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"Central Bank Independence: What It Is, What It Isn't – and the Importance of Accountability"

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The views expressed today are my own, not necessarily those of my colleagues on the Federal Reserve Board of Governors or the Federal Open Market Committee.

Good afternoon. It is a pleasure to serve on a panel with such distinguished central bankers, to discuss the very important issue of central bank independence. The experience and global reach of the panelists serve as reminders that the issue of independent central banks is highly relevant around the world.

As I begin and throughout my remarks today, I hope to clarify what central bank independence is, and what it *isn't*.[1] Doing so requires distinguishing between the "what" and the "how" of monetary policy in the U.S. – what goals the central bank is supposed to achieve, and how it pursues those goals.[2]

In the U.S., the *what* is the set of Congressionally mandated goals for monetary policy, for which the central bank is accountable. The *how* encompasses the tools authorized by Congress and how we use them, which the Fed has altered over time to achieve those goals as conditions change. To me, central banks need not have independence with respect to the what – the end goals, which are set by the elected representatives. But central banks should have independence with respect to the how – the means of getting there. Former Federal Reserve Vice Chair Stanley Fischer referred to this as having "instrument independence" but not "goal independence."[3]

Regarding *what* a central bank is charged with achieving, I believe the people's elected representatives in government should set goals for the nation's central bank. In many countries there is a *single* stated mandate given to the central bank – for example, achieving a particular numerical inflation rate, or keeping the inflation rate within a particular range.[4] In contrast, since 1977 the Federal Reserve in the United States has operated under a *dual* Congressional mandate, with the two goals essentially summed up as maximum sustainable employment and stable prices.[5]

No consideration of independence would be complete without a discussion of accountability. So, before turning to the "how" I'd like to digress for a moment, to provide a bit of detail on the Fed's mandate, as well as the Fed's accountability for implementing its mandate in the public interest.[6]

In January 2012, the Fed (through its policymaking Federal Open Market Committee or FOMC) adopted a formal monetary policy framework containing the explicit numerical objective that it views as consistent with its Congressional price-stability mandate.[7] The FOMC noted in its statement that the Committee judged that inflation at the rate of 2 percent[8] was most consistent over the longer run with the Fed's statutory mandate.[9]

At the same time it reiterated its commitment to attaining the other aspect of the dual mandate, maximum sustainable employment. On this, let me note that the maximum sustainable employment rate may change over time depending on variables beyond the Fed's control, such as the demographic composition of the workforce, and other labor market characteristics. As such, the framework recognizes that the Fed cannot choose a target for maximum employment. So the Fed aims to achieve its best estimate of maximum sustainable employment, recognizing that the factors that determine it change over time.

The Federal Reserve Reform Act of 1977, which added the dual mandate, also contained the first of several iterations of accountability mechanisms for the Fed's execution of its dual mandate, including reporting to and consultation with Congress.[10] Today, under Section 2B of the Federal Reserve Act,[11] the Chairman of the Board of Governors is required to testify at semi-annual hearings before Congressional committees[12] on efforts, activities, objectives and plans of the Fed in conducting monetary policy. The Fed is also required to submit written reports to Congress on the conduct of monetary policy and economic developments and prospects, taking into account developments in unemployment, productivity, exchange rates, international trade, and other factors. This appearance and reporting process is a key way in which Congress oversees the Federal Reserve and holds it accountable for the responsibilities it has been delegated.

While in some countries an explicit numerical inflation goal is mandated by the government,[13] in the United States only the broad goals of price stability and maximum employment are set by the government and are somewhat open to interpretation by the Federal Reserve – and explicitly answered to in monetary policy hearings.

Having touched on the "what," let me say that *how* a central bank achieves its goal or goals is inherently a more technical enterprise. It includes the specific instruments used to influence the economy, the operating details of how these instruments are to be implemented, the strategies to weigh various economic conditions in determining the setting of policy instruments, the models used to make sense of economic data and to forecast outcomes over time, and the communications that the central bank uses to clarify its intent and augment the transmission of policy through financial markets.

