## Accessible Version

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## Figure 1: Phillips Curve 2000-2019

| Date | Unemployment Rate | Inflation Rate |
| :---: | :---: | :---: |
| 1/31/2009 | 7.8 | -0.1 |
| 2/28/2009 | 8.3 | -0.1 |
| 3/31/2009 | 8.7 | -0.5 |
| 4/30/2009 | 9.0 | -0.6 |
| 5/31/2009 | 9.4 | -0.9 |
| 6/30/2009 | 9.5 | -1.0 |
| 7/31/2009 | 9.5 | -1.5 |
| 8/31/2009 | 9.6 | -1.1 |
| 9/30/2009 | 9.8 | -1.0 |
| 10/31/2009 | 10.0 | 0.0 |
| 11/30/2009 | 9.9 | 1.5 |
| 12/31/2009 | 9.9 | 2.1 |
| 1/31/2010 | 9.8 | 2.3 |
| 2/28/2010 | 9.8 | 2.1 |
| 3/31/2010 | 9.9 | 2.4 |
| 4/30/2010 | 9.9 | 2.3 |
| 5/31/2010 | 9.6 | 2.2 |
| 6/30/2010 | 9.4 | 1.6 |
| 7/31/2010 | 9.4 | 1.6 |
| 8/31/2010 | 9.5 | 1.5 |
| 9/30/2010 | 9.5 | 1.4 |
| 10/31/2010 | 9.4 | 1.4 |
| 11/30/2010 | 9.8 | 1.3 |
| 12/31/2010 | 9.3 | 1.5 |
| 1/31/2011 | 9.1 | 1.6 |
| 2/28/2011 | 9.0 | 1.8 |
| 3/31/2011 | 9.0 | 2.1 |
| 4/30/2011 | 9.1 | 2.5 |
| 5/31/2011 | 9.0 | 2.8 |
| 6/30/2011 | 9.1 | 2.8 |
| 7/31/2011 | 9.0 | 2.9 |
| 8/31/2011 | 9.0 | 3.0 |
| 9/30/2011 | 9.0 | 3.0 |
| 10/31/2011 | 8.8 | 2.7 |
| 11/30/2011 | 8.6 | 2.7 |
| 12/31/2011 | 8.5 | 2.5 |
| 1/31/2012 | 8.3 | 2.6 |
| 2/29/2012 | 8.3 | 2.5 |
| 3/31/2012 | 8.2 | 2.3 |


| Date | Unemployment Rate | Inflation Rate |
| :---: | :---: | :---: |
| 4/30/2012 | 8.2 | 2.0 |
| 5/31/2012 | 8.2 | 1.6 |
| 6/30/2012 | 8.2 | 1.5 |
| 7/31/2012 | 8.2 | 1.4 |
| 8/31/2012 | 8.1 | 1.5 |
| 9/30/2012 | 7.8 | 1.7 |
| 10/31/2012 | 7.8 | 2.0 |
| 11/30/2012 | 7.7 | 1.7 |
| 12/31/2012 | 7.9 | 1.6 |
| 1/31/2013 | 8.0 | 1.5 |
| 2/28/2013 | 7.7 | 1.6 |
| 3/31/2013 | 7.5 | 1.3 |
| 4/30/2013 | 7.6 | 1.1 |
| 5/31/2013 | 7.5 | 1.3 |
| 6/30/2013 | 7.5 | 1.5 |
| 7/31/2013 | 7.3 | 1.6 |
| 8/31/2013 | 7.2 | 1.4 |
| 9/30/2013 | 7.2 | 1.2 |
| 10/31/2013 | 7.2 | 1.0 |
| 11/30/2013 | 6.9 | 1.3 |
| 12/31/2013 | 6.7 | 1.5 |
| 1/31/2014 | 6.6 | 1.5 |
| 2/28/2014 | 6.7 | 1.2 |
| 3/31/2014 | 6.7 | 1.5 |
| 4/30/2014 | 6.2 | 1.8 |
| 5/31/2014 | 6.3 | 1.9 |
| 6/30/2014 | 6.1 | 1.8 |
| 7/31/2014 | 6.2 | 1.8 |
| 8/31/2014 | 6.1 | 1.6 |
| 9/30/2014 | 5.9 | 1.6 |
| 10/31/2014 | 5.7 | 1.4 |
| 11/30/2014 | 5.8 | 1.2 |
| 12/31/2014 | 5.6 | 0.8 |
| 1/31/2015 | 5.7 | 0.2 |
| 2/28/2015 | 5.5 | 0.3 |
| 3/31/2015 | 5.4 | 0.3 |
| 4/30/2015 | 5.4 | 0.2 |
| 5/31/2015 | 5.6 | 0.2 |
| 6/30/2015 | 5.3 | 0.3 |
| 7/31/2015 | 5.2 | 0.2 |
| 8/31/2015 | 5.1 | 0.3 |
| 9/30/2015 | 5.0 | 0.1 |
| 10/31/2015 | 5.0 | 0.1 |
| 11/30/2015 | 5.1 | 0.2 |
| 12/31/2015 | 5.0 | 0.3 |
| 1/31/2016 | 4.8 | 0.8 |
| 2/29/2016 | 4.9 | 0.6 |
| 3/31/2016 | 5.0 | 0.6 |
| 4/30/2016 | 5.1 | 0.9 |
| 5/31/2016 | 4.8 | 0.8 |
| 6/30/2016 | 4.9 | 0.8 |
| 7/31/2016 | 4.8 | 0.8 |


