these trends, I will turn briefly to both the role and the limits of monetary policy in countering them.[1]

Structural Challenges for the American Economy

Lagging productivity growth

Over the long term, the pace at which our standards of living increase depends on the growth of labor productivity—that is, the increase in the amount of economic value that a worker can generate during each hour on the job. Unfortunately, the data on productivity growth in recent years have been disappointing. Although output per hour in the nonfarm business sector rose about 2¾ percent per year from the end of World War II through 1971, productivity has risen just 1½ percent per year since then, excluding a brief burst of rapid growth that occurred roughly between 1996 and 2004.

Just as it took economists a long time to identify the sources of the surge in productivity that began nearly two decades ago, they are only now beginning to grapple with the more recent slowdown. Some have argued that the burst of productivity growth that began in the mid-1990s was the anomaly, and that the more pedestrian pace of growth over the past decade represents a return to the norm.[2] In this view, the long period of rapid productivity growth that ended in the 1970s grew out of the technological innovations of the first and second Industrial Revolutions. But now, despite continued technological advances, a return to that pace of performance is thought unlikely. In particular, these authors argue that the information technology revolution of the past several decades—including the diffusion of computers, the development of the Internet, and improvements in telecommunications—is unlikely to generate the productivity gains prompted by earlier innovations such as electrification and mass production.

This somewhat pessimistic perspective is far from being conventional wisdom. While productivity has increased less rapidly in recent years than during the first three-fourths of the 20th century, per capita income (a statistic available over a longer time span) is still rising more quickly than it was even during the second Industrial Revolution. Indeed, some have argued that the problem with new technology is not with productivity growth but with our ability to capture the productivity in our statistics. Moreover, many economists and technophiles remain optimistic that we have yet to fully realize the potential of the information revolution, and that technological change will continue to bring inventions and productivity enhancements that we cannot imagine today.[3] This view holds that there is no reason productivity could not continue to rise in line with its long-term historical average.[4]

It must be noted that, even among the productivity optimists, there are differences over how the expected progress will affect job creation and income distribution. In particular, some in this camp believe that we are likely to see a continuation of the pattern by which recent productivity growth seems to have mostly benefited relatively skilled workers. It may also have favored returns to capital investment, as opposed to labor, in greater proportion than past productivity gains.

While there is some reason for optimism about the prospects for technological progress, there are grounds for concern over the decline in the dynamism of the US labor market, an attribute that has contributed to productivity growth in the past and has traditionally distinguished the United States from many other advanced economies. Historically, the US labor market has been characterized by substantial geographic mobility. Our high rates of geographic mobility are one facet of the overall dynamism of our labor market, which is also manifest in the continual churning of jobs through hirings and separations, as well as firm expansions and contractions—a process that

the economist Joseph Schumpeter called "creative destruction."[5] To give a sense of the magnitude of this process, while *net* job gains and losses are typically measured in the hundreds of thousands each calendar quarter, *gross* job creation and destruction commonly run at a pace of roughly *7 million* jobs each quarter. Creative destruction has been shown to improve productivity as jobs that have low productivity are replaced with jobs that yield greater productivity.[6]

However, a variety of data indicate that this feature of labor market dynamism has diminished. Since the 1980s, internal migration in the United States over both long and short distances has declined. To give an example, the rate of cross-state migration was less than half as large in 2011 as its average over the period from 1948 to 1971.[7] And, while we still see the level of employment rising and falling over the business cycle, the gross flows of people between jobs and of jobs across firms that underlie the observed aggregate changes have fallen over the past 15 years.

At this point, we do not have a full understanding of the factors contributing to the decline in labor market dynamism. As a number of economists who have studied the issue have pointed out, some of the explanations may be benign or even positive.[8] For instance, the aging of the population accounts for some of the decline in migration and job churning, as older individuals are less likely to move and change jobs; such demographic factors probably do not represent an adverse reduction in dynamism. Moreover, some of the decline in turnover could be the result of individuals and firms finding productive job matches more quickly than before. For many employers and workers, the Internet has reduced the cost of posting job openings and the cost of searching for jobs. This more efficient process could result in better matches between firms and workers and thus fewer separations. Similarly, a reduction in firm uncertainty about the costs and benefits of investing could reduce firm-level churning in jobs. In both cases, workers and firms are able to achieve a good outcome with less turnover and, presumably, no loss of productivity.

While it seems possible that improved information could be a force behind the reduction in geographic mobility and labor turnover, there are less benign possibilities as well. For instance, an increase in the costs to firms of hiring and firing individuals or an increase in the costs to individuals of changing jobs could lead to fewer productivity-enhancing job changes. Alternatively, the reduction in churning could itself be a function of slower productivity growth, as slower productivity growth implies lower benefits to forming new matches.

One recent trend that is particularly disturbing is stagnation in the formation of new firms. Statistics from the Bureau of Labor Statistics (BLS) show that the number of establishments in operation for less than one year rose between the mid-1990s, when the data start, and the early 2000s. But, smoothing through the ups and downs of the business cycle, new firm formation has been roughly flat since then. Moreover, the number of individuals working at such firms stands almost 2 million below its peak in 1999. Given the role of innovation by entrepreneurs and the well-documented importance of successful young firms in creating jobs, these trends are disheartening.

The lagging share of national income accruing to workers

A second adverse development in recent years has been the apparent reduction in the share of overall national income that accrues to workers. Here I will be brief and suggestive because the scholarship is far from settled. But the basic trends in the data are troubling. Labor's share of total income generated in the nonfarm business sector has been on a downtrend since the 1980s and has

fallen sharply since the turn of the millennium. It stood at 56 percent at the end of 2013, the lowest level since the BLS began collecting data on the measure in 1948.

To be sure, various conceptual and measurement challenges make it difficult to compute labor's share of income with any degree of precision. However, taken at face value, these data have significant implications for the distribution of income in our society, given how skewed the holdings of capital are. Economists have focused less attention on the factors underlying the apparent decline in labor's share of income than they have on the rise in income inequality in general, but among the candidates are technological change, which has allowed for the substitution of capital for labor in the handling of routine tasks, an increase in firm bargaining power, and perhaps a decline in competition in product markets.

The increase in inequality

Of the trends I have identified, the one that has received the largest amount of press attention recently is the rise in income inequality. While income inequality has been increasing since the 1970s, over the past two decades the process has been characterized by what some have called polarization, with those at the top of the distribution accumulating a significantly larger share of income, those at the bottom of the distribution experiencing modest relative gains, and those in the middle of the income distribution falling further behind in relative terms.

Gauging by one fairly comprehensive measure of income used by the Congressional Budget Office, the share of income garnered by those in the top 1 percent of the distribution more than doubled between 1979 and 2007 to about 17 percent, while the share accruing to those in the 1st through 80th percentiles fell nine percentage points.[9] And while it is true that those at the upper end of the income distribution were disproportionately affected during the financial crisis, with the result that inequality actually fell a bit in the wake of the recession, high earners also appear to be benefiting disproportionately from the recovery. Thus, the crisis does not seem really to have changed the trajectory of inequality.

As interesting as these statistics on inequality are, they obscure a key part of the story—one that has been an important part of our identity as Americans: whether a family has the ability, through hard work, to attain a better standard of living. And on that point, we find that households in the middle and lower parts of the earnings distribution have experienced, at best, only modest improvements in inflation-adjusted income.[10] Between 1979 and 2007, households in the middle quintile of the income distribution—a functional definition of the middle class—saw their real labor income (adjusted for household size) rise only about 3 percent. Meanwhile, households in the bottom one-fifth of the distribution did a bit better, experiencing about a 24 percent rise, although this figure reflects an improvement of just 1 percent per year, and that from a very low base. In contrast, income rose more than 70 percent among households in the top one-fifth of the earnings distribution.

The polarization of the labor income distribution has been mirrored in the types of jobs we are creating. Since the 1990s, job gains have been concentrated at the upper and lower ends of the earnings distribution. There have been healthy gains in employment in highly paid occupations, such as computer and information systems managers, and a rise in low-paid jobs, such as home health-care workers, but growth has been much slower in occupations with earnings in the middle

of the distribution, such as machinists. This trend accelerated during the Great Recession and the ensuing recovery. For example, food services, retail, and employment services, all low-wage industries, accounted for nearly 45 percent of net employment growth from the start of the recovery through early 2012, while employment in a number of industries that offer good jobs for mid-wage workers—including construction, manufacturing, and finance, insurance, and real estate—did not grow in those years or grew too slowly to make up for their job losses during the recession.[11]

There is no single explanation for the rise in inequality and the decline in the share of jobs that provide a middle-class standard of living. Economists generally agree that technological change and globalization have played a role.[12] Both of these forces have reduced the demand for workers whose jobs had involved routine work that can easily be mechanized or offshored while, at the same time, increasing the productivity of higher-skilled workers. However, it is less clear whether technology and globalization are sufficient explanations for the increased share of income going to those at the very top of the income distribution. It may be that by increasing the effective size of the markets for their skills, technological change and globalization can also explain some of the large increase in earnings of top athletes, musicians, and even chief executive officers. In the popular press, the phenomenon of the very few reaping enormous windfalls has become known as the winner-take-all economy. However, other researchers have noted that a large share of the top earners is found in industries such as finance and law, suggesting that deregulation, corporate governance, and tax policy may have also played a role in the trend toward rising inequality.

Economic mobility has not increased to mitigate higher inequality

Despite the fact that rising inequality has compounded the stakes associated with one's position in the income distribution, mobility up and down the economic ladder from one generation to the next in the United States has been stagnant. Work by Raj Chetty and his coauthors using income tax data has shown that a child who was born in the early 1990s had about the same chance of moving up in the income distribution as a child born in the 1970s.[13] Combining these results with previous research suggests that mobility has not increased in the postwar era. And, despite the long-held view of the United States as the land of opportunity, we actually fall short of other advanced economies in terms of intergenerational mobility. In the United Kingdom, for example, about 30 percent of sons with low-income parents end up being low-income themselves, while in the United States the comparable figure is over 40 percent.[14]

The Role of Monetary Policy

As must be apparent, the challenges I have discussed are not susceptible to easy or rapid solution. It is equally apparent that monetary policy cannot be the only, or even the principal, tool in addressing these challenges. But that is not to say it is irrelevant. There is not as sharp a demarcation between cyclical and structural problems as is sometimes suggested. Monetary policies directed toward achieving the statutory dual mandate of maximum employment and price stability can help reduce underemployment associated with low aggregate demand. And, to the degree that monetary policy can prevent cyclical phenomena such as high unemployment and low investment

from becoming entrenched, it might be able to improve somewhat the potential growth rate of the economy over the medium term.[15]

More generally, reducing labor market slack can help lay the foundation for a more sustained, self-reinforcing cycle of stronger aggregate demand, increased production, renewed investment, and productivity gains. Similarly, a stronger labor market can provide a modest countervailing factor to income inequality trends by leading to higher wages at the bottom rungs of the wage scale.

The very accommodative monetary policy of the past five years has contributed significantly to the extended, moderate recoveries of gross domestic product (GDP) and employment. To this point, however, there has not been a corresponding upturn in wages. To be sure, there have been notable wage increases in specific areas of the country enjoying economic growth much higher than the national average. And, as is nearly always the case, labor shortages in discrete skilled job categories may be placing some upward pressures on wages for those jobs (though, judging by such aggregate data as we have, not by as much as one might have thought based on the widespread anecdotal reports of skilled labor shortages).

But one sees only the earliest signs of a much-needed, broader wage recovery. Compensation increases have been running at the historically low level of just over 2 percent annual rates since the onset of the Great Recession, with concomitantly lower real wage gains. The reasons for the lag in wage gains in the context of continuing moderate growth are not totally clear. Nominal wage rigidity on the downside may have played a role to the extent that employers were reluctant to cut nominal wages even in the period from late 2008 to early 2009, when they were eliminating jobs in staggering numbers. The secular labor market factors mentioned earlier are also likely relevant.

There is, of course, also a debate around the question of how much of current unemployment—particularly long-term unemployment—is structural and thus how much slack still exists in labor markets. Last week Chair Yellen explained why substantial slack very likely remains. I would add to her explanation only the observation that, in the face of some uncertainty as to how best to measure slack, we are well advised to proceed pragmatically. We should remain attentive to evidence that labor markets have actually tightened to the point that there is demonstrable inflationary pressure that would place at risk maintenance of the FOMC's stated inflation target (which, of course, we are currently not meeting on the downside). But we should not rush to act preemptively in anticipation of such pressures based on arguments about the potential increase in structural unemployment in recent years.

In this regard, the issue of how much structural damage has been suffered by the labor market is of less immediate concern today in shaping monetary policy than it might have been had we experienced a period of rapid growth during the recovery. Remember that, just a few years ago, many forecasters—in and out of the Federal Reserve—were projecting growth rates at an annualized rate of 4 percent or greater for at least a year. That expectation raised the question of whether a reasonably rapid tightening in monetary policy might at some point be needed. But now, in part because we did not have such a spike in the early stages of recovery and instead have had modest growth in place for several years, it seems less likely that we will experience a growth spurt in the next couple of years that would engender concerns about rapid wage pressures and changes in inflation expectations.

The Importance of a National Investment Agenda

In short, by promoting maximum employment in a stable inflation environment around the FOMC target rate, monetary policy can help set the stage for a vibrant and dynamic economy. But there are limits to what monetary policy can do in counteracting the longer-term trends I have discussed. In economic research and in policy debates, we need more focus on these issues and more attention to concrete proposals to address them. I would suggest that one element, though by no means the only one, in such a program is a well-formulated government investment agenda.

A pro-investment policy agenda by the government could help address some of our nation's long-term challenges by promoting investment in human capital, particularly for those who have seen their share of the economic pie shrink, and by encouraging research and development and other capital investments that increase the productive capacity of the nation.

There is already a well-known list of investments that have been shown to be successful. For instance, early childhood education can increase the educational attainment of children from low-income families as well as improve other outcomes.[16] In addition, recent innovations in job training programs, which more tightly link the training to the needs of employers in sectors of the economy with a demand for workers, have been shown to increase both the employment and wages of participants.[17]

Investment in basic research by the federal government is another area in which greater investments could yield significant returns and in which a public policy role is warranted because of externalities. Econometric studies suggest that the rates of return to this type of investment can be very high.[18] And a range of policy commentators agree that there is a continuing role for government investment in infrastructure, including various forms of transportation, as a way to enhance productivity. Not too long ago, the American Society of Civil Engineers gave the United States a rating of D on its roads and bridges. Improving that system, both by doing necessary maintenance to maintain safety and functionality and by reducing congestion could yield substantial benefits.[19]

This agenda might sound ambitious. In fact, spending in these areas is currently not a very large proportion of federal outlays. For example, the entire federal budget for nondefense research programs—including expenditures on health research, the National Aeronautics and Space Administration, and the National Science Foundation—is only 2 percent of federal spending (or less than 0.4 percent of GDP), well below the share in the 1960s, when we last made a significant effort to advance our capacities in math and science during the era of space exploration. Moreover, spending in these areas has been the target of much of the budget restraint in recent years. Even in the area of physical infrastructure, we have fallen behind past efforts. After a surge associated with fiscal stimulus during the recent recession, public spending on infrastructure has tumbled, resulting in the slowest growth (1 percent) in the state and local capital stock since WWII.

I certainly am not intending here to join the broader debate on fiscal policy, either short or longer term. But I do note that fiscal policymakers could promote the longer-term prospects of the nation by increased spending in areas that are likely to yield increases in living standards. The amount of increased investment spending that could reasonably be absorbed would be quite modest in comparison with the very large amounts associated with major fiscal issues such as health-care expenses. And even a strong investment agenda would not be a complete response to the economic challenges I have discussed. But, like monetary policy, it could play a useful role.

Conclusion

The longer-term challenges to the American economy that I have identified this evening are real. But I certainly do not regard a continuation of these trends as inevitable. On the contrary, the American economy is still possessed of great advantages and potential that, while always and necessarily evolving, have served us well over the years.[20] My principal aims this evening have been, first, to echo those who have been drawing attention to these challenges in recent years and, second, to encourage more discussion and debate of the specific policies that can best help us meet these challenges. As should be apparent in my remarks on monetary policy and an investment agenda, I believe that there are policies already developed and available to us that can contribute to this effort. My hope is that such policies will be pursued and that others, perhaps yet to be developed, will follow.

Notes

1. Stephanie Aaronson of the Board's staff contributed substantially to these remarks.
2. See, for example, Tyler Cowen (2011), *The Great Stagnation: How America Ate All the Low-hanging Fruit of Modern History, Got Sick, and Will (Eventually) Feel Better* (New York: Dutton); Robert J. Gordon (2010), "Revisiting U.S. Productivity Growth over the Past Century with a View of the Future," NBER Working Paper Series 15834 (Cambridge, Mass.: National Bureau of Economic Research, March); and Robert J. Gordon (2012), "Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds," NBER Working Paper Series 18315 (Cambridge, Mass.: National Bureau of Economic Research, August).
3. See, for example, Erik Brynjolfsson and Andrew McAfee (2011), *Race Against the Machine: How the Digital Revolution Is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy* (Lexington, Mass.: Digital Frontier Press); Erik Brynjolfsson and Andrew McAfee (2014), *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (New York: W.W. Norton & Company); and Martin Neil Baily, James Manyika, and Shalabh Gupta (2013), "U.S. Productivity Growth: An Optimistic Perspective," *International Productivity Monitor,* no. 25 (Spring), pp. 3–12. See also Ben Bernanke (2013), "Economic Prospects for the Long Run," speech delivered at Bard College at Simon's Rock, Great Barrington, Mass., May 18.
4. See, for example, David M. Byrne, Stephen D. Oliner, and Daniel E. Sichel (2013), "Is the Information Technology Revolution Over?" *International Productivity Monitor*, no. 25 (Spring), pp. 20–36.
5. Joseph A. Schumpeter (1942), *Capitalism, Socialism, and Democracy* (New York: Harper & Brothers).
6. See, for example, Lucia Foster, John Haltiwanger, and C. J. Krizan (2001), "Aggregate Productivity Growth: Lessons from Microeconomic Evidence," in Edward Dean, Michael Harper, and Charles Hulten, eds., *New Developments in Productivity Analysis* (Chicago: University of Chicago Press); and Lucia Foster, John Haltiwanger, and C. J. Krizan (2006), "Market Selection, Reallocation, and Restructuring in the U.S. Retail Trade Sector in the 1990s," *Review of Economics and Statistics,* Vol. 88 (November), pp. 748–58.

7. For more information on the rate of cross-state migration, see Raven Molloy, Christopher L. Smith, and Abigail Wozniak (2013), "Declining Migration within the U.S.: The Role of the Labor Market," Finance and Economics Discussion Series 2013-27 (Washington: Board of Governors of the Federal Reserve System, September).
8. For additional details on the decline in labor market dynamism, see Henry R. Hyatt and James R. Spletzer (2013), "The Recent Decline in Employment Dynamics (PDF)," Center for Economic Studies Working Paper Series 13-03 (Washington: U.S. Census Bureau, March).
9. This measure of income accounts for total compensation, including health benefits, and capital income, government transfers, and taxes while also adjusting for household size. See Congressional Budget Office (2011), *Trends in the Distribution of Household Income between 1979 and 2007* (Washington: CBO, October).
10. This measure of income covers total compensation, including benefits, and adjusts for household size. See Congressional Budget Office, *Trends in the Distribution of Household Income,* in note 9.
11. For more information on this trend, see National Employment Law Project (2012), "The Low-wage Recovery and Growing Inequality (PDF)," data brief (New York: NELP, August).
12. The literature on the reasons for the rise in inequality is extensive, but one recent work that tries to address the issue is David H. Autor, David Dorn, and Gordon H. Hanson (2013), "Untangling Trade and Technology: Evidence from Local Labor Markets," NBER Working Paper Series 18938 (Cambridge, Mass.: National Bureau of Economic Research, April).
13. For a discussion of mobility in income distribution, see Raj Chetty, Nathaniel Hendren, Patrick Kline, Emmanuel Saez, and Nicholas Turner (2014), "Is the United States Still a Land of Opportunity? Recent Trends in Intergenerational Mobility," NBER Working Paper Series 19844 (Cambridge, Mass.: National Bureau of Economic Research, January).
14. For more information on intergenerational mobility, see Markus Jäntti, Bernt Bratsberg, Knut Røed, Oddbjørn Raaum, Robin Naylor, Eva Österbacka, Anders Björklund, and Tor Eriksson (2006), "American Exceptionalism in a New Light: A Comparison of Intergenerational Earnings Mobility in the Nordic Countries, the United Kingdom, and the United States (PDF)," IZA Discussion Paper Series 1938 (Bonn, Germany: Institute for the Study of Labor, January).
15. For details on the potential growth rate of the economy, see Dave Reifschneider, William Wascher, and David Wilcox (2013), "Aggregate Supply in the United States: Recent Developments and Implications for the Conduct of Monetary Policy," Finance and Economics Discussion Series 2013-77 (Washington: Board of Governors of the Federal Reserve System, November).
16. For more information on the effect of early childhood education, see James J. Heckman, Seong Hyeok Moon, Rodrigo Pinto, Peter A. Savelyev, and Adam Yavitz (2010), "The Rate of Return to the HighScope Perry Preschool Program," *Journal of Public Economics*, Vol. 94 (February), pp. 114–28; James Heckman, Rob Grunewald, and Arthur Reynolds (2006), "The Dollars and Cents of Investing Early: Cost-Benefit Analysis in Early Care and Education," *Zero to Three*, Vol. 26 (July), pp. 10–17; and Elizabeth U. Cascio and Diane Schanzenbach (forthcoming),

"The Impacts of Expanding Access to High-Quality Preschool Education," *Brookings Papers on Economic Activity*.

17. For a discussion of such rates of return, see, for example, Sheila Maguire, Joshua Freely, Carol Clymer, Maureen Conway, and Deena Schwartz (2010), *Tuning In to Local Labor Markets: Findings from the Sectoral Employment Impact Study* (Philadelphia: *Public/Private Ventures*).
18. See Zvi Griliches (1992), "The Search for R&D Spillovers," *Scandinavian Journal of Economics*, Vol. 94 (Supplement), pp. S29–S47; and Charles I. Jones (2002), "Sources of U.S. Economic Growth in a World of Ideas," *American Economic Review*, Vol. 92 (March), pp. 220–39.
19. For more details on the US infrastructure, see American Society of Civil Engineers (2013), *2013 Report Card for America's Infrastructure (PDF)* (Reston, Va.: ASCE); and Her Majesty's Treasury (2006), *The Eddington Transport Study—The Case for Action: Sir Rod Eddington's Advice to Government (PDF)* (London: Her Majesty's Stationery Office).
20. These advantages—such as the country's substantial natural resources, a stable but adaptive legal framework for economic activity, a dynamic labor market, and a fostering of entrepreneurship—have contributed to productivity growth that is estimated to have averaged about 2¼ percent over the past 140 years. See David M. Bryne, Stephen D. Oliner, and Daniel E. Sichel (2013), "Is the Information Technology Revolution Over?" *International Productivity Monitor*, no. 25 (Spring), pp. 20–36.

PETER PRAET

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The Financial Cycle and Real Convergence in the Euro Area

Ladies and gentlemen,[1] Thank you for inviting me to address this conference. The latest data confirm that the euro area on aggregate is proceeding slowly along the path of economic recovery. Yet, a key issue that faces policymakers today, and that will continue to face them for several years to come, is how to deal with persistent divergence between national economies. Some euro-area countries are experiencing steady growth, while in others growth remains anemic. Some have unemployment rates under 5 percent, while in others unemployment exceeds 25 percent.

In the euro area, which is a monetary union but not a formal political union, there are risks if such divergences remain unaddressed. Without fiscal equalization mechanisms, real economic convergence is important to gradually reduce cross-country income gaps, and this in turn ensures the economic and social cohesion of the single currency. This issue of real convergence is what I would like to focus on in my remarks today—in particular, why the first decade of Economic and Monetary Union (EMU) failed to produce real convergence, and how the euro area can produce a sustainable convergence process going forward.

My main argument is as follows. Economic theory tells us that the introduction of the euro should have led to real convergence as capital flowed toward so-called "catching-up" economies where the marginal product of capital was higher. Yet, while capital growth was indeed higher in catching-up economies, it did not lead to underlying productivity convergence. In my view this was because two structural and institutional conditions were missing.

First, there was an incomplete single market in goods and services, and a general lack of competitive processes in the nontradable/services sector, which allowed some firms in so-called catching-up economies to extract excessive rents and distort capital allocation. Second, there was an incomplete single market in capital, and lack of a common approach to supervision and resolution of banks, which allowed the financial cycle to take hold too strongly in these countries in the upswing, and limited the potential for risk sharing between jurisdictions in the downswing. This "Minsky" cycle in turn masked the underlying lack of productivity convergence in the precrisis period.

The reform process in the euro area today is essentially a process of filling these two lacunae: improving the functioning of national economies through structural reforms; and creating a well-supervised, integrated financial market through banking union. This should provide the conditions for efficient resource allocation and hence sustainable convergence in the future.

The Illusion of Convergence before the Crisis

In its simplest form, economic convergence can be understood as the process of narrowing income gaps between lower- and higher-income countries, achieved through faster relative growth in the catching-up economies. According to the standard neoclassical growth model, convergence should be driven by capital flows toward the lower-income countries, which have low capital-to-output ratios and hence a higher marginal return on capital. An increase in labor productivity in the catching-up economies would also accelerate convergence, as capital deepening would empower production in those economies and organizational processes would gradually reach the standards of efficiency set by more mature regions.

When EMU was launched, the conditions for economic convergence to proceed according to this model seemed to be present. Nominal interest rates between higher- and lower-income countries converged rapidly. Capital flowed toward lower-productivity economies where the marginal product of capital was higher, supported by the elimination of exchange rate risk within the euro area. For example, from 1999 to 2008 exposures from banks in higher-income economies toward those in the catching-up economies (Spain, Ireland, Greece, and Portugal) increased more than fivefold. Facilitated by these flows, capital accumulation accelerated in these countries: from 1999 to 2007 average growth in capital services in catching-up economies ranged from around 5 percent to almost 9 percent, compared with a range of 2 percent to 3.5 percent in more productive economies.

On the surface, these developments appeared to be contributing to convergence: GDP growth in catching-up economies was generally faster than in higher-income economies. Yet, with hindsight we know that there was no underlying convergence in labor productivity. In particular, strong capital accumulation in catching-up economies did not translate into faster total factor productivity (TFP) growth. TFP actually diverged between higher- and lower-income countries in this period. In fact, there was a positive correlation between the initial level of GDP per capita and average TFP growth rates: the highest TFP growth rates were found in Germany, Austria, the Netherlands, and Finland. A special case here is Italy, where initial GDP per capita was high but TFP converged downwards [toward] the catching-up economies. This seems to be because falling real interest rates eased fiscal constraints and reduced the incentive of governments to focus on structural policies.

In other words, the apparent economic convergence in the precrisis period was largely illusory. There was a cyclical convergence in GDP levels, but it was not structurally anchored. This poses two questions that can help inform policy choices in the euro area today: First, why did capital flows not lead to productivity convergence? And second, why did more observers not see through the illusion of convergence prior to the crisis?

Why Did Real Convergence Not Happen?

Starting with the question of why TFP in particular did not converge, an important explanation seems to be that—contrary to the assumptions of the neoclassical growth model—foreign capital flowing into catching-up economies was allocated to sectors where the marginal product of capital was low and falling. This implied that capital accumulation was not associated with technological

change and hence TFP growth. Indeed, in the catching-up economies capital flowed disproportionately into the nontradable/services sector, which was in general experiencing significant productivity losses.[2] Specifically, capital accumulation was highest in the construction and real estate sectors, closely followed by retail, transport and leisure. There seem to be two explanations why this happened.