Simply put, monetary policy decisions center primarily on the technical processes by which central banks determine how best to interpret and implement the government-mandated goals. For example, understanding how key economic relationships in the economy work to transmit central bank actions to employment and inflation outcomes, and trying to detect when such relationships are changing, are both the sorts of technical endeavors that are central to setting policy.

It is important that central banks have flexibility to adjust their tactics to a changing economic environment.[14] This technical work often needs to be completed quickly. Also, it is quite possible that the mandated goals of the central bank – which center on attaining medium-run economic prosperity – can differ substantially from the understandably shorter-term pressures facing elected officials. Allowing the central bank the independence to alter its instruments as it deems necessary in the short- to medium-run reduces the possibility that political or partisan pressures will divert the central bank from its mandated monetary policy goals.

To reiterate, central bank independence is not about deciding *what to pursue* but rather allowing the central bank to determine *how best to pursue it* (while holding the central bank accountable for as much). For the Federal Reserve, while long-term goals are determined by Congress, the day-to-day implementation of policies is and should be conducted based on data and technical analysis, independent of short-term political objectives.[15]

Now I will briefly cover a few key insights from academic work on central bank independence. Then I'll turn to the economic data to consider the implications of central bank independence, and look at the change over time in certain concepts focused on by the central bank, as evidenced by mentions in official meeting records. I'll also briefly touch on the Fed's review, under way, of its monetary policy framework. This exercise demonstrates, in my view, the Fed's commitment to using its tactical independence, coupled with accountability and transparency, to service the public interest.

Emergence of Formal Studies of Central Bank Independence in Academic Literature

In order to understand central bank independence, it is important to take into account some of the academic literature on the subject. It is notable that much of this literature emerged from the study of periods in which inflation was high and variable, and in some cases in which central governments used their country's central bank to achieve fiscal objectives, essentially "printing money" to finance spending without regard for the inflationary consequences.[16]

Much of the earliest academic literature on central bank independence in the U.S. was motivated by the historical experience of high and variable inflation in the late 1960s and early 1970s. In particular, Allan Meltzer's *A History of the Federal Reserve* documents how closely Federal Reserve Chairman Arthur Burns consulted with the Nixon administration, and attributes the accommodative monetary policy of that time to responding to executive branch pressure to support the expansion of fiscal policy, given the Vietnam War.[17]

As inflation rose dramatically in the late 1960s and the 1970s, economists began to focus on the institutional reasons behind the failure to contain inflation. Many of the earliest academic articles focused on political economy motivations for a central bank allowing inflation to rise. For example, Robert Barro and David Gordon's *A Positive Theory of Monetary Policy in a Natural Rate Model* provides a model wherein the central bank tries to over-stimulate the economy, pushing the economy below the natural rate of unemployment, which the public anticipates, resulting in higher inflation.[18] They suggest, however, that this bias can be attenuated or even avoided, if the central bank is constrained to focus on maintaining low inflation. How to constrain the central bank to avoid this inflationary bias is a non-trivial problem, and an issue that Kenneth Rogoff's *The Optimal Degree of Commitment to an Intermediate Monetary Target* seeks to address. Rogoff essentially advocates for a simple model where the central banker places more weight on inflation than an elected government would, and as a result generates a lower inflation rate.[19]

This theoretical literature was followed by empirical studies that focused on empirical measures of central bank independence, looking in the data for an association between the independence of central banks so measured and their countries' inflation outcomes.[20] In general, the studies found that countries with more independent central banks have lower inflation rates, compared with countries with less independent central banks. These empirical findings have been used to support the international trend towards central bank independence, but so too have the egregious examples in which some governments use their central bank as a printing press, uniformly leading to poor economic outcomes.