| Date | Unemployment Rate | Inflation Rate |
| :---: | :---: | :---: |
| 8/31/2016 | 4.9 | 0.9 |
| 9/30/2016 | 5.0 | 1.2 |
| 10/31/2016 | 4.9 | 1.5 |
| 11/30/2016 | 4.7 | 1.4 |
| 12/31/2016 | 4.7 | 1.7 |
| 1/31/2017 | 4.7 | 2.0 |
| 2/28/2017 | 4.6 | 2.3 |
| 3/31/2017 | 4.4 | 2.0 |
| 4/30/2017 | 4.4 | 1.9 |
| 5/31/2017 | 4.4 | 1.7 |
| 6/30/2017 | 4.3 | 1.6 |
| 7/31/2017 | 4.3 | 1.6 |
| 8/31/2017 | 4.4 | 1.6 |
| 9/30/2017 | 4.3 | 1.9 |
| 10/31/2017 | 4.2 | 1.8 |
| 11/30/2017 | 4.2 | 1.9 |
| 12/31/2017 | 4.1 | 1.9 |
| 1/31/2018 | 4.0 | 1.9 |
| 2/28/2018 | 4.1 | 1.9 |
| 3/31/2018 | 4.0 | 2.1 |
| 4/30/2018 | 4.0 | 2.1 |
| 5/31/2018 | 3.8 | 2.3 |
| 6/30/2018 | 4.0 | 2.4 |
| 7/31/2018 | 3.8 | 2.4 |
| 8/31/2018 | 3.8 | 2.3 |
| 9/30/2018 | 3.7 | 2.1 |
| 10/31/2018 | 3.8 | 2.1 |
| 11/30/2018 | 3.8 | 2.0 |
| 12/31/2018 | 3.9 | 1.9 |
| 1/31/2019 | 4.0 | 1.5 |
| 2/28/2019 | 3.8 | 1.4 |
| 3/31/2019 | 3.8 | 1.5 |
| 4/30/2019 | 3.6 | 1.7 |
| 5/31/2019 | 3.7 | 1.5 |
| 6/30/2019 | 3.6 | 1.5 |
| 7/31/2019 | 3.7 | 1.5 |
| 8/31/2019 | 3.7 | 1.5 |
| 9/30/2019 | 3.5 | 1.4 |
| 10/31/2019 | 3.6 | 1.4 |
| 11/30/2019 | 3.6 | 1.4 |
| 12/31/2019 | 3.6 | 1.6 |

Note: Inflation is the 12-month percent change in the personal consumption expenditures index (PCE).
Source: Source: Bureau of Economic Analysis; Bureau of Labor Statistics; both via Haver Analytics.
Figure 2: Phillips Curve 2021

## Percent

| Date | Unemployment Rate | Inflation Rate |
| :--- | ---: | ---: |
| $1 / 31 / 2021$ | 6.3 | 1.5 |
| $2 / 28 / 2021$ | 6.2 | 1.7 |
| $3 / 31 / 2021$ | 6.1 | 2.5 |


| Date | Unemployment Rate | Inflation Rate |
| :--- | :---: | ---: |
| $4 / 30 / 2021$ | 6.1 | 3.6 |
| $5 / 31 / 2021$ | 5.8 | 4.0 |
| $6 / 30 / 2021$ | 5.9 | 4.3 |
| $7 / 31 / 2021$ | 5.4 | 4.4 |
| $8 / 31 / 2021$ | 5.2 | 4.5 |
| $9 / 30 / 2021$ | 4.8 | 4.7 |
| $10 / 31 / 2021$ | 4.5 | 5.2 |
| $11 / 30 / 2021$ | 4.2 | 5.9 |
| $12 / 31 / 2021$ |  | 3.9 |