First, in some sectors the falling marginal product of capital was counterbalanced by rising profit margins, meaning that total compensation from investing in these sectors remained high.[3] This was principally the result of an incomplete single market and a lack of competition—for example, in network industries such as utilities and telecommunications—which allowed incumbent firms to charge excessive rents and distorted price signals. The capturing of rents by firms in these sectors may have affected productivity growth not only by channeling resources away from more productive uses, but also by creating a drag on incentives to become more efficient in other sectors. For example, research has shown that anticompetitive regulations in upstream sectors such as utilities can curb TFP growth in downstream sectors.[4]

Second, specific financial factors also contributed to capital misallocation. In certain sectors in catching-up economies both the marginal product of capital and profitability were relatively low—for example, construction and retail—yet capital formation remained elevated. The explanation for this apparent contradiction seems to have been very loose credit conditions. This meant that, despite low gross remuneration for enterprises in these sectors, net remuneration was kept high by low real borrowing costs. In Ireland, for example, from 2003 to 2008 the average real borrowing costs for households (mortgages) was 1.1 percent, while for nonfinancial corporations it was 2.1 percent. In both cases this averaged 2.8 percentage points below the nominal cost. As a consequence, and facilitated by insufficiently intrusive banking supervision, credit volumes also increased steeply, with loans to households growing on average by 23 percent per year in the four years before the crisis, and by almost 28 percent for nonfinancial corporations. The fact that this credit growth was associated with labor-intensive sectors such as construction, and hence diverted labor toward these sectors, itself contributed to the weak performance of productivity.

Another financial factor that may have influenced capital allocation was the type of cross-border capital flows, which reflected an incomplete single market in capital. According to the ECB's financial integration indicators, by 2008 there was almost complete integration of euro-area interbank markets, but retail banking remained largely fragmented and cross-border equity markets were hardly developed at all.[5] This meant that the cross-border capital flows into catching-up countries were mainly debt-based and intermediated through local, relationship-based banks. Generally speaking, such a financing mode—compared with equity portfolio investment or direct cross-border lending from foreign banks—tends to favor incumbent and local firms, and can make bank lending decisions less sensitive to price signals.[6] This may have also supported capital misallocation.

In short, capital flows did not lead to real convergence because the catching-up economies lacked the appropriate structural and institutional frameworks to allocate those flows efficiently. In the context of an incomplete single market in goods and services and weak competitive conditions, profit signals became disconnected from underlying productivity and diverted capital from more productive uses. And with an incomplete single market in capital and uneven banking supervision, credit growth became excessive and overconcentrated in low productivity sectors.

Why Did More Observers Not Recognize It?

While weak TFP growth was the subject of academic debate before the crisis, this was generally seen as a euro-area problem, in particular vis-à-vis the United States.[7] The general mood among observers was that the catching-up economies were progressing relatively well, or at least not markedly worse than others. For example, the European Commission's *EMU@10 Report* stated that "three of the four cohesion countries (Spain, Ireland and Greece) have shown a satisfactory development overall, while only the fourth (Portugal) has disappointed."[8] This leads me to my second question: if this convergence was in fact cyclical rather than structural, why was it not identified earlier?

My tentative answer would be that observers' assessments were influenced by the financial cycle, a theme that has echoed in Hyman Minsky's work.[9] In retrospect, it seems now that the early years of the euro were the peak of a much longer financial upswing. This led observers to overestimate the sustainability of consumption and investment, and to underestimate the risks of rising private debt levels—and this was true on both sides of the Atlantic. One explanation for this is that, as the upward phase of the financial cycle can be very prolonged—according to estimates by BIS scholars, the typical duration of the financial cycle is around 16 years[10]—perceptions of risk and value adjusted upward. Historical relationships between asset prices, debt ratios, and underlying productivity levels were deemed no longer to hold. Hence, developments that merely reflected the longer financial cycle were falsely believed to be structural.

Another explanation is that observers overestimated future productive capacity due to the effect of the financial cycle on real-time potential growth estimates.[11] This in turn could have led firms' and households to bring forward future consumption and investment into the present, based on an overestimation of their lifetime income. One way such misperceptions can arise is if a prolonged credit-driven economic expansion weakens supply constraints and raises estimates of potential output, making growth appear more structural in nature. In Spain, for example, the boom in the construction sector raised both domestic participation rates and immigration levels. The European Commission's latest estimates of potential growth rates are in the range of 3.2 percent and 4 percent for the period 2000–07, driven mainly by the increasing labor contribution (adding around two percentage points on average per year). Since 2008, however, the labor contribution has been the largest drag on potential growth, for example, subtracting more than two percentage points from the 2013 estimate.

A final explanation is that observers mistook the significance of inflation differentials within the euro area. Excess domestic demand combined with low productivity growth should be reflected in rising prices, and domestic measures of price and wage inflation in the catching-up economies were indeed running considerably higher than the euro-area average on a cumulative basis. Average annual inflation differentials in the 2002 to 2008 period were in the range of 0.5 to 1.5 percentage points. However, these developments were not considered especially alarming by some observers as they were interpreted as reinforcing the theory of Balassa-Samuelson equalization. Some also saw inflation differentials as being more reflective of low inflation in Germany as it went through a phase of wage adjustment. Overall, this may have led to less concern about the lack of real convergence in productivity levels than was warranted.

Achieving Sustainable Convergence

It was only when the financial cycle turned that the unsustainability of economic convergence became apparent. The majority of countries with relatively strong GDP growth rates prior to the crisis also experienced a relatively strong downward adjustment, in some cases undoing much of the welfare gains that were achieved since the launch of the euro. Some might see this as evidence that the assumptions of the neoclassical growth model need to be qualified—that absent credit-driven growth, there is no reason to believe that euro-area economies should converge toward similar levels of productivity, or even rates of productivity growth.[12] Indeed, endogenous growth models allow for persistent divergences as some forms of capital exhibit nondiminishing returns.

Yet, I think it is too early to draw such a conclusion. The neoclassical assumptions have not yet been properly tested, simply because capital did not flow where the marginal return would have been highest. What the euro area needs, in my view, is to "re-run" the convergence process, but with the appropriate conditions in place to ensure efficient allocation of resources, and the right framework to make convergence sustainable. Let me explain in more detail what that might entail.

To begin with, catching-up economies have to address the immediate aftereffects of the previous misallocation of capital. The precrisis inflows into the nontradable/services sector were associated with real exchange rate appreciation, rising unit labor costs (ULC), and increasing dependence on external financing. When the financial cycle turned, however, capital flows quickly reversed. This reflected the incomplete nature of financial integration prior to the crisis—based largely based on short-term debt—and in turn unwound the channels for potential risk sharing within the euro area. A study on risk sharing published in 2008 had found that "monetary union has facilitated risk sharing, although the level of risk sharing is still much below the level found among U.S. states."[13] However, a study using a similar methodology in 2013 found that risk sharing through capital markets had virtually collapsed during the crisis.[14]

With external financing drying up, the catching-up economies faced the risk of a "sudden stop." They therefore had to pursue both fiscal and structural policies aimed at achieving an internal devaluation so as to restore external balance. And they have been rather successful: since 2009 Greece has almost entirely reversed the ULC growth it experienced in the precrisis period, while good progress has also been made in Spain, Ireland, and to a lesser extent Portugal. All the catching-up economies have also experienced remarkable improvements in their current accounts,[15] ranging from an almost 11 percentage points of GDP correction in Spain to a 16 percentage points of GDP improvement in Greece.

However, while internal devaluation may improve the sustainability of the external position, it does not in itself produce sustainable convergence. Indeed, there is a risk that, if ULC adjust mainly due to falling wages and the current account closes, policymakers may lack incentives to address the underlying productivity problem. This may in turn imply that similar imbalances reappear in the future: the experience of exchange rate devaluations in the 1990s suggests that adjusting only through relative costs, without lifting productivity, may not be sustainable. Hence, I see reforms that boost productivity as a cornerstone of a sustainable convergence process—but which reforms?

The Importance of Reallocation

Raising TFP is chiefly a function of innovation, technology adoption and reallocation. Innovation creates new technologies that improve the efficiency of the production process, adoption helps those technologies to become more widespread, and reallocation helps capital and labor concentrate in firms where they can be employed most efficiently.

Public policy can and should contribute to innovation and technological spillovers by raising the quality of human capital and helping incubate research and development, as well creating a business environment that favors entrepreneurship. However, the benefits in terms of productivity tend to be felt over a longer time horizon. There may also be a lag between technology adoption and TFP growth, as optimizing the use of new technologies—in particular information and communication technology—tends to require parallel investment in intangible capital such as management systems and organizational processes.[16] Hence, in the short to medium term, perhaps the most effective role that public policy can play in boosting TFP is to strengthen the conditions for reallocation to sectors that are *already* productive. This is particularly the case in the catching-up economies because, as we saw, weak TFP growth there was in part driven by misallocation of capital inflows.

Recent firm-level analysis from the Eurosystem's Competitiveness Network provides two insights that suggest this could be a promising strategy. The first is that the distribution between the most and least productive firms in individual euro-area countries is very large and skewed. Far from being normally distributed—with many firms centered around the average performance level—there are a few highly productive firms and many that have low productivity. The second insight, which applies in particular to Spain, is that the ULC developments of firms at the bottom and the top of the productivity distribution are dissimilar. While ULC went up sharply before the crisis for unproductive firms, highly productive firms did not experience significant ULC growth.[17]

This implies, first, that there is substantial potential to boost productivity by reallocating resources both across sectors and within sectors toward the most productive firms; and second, that reallocation is not dependent on further ULC adjustment among those firms, as the most productive firms did not experience a significant competitiveness loss. In other words, productivity gains can be realized in the short to medium term independent of necessary longer term processes such as improving innovation or adopting new technology—or indeed, completing internal devaluation. Achieving these gains in the euro area today requires reforms that address both *price signals* and *credit allocation* that hinder the pace of reallocation.

In terms of price signals, I have discussed how before the crisis excessive rents in sheltered sectors distorted profit signals and encouraged capital misallocation. Hence, ensuring that capital now flows toward higher TFP firms must involve deepening the single market and strengthening competitive forces in the nontradable/services sector. Greater competition will also support TFP growth through various static and dynamic channels: a recent empirical study of the impact of competition policy on TFP in 12 OECD countries found a positive and significant effect.[18]

So far, catching-up economies have made notable reforms of framework conditions that increase competition, for example by strengthening competition authorities, reducing administrative burdens on companies, softening authorization requirements, and ensuring a fair public procurement process. However, progress in reducing excessive rents in sheltered goods and services

markets has been less impressive, especially in network industries such as energy, telecommunications and transport. This is partly due to the micro- or sector-specific dimension of the reform needs, which imply confronting vested interests inside a certain sector. Reforms in these sectors are key, not only because they support reallocation, but also because they immediately increase the competitiveness of the tradable sector by reducing often onerous input costs. This could in turn strengthen incentives to raise TFP, as the gains would no longer have to be shared with suppliers of intermediate inputs.

Reallocation of capital needs of course to be accompanied by reallocation of labor, and here price signals are also important. For example, there is some evidence that slower ULC adjustment in the nontradable/services sectors in catching-up economies is discouraging labor from moving to the tradable sector, as wages remain higher in the former. Addressing this distortion across sectors is the rationale for labor market reforms that strengthen the link between wage formation and economic conditions. Reforms in this area are now well advanced.

However, we must also acknowledge that there may be skill mismatches that prevent reallocation—especially for workers previously employed in low-skill sectors such as construction—and these are more challenging to address. At the end of 2012, 18 percent of workers in the euro area with low education levels were unemployed, compared with only 6 percent of highly educated workers. This puts a strong onus on active labor market policies and, over the longer term, raising educational attainment.

Fixing the Financial Sector

Improving price signals in these ways is necessary for reallocation to take place in catching-up economies—but it is not sufficient. For example, in several such countries profit margins in the tradable sector have increased relative to nontradables in recent years, yet these signals have not triggered meaningfully higher investment. Research by the European Commission suggests that financing constraints are an important factor limiting capital reallocation in this direction.[19] Moreover, there is some evidence that weak bank balance sheets have retarded the process of "churn" between firms that drives resource reallocation. One study found that, in the early phase of the crisis, banks that were lowly capitalized were more likely to maintain credit to less creditworthy borrowers—so-called "ever-greening."[20] This type of behavior inhibits firm exits and reduces the availability of credit for new entrants.

Addressing these financing constraints has both a short- and a longer-term dimension. The short-term part concerns dealing with the legacy of the previous financial cycle—that is, repairing bank balance sheets and reintegrating the euro area's financial markets. This is necessary so that capital can once more flow "downhill" from higher-income to lower-income countries, and so that banks in those countries are sufficiently capitalized to be able to allocate credit efficiently. The main policy initiative that will support this is the banking union project and, as part of that, the ECB's Comprehensive Assessment. Its aim is to dispel doubts about asset quality and levels of capital and provisions, and in doing so to accelerate the process of deleveraging and restructuring in the banking sector that is the inevitable consequence of a major financial crisis.

Over the longer term, however, it is important that policymakers also reflect on the *quality* of financial integration in the euro area—that is, the incentive structures in the financial sector that can lead to inefficient credit allocation, and the channels for sharing risk when financial crises do arise. Indeed, one criticism we could perhaps make of Optimal Currency Area theory is that is does not take account of the financial instability that may arise when capital reallocates across regions, both in terms of inflows and outflows. Banking union goes some way toward redressing this, which is why it is essential for the longer-term stability of the euro area.

In terms of improving incentives, the Single Supervisory Mechanism (SSM) should in principle be better placed to prevent credit misallocation as supervision will be decoupled from national economic conditions. The shift toward bail-in ability under the new EU resolution framework should also, over time, increase the quality of scrutiny over allocation decisions by shareholders and creditors. And by removing supervisory barriers to retail banking integration, the SSM should provide the preconditions for greater foreign entry into national banking markets, which research suggests could improve capital allocation by increasing the distance between the main shareholders and management of a bank and the vested interests in the country where the bank operates.[21]

These same factors also provide stronger channels for risk sharing within the euro area. A more integrated retail banking market would imply that losses from local banking crises would be shared across multiple jurisdictions, thus acting as a shock absorber—as we see, for example, in the United States. If such losses were still to erode a bank's capital, the new EU resolution framework would ensure, first, that the costs of bank failure fall mainly on the private sector rather sovereigns; and second, that they are spread evenly across the euro-area banking sector rather than concentrated in the affected countries. The relevant innovations here are the minimum requirements for bail-in before sovereign interventions, and the creation of the Single Resolution Fund for all banks that participate in the SSM.

That said, in my view achieving high-quality financial integration must also involve deepening capital markets in Europe, both to improve the possibilities for market-based debt and equity financing, and to provide further channels for private risk sharing. This obviously goes beyond banking union and will not be straightforward, as it concerns multiple aspects of national law. But there are practical ways in which progress could be made. To give just one example, a Securities Law Directive has not been proposed to date, although it was already recommended in the second report by the Giovannini Group more than 10 years ago (in 2003).[22]

Managing the Financial Cycle

Facilitating the process of resource reallocation should allow TFP convergence to resume in catching-up economies, while the structural reforms being undertaken in these economies should help ensure that efficient resource allocation lasts. However, there is still one question from the precrisis period that I have not addressed: how can we ensure that the convergence process is not again disrupted by the financial cycle? One would hope that a better-supervised and more diversified financial system would have a smoothing effect on the financial cycle. Yet, some academics argue that such is the force of the financial cycle that it is unavoidable that monetary policy will also have

to play a central role in "leaning against the wind." In the euro area, however, the situation is not quite so clear-cut.

The ECB's two-pillar strategy does make financial imbalances an important element of our policy assessment, even when inflation is low. Specifically, the monetary pillar captures the connection between excess credit and liquidity creation and potential risks to future price developments, including disruptive asset price booms. And our medium-term orientation grants us a sufficiently long policy horizon to account for the financial imbalances in our strategy. In this way, it implicitly incorporates elements of a "leaning against the wind" approach.

To quote the ECB *Monthly Bulletin* from April 2005: "[Our] approach amounts to a cautious policy of 'leaning against the wind' of an incipient bubble. The central bank would adopt a somewhat tighter policy stance in the face of an inflating asset market than it would otherwise allow if confronted with a similar macroeconomic outlook under more normal market conditions. It would thus possibly tolerate a certain deviation from its price stability objective in the shorter term in exchange for enhanced prospects of preserving price and economic stability in the future."[23, 24]

Yet, were evidence of financial imbalances to reappear, we would have to reflect carefully on whether standard monetary policy would be the right tool to use in response. This is for two reasons. First, there is some uncertainty as to what interest rate path would be required to prick an emerging credit bubble. Some studies find that in a leverage-driven boom profits are very sensitive to even small interest rate changes, implying monetary policy could provide a powerful offset.[25] However, other evidence suggests that quite large interest rates movements would be needed to offset the financial cycle, which would in turn create collateral damage for the economy and price stability.[26]

Second, there is still heterogeneity between the financial cycles of individual countries within the euro area. While it is true that aggregate euro-area money and credit growth before the crisis was high, that growth was concentrated in specific regions. In the catching-up economies, growth in credit in the precrisis period was 10 percentage points higher than in more productive countries. In such circumstances, it may well be the case that hiking rates at the aggregate level would be too strong a response for regions that are not subject to financial exuberance.

The conclusion I draw from this is that standard monetary policy might be the right response when the financial cycle is rising across sectors and countries. In these circumstances, even if there was collateral damage, it could be justified for a period of time to offset the danger of a much larger risk to price, financial and economic stability in the future. When imbalances are regional or sectoral in nature, however, interest rate policy would seem too blunt a tool. We need more surgical instruments, namely an effective macro-prudential policy framework. For example, tools such as loan-to-value ratios or debt-to-income ratios could be used to limit credit misallocation to nonproductive sectors, without at the same time harming sectors where capital needs to flow.

Conclusion

Let me conclude.

Real economic convergence supports the cohesion and smooth functioning of monetary union. What I have tried to illustrate today, however, is that there are no shortcuts to achieve it—and least of all by riding the upswing of the financial cycle. As Hyman Minsky demonstrated, what goes up must sadly come down.

One way to begin a more sustainable convergence process, in the near term, is through reallocating resources where they are most productive. But the challenge for euro-area countries does not stop there. Raising productivity is a complex process that reaches across the economy and into many different policy domains, be they education, judicial systems, or administrative capacity. Yet we have ageing populations across the euro area, so if we desire to GDP per capita in a sustainable manner, we have no choice but to face this challenge head on.

Thank you for your attention.

Notes

1. I would like to thank Jonathan Yiangou, Neale Kennedy, and Grigor Stoevsky for their contributions to this speech.
2. See European Commission, "The Drivers of Total Factor Productivity in Catching-up Economies," in *Quarterly Report on the Euro Area*, Vol. 13, no. 1, April 2014.
3. See European Commission, "Catching-up Processes in the Euro Area," in *Quarterly Report on the Euro Area*, Vol. 12, no. 1, March 2013.
4. Bourlès et al., "Do Product Market Reforms in Upstream Sectors Curb Productivity Growth? Panel Data Evidence for OECD Countries," NBER Working Paper 16520, November 2010.
5. See *Financial Integration in Europe*, European Central Bank, April 2008.
6. For a detailed exposition of this argument see Rajan, R., and L. Zingales, "Banks and Markets: The Changing Character of European Finance," in V. Gaspar (ed.), *The Transformation of the European Financial System*, European Central Bank, 2003.
7. See, for example, Havik et al., "The EU-US Total Factor Productivity Gap: An Industry Perspective," DG ECFIN Economic Papers 339, September 2008.
8. European Commission, "EMU@10: Successes and Challenges after Ten Years of Economic and Monetary Union," *European Economy* 2, 2008.
9. See, for example, Minsky, H. "Can 'It' Happen Again?," *Essays on Instability and Finance*, M. E. Sharpe, 1982.
10. Drehmann et al., "Characterising the Dinancial Cycle: Don't Lose Sight of the Medium Term!," BIS Working Papers No. 380, June 2012.
11. For a detailed explanation see Borio et al., "Rethinking Potential Output: Embedding Information about the Financial Cycle," BIS Working Papers No. 404, February 2013.
12. The most widely used concepts in applied work are those of β-*convergence* (faster productivity growth, exhibited by countries with lower productivity levels) and σ-*convergence* (decreasing cross-country dispersion in productivity levels).

13. Demyanyk, Y., et al., "Risk Sharing and Portfolio Allocation in EMU," DG ECFIN Economic Papers 334, July 2008.
14. Kalemli-Ozcan, S., et al., "Debt Crises and Risk Sharing: The Role of Markets versus Sovereigns," CEPR Discussion Paper No. 9541, July 2013.
15. Including capital transfers (e.g., EU funds).
16. For an explanation of this phenomenon in the US context, see Bernanke, B., "Productivity," remarks at the C. Peter McColough Roundtable Series on International Economics, January 2005.
17. Di Mauro, F., "Firm-level Data: Who Said that They Are Too Difficult to Use for Policy?," VoxEU, March 11, 2014.
18. Buccirossi et al., "Competition Policy and Productivity Growth: An Empirical Assessment," *The Review of Economics and Statistics*, October 2013, 95(4).
19. European Commission, "Product Market Review 2013: Financing the Real Economy," *European Economy* 8, 2013.
20. Albertazzi, U., and D. J. Marchetti, "Credit Crunch, Flight to Quality and Evergreening: An Analysis of Bank-Firm Relationships after Lehman," working paper, Banca d'Italia, 2010.
21. Giannetti, M., and S. Ongena, "Financial Integration and Firm Performance: Evidence from Foreign Bank Entry in Emerging Markets," *Review of Finance* 13 (2009), 181–223.
22. The Giovannini Group, *Second Report on EU Clearing and Settlement Arrangements*, April 2003.
23. See ECB Monthly Bulletin article on "Asset Price Bubbles and Monetary Policy," April 2005.
24. It should be noted that at the time this article was written, the idea of using monetary policy to prick asset price bubbles was alien to much of the theory and practice of central banking. Indeed, in 2006 former Federal Reserve Governor Don Kohn argued that only if the likelihood and risks of bubbles could be accurately identified would early intervention by central banks be superior to cleaning up after the bust, adding that "for my part, I am dubious that any central banker knows enough about the economy to overcome these hurdles" (see Kohn, D., "Monetary Policy and Asset Prices," speech at the European Central Bank Colloquium held in honor of Otmar Issing, March 16, 2006). However, that view has now largely changed across the central banking community. In particular, the importance of financial stability for price stability is now self-evident after the crisis, and most central bankers agree that for certain types of financial imbalances monetary policy may be the only tool that is sufficiently broad-based and powerful.
25. See, for example, Adrian, T., and H.-S. Shin, "The Changing Nature of Financial Intermediation and the Financial Crisis of 2007–09," Federal Reserve Bank of New York Staff Reports No. 439, March 2010.
26. See, for example, Bean, C., et al., "Monetary Policy after the Fall," in *Macroeconomic Challenges: The Decade Ahead*, Federal Reserve Bank of Kansas City, 2011.

JASON FURMAN

Chairman, Council of Economic Advisers, Executive Office of the President

Is the Great Moderation Coming Back?

Thank you so much for inviting me here today.

It is appropriate to use the occasion of the 23rd Annual Hyman Minsky Conference to discuss the topic of economic fluctuations, how they have evolved over time, and what we can and should do about them.

In the late 1990s, economists began a debate over what was termed the "Great Moderation," which refers to the reduction in the volatility of a wide range of economic variables, and to the associated increase in the longevity of economic expansions and reduction in the frequency and severity of economic contractions.[1] The debate was not over whether or not there was a Great Moderation—on the heels of the longest economic expansion in American history it was generally agreed that the fact was real, and the relatively mild recession in 2001 only further strengthened the belief. Instead the debate was over what caused it. Was it better monetary or fiscal policy? Or improved inventory management? Or expansions in consumer credit? Or just good luck?

The debate over the causes of the Great Moderation ended abruptly with the onset of the Great Recession in late 2007. With the worst economic crisis of our lifetimes still fresh in our minds, it shows little prospect of restarting anytime soon.[2] If anything, the media appears to have become increasingly sensitive to day-to-day fluctuations in the stream of economic data reports. It is easy to remember a lot of the recent volatility, whether it is the S&P 500 rising more than 1 percent after the initial estimate of fourth-quarter GDP growth came in above expectations this past January, or falling 2 percent just a week later, attributed to news of a large drop in the new orders subcomponent of the ISM manufacturing index.

In the wake of the Great Recession, it is worth reassessing the Great Moderation hypothesis and understanding what it means for policy going forward. Was the Great Moderation hypothesis spectacularly wrong, and did researchers miss the fact that the economy was increasingly unstable? After all, in addition to the Great Recession in the United States, we have also seen a number of serious banking and exchange rate crises in countries around the world over the last few decades. On the other hand, a number of key data series have exhibited a high degree of consistency and stability since the recovery began in mid-2009, and we are now two months away from what would be the longest streak of private-sector job growth on record. Is there a sense in which the Great Moderation has continued or returned? Even if we still see low volatility in the summary statistics we use to assess the Great Moderation, does this tell us something meaningful about the economy, or does it tell us more about the shortcomings of these summary statistics themselves?

In my remarks today, I will first explore what the original results on the Great Moderation look like with an additional 10 to 15 years of data, including the Great Recession.[3] I will also use these data to explore whether the factors that led economists to identify a Great Moderation are still present in the economy today, and whether the additional data affect our view of these factors. Second, I will sketch out some major problems with the Great Moderation hypothesis that have been highlighted by the Great Recession. Third, I will talk about why economic stability matters. I will end with a brief outline of the unfinished agenda to promote macroeconomic stabilization, focusing on areas outside of monetary policy that play an important but sometimes underappreciated role in fostering macroeconomic stability.

The President's economic agenda is focused on returning the economy more quickly to its full potential, expanding that potential growth over time, and ensuring that everyone shares in that economic growth. Putting in place steps that would reduce the likelihood of recessions, reduce their severity when they do occur, and better protect people from their consequences, would help advance all of these goals. Looking at how volatility has changed over time will help improve our understanding of the steps we need to take.

The Great Moderation in Normal Times

To start, I am going to take the previous definitions of the Great Moderation as given and ask whether or not it has continued based on those definitions. As I discuss in the next section, I believe that this exercise may tell us as much about the limitation of these measures as it does about actual

Figure 1a Five-year Rolling Standard Deviation of Quarterly Real GDP Growth

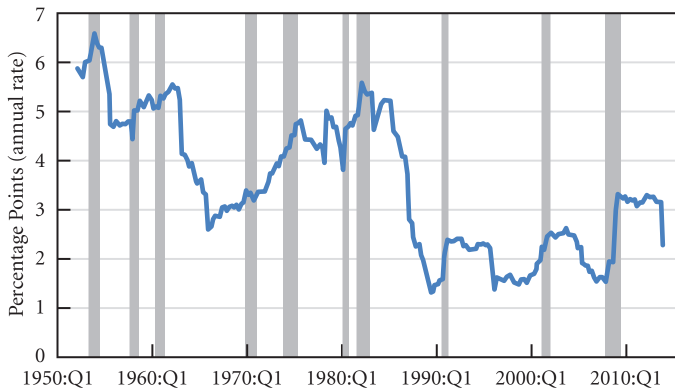


Figure 1b Five-year Rolling Standard Deviation of Quarterly Real GDP Growth, Comparison of G7 Countries

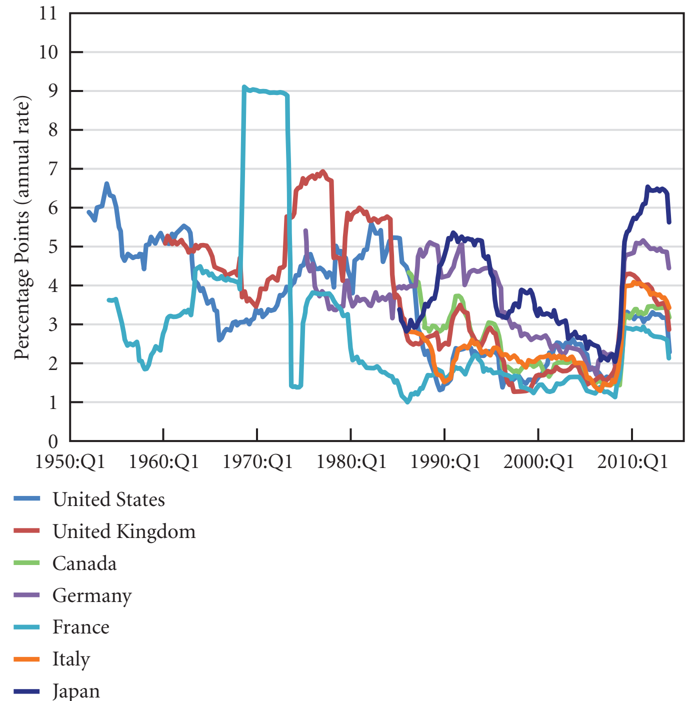


Table 1 **Mean and Standard Deviation of Four-Quarter Real GDP Growth**

Period	Arithmetic Mean (Percent)	Standard Deviation (Percentage Points)
Full Sample (1960-2013)	3.1	2.3
1960s	4.5	2.0
1970s	3.2	2.7
1980s	3.1	2.7
1990s	3.2	1.5
2000-2013	1.9	1.9

structural trends in the economy. With that said, Figure 1a shows the volatility of output growth in the United States, measured by a 20-quarter rolling standard deviation of quarterly real GDP growth.[4] This figure was used by Olivier Blanchard, now the chief economist of the International Monetary Fund (IMF), and John Simon to motivate their 2001 study in the Brookings Papers on Economic Activity. This particular measure of volatility increased sharply in the Great Recession, but still remained below where it had been for most of the 1950s through the mid-1980s. Moreover, this measure of volatility has now fallen back to the levels during the canonical "Great Moderation" period from the mid-1980s through 2007. This pattern is similar to that of other advanced economies in recent decades, as shown in Figure 1b.

