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Central Bank Independence and the Conduct of Monetary Policy

Remarks by

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Thank you for your generous introduction, Marcela, and thank you for the opportunity to be here and speak to you today.¹ I believe I am the first central banker from the U.S. to address this annual meeting, but I know, and am proud to say, that I am the first who is also Latin American. And, of course, I have been part of the LACEA Executive Committee and I have presented papers at many LACEA conferences over the years, so it is a pleasure to be back here among many colleagues.

When the United States suffered very high inflation beginning in 2021, it was a new and unfamiliar experience for many too young to recall the last time this occurred in the 1970s and 1980s. Of course, very high inflation is not such a distant memory for people from Latin America and the Caribbean, and that includes me. Growing up in Colombia, I vividly recall the daily challenges of trying to plan and live with sustained double-digit inflation, and I especially remember the pain it imposed on disadvantaged people.

Gaining control over inflation requires a commitment by society to accept the tradeoffs and sacrifices often needed, and it also requires deliberate and principled decision making by central banks.² Central bankers must both formulate their best judgment of the correct policies that will achieve a desired level of inflation and follow through by executing and maintaining those policies. It has been widely recognized—and is a finding of economic research—that central bank independence is fundamental to achieving good policy and good economic outcomes. It is not sufficient by itself to achieve those goals, but, over time, it is almost always necessary.

¹ The views expressed here are my own and are not necessarily those of my colleagues on the Federal Reserve Board or the Federal Open Market Committee.

² See the box “Monetary Policy Independence, Transparency, and Accountability” in Board of Governors (2024, pp. 42–44).

Let me start by defining terms. An independent central bank is one that can carry out monetary policy insulated from pressures arising from other parts of government or elsewhere. When there is central bank independence, the role of national or jurisdictional governments is typically one of representing the public in specifying a mandate for the central bank and holding the central bank accountable by monitoring its performance and appointing central bank leadership. In this arrangement, the public, through representative government, specifies the overall objectives that central banks should pursue.

Some noteworthy examples of central bank mandates include the dual mandate established by the U.S. Congress that requires the Federal Reserve Board and the Federal Open Market Committee (FOMC) to promote maximum employment and price stability. The European Central Bank's primary mandate of price stability is spelled out in a treaty enacted by the legislatures of its constituent member states. The central bank of Brazil pursues price stability as its primary objective as well. In the United Kingdom, its parliament has mandated that the Bank of England pursue monetary and financial stability.³ Similarly, the objectives of the central banks of Chile and Uruguay are both to keep inflation low and stable and to foster the stability and efficiency of the financial system.

Before we discuss why monetary policy independence can benefit the economy, let me take a step back and discuss the tradeoffs associated with the conduct of monetary policy. Central banks significantly influence prices, interest rates, employment, and income in the economy, so it is natural that sometimes there would be differing views on

³ The European Central Bank, the central bank of Brazil, and the Bank of England have as additional objectives, without the prejudice of their monetary stability mandates, to contribute to economic growth.

their decisions. For instance, monetary policy actions that promote economic activity and employment growth can put upward pressure on inflation. Conversely, policies to lower inflation tend to slow economic activity and employment growth. This tradeoff typically means that returning inflation to a specific target level when inflation has been allowed to run high may require more restrictive policy and a reduction in demand and higher unemployment. As I pointed out in a speech last spring at Stanford University, however, we have seen this tradeoff dissipate over the past couple of years, pointing to the possibility that we have been now for some time on the steep part of the Phillips curve, where inflation can come down substantially without a big increase in unemployment. Yet there is a possibility that this tradeoff may become more prominent as we move toward the flatter part of the Phillips curve.