Note: Inflation is the 12-month percent change in the personal consumption expenditures index (PCE).
Source: Bureau of Economic Analysis; Bureau of Labor Statistics; both via Haver Analytics.
Figure 3: Phillips Curve 2022-Present

## Percent

| Date | Unemployment Rate | Inflation Rate |  |
| :--- | :---: | ---: | ---: |
| $1 / 31 / 2022$ |  | 4.0 | 6.1 |
| $2 / 28 / 2022$ |  | 3.8 | 6.4 |
| $3 / 31 / 2022$ | 3.6 | 6.8 |  |
| $4 / 30 / 2022$ | 3.6 | 6.4 |  |
| $5 / 31 / 2022$ | 3.6 | 6.5 |  |
| $6 / 30 / 2022$ | 3.6 | 7.0 |  |
| $7 / 31 / 2022$ | 3.5 | 6.4 |  |
| $8 / 31 / 2022$ | 3.7 | 6.3 |  |
| $9 / 30 / 2022$ | 3.5 | 6.3 |  |
| $10 / 31 / 2022$ | 3.7 | 6.1 |  |
| $11 / 30 / 2022$ | 3.6 | 5.6 |  |
| $12 / 31 / 2022$ | 3.5 | 5.3 |  |
| $1 / 31 / 2023$ |  | 3.4 | 5.4 |

Note: Inflation is the 12-month percent change in the personal consumption expenditures index (PCE).
Source: Bureau of Economic Analysis; Bureau of Labor Statistics; both via Haver Analytics.

## Figure 4: Unanchored Inflation Expectations

Figure 4 plots the inflation rate on the $y$ axis and the unemployment rate on the $x$ axis. There is a vertical line, with a label of $U^{*}$ on the $x$ axis, that represents the long-run Phillips curve. There are three downward sloping lines, all with the same, constant slope. The lowest line, a blue solid line, is labeled $\pi^{e}=2$, representing the short-run Phillips curve when inflation expectations are $2 \%$. The middle line, a red dashed line, is labeled $\pi^{e}=3$, representing the short-run Phillips curve when inflation expectations are $3 \%$. The top line, a green dash-dotted line, is labeled $\pi^{e}=4$, representing the short-run Phillips curve when inflation expectations are $4 \%$.

The three lines have a dot on them at an arbitrary, but same, value of unemployment that is less than $U^{*}$. So the dots have the same $x$-value of the unemployment rate, but different $y$-values of inflation. With the blue dot lower (on $y$ axis) than the red dot, than the green dot.

## Figure 5: Frequency of Price Changes

Figure 5 plots the inflation rate on the $y$ axis and the unemployment rate on the $x$ axis. There is a vertical line, with a label of $U^{*}$ on the $x$ axis, that represents the long-run Phillips curve. There are two downward sloping curves. Both have the same inflation expectations of $2 \%$. And, both intersect the long-run Phillips curve at the same point, where inflation is $2 \%$ and the unemployment rate is $U^{*}$. The first curve, blue solid, has a gentle slope. This curve represents the short-run Phillips curve when there are infrequency price changes. The second curve, red dashed, has a steeper slope. This curve represents the short-run Phillips curve when there are frequency price changes.

The two curves cross. For values of the unemployment rate less than $U^{*}$ the frequent price changes curve (red dashed curve) lies above that for infrequency price changes curve (the blue solid curve). So, for a given level of the unemployment rate, the frequent price changes curve lies above the infrequent price change curve. This point is made by showing dots on the two curves. These dots have an arbitrary, but same, value of unemployment that is less than $U^{*}$ and the associated inflation rate on the blue line is less than that on the red line. For values of the unemployment rate greater than $U^{*}$ the red dashed curve lies below the blue solid curve.

Figure 6: Inflation expectations

## MPR Figure 8. Measures of inflation expectations

Monthly

## Percent

| Period | Michigan survey, next 12 months | Michigan survey, next 5 to 10 years |
| :--- | ---: | ---: |
| January 2005 | 2.90 | 2.70 |
| February 2005 | 2.90 | 2.80 |
| March 2005 | 3.20 | 2.90 |
| April 2005 | 3.30 | 3.00 |
| May 2005 | 3.20 | 2.90 |
| June 2005 | 3.20 | 2.80 |
| July 2005 | 3.00 | 2.90 |
| August 2005 | 3.10 | 2.80 |
| September 2005 | 4.30 | 3.10 |
| October 2005 | 4.60 | 3.20 |
| November 2005 | 3.30 | 3.00 |
| December 2005 | 3.10 | 3.10 |
| January 2006 | 3.00 | 2.90 |
| February 2006 | 3.00 | 2.90 |
| March 2006 | 3.00 | 2.90 |
| April 2006 | 3.30 | 3.10 |
| May 2006 | 4.00 | 3.20 |
| June 2006 | 3.30 | 2.90 |
| July 2006 | 3.20 | 2.90 |
| August 2006 | 3.80 | 3.20 |
| September 2006 | 3.10 | 3.00 |
|  |  |  |


