

Global macro matters

Here today, gone tomorrow: The impact of economic surprises on asset returns

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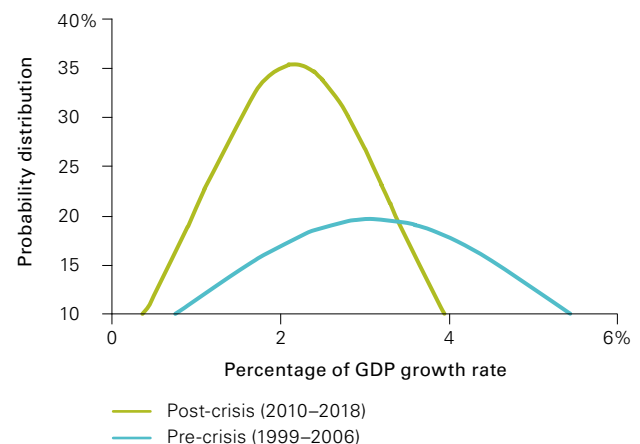
Since the end of the global financial crisis, economic forecasts have clustered in a much narrower range than their pre-crisis dispersion, as shown in **Figure 1**. Structural forces such as demographic change have put downward pressure on growth, while extraordinarily accommodative monetary policy has provided a cushion. The U.S. economy's performance has been consistent with these constrained expectations, producing few surprises.

That may be changing. The U.S. Federal Reserve has continued to normalize monetary policy and withdraw excess liquidity, and fiscal policy is helping fuel a cyclical bounce above the structural limits. Record-low unemployment and rising short-term interest rates are the most visible signs that the post-crisis economic environment is in flux. And as common sense—and historical analysis—suggests, a narrow range of expectations is associated with a higher degree of surprise.¹

Economic surprises reverberate through the financial markets, producing short-term volatility in asset prices. The impact of economic surprises on returns varies by asset class. It also depends on the phase of the business cycle in which the surprise occurs. Although there is some correlation between economic surprises and asset returns in the short term, we find that in the long term, these surprises hardly matter. We use these relationships between economic surprises and asset returns to explore various implications for portfolio strategy.

¹ We regress GDP growth surprises (3-month moving average) on forecast dispersion in four macroeconomic variables: GDP, unemployment rate, Consumer Price Index, and T-bills (3-month moving average). We find an association between forecast dispersion and economic surprise. