

February 2006, he noted that the FOMC had been able to raise the policy rate in a more gradual and predictable fashion during the mid-2000s than during the 1970s, given that inflation expectations had remained low. See Bernanke, Ben S. “ [The Benefits of Price Stability](<http://www.federalreserve.gov/newsevents/speech/bernanke20060224a.htm>),” speech on Feb. 24, 2006.

*Additional Resources* • [President Bullard’s website](<https://www.stlouisfed.org/from-the-president>)

- Regional Economist: [What Does Data Dependence Mean?](<https://www.stlouisfed.org/publications/regional-economist/january-2016/what-does-data-dependence-mean>)
- Speech: [Inflation Targeting in the USA]([https://www.stlouisfed.org/-/media/project/frbstl/stlouisfed/files/pdfs/bullard/remarks/bullard\\_inflation\\_targeting\\_in\\_the\\_usa\\_06feb2012\\_final.pdf](https://www.stlouisfed.org/-/media/project/frbstl/stlouisfed/files/pdfs/bullard/remarks/bullard_inflation_targeting_in_the_usa_06feb2012_final.pdf))

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- **January 29, 2016.** Article. ["What Does Data Dependence Mean?"](#) Federal Reserve Bank of St. Louis *The Regional Economist*, January 2016. This article also appeared in the [St. Louis Fed On the Economy blog](#), February 1, 2016.

### **What Does Data Dependence Mean?**

The Federal Open Market Committee (FOMC) has emphasized that decisions regarding the normalization of monetary policy will be data-dependent. Data dependency is sometimes misinterpreted as meaning decisions are based on the data released just before an FOMC meeting. That interpretation is far too narrow and inconsistent with good monetary policymaking. Rather, the decisions should be based not only on the current dynamics in the data but also on longer-run trends and expectations for data going forward.

Data are often revised, sometimes significantly. For example, payroll employment increased in August 2014 by an initial estimate of 142,000 compared with the current estimate of 213,000.

[1](<https://www.stlouisfed.org#endnotes>) Knowing that revisions are possible, monetary policymakers must strike a balance between not wanting to react too much to day-to-day observations on the economy versus wanting to react sufficiently to changes in underlying macroeconomic conditions. Every observation on the economy (e.g., a GDP report or an employment report) contains a certain amount of signal and a certain amount of noise. The art of policymaking includes separating the signal from the noise.

Weather is a factor that at times can increase the size of noise relative to the signal for economic data. In such cases, monetary policymakers might want to temper their reaction to specific data. Consider the case of real gross domestic product early last year, when weather was thought to have disrupted economic activity. According to the most recent estimate, real GDP in the first quarter of 2015 grew at an annualized rate of 0.6 percent—higher than the initial and follow-on estimates of 0.2 percent, -0.7 percent and -0.2 percent. The FOMC did not make any appreciable adjustments to policy in response to those GDP reports. As this example illustrates, data dependence does not mean necessarily that a particular number or even a sequence of numbers is going to change the course of policy.

Monetary policy decisions must be made with an eye toward the future. It is well-known that monetary policy operates with long and variable lags. Accordingly, the monetary policymaker must incorporate forecasted future outcomes when making current monetary policy decisions. Although macroeconomic forecasts are changed in response to new data, the changes tend to depend on whether a particular piece of data was expected and how important it is relative to other pieces of data. Given that the contours of forecasts do not change very quickly, monetary policy strategy also does not change very quickly. However, both probably would change in response to an ongoing slew of worse-than-expected or better-than-expected data.

The FOMC effectively deviated from data-dependent decision-making when

it introduced calendar-based forward guidance in August 2011. The committee gave a specific calendar date for how long the zero interest rate policy, which had been in place since December 2008, was expected to continue ("at least through mid-2013").

[2](<https://www.stlouisfed.org#endnotes>)At subsequent meetings, the committee extended the date. Throughout that period, I argued that the guidance should be dependent on the state of the economy rather than on a calendar date. The FOMC moved to data-dependent forward guidance in December 2012, when it replaced the calendar date with the so-called thresholds for inflation (2.5 percent) and unemployment (6.5 percent).

[3](<https://www.stlouisfed.org#endnotes>)In March 2014, the FOMC discarded the thresholds because unemployment approached 6.5 percent. However, language about being data-dependent remained in the statement.

During the 2004-2006 normalization cycle, the FOMC raised the policy rate by 0.25 percentage points per meeting for 17 consecutive meetings.

Arguably, monetary policy during that era was insufficiently attentive to incoming macroeconomic data. Possibly, the recent emphasis on data dependence will usher in a period of monetary policymaking more akin to the 1980s, 1990s and the early 2000s, when the policy rate was adjusted in response to current macroeconomic data, longer-run trends and forecasts, but not in a fashion that was overly reactive to only the latest data or noisy aspects of macroeconomic developments.

## Endnotes

1. Numbers were obtained from ALFRED, the St. Louis Fed's archival economic database. See also Kevin Kliesen, "August Nonfarm Payroll Numbers Lower than Forecasted? Wait for the Revisions." St. Louis Fed On the Economy blog post on Sept. 4, 2015, at [[www.stlouisfed.org/on-the-economy/2015/september/august-nonfarm-payroll-numbers-down-revisions](http://www.stlouisfed.org/on-the-economy/2015/september/august-nonfarm-payroll-numbers-down-revisions)](<http://www.stlouisfed.org/on-the-economy/2015/september/august-nonfarm-payroll-numbers-down-revisions>).