| Period | Michigan survey, next 12 months | Michigan survey, next 5 to 10 years |
| :---: | :---: | :---: |
| October 2006 | 3.10 | 3.10 |
| November 2006 | 3.00 | 3.00 |
| December 2006 | 2.90 | 3.00 |
| January 2007 | 3.00 | 3.00 |
| February 2007 | 3.00 | 2.90 |
| March 2007 | 3.00 | 2.90 |
| April 2007 | 3.30 | 3.10 |
| May 2007 | 3.30 | 3.10 |
| June 2007 | 3.40 | 2.90 |
| July 2007 | 3.40 | 3.10 |
| August 2007 | 3.20 | 2.90 |
| September 2007 | 3.10 | 2.90 |
| October 2007 | 3.10 | 2.80 |
| November 2007 | 3.40 | 2.90 |
| December 2007 | 3.40 | 3.10 |
| January 2008 | 3.40 | 3.00 |
| February 2008 | 3.60 | 3.00 |
| March 2008 | 4.30 | 2.90 |
| April 2008 | 4.80 | 3.20 |
| May 2008 | 5.20 | 3.40 |
| June 2008 | 5.10 | 3.40 |
| July 2008 | 5.10 | 3.20 |
| August 2008 | 4.80 | 3.20 |
| September 2008 | 4.30 | 3.00 |
| October 2008 | 3.90 | 2.90 |
| November 2008 | 2.90 | 2.90 |
| December 2008 | 1.70 | 2.60 |
| January 2009 | 2.20 | 2.90 |
| February 2009 | 1.90 | 3.10 |
| March 2009 | 2.00 | 2.60 |
| April 2009 | 2.80 | 2.80 |
| May 2009 | 2.80 | 2.90 |
| June 2009 | 3.10 | 3.00 |
| July 2009 | 2.90 | 3.00 |
| August 2009 | 2.80 | 2.80 |
| September 2009 | 2.20 | 2.80 |
| October 2009 | 2.90 | 2.90 |
| November 2009 | 2.70 | 3.00 |
| December 2009 | 2.50 | 2.70 |
| January 2010 | 2.80 | 2.90 |
| February 2010 | 2.70 | 2.70 |
| March 2010 | 2.70 | 2.70 |
| April 2010 | 2.90 | 2.70 |
| May 2010 | 3.20 | 2.90 |
| June 2010 | 2.80 | 2.80 |
| July 2010 | 2.70 | 2.90 |
| August 2010 | 2.70 | 2.80 |
| September 2010 | 2.20 | 2.70 |
| October 2010 | 2.70 | 2.80 |
| November 2010 | 3.00 | 2.80 |


| Period | Michigan survey, next 12 months | Michigan survey, next 5 to 10 years |
| :---: | :---: | :---: |
| December 2010 | 3.00 | 2.80 |
| January 2011 | 3.40 | 2.90 |
| February 2011 | 3.40 | 2.90 |
| March 2011 | 4.60 | 3.20 |
| April 2011 | 4.60 | 2.90 |
| May 2011 | 4.10 | 2.90 |
| June 2011 | 3.80 | 3.00 |
| July 2011 | 3.40 | 2.90 |
| August 2011 | 3.50 | 2.90 |
| September 2011 | 3.30 | 2.80 |
| October 2011 | 3.20 | 2.70 |
| November 2011 | 3.20 | 2.70 |
| December 2011 | 3.10 | 2.70 |
| January 2012 | 3.30 | 2.70 |
| February 2012 | 3.30 | 2.90 |
| March 2012 | 3.90 | 3.00 |
| April 2012 | 3.20 | 2.90 |
| May 2012 | 3.00 | 2.70 |
| June 2012 | 3.10 | 2.80 |
| July 2012 | 3.00 | 2.70 |
| August 2012 | 3.60 | 3.00 |
| September 2012 | 3.30 | 2.80 |
| October 2012 | 3.10 | 2.70 |
| November 2012 | 3.10 | 2.80 |
| December 2012 | 3.20 | 2.90 |
| January 2013 | 3.30 | 2.90 |
| February 2013 | 3.30 | 3.00 |
| March 2013 | 3.20 | 2.80 |
| April 2013 | 3.10 | 2.90 |
| May 2013 | 3.10 | 2.90 |
| June 2013 | 3.00 | 2.90 |
| July 2013 | 3.10 | 2.80 |
| August 2013 | 3.00 | 2.90 |
| September 2013 | 3.30 | 3.00 |
| October 2013 | 3.00 | 2.80 |
| November 2013 | 2.90 | 2.90 |
| December 2013 | 3.00 | 2.70 |
| January 2014 | 3.10 | 2.90 |
| February 2014 | 3.20 | 2.90 |
| March 2014 | 3.20 | 2.90 |
| April 2014 | 3.20 | 2.90 |
| May 2014 | 3.30 | 2.80 |
| June 2014 | 3.10 | 2.90 |
| July 2014 | 3.30 | 2.70 |
| August 2014 | 3.20 | 2.90 |
| September 2014 | 3.00 | 2.80 |
| October 2014 | 2.90 | 2.80 |
| November 2014 | 2.80 | 2.60 |
| December 2014 | 2.80 | 2.80 |
| January 2015 | 2.50 | 2.80 |


| Period | Michigan survey, next 12 months | Michigan survey, next 5 to 10 years |
| :---: | :---: | :---: |
| February 2015 | 2.80 | 2.70 |
| March 2015 | 3.00 | 2.80 |
| April 2015 | 2.60 | 2.60 |
| May 2015 | 2.80 | 2.80 |
| June 2015 | 2.70 | 2.60 |
| July 2015 | 2.80 | 2.80 |
| August 2015 | 2.80 | 2.70 |
| September 2015 | 2.80 | 2.70 |
| October 2015 | 2.70 | 2.50 |
| November 2015 | 2.70 | 2.60 |
| December 2015 | 2.60 | 2.60 |
| January 2016 | 2.50 | 2.70 |
| February 2016 | 2.50 | 2.50 |
| March 2016 | 2.70 | 2.70 |
| April 2016 | 2.80 | 2.50 |
| May 2016 | 2.40 | 2.50 |
| June 2016 | 2.60 | 2.60 |
| July 2016 | 2.70 | 2.60 |
| August 2016 | 2.50 | 2.50 |
| September 2016 | 2.40 | 2.60 |
| October 2016 | 2.40 | 2.40 |
| November 2016 | 2.40 | 2.60 |
| December 2016 | 2.20 | 2.30 |
| January 2017 | 2.60 | 2.60 |
| February 2017 | 2.70 | 2.50 |
| March 2017 | 2.50 | 2.40 |
| April 2017 | 2.50 | 2.40 |
| May 2017 | 2.60 | 2.40 |
| June 2017 | 2.60 | 2.50 |
| July 2017 | 2.60 | 2.60 |
| August 2017 | 2.60 | 2.50 |
| September 2017 | 2.70 | 2.50 |
| October 2017 | 2.40 | 2.50 |
| November 2017 | 2.50 | 2.40 |
| December 2017 | 2.70 | 2.40 |
| January 2018 | 2.70 | 2.50 |
| February 2018 | 2.70 | 2.50 |
| March 2018 | 2.80 | 2.50 |
| April 2018 | 2.70 | 2.50 |
| May 2018 | 2.80 | 2.50 |
| June 2018 | 3.00 | 2.60 |
| July 2018 | 2.90 | 2.40 |
| August 2018 | 3.00 | 2.60 |
| September 2018 | 2.70 | 2.50 |
| October 2018 | 2.90 | 2.40 |
| November 2018 | 2.80 | 2.60 |
| December 2018 | 2.70 | 2.50 |
| January 2019 | 2.70 | 2.60 |
| February 2019 | 2.60 | 2.30 |
| March 2019 | 2.50 | 2.50 |


| Period | Michigan survey, next 12 months | Michigan survey, next 5 to 10 years |
| :---: | :---: | :---: |
| April 2019 | 2.50 | 2.30 |
| May 2019 | 2.90 | 2.60 |
| June 2019 | 2.70 | 2.30 |
| July 2019 | 2.60 | 2.50 |
| August 2019 | 2.70 | 2.60 |
| September 2019 | 2.80 | 2.40 |
| October 2019 | 2.50 | 2.30 |
| November 2019 | 2.50 | 2.50 |
| December 2019 | 2.30 | 2.20 |
| January 2020 | 2.50 | 2.50 |
| February 2020 | 2.40 | 2.30 |
| March 2020 | 2.20 | 2.30 |
| April 2020 | 2.10 | 2.50 |
| May 2020 | 3.20 | 2.70 |
| June 2020 | 3.00 | 2.50 |
| July 2020 | 3.00 | 2.60 |
| August 2020 | 3.10 | 2.70 |
| September 2020 | 2.60 | 2.70 |
| October 2020 | 2.60 | 2.40 |
| November 2020 | 2.80 | 2.50 |
| December 2020 | 2.50 | 2.50 |
| January 2021 | 3.00 | 2.70 |
| February 2021 | 3.30 | 2.70 |
| March 2021 | 3.10 | 2.80 |
| April 2021 | 3.40 | 2.70 |
| May 2021 | 4.60 | 3.00 |
| June 2021 | 4.20 | 2.80 |
| July 2021 | 4.70 | 2.80 |
| August 2021 | 4.60 | 2.90 |
| September 2021 | 4.60 | 3.00 |
| October 2021 | 4.80 | 2.90 |
| November 2021 | 4.90 | 3.00 |
| December 2021 | 4.80 | 2.90 |
| January 2022 | 4.90 | 3.10 |
| February 2022 | 4.90 | 3.00 |
| March 2022 | 5.40 | 3.00 |
| April 2022 | 5.40 | 3.00 |
| May 2022 | 5.30 | 3.00 |
| June 2022 | 5.30 | 3.10 |
| July 2022 | 5.20 | 2.90 |
| August 2022 | 4.80 | 2.90 |
| September 2022 | 4.70 | 2.70 |
| October 2022 | 5.00 | 2.90 |
| November 2022 | 4.90 | 3.00 |
| December 2022 | 4.40 | 2.90 |
| January 2023 | 3.90 | 2.90 |
| February 2023 | 4.10 | 2.90 |

Note: The Survey of Professional Forecasters (SPF) data are quarterly, begin in 2007:Q1, and extend through 2023:Q1. The data for the Michigan survey are monthly and extend through February 2023.

Source: University of Michigan Surveys of Consumers; Federal Reserve Bank of Philadelphia, SPF.

## Quarterly

Percent

| Period | SPF, 10 years ahead | SPF, 6 to 10 years ahead |
| :---: | :---: | :---: |
| 2007:Q1 | 2.00 | 2.05 |
| 2007:Q2 | 2.00 | 2.05 |
| 2007:Q3 | 2.10 | 2.00 |
| 2007:Q4 | 2.10 | 2.00 |
| 2008:Q1 | 2.20 | 2.10 |
| 2008:Q2 | 2.20 | 2.10 |
| 2008:Q3 | 2.20 | 2.07 |
| 2008:Q4 | 2.20 | 2.25 |
| 2009:Q1 | 2.20 | 2.40 |
| 2009:Q2 | 2.27 | 2.40 |
| 2009:Q3 | 2.15 | 2.50 |
| 2009:Q4 | 2.10 | 2.40 |
| 2010:Q1 | 2.10 | 2.30 |
| 2010:Q2 | 2.15 | 2.30 |
| 2010:Q3 | 2.10 | 2.30 |
| 2010:Q4 | 2.00 | 2.30 |
| 2011:Q1 | 2.10 | 2.20 |
| 2011:Q2 | 2.27 | 2.40 |
| 2011:Q3 | 2.25 | 2.25 |
| 2011:Q4 | 2.15 | 2.25 |
| 2012:Q1 | 2.15 | 2.20 |
| 2012:Q2 | 2.20 | 2.18 |
| 2012:Q3 | 2.20 | 2.20 |
| 2012:Q4 | 2.10 | 2.20 |
| 2013:Q1 | 2.00 | 2.10 |
| 2013:Q2 | 2.00 | 2.10 |
| 2013:Q3 | 2.00 | 2.15 |
| 2013:Q4 | 2.00 | 2.30 |
| 2014:Q1 | 2.00 | 2.20 |
| 2014:Q2 | 2.00 | 2.10 |
| 2014:Q3 | 2.00 | 2.10 |
| 2014:Q4 | 2.00 | 2.10 |
| 2015:Q1 | 2.00 | 2.00 |
| 2015:Q2 | 1.98 | 2.00 |
| 2015:Q3 | 2.00 | 2.10 |
| 2015:Q4 | 1.90 | 2.10 |
| 2016:Q1 | 1.97 | 2.05 |
| 2016:Q2 | 2.00 | 2.01 |
| 2016:Q3 | 2.00 | 2.00 |
| 2016:Q4 | 2.00 | 2.05 |
| 2017:Q1 | 2.10 | 2.05 |
| 2017:Q2 | 2.09 | 2.03 |
| 2017:Q3 | 2.00 | 2.10 |
| 2017:Q4 | 2.00 | 2.00 |