Another look at output volatility is provided by Table 1, which shows the mean and standard deviation of four-quarter GDP growth rates by decade. A version of this table initially appeared in a 2003 NBER Macroeconomics Annual paper written by Jim Stock, currently my colleague on the Council of Economic Advisers, and Mark Watson. This table shows a similar pattern, with a slight increase in volatility in the 2000–13 period reflecting the Great Recession, but overall volatility still appears to be at a lower level than in the past.

Finally, comparing periods of economic expansions, we see that the general trend has been toward more consistent and less volatile recoveries. As shown in [Figures 2a and 2b], the standard deviation of quarterly GDP or monthly job growth is generally consistent with the pattern in the last two economic expansions, and well below the levels of volatility in earlier expansion periods. This fact is worth remembering the next time we are struck by a jobs report that comes in 50,000 above or below recent trends—this type of month-to-month noise is standard and if anything diminished from the typical fluctuations we experienced in the past.

These various figures suggest that the features of the time series data that economists described as the Great Moderation have continued. But it still leaves open the question of whether the forces that produced less volatility pre-2007 have always been present, went away but have returned, or if new forces are at work. Just what were those forces that helped produce what was originally called the Great Moderation, and has another decade of data shed any more light on the debate? I will describe a few tentative conclusions here, recognizing that I am relying on relatively simple econometrics, considering data for only a relatively short period in some cases, and using a period that includes a very significant outlier event.

Figure 2a **Standard Deviation of Quarterly Real GDP Growth during Expansion Periods**

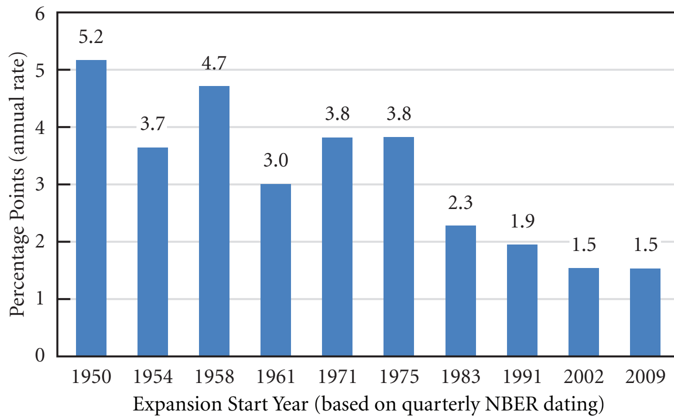
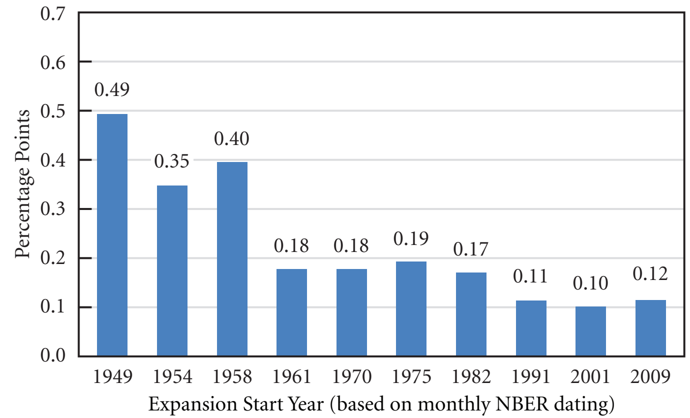


Figure 2b **Standard Deviation of Monthly Nonfarm Employment Growth during Expansion Periods**



Is the Great Moderation due to reduced shocks or reduced propagation of these shocks?

The explanations originally offered for the Great Moderation were often summarized as good luck (i.e., fewer shocks), good policy (i.e., better ability to offset the shocks), or good structural changes (i.e., changes to features of the economy, like improved inventory management or composition shifts to less-volatile industries).

I would like to return to a key stylized fact that emerged in the literature, which is that the reduced variance of key macroeconomic data was associated with reductions in the volatility of the estimation errors in a time series model. To the extent these estimation errors are interpreted as "shocks," declining output volatility would reflect less volatile or less frequent "shocks," rather than a change in how the estimation errors, or shocks, are propagated through the economy over time. Another decade of data generally confirms and strengthens this original stylized fact. To illustrate this point, I update the simplest formulation of the stylized fact from Blanchard and Simon, estimating an equation that relates deviations in output growth from its trend to the first lagged deviation of output growth and a white noise shock term.[5] Specifically, I estimate an equation of the form:

$$(\Delta yt - g) = a(\Delta yt\text{-}1 - g) + et$$

where y represents log output, g is the trend growth rate, a is a parameter that captures the persistence of output growth, and e is a white-noise error term with variance σ.

In this formulation, a can be said to capture the underlying structure of the economy, while σ captures the nature of the shocks. If $a = 0$, then the volatility of output growth will exactly mirror the volatility of the underlying shocks. As a rises toward one, the total volatility of growth increasingly reflects some feature of the economy that makes shocks more persistent from one period to the next. Higher values of a indicate greater volatility, because growth depends not just on the shock in the given year, but also on a compounding process that incorporates a weighted average of all the previous shocks as well.

Figure 3a AR(1) Coefficient (α)

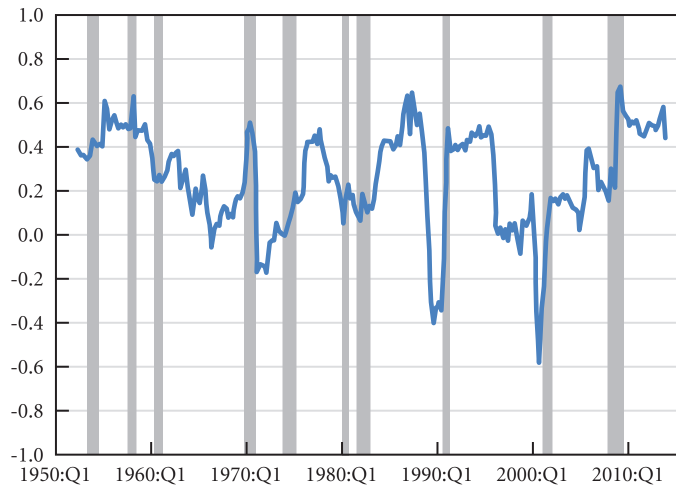
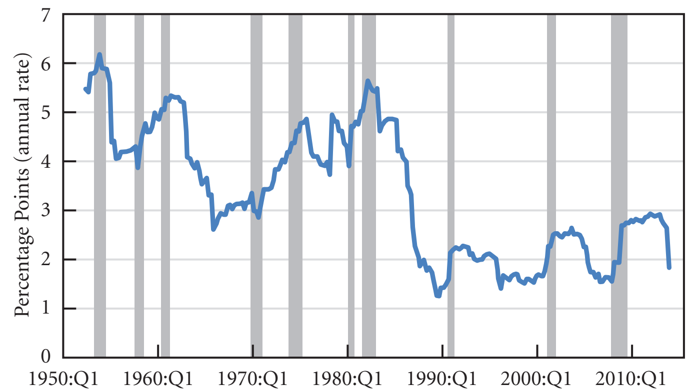


Figure 3b Standard Deviation of Residuals (σ)



The econometric estimates for rolling 20-quarter estimates of the parameters *a* and σ are shown in Figures 3a and 3b. If anything, shocks appear to have become more persistent over the last decade—which by itself would actually increase overall volatility. Rather, consistent with the earlier results, the moderation in output volatility is driven by the reduction in the variance of the shocks themselves, which has greatly diminished over time and now stand around the same level as its postwar lows.

What is the source of the reduced shocks?

By itself, this univariate approach says nothing about the source of the reduction in the volatility of shocks, since the error terms are by definition unexplained by the model. Stock and Watson (2003) generalize this approach to a multivariate vector autoregression using data through 2001, allowing their model to parse out specific shocks. They conclude that "the moderation in volatility is attributable to a combination of improved policy (10–25%), identifiable good luck in the form of productivity and commodity price shocks (20–30%), and other, unknown forms of good luck that manifest themselves as smaller reduced-form forecast errors (40–60%)."

One should be careful in interpreting these sorts of results—and Stock and Watson themselves offer a number of caveats to their analysis. The so-called "shocks" in this model are not necessarily truly independent from the structure of the economy itself; instead they are errors in the structure that was assumed in the model. Some of these errors may represent genuine good or bad luck in the economic draw. But they likely represent much more than that.

As Ben Bernanke (2004) pointed out, more predictable monetary policy could lead to smaller measured "shocks" for a range of reasons, including fewer monetary disturbances and more anchored inflation expectations, as well as changes in wage and price setting institutions. To help illustrate this point, Bernanke cited work showing that seemingly exogenous "shocks" to oil prices in the 1970s could be in part traced to earlier monetary policy decisions. He also cited a series of papers showing that stable inflation expectations reduce the impact of exchange rate fluctuations.

To the extent this factor contributes to smaller and less volatile shocks in an econometric model, we certainly would not want to attribute it solely to "good luck."

Finally, in spite of the econometric evidence, I do have some concern at an intuitive level about the view that the current expansion has been less volatile because of smaller and less frequent shocks. In actuality, we have seen a long list of shocks. This list includes international events like the European sovereign debt crisis, the tsunami and nuclear accident in Japan, and the disruption of Libya's oil supply. It includes extreme weather like Hurricane Sandy and the 2012 drought that was described by the USDA as the "most severe and extensive drought in at least 25 years."[6] And, of course, it includes an unnecessary and unprecedented degree of brinksmanship in Congress' handling of federal fiscal policy, culminating in the 16-day shutdown last October.

One view is that, when examined systematically these shocks are not as large as we may have intuitively thought—that may be possible. But it is also certainly possible that our econometric models are failing to capture more subtle ways in which the structure of the economy has become more stable over time, the policy response to the crisis helped to preemptively mitigate subsequent shocks, or that a series of roughly equal-sized negative shocks will show up in the trend growth term rather than in the residual.

Does the improved inventory management hypothesis hold up?

Another decade of data calls into question one of the original explanations of the Great Moderation: improved inventory management.[7] These data should be taken cautiously because they cover only a short period of time; nevertheless, they are suggestive. Table 2, which is based on analysis originally in Kahn, McConnell, and Perez-Quiros (2002), decomposes the variance of goods output into three pieces: the variance of sales, the variance of the change in inventories, and the covariance of sales and inventories. From 1960 to 1984, inventories were quite volatile, and were also procyclical, meaning that when sales increased, inventories also increased, further contributing to the volatility of production.

Table 2 **Decomposition of Variance of Goods Output**

Component	1960–1983	1984–2007	2008–2013	% of Great Moderation decline	% of post 2008 Increase	09: Q2-13: Q4 excl. recession
Goods						
var (output)	13.0	2.3	5.6			1.9
var (sales)	4.8	2.1	2.6	25%	16%	0.5
var (inventories)	7.3	2.4	2.5	46%	2%	2.6
2* cov (sales, inventories)	0.9	-2.2	0.5	29%	82%	-1.2
Durable Goods						
var (output)	9.3	1.5	2.7			0.4
var (sales)	3.2	1.7	1.2	19%	-37%	0.2
var (inventories)	4.3	1.7	1.1	34%	-42%	0.7
2* cov (sales, inventories)	1.8	-1.9	0.3	46%	180%	-0.5

During the post-1984 Great Moderation period, inventory investment itself became much less volatile, and the previous relationship between inventories and sales reversed, so that the two became negatively correlated. Focusing specifically on durable goods, the change in the covariance between inventories and sales accounts for nearly half of the decline in the variance in durable goods output. However, including the Great Recession, it appears that the relationship between output, sales and inventories partially reverted to the pre–Great Moderation pattern. The covariance of inventories and sales turned positive again, suggesting that improved inventory management was not enough to cushion the massive blow of the Great Recession, and in fact exacerbated it. Focusing just on durable goods again, the change in the covariance between inventories and sales accounts for all of the increase in durable goods output volatility we have seen since 2008.

Even looking just at the recovery period since mid-2009 and excluding the Great Recession, the covariance of sales and inventories is much less negative than it was in the original Great Moderation period, suggesting that inventories are doing less to stabilize output than they once were. Of course, more analysis and more time will be needed to come to a definitive answer on this question.

However, I should note that even before the Great Recession, there were serious challenges being posed to the inventory management hypothesis. One of the main challenges drew heavily on data from the automotive sector, showing that one did not need to rely on improved inventory management to explain the reduction in output volatility observed in that industry (Vine and Ramey 2006). Later on, when I return to talk about stabilization policy, I will say a bit more about the volatility of the automotive sector and the President's decision to rescue the auto industry.

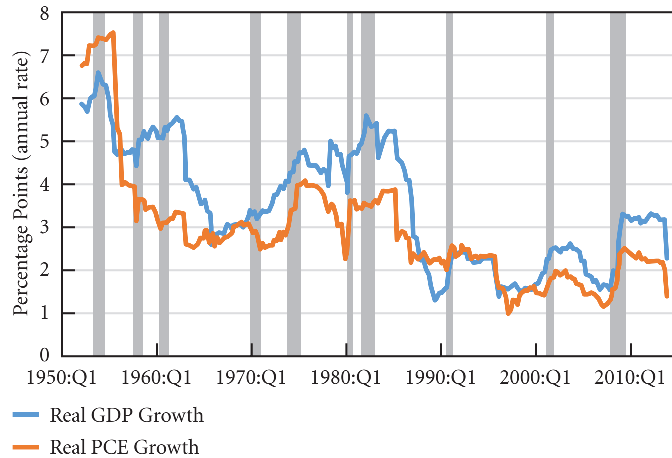
What role has financial innovation played?

Disaggregating the GDP data, the reduced volatility of consumption is one of the major sources of the Great Moderation—and this reduced volatility has continued to hold up during and after the Great Recession, especially in consumer durables. The continued stability in consumption stands in contrast to other components of GDP like business fixed investment, which became less volatile during the initial Great Moderation but has since at least partially reverted to its earlier volatility.

Reduced consumption volatility originally led Doug Elmendorf, now Director of the Congressional Budget Office (CBO), Karen Dynan, now a senior Treasury official, and Dan Sichel (2006) to posit that financial innovation had made it easier for households to borrow and smooth consumption, thereby contributing to the Great Moderation. This possibility was initially raised by Brad DeLong and Larry Summers (1986), who considered data from 1899 to1982 and found that a smaller share of consumption in the postwar period was accounted for by liquidity-constrained consumers, leading them to argue that, in addition to more robust automatic stabilizers, financial intermediation may have contributed to the moderation in consumption.[8]

The Great Recession, however, showed that financial innovation also makes it possible to create and magnify a shock that can lead to a large downturn in economic activity. So first and foremost, we have to acknowledge that the financial innovation hypothesis can appear to be true in normal times even as the practices it identifies are increasing the chances of greater instability in the future. In a later paper, Dynan (2009) argued that while the decades leading up to the mid-1990s saw a

Figure 4 **Five-year Rolling Standard Deviation of Quarterly Real GDP and PCE Growth**



gradual rise in indebtedness that was likely a net positive for households and economic stability, the same cannot be said of the sharper increase in debt that occurred from the mid-1990s until 2007.

In the aftermath of the Great Recession, it is clear that consumers in the aggregate have massively reduced their credit card debt, and cash-out refinancings have fallen substantially. If the original Dynan, Elmendorf, and Sichel (2006) hypothesis was correct, then we would expect to have seen aggregate consumption become noticeably more volatile over the last several years, as households have had less opportunity to use credit to smooth consumption. However, this does not appear to be the case. Figure 4 presents the 20-quarter rolling standard deviation of quarterly real GDP growth that was in Figure 1, along with the same metric for real consumption growth. Puzzlingly, the rise in consumption volatility during and after the Great Recession appears quite muted, both relative to its own historical levels, and to the rise in the volatility of overall GDP growth. But in a period of tight credit conditions, what, then, could explain such relative stability in consumption? This is potentially a very interesting question for future research.

Redefining Moderation: The Importance of Tail Events

Looking at the metrics that were originally used to establish the "Great Moderation" it would seem that, while the economy continues to exhibit substantial month-to-month and year-to-year fluctuations, the volatility of a number of key series have actually returned to—and perhaps even extended—the previous moderation. This suggests that many of the same forces we were discussing prior to 2008 could still be present and stabilizing the economy, with some of the caveats I just discussed.

In this vein, the Great Recession did not outright refute the Great Moderation hypothesis as it was originally proposed. But, the Great Recession certainly does reveal serious limitations of the concept of a Great Moderation. After all, there is no sense in which the recession itself—which witnessed the largest peak-to-trough downturn in GDP on record—was indicative of a more stable economy than in the 1950s or 1960s.

Figure 5a **Absolute Deviation of One-year GDP Growth from Its Full-sample Average**

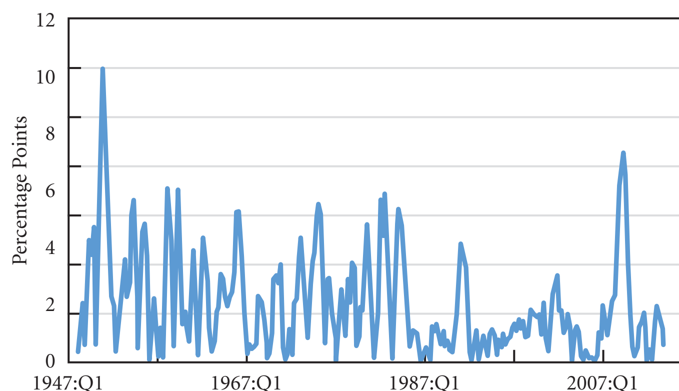
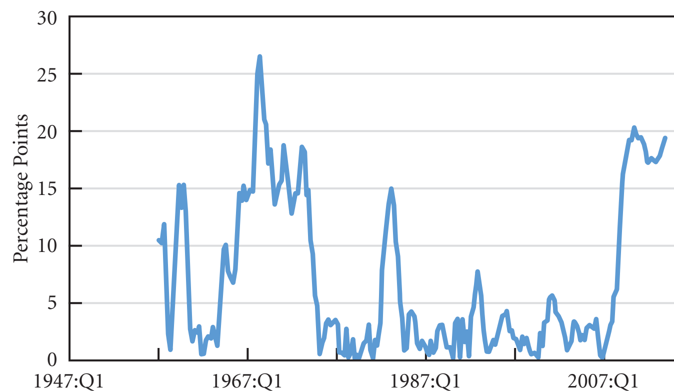


Figure 5b **Absolute Deviation of Ten-year GDP Growth from Its Full-sample Average**



The issue is that the statistics shown in Figure 1 and Table 1 and predominately used in the previous literature are for fluctuations at a quarterly or annual frequency. But these can gloss over lower-frequency events that are the major concern of macroeconomic stabilization, particularly the larger and more persistent tail events that risk reducing us to a lower path of growth and were the focus of Minsky's work. And the Great Recession was, of course, the largest and longest downturn we have had in eighty years.

One way of conveying this distinction is to update two graphs from Bob Hall's (2003) comment on the Stock and Watson paper. Figure 5a shows the volatility of one-year changes in GDP, as measured by the absolute difference between the one-year real GDP growth and its long-term average. Like the results above, it spiked up during the Great Recession but has since come back down and exhibits the very muted pattern characteristic of the last several recoveries, as growth after the downturn has recently remained close to the long-term average. But looking at the absolute deviation of 10-year GDP growth from its long-term average, Figure 5b shows a very different picture—depicting a tremendous and sustained increase in volatility exceeding the most volatile point just before the Great Moderation. It can be somewhat counterintuitive to think of "volatility" in a 10-year change, but that is precisely what we are seeing right now, even in the recovery.

It is much harder to make statistical inferences about rare events, especially when the structure of the economy and policy itself is changing—and changing in part because of policy responses to these rare events like the Dodd-Frank Wall Street Reform Act, which I will discuss later. That said, based on recent experience it would be foolish to be complacent and fully assume that in the deeper, lower frequency sense there ever was a genuine "Great Moderation," let alone that it has returned and renders further policy steps unnecessary. But before discussing the unfinished policy agenda for macroeconomic stabilization, let me briefly describe why macroeconomic stability is so important.

Why Moderation Matters

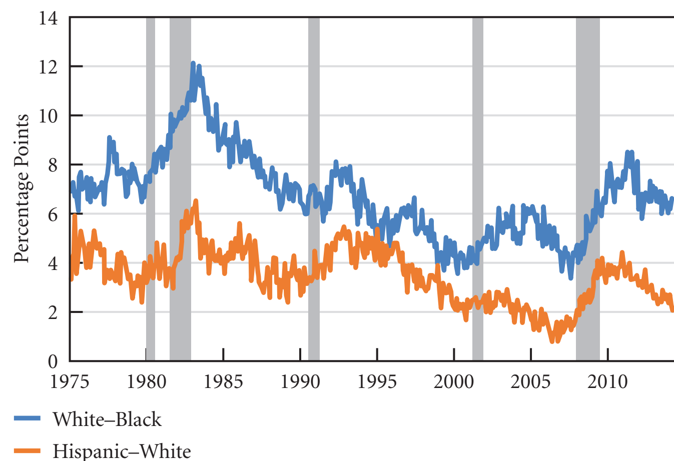
The proposition that large fluctuations in output are problematic and worth addressing should not be controversial. In some academic circles, however, a number of theories have been advanced that question this premise. These theories have real-world analogues, playing into arguments against macroeconomic stabilization policies. For this reason it is worth briefly discussing some of the main arguments.

The first objection to stabilization policy is that output fluctuations are optimal or nearly irrelevant. The stronger version of this view is real business cycle theory, which posits that fluctuations are optimal responses to productivity and taste shocks,[9] an idea that flies in the face of the patently suboptimal results that are recessions. Some of the more extreme policy implications of this view are generally not taken as seriously anymore, even in freshwater circles, which often accept that a variety of market or government imperfections allow for the possibility of suboptimal equilibria.

The weaker version of this view is associated with Robert Lucas (1987, 2003), who undertook a calibration exercise showing that assuming perfect insurance and a particular utility function, then a person would only be willing to give up less than 0.1 percent of his or her lifetime consumption to avoid volatility in consumption generated by aggregate economic fluctuations. A number of responses have been made to this claim, including technical objections to Lucas's assumption about the degree of risk aversion people exhibit, as well as a recalibration of the same exercise that recognizes the possibility of rare disasters.[10]

But one of the most fundamental issues with Lucas's calculation is that it assumes a representative agent (or equivalently perfect insurance), so that in his model a downturn means that everyone is consuming 5 percent less—not that 5 percent of the people lose their jobs, their earnings power, and thus see a much larger hit to their consumption. As a number of researchers have pointed out, people would pay a lot more to avoid this risk.[11] Moreover, this risk is not spread identically across the economy because downturns disproportionately hurt the most vulnerable groups. Figure 6 shows the well-known pattern of black and Hispanic unemployment rates rising much higher than white unemployment rates in recessions and falling back slowly in recoveries, albeit with a persistent gap.

Figure 6 Gap between Black–White and Hispanic–White Unemployment Rates



The second objection to stabilization policy is that output fluctuations are actually supportive of future growth—as Joseph Schumpeter (1934) famously noted, "[Recessions] are but temporary. They are the means to reconstruct each time the economic system on a more efficient plan." In other words, the relative return of productive activities to productivity-enhancing activities falls in a recession, increasing the return to the latter and thus fostering more innovation. Theory and evidence, however, suggest the opposite is true. As Garey Ramey and Valerie Ramey (1991) argued in an early reply to Lucas, higher volatility can be harmful for growth because increased uncertainty reduces investment, especially when firms must commit in advance to a certain scale of production. On a similar note, Barlevy (2007) shows that even though it might be rational to devote more resources to research and development (R&D) during a downturn when sales are lower, the empirical fact is that R&D activity is procyclical, which compounds the cost of negative macroeconomic shocks. Moreover, the relationship between growth and volatility is much more nuanced than the original Schumpeterian formulation allows for. Research by Philippe Aghion and others, for example, has linked long-run growth with credit constraints, cyclical fiscal policy, and exchange rates, all of which are used to attempt to account for the observed inconsistency between Schumpeter's claim and the observed behavior of countries and industries.[12]

DeLong and Summers (1988) also pointed out that stabilization policy is not symmetric; rather, it means that the economy spends less time operating well below potential and thus increases average output. This observation is also another flaw in Lucas's calculation of the welfare cost of business cycle fluctuations, which assumed that fluctuations had no impact on the average level of output.

Finally, a third objection to stabilization policy is that even if fluctuations are undesirable for distributional reasons and harmful (or neutral) for growth, there is still nothing we can do about them. This view goes back at least to President Herbert Hoover, was formalized by Milton Friedman (1953), and has unfortunately been the theory most often advanced against efforts to combat the Great Recession.[13] While this general set of ideas was a useful caution against attempts to fine-tune the economy in more normal times, it is a potentially dangerous perspective when the economy is clearly operating below potential and, despite progress, will be operating below potential for a sustained period of time.

In fact, I believe policymakers have and can continue to do something about economic fluctuations. The next section discusses some of the progress and unfinished business in that area.

The Unfinished Agenda for Economic Stability

Improvements in monetary and fiscal policy have likely contributed to the patterns in the high-frequency data originally identified as the Great Moderation, although one could debate the share of the credit they deserve. I believe policy steps have also played a critical role at lower frequencies as well, with the best example being the Great Recession itself, which in many ways started off looking like it could be as bad or worse than the Great Depression. To appreciate this point, consider that the plunge in stock prices in late 2008 proved similar to what occurred in late 1929, but was compounded by sharper home price declines, ultimately leading to a drop in overall household wealth that was substantially greater than the loss in wealth at the outset of the Great Depression

(Romer 2009). The crisis had global reverberations, and world trade volumes fell even more sharply from mid-2008 to mid-2009 than they did in the early stages of the Great Depression (Almunia et al. 2010). Moreover, Alan Greenspan (2013) has argued that short-term credit markets froze more severely in 2008 than in 1929, and to find a comparable episode in this regard one has to go back to the panic of 1907. However, in large part because of an aggressive policy response, the unemployment rate increased five percentage points, compared to a more than 20 percentage point increase in the Great Depression from 1929 to 1934. And real GDP per working age population returned to its prerecession peak more quickly in the United States than in other countries that also experienced systemic crises in 2007–08.

And it was not just fiscal and monetary policies that made a difference: the rescue of the automobile industry is an important part of the story in both preventing a second Great Depression and in increasing overall economic stability in the recovery. Before the recession, Vine and Ramey (2006) pointed out that since the 1960s, motor vehicle production accounted for almost 25 percent of the variance of aggregate GDP growth, even though motor vehicle production represented less than 5 percent of GDP on average. One implication of this striking fact is that a more stable auto sector can go a long way toward stabilizing the overall economy, and that is exactly what we have seen in the recovery. Looking since mid-2009, the variance of real GDP growth increases by nearly a quarter if you exclude the motor vehicle sector—that is to say, the auto sector has actually reduced economic volatility.