The Evolution and Implications of Independence

In the United States, the independence of the Federal Reserve has evolved along with generally held views on the benefits of central bank independence.[21] **Figure 1** highlights periods where actual economic outcomes deviated from maximum employment and stable prices since 1960. It plots the "loss function" for the Fed, expressed as the sum of squared deviations of unemployment from an estimate of the natural rate of unemployment, and squared deviations of inflation from two different estimates of the target for inflation.[22] The largest losses, as the chart shows, occur in the 1970s as inflation and unemployment rose; in the early 1980s when Federal Reserve Chairman Paul Volcker slowed down the economy, raising unemployment significantly so as to bring down the elevated inflation rate; and in the aftermath of the financial crisis of 2008, when unemployment (but not inflation) was quite elevated. The losses of the 1970s clearly had their roots in the lack of independence Allan Meltzer documented. The 1980s losses were indirectly related to independence, too, as they stemmed from the painful but necessary remedies to the earlier era where independence was compromised.

Of course this figure reflects the U.S. experience. But longer economic history around the world contains more dramatic examples in which monetary policymakers lacked independence from the short-term financing constraints faced by fiscal policymakers, sometimes resulting in ruinous hyperinflation. We learn what central bank independence is, not only through academic studies, but also through its absence during such episodes.

The framework the Fed found itself in during the 1960s and 1970s raised doubts that the central bank could attain its goals, likely related to the concern that the Fed had not been as independent of short-run goals as it should have been, resulting in elevated inflation. **Figure 2** provides mentions of the word "credibility" from FOMC meeting transcripts.[23] The word received little attention during the 1960s and early 1970s, but became increasingly common as the inflation rate rose after the mid-1970s. Once the amended Federal Reserve Act provided more explicit goals for monetary policy, the Federal Reserve sought to maintain credibility in order to achieve price stability. With a clearer mandate that delegated the attainment of ultimate goals to the FOMC, the policy-making body was empowered to take actions consistent with that mandate.

However, a clearer mandate also means making unpopular decisions, sometimes at inopportune times, as discussed in the seminal Barro and Gordon work. Specifically, in order to avoid the tendency to overheat the economy and build inflationary pressures, the central bank has, at times, needed to slow an unsustainably rapid expansion by raising interest rates. Such policy actions may not be uniformly popular, even if they aim to sustain an expansion and avoid the costs of rising inflation. Such times particularly require greater transparency about what the Fed is doing, and why. As **Figure 3** shows, the mentions of the word "transparency" in FOMC records has risen over the past 20 years.

Transparency also improves accountability. For example, increased transparency at the Fed has included clarifying annually our strategy of long-term goals and objectives, at the first FOMC meeting of the year, and adopting an explicit inflation target of 2 percent. What's more, increased transparency around goals makes it easier for the public and Congress to evaluate how well the Fed's actions are performing relative to those goals.

Because Congress provides oversight of the central bank, but naturally responds to public concerns, it has become quite important for the Fed to communicate more clearly not only with Congress, but also with the public at large. This increased focus on clarity and transparency is shown by the increased mentions of the word "communication" in FOMC meetings, in **Figure 4**. Communication played very little role in the meetings prior to 1990, but has become much more of a priority.[24] Announcements around FOMC meetings – which had once been quite obscure – now include a statement describing the policy action and its justification, a press conference with the Chair of the FOMC, detailed minutes released shortly after the meeting, and, with a lag, verbatim transcripts. In addition, all FOMC members – members of the Fed's Board of Governors and the 12 Reserve Bank presidents – deliver economic outlook talks that provide updates on the state of the economy and how the economic data align with our dual mandate. Given all this, the public has the opportunity for much greater visibility into the actions the Fed takes, and hopefully a much better understanding of why we believe these actions are necessary to attain the public's long-run goals.

With greater clarity on goals, and more transparency and communication around how policymakers alter policy to achieve those goals, there has been considerable success in changing the inflation experience. **Figure 5** shows that the FOMC in its deliberations has focused on keeping inflation expectations well anchored – by which we mean ensuring that the public believes the Fed will act to consistently attain its inflation target. The hope is that a highly credible inflation goal will lead to well-anchored inflation expectations which, in turn, will imply that temporary changes in prices will not lead individuals to alter their longer-run expectations of inflation, and thus short-run blips in inflation will be transitory rather than persistent. **Figure 6** shows a marked change in the behavior of inflation since the late 1970s. The high and variable inflation of the 1970s has been replaced by a low and remarkably stable rate of inflation since the early 1990s. The Dallas Fed's Trimmed Mean PCE inflation rate measure, the solid line, shows that the temporary blips in inflation discussed above have indeed remained temporary, and so inflation has remained quite close to policymakers' 2 percent target for most of the past two decades.

An advantage of a stable inflation process with well-anchored expectations is that it provides the central bank greater leeway to offset bouts of high unemployment during recessions. **Figure 7** highlights that while monetary policymakers have more flexibility with well-anchored inflation expectations, those expectations cannot be taken for granted. Following periods in which the economy has stretched beyond full employment, recessions frequently ensued. Earlier in our history, increased inflationary pressures forced the central bank to react with tighter credit conditions. More recently, an over-stretched economy has been associated with concerns about financial instability.

Indeed, as **Figure 8** highlights, the FOMC has increasingly discussed financial stability concerns at its policy meetings. The mentions of terms associated with financial instability during FOMC discussions, tracked in the figure, reflect the significant financial-market turbulence that led to, and accompanied, the past two recessions. Central bankers strive to attain *sustainable* economic expansions. Financial instability that arises in part from an overheated economy has been the proximate cause of recent U.S. downturns. Thus, maintaining a focus on financial stability concerns remains critical.

Central Bank Independence and the Fed's Monetary Policy Framework

Independence is one element of a much broader issue – the monetary policy framework. This year, the Federal Reserve has embarked on a broad review of its framework – that is, the strategy, tools, and communication practices the Fed uses to pursue its monetary policy goals. Because the Fed wants to hear from a broad set of public constituents about its performance in attaining goals on their behalf, this review includes a "listening tour" with forums featuring a wide range of public perspectives at Reserve Banks across the country and at the Board of Governors in Washington D.C. A Federal Reserve System-sponsored conference held at the Federal Reserve Bank of Chicago, for instance, solicited viewpoints from both academic researchers and representatives of low-income and under-represented groups. Later this year, the FOMC will discuss the economic research and public perspectives offered during these events, and will determine whether the Fed should consider changes to its framework consistent with the goals established by Congress.

This may seem like an unusual event, and in some respects it is, but it is important to note that the Federal Reserve's monetary policy framework has changed significantly over the past 50 years.[25] For example, **Figure 9** shows how frequently money aggregates and specifically M1 and M2 were mentioned during FOMC meetings since the 1960s. While they received significant attention during the 1970s and 1980s, they have not been mentioned with any great frequency over the past 20 years. The decision to deemphasize money aggregates in policymaking reflected real-world changes in financial markets and financial institutions – changes that made aggregates less reliable indicators of underlying macroeconomic fundamentals, which in turn made monetary policy based on these aggregates less effective at achieving the Fed's goals.

More recently, during the financial crisis, the Federal Reserve aggressively used asset purchases (in shorthand, its balance sheet) to lower long-term interest rates so as to stimulate the economy during the extended financial turmoil and an economic downturn, once short-term interest rates reached the effective lower bound. **Figure 10** shows that the Fed's balance sheet did not receive much attention, in terms of mentions during FOMC meetings, prior to the crisis – but became widely discussed as interest rates approached zero during the financial crisis. Similarly, **Figure 11** shows that "forward guidance" – that is, communications that are used to shape expectations about the future path of interest rates – was a tool that was primarily discussed only when short-term interest rates approached zero. Both of these tools reflected changes in the Fed's framework that were responses to evolving conditions and the realities of the moment – the need to continue to provide monetary stimulus despite short-term interest rates being at the effective lower bound, yet with an unemployment rate still well above a level consistent with maximum employment.