| Period | SPF, 10 years ahead | SPF, $\mathbf{6}$ to $\mathbf{1 0}$ years ahead |  |
| :--- | ---: | ---: | ---: |
| 2018:Q1 | 2.00 | 2.10 |  |
| 2018:Q2 | 2.00 | 2.08 |  |
| 2018:Q3 | 2.00 | 2.07 |  |
| 2018:Q4 | 2.00 | 2.02 |  |
| 2019:Q1 | 2.00 | 2.00 |  |
| 2019:Q2 | 2.00 | 2.00 |  |
| 2019:Q3 | 2.00 | 2.04 |  |
| $2019: Q 4$ | 2.00 | 2.00 |  |
| $2020: Q 1$ | 2.00 | 2.00 |  |
| $2020: Q 2$ | 1.86 | 2.00 |  |
| $2020: Q 3$ | 1.85 | 2.00 |  |
| $2020: Q 4$ | 1.90 | 2.10 |  |
| $2021: Q 1$ | 2.03 | 2.08 |  |
| $2021: Q 2$ | 2.10 | 2.05 |  |
| $2021: Q 3$ | 2.20 | 2.00 |  |
| $2021: Q 4$ | 2.30 | 2.00 |  |
| $2022: Q 1$ | 2.20 | 2.00 |  |
| $2022: Q 2$ | 2.40 | 2.00 |  |
| $2022: Q 3$ | 2.45 | 2.04 |  |
| $2022: Q 4$ | 2.58 | 2.15 | 2.00 |
| $2023: Q 1$ | 2.15 |  |  |

Note: The Survey of Professional Forecasters (SPF) data are quarterly, begin in 2007:Q1, and extend through 2023:Q1. The data for the Michigan survey are monthly and extend through February 2023.

Source: University of Michigan Surveys of Consumers; Federal Reserve Bank of Philadelphia, SPF.

## MPR Figure 9. Inflation compensation implied by Treasury Inflation-Protected Securities

Series: 5-to-10-year and 5-year
Horizon: January 4, 2010, to February 28, 2023
Description: A line chart with two curves over January 4, 2010, to February 28, 2023. Units are percent, and the data are daily. The 5-to-10-year series begins around 3.25 in January 2010, decreases to about 2.25 by mid-August 2010, and then increases back to about 3.25 by December 2010. The series then fluctuates between approximately 2.75 and 3.25 throughout the first eight months of 2011 before dropping almost to 2 in September 2011, reaching nearly 3 in March 2012, and dropping to about 2.5 in June 2012. The series then moves up to about 3 by January 2013 before it steps down to a bit below 1.5 through June 2016. The series then grows to about 2 in January 2018, moderates to about 1.5 by the end of February 2020, and then falls below 1 in March 2020 before returning to about 1.5 in April 2020. The series then steadily climbs to about 2.5 by May 2021 before edging down below 2.25 in September 2021. The series then fluctuates between approximately 2 and 2.5 throughout mid-April 2022 before briefly hitting 2.6 in late April, dropping to just above 2 in late May, and returning to just above 2.25 in mid-June 2022. The series then fluctuates between about 2.3 and 1.9 for the next four months of 2022 before edging up to 2.5 by November 2022. The series then declines steadily to about 1.9 in mid-December 2022 before rising slowly to about 2.5 by the end of February 2023.

The contour of the 5 -year series is similar to that of the 5-to-10-year series from January 2010 through January 2016, except that it starts at about 2, more than 1 percent lower than the 5 -to10 -year series, and remains noticeably below the 5 -to-10 year series through 2015. Then from early 2016 through February 2020, they are nearly identical. The 5 -year series subsequently falls to just above 0 by mid-March 2020 before jumping to around 2 in January 2021, surpassing the 5 -to-10-year series, and then ramps up to more than 3 in November 2021. The series retreats slightly to about 2.75 by December 2021 and remains around there through most of February 2022. In late February 2022 and through March 2022, the series begins to rise, peaking around 3.5 in late March 2022. The series drops briefly to around 3.2 in early April before increasing again to roughly 3.4 in late April 2022. From there, it decreases to just below 3 in mid-May and remains roughly between 2.8 and 3.1 through mid-June 2022. The series then falls to about 2.1 by the end of September 2022 before rebounding to about 2.5 in early November 2022. The series then follows the 5-to-10-year series closely until the end of 2023, ending at about 2.5 .

Note: The data are at a business-day frequency and are estimated from smoothed nominal and inflation-indexed Treasury yield curves.

Source: Federal Reserve Bank of New York; Federal Reserve Board staff calculations.