Nevertheless, significant hardship has been caused by the Great Recession, and despite steady progress, it continues to linger today. Much of the response to the Great Recession was necessarily ad hoc and improvised, with policymakers being forced to develop unprecedented new tools and approaches to address an unprecedented situation. As the economy continues to heal, now is the time to continue working on what can be done to put us in a better position to prevent or respond to future downturns. We have made progress in fostering macroeconomic stability, but there is a great deal of unfinished business.

Discussions about improving macroeconomic stability have often centered on monetary policy, both on questions of alternative rules and the way it is implemented in practice. I will not have anything to say about monetary policy, not because it is unimportant but because it is a topic that I am institutionally and appropriately precluded from commenting on. Moreover, in focusing nearly exclusively on monetary policy, some of the discussions of macroeconomic stabilization have underemphasized a number of other areas that are also important. I will focus on four of these areas. I should note that for some of the areas I will discuss, macroeconomic stability is not the primary purpose—for instance, we also care about seeing the economy grow faster, and about ensuring that growth is broadly shared. Nevertheless, my hope is that considering some of the policies through the lens of macroeconomic stability can shed light on some of their underappreciated benefits and in some cases affect how we think about designing the policies themselves.

Improving Fiscal Stabilizers—From the Affordable Care Act to Broader Fiscal Policies

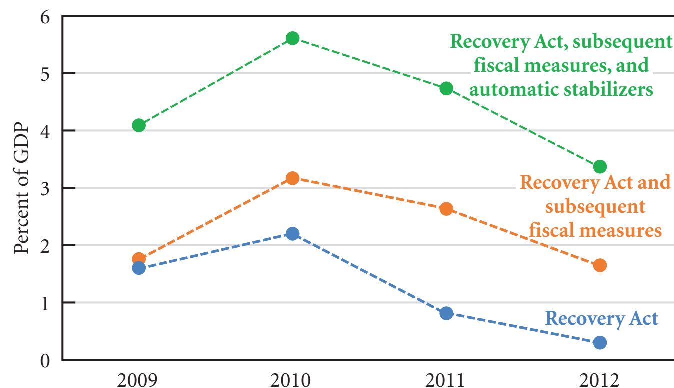
Many economists have a long-standing skepticism of discretionary countercyclical fiscal policy, citing recognition lags, implementation lags, impact lags, and political constraints (e.g., Taylor 2000). A more widely but still not universally accepted exception is when monetary policy is constrained at the zero lower bound and the output gap is large and persistent. In this context, the usual lags are not an objection to discretionary fiscal policy and the multiplier may be larger (e.g., DeLong and Summers 2012). Moreover, by preventing permanent damage to the economy's growth path and investing in things like infrastructure that enhance long-run growth, discretionary fiscal policy can in certain macroeconomic environments largely pay for itself. In the current cycle, the evidence suggests that discretionary fiscal policy played a critical role in helping stabilize the economy more quickly than normal following a systemic financial crisis (Council of Economic Advisers 2014). But as shown in Figure 7, automatic stabilizers also played a quantitatively important role, representing about half of the fiscal expansion from 2009 through 2012.

The Administration has meaningfully strengthened the automatic stabilizers in the last several years. The Affordable Care Act (ACA) is not normally thought of as a countercyclical macroeconomic policy, but it is. The combination of progressive tax credits and the Medicaid expansion will significantly help households smooth consumption and will expand aggregate demand when it would otherwise be impaired. Although macroeconomic stabilization was not the goal of the ACA, its benefits in that regard are not an accident either. In general, policies that strengthen social insurance, helping people when their incomes are lower, will also have a broader macroeconomic benefit in the form of increased stability. In that vein, the additional progressivity in the tax code we have implemented—including expanded refundable tax credits for lower-income households and higher tax rates for high-income households—also contribute to automatic stabilization.

Going forward it is worth exploring whether there are further steps that would expand automatic stabilizers, and strengthen the countercyclical features of other key programs, including means-tested programs.

Additionally, as we think about the significant challenge of elevated long-term unemployment today, these types of steps to enhance the automatic stabilizers would help prevent more individuals from experiencing extended spells of unemployment, and to the degree we cannot prevent it,

Figure 7 **Fiscal Expansion from 2009 to 2012**



we should provide them with support as they continue to look for jobs. That particular priority is especially important today, as the House of Representatives now has the opportunity act on the Senate-passed bill that would reinstate extended unemployment insurance benefits for the more than two million people who have seen their benefits expire since the beginning of the year as they continue to look for jobs.

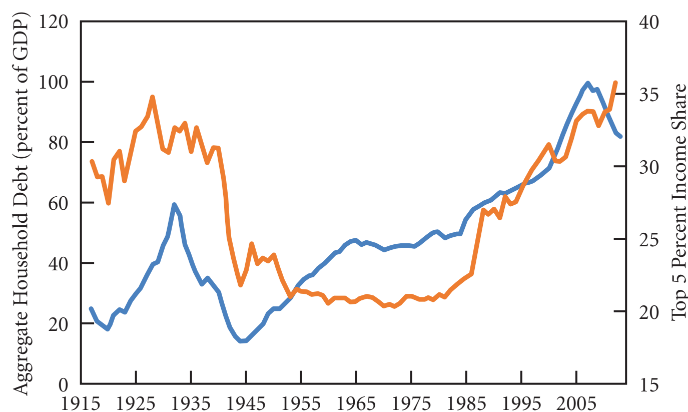
Reducing Inequality as a Macroeconomic Stability Measure

One of the major frontiers for researchers is to develop a better understanding of the link between macroeconomic performance and inequality. Economists at the IMF have identified a link in cross-country data between lower inequality and longer periods of growth (Berg and Ostry 2011), generalizing a story that Raghuram Rajan (2010) told in his book *Fault Lines*. Other IMF work has shown that steps taken to reduce inequality are in and of themselves generally benign with respect to growth, and in fact are progrowth when their inequality-reducing effects are taken into account (Ostry, Berg, and Tsangarides 2014). But we still have a lot more to learn in this area.

Looking at the United States over the last several years, the challenge right now is not to stabilize consumption—it has actually been quite stable since the recession—but to strengthen it. And one way to do that is to boost incomes for lower-income households, which have a higher marginal propensity to consume on average. The Administration has proposed a range of measures, from short-run steps like raising the minimum wage, to longer-run proposals like expanding access to preschool, that ultimately seek to grow wages and expand economic opportunity for low-income households. But even as the current focus remains on strengthening rather than stabilizing consumption, we should not lose sight of the fact that these sorts of actions can also have a stabilizing effect. Rising incomes put households in a better position to build financial assets that they can use to smooth consumption in the face of unexpected disruptions to their income, helping to prevent borrowing bubbles, while at the same time creating a broader, more stable foundation for aggregate consumer spending growth.

Drawing on another IMF study (Kumhof, Ranciere, and Winant 2013), Figure 8 presents the aggregate household debt-to-GDP ratio for the US economy, and the share of income going to the

Figure 8 **Top 5 Percent Income Share and Aggregate Debt-to-GDP Ratio**



top 5 percent of earners.[14] While I concede that this picture vastly oversimplifies an incredibly complex web of economic issues, it is striking that the run-ups to two high points in income inequality were matched by run-ups in household debt. While this does not establish anything causal, it does highlight the importance of continuing to think about the link between inequality and macroeconomic stabilization.

Improving Financial Stability—And the Unfinished Business of Housing Finance Reform

The Great Recession was caused by a financial crisis that had many dimensions, including overborrowing by households, risky securities, undercapitalized banks, and runs on key markets. The Dodd-Frank Wall Street Reform and Consumer Protection Act and complementary reforms are designed to provide multiple firewalls against future financial crises, including reducing chances to make systemic errors through better consumer protections, limits on certain risky activities, and systemic oversight; reducing the risk that bad decisions would lead to the failure of a bank through higher capital standards; reducing the risk that a bank failure would be a systemic event through better resolution mechanisms; and ultimately ensuring that no matter what happens taxpayers will not be on the hook for bailouts.

The most important piece of unfinished business in the financial arena is housing finance reform. There is no doubt that the housing system contributed to the financial crisis. And while placing Fannie Mae and Freddie Mac in conservatorship and infusing them with liquidity in the midst of the Great Recession has helped to foster a housing recovery, further progress will best be served by moving forward with a system that puts private capital at risk, protects homeowners, creates a vibrant competitive marketplace, and includes transparent support for broader homeownership.

In addition to all of these goals, one critical and sometimes underappreciated goal of a reformed system is that it should enhance macroeconomic stability. The residential sector has historically been one of the most cyclically volatile, and, as was acutely felt in the Great Recession, this volatility can take a severe toll on all Americans homeowners but especially those middle-income families that have a disproportionate share of wealth in their homes. Housing finance reform can thus play a critical role by providing both a structure that makes housing finance, and in turn the housing sector, more cyclically resilient, and also providing a mechanism that helps lean against the wind of the worst downturns in housing.

The motivation behind cyclical resilience is straightforward: even if the economy is in a downturn, and even if there are disruptions to financial markets, the housing finance system should still continue providing reasonably priced mortgages to creditworthy borrowers. Instead, even to this day, roughly five years after the Great Recession, lending standards remain tight and many creditworthy borrowers are still unable to get a mortgage. The natural cyclical volatility of housing should not continue abetted by financial market failures that stifle lending in the mortgage market.

Encouraging cyclical resilience means ensuring that the structural pipelines through which credit flows from the secondary market to mortgage originators are exposed to limited credit risk. It also means setting up an institutional structure in which the federal government can expand

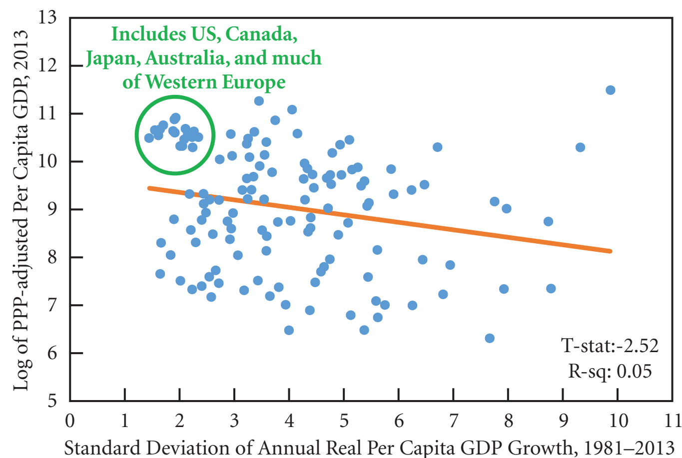
quickly in the event of a financial market disruption or economic downturn from its ideally remote position to one that temporarily ensures funds keep flowing to qualified borrowers. Finally, it entails an institutional structure that greatly minimizes the chances of government bailouts, so that private participants do not have an incentive to take excessive risks. The perceived implicit guarantee and legal advantages conferred on government-sponsored enterprises before the recession lowered their cost of funding relative to their competitors and allowed them to capture large shares of the market to the point where they became too big to fail. It is critical that we do not allow history to repeat itself at the expense of the taxpayer. It is also critical that we do not eliminate any fee-financed government backstop entirely, both because of what this would do to the functioning of housing markets but also because it would not be a credible commitment and would almost inevitably result in an ad hoc, taxpayer-financed bailout the next time the system ran into serious problems.

Putting all these pieces together is a complex undertaking. However, the current period provides an opportunity in which major steps can be taken on the long path of reform. The Senate Banking Committee is making promising bipartisan progress and the Administration looks forward to continuing to work with Congress to forge a new private housing finance system that better serves current and future generations of Americans.

Improving International Stability—Preventing and Responding to Crises and Enhancing Development

Macroeconomic stability does not just depend on policy steps in the United States. We know full well that international crises can have spillover effects that have a major impact on the US economy and the interests of our companies abroad. Our first line of defense against these crises is the IMF, which has been central to the stability of the international financial system since World War II. In 2010, G-20 leaders and IMF members agreed to a landmark set of reforms to modernize and strengthen the IMF. These reforms ensure the IMF has the resources the Fund needs to safeguard the global economy and give a greater voice to dynamic emerging economies that want to play a

Figure 9 **Cross-Country Comparison of Income and Volatility**



greater role in the international financial system. That is very much in the interests of the United States. These reforms are critical to ensure our leadership in the IMF, which is central to the promotion of our national security and economic interests around the world. Ratification in the US Congress is the final step before these reforms can go into effect, and Congress's failure to act jeopardizes our influence in the IMF and undermines our international leadership.

Beyond the IMF's role in managing immediate crises, it is also worth noting that developing economies around the world can benefit from improved macroeconomic stabilization policies, including the types of steps I have been talking about in the context of the United States. More broadly, steps that foster income growth and development tend to increase macroeconomic stability by creating a more diversified economy and increasing the ability of households to insure against shocks.

Without making any claim to have determined the direction of causality, Figure 9 shows the relationship between countries' economic volatility and level of income, plotting the log of real per capita GDP in 2013 in purchasing power parity terms against the standard deviation of yearly real per capita GDP growth from 1981 to 2013.[15] What is particularly striking is the overall negative relationship and the cluster of countries in the upper left with high income and low volatility, including the United States, Canada, Japan, Australia, and much of Western Europe.

Conclusion

As turbulent as the economy can seem from day-to-day or from month-to-month, it is important to put these higher frequency fluctuations in perspective. A combination of true volatility associated with everything from animal spirits to weather to high-frequency feedback cycles will always impact the economy. But, if anything, these shocks are smaller today and we are better able to control them. In part, this represents a substantial public policy accomplishment.

But the Great Recession, at the very least, put the declaration of victory on the Great Moderation in substantial perspective. There is much more to macroeconomic stabilization than smoothing quarterly or annual fluctuations—the ultimate goal is to address the largest and most persistent fluctuations. In the case of the Great Recession, policy partly failed to do that, although the fact that we avoided a second Great Depression is a testament to improvements in macroeconomic and financial policy.

Ultimately, our most fundamental concern is with strengthening growth—both in the short run as the economy returns to its potential and over the longer run as we aim to expand that potential—while ensuring that everyone shares in that growth. But macroeconomic stabilization, especially for the larger, lower frequency tail events, is both an important end in itself as well as generally a complement to these other goals. There is no doubt that going through another Great Recession would not only risk substantial damage to the economy, but would have a substantial human toll. As we continue to dig out of the Great Recession, we can also continue to look forward to what we can do to prevent, mitigate or ameliorate the potential for a next one at some future date.

Notes

1. Two of the earliest contributions were Kim and Nelson (1999) and McConnell and Perez-Quiros (2000). Blanchard and Simon (2001) and Stock and Watson (2003) were two of the more comprehensive and influential analyses. Some of the many other contributions include Kahn, McConnell, and Perez-Quiros (2002), Bernanke (2004), Ahmed, Levin, and Wilson (2004), and Dynan, Elmendorf, and Sichel (2006).
2. One notable exception is a recent working paper by Gadea, Gomez-Loscos, and Perez-Quiros (2013).
3. I want to thank Matt Aks, Philip Lambrakos, and Chase Ross at the Council of Economic Advisers for their contributions to this analysis.
4. The picture is very similar even if one uses the geometric average of the income (GDI) and expenditure (GDP) sides of total output.
5. Stock and Watson (2003) present results using more sophisticated statistical methods and a wider range of variables that largely confirm the original Blanchard and Simon (2001) analysis.
6. See http://www.ers.usda.gov/topics/in-the-news/us-drought-2012-farm-and-food-impacts.aspx#.U0ay4PldXFk.
7. In addition to the work cited in the text, see also Kahn and Stevens (2008), McCarthy and Zakrajsek (2007), and Morley and Singh (2009).
8. Some have argued that at least part of the reduction in volatility observed in the postwar business cycle is a consequence of improvements in the measurement of key economic indicators since the prewar era. See Romer (1986a, 1986b, 1989, 1991) and Shapiro (1988).
9. See, for example, Kydland and Prescott (1977)
10. See, for example, Alvarez and Jermann (2004) and Barro (2009)
11. See Barlevy (2005) for an overview.
12. See, for example, Aghion et al. (2006), Aghion, Hemous, and Kharroubi (2009), and Aghion et al. (2010)
13. See Taylor (2009).
14. Data on household liabilities prior to 1952 are taken from Saez and Kopczuk (2004). Top 5 percent income share from the 2013 update to Piketty and Saez (2003). GDP data prior to 1929 are taken from the Historical Statistics of the United States.
15. The chart includes 131 countries for which the IMF has complete yearly data going back to 1980. It excludes four outliers with standard deviation of yearly GDP growth in excess of 10 (Kuwait, Lebanon, Libya, and Sudan). A similar figure appears in Koren and Tenreyro (2007).

Bibliography

Aghion, P., Angeletos, G. M., Banerjee, A., and Manova, K. (2010). "Volatility and Growth: Credit Constraints and the Composition of Investment." *Journal of Monetary Economics*, 57(3), 246–65.

Aghion, P., Bacchetta, P., Ranciere, R., and Rogoff, K. (2009). "Exchange Rate Volatility and Productivity Growth: The Role of Financial Development." *Journal of Monetary Economics*, 56(4), 494–513.

Aghion, P., Hemous, D., and Kharroubi, E. (2009). *Credit Constraints, Cyclical Fiscal Policy and Industry Growth* (No. w15119). National Bureau of Economic Research.

Ahmed, S., Levin, A., and Wilson, B. A. (2004). "Recent US Macroeconomic Stability: Good Policies, Good Practices, or Good Luck?" *Review of Economics and Statistics*, 86(3), 824–32.

Almunia, M., Benetrix, A., Eichengreen, B., O'Rourke, K. H., and Rua, G. (2010). "From Great Depression to Great Credit Crisis: Similarities, Differences and Lessons." *Economic Policy*, 25(62), 219–65.

Barlevy, G. (2007). "On the Cyclicality of Research and Development." *The American Economic Review*, 1131–64.

Bernanke, B. S. (2004). "The Great Moderation: Remarks by Governor Ben S. Bernanke at the meetings of the Eastern Economic Association, Washington, D.C., February 20, 2004." *Eastern Economic Association, Washington, DC*, 20.

Blanchard, O., and Simon, J. (2001). The Long and Large Decline in US Output Volatility. *Brookings Papers on Economic Activity*, 2001(1), 135–74.

Council of Economic Advisers (2014). *The Economic Report of the President*.

Davis, S. J., and Kahn, J. A. (2008). *Interpreting the Great Moderation: Changes in the Volatility of Economic Activity at the Macro and Micro Levels* (No. w14048). National Bureau of Economic Research.

DeLong, J. B., and Summers, L. H. (1986). "The Changing Cyclical Variability of Economic Activity in the United States." In *The American Business Cycle: Continuity and Change* (pp. 679–734). University of Chicago Press.

———. (1988). "How Does Macroeconomic Policy Affect Output?" *Brookings Papers on Economic Activity*, 433-494.

———. (2012). "Fiscal Policy in a Depressed Economy [with Comments and Discussion]." *Brookings Papers on Economic Activity*, 233–97.

Dynan, K. E. (2009). "Changing Household Financial Opportunities and Economic Security." *The Journal of Economic Perspectives*, 49–68.

Dynan, K. E., Elmendorf, D. W., and Sichel, D. E. (2006). "Can Financial Innovation Help to Explain the Reduced Volatility of Economic Activity?" *Journal of Monetary Economics*, 53(1), 123–50.

Friedman, M. (1953). "The E ects of Full Employment Policy on Economic Stability: A Formal Analysis." *Essays in Positive Economics*. Chicago: University of Chicago Press, 117–32.

Gadea, M. D., Gómez-Loscos, A., and Pérez-Quirós, G. (2013). "Has the Great Recession Ousted the Great Moderation?"

Greenspan, A. (2013). *The Map and the Territory: Risk, Human Nature, and the Future of Forecasting*. Penguin.

Kahn, J. A., McConnell, M. M., and Perez-Quiros, G. (2002). "On the Causes of the Increased Stability of the US Economy." *Federal Reserve Bank of New York Economic Policy Review*, 8(1), 183–202.

Kim, C. J., and Nelson, C. R. (1999). "Has the US Economy Become More Stable? A Bayesian Approach Based On a Markov-Switching Model of the Business Cycle." *Review of Economics and Statistics*, 81(4), 608–16.

Koren, M., and Tenreyro, S. (2007). "Volatility and Development." *The Quarterly Journal of Economics* 122(1), 243–87.

Kumhof, M., Ranciere, R., and Winant, P. (2013). "Inequality, Leverage and Crises: The Case of Endogenous Default." (No. 13/249). International Monetary Fund.
Lucas, R. E. (1987). *Models of Business Cycles* (Vol. 26). Oxford: Basil Blackwell.
———. (2003). "Macroeconomic Priorities." *American Economic Review*, 93(1), 1–14.
McCarthy, J., and Zakrajšek, E. (2007). "Inventory Dynamics and Business Cycles: What Has Changed?" *Journal of Money, Credit and Banking*, 39(2–3), 591–613.
McConnell, M. M., and Perez-Quiros, G. (2000). "Output Fluctuations in the United States: What Has Changed since the Early 1980's?" *American Economic Review*, 1464–76.
Ostry, J. D., and Berg, A. (2011). *Inequality and Unsustainable Growth: Two Sides of the Same Coin?* (No. 11/08). International Monetary Fund.
Ostry, M. J. D., Berg, M. A., and Tsangarides, M. C. G. (2014). *Redistribution, Inequality, and Growth*. International Monetary Fund.
Piketty, T., and Saez, E. (2003). "Income Inequality in the United States 1913–1998." *Quarterly Journal of Economics*, 118(1), 1–39.
———. (2013). Data update to "Income Inequality in the United States 1913–1998."
Rajan, R. G. (2010). *Fault Lines: How Hidden Fractures Still Threaten the World Economy*.
Princeton University Press.
Ramey, G., and Ramey, V. A. (1991). *Technology Commitment and the Cost of Economic Fluctuations* (No. w3755). National Bureau of Economic Research.
Ramey, V. A., and Vine, D. J. (2006). "Declining Volatility in the US Automobile Industry." *The American Economic Review*, 1876–1889.
Romer, C. (2009). "Lessons from the Great Depression for Economic Recovery in 2009."
———. (1986a). "Spurious Volatility in Historical Unemployment Data." *Journal of Political Economy*, 97(1), 1–37.
———. (1986b). "Is the Stabilization of the Postwar Economy a Figment of the Data?"
American Economic Review, 76(3), 314–34.
———. (1989). "The Prewar Business Cycle Reconsidered: New Estimates of Gross National Product, 1869–1908." *Journal of Political Economy*, 97(1), 1–37.
———. (1991). "The Cyclical Behavior of Individual Production Series, 1889–1984." *The Quarterly Journal of Economics*, 106(1), 1–31.
Saez, E., and Kopczuk, W. (2004). "Top Wealth Shares in the United States, 1916–2000: Evidence from Estate Tax Returns." *National Tax Journal* 57(2), 445–87.
Schumpeter, J. A. (1934). "Depressions." In Douglass V. Brown et al., *The Economics of the Recovery Program* (pp. 3–21). New York: Whittlesey House, McGraw-Hill.
Shapiro, M. D. (1988). "The Stabilization of the U.S. Economy: Evidence from the Stock Market." *American Economic Review*, 78(5), 1067–79.
Singh, A., and Morley, J. (2009). "Inventory Mistakes and the Great Moderation."
Stock, J. H., and Watson, M. W. (2003). "Has the Business Cycle Changed and Why?" In *NBER Macroeconomics Annual 2002, Volume 17* (pp. 159–230). MIT Press.
Taylor, J. B. (2000). "Reassessing Discretionary Fiscal Policy." *The Journal of Economic Perspectives*, 21–36.

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Growing Out of the Crisis: Is Fixing Finance Enough?

Introduction

In the wake of the financial crisis that started in 2008 and two years later evolved into a sovereign debt crisis, there is little evidence that the European economy will soon be returning to robust growth.

Risks for growth remain tilted toward the downside. Many European countries are facing low growth prospects and are plagued by record high unemployment, especially among the young, pointing to a considerable slack in the labor market, lack of demand, and subdued inflationary pressures, which in turn complicate the deleveraging process of sovereigns and households.

There is now a real but mild recovery going on, and there are, of course, a number of narratives about what can and should be done to restore growth on the European continent. Foremost among these is the idea that the economic recovery is hindered by weaknesses in bank balance sheets, and that if the weak European banks were to be fixed, growth would inevitably return.

Naturally, policymakers have been aware of the negative effect that weak bank balance sheets and deleveraging have had by restricting the normal flow of credit to the economy. The ECB has gone to great lengths to support the bank lending channel, and we are now conducting an asset quality review coupled with stress tests to ensure that banks complete the process of repairing their balance sheets. Furthermore, the banking union, consisting of genuine supervision and resolution at the European level, will be the most far-reaching change introduced since the inception of the euro. European countries participating in this project can rest assured that systemic risks will be better addressed in the future, enhancing financial stability and boosting the credibility of banks.

Nevertheless, I would like to sound a note of caution and pose two questions about the benefits of restoring a well-functioning banking sector in Europe, and its contribution to growth:

> First, how can we take advantage, in terms of growth, of a dynamic and sophisticated financial industry without running into the risks it tends to create?
>
> Second, is restoring a well-functioning financial system sufficient for robust long-term growth?

The first question is important because even though financial intermediation undoubtedly contributes to economic growth, the crisis has reminded us that finance can breed instability, too,

and that the welfare costs of instability can be very high. It is important that we are aware of the trade-off between growth and stability when designing an institutional framework for the future in which finance is not excessive.

The second question is even more important, as it refers to the degree to which we can expect robust financial sector-driven growth in Europe once the banking union becomes operational and all the problems related to bank balance sheet weaknesses have been properly addressed. It is my contention that the European economy is gripped by problems that are more serious than bank deleveraging and also of greater consequence, because it is not immediately clear how to address them. I will argue that even when bank balance sheets have been fully repaired, structural problems related to the slowdown in emerging markets, to weak domestic demand, and to structural phenomena such as the ageing population will continue to hamper European growth prospects.

Finance and Growth: An Overview

The empirical literature on finance and growth has accumulated a substantial body of evidence on the positive relationship between financial development and long-term economic growth over the past 20 years. From the academic literature, we have learned that countries with higher levels of financial development grow at a faster rate. Industries that have a greater need for external finance and face better growth opportunities grow faster in countries with a higher level of financial development.[1] This positive effect has a well-known microeconomic underpinning: financial deepening alleviates financing constraints at the firm level, allowing firms to grow by engaging in higher capital investment and R&D investment, among other things.[2] This large body of evidence strongly supports the view that by inducing a positive resource reallocation and by supporting the creative destruction-driven process of technological innovation, financial deepening has a transformational effect on the real economy.

At the same time, the global financial crisis of 2008-09 reminded us of the perils of finance. Academic research has suggested that financial development does not have a uniformly positive effect on economic growth, at all levels of financial intermediation. The evidence points to the fact that there is a threshold beyond which the positive effect of finance on growth starts petering out.[3] A BIS paper puts that threshold at 100 percent to 150 percent of GDP.[4] There are different reasons for this concept of a threshold. For example, an excessively large financial industry can lead to a migration of talented individuals away from productive sectors.[5] Alternatively, as the financial sector grows too large, financial intermediaries can start taking on excessive risk, and this behavior can expose the economy to large macroeconomic contractions.[6]

In other words, while we know that we need a well-functioning financial sector, we have to pay attention to its evolution. At reasonable levels, finance is essential for growth, but once it grows to an excess, the damage it can do can easily wipe out its positive contribution. This is why we should resist the efforts of the industry to push back on regulatory reform with the argument that more finance is always good for growth and jobs. Fortunately, we will have now a leverage ratio that will be an important instrument to control possible excesses of the financial system, especially if its level will be set above the 3 percent of the initial proposal as it has been done recently in the United States.

Finance and Growth in the Postcrisis world

During the financial crisis, financial intermediation in Europe was greatly impaired, and the recovery in credit supply has been slow at best. Credit standards for loans to enterprises were reported to have been tightened by a net percentage of around 40 percent of euro-area banks, on average, in each quarter between the third quarter of 2007 and the second quarter of 2009. After a period of stabilization, they started tightening rapidly again in the summer of 2011.[7] This process reflects the rapid deleveraging that banks have been engaged in. For example, just between May 2012 and November 2013, the size of the collective balance sheet of euro-area banks dropped by 3.5 trillion. Households and firms in the euro area have been strongly affected by this contraction of credit. Over the same period, lending to nonfinancial corporations dropped by 361 billion, or 7.5 percent.