The economic literature points out that striking a balance in these tradeoffs can be difficult for an elected or otherwise representative government for various reasons. One reason highlighted in the literature is that an elected government may be naturally focused on the short-term goals of its constituents and may have an incentive to try to lower the unemployment rate in the short run, with less concern about the longer-term effects on inflation and growth. The literature has labeled this fundamental problem “time inconsistency.”⁴ This incentive may generate undesirable economic cycles, potentially destabilizing prices. And if the public learns over time that the central bank is responsive to these incentives to increase inflation to boost employment temporarily, expectations of future inflation would rise, a symptom of a loss of credibility of the monetary policy authority. Governments also may have an incentive to increase inflation

⁴ Research on “time inconsistency” was pioneered by Kydland and Prescott (1977) and Calvo (1978). This problem was analyzed in more detail in the context of monetary policy by Barro and Gordon (1983).

to monetize their debts, which become effectively smaller as the purchasing power of money declines. Also, if elected officials are responsible for monetary policy decisions, the typical alternation in control of government between different parties may lead to different preferences in the tradeoff between employment and inflation, destabilizing prices and the economy in the long term.⁵ In summary, economic research argues that demands on government to address concerns in the short term may result in excessively discretionary monetary policy and do not provide the best incentives for effective monetary policy that promotes the long-term health of the economy.

A solution devised by governments and explored in economic research is to delegate monetary policy to an independent entity: the central bank.⁶ By establishing policy mandates in laws or treaties, the government voluntarily constrains itself from suddenly altering policy, and thus it also discourages public pressure to do so. As in Homer's *Odyssey*, in which Odysseus asks his crew to tie him to the mast of his ship to avoid being bewitched by the Sirens' songs, policy mandates help central banks avoid being swayed by short-term desires to the detriment of longer-term goals.

Now that we have discussed the reasons for delegating the authority to conduct monetary policy to an independent entity, we are left with the task of describing how such independence should be designed and implemented in practice. There are two broad categories of central bank independence. The first of these is goal independence—to what extent is the central bank free to define its goals? The research literature makes a

⁵ Alesina and Stella (2010) and Kiley and Mishkin (2024) provide summaries of the literature on rules versus discretion.

⁶ Rogoff (1985) suggested the appointment of a central banker predisposed toward keeping inflation low and stable as a solution to the time-inconsistency problem; additional discussions are presented in Persson and Tabellini (1993) and Walsh (2003, chap. 8).

distinction between instrument independence—the prerogative to make monetary policy decisions, which I will discuss more later—and goal independence.⁷ In particular, the Federal Reserve’s goals are defined by law, so it is not goal independent. Nevertheless, in spelling out those goals, the law provides the Federal Reserve with some degree of independence in defining them in detail.

First, let’s talk about the extent to which the law has defined the Federal Reserve’s monetary policy goals. Unlike some other central banks that target inflation, the FOMC has been handed two coequal goals—maximum employment and price stability. The Committee is not free to pursue one or the other—it must pursue both. And these two sides of the mandate are pretty clear. Maximum employment means, in effect, the lowest unemployment rate that is consistent with stable prices. The law does not spell out a level of inflation that fulfills the goal of stable prices, but it has traditionally been viewed as a low and stable inflation rate.

Mandates limit goal independence, but the form of those mandates can allow some role for the central bank in setting out its goals. The 1977 law defined the Federal Reserve’s dual mandate, allowing the FOMC to work out the details. In 2012, the FOMC defined price stability as a longer-run annual inflation rate of 2 percent, as measured by the Commerce Department’s estimate of the rate of increase in the personal consumption expenditures (PCE) deflator. Because maximum employment is unobserved and likely changes over time, it can be estimated only with considerable uncertainty; thus, the Committee chose not to define it in numerical terms. But Committee participants

⁷ See Debelle and Fischer (1994) and Fischer (1994).

estimate a related number, the longer-run rate of unemployment, which is published every three months in the Summary of Economic Projections.

Another aspect of independence is instrument independence, which affords central banks flexibility in how to use the tools of monetary policy, such as policy interest rates, to achieve their goals. In the case of the FOMC, instrument independence has allowed it to adopt new ways to achieve its goals, as the financial system has evolved over the decades. This has been particularly important when the economy faced unprecedented challenges, as it did during the 2008 Global Financial Crisis and during the 2020 pandemic. Because of this flexibility, the Federal Reserve Board and the FOMC were able to respond promptly and, as it turned out, very effectively.

Across countries and jurisdictions, goal independence and instrument independence have different dimensions and many variations. In some countries, including India, Brazil, and South Korea, the targets for inflation rates are jointly decided by the central bank and the ministry of finance. In contrast, the central banks of Chile, Colombia, Mexico, and Peru, among others, are given authority to choose their own inflation objectives.