Figure 7: Frequency of Price Changes
Fraction

|  | Price Increases | Price Decreases | Price Changes | CPI inflation |
| :---: | :---: | :---: | :---: | :---: |
| 2018m1 | 0.05 | 0.03 | 0.09 | 2.1 |
| 2018m2 | 0.06 | 0.03 | 0.08 | 2.2 |
| 2018m3 | 0.06 | 0.03 | 0.09 | 2.4 |
| 2018m4 | 0.05 | 0.02 | 0.08 | 2.5 |
| 2018m5 | 0.06 | 0.03 | 0.08 | 2.8 |
| 2018m6 | 0.06 | 0.03 | 0.08 | 2.9 |
| 2018m7 | 0.05 | 0.03 | 0.08 | 2.9 |
| 2018m8 | 0.05 | 0.03 | 0.09 | 2.7 |
| 2018m9 | 0.05 | 0.03 | 0.09 | 2.3 |
| 2018m10 | 0.06 | 0.03 | 0.09 | 2.5 |
| 2018 m 11 | 0.07 | 0.04 | 0.10 | 2.2 |
| 2018m12 | 0.06 | 0.03 | 0.09 | 1.9 |
| 2019m1 | 0.07 | 0.03 | 0.09 | 1.6 |
| 2019m2 | 0.06 | 0.02 | 0.09 | 1.5 |
| 2019m3 | 0.06 | 0.03 | 0.09 | 1.9 |
| 2019m4 | 0.07 | 0.03 | 0.10 | 2 |
| 2019m5 | 0.05 | 0.03 | 0.10 | 1.8 |
| 2019m6 | 0.06 | 0.04 | 0.09 | 1.6 |
| 2019m7 | 0.06 | 0.03 | 0.10 | 1.8 |
| 2019m8 | 0.07 | 0.03 | 0.10 | 1.7 |
| 2019m9 | 0.06 | 0.03 | 0.08 | 1.7 |
| 2019m10 | 0.07 | 0.03 | 0.10 | 1.8 |
| 2019m11 | 0.06 | 0.03 | 0.12 | 2.1 |
| 2019m12 | 0.07 | 0.03 | 0.11 | 2.3 |
| 2020m1 | 0.07 | 0.04 | 0.11 | 2.5 |


|  | Price Increases | Price Decreases | Price Changes | CPI inflation |
| :---: | :---: | :---: | :---: | :---: |
| 2020m2 | 0.07 | 0.04 | 0.13 | 2.3 |
| 2020m3 | 0.08 | 0.05 | 0.13 | 1.5 |
| 2020m4 | 0.08 | 0.05 | 0.17 | 0.3 |
| 2020m5 | 0.09 | 0.05 | 0.13 | 0.1 |
| 2020m6 | 0.07 | 0.04 | 0.11 | 0.6 |
| 2020m7 | 0.08 | 0.05 | 0.13 | 1 |
| 2020m8 | 0.08 | 0.05 | 0.14 | 1.3 |
| 2020m9 | 0.08 | 0.04 | 0.13 | 1.4 |
| 2020m10 | 0.08 | 0.04 | 0.12 | 1.2 |
| 2020m11 | 0.08 | 0.06 | 0.12 | 1.2 |
| 2020m12 | 0.08 | 0.04 | 0.13 | 1.4 |
| 2021m1 | 0.08 | 0.04 | 0.13 | 1.4 |
| 2021m2 | 0.09 | 0.04 | 0.12 | 1.7 |
| 2021m3 | 0.08 | 0.03 | 0.16 | 2.6 |
| 2021m4 | 0.08 | 0.04 | 0.12 | 4.2 |
| 2021m5 | 0.08 | 0.02 | 0.13 | 5 |
| 2021m6 | 0.10 | 0.04 | 0.15 | 5.4 |
| 2021 m 7 | 0.11 | 0.04 | 0.15 | 5.4 |
| 2021m8 | 0.11 | 0.04 | 0.15 | 5.3 |
| 2021m9 | 0.11 | 0.04 | 0.17 | 5.4 |
| 2021m10 | 0.12 | 0.04 | 0.18 | 6.2 |
| 2021m11 | 0.13 | 0.04 | 0.18 | 6.8 |
| 2021m12 | 0.12 | 0.04 | 0.19 | 7 |
| 2022m1 | 0.13 | 0.04 | 0.20 | 7.5 |
| 2022m2 | 0.13 | 0.05 | 0.19 | 7.9 |
| 2022m3 | 0.14 | 0.04 | 0.23 | 8.5 |
| 2022m4 | 0.11 | 0.04 | 0.19 | 8.3 |
| 2022m5 | 0.14 | 0.05 | 0.20 | 8.6 |
| 2022m6 | 0.14 | 0.05 | 0.20 | 9.1 |
| 2022m7 | 0.14 | 0.06 | 0.21 | 8.5 |
| 2022m8 | 0.12 | 0.04 | 0.19 | 8.3 |
| 2022m9 | 0.12 | 0.06 | 0.19 | 8.2 |

Note. CPI is consumer price index.
Source: Montag and Villar Vallenas (2023)

Last Update: March 31, 2023