In the light of my discussion of the effect of finance and growth, this is not necessarily an unnatural development. The euro-area financial sector was overextended before the crisis, with the balance sheets of the euro area's largest banks remaining even today among the largest in any region of the world. Contraction is the only way to bring the financial sector to a more "reasonable" size that is relatively more conducive to long-term economic growth. Of course, we do not fail to recognize that in a recession environment, bank deleveraging makes policy-makers' goal of encouraging lending to nonfinancial corporations, and especially to SMEs (which provide the bulk of employment in Europe), very problematic.

Many countries have in the past experienced boom-bust episodes brought about by some sort of financial market excess. The three major types of such excess are asset price booms, credit booms and real estate booms. The recessions that follow any of these episodes are deeper than standard business cycle contractions; they are even deeper when two of these excesses take place at the same time; and they are deepest when all three are present.[8] The global financial crisis was preceded by all three, and so the sluggish recovery of the European economy simply reinforces conventional wisdom.

The resulting state of affairs is a so-called "creditless" recovery in the euro area. Right now we are witnessing the coexistence of low levels of credit to the private sector and three consecutive quarters of positive GDP growth. Such creditless recoveries are far from unusual: one out of five recoveries is "creditless," and output growth during creditless recoveries tends to be lower than output growth during recoveries when the financial sector is not impaired. Such recoveries are particularly common after financial crises, and are often preceded by high levels of private sector indebtedness.[9] Nevertheless, it seems that declining bank credit to the private sector does not necessarily constitute a constraint on economic recovery once output has bottomed out. Moreover, credit growth and output growth tend to be uncorrelated in the aftermath of financial crises that were preceded by credit booms, suggesting that private sector deleveraging does not necessarily pose a threat to the postcrisis recovery. A recent BIS paper extends earlier evidence for emerging economies to advanced economies.[10] International evidence suggests that recoveries following financial crises are often not just creditless, but also jobless.[11]

In other words, following a financial crisis, it is not uncommon to have a recovery without finance. This is an important observation, and one that is at odds with the conventional wisdom that finance is indispensable for economic growth. Numerous voices these days urge European policymakers to repair the balance sheets of banks so that they can lend again and in the process

jump-start GDP growth. There will be no growth without finance, the narrative goes, and the fact that the United States has returned to robust economic growth faster than Europe is to a large degree put down to policy-makers acting quickly to repair the balance sheets of US banks.

This narrative, while intuitively compelling, is missing two crucial points. The first is that bank balance sheets in the euro area have to a large degree already been repaired. For instance, since the onset of the global financial crisis until last year, the top 20 European banks have increased their capital in absolute amounts net of shares buybacks by 60 percent more than the top 20 American banks. As a result, large parts of the sector now fully comply with the minimum capital requirements under Basel III well ahead of 2018. The remaining weakness will be addressed in the near future, and once the architecture of the banking union is operating after our comprehensive assessment of banks' situation, I expect that the European banking sector will be in a solid shape.

But even if we were to agree that finance is a *necessary* condition for growth (a conclusion that is called into question by the prevalence of creditless recoveries), it is far from clear that finance is a *sufficient* condition for jump-starting growth in Europe. I will argue that even a complete rehabilitation of the euro area's banking system (which is well on its way thanks to the various policy steps related to the banking union) will not guarantee a quick return to high growth and low unemployment. In fact, the euro-area economy faces a number of issues that are potentially more serious than the damage inflicted by the financial crisis and the subsequent euro-area crisis on the euro-area banking sector. These issues are also far more difficult to address.

Short-run Nonfinancial Impediments to Growth in Europe

Let me now talk briefly about what I believe are the chief obstacles to growth in the future. I want first to highlight three short-term impediments in Europe: the slowdown in emerging markets, the fall in domestic private investment, and weak domestic demand. I will then move on to longer-term considerations.

In my view, chief among these short-term impediments is the remarkable *slowdown in emerging markets*. Take as an example the four BRIC countries (Brazil, Russia, India, and China). While in 2007 these countries grew at an average rate of 9.8 percent, in 2013 they managed a rate of growth of only about 4 percent, on average, the lowest growth rate in more than a decade if we exclude the crisis in 2009. This was largely due to country-specific factors, such as excessive investment in China and infrastructure and regulatory bottlenecks in Brazil and India, to mention just a few. This process is necessarily accompanied by a reduction in demand for foreign goods, including euro-area exports. This is bad news for the euro area, whose recovery so far has been largely driven by export strength. In addition to structural issues, there are a number of potential risk factors that have not materialized. For example, there is a risk of a real estate bubble in Brazil, where house prices have doubled in three years.

A second important factor is *the large drop in domestic private investment* following the onset of the global financial crisis. Between 2007 and 2011, private investment in the then 27 countries of the EU fell by €354 billion, a 15 percent decline relative to its 2007 level. This compares with a mere €17 billion (or 0.2 percent) drop in private consumption. While it is not unusual for private investment to fall sharply during a contraction in real GDP, its contribution to the latest contraction in

the EU is among the largest on record, and some countries have seen unprecedented declines (for instance, over the same period private investment declined by 27 percent in Spain, by 47 percent in Greece, and by 64 percent in Ireland). Today, private investment is almost 20 percent below a 25-year trend that came to an end with the financial crisis.[12]

The third important factor *is weakness in domestic demand*. This is often left out of the public discourse, but micro evidence suggests that it is a problem that cannot be underestimated. For example, SMEs interviewed for the ECB's "Survey on the access to finance of small and medium-sized enterprises in the euro area" have consistently cited "finding customers" as their most pressing concern. This suggests that euro-area corporations face serious problems on the demand side that seem to be more pressing than the problems stemming from the bank lending channel. By way of comparison, while in the latest wave of the survey 24 percent of euro-area SMEs cite demand concerns as the most limiting factor in their operations, only 16 percent cite "access to finance" as their most pressing concern.

Of course, this is not to say that financial sector weaknesses are not important, or that they are not recognized. The massive Comprehensive Assessment of banks' balance sheets is proof enough that we take the matter very seriously. My point is rather that while the ongoing deleveraging in the banking sector certainly plays an important role in the inadequate current levels of credit supply to the real economy, factors related to the demand side are even more important. The weak demand outlook combined with slack industrial capacity is the most important explanation for the drop in private investment during the crisis, and the most important limiting factor for future investment.

Long-Term Trends in Growth: The Global Economy

Let me now turn to the other fundamental challenges for growth that lie ahead of us, for the world economy and, in particular, for the euro area. After almost a decade of relatively fast-paced economic growth and subdued inflationary pressures in the period preceding the crisis, the "Goldilocks era," we thought that the potential growth rate of the world economy could continue along the same trends. The global financial crisis has shaken our certainties about the sources of global growth, namely: (1) an endless growth of the world population, global trade and financial integration; (2) the contribution of emerging markets as a separate engine of world growth; and finally, (3) the impact of technological progress, largely driven by the information technology and communication revolution.

Let's assess the solidity of these pillars of global growth, five years after the start of the global financial crisis.

According to a recent report that has been produced by the Centre for European Policy Studies (CEPS), the global population may peak by 2030. The negative impact that this has on future growth has to be weighed against the positive effects stemming from contained pressures on natural resources and energy. There is evidence that trade globalization may have already reached a peak, and the potential for further financial globalization is likely to stem mainly from developments in emerging markets.[13]

The *global value of trade* as a ratio of world GDP peaked at 64 percent in 2008, compared with an average of less than 40 percent in the 1980s. Over the intervening period, from the 1990s to 2007,

the trade volume of goods and services grew, in real terms, at a remarkable pace of around 7 percent per year, on average, while it has posted a meager rate of less than 3 percent in the past two years. Overall, according to IMF projections, world trade seems to have stabilized relative to world GDP around a plateau close to the level reached in 2008.

The financial crisis has been accompanied by a significant *retrenchment in cross-border financial flows,* concentrated in particular in banking flows and, to a lesser extent, in portfolio and FDI flows.[14] Across advanced economies, a revival of the boom in financial integration that we experienced in the first decade of this century is unlikely.[15] Nevertheless, the scope for financial deepening and capital account liberalization is still large across emerging markets. This represents an opportunity and, at the same time, a significant challenge for emerging markets, the second pillar of the growth of the world economy.

Let me then briefly discuss the role played by emerging markets. For the first time, at the end of last year, emerging markets and developing economies accounted for more than 50 percent of world GDP, when measured at purchasing power parity. From now on, it is legitimate to expect that the value added produced by emerging and developing economies every year will be larger than that produced by advanced economies. Moreover, emerging markets are expected to grow at a pace of more than 5 percent on an annual basis, more than twice the pace of advanced economies, so that their share in the world economy is bound to grow further.

Can emerging markets represent an independent source of world growth? It is questionable that this will be the case. Much of the catching-up potential that emerging markets had at the beginning of the 1990s, in terms of capital accumulation, innovation and employment growth, has already been realized. Over the medium to long term, the growth path of emerging markets may remain bumpy, in particular if emerging markets fail to manage the process of financial and capital account liberalization or, as in the case of China, the needed rebalancing from investment to consumption as a main driver of domestic growth.

The third pillar of long-term growth is further technological progress. Recent work by one of the leading scholars of growth theory, Robert Gordon, offers a particularly downbeat assessment of the future of innovation. His main tenet is that innovation is not a continuous process, but a discrete one where waves of inventions are followed by their application and refinement to extract their full potential. Against this metric, though, the latest ICT revolution, having generated a rather short-lived increase in productivity, ranks well below previous industrial revolutions.[16]

Even if the rate of technological progress were to continue at the same pace of recent years, according to Gordon, the US economy in any case faces severe "headwinds" due to demography, education, inequality, globalization, energy/environmental factors, and the overhang of consumer and government debt.

Gordon's pessimism seems to have been rather contagious. Late last year, first Paul Krugman and then Lawrence Summers wondered whether advanced economies were slipping into a state of "secular stagnation."[17] This could be depicted as a condition where the natural and equilibrium interest rate, the rate equalizing desired savings and investment at full employment, is negative and economies are forced to generate bubbles and an overhang of private or public debt to support aggregate demand. Research at the BIS shows that, accounting for the financial cycle—including in particular information on the growth of credit and property prices—potential output estimates

are much lower before the crisis and display less volatility during the crisis. This can be reconciled with a view reflecting the unsustainable nature of the precrisis financial cycle, leading to a rethinking of the potential output measurement to include the effects of the financial cycle.[18]

The main concern is that this potential "secular stagnation" severely curtails the scope for using traditional policy levers, hampering the growth of advanced economies so that it remains below potential. On the one hand, the zero lower bound to nominal interest rates constrains monetary policy; on the other hand, after governments have absorbed the liabilities of the private sector following the bursting of the bubble and public debts have swollen, the room for expansionary fiscal policies is severely limited.

Long-Term Trends in Growth: The Euro Area

Is the euro area at risk of ending up in secular stagnation? Looking ahead, what are then the growth prospects and challenges for the euro area?

On the back of the fall in capital accumulation and labor utilization, euro-area potential output growth declined from a level close to 2 percent in the years preceding the crisis to less than 1 percent on average between 2008 and 2012. Notably, total factor productivity, which gauges the efficiency of the use of the factors of production, even though subdued, contributed only marginally to this decline.[19] However, over the medium to long term, cyclical factors dragging down potential output are expected to fade, with investment recovering through the normalization of the credit channel and net immigration, which also has an indirect impact through an increase in the fertility rate, providing renewed support to the employment contribution. According to the estimates of the European Commission's Ageing Working Group, euro-area potential output growth is expected to rebound to around 1.5 percent until 2025, mainly on the back of a positive contribution from labor input, and then to even out to 1.3 percent over the long run.

For the euro area, the main structural challenge is posed by the ageing of the population and the ensuing decline in the share of the working-age population. According to the CEPS report already mentioned, the European working age population will decline annually by 0.6 percent until 2030, meaning that the contribution of labor to potential output is projected to become negative. Potential output is expected to be supported by capital deepening, around half a percentage point, and, crucially, total factor productivity, assuming that it resumes growing at an annual pace of close to 1 percent, the rate prevailing at the beginning of the previous decade.

Unfortunately, since the start of the crisis, euro-area total factor productivity growth has remained subdued, falling behind productivity growth in the United States, where it rebounded after reaching a trough in 2009. The crisis and the persistent low levels of capacity utilization led to a destruction of human capital in those firms and sectors experiencing the most dramatic downsizing. In the euro area, the greater rigidity of labor and product market regulation as compared with the United States is likely to have hampered the needed reallocation of resources toward the most productive sectors. I will come back to this later; the point I want to make now is that there are downside risks to the long-term projections for the growth of euro-area total factor productivity, unless the euro area implements reforms that foster innovation, competitiveness, and the reallocation of resources toward the most productive sectors.

What Can Policy Do?

During the financial crisis and the ensuing sovereign debt crisis, policy was mostly focused on stabilization. Restoring confidence in the banking system and repairing excessive indebtedness were the two most pressing concerns, and they were addressed forcefully. Today, the euro area's economies have largely been stabilized relative to three or five years ago.

On the basis of current trends, the euro area is facing a medium-term future of stable but low growth, with unemployment evolving to lower levels in 15 years as a result of a declining active population. Europe has to react swiftly if it wants to avoid a whole generation being wasted and sacrificed. Can structural reforms provide a solution in the long run? There is not much we can do about the ageing of the population because European politics is refusing immigration and going Malthusian. In this context, can policy address the dual problems of weak demand and slack industrial capacity?

Regarding demand, only a few countries have financial scope to stimulate consumption and, more importantly, to increase public investment in a context of very low interest rates. That is the answer that Bernanke and Blanchard suggest to dispel the risks of secular stagnation. The reality is nevertheless that Europe as a whole is still pursuing consolidation to achieve a reduction of debt ratios. In this context, the challenge is to counter the structural impediments driving potential growth down—above all, the negative demographic trends—in a situation in which the scope and effectiveness of conventional macroeconomic policies is reduced. I will contend that it is of paramount importance to carry out those structural reforms that may increase the participation rate of the labor force and lead to a more efficient use of the factors of production. Reforms aimed at increasing investment and employment in the most productive sectors are particularly needed at the current juncture.

The preliminary findings of the Eurosystem's CompNet network, which has collected competitiveness indicators across a huge sample of about 700,000 firms from 11 EU countries, show a strong heterogeneity of firm labor productivity within and across countries. The distribution of firms' productivity, or cost structure, is not only very dispersed but also very asymmetric: there are few champions and a high proportion of low-performance firms. For policymakers, this has two major implications. First, when talking about the competitiveness or productivity of a country, we must look much deeper than simple average indicators, such as unit labor costs or market shares. The same policy intervention may produce different results, depending on the initial distribution of firms' productivity, even if average productivity is the same. Second, the dispersion and skewness of firms' distribution have important implications for aggregate productivity growth. A recent strand of literature has shown that aggregate productivity in a country may be lagging behind partly because inputs are not allocated efficiently across firms or industries. This suggests that there is significant scope to increase productivity through targeted policies, such as product market reforms, that facilitate the reallocation of resources across sectors and firms. For instance, the work of the CompNet network shows that better regulated industries are able to channel resources more efficiently to the most productive firms. Moreover, it can be shown that the contribution of the reallocation of resources to productivity growth has been reduced during the crisis period in some countries, such as Italy and Spain. This evidence may be viewed as an indicator of structural rigidities that have become binding in the Great Recession.[20]

Labor market reforms have also been advocated by many commentators. A widely held view during the 1990s was that labor market institutions were too rigid and that the common currency would make reform of these markets even more urgent. In the absence of country-specific monetary policy, and with national fiscal policy bound by rules, labor market flexibility needed to become an important channel of adjustment.[21]

This is added to the fact that labor mobility across national borders is traditionally low, with migration responding considerably more slowly to regional labor shocks than in the United States.[22] The crisis itself had a more pernicious and long-lasting effect on the euro area labor market through the increase in "structural unemployment" and "skills mismatch," with the unemployment rates of those staying out of work for longer and those with lower skills increasing more in relation to the average unemployment rate. Participation rates have been negatively influenced by "discouraged" worker effects.

Pressed against the wall, however, governments have recently acted to provide a legal framework for more growth. For example, Greece, Portugal, and Spain have reformed their legislation to reduce the burden on firms and to encourage hiring and labor mobility. More can be done to reduce the corporate labor burden further and to ensure a level playing field that does not hinder young people and favors insiders. Encouraging a more flexible governance structure of labor market institutions accompanied by an appropriate social safety net and active labor policies can also contribute to a reallocation toward more productive sectors.[23]

While a well-functioning safety net reduces the short-run consequences of high unemployment, the fact that so many (in particular, young and educated) workers are out of work today could have serious implications for long-term growth prospects in Europe. Persistently high unemployment diminishes the economy's ability to cope with more turbulent economic developments, such as the restructuring from manufacturing to the services industry, the adoption of new information technologies, and a rapidly changing international economy.[24] It is important to recall that Europe still has a lot of improvements to make in terms of increasing the segment of the population with a complete tertiary education, a measure on which we lag well behind the United States and which is so important to foster total factor productivity.

Policymakers can tackle the negative long-term consequences by enacting policies aimed at reducing the negative impact of long-term unemployment on human capital. One such policy that has proved effective in the past is training. On-the-job training provides workers with general skills, but especially with the industry-specific skills that are indispensable in today's knowledge economies. Training has been shown to have a significant positive effect on firm-level value added growth, productivity and innovation. At the same time, it is costly; for example, overall expenditure on professional training in the United States amounts each year to almost one-third of overall expenditure on formal education. So even though the benefits to the firm of training are obvious, workers are less likely to receive it in an environment where access to external finance is constrained.[25] And the unemployed are obviously completely shut out of firm-provided on-the-job training. This is where policy can help, by subsidizing various active labor market programs aimed at equipping unemployed workers with professional skills. There is much evidence that such programs are beneficial not only for the overall economy, as they increase its skill intensity, but also for the workers themselves, whose employment and earnings increase in the medium and long run.

These benefits are greater when overall unemployment is high, as is the case in a number of euro-area countries right now.[26]

Subsidizing R&D is another policy that can be used to target an improvement in long-term productivity in a low-growth environment. Contrary to theoretical prediction, recent evidence suggests that R&D investment tends to be procyclical. So, rather than picking up during a recession, when the opportunity cost of innovation is lower—as a number of theories have suggested in the past—R&D investment tends to fall dramatically when demand is low.[27] If the market allocates an inefficiently low fraction of innovation-promoting activities to recessions, then there is a clear role for policy in the form of countercyclical R&D subsidies.

Finally, there is evidence that policies aimed at increasing self-employment and small firm creation, such as the reduction of corporate tax rates and barriers to entry, can have a substantial positive effect on new business creation and firm dynamism.[28]

Conclusion

Let me conclude.

I have argued that while finance is important for growth, and completing the repair of the euro area's financial system is an essential condition, it will not be sufficient to jump-start the economy. Europe has turned a corner after a dangerous period of turmoil. The sovereign debt crisis has been stabilized, redenomination tail risks have been overcome, and financial markets have recovered their buoyancy. ECB decisions and the painful adjustment in stressed countries were mostly responsible for those achievements. We are now experiencing a period of financial stability, but we face the double risk of short-term high unemployment with low inflation that aggravates the burden of the debt overhang with a long-term risk of quite low potential growth. The aftermath of the financial crisis and the policies with which it was countered left behind a labor force weakened by hysteresis effects, and this, combined with low levels of investment, has reduced potential growth. In the long term it is also negatively affected by weak demographics. Policies to foster total factor productivity are crucial to improve growth prospects and to help absorb the high unemployment and reduce the debt overhang.

Monetary policy has been accommodative and has helped to stabilize the economy, but after a banking crisis that weakened economic agents' balance sheets, we all know that monetary policy loses some of its effectiveness. Nevertheless, monetary policy will continue to provide some stimulus, as has been confirmed several times by our forward guidance and by the recent statement by the ECB's Governing Council that it was unanimous in its "commitment to using also unconventional instruments within our mandate to cope effectively with risks of a too prolonged period of low inflation." The ECB will also do its best, in its role as the Single Supervisory Mechanism, to fix the bank-lending channel.

However, it is important to caution that monetary policy cannot do everything and that people seem to expect too much from central banks. Governments have to accept responsibility for measures that favor investment and increase demand, foster R&D and technological innovation, improve education levels, and implement active labor market reforms and policies. All advanced economies, albeit to different degrees, seem to have been caught in a trap of relative low growth and

low inflation. Many commentators seem just to be waiting for the Godot of a new wave of technical innovations that will save the day. Maybe it will come, but I am sure that we also need active policies and new economic thinking to deal with the income distribution problems that the coming technology will aggravate as well as the role of finance and demand in monetary economies where it is wrong to try to reduce macroeconomics to narrow real and long-term supply-side considerations, as our present predicament so impressively demonstrates.

Notes

1. King, R., and R. Levine, 1993, "Finance and Growth: Schumpeter Might Be Right," *Quarterly Journal of Economics* 108, 717–37; Rajan, R., and L. Zingales, 1998, "Financial Dependence and Growth," *American Economic Review* 88, 559–86; Fisman, R., and I. Love, 2007, "Financial Dependence and Growth Revisited," *Journal of the European Economic Association* 5, 470–79.
2. Love, I., 2003, "Financial Development and Financing Constraints: Evidence from the Structural Investment Model," *Review of Financial Studies* 16, 765–91; Brown, J., Fazzari, S., and M. Petersen, 2009, "Financing Innovation and Growth: Cash Flow, External Equity, and the 1990s R&D Boom," *Journal of Finance* 64, 151–85.
3. Rioja, F., and N. Valev, 2004, "Does One Size Fit All? A Re-examination of the Finance and Growth Relationship," *Journal of Development Economics* 74, 429–47; Manganelli, S., and A. Popov, 2013, "Financial Dependence, Global Growth Opportunities, and Growth Revisited," *Economics Letters* 120, 123–25.
4. Cecchetti, S., and E. Kharroubi, 2012, "Reassessing the Impact of Finance on Growth," BIS Working Paper No. 38.
5. Tobin, J., 1984, "On the Efficiency of the Financial System," *Lloyds Bank Review* 153, 1–15; Philippon, T., 2010, "Financiers vs. Engineers: Should the Financial Sector Be Taxed or Subsidized?," *American Economic Journal: Macroeconomics* 2, 158–82.
6. Rajan, R., 2006, "Has Finance Made the World Riskier?," *European Financial Management* 12, 499–533; Brunnermeier, M., and Y. Sannikov, 2014, "A Macroeconomic Model with a Financial Sector," *American Economic Review* 104, 379–421.
7. See the ECB's bank lending survey.
8. Claessens, S., Kose, A., and M. Terrones, 2008, "What Happens during Recessions, Crunches, and Busts?," *Economic Policy* 24, 653–700.
9. Abiad, A., Dell'Ariccia, G., and B. Li, 2011, "Creditless Recoveries," IMF Working Paper 11/58; Bijsterbosch, M., and T. Dahlhaus, 2011, "Determinants of Credit-less Recoveries," ECB Working Paper No. 1358.
10. Takats, E., and C. Upper, 2013, "Credit and Growth after Financial Crises," BIS Working Paper No. 416.
11. Calvo, G., Coricelli, F., and P. Ottonello, 2013, "Jobless Recoveries during Financial Crises: Is Inflation on the Way Out?," NBER Working Paper 19683.
12. McKinsey and Co., 2012, "Investing in Growth: Europe's Next Challenge."
13. "The Global Economy in 2030: Trends and Strategies for Europe," European Strategy and Policy Analysis System and Centre for European Policy Studies, April 2014.

14. Milesi-Ferretti, G., and C. Tille, 2011, "The Great Retrenchment: International Capital Flows During the Global Financial Crisis," *Economic Policy* 26, 285–342.
15. See, for instance, R. Dobbs and S. Lund, "Is Financial Globalisation in Retreat? And If So, Does It Matter?," 19 June 2013, http://www.voxeu.org/article/financial-globalisation-retreat-or-reset.
16. Gordon, R., 2012, "Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds," NBER Working Paper 18315.
17. Krugman, P., 2013, "Bubbles, Regulation and Secular Stagnation," http://krugman.blogs.nytimes.com/2013/09/25/bubbles-regulation-and-secular-stagnation, April; Summers, L., speech at the IMF Economic Forum, November 8, 2013.
18. Borio, C., Disyatat, P., and M. Juselius, 2013, "Rethinking Potential Output: Embedding Information about the Financial Cycle," BIS Working Papers 404.
19. *ECB Monthly Bulletin*, 2013, "Potential Output, Economic Slack and the Link to Nominal Developments since the Start of the Crisis," November.
20. See CompNet Task Force, 2014, "Micro-based Evidence of EU Competitiveness: The CompNet Database," ECB Working Paper No. 1634, February.
21. Arpaia, A., and G. Mourre, 2009, "Institutions and Performance in European Labor Markets: Taking a Fresh Look at Evidence," European Economy—Economic Paper 391, Directorate General Economic and Monetary Affairs, European Commission.
22. Decressin, J., and A. Fatas, 1995, "Regional Labor Market Dynamics in Europe," *European Economic Review* 39, 1627–55.
23. Dustmann, C., Fitzenberger, B., Schonberg, U., and A. Spitz-Oener, 2014, "From Sick Man of Europe to Economic Superstar: Germany's Resurgent Economy," *Journal of Economic Perspectives* 28, 167–88.
24. Ljungqvist, L., and T. Sargent, 1998, "The European Unemployment Dilemma," *Journal of Political Economy* 106, 514–50.
25. Popov, A., 2014, "Credit Constraints and Investment in Human Capital: Training Evidence from Transition Economies," *Journal of Financial Intermediation* 23, 76–100.
26. Lechner, M., and C. Wunsch, 2009, "Are Training Programs More Effective When Unemployment Is High?," *Journal of Labor Economics* 27, 653–92.
27. Barlevy, G., 2007, "On the Cyclicality of Research and Development," *American Economic Review* 97, 1131–64.
28. Klepper, L., Laeven, L., and R. Rajan, 2006, "Entry Regulation as a Barrier to Entrepreneurship," *Journal of Financial Economics* 82, 591–621; Da Rin, M., Di Giacomo, M., and A., Sembenelli, 2010, "Corporate Taxation and the Size of New Firms: Evidence from Europe," *Journal of the European Economic Association* 8, 606–16.

Sessions

SESSION 1

Financial Reregulation to Support Growth and Employment

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A key part of the boom-and-bust financial cycle, according to **POLLOCK**, is what he described as the political overreaction that inevitably follows the bust phase, resulting in the creation of new rules and regulatory bodies. The most recent crisis, Pollock noted, is no exception: he characterized the regulatory reaction to the 2007–09 bust as involving a dramatic expansion of bureaucratic discretion that has increased costs and inefficiency, and created, as he put it, a "bull market in compliance officers and in general in the paper-pushing class."

But the larger problem with the latest regulatory reforms, Pollock argued—and the general problem underlying all such "overreactions"—is that they are guided by a set of ideas that tend to be procyclical. Citing Hyman Minsky's well-known views regarding the significance of the euphoria that spreads among agents in the private sector during a financial boom, Pollock suggested that what Minsky goes on to say has received less attention:

namely, that central bankers and government officials (and, Pollock added, economists) are also prone to internalize these euphoric biases—which is part of what we witnessed, Pollock said, in the case of the US housing bubble. Likewise, during the downturn, the subjective biases that develop among government and private sector agents are such as to assume that the bust will last forever. Government tends to partake in, and thereby reinforce, the generalized pessimism that accompanies the bust phase, which makes a recovery more difficult. This is part of what we experienced, Pollock suggested, in 2011, ’12, and ’13.

Pollock also cited Minsky’s view that, behind legislative, bureaucratic, and central bank interventions, there lies some theory regarding how markets, particularly financial markets, behave, and that if these theories diverge from the way the economy actually operates, the reforms in question will be ineffective. This gives rise, said Pollock, to a view of the economy as an interactive system in which ideas, and in particular expectations (and expectations of expectations), play a large role. And, he stressed, we have to include central bankers and regulators alongside private actors in this system, with its high levels of uncertainty and recursiveness. In other words, it is important to appreciate the extent to which central bankers and regulators are not merely manipulating the system from the outside, but are unavoidably a part of it: their actions and expectations (and expectations about their expectations) are all “enmeshed” in the system. Pollock noted that, for this reason, even a successful financial reform effort would not last long, due to innovation in the financial sector.