My examples are chosen to demonstrate that the value of independence lies not only in delegating the setting of the policy instrument to the central bank, but also in providing the central bank the freedom to change other aspects of its framework as it deems necessary to best achieve its mandated goals. This ability to dynamically change the implementation of monetary policy — flexibility in the *how* with which I began this discussion — is a critical aspect of independence that has received less attention in the discourse around central bank independence. Importantly, while the tactics the Fed chose in response to evolving economic circumstance were innovative and new, they did not change the *what*—that is, they were consistent with meeting the overarching statutory mandate provided by Congress to return as quickly as possible to maximum sustainable employment and price stability.

Our history shows that the Fed has frequently changed the instruments it uses to attain policy goals, and has changed how the Committee has used communications to explain its decisions, articulate its goals, shape expectations, and improve accountability for its delegated authority. An issue of particular importance is recognizing that consistently attaining the 2 percent inflation target has become increasingly challenging in a world with very low interest rates, which implies a higher likelihood that future economic downturns will result in short-term rates quickly hitting their effective lower bound. The Fed's current framework review will try to assess whether there are ways in which we might change the *how* of policy to better address this challenge going forward, ensuring that inflation and inflation expectations remain well anchored around our two percent goal.

My own view is that open and transparent discussions of monetary policy issues will help provide the public a better understanding of those challenges and how the central bank hopes to address them. For a central bank to prove the value of its tactical independence, it needs to evolve with changes in the economy, and explain clearly why its policies are consistent with achieving the overarching mandate from the peoples' elected representatives.

Concluding Observations

The Federal Reserve receives its mandate from Congress and is accountable to the public and their Congressional representatives for carrying out that mandate. The appropriate central bank independence for the Fed is not independence from Congressional oversight or accountability, nor is it independence to set some new, broad goals that supersede those mandated by Congress.[26] However, the degree of independence the Fed has over the "how" or the "means" (instrument independence) has included the flexibility to implement monetary policy in a way that responds effectively to changing economic conditions so as to best achieve the Fed's Congressional dual mandate of maximum employment and price stability.

Empirical work has highlighted that better economic outcomes occur over the longer term when the central bank's policy implementation is independent from the type of cyclicality that can be induced by trying to meet short-term objectives. In the U.S., that independence is based on a combination of delegated responsibility to achieve the legislated mandate, along with a decades-long process of developing understanding among legislators, administrations, the public, and the central bank about the long-run benefits of central bank independence – essentially, that the primary goal of the Fed is to attain the long-run goals that best serve the public's interests.

In closing I will provide a more colloquial rationale for the delegation of the "how" that comes with central bank independence. In truth, in modern life we ask people all the time to act on our behalf, with independence. For example, lots of very smart people leave it to commercial airline pilots to get them to their destination, plotting the best course and flying the plane through any emergencies. But we expect the pilots to keep us informed, too. And we certainly expect homebuilders to construct what is in our blueprints, but we leave the plumbing and wiring to them, albeit with frequent reports and updates. And speaking from personal experience, some people hire a wedding planner or caterer to help execute a wonderful event – one that they described and helped to plan, but in the end leave to the wedding planner to execute, troubleshoot, and also not let things get out of hand.[27] All analogies are imperfect, but these illustrations bear some similarities to central banking.

Thank you again for the opportunity to be part of such a distinguished panel and to offer these comments on central bank independence.

NOTES

[1] The focus of this talk is governance issues related to monetary policy. It is important to note, however, that the Federal Reserve also plays an important role in bank supervision, financial stability, and the U.S. payment system. These remarks do not address governance issues related to these other functions of the Federal Reserve.

[2] Some would suggest it also entails broadening a bit the notion of what is included in the "how." Traditionally, independence has focused on the freedom to set our policy instrument in the way that we think will best achieve our goals. It may well be worth exploring including in the domain of independence additional elements of our monetary policy "framework"— including which policy instrument we use, the tactics we use to set the instrument, and the ways we communicate about the rationale for our policy, as well as our intentions for future policy. But that exploration is largely beyond the scope of my talk today.