[[back to text](https://www.stlouisfed.org#1##1)](<https://www.stlouisfed.org#1##1>)

2. See the FOMC statement on Aug. 9, 2011, at [[www.federalreserve.gov/newsevents/press/monetary/20110809a.htm](http://www.federalreserve.gov/newsevents/press/monetary/20110809a.htm)](<http://www.federalreserve.gov/newsevents/press/monetary/20110809a.htm>).

[[back to text](https://www.stlouisfed.org#2##2)](<https://www.stlouisfed.org#2##2>)

3. That is, the zero interest rate policy was expected to continue at least as long as unemployment was above its threshold and inflation was at or below its threshold. For a discussion of some issues related to thresholds, see my presentation on Jan. 10, 2013, "The Fed's New Regime and the 2013 Outlook," at [\[www.stlouisfed.org/~media/Files/PDFs/Bullard/remarks/BullardWisconsinForecastLuncheon10Jan2013final.pdf\]](http://www.stlouisfed.org/~media/Files/PDFs/Bullard/remarks/BullardWisconsinForecastLuncheon10Jan2013final.pdf)(<https://www.stlouisfed.org/~media/project/frbstl/stlouisfed/files/pdfs/bullard/remarks/bullardwisconsinforecastluncheon10jan2013final.pdf>). [ [\[back to text\]](#)(<https://www.stlouisfed.org#3##3>)]

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### **What Does Data Dependence Mean?**

The text below, written by Federal Reserve Bank of St. Louis President James Bullard, first appeared as the President's Message in the January issue of The Regional Economist .

The Federal Open Market Committee (FOMC) has emphasized that decisions regarding the normalization of monetary policy will be data-dependent. Data dependency is sometimes misinterpreted as meaning decisions are based on the data released just before an FOMC meeting. That interpretation is far too narrow and inconsistent with good monetary policymaking. Rather, the decisions should be based not only on the current dynamics in the data but also on longer-run trends and expectations for data going forward.

Data are often revised, sometimes significantly. For example, payroll employment increased in August 2014 by an initial estimate of 142,000 compared with the current estimate of 213,000. Knowing that revisions are possible, monetary policymakers must strike a balance between not wanting to react too much to day-to-day observations on the economy versus

wanting to react sufficiently to changes in underlying macroeconomic conditions. Every observation on the economy (e.g., a GDP report or an employment report) contains a certain amount of signal and a certain amount of noise. The art of policymaking includes separating the signal from the noise. 1

Weather is a factor that at times can increase the size of noise relative to the signal for economic data. In such cases, monetary policymakers might want to temper their reaction to specific data. Consider the case of real gross domestic product early last year, when weather was thought to have disrupted economic activity. According to the most recent estimate, real GDP in the first quarter of 2015 grew at an annualized rate of 0.6 percent—higher than the initial and follow-on estimates of 0.2 percent, -0.7 percent and -0.2 percent. The FOMC did not make any appreciable adjustments to policy in response to those GDP reports. As this example illustrates, data dependence does not mean necessarily that a particular number or even a sequence of numbers is going to change the course of policy.

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December 2012, when it replaced the calendar date with the so-called thresholds for inflation (2.5 percent) and unemployment (6.5 percent). 2

In March 2014, the FOMC discarded the thresholds because unemployment approached 6.5 percent. However, language about being data-dependent remained in the statement. 3

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#### Notes and References

1Numbers were obtained from ALFRED, the St. Louis Fed's archival economic database. See also Kevin Kliesen, " [August Nonfarm Payroll Numbers Lower than Forecasted? Wait for the Revisions](<http://www.stlouisfed.org/on-the-economy/2015/september/august-nonfarm-payroll-numbers-down-revisions>)." St. Louis Fed On the Economyblog post on Sept. 4, 2015.

2See the [FOMC statement](<http://www.federalreserve.gov/newsevents/press/monetary/20110809a.htm>)on Aug. 9, 2011.

3That is, the zero interest rate policy was expected to continue at least as long as unemployment was above its threshold and inflation was at or below its threshold. For a discussion of some issues related to thresholds, see my presentation on Jan. 10, 2013, " [The Fed's New Regime and the 2013 Outlook](<https://www.stlouisfed.org/-/media/project/frbstl/stlouisfed/files/pdfs/bullard/remarks/bullardwisconsinforecastluncheon10jan2013final.pdf>)."

### *Additional Resources*

- Regional Economist: [What Does Data Dependence Mean?](<https://www.stlouisfed.org/publications/regional-economist/january-2016/what-does-data-dependence-mean>)
- Presentation: [The Fed's New Regime and the 2013 Outlook](<https://www.stlouisfed.org/-/media/project/frbstl/stlouisfed/files/pdfs/bullard/remarks/bullardwisconsinforecastluncheon10jan2013final.pdf>)
- On the Economy: [Beige Book: Economic Activity Expands in 9 Districts](<https://www.stlouisfed.org/on-the-economy/2016/january/beige-book-economic-activity-expands-nine-districts>)

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- **January 14, 2016.** Presentation. "[Oil Prices, Inflation and U.S. Monetary Policy.](#)" 2016 Regional Economic Briefing and Breakfast, Economic Club of Memphis, Memphis, Tenn. [Presentation \(pdf\) \(bullard-economic-club-of-memphis-14-jan-2016pdf\)](#) | [Press Release](#) | [Photos](#).

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January 14, 2016

[Presentation (pdf)](<https://www.stlouisfed.org/-/media/project/frbstl/stlouisfed/files/pdfs/bullard/remarks/bullard-economic-club-of-memphis-14-jan-2016.pdf>) | [Press Release](<https://www.stlouisfed.org/news-releases/2016/01/14/st-louis-feds-bullard-discusses-oil-prices-and-inflation>)