He closed by contending that the Federal Reserve (which he described as having become “the largest savings and loan in the world”) and its suppression of interest rates and pursuit of asset price inflation is distorting investment decisions and capital allocation, contributing to the emergence of housing bubbles in many countries around the world.

SHENG discussed how regulatory changes in the developed world following the global financial crisis are affecting emerging markets, particularly in Asia.

Finance, he began, is (or rather should be) a “service industry,” in the sense that it is meant to serve the real sector: growth and jobs. However, the financial sector has become too large in relation to the real sector (as it tends to do, he noted) and we need a rebalancing. Recent rule changes, however, have not done much to reduce leverage in the financial system. Sheng pointed out that, in gross balance sheet terms, the financial sector is four times larger than global GDP; including derivatives, he said, it is 16 times larger than GDP.

Sheng argued that the six-years’-worth of significant regulatory changes we have witnessed may be suited to advanced economies, but they are not suited to emerging market economies. The problems besieging emerging markets, especially in Asia, are not those of the developed world. Asia has succeeded in becoming the “factory to the world” in the last several decades. However, these countries are bound to undergo a period of disruption as they face all the challenges that accompany the transition from a manufacturing to a service economy, including excess capacity, energy inefficiency, and pollution. In that sense, Sheng said, finance needs to “think outside the box” and look toward innovation and research and development, with an eye to the next stage for Asian economies, rather than the soon-to-be-old polluting and excess-capacity industries. Sheng mentioned his work as an adviser to a United Nations Environment Programme study on the subject of green financing, which has shown that while roughly a trillion dollars of investment is needed to

begin dealing with the effects of climate change, globally the actual amount of such investment is only around $250 billion annually. Finance, he urged, needs to turn away from short-termism and be reoriented toward solving some of these "big picture" problems. But regulations are not helping with such a reorientation because, as Sheng put it, we are still trying to fix yesterday's problems.

Sheng agreed with Pollock's characterization of central banks as playing a new, expansive role. Before the crisis, he stated, central banks held 4 percent of world financial assets; after the crisis, roughly 8 percent and growing (in that context, Sheng emphasized that tapering is merely slowing the rate of growth of asset purchases). Moreover, central banks have become not just lenders of last resort, but the frontline lenders and major intermediators in the interbank market. They are, he said, "changing the rules of the game."

Lack of cooperation and dialogue between regulators and the financial industry has left some major economic problems unattended. According to Sheng, small- and medium-size enterprises do not have sufficient access to credit, and the rules are biased against long-term investment in infrastructure and green projects. Noting that Asia is in an era featuring bank-dominated finance, in which banking is more than 70 to 80 percent of many countries' financial systems, he observed that most parts of Asia (like many other places around the world) are "long debt and short equity." The reason for the latter phenomenon, he explained, is a tax system that is based on the advanced-market model, which gives preferential treatment to debt over equity, allowing write-offs for debt losses and interest, for instance.

MARCÓ DEL PONT began with a discussion of the recent slowdown in economic growth rates in Latin America and linked this to a weakening of these countries' external sectors and the "primarization"—the shift toward greater reliance on commodities exports—of Latin American economies over the last decade. This growth in commodities' share of the export basket has been witnessed in every Latin American country other than Argentina, and she noted that what helped drive growth prior to the more recent slowdown was a commodity price windfall. However, the global conditions that made this windfall possible, in terms of trade and short-term financial inflows, will not, she warned, be as favorable looking forward.

Nevertheless, Marcó del Pont stated that the region is in a more favorable position in terms of its ability to handle financial fragility, in part due to a debt reduction process that has been occurring at the aggregate level, but also due to Latin America's improved ability to cushion itself from external shocks. Through greater "policy wiggle room," particularly in the areas of macroprudential policy and the ability of central banks to intervene in the currency markets, Latin America was able to weather the global financial crisis.

Marcó del Pont commented that while more attention is now being paid to the dangers of short-term capital flows (justifiably so, she added), there is still insufficient focus on currency appreciation as a special problem in underdevelopment, as the appreciation that developing countries, particularly in Latin America, have experienced over the years helps to explain these countries' problems with primarization. She also emphasized that the regulation of short-term capital flows ought to be regarded as a permanent part of the policy tool kit for developing countries, and not just something to be used in exceptional circumstances. Noting that the International Monetary Fund is recommending fiscal contraction and higher interest rates for Latin America,

Marcó del Pont argued that these policies would have significant procyclical impacts that would worsen the situations of these countries.

Shifting to Argentina, Marcó del Pont noted that the country's avoidance of the primarization otherwise widespread in Latin America was the result of policy decisions, including the 2004 decision to decouple from global liquidity cycles by curbing capital inflows and the imposition of export duties on agricultural products; the latter allowed, according to Marcó del Pont, a reallocation of domestic investment away from commodities and toward reindustrialization. She also pointed out that Argentina's external sector has recently been declining. An energy deficit and industrial disequilibrium help explain the country's rising current account deficit—which is, she qualified, still below average for the region, but may become a problem in the future.

According to Marcó del Pont, Argentina is in a much better position now, as compared with past decades, in terms of its ability to deal with economic challenges. Once again, this is the result of policy choice, including the fall in foreign debt and the elimination of currency mismatching—one of the central factors, she noted, in Argentina's 2001–02 crisis. And although Argentina has made significant progress on economic growth in the last decade—registering the longest, most intensive growth period in the country's history—she observed that it is still below where it was in the 1980s in terms of its per capita income relative to the United States.

Noting that Argentina's inflation had historically less to do with monetary issues and more to do with problems stemming from the external sector, Marcó del Pont commented that there has been a move to expand the mission of the central bank beyond price stability alone. In 2012, Argentina amended its central bank charter so that monetary stability was no longer the exclusive goal, including financial stability, employment, and growth. Marcó del Pont outlined what she characterized as some of the outcomes of that decision. Banking behavior in Argentina was procyclical after the 2008–09 crisis, but not after the 2012 mandate change, which provided the central bank with the tools to restore the ability to channel lending and affect its terms and rates. The outcome of the new mandate, she argued, was a recovery in terms of lending. Comparing the composition of loans in the 1990s to the present, she observed that loans have become de-dollarized in Argentina. Finally, she noted that the share of lending going to small- and medium-size enterprises grew by 10 percentage points under the new central bank mandate.

GREENBERGER began by highlighting what he regarded as several misconceptions about the nature of the reregulation of financial markets that occurred following the 2007–08 crisis. He commented that the 2012 JOBS Act, which made smaller companies with fewer than 500 shareholders virtually exempt from the requirements of the securities laws that otherwise apply to public corporations, had no impact on the US economy. Greenberger dissented from the view that there is a lack of communication between regulators and the financial industry. There is, he said, a noticeable dialogue between Wall Street and regulators: namely, "Wall Street telling regulators what to do." And the problem, he added, is that money will play an increasingly important role in politics (a problem that will be further aggravated by the US Supreme Court's *McCutcheon* decision, he noted). As an example, Greenberger cited a bipartisan bill introduced in the House that would reverse certain sections of the 2010 Dodd-Frank Act in order to deregulate derivatives (specifically by preventing Dodd-Frank from being enforced beyond the sovereign United States), and

explained the broad support for this bill by reference to the attraction of political campaign contributions from the financial industry.

Greenberger said that we now have bigger, faster-moving financial markets, but he suggested that part of the reason has to do with the fact that Dodd-Frank now requires a number of transactions to be moved to exchange trading. He cited as an example the so-called Abacus deal orchestrated by hedge fund manager John Paulson in 2007 with the aid of Goldman Sachs, which involved enabling Paulson to short the mortgage market by taking out insurance on mortgages he did not own (naked credit default swaps). One of the reasons we have bigger markets, according to Greenberger, is that these sorts of transactions have been moved on to exchanges, such that, in theory, these financial instruments will be more transparent and priced daily.

As an aside, Greenberger mentioned that, after Lehman Brothers collapsed, one of the reasons Secretary of the Treasury Hank Paulson and Federal Reserve Chair Ben Bernanke shifted strategy in September 2008 to providing liquidity support to banks was that they were aware of these Abacus-type transactions but, because the transactions were private bilateral deals, the government had no clear idea of how many banks had made "bad bets" (in this case, that mortgages would be paid).

Greenberger pointed out that a congressional commission had determined that in many cases of mortgage failure the mortgage had been "bet on" up to nine times by outside parties. This meant that when a mortgage payment was missed, it had ripple effects throughout the financial system, such that it was not so much the failed mortgages themselves that accounted for the scale of the crisis, but these layers of bets by outside parties. Moreover, because derivatives had been deregulated in 2000, there were no requirements for holding capital reserves.

Now, Greenberger said, credit default swaps and many other instruments—though not enough of them, he qualified—are traded on exchanges, and the theory is that moving them off a private, opaque market will increase transparency and make it easier for the government to monitor risks and potential crises. However, Greenberger also noted that when Dodd-Frank was passed, it exempted preexisting derivatives transactions (which is to say, all transactions made prior to the point the rules were finalized by the relevant agencies), such that there are still "hundreds of thousands" of transactions that are still unregulated.

As another example of the problems with these private bilateral transactions—and the benefit of moving them to exchange trading post-Dodd-Frank—Greenberger cited the interest rate swaps that played a role in the city of Detroit's bankruptcy (swaps in which banks assumed the interest payments on municipal bonds—of around 1 or 1.5 percent—for which Detroit paid the banks 6 percent interest). Under the Commodity Futures Modernization Act of 2000, the transactions could not be challenged, and prior to Dodd-Frank, it was not possible to trade out of these transactions.

Summing up, Greenberger suggested that Dodd-Frank was helpful, but that it is being undermined constantly by lobbying of both lawmakers and agencies. He argued that the recent appointees to fill three vacancies on the Commodity Futures Trading Commission (approved by the Senate Agriculture Committee the day before Greenberger gave his presentation) will create "the most conservative . . . Wall Street–friendly CFTC in the history of the CFTC," as he put it. While there has always been, he said, at least one consumer-friendly or investor-friendly commissioner, if these appointments are made, there will be none.

SESSION 2

Financial Reregulation and Economic Stability: Was Dodd-Frank Enough, or Too Much?

Binyamin Appelbaum, Anat Admati, Jan Kregel

MODERATOR:
BINYAMIN APPELBAUM
The New York Times

ANAT ADMATI
Stanford University

JAN KREGEL
Levy Institute and Tallinn University of Technology

ADMATI sided with those who argue that the financial system has not changed very much post-Dodd-Frank. The principal issue is the continuation of the excessive indebtedness of banks. She suggested that Dodd-Frank suffers from a lack of focus with respect to implementation and a misguided focus on the notion of bailouts. On the latter, Admati stressed that the problems with the banking sector are present every single day—not just during crisis periods.

Under Title 1 of Dodd-Frank—which, she noted, established the Office of Financial Research and the new collection of regulators called the Financial Stability Oversight Council—once we have defined financial institutions that are "systemically important" and "too big to fail" (or as Admati put it, "too blank to blank—there are many ways that you can fill the blanks"), these institutions are supposed to submit living wills to regulators, which are meant to demonstrate that the institutions can go through a bankruptcy procedure without harming the economy. If

this cannot be demonstrated, then Dodd-Frank calls for further action from regulators. However, Admati pointed out that although most of these living wills are not released to the public, the information we do have suggests there are financial institutions that do not meet the test (and she added, "I don't need to see what was submitted to know that the answer to the question 'Can J. P. Morgan Chase fail through bankruptcy without harming the economy?' is 'No'"). Despite this fact, she said, the Fed, the Office of the Comptroller of the Currency, and other relevant agencies are not acting. They are failing, she stated, to take the simplest steps: to help prevent bankruptcy or failure in the first place, by, for instance, preventing banks for the foreseeable future from making payouts that increase their fragility.

Admati observed that the risks taken in Silicon Valley—innovation risks—are sometimes greater than the risks of making loans, which are, she said, not that risky if prudent loans are made and credit risk can be averaged out. However, she pointed out that, by contrast with banks, the innovation risks in Silicon Valley are not funded with so much debt. Public corporations in the United States fund themselves with, on average, 70 percent equity, whereas for banks it is in the single digits. And there is nothing special about bank equity, Admati insisted: the reason banks are fragile is not that this is beneficial to the economy, but simply that banks have gotten away with living on such thin equity. She dismissed claims about "tough" new leverage regulations, as those requirements call for a mere 5 or 6 percent equity. This is, Admati stressed, unheard of in the rest of the economy, and cannot be justified on the basis of some supposed unique economic features of banks—banks' uniqueness lies only in what they can "get away with."

We need, according to Admati, for more derivatives to be on exchanges, but foremost, we must reduce the indebtedness of lenders and have them rely more on raising equity. This would also make them better lenders, making them less inclined to take on so much risk (they would act, said Admati, more like "a person investing their own money") and more inclined to invest in the "unexciting" business loans the economy needs. Not only does the tax code encourage borrowing, Admati observed, but also the ways in which we provide support to banks—in particular the Troubled Asset Relief Program—fail to deal with this problem of excessive indebtedness.

In Admati's view, we have failed to learn the appropriate lessons from the crisis and correct the mistakes of the past. Regulators have sufficient authority—under Dodd-Frank they have even more than they had before, she stated—but they have not chosen to exercise it, much like they failed to exercise what authority they had during the last crisis: risks in the financial system were allowed to build up through insufficient enforcement. And while she conceded that current regulations are too complicated, Admati emphasized that deregulating, or "throwing out the baby with the bathwater," would be even worse—and banks would be no more likely to make the loans we want them to make.

KREGEL devoted his presentation to laying out Hyman Minsky's (overlooked) early work on regulation—a precursor, Kregel noted, to Minsky's financial instability hypothesis (FIH). In the 1960s, Minsky worked as a consultant to a number of government agencies (including the Commission on Money and Credit, the Federal Deposit Insurance Corporation, and the Federal Reserve), and during that time he wrote about regulation, and bank examination and supervision in particular.

Minsky was likely the first economist, Kregel stated, who concerned himself with macroprudential regulation. In Minsky's early work, his basic criticism of existing approaches to regulation was that there was no economic theory behind them; largely because in standard mainstream theory there was no possibility of systemic crises. Without theoretical grounding, crises were attributed to idiosyncratic or fraudulent behavior (the "rotten apple" theory, as Kregel described it), and regulation was therefore largely microprudential: which is to say, regulation of single institutions and their potential misbehavior.

For Minsky, the FIH, which explained why the system had a tendency to generate crises in the course of its normal functioning, filled this theoretical void; it grounded Minsky's view of regulation, according to Kregel. But the FIH also presented a conundrum: if stability is destabilizing, as Minsky maintained, then regulating to produce stability can be, in a sense, self-defeating. The answer was that regulation ought to be devised in a way that aims not at stability per se, but at obtaining greater knowledge of how instability is generated in a particular financial system.

What was needed, Kregel explained, was a better understanding of the structure of bank balance sheets and position-making activities—that is, how the assets and liabilities on banks' balance sheets are combined. In this view, Kregel continued, bank failures are not the result of "bad apples" in management, but are generated by, in Minsky's words, "the interdependence of payment commitments and position-making transactions across institutions and units."

And so, for Minsky, proper bank examination and supervisory procedures form a crucial part of regulation. The examination of balance sheets, Kregel emphasized, needs to be motivated by the view that liquidity is not an innate attribute of an asset. Rather, liquidity ought to be viewed as a characteristic of an ongoing, evolving financial institution. And at the heart of this conception of liquidity, Kregel explained, is the ability of the institution to fulfill its payment commitments. In this Minskyan framework, the liquidity of an institution depends upon assumptions about the behavior of the economy and financial markets, and estimates of institutional liquidity will change as these assumptions change. Bank examiners ought to be concerned about, not just an institution's combination of assets and liabilities, but also the liquidity of the markets (what the conditions in the market will be when an asset needs to be sold for liquidity) and the concentration of the holdings of particular assets (if most market participants are holding the same asset as a liquid asset and they all need to be sold at the same time, liquidity will become a problem).

Minsky also insisted that proper bank examination requires taking alternative economic and policy scenarios into account, since both of these factors will change market conditions. As an example, Kregel mentioned current concerns about the end of quantitative easing and future rises in interest rates in the context of how this would affect the value of a large number of fixed interest securities. In addition, Minskyan bank examination procedures need to be attentive to institutional change (Minsky focused on the emergence of large, highly concentrated banks and fringe banking institutions and markets). Regulations must therefore be dynamic and frequently reassessed, since they can quickly become obsolete as profit-seeking institutions adapt and innovate in response to existing regulatory structures. Essentially, Kregel said, Minsky told us that we will never be able to write a set of regulations that creates stability once and for all; what we can do is to figure out how the particular system generates instability and respond to it.

To illustrate these points, Kregel discussed Minsky's treatment of the savings and loan crisis. The question is why the savings and loan insurance system worked for 40 years before encountering problems. Minsky's answer highlighted the importance of institutional and policy changes. A change in institutional operations—including a shift in position making that decreased margins of safety—accompanied by a change in monetary policy rendered the deposit insurance system for the savings and loans untenable. The problem, Minsky saw, is that an insurance model works well if we are dealing with the failure of an individual institution, but not with a systemic crisis. Kregel noted that Minsky regarded the reforms that were being considered in the aftermath of the savings and loan crisis, including risk-adjusted premiums, capital requirements, and greater public disclosure, as making insurance payoffs more rather than less likely—and Kregel pointed out that these are the same proposals that have been written into Dodd-Frank and which we are relying on to save the financial system. The purpose of deposit insurance, according to Minsky, is not to save depositors but to ensure the safety and soundness of the banking system, and the rational response, if we take the prospect of systemic failure seriously, is for the government to accept that it has an open-ended, contingent liability.

SESSION 3

The Global Growth and Employment Outlook: Cloudy with a Risk of . . . ?

James Politi, Willem H. Buiter, Bruce Kasman, Frank Veneroso

MODERATOR:
JAMES POLITI
Financial Times

BRUCE KASMAN
J. P. Morgan

WILLEM H. BUITER
Citi

FRANK VENEROSO
Veneroso Associates

KASMAN shared his assessment of the prospects for global economic growth in the context of a broader view of the challenges facing the global economy. On the latter, he argued that while we are no longer likely to face the acute near-term risk of a recession or financial crisis, chronic problems on the supply side have moved to the fore.

Kasman stated that growth would be "decent" over the next year, but with some regional differentiation. We have entered, he said, a disinflationary world; one in which the disinflation we have witnessed in the United States and Western Europe will be moving into emerging markets over the next year. And the reason we have such low inflation, Kasman said, is that there is so much slack in the global economy. He argued that the world is in the midst of a chronic supply-side crisis, noting the drop in estimates of potential output for developed market economies.

Kasman commented that a number of "weapons of mass destruction" have been

taken away from policymakers in the developed market economies: he referenced the turn toward Outright Monetary Transactions (OMTs) in the eurozone, his view that Japan has "turned the tide" on its deflationary environment, and the cessation of the drama in US fiscal policymaking (regarding the debt ceiling debate and the "fiscal cliff").

Global growth is constrained, Kasman argued, by the differentiation—in terms of corporate performance and credit conditions—between the developed market economies and emerging markets; notably, the "softening" of the latter's performance. This is, he said, more than just a cyclical issue; it represents the unwinding of excesses that have built up in the emerging markets over the course of a decade of strong growth, which featured a rapid rise in credit and misallocation of resources.

Kasman described himself as "cautious" about the prospects for US growth and said he expects growth to be closer to 3 percent (which is, he noted, above the 2.25 percent average for the expansion), but emphasized that there are still elements of "post-traumatic stress" in the US economy: specifically, the fact that the corporate sector has not yet seen enough demand to justify higher investment and that households remain cautious, despite being in a better position in terms of the reduction in fiscal drag.

Europe is one area of the world that has the "capacity to surprise," according to Kasman. He predicted that the euro area would grow just over 1.5 percent for the year, as confidence and financial conditions stabilize and fiscal austerity fades on the periphery.

There will likely be a great deal of variation in growth performance within the emerging markets: Central Europe will be solid; Russia and Turkey will fall behind; the divergence between Mexico and Brazil will continue; and while China will experience slower growth, this will not have significant spillover effects—even for the other export-oriented Asian economies ("What is happening in China is going to stay in China"). The financial linkages between China and the rest of the world are limited, Kasman argued; moreover, slower growth in China is being driven in part by policymakers' decision to pull back on credit, such that they could contain the slowdown. Kasman said he expected China's economic growth to be no more than a percentage point below last year's number.

We have entered a world in which central bank multitasking is the norm, said Kasman; where, in addition to the Federal Reserve's "dual mandate," for instance, there is now a financial stability element to Fed policy. There is also, he noted, a willingness on the part of central banks to take risks with the growth–inflation trade-off, to see if this can elicit a response in the interests of dealing with the persistent weakness in demand. However, Kasman observed that the Fed does not have separate, differentiated tools for dealing with all of these various goals, and that competing considerations pull the central bank in different directions.

Kasman said he thought we would see the end of the Fed's balance sheet expansion by the fourth quarter of 2014 and the end of reinvestment by the first quarter of 2015. Finally, he predicted that the Federal Reserve, in an environment in which inflation will likely stay low (below 2 percent), will not begin raising interest rates until the end of 2015.

BUITER outlined his view of the main risks to global growth. He began with the prospect of a short but significant slowdown in China in the next two-plus years, which, he said, would mainly affect the rest of the world through trade channels (Buiter echoed Kasman's point regarding the

limited financial linkages between China and the advanced economies). It is difficult to see, said Buiter, how China can avoid at least a short-lived credit crunch and recession, given that its growth is currently driven by a credit bubble and construction boom (with 17 percent of GDP in construction). However, he added that China's recession would not be long-lasting because its housing boom was not highly leveraged (with a typical loan-to-value ratio around 20 to 40 percent for households). And Buiter expressed optimism regarding China's ability to shift to a more sustainable growth model in the longer term.

Although the United Kingdom is enjoying a construction boom that has boosted demand, a boom that Buiter linked to an "opportunistic electioneering policy," he warned that the sustainability and composition of demand also matter. When first-time homebuyers take out 90 percent loan-to-value mortgages with variable rates, this will work out when the bank rate is at 50 basis points and unemployment is falling, but when the rate is back at 400 basis points and unemployment is rising, he said, there will be foreclosures and evictions "galore."

In addition to China, Buiter pointed to two underestimated risks in the euro area: sovereign debt risk on the periphery and banking sector risks throughout the eurozone. Buiter stated that none of the peripheral eurozone countries is fiscally solvent unless it achieves something on the order of 3.5 to 4 percent nominal GDP growth—and with inflation in the euro area as a whole at 0.5 percent and likely negative inflation rates on the periphery, the peripheral countries would need to have *real* growth rates around 3.5 to 4 percent. This is not realistic, he observed.

Buiter commented that the German Constitutional Court has created some uncertainty regarding the legality of initiating OMTs. While he said that the European Court of Justice will likely find that OMTs do not violate the Treaty on the Functioning of the European Union, the German Constitutional Court will probably then rule that it violates the German Basic Law (correctly, said Buiter, since OMTs impose on the German public something only the Bundestag may impose: a potentially open-ended fiscal commitment). Buiter added that, until these rulings come down, there is no downside for the European Central Bank (ECB) to initiate OMTs should the need arise, since without OMTs the failure of, say, Spain or Italy to access market funding would lead to the disorderly default of a large sovereign, meaning the end of the eurozone (and the ECB); better to pull the trigger and worry about the legality afterward. Still, Buiter emphasized that it is not clear what will happen after the German Constitutional Court rules that OMTs are inconsistent with the German constitution, and the uncertainty involved is a risk that has not been priced in by markets. The only way this risk can be eliminated and the only way to ensure there is a lender of last resort for eurozone sovereigns, he argued, is by making changes to the Treaty and the German constitution to explicitly allow the ECB to play this role.

He also raised the possibility (a "tail risk") of a scenario in which the Russia–Ukraine conflict leads to sanctions against the former and a sinking Russian economy drags Europe into recession. And he pointed out that markets are not pricing this risk into European asset prices.

Buiter described US economic growth performance as better than expected, and said that it should be sufficient to bring the unemployment rate down far enough where the Federal Open Market Committee begins to worry about inflationary pressures by the second half of 2015; leading, he continued, to an increase in interest rates. The long-run potential growth rate of the US economy is somewhere between 2 and 2.5 percent—lower than where we thought it was prior to

the crisis, said Buiter—and could be raised through improvements in human and physical capital, infrastructure, education, public health, and immigration policy.

VENEROSO examined whether the US economy is generating another financial bubble. Looking at a number of relevant measures (Tobin's Q, the Shiller PE ratio, and market capitalization as a percentage of GDP), he observed that while the stock market is not at its "super-bubble peak," it is nevertheless registering high levels on these measures. As for whether we have a credit bubble, Veneroso said that while household credit is down, corporate credit—and the riskiest part of corporate credit (leveraged loans)—is going up. There are, he concluded, "incipient bubble signs," and the question is whether the situation will worsen. Responding to the idea that high profits justify these valuations, Veneroso argued that the profit numbers may be (fraudulently) overstated.

He commented that there are a number of dynamics normally accompanying a bubble that are not evident this time around. For instance, we are not seeing an overall expansion of credit, transformative innovation that creates "bonanza returns," or the loss of a sense of risk—the complacency that usually presages a bubble. In that sense, he said, it is strange that we would seem to be coming close to a new bubble. Veneroso's explanation for why we might nevertheless be approaching bubble territory centered on moral hazard and a version of the principal–agent problem: the scope and nature of government interventions to aid the financial sector have led to changes in behavior among market participants, and the "bonus culture" discussed by Andrew Smithers is leading corporations to use cash to engage in buybacks in order to inflate stock prices and cash in on options.

Veneroso outlined five mechanisms that can be found in Hyman Minsky's theories of financial instability. First, there is the idea that uncertainty requires extrapolation from present circumstances, leading to euphoric expectations during good times, overinvestment, a greater reliance on financing with debt, and thereby an increase in financial fragility. Second, there is a version of this same story in which the absence of downside volatility creates higher risk-adjusted returns, once again leading to overinvestment and high debt structures. According to Veneroso, these first two mechanisms are both associated with the domain of business investment, but Minsky found that the postwar period did not feature business booms financed with debt.

Veneroso identified three other dynamics that, for Minsky, operate as sources of financial instability. These include moral hazard—when the government intervenes to reduce risk, it shifts the propensity to spend and borrow, generating financial fragility—and the concept of Ponzi finance (here Veneroso noted that the third world debt crisis was occurring "under Minsky's nose"). The final instability mechanism in Minsky's framework is a variant of the principal–agent problem related to the rise of money manager capitalism. The latter created a distorted set of incentives that led to a focus on shifting assets around to generate short-run returns and higher fees rather than good long-term investments, resulting in more speculative markets. Among these five mechanisms, Veneroso said, some are applicable to today and some are not. Business investment and its finance do not appear to be sources of instability at present, he observed, while mounting moral hazard in response to greater intervention seems to be a more relevant consideration.

There is a "more profound story" associated with Minsky's financial instability hypothesis, said Veneroso: namely, because uncertainty is so great, and since we therefore have to extrapolate from the present, "rationality" in the technical sense used in economics—that which is associated

with Paul Samuelson and Kenneth Arrow—does not apply. Noting that Arrow himself expressed concerns about the limitations of human ability with respect to intertemporal rationality, Veneroso added that John Maynard Keynes went even further (regarding computing the probabilities of some future states, Keynes said that "there is no scientific basis on which to form any calculable probability whatever"). According to Veneroso, Keynes saw that the behavior we observe in financial markets does not conform to the standard assumption of rationality. For Keynes, whenever a perturbation occurs that moves the market away from equilibrium, agents extrapolate from this trend; and thus, instead of prices moving back to equilibrium as a result of rational agents betting against the trend, prices continue moving away from equilibrium. This is, said Veneroso, the basis of Minsky's view of the endogeneity of financial instability. The experience of frequent losses can break this behavior, but in a world in which policymakers are trying to eliminate recessions and debt deflations, Veneroso stated, moral hazard creates a dynamic in which markets are being allowed to become more and more fragile.