[3] See Nov. 4, 2015 speech by Vice Chair Fischer entitled, *Central Bank Independence*, at the 2015 Herbert Stein Memorial Lecture National Economists Club, Washington, D.C. In this speech he discussed the difference between "instrument independence" in which "the central bank has control over the policy instruments it has been assigned," and "goal independence" in the establishment of operational goals.

[4] Australia is an example of a country that has an inflation range. Australia's inflation target is to keep the annual consumer price index (CPI) inflation rate between 2 and 3 percent, on average, over time.

[5] The Federal Reserve Act provides the following monetary policy goals, "promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates." The first two are the dual mandate.

Moderate long-term interest rates are generally viewed as a product of the first two, provided that the maximum employment is a sustainable maximum employment.

[6] Above all, accountability resides in the fact that lawmakers have the authority to adjust the Fed's mandate and modify its powers and the instruments available to it, as they have exercised from time to time through the Fed's history.

[7] The longer-run goals were first articulated in the FOMC's January 25, 2012 press release and have been reaffirmed annually. See https://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf.

[8] As measured by the annual change in the price index for personal consumption expenditures.

[9] January 25, 2012 was the first time that the Federal Reserve released an FOMC statement of longer-run goals and monetary policy strategy that included an explicit inflation target: "The Committee judges that inflation at the rate of 2 percent, as measured by the annual change in the price index for personal consumption expenditures, is most consistent over the longer run with the Federal Reserve's statutory mandate."

[10] The Full Employment and Balanced Growth Act of 1978 (better known as the Humphrey-Hawkins Act) amended the Employment Act of 1946.

[11] American Homeownership and Economic Opportunity Act of 2000 (114 Stat. 2944, 3028), adding a new Section 2B to the Federal Reserve Act, 12 U.S.C. Section 225b.

[12] The Senate Committee on Banking, Housing, and Urban Affairs and the House of Representatives Committee on Financial Services.

[13] The European Central Bank is mandated to achieve only price stability, but the ECB has provided the specific implementation goal. The Governing Council adopted this definition in 1998: "Price stability is defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2 percent." It then further clarified price stability in 2003 as: "It aims to maintain inflation rates below, but close to, 2 percent over the medium term." Thus, a verbal mandate with clear implementation guidance by the central bank is consistent with the practice in the United States, though the United States has a dual mandate. The Bank of England receives an annual letter from the government confirming the explicit mandate they should follow. The 2018 letter provides an example: "The Bank of England Act 1998 (the Act) requires that I specify the definition of price stability and the government's economic policy objectives at least once in every period of 12 months beginning on the anniversary of the day the Act came into force. I am doing that today by publishing the remit for the Monetary Policy Committee, where the only change is an update to the timing of the open letter process. I hereby re-confirm the inflation target as 2 per cent as measured by the 12-month increase in the Consumer Prices Index (CPI). The inflation target of 2 per cent is symmetric and applies at all times. This reflects the primacy of price stability and the forward-looking inflation target in the UK monetary policy framework." See: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752077/PU2207_MPC_remit_web.pdf

[14] For example, as money aggregates became less predictive of inflation, the Federal Reserve stopped focusing monetary policy decisions on growth in money aggregates.

[15] For a more skeptical legal discussion of the need for central bank independence see Conti-Brown, P. (2017). *Ulysses and the Punch Bowl: The Governance, Accountability, and Independence of the Federal Reserve*. George Mason Law Review. 617-633. See http://www.georgemasonlawreview.org/wp-content/uploads/24_2_Conti-Brown.pdf

[16] For further discussion, see speech given by Chairman Ben S. Bernanke at the Institute for Monetary and Economic Studies International Conference, Bank of Japan, entitled *Central Bank Independence, Transparency, and Accountability*, delivered in Japan on May 25, 2010.

[17] See Meltzer, A. *A History of the Federal Reserve*. University of Chicago Press.