To understand how governments have come to embrace the independence of central banks, it is helpful to review how they have evolved from their origins in the 17th century. Sweden's Riksbank was established by the private sector in 1688 to lend the government funds, and the Bank of England followed in 1694, with a similar structure and purpose.⁸ Other European central banks followed in the 19th century and a wave of many more in the 20th, including the Federal Reserve. At different times, these central

⁸ See Bordo (2007).

banks made the transition from wholly private to wholly public institutions and became accountable to government, and by the mid-20th century, there was a growing recognition that independence made for a more practical and, ultimately, more effective central bank. In the United States, the moment of truth came in 1951. During World War II, the Federal Reserve had agreed to peg interest rates on Treasury securities in order to ensure smooth funding of the war effort, and after the war, it continued to peg the longer-term Treasury rate. In the early 1950s, inflation soared, but Treasury favored continuing a cap on longer-term interest rates so that debt management costs could continue to be low during the Korean War. After a series of high-level meetings, the Federal Reserve and the Treasury reached an agreement in 1951 that freed the Fed from the obligation to fix interest rates and allowed it to use monetary policy independently to pursue national economic goals.

Researchers have analyzed the historical experiences of particular central banks, such as the Federal Reserve, to understand the transition toward central bank independence and how it affects economic performance.⁹ In addition, researchers have also developed large cross-country indexes measuring the level of central bank independence while capturing multifaceted aspects of this independence based on banks' legal statutes over long periods.¹⁰ The empirical regularity that stands out in many different studies analyzing these indexes is the rise in central bank independence starting in the 1980s, with studies analyzing at least 120 countries.¹¹

⁹ For a review of the historical experience of the United States in particular, see Binder S, Spindel M. (2017).

¹⁰ One early index is due to Cukierman, Webb, and Neyapti (1992). It captures some aspects of various institutional arrangements, such as the presence of a mandate on price stability or additional mandates.

¹¹ See Dincer, Eichengreen, and Martinez (2024). See also Romelli (2024).

Economic research has cited several factors driving this adoption of central bank independence. In the 1980s and 1990s, emerging economies saw central bank independence as a way to facilitate access to global trade and financial markets, which were liberalized during that time.¹² Another important factor was the experience of developing country debt crises during this period, which led to demands by creditor banks and international lenders for central bank independence.¹³

To whatever extent these other factors pushed governments toward central bank independence, a consensus developed that such an arrangement yielded better economic outcomes. Based on measures of central bank independence, researchers indeed have found a relationship between independence and lower inflation, especially for advanced economies.¹⁴ While evidence of a negative relationship between independence and inflation has been a bit more elusive in the case of emerging market and developing economies (EMDEs), the economic literature does find a relationship between independence and lower inflation volatility in these countries.¹⁵ Among the reasons I would cite for why it is more difficult to find a relationship between independence and lower inflation in EMDEs is that legal measures of central bank independence, also called “de jure independence,” may not reflect the relationship between the central bank and the government that exists in practice—referred to as “de facto independence.” In countries where the rule of law is not as strongly embedded in their institutions, there can be wide gaps between the formal, legal institutional arrangements and their practical effect.¹⁶

¹² See Maxfield (1997).

¹³ See Cukierman (2008).

¹⁴ See Crowe and Meade (2008).

¹⁵ See Garriga and Rodriguez (2020).

¹⁶ Cukierman and others (2002) provide some evidence on the relationship between inflation and central bank independence across different countries.

Indeed, alternative measures of independence, such as turnover of central bank governors, point to de facto measures being negatively associated with inflation, especially in emerging economies.¹⁷ Another possible reason is that emerging economies may be more exposed to volatile shocks and governmental regime changes, leading to greater turnover in central bank leadership and clouding the relationship between central bank independence and inflation.¹⁸

The relationship between central bank independence and lower inflation and inflation volatility is therefore clear. But the connection to faster growth in economic activity is not. On the one hand, the primary reason for central bank independence in most countries with a single mandate is to provide price stability, so the lack of association between monetary policy independence and adverse economic consequences is not surprising.¹⁹ On the other hand, indexes of central bank independence may be biased. Most indexes of central bank independence tend to penalize the presence of additional mandates or responsibilities beyond price stability.²⁰ However, a mandate that excludes full employment does not seem optimal, given that a central banker should focus on the consequences of its actions on long-term growth and economic activity. Research has emphasized complementarities between price stability, economic stability, and financial stability, providing a rationale for these overlapping objectives at many central banks.²¹ Also, in practice, although the recent inflation run-up showcased the

¹⁷ See, for instance, Jácome and Vázquez (2008) and Vuletin and Zhu (2011).