The problem, Veneroso concluded, is that policymakers assume markets will be efficient in the traditional sense. They do not examine the potential for extrapolative behavior under conditions of stability, which means they miss the growing financial fragility and are surprised by crises. Generally speaking, he said, we should not be having a crisis so soon, since we have already had a bubble and an "echo bubble"—and having a third bubble at this point would be highly improbable. But Veneroso expressed the concern that, in a world of weak economic growth, in which central banks feel the need to "keep the pedal to the metal," we may be setting the system up for stability-generated instability, creating a third bubble in the United States and another global crisis.

SESSION 4

The Euro and European Growth and Employment Prospects

Dimitri B. Papadimitriou, Denis MacShane, Heiner Flassbeck, Tom Redburn

MODERATOR:
TOM REDBURN
The New York Times

HEINER FLASSBECK
Flassbeck-Economics

DENIS MACSHANE
European Policy Counsel

DIMITRI B. PAPADIMITRIOU
Levy Institute

Pushing back against the idea of inflation as strictly a monetary phenomenon, **FLASSBECK** presented an alternative explanation with wages, and specifically unit labor costs, as the central focus. He began by illustrating the close connection between unit labor costs and inflation in Japan, Europe (the Economic and Monetary Union), and the United States.

Flassbeck argued that the fact the labor market does not function like other markets is too often ignored by certain economists. In 2008 and 2009, he pointed out, we had an increase in unemployment, but wages were already low (with wage shares at their lowest level in 50 years). How can you get an excess supply of wages, he asked, when the price is already low? The answer, he said, is that the labor market is not just another market. There is continued downward pressure on wages because the balance of bargaining power has shifted away from workers and unions since

the 1970s. And the rise in unemployment was the result of a financial crisis and had nothing to do with wages, he said.

According to Flassbeck, neoclassical economists are resistant to abandoning the idea that the labor market is a market like any other because if they remove this part from neoclassical theory, "everything collapses," as he put it—including their faith in the efficacy of monetary policy. This is a lesson that Japanese Prime Minister Shinzo Abe has begun to learn, Flassbeck commented. As evidence, he mentioned that Abe has begun talking about wages, and not in the (neoclassical) sense of the need for wage "flexibilization," but about increasing wages—which is, Flassbeck insisted, what needs to be done in Japan and elsewhere. In his view, the critical question is how we can engineer wage increases in spite of high levels of unemployment.

Moving to the eurozone, Flassbeck noted that from 1999 to 2007 there was a significant split within the eurozone: between Germany, which essentially did not increase its unit labor costs, and the rest of the eurozone. If unit labor costs determine inflation, Flassbeck said, then a monetary union requires unit labor costs in all countries to follow the inflation target. Germany is the only country that has not followed this crucial guideline since 1999. The rest of the eurozone countries put together had unit labor cost growth marginally above the inflation target, but Germany was the one country that really "got it wrong," he stated.

Flassbeck demonstrated that nominal wages overshot productivity in France, while in Germany, despite nearly identical productivity growth, nominal wages remained suppressed (rising at the same rate as productivity). In this, he argued, France was right and Germany was wrong. If we look at real wages, Flassbeck said, then in a monetary union with an inflation target of 2 percent, real wages need to follow productivity (France, he noted, is the only country that has been perfectly on target). If a country wants to conduct a neoliberal experiment in wage moderation, as Germany has done following "enormous political pressure," he noted, then that country should not be part of a monetary union (or at least not one with a 2 percent inflation target).

Since 2008, Flassbeck observed, we have seen some adjustment, as Southern Europe (excluding Italy) has achieved internal devaluation (wage cuts). However, he stressed that this sort of cut in unit labor costs is bound to have a significant effect on prices—and this is precisely what we have seen in terms of deflation. Flassbeck pointed to the incongruity of the European Central Bank (ECB) being called on to halt deflation even while the European Council puts pressure on Southern Europe to cut wages.

Moreover, as wages began to fall in Southern Europe, unemployment rose, Flassbeck pointed out, returning to the argument about the nature of labor markets. The problem with the view that the labor market is like the potato market is that "potatoes don't buy other goods," he said; whereas, if the price of labor falls, workers spend less, and this has repercussions for the overall economy, undermining the domestic market and raising unemployment. Greece has been the "most efficient wage cutter under the sun," he noted, but at precisely the moment it began to cut wages, the unemployment rate accelerated upward.

Looking forward, Italy and France have a choice, Flassbeck stated. They can continue on the current track, not cutting wages, and will eventually face ruin (in five or 10 years, he suggested) due to being overvalued by 20–25 percent compared to Germany. Or they can go the Southern European route and cut wages—in which case they will face economic ruin even sooner. In this

latter scenario, unemployment will rise, and this will lead, he predicted, to the election of Marine Le Pen (leader of the Front National) and the end of the euro. This option of cutting wages (or continuing to cut wages, in the case of Southern Europe) is not politically feasible, Flassbeck concluded, and the only way to avoid deflation in the eurozone is for German policy to shift in the direction of higher wages.

MACSHANE stated that Europe is at a turning point in terms of its future economic and policy model. Broadly speaking, Europe went through a period he described as the "New Deal welfare state" from roughly 1950 to 1980. The next period, defined by a neoliberal, market-driven model, came to an end in 2008, and we are now in an interim period marked by symptoms of morbidity, he said. In addition to what he described as high levels of social spending, MacShane noted that central banks, including the Bank of England and the ECB, are undershooting their inflation targets. Central banks are supposed to "press every panic button" when inflation rises above the target, he observed, but they have remained too complacent with inflation well below target. However, this may be changing: MacShane suggested that the ECB is coming to realize it needs to take more aggressive action, whether through helicopter drops or quantitative easing. He agreed with Buiter that there is a housing bubble in London, and pointed out that many properties (40 percent of properties in upmarket Belgravia, according to MacShane) are unoccupied and held by overseas owners for speculation purposes because the appreciation on housing is superior to the returns offered by many hedge funds. The UK also has a large current account deficit, household incomes are down, and youth unemployment is high.

He suggested better economic news is beginning to emerge, with Britain at the top of the International Monetary Fund's (IMF) chart for growth prospects and Greece carrying out a successful bond sale. Nevertheless, he pointed out, Greece's economy has shrunk by 25 percent since 2008 and its unemployment rate is still around 27 percent. And there are significant differences within the eurozone, with unemployment in Germany at 5 percent and large variations in GDP per hour worked. It is a challenge, he said, to find the right policy mix for these divergent economic situations.

MacShane argued that a Greek exit would send waves of panic throughout Europe, but that we are not likely to see any member-states leave the eurozone. It was a good idea to create a single market in the first place, he said, but the eurozone is not working and needs to be reformed.

Beginning with the observation that Poland has exported a great deal of its unemployment, MacShane speculated that there is more free movement of labor between European countries than between US states. Although it is causing political tensions, there is some truth, he said, to the claim that foreign workers are displacing domestic workers in Britain by undercutting them. This may be economically necessary, he added, since it ensures that the work stays in Britain rather than being offshored.

Germany has taken a "wrong turn of historic proportions," according to MacShane, with its overinvestment in wind energy (under the Energiewende). The "green industrial complex" is imposing large energy costs on the German economy, he said, and as a result there are 6.9 million households living in energy poverty (defined by the German government as spending more than 10 percent of household income on utility bills), and the country has become dependent on Russian gas.

Turning to the political consequences of the eurozone's ongoing economic crisis, MacShane observed that most European Union (EU) states are governed by coalitions, and he

noted that coalitions tend to slow down the political process. There is also a broad turn to the left in Europe, he said, but along with that has come a rise in nationalist identity politics. This new identity politics is populist, anti-European, antiglobalization, and antimarket.

The central challenges facing Europe include finding a way to increase economic growth, persuading the ECB to inject more money into the economy, and completing the single market, which, while it exists for goods, is incomplete in other areas, MacShane argued. Russia's suspension from the Council of Europe will cause problems, in part due to European dependence on Russian energy. MacShane also expressed concern over UK Prime Minister David Cameron's promise to hold a referendum on whether the UK will exit the EU. In short, MacShane concluded, the economic scene is Europe is improving, but the political environment is deeply problematic.

PAPADIMITRIOU presented the results of the Levy Institute's strategic analysis of the Greek economy. He began by highlighting two pieces of good news: Greece's sale of €3 billion of five-year notes at an interest rate of 4.95 percent (Papadimitriou noted that the analysis he would present does not justify such a favorable interest rate), and a primary surplus for the Greek government of €3 billion. Although the latter figure remained to be confirmed by Eurostat, the important point, Papadimitriou stressed, is that one-third of it will be given back to the most vulnerable (unfortunately, he noted, that would only barely begin to repair to damage done).

The Greek crisis began, Papadimitriou recounted, when the government was unable to roll over its maturing debt in 2009 and was forced to seek assistance from the EU and the IMF, which, together with the ECB, provided two rescue packages totaling €240 billion. There were, however, strings attached to these packages in the form of austerity, including spending cuts, tax increases, and labor market restructuring. The result, Papadimitriou reported, has been a loss of output from 2008 levels that, while generally reported at 25 percent, is actually closer to 28 percent. He demonstrated that the cumulative effects, in terms of both output and unemployment, have made the Greek crisis worse than the Great Depression in the United States.

The troika plan has also included cuts in public sector employment, privatization of public assets, and internal devaluation. Papadimitriou noted that while the internal devaluation target was supposed to be a 15 percent reduction in real wages, the actual devaluation ended up closer to 30 percent. And although public debt was restructured through a haircut for private investors, it has reached 175 percent of GDP (compared to 125 percent of GDP when the crisis started)—which leaves one wondering, he said, what the purpose of the rescue packages was.

Using a stock-flow macroeconometric model, the Levy Institute's strategic analysis examined the likely trajectories for the Greek economy's financial balances. Papadimitriou began by noting that troika projections have been continuously overoptimistic about eurozone economic performance, and that the Levy Institute's baseline has been more accurate in terms of its growth and unemployment projections.

He observed that Greek unemployment encompassed 1.37 million people, with the gender distribution biased against women (a 32 percent unemployment rate for women, versus 25 percent for men). He also commented that while youth unemployment is high, at 58 percent, there is more attention paid to their plight than is paid to the long-term unemployed.

With respect to internal devaluation, Papadimitriou pointed out that nominal wages in Gerece have dropped by 23 percent and, as mentioned, real wages by 30 percent, and while the consumer

price index had been on an upward trend, it was beginning to decline—and may continue to do so due to deflationary pressures. Comparing harmonized indices of competitiveness across the eurozone, he pointed out that Germany had increased its competitiveness with respect to consumer prices, the GDP deflator, and unit labor costs, while Greece had become more competitive only in the last measure (a decline in unit labor costs).

Papadimitriou noted that Greece has been improving its trade balance in goods largely because of a drop in imports, and that its current account balance is improving because of a drop in the interest rates charged on loans coming from the eurozone—not because of any dramatic boost in exports. On the export side, most of the observed improvement is due to petroleum-related goods, he said.

Pointing to the continuation of declining consumption in Greece, Papadimitriou argued (contra Peter Praet) that there is no evidence of a convergence in domestic demand; domestic demand is very low in Greece and will continue to be so, he said. Papadimitriou noted that the rise in exports has failed to offset the cuts in public expenditure. He also commented on the low level of household and corporate borrowing in Greece: credit availability is constrained, he said, and those who can borrow do so at an average interest rate of 8.3 percent, which is the highest rate since Greece joined the Economic and Monetary Union.

The Levy Institute's baseline projections see the Greek economy bottoming out in 2015. Papadimitriou suggested there may be some deviation from the projected -2.6 percent growth rate for 2014 if the government spends €1 billion from its primary surplus, as expected, but that the change will be very small and not sufficient to reach the 0.6 percent growth rate that many forecasters are predicting for 2014.

He predicted that neither eurobonds nor a Euro Treasury would come to pass in any relevant time frame, but that there are alternative solutions. First, he mentioned the creation of a Marshall Plan–like program that would be externally financed (by the European Bank for Reconstruction and Development). The program, which would total 30 billion (at 2 billion per quarter) could include public consumption, targeted investment, or an employer-of-last-resort (ELR) program along the lines envisioned by Hyman Minsky. A second option would be to suspend interest payments on public debt until growth resumes and Greek GDP returns to its 2010 level, which would require cooperation from the ECB, European Stability Mechanism, and private sector to ensure maturing debt is rolled over. The unspent amounts would then be diverted to some of the Marshall-type projects. Third, the Greek government could issue €30 billion of development bonds to fund these projects. The only difference between this alternative and the first would be an increase in public debt, Papadimitriou noted. Although all three alternatives would increase real GDP growth relative to the baseline, the first and third options would have the greatest effect, and an ELR program in particular would have the largest employment effect.

Papadimitriou also discussed, as a last resort, the creation of a parallel financial system involving the issuance by the Greek government of a new type of bond. He observed that there is some precedent for this: in 2010 the Greek government was forced to issue €6 billion worth of "pharma bonds," which could be deposited at banks at a discounted rate in receipt of cash, when pharmaceutical companies threatened to stop delivering medicine to public hospitals that were in arrears (at the time, Papadimitriou pointed out, neither the ECB nor the EU objected).

SESSION 5

What Are the Monetary Constraints to Sustainable Recovery of Employment?

Jon E. Hilsenrath, Robert Barbera, Frank N. Newman, L. Randall Wray

MODERATOR:

JON E. HILSENRATH

The Wall Street Journal

ROBERT BARBERA

The Johns Hopkins University

FRANK N. NEWMAN

Promontory Financial Group China

L. RANDALL WRAY

Levy Institute and University of Missouri–Kansas City

BARBERA challenged the Congressional Budget Office's (CBO) projections for the path of federal public debt. He qualified that the CBO is merely utilizing conventional wisdom to produce its debt and deficit projections, and that his remarks should be taken as a critique of that conventional wisdom rather than the CBO per se. Looking at those projections for the next five years, Barbera pointed out that the CBO is predicting a drop in payroll employment gains and a rise in the interest rate on the 10-year Treasury note from 3 percent to 5 percent. Each of those things is certainly possible, he said—but it is highly unlikely that both occur. If the next five years of employment growth are as bad as the CBO is projecting, Barbera emphasized, then interest rates will not rise in the manner the CBO is predicting.

Barbera pointed out that in 2001 the CBO was predicting annual labor productivity growth over the next 25 years to be 2.6 percent, and that they are now projecting it to be 1.6 percent. Looking at the distribution of 25-year

average labor productivity performances from 1952–2013, he observed that two-thirds of the time productivity was 1.9 percent or above. By contrast, labor productivity was 1.6 percent only 8 percent of the time over this period of roughly 50 years—and in those years, he noted, the labor input was strong (employment was growing at 2 percent per year). In other words, the CBO is predicting historically weak productivity growth.

Meanwhile, what will be happening to labor input, he asked? Turning to the Bureau of Labor Statistics' (BLS) labor force participation projections, he noted that in late 2006 the BLS predicted that labor force participation would go from 66.2 percent in 2007 to 66 percent in 2013, but in reality it went from 66 percent all the way down to 63.2 percent. This was not because baby boomers retired early, Barbera said, but because younger people had a harder time finding a job (dropping from a 59.4 percent participation rate to 55 percent, instead of the predicted 58.5 percent) and because the rate for prime-working-age laborers fell as well (from 83 percent to 81 percent). The declining participation rate was not driven by demographics, he stressed, but was instead due to the severity of the recession.

Barbera compared labor market conditions in 1994Q1 to 2014Q1, commenting that "not all 6.7 percent unemployment rates are created equal." While both periods saw U3 unemployment at 6.7 percent, U6 was 11.5 percent (compared to 12.7 percent for 2014), 83.4 percent of prime-age workers were employed (compared to 81.2 percent for 2014), and the core PCE deflator was 2.4 percent in 1994 (but 1.1 percent in 2014). The point is, he said, looking solely at the official (U3) unemployment rate does not tell you everything you need to know about labor market slack. He demonstrated that a modified Taylor rule that takes U6 into account suggests Federal Reserve policy should be looser than if one looks only at U3 unemployment.

Returning to the CBO projections, Barbera observed that the consensus view is that the trajectory of GDP growth will be closer to 2 percent than 3.5 percent. He said that he doubted this pessimistic forecast, but that, nonetheless, if we accept it, then it follows that future interest rates should be lower than what the CBO projects: the neutral short-term interest rate that was appropriate when GDP growth averaged 3.5 percent is not going to work under conditions of 2.1 percent average GDP growth, as Barbera put it.

Barbera pointed out that in 2011 the CBO was projecting that the primary deficit would be 6.9 percent of GDP in 2038, but that after a tax increase for the wealthy, defense spending cuts, and slower Medicare spending growth, the current estimate for 2038 is a primary deficit of a mere 1.6 percent of GDP. How then, he asked, do we get the CBO's dire debt projections?

The answer, Barbera explained, is found in the relationship between the CBO's projections of the real growth rate and its projections of the interest rate on government debt: the CBO is projecting slower growth in the future but has not meaningfully lowered its projected borrowing costs in tandem. Over the postwar period, through 2005, real GDP growth averaged 3.4 percent and the real borrowing cost for the government averaged 2.7 percent, but now that real GDP is projected to average 2.1 percent, Barbera said, it makes no sense for borrowing costs to remain the same. If, on the other hand, the real borrowing cost for the government is 60 basis points below the real growth rate (i.e., the government pays a real interest rate of 1.5 percent), then the debt-to-GDP ratio would rise from its current 73 percent to only 78 percent by 2038—instead of the CBO's projected 100 percent.

In the past, productivity growth as low as the CBO's projected 1.6 percent has been very rare, and when it did occur, Barbera noted, it was always in the context of strong labor input. A future of low productivity growth, weak labor input, and high real interest rates is highly unlikely.

NEWMAN examined issues surrounding the financial consequences of spending public funds to handle a financial crisis or deep recession. As he pointed out, many economic policy debates come back to the question "Can we afford this?"; and too often the answer, usually motivated by concerns about the level of public debt, is "No." Answering this question in the right way, he said, is crucial for how we handle the next financial crisis, not to mention how we deal with recessions and unemployment.

A country like the United States, Newman argued, need not be concerned about its national debt. However, he emphasized that eurozone member-states are in a different situation: by contrast with the United States, they do not truly have their own central bank and do not issue bonds in their own currency.

Newman suggested that some of the problems with the public perception of these issues stem from the terminology used: instead of "national debt," we might be better off saying "US Treasuries." Treasuries, he said, are just a particular form of financial asset created by the government, and they do not share many of the characteristics of what we normally think of as debt. He added that public debt is not a large burden on future generations, and that the notion governments will need to raise taxes to "pay down" the public debt in the future is fanciful—that paying off the debt in this way never happens, and never will.

For a country with its own central bank and that borrows in its own currency, there is no practical limitation to spending whatever is necessary to rescue the real economy or the financial system, he stated. Suppose, Newman said, the banking system lost a third of its $1.5 trillion in equity capital. In such a case, the government could simply create a special type of bond and place these bonds in the troubled banks. China did something similar in 2000, he observed, when its "Big Four" banks had troubled loans amounting to roughly 20–25 percent of GDP. Despite dire predictions from the West, the Chinese government simply bought the bad loans from the banks, created separate "asset management companies," and funded the latter with new bonds.

Newman commented that there is a difference between spending money on something that consumes economic resources and spending money after a waste of economic resources has already occurred. When banks make bad loans to fund housing developments that should never have been built, the money has been wasted, he said; but if the government subsequently provides funding to these banks to keep them solvent in the aftermath, by contrast, this is not a waste of economic resources.

Issuing Treasuries does not increase the money supply, Newman explained, and while quantitative easing does increase the money supply, creating more deposits and reserves, it does not necessarily lead to inflation. The belief that increasing the money supply automatically leads to inflation by causing banks to make more loans is in part based on a mistaken view of the way the banking system operates, he said. The banking system creates deposits as loans are made, Newman stated (in other words, loans create deposits, not the other way around). And while there is a correlation between the money supply and inflation, with the money supply going up at the same time as inflation goes up (because in an economy with little slack, banks are making loans to people

who want to spend the money, and this spending, in the context of an economy with few available resources, increases inflation), the increase in the money supply is not the cause of the inflation (rather, he observed, it is the spending from the new loans—loans that happen to cause the money supply to increase).

If the government spends a trillion dollars on rescuing the banking system or funding infrastructure, this only amounts to 0.5 percent of the total financial assets in the country, Newman observed. This trillion dollars is an even smaller percentage of the net present value of the future value of US GDP, which he estimated at over $500 trillion. Summing up, Newman said that a trillion dollars of new infrastructure spending would represent a very small claim against the future production of the nation, would be very unlikely to cause excessive inflation, and the very slight increase in productivity growth that would follow from infrastructure development would, in real terms, more than pay for the trillion-dollar investment.

WRAY outlined the recent (2014) report of the Ford Foundation–supported research project under his direction (Improving Governance of the Government Safety Net in Financial Crisis). The latest installment, he explained, centers on questions regarding central bank governance and independence in times of crisis. Against the background of an investigation of the 1951 Treasury–Federal Reserve Accord, the report argues that the concept of Fed "independence" is poorly defined and is often excessively focused on the Fed's ability to fight inflation, and that while the Fed may be independent of "day-to-day" politics, ultimately it is not operationally independent of the Treasury. The Fed, said Wray, often "fails up"—that is, when it fails to handle a crisis, its powers tend to be expanded—and this raises significant issues regarding democratic governance.

Turning to the central theme of the session, Wray commented he agrees with those who say that the Federal Reserve has done all it can (adding that the Fed has likely done more than it should have) and that it is now time to turn to fiscal policy. The problem, he observed, is that the active use of fiscal policy is often blocked by the perception that the US government is "broke."

Making use of a statement by the St. Louis Federal Reserve, Wray stated that the US government can never run out of dollars, be forced to miss a payment or default, or be made subject to the whims of "bond vigilantes"—and because of this, the belief that the government is "broke" is simply false. He quoted former Fed Chairman Ben Bernanke to the effect that the Federal Reserve was not "spending tax money" when it engaged in its extraordinary measures (mainly loans and asset purchases, as Wray pointed out) in response to the recent financial crisis; instead, the Fed simply created the money by marking up accounts through keystrokes.

Summarizing the Modern Money Theory view, Wray explained that a government issuing its own sovereign currency with a floating exchange rate faces no financial constraints. The government spends by crediting reserves and taxes by debiting reserves. The central bank sets the overnight interest rate target and hits that target by adding or draining reserves. With the central bank cooperating with the Treasury, he said, the sovereign cannot "run out" of the ability to spend.

The real constraints the sovereign faces, Wray emphasized, have to do with full employment and inflation. At full employment the sovereign risks drawing resources away from the private sector, he said, and inflation can become a problem even before full employment is reached (depending on, Wray noted, the government's fiscal policy).

Wray described a potential objection to his account that might be raised for the case of the

United States: namely, that he has assumed the Treasury and the Federal Reserve will always cooperate to allow the Treasury to spend, when in reality, according to this objection, there are constraints on the operations of the Treasury and the Fed that prevent such full cooperation. According to one view, Wray said, the Federal Reserve *should* remain independent of the Treasury in order to fight inflation: if the Fed always cooperates with the Treasury and finances its deficits, so the argument goes, inflation will run out of control. However, he argued that, operationally speaking, the Fed's independence is limited: it is not independent in the sense that it can refuse to allow checks to clear. Once the Fed has selected its overnight rate target, "its hands are tied," as Wray put it (the Fed needs to accommodate the Treasury operations if it wants to hit its target). And historically, he commented, the Fed does end up cooperating with the Treasury—even if forced to do so by Congress. With respect to the 1951 Accord, which formally established the Fed's independence, Wray observed that many of the protagonists involved (including former Fed Chairman Marriner Eccles) thought of the Fed's independence as pragmatic and situational (rather than a "universal law").

Wray then outlined his view of the proper goals of a sovereign government and explained Hyman Minsky's approach to reaching these goals. Economic growth, Wray maintained, is not enough. The government has the fiscal capacity to ensure continuous full employment, and ought to aim at this goal alongside price stability and financial stability. Minsky argued that policies sufficient to move the economy from slack to full employment are not sufficient to maintain full employment. In other words, Wray said, conventional fiscal stimulus policies are not enough: strategies to boost private investment through fiscal stimulus are not sustainable. Minsky's alternative was focused on maintaining high levels of consumption by increasing jobs and wages at the bottom of the income scale—the private sector, Wray said, cannot accomplish this on its own. Minsky's answer, he explained, is for the government to engage in direct job creation through an employer-of-last-resort (ELR) policy. The ELR strategy involves guaranteeing paid work opportunities for all who are ready and willing to work. The government need not directly employ participating individuals, but it must deliver the funding, since the federal government is the only entity capable of providing an "infinitely elastic demand for labor," as Wray put it. This is not a conventional "pump-priming" strategy; the latter, Minsky thought, are likely to produce inflation before full employment is reached, Wray explained. The ELR program effectively eliminates poverty that stems from unemployment, Wray noted, and also improves the distribution of income by raising the incomes of low-wage workers faster than those of high-wage workers. Investment-led fiscal policy strategies, he said, have the opposite effect on the income distribution, and they also lead to greater financial fragility.

Participants

ANAT ADMATI

Anat Admati is the George G.C. Parker Professor of Finance and Economics at the Graduate School of Business, Stanford University. She has written extensively on information dissemination in financial markets, trading mechanisms, portfolio management, financial contracting, and, most recently, corporate governance and banking. Admati is the author, with Martin Hellwig, of *The Bankers' New Clothes: What's Wrong with Banking and What to Do About It* (Princeton University Press, 2013), now available in paperback, and has been actively involved in the policy debate on financial regulation. Her commentaries have appeared in *The New York Times*, *Financial Times*, Bloomberg News, Project Syndicate, and elsewhere. Admati received her BS from the Hebrew University in Jerusalem and her Ph.D. from Yale University. She is a fellow of the Econometric Society and the recipient of multiple research grants and awards, has served as a board member of the American Finance Association, and currently sits on the FDIC Systemic Resolution Advisory Committee.

BINYAMIN APPELBAUM

Binyamin Appelbaum is a Washington correspondent for *The New York Times*. He writes about economic policy. A 2001 graduate of the University of Pennsylvania, Appelbaum began his career at *The Florida Times-Union*, then worked at *The Charlotte Observer*, *The Boston Globe*, and *The Washington Post* before joining the *Times* in 2010. His honors include the George Polk and Gerald Loeb Awards, and he was a finalist for the 2008 Pulitzer Prize for Public Service.

ROBERT BARBERA

Robert Barbera is an economics department fellow and acting director of the Center for Financial Economics (CFE) at Johns Hopkins University. The CFE has as its goal embedding robust finance considerations into macroeconomic theory. Barbera's current research interests include three-asset macro models and monetary/fiscal policy interplay in the aftermath of the Great Recession. Since 1982, Barbera has worked with Wall Street firms, serving as chief economist at E. F. Hutton, Lehman Brothers, Investment Technology Group, and Mt. Lucas Management. His responsibilities have included both the provision of global economic forecasts and strategic assessments of asset markets. Barbera has been a guest on CNBC and Bloomberg News and is often quoted in *The New York Times*, *The Wall Street Journal*, and *The Economist*. Prior to his Wall Street career, he served as an economist for US Senator Paul Tsongas, covering banking and energy issues. He was also an economist in the Natural Resources Division of the Congressional Budget Office. For two years, following his graduate education, Barbera lectured at the Massachusetts Institute of Technology. He is the author of *The Cost of Capitalism: Understanding Market Mayhem and Stabilizing Our Economic Future* (2009), a book hailed by the *Times* as "one of the top 10 books on the 2008 global financial crisis." Barbera holds a BA and a Ph.D. from Johns Hopkins.

SHERROD BROWN

Described as "Congress's leading proponent of American manufacturing," US Senator Sherrod Brown is working with the Obama administration on the creation of a national manufacturing policy that would invest in manufacturing innovation, strengthen our component supply chain, connect workers with emerging industries, and align our trade policies to promote our national interests. He is also working with Ohio's universities, entrepreneurs, and community stakeholders to use the state's resources to create new jobs in high-growth industries and make Ohio a national leader in clean-energy manufacturing. A longtime advocate for fair trade, Brown led the bipartisan opposition to NAFTA in 1993—as a freshman in the US House of Representatives—and to CAFTA in 2005. He also helped pass the historic health care law that will make health insurance more affordable and accessible for American families, and prevent insurers from placing limits on the care patients receive.