[18] See Barro, R. and D. Gordon (1983). *A Positive Theory of Monetary Policy in a Natural Rate Model*. Journal of Political Economy. 589-610.

[19] See Rogoff, K. (1985). *The Optimal Degree of Commitment to an Intermediate Monetary Target*. Quarterly Journal of Economics, 1169-1189.

[20] See for example Alesina, A. and Summers, L. (1993). *Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence*, Journal of Money Credit and Banking. 151-162. While the authors find a strong negative correlation between central bank independence and inflation, they do not see significant differences when looking at real variables.

[21] Note how the Federal Reserve is structured to provide independence. For example, the Federal Reserve does not require congressional appropriations, Federal Reserve Governors are appointed to long terms, 14 years, and the Reserve Bank presidents are not appointed by the President nor require Senate confirmation.

[22] For more discussion, see: Fuhrer, J., Olivei, G., Rosengren, E., and Tootell, G. (2019) *Should the Federal Reserve Regularly Evaluate Its Monetary Policy Framework?* presented as a draft at the Brookings Institution's Fall 2018 Brookings Papers on Economic Activity Conference in Washington D.C., and will be published later in 2019. The loss function is estimated using the Congressional Budget Office estimate of the natural rate of unemployment and inflation is assumed to be 2 percent or alternatively the inflation rate is estimated from a time-varying model for the target of inflation. See https://www.brookings.edu/wp-content/uploads/2018/09/BPEA_Fall2018_Should-the-Fed-Regularly-Evlauate-its-Monetary-Policy-Framework.pdf.

[23] These mentions of particular terms in the transcripts of FOMC meetings are expressed as a percentage of total words in FOMC transcripts. Prior to June 1967, these documents were called historical minutes. From June 1967 through March 16, 1976, these documents were called memoranda of discussions, and since March 29, 1976 they have been referred to as FOMC transcripts.

[24] Federal Reserve Chair Ben Bernanke said, "Improved communication can help our policies work better [and] build public confidence in the Federal Reserve, which is essential if it is to be successful in fostering stability and prosperity… The Fed's ability to make and implement decisions ultimately depends on the public's understanding … We must do all that we can to explain our actions and to show how they serve the public interest." See: https://www.federalreserve.gov/newsevents/speech/bernanke20131216a.htm. Chair Janet Yellen said, "I have discharged one of my most important responsibilities, accounting for the Fed's actions and explaining its policies... Such communication is vital in a democracy and especially important for the Federal Reserve, which relies on the confidence of the public to be effective in carrying out its mission." See: https://www.federalreserve.gov/newsevents/speech/yellen20140305a.htm. Chair Jay Powell said, "As I begin my term, I want to stress my commitment to explaining what we're doing and why we are doing it..." See: https://www.federalreserve.gov/mediacenter/files/chairman-powell-transcript-20180205a.pdf.

[25] For more discussion, see: Fuhrer, J., Olivei, G., Rosengren, E., and Tootell, G. (2019) *Should the Federal Reserve Regularly Evaluate Its Monetary Policy Framework?* presented as a draft at the Brookings Institution's Fall 2018 Brookings Papers on Economic Activity Conference in Washington D.C., and will be published later in 2019. See https://www.brookings.edu/wp-content/uploads/2018/09/BPEA_Fall2018_Should-the-Fed-Regularly-Evlauate-its-Monetary-Policy-Framework.pdf.

[26] Note that while Congress has established significant independence for the Federal Reserve, that independence can be subject to legislative change. For example Binder, S. and M. Spindel (2016) *Independence and accountability: Congress and the Fed in a polarized era.* Brookings Center for Effective Public Management. 1-18. See https://www.brookings.edu/research/independence-and-accountability-congress-and-the-fed-in-a-polarized-era/

[27] William McChesney Martin (Fed Chairman 1951-1970) famously cited the metaphor of central bank rate increase decisions being akin to "[ordering] the punch bowl removed just when the party was really warming up." See *Address before the New York Group of the Investment Bankers Association of America*, Oct. 19, 1955.