¹⁸ See Jácome and Vázquez (2008).

¹⁹ For instance, Alesina and Summers (1993) find no increase in business cycle volatility in developed countries.

²⁰ Take, for instance, the very recently updated index by Romelli (2024): The joint presence of price stability together with economic growth or full employment or responsibilities in bank supervision, as is the case for the Federal Reserve, depresses the score.

²¹ See Kiley and Mishkin (2024).

commitment of most central banks to fight inflation, it also appears that they have been willing to provide some accommodation after having gained greater confidence that inflationary pressures have dissipated. In fact, most central banks have initiated an easing cycle even with inflation still somewhat above their respective targets and regardless of the presence or not of an employment goal in their mandates.

So if central bank independence does improve inflation outcomes, one question is how it accomplishes this. Let me return to an issue I mentioned earlier: credibility. If the central bank is credible about its longer-run inflation target, it would be a natural outcome that long-run inflation expectations will tend to be closer to the target than when that credibility is lacking. And a central bank will be more credible if it takes actions that lead the public to be confident that the central bank is actively pursuing its stated goal.

It is possible to formalize the channel through which a central bank chooses a long-run inflation target and the public slowly learns about its commitment to achieving it, thus gradually anchoring long-run expectations.²² The public observes inflation and economic activity outcomes as well as the central bank actions (say, changes in the federal funds rate), and it updates its long-run inflation expectations, which, in this model, coincide with its perception of the long-run target. For instance, a nominal interest rate that is higher than expected, given observed inflation and economic activity and the public's long-run inflation expectations, leads to an updated—lower—value of the perceived inflation target.

²² Kiley (2008) develops a model in which the public does not observe the central bank inflation target and it has to infer the target from observations on macro variables and interest rates. Long-run inflation expectations in Kiley's model are the optimal estimates of the unobserved long-run target. The estimates in Kiley (2008) suggest that the updating of long-run inflation expectations is affected by monetary policy, in contrast to alternative frameworks, such as adaptive expectations.

If the central bank's policy actions are consistent with its long-run inflation goal, the public's long-run expectations will gradually settle at the central bank's long-run goal: This dynamic will anchor inflation expectations to the long-run target. The stock of credibility of a central bank will be reflected in long-run inflation expectations moving in a relatively narrow range close to the stated inflation goal. Conversely, inconsistent actions will imply that agents will update their long-run expectations higher or lower, depending on the direction of surprises in central bank actions, causing de-anchoring of expectations. Despite a very large inflation shock starting in 2021, available measures of long-run inflation expectations, such as those in the Survey of Professional Forecasters or the Livingston Survey, increased just a bit compared with the inflation run-up and quickly descended in 2023. That can be taken as a sign of anchoring and sufficient central bank credibility through the lens of the model just described. And, to the extent that long-run inflation expectations matter to the dynamics of actual inflation, such as in some Phillips curve models, anchoring of inflation expectations is one of the key elements leading to stable inflation.²³

The model also offers an interpretation of and a contrast to the behavior of inflation and inflation expectations during the Great Inflation of the 1970s and in the post-pandemic period. As inflation rose in the 1970s and monetary policy actions failed to rein it in, the Federal Reserve lost credibility, and longer-term expectations of future inflation rose toward the end of the decade. The Federal Reserve struggled for years to rebuild that credibility, resulting in high and volatile inflation. Conversely, in the recent episode, inflation has traveled a long way from its peak, with no deterioration in

²³ See Yellen (2015).

economic activity and comparatively limited movement in long-run inflation expectations.

Credibility is enhanced by transparency and accountability, and I will conclude with a discussion of how these principles are carried out by the Federal Reserve. The Federal Reserve seeks to explain as clearly as possible what it is trying to do in carrying out its dual-mandate objectives and how it is trying to do it. Such transparency and accountability are necessary under our democratic system but are perhaps especially important for the Federal Reserve, which has been assigned such an important role in promoting a healthy economy. In addition to conferring legitimacy for decisions, transparency makes monetary policy more effective, as the public better understands our monetary policy reaction function, which informs the public on how our decisions are shaped by economic conditions. Monetary policy works in part by trying to influence the public's view of future economic conditions, so it is crucial that these intentions are clearly communicated. The Federal Reserve promotes transparency by issuing a postmeeting statement explaining its decision and then following up with more detailed minutes three weeks later. Every three months, FOMC participants' projections for inflation, unemployment, economic activity, and the likely path of monetary policy are published in the Summary of Economic Projections. The Chair conducts press conferences after each FOMC meeting, and both the Chair and FOMC participants further explain their reasoning on policy in speeches, news interviews, and other public appearances. The Chair testifies to Congress on monetary policy twice a year, responding to questions from lawmakers. Transcripts of FOMC meetings are published after five years. More recently, the Fed has adopted the practice of periodically

reviewing its monetary policy strategy, tools, and communication practices, including holding public *Fed Listens* sessions around the country to get public input.

Transparency is likewise seen in other economies as fundamental to monetary policy independence, which has increasingly been recognized for delivering better policy decisions that are more focused on the longer-term health of an economy. Research continues to add to our understanding of the extent of these better outcomes in different economies and also how independence works in different institutional arrangements. The goal, of course, is more stable economies that deliver broadly rising living standards—in Latin America, the Caribbean, and around the world.

Let me now turn to the current economic outlook in the United States and how our monetary policy independence has permitted us to get where we are now. The United States has seen considerable disinflation while experiencing a cooling but still resilient labor market. Numbers just released this week show headline and core PCE inflation have fallen substantially from 7.1 percent to an estimated 2.3 percent and from 5.6 percent to an estimated 2.8 percent, respectively. While wage moderation and anchored inflation expectations may allow us to continue making progress on inflation, stubborn housing inflation and high inflation in certain goods and services categories may stall progress in reaching our target. At the same time, labor markets have rebalanced, given greater labor supply from immigration and prime-age workers and lower demand from restrictive monetary policy. Thus, although the labor market experienced an extended period of low unemployment and job creation these past several years and strong real wage growth, the labor market has cooled. This combination of a continued but slowing trend in disinflation and cooling labor markets means that we need to continue paying

attention to both sides of our mandate. If any risks arise that stall progress or reaccelerate inflation, it would be appropriate to pause our policy rate cuts. But if the labor market slows down suddenly, it would be appropriate to continue to gradually reduce the policy rate.

Thank you again for inviting me to address you today. I would be glad to spend some time on further discussion of my presentation and to respond to your other questions.

References

- Alesina, Alberto, and Andrea Stella (2010). “The Politics of Monetary Policy,” in Benjamin M. Friedman and Michael Woodford, eds., *Handbook of Monetary Economics*, vol. 3. Amsterdam: Elsevier, pp. 1001–54.
- Alesina, Alberto, and Lawrence H. Summers (1993). “Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence,” *Journal of Money, Credit and Banking*, vol. 25 (May), pp. 151–62.
- Barro, Robert J., and David B. Gordon (1983). “A Positive Theory of Monetary Policy in a Natural Rate Model,” *Journal of Political Economy*, vol. 91 (August), pp. 589–610.
- Binder, Sarah, and Mark Spindel (2017). *The Myth of Independence: How Congress Governs the Federal Reserve*. Princeton, N.J.: Princeton University Press.
- Board of Governors of the Federal Reserve System (2024). *Monetary Policy Report*. Washington: Board of Governors, July, https://www.federalreserve.gov/monetarypolicy/files/20240705_mprfullreport.pdf.
- Bordo, Michael D. (2007). “A Brief History of Central Banks,” Economic Commentary. Cleveland: Federal Reserve Bank of Cleveland, December, <https://www.clevelandfed.org/publications/economic-commentary/2007/ec-20071201-a-brief-history-of-central-banks>.
- Calvo, Guillermo A. (1978). “On the Time Consistency of Optimal Policy in a Monetary Economy,” *Econometrica*, vol. 46 (November), pp. 1411–28.
- Crowe, Christopher, and Ellen E. Meade (2008). “Central Bank Independence and Transparency: Evolution and Effectiveness,” *European Journal of Political Economy*, vol. 24 (December), pp 763–77.

- Cukierman, Alex (2008). "Central Bank Independence and Monetary Policymaking Institutions—Past, Present and Future," *European Journal of Political Economy*, vol. 24 (December), pp. 722–36.
- Cukierman, Alex, Geoffrey P. Miller, and Bilin Neyapti (2002). "Central Bank Reform, Liberalization and Inflation in Transition Economies—An International Perspective." *Journal of Monetary Economics*, vol. 49 (2), pp. 237-264.
- Cukierman, Alex, Steven B. Webb, and Bilin Neyapti (1992). "Measuring the Independence of Central Banks and Its Effect on Policy Outcomes," *World Bank Economic Review*, vol. 6 (3), pp. 353–98.
- Debelle, Guy, and Stanley Fischer (1994). "How Independent Should a Central Bank Be?" in Jeffrey C. Fuhrer, ed., *Goals, Guidelines, and Constraints Facing Monetary Policymakers*, Conference Series 38. Boston: Federal Reserve Bank of Boston, pp. 195–221.
- Dincer, Nergiz, Barry Eichengreen, and Joan J. Martinez (2024). "Central Bank Independence: Views from History and Machine Learning," *Annual Review of Economics*, vol. 16 (August), pp. 393–428.
- Fischer, Stanley (1994). "Modern Central Banking," in Forrest Capie, Stanley Fischer, Charles Goodhart, and Norbert Schnadt, eds., *The Future of Central Banking: The Tercentenary Symposium of the Bank of England*. Cambridge, U.K.: Cambridge University Press.
- Garriga, Ana Carolina, and Cesar M. Rodriguez (2020). "More Effective Than We Thought: Central Bank Independence and Inflation in Developing Countries," *Economic Modelling*, vol. 85 (February), pp. 87–105.
- Jácome, Luis I., and Francisco Vázquez (2008). "Is There Any Link between Legal Central Bank Independence and Inflation? Evidence from Latin America and the Caribbean," *European Journal of Political Economy*, vol. 24 (December), pp. 788–801.
- Kiley, Michael T. (2008). "Monetary Policy Actions and Long-Run Inflation Expectations," Finance and Economics Discussion Series 2008-03. Washington: Board of Governors of the Federal Reserve System, February, <https://www.federalreserve.gov/econres/feds/monetary-policy-actions-and-long-run-inflation-expectations.htm>.
- Kiley, Michael T., and Frederic S. Mishkin (2024), "Central Banking Post Crises," Finance and Economics Discussion Series 2024-035. Washington: Board of Governors of the Federal Reserve System, May, <https://doi.org/10.17016/FEDS.2024.035>.
- Kydland, Finn E., and Edward C. Prescott (1977). "Rules Rather Than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy*, vol. 85 (June), pp. 473–91.
- Maxfield, Sylvia (1997). *Gatekeepers of Growth: The International Political Economy of Central Banking in Developing Countries*. Princeton, N.J.: Princeton University Press.

- Persson, Torsten, and Guido Tabellini (1993). “Designing Institutions for Monetary Stability,” *Carnegie-Rochester Conference Series on Public Policy*, vol. 39 (December), pp. 53–84.
- Rogoff, Kenneth (1985). “The Optimal Degree of Commitment to an Intermediate Monetary Target,” *Quarterly Journal of Economics*, vol. 100 (November), pp. 1169–89.
- Romelli, Davide (2024). Trends in Central Bank Independence: A De-jure Perspective,” Working Paper 217. Milan: BAFFI Centre on Economics, Finance and Regulation, Bocconi University, February, <https://repec.unibocconi.it/baffic/baf/papers/cbafwp24217.pdf>.
- Vuletin, Guillermo, and Ling Zhu (2011). “Replacing a ‘Disobedient’ Central Bank Governor with a ‘Docile’ One: A Novel Measure of Central Bank Independence and Its Effect on Inflation,” *Journal of Money, Credit and Banking*, vol. 43 (September), pp. 1185–1215.
- Walsh, Carl E. (2003). *Monetary Theory and Policy*, 2nd ed. Cambridge, Mass.: MIT Press.
- Yellen, Janet L. (2015). “Inflation Dynamics and Monetary Policy,” speech delivered at the Philip Gamble Memorial Lecture, University of Massachusetts, Amherst, September 24, <https://www.federalreserve.gov/newsevents/speech/yellen20150924a.htm>.