Brown serves on the Senate Committee on Finance. He also serves on the Senate Banking Committee, where he played an instrumental role in passing the historic Wall Street reform law, and is chairman of its Financial Institutions and Consumer Protection Subcommittee. He is the first Ohio senator in 40 years to serve on the Senate Agriculture, Nutrition, and Forestry Committee, where he has been instrumental in strengthening the farm safety net and addressing childhood hunger, and chairs the Subcommittee on Jobs, Rural Economic Growth, and Energy Innovation. From his position on the Senate Veterans Affairs Committee, Brown has advocated for veterans training programs to ensure returning service members have access to good-paying, high-demand jobs.

Prior to serving in the Senate, Brown served as a United States Representative for the 13th District, as Ohio's secretary of state, and as a member of the Ohio General Assembly, and he has taught in Ohio's public schools and at The Ohio State University. He is a native of Mansfield, Ohio, where he spent summers working on his family's farm. He is married to Pulitzer Prize–winning columnist Connie Schultz. They have four children and reside in Cleveland, Ohio.

WILLEM H. BUITER

Willem H. Buiter joined Citi in January 2010 as chief economist. One of the world's most distinguished macroeconomists, he was previously professor of political economy at the London School of Economics (LSE), and is a widely published author on economic affairs in books, professional journals, and the press. Between 2005 and 2010, he was an adviser to Goldman Sachs, advising clients on a global basis. Prior to this, Buiter was chief economist for the European Bank for Reconstruction and Development (2000–05), and a founding external member of the monetary policy committee of the Bank of England (1997–2000). He has served as a consultant to the International Monetary Fund, the World Bank, the Inter-American and Asian Development Banks, and the European Commission, and as an adviser to many central banks and finance ministries. Buiter has held a number of other leading academic positions, including Cassel Professor of Money and Banking at the LSE (1982–84), professorships in economics at Yale University (1985–94), and professor of international macroeconomics at Cambridge University (1994–2000). He holds a BA in economics from Cambridge and a Ph.D. in economics from Yale. He has been a member of the British Academy since 1998 and was awarded the CBE in 2000 for services to economics.

VÍTOR CONSTÂNCIO

Vítor Constâncio was appointed vice president of the European Central Bank in June 2010. He was governor of the Banco de Portugal from 1985 to 1986, and again from 2000 to May 2010. Constâncio is a former executive director of the Banco Português de Investimento (1995–2000) and nonexecutive director of the Electricidade de Portugal, the Portuguese national power utility (1998–2000). From 1989 until June 2010, he was visiting senior professor of economics at the Instituto Superior de Economia e Gestão, culminating a long academic career. He holds a degree in economics from the Universidade Técnica de Lisboa.

CHARLES L. EVANS

Charles L. Evans is the ninth president and chief executive officer of the Federal Reserve Bank of Chicago. In that capacity, he serves on the Federal Open Market Committee (FOMC), the Federal Reserve System's monetary policymaking body. The Federal Reserve Bank of Chicago is one of 12 regional Reserve Banks across the country. These 12 banks—along with the Board of Governors in Washington, DC—make up our nation's central bank. As head of the Chicago Fed, Evans oversees the work of roughly 1,400 employees in Chicago and Detroit who conduct economic research, supervise financial institutions, and provide payment services to commercial banks and the US government. Before becoming president in September 2007, Evans served as director of research and senior vice president, supervising the bank's research on monetary policy, banking, financial markets, and regional economic conditions. Prior to that, he was a vice president and senior economist with responsibility for the macroeconomics research group. Evans's personal research has focused on measuring the effects of monetary policy on US economic activity, inflation, and financial market prices. It has been published in the *Journal of Political Economy*, *American Economic Review*, *Journal of Monetary Economics*, *Quarterly Journal of Economics*, and the *Handbook of Macroeconomics*.

Evans is active in the civic community. He is a board member at Chicago-based Metropolis Strategies, a trustee at Rush University Medical Center, a director of the Chicago Council on Global Affairs, and a member of The Economic Club of Chicago as well as the Civic Committee of the Commercial Club of Chicago. He has taught at the University of Chicago, the University of Michigan, and the University of South Carolina. Evans received a bachelor's degree in economics from the University of Virginia and a doctorate in economics from Carnegie-Mellon University.

HEINER FLASSBECK

Heiner Flassbeck is director of Flassbeck-Economics, a consultancy for global macroeconomic issues (www.flassbeck-economics.de). From 2003 to 2012, he was director of the Division on Globalization and Development Strategies, United Nations Conference on Trade and Development (UNCTAD). He was the principal author and leader of the team preparing UNCTAD's annual Trade and Development Report, with specialization in macroeconomics, exchange rate policies, and international finance. He was also an observer to the G20 finance ministers meetings from 2010 to 2012. Prior to joining UNCTAD in 2000, Flassbeck worked with the German Council of Economic Experts (1976–80) and the Federal Ministry of Economics (1980–86), as chief macroeconomist at the German Institute for Economic Research (DIW; 1988–98), and as state secretary

(vice minister) at the Federal Ministry of Finance (1998–99), with responsibility for international affairs, the European Union, and the International Monetary Fund. At Saarland University, he concentrated in money and credit, business cycle theory, and the general philosophy of science, graduating in economics in 1976. He obtained a Ph.D. in economics from the Free University, Berlin, in 1987. In 2005, Flassbeck was appointed honorary professor at the University of Hamburg.

JASON FURMAN

Jason Furman is chairman of the Council of Economic Advisers (CEA). Prior to this role, he served as assistant to the president for economic policy under President Obama and as principal deputy director of the National Economic Council (NEC). From 2007 to 2008, Furman was a senior fellow in economic studies and director of the Hamilton Project at The Brookings Institution. Previously, he served as a staff economist at the CEA, a special assistant to the president for economic policy at the NEC under President Clinton, and senior adviser to the chief economist and senior vice president of the World Bank. He was the economic policy director for Obama for America. Furman, who earned his Ph.D. in economics and MA in government from Harvard University and an M.Sc. in economics from the London School of Economics, has also served as visiting scholar at New York University's Wagner Graduate School of Public Service, a visiting lecturer at Yale and Columbia Universities, and a senior fellow at the Center on Budget and Policy Priorities. He has conducted research in a wide range of areas, including fiscal policy, tax policy, health economics, Social Security, and monetary policy. In addition to numerous articles in scholarly journals and periodicals, Furman is the editor of several books on economic policy, including *Path to Prosperity* (2008) and *Who Has the Cure?* (2009).

MICHAEL GREENBERGER

Michael Greenberger is professor at the University of Maryland Francis King Carey School of Law, where he teaches a course titled Futures, Options, and Derivatives. In 1997, Greenberger left private law practice to become director of the division of trading and markets at the Commodity Futures Trading Commission (CFTC), and through 1999 he served in that position under CFTC Chair Brooksley Born. Prior to the passage of the Dodd-Frank Act in 2010, Greenberger testified numerous times before House and Senate committees about that legislation. Following the passage of Dodd-Frank, he was asked to testify before the House and Senate oversight committees on the implementation of the Act and to present at three different round tables sponsored by CFTC and Security and Exchange Commission staffs. Greenberger has done many media interviews to discuss financial regulation, including appearances on CNN, ABC's *World News Tonight*, the *CBS Evening News*, the *NBC Evening News*, CNBC, MSNBC, *The Jim Lehrer News Hour*, NPR's *Fresh Air*, PBS's *Frontline*, BBC Radio, and C-SPAN. His recent testimony and related media can be found at michaelgreenberger.com.

JON E. HILSENRATH

Jon E. Hilsenrath is the chief economics correspondent for *The Wall Street Journal* and is based in Washington, DC. He is responsible for covering the Federal Reserve. In cooperation with reporters in the economics and other bureaus, he also covers major developments in the US and global

economies for all print and online editions of the Journal and contributes to WSJ.com's Real Time Economics site. Prior to his current position, Hilsenrath was markets editor, overseeing global coverage of stock, bond, and currency markets. He has been a member of the global *Wall Street Journal* team since 1997. During the past decade, he has helped to lead coverage of the late-1990s Asian financial crisis, the 2001 US recession, the tech boom, the 9/11 terror attacks, and the recent crisis in global debt markets. Before becoming an editor in 2006, he covered economics from New York and Hong Kong for six years. He also wrote the "Heard on the Street" column on stocks and markets for *The Asian Wall Street Journal* in Hong Kong.

Prior to joining the Journal, Hilsenrath was a freelance reporter for *The New York Times* and *Time* Magazine in New York and Hong Kong, and an economics and finance reporter for Knight-Ridder Financial News in Washington, DC. In 2009, he and a team of reporters won an award for distinguished business reporting from the New York Newspaper Publishers Association for their article "Lehman's Demise: The Shock Heard round the World." In 2003, he received the Best of Knight-Bagehot Award for excellence in economics writing, for a package of stories on the global economy. Hilsenrath contributed firsthand accounts and reporting from near the World Trade Center as part of *The Wall Street Journal*'s Pulitzer Prize–winning coverage of the September 11, 2001, World Trade Center attacks. His personal account of the attacks was published in the book The Best Newspaper Writing in 2002. He has been a contributor to several books, including *Emerging Financial Markets* (2000) by David Beim and Charles Calomiris, and *Trading the Fundamentals* (1998) by Michael P. Niemira. He is also a regular guest on CNBC, the cable news television channel, with a featured segment on Monday mornings called "Five for Five" that highlights stocks that will be in the news in the days ahead. Born in New York, Hilsenrath received his bachelor's degree from Duke University. He was a summer fellow at the University of Wisconsin and an MBA exchange student at the Hong Kong University of Science and Technology. He received an MBA and a master's degree in journalism from Columbia University. At Columbia, Hilsenrath was a Knight-Bagehot fellow in 1995–96.

BRUCE KASMAN

Bruce Kasman is J. P. Morgan's chief economist and global head of economic research. He is responsible for the firm's worldwide economic and policy views and directs its flagship Global Data Watch publication. Kasman was previously head of the firm's European economic research (1996–99). Prior to joining J. P. Morgan in 1994, he was senior international economist at Morgan Stanley. Kasman began his career at the Federal Reserve Bank of New York in the international research department. He holds a Ph.D. in economics from Columbia University.

JAN KREGEL

Jan Kregel is a senior scholar at the Levy Institute and director of the Monetary Policy and Financial Structure program. He is also professor of development finance at the Tallinn University of Technology and distinguished research professor at the University of Missouri–Kansas City. During 2009, he served as Rapporteur of the President of the United Nations General Assembly's Commission on Reform of the International Financial System. He was formerly professor of economics at the Università degli Studi di Bologna, as well as professor of international economics at

Johns Hopkins University's Paul Nitze School of Advanced International Studies. Kregel studied at the University of Cambridge under Joan Robinson and Nicholas Kaldor, and received his Ph.D. in 1970 from Rutgers University under the chairmanship of Paul Davidson. He is a life fellow of the Royal Economic Society (UK) and an elected member of the Società Italiana degli Economisti. In 2010, Kregel was elected to the Italian Academy of Sciences (Accademia Nazionale dei Lincei), and he received the Veblen-Commons Prize of the Association for Evolutionary Economics in 2011. He is co-editor of the *Journal of Post Keynesian Economics* and a Patron of the Associação Keynesiana Brasileira.

DENIS MACSHANE

Denis MacShane is one of Europe's leading experts on European politics. He was Tony Blair's Europe minister and deputy foreign secretary, and has served as UK delegate to the Council of Europe and NATO parliamentary assemblies. He served 18 years as a UK Labour Party Member of Parliament working mainly on European Union (EU) affairs. MacShane holds an MA from Oxford University and a Ph.D. from London University and is the author of several books on European politics, including biographies of François Mitterrand and Ted Heath, the birth of Solidarnosc, the new anti-Semitism, and recent Balkan politics. His next book will examine the likelihood of "Brexit"—a word he coined to describe Britain exiting the EU, following Prime Minister David Cameron's announcement of an "in-out" referendum in 2017 on Britain's continuing membership in the EU. MacShane writes regularly for the UK and European press and appears on British, French, and Russian television as an acknowledged expert commentator on European affairs. He works as a consultant with colleagues in London and Brussels advising government and private sector clients on European policy matters.

CAROLYN B. MALONEY

First elected to Congress in 1992, US Representative (D-NY, 12) Carolyn B. Maloney is recognized as a national leader with extensive accomplishments on financial services, national security, the economy, and women's issues. She is a senior member of both the House Financial Services Committee and the House Oversight and Government Reform Committee, and the ranking House member of the Joint Economic Committee. In the House Democratic Caucus, she serves as a regional whip. Maloney has authored and passed more than 60 measures, either as standalone bills or as language incorporated into larger bills. She is the first woman to represent New York's 12th Congressional District, the first woman to represent New York City's 8th Councilmanic district, and the first woman to chair the Joint Economic Committee, a House and Senate panel that examines and addresses the nation's most pressing economic issues. Only 18 women in history have chaired congressional committees. On the House Financial Services Committee, she has worked to modernize financial services laws and regulations, strengthen consumer protections, and institute more vigilant oversight of the safety and soundness of our nation's banking industry. In the 113th Congress, she was selected by her committee colleagues to be ranking member on the Subcommittee on Capital Markets and Government Sponsored Enterprises. She continues her membership on the Subcommittee on Financial Institutions and Consumer Credit, and joins the Subcommittee on Oversight and Investigations.

Maloney served on the historic conference committee for the Dodd-Frank financial reforms, which also created the Consumer Financial Protection Bureau. Her Credit Cardholders' Bill of Rights (the Credit CARD Act) was signed into law by President Obama in 2009. As a senior member of the House Oversight and Government Reform Committee, she has supported legislation that has helped government work more efficiently and has saved hundreds of millions in taxpayer dollars. As co-founder of the House 9/11 Commission Caucus, Maloney helped author and pass legislation that created the 9/11 Commission and, later, to implement all of the 9/11 Commission's recommendations for improving intelligence gathering—described as the most influential intelligence bill in decades. The James Zadroga 9/11 Health Care and Compensation Act, her bill to provide health care and compensation for 9/11 first responders, residents, and workers near ground zero, passed Congress in late 2010 and was signed into law in January 2011.

MERCEDES MARCÓ DEL PONT

Mercedes Marcó del Pont chaired the Board of Governors of the Central Bank of Argentina between February 2010 and November 2013. She was previously president of Banco de la Nación Argentina, the country's largest government-owned bank; and, prior to that, was a member of the lower chamber of Congress. She previously served as research director at the Foundation of Research on Economic Development (FIDE), where she is now the managing director. Marcó del Pont has published extensively on industrial policy and development, and lectured at the University of Buenos Aires. She is a former consultant to the United Nations Development Programme, the Inter-American Development Bank, and the World Bank. Marcó del Pont graduated with a degree in economics from the University of Buenos Aires and holds a master's degree in international development economics from Yale University.

FRANK N. NEWMAN

Frank N. Newman has had a very unusual career, including 30 years as a banking executive in both the United States and China, and as a senior official of the US Treasury. He recently completed five years as chairman of the board and chief executive officer of Shenzhen Development Bank, a nationally chartered, publicly traded bank in China—a unique role for an American. Newman led a team that guided the troubled bank to success. Previously, he served as chairman and CEO of Bankers Trust, a major international bank based in New York. In the 1990s, Newman served as undersecretary, then deputy secretary, of the US Treasury. As the department's number two official, he represented it on a broad range of issues domestically and internationally, including economic and banking policy. He was awarded the Alexander Hamilton Award, the department's highest honor. Prior to government service, Newman served as vice chairman of the board and chief financial officer of BankAmerica Corporation, and executive vice president and CFO of Wells Fargo Bank. He has also served as a director of a number of corporations in the United States and other countries, including Dow Jones & Company. He is currently chairman of Promontory Financial Group China and vice chairman – Asia for Global Strategic Associates, and has recently written two books: *Six Myths that Hold Back America—And What America Can Learn from the Growth of China's Economy* (2014; also available in Chinese) and *Freedom from National Debt* (2013). Newman graduated from Harvard University with a BA (magna cum laude) in economics.

DIMITRI B. PAPADIMITRIOU

Dimitri B. Papadimitriou is president of the Levy Institute, executive vice president and Jerome Levy Professor of Economics at Bard College, and managing director of Bard College Berlin. He has testified on a number of occasions in committee hearings of the US Senate and House of Representatives, was vice-chairman of the Trade Deficit Review Commission of the US Congress (1999–2001), and is a former member of the Competitiveness Policy Council's Subcouncil on Capital Allocation (1993–98). He was a distinguished scholar at the Shanghai Academy of Social Sciences in fall 2002. Papadimitriou's research includes financial structure reform, fiscal and monetary policy, the eurozone crisis, community development banking, and employment policy. He heads the Levy Institute's macroeconomic modeling team studying and simulating the US and European economies. In addition, he has authored and coauthored many articles in academic journals and Levy Institute publications relating to Federal Reserve policy, fiscal policy, the eurozone and Greek crises, financial structure and stability, employment growth, and Social Security reform. Papadimitriou has edited and contributed to 13 books published by Palgrave Macmillan, Edward Elgar, and McGraw-Hill, and is a member of the editorial boards of *Challenge* and the *Bulletin of Political Economy*. He is a graduate of Columbia University and received a Ph.D. in economics from The New School for Social Research.

JAMES POLITI

James Politi is the US economics and trade correspondent for the *Financial Times*, based in Washington, DC. In this role, he covers US economic policy, economic data, and US trade policy. Politi was previously based in New York as the *FT*'s US deals reporter, covering mergers and acquisitions and private equity, after joining the *FT* in London in 2002 on the international capital markets desk. He took up his current position in Washington in March 2008. In 2006, Politi was awarded an honorable mention at the Overseas Press Club's Malcolm Forbes Award for "Best Business Reporting from Abroad," for the *FT*'s coverage of Cnooc's attempted takeover of Unocal. In 2007, he won first prize for his coverage of Kohlberg Kravis Roberts, the private equity firm, at the M&A International Awards. In 2004 and 2007, Politi was named one of NewsBios/TJFR's "30 under 30" rising stars. In 2000, Politi won the Nico Colchester Prize for Young European Journalists. As a Colchester fellow, he was chief researcher and commissioning editor for "Europe Reinvented," a four-part special supplement published with the *FT* in January/February 2001. Politi has appeared on CNBC, MSNBC, and BBC-TV, and on ABC and NPR radio. He holds a master's degree from the London School of Economics, a bachelor's degree from Georgetown University, a University degree from the University of Florence, and a certificate from the international program, Institute of Political Studies, Paris.

ALEX J. POLLOCK

Alex J. Pollock is a resident fellow at the American Enterprise Institute (AEI) in Washington, D.C. Before joining AEI, he was president and chief executive officer of the Federal Home Loan Bank of Chicago from 1991 to 2004. Pollock focuses on financial policy issues, including financial cycles, government-sponsored enterprises, housing finance, banking, retirement finance, corporate governance, the housing bubble, financial crises, and the ensuing political responses. He is the author

of Boom and Bust: Financial Cycles and Human Prosperity (2010) as well as numerous articles and congressional testimony. Pollock is the lead director of CME Group, a director of the Great Lakes Higher Education Corporation, a past president of the International Union for Housing Finance, and chairman of the board of the Great Books Foundation. He is a graduate of Williams College, the University of Chicago, and Princeton University.

PETER PRAET

Peter Praet joined the European Central Bank (ECB) in 2011 as a member of the executive board, with responsibility for economics and human resources, budgeting, and organization. Before joining the ECB, Praet served as executive director of the National Bank of Belgium (2000–11), where he was responsible for international cooperation, financial stability, and oversight of financial infrastructures and payments systems. He was also a member of the management committee of the Belgian Banking, Finance, and Insurance Commission (CBFA; 2002–11), where he was responsible for prudential policy for banking and insurance; and first alternate on the board of directors of the Bank for International Settlements (2000–11). Praet has served as chief of cabinet for the Belgian Minister of Finance (1999–2000), as chief economist of Générale de Banque and Fortis Bank (1988–99), as professor of economics at the Université Libre de Bruxelles (1980–87), and as an economist at the International Monetary Fund (1978–80). He has also served on several high-level international committees, including the Basel Committee on Banking Supervision, the Committee on Payment and Settlement Systems, the Committee on the Global Financial System, and the European Banking Authority. Praet holds a Ph.D. in economics from the Université Libre de Bruxelles (1980).

TOM REDBURN

Tom Redburn is economics editor of *The New York Times*, covering US economics for Bizday and the Washington, DC, bureau. He was managing editor of the *International Herald Tribune* from 2008 to 2012. Prior to his four years in Paris at the *Tribune*, Redburn had various reporting and editing jobs at *The New York Times*, including deputy business editor and technology editor. He was a reporter for the Los Angeles Times for 14 years, both in Los Angeles and Washington, and was a reporter at the *International Herald Tribune* in the early 1990s. Over the years, Redburn has reported on a variety of economics and business issues, and, as an editor, shepherded stories about financial upheavals from Enron to Greece, cultivating distinctive voices in the newsroom. He graduated from Pomona College in 1972.

ANDREW SHENG

Andrew Sheng is well known in global financial circles as a former central banker and financial regulator in Asia and as a commentator on global finance. As president of the Fung Global Institute, he is responsible for its operations and, with the support and advice of the Academic Council, for driving its research agenda and thought leadership. He is also chief adviser to the China Banking Regulatory Commission and a member of the board of Khazanah Nasional Berhad, Malaysia. In addition, he serves as a member of the International Advisory Council of the China Investment Corporation, the China Development Bank, the Advisory Council on Shanghai as an

International Financial Centre, and the International Council of the Free University, Berlin. He is an adjunct professor at the Graduate School of Economics and Management, Tsinghua University, Beijing, and the University of Malaya, Kuala Lumpur. In 2009, Sheng became the pro-chancellor of Universiti Tun Abdul Razak. He served as chairman of the Securities and Futures Commission of Hong Kong from 1998 to 2005, having previously been a central banker with the Hong Kong Monetary Authority and Bank Negara Malaysia. He also worked with the World Bank from 1989 to 1993. From 2003 to 2005, Sheng chaired the technical committee of the International Organisation of Securities Commissions (IOSCO). He has published widely on monetary, economic, and financial issues. His most recent book is *From Asian to Global Financial Crisis: An Asian Regulator's View of Unfettered Finance in the 1990s and 2000s* (2009). He is also a regular contributor to leading economic magazines and newspapers in China and the Asian region. A chartered accountant by training, Sheng holds a B.Sc. in economics and an honorary doctorate from the University of Bristol. In April 2013, he was named one of the 100 most influential people in the world by *Time* Magazine.

DEBORAH SOLOMON

Deborah Solomon is a reporter in the Washington, D.C., bureau of *The Wall Street Journal*, covering economic policy. Previously, she covered the Securities and Exchange Commission and financial regulation. Solomon joined the *Journal*'s New York bureau in May 2000, covering technology and telecommunications. In 2009, she and other Journal reporters won an award from the Society of American Business Editors and Writers (SABEW) in the breaking news category for articles that ran in the paper covering the collapse of Lehman Brothers. In the same year, she was also part of a team that won in the spot news category at the annual National Headliner Awards for coverage of Wall Street's collapse. Most recently, Solomon and other Journal reporters were finalists in the national affairs category for the 2009 Pulitzer Prize. In 2003, Solomon was a member of a team of Journal reporters awarded the Pulitzer Prize for Explanatory Reporting for a series of stories that exposed corporate scandals, elucidated them, and brought them to life in compelling narratives. That same year, she and a *Journal* colleague won the SABEW award in the spot enterprise category for their page-one story "Uncooking the Books." She was also part of a team that won the 2003 Gerald Loeb Award for the paper's coverage of the WorldCom scandal.

Solomon began her journalism career as a reporter at the *Birmingham Post-Herald* in 1994, moved to the *Detroit Free Press* in February 1997, joined the *San Diego Union-Tribune* in May 1998, and five months later moved to the *San Francisco Chronicle*. Before joining the *Journal*, she had been a reporter for *USA Today* since November 1999. Solomon holds a bachelor's degree in journalism from George Washington University.

DANIEL K. TARULLO

Federal Reserve Board Governor Daniel K. Tarullo took office on January 28, 2009, to fill an unexpired term ending January 31, 2022. Prior to his appointment to the board, he was professor of law at Georgetown University Law Center, where he taught courses in international financial regulation, international law, and banking law. Prior to joining the Georgetown Law faculty, he held several senior positions in the Clinton administration. From 1993 to 1998, Tarullo served, successively, as assistant secretary of state for economic and business affairs, deputy assistant to the

president for economic policy, and assistant to the president for international economic policy. He also served as a principal on both the National Economic Council and the National Security Council. From 1995 to 1998, Tarullo also served as President Clinton's personal representative to the G7/G8 group of industrialized nations. Before joining the Clinton administration, he served as chief counsel for employment policy on the staff of Senator Edward M. Kennedy, and practiced law in Washington, DC. He also worked in the antitrust division of the Department of Justice and as special assistant to the undersecretary of commerce. From 1981 to 1987, Tarullo taught at Harvard Law School. He has also served as a senior fellow at the Council on Foreign Relations and as a nonresident senior fellow at the Center for American Progress. Tarullo has also held a visiting professorship at Princeton University.

Tarullo was born in 1952 in Boston, Massachusetts. He received his AB from Georgetown University in 1973 and his MA from Duke University in 1974. In 1977, he received his JD (summa cum laude) from the University of Michigan Law School, where he served as article and book review editor of the *Michigan Law Review*. Tarullo is married and has two children.

FRANK VENEROSO

Frank Veneroso is the founder, in 1995, of Veneroso Associates, which provides global investment strategy to money managers. In the German market, he acts as a market strategist for the Global Policy Committee of RCM, a global equity management affiliate of the Allianz Group. Veneroso served from 1992 to 1994 as partner-in-charge of global investment policy formulation at Omega, one of the world's largest hedge funds. Prior to that, he provided investment strategy advice to long-only money managers, hedge funds, and the world's largest private equity firm. In 1988, he was commodities adviser to PHIBRO, then the leading global commodities trading firm. In those years, Veneroso also wore a public policy hat, working as a financial sector policy analyst and adviser to several of the major multinational agencies responsible for economic development and, either through these agencies or directly, to the governments of emerging economies. This work encompassed money and banking, financial instability and crisis, privatization, and the development and globalization of emerging securities markets. His clients included the World Bank, International Finance Corporation, US Department of State, and Organization of American States. During this time, he also advised the governments of Bahrain, Bolivia, Brazil, Chile, Columbia, Ecuador, Korea, Mexico, Peru, Portugal, Thailand, Venezuela, and the UAE. Veneroso has published numerous papers on finance and development and financial instability issues. He also published a lengthy book on the gold market in 1998, when gold, then trading at $282 an ounce, was perhaps the most discredited of all asset classes. Applying classic principles of microeconomics to the gold market, he forecasted that gold would reach $1,200 per ounce in 2010. That year, the price of gold reached $1,200 for the first time ever. Veneroso graduated cum laude from Harvard University.

L. RANDALL WRAY

Senior Scholar L. Randall Wray is a professor of economics at the University of Missouri–Kansas City. His current research focuses on providing a critique of orthodox monetary theory and policy, and the development of an alternative approach. He also publishes extensively in the areas of full employment policy and, more generally, fiscal policy. With President Dimitri B. Papadimitriou, he is working to publish, or republish, the work of the late financial economist Hyman P. Minsky, and is using Minsky's approach to analyze the current global financial crisis. Wray is the author of *Money and Credit in Capitalist Economies* (1990); *Understanding Modern Money: The Key to Full Employment and Price Stability* (1998); and *Modern Money Theory: A Primer on Macroeconomics for Sovereign Monetary Systems* (2012). He is also coeditor of, and a contributor to, *Money, Financial Instability, and Stabilization Policy* (2006) and *Keynes for the 21st Century: The Continuing Relevance of* The General Theory (2008). Wray taught for more than a decade at the University of Denver and has been a visiting professor at Bard College, the University of Bologna, and the University of Rome (La Sapienza). He received a BA from the University of the Pacific and an MA and a Ph.D. from Washington University, where he was a student of Minsky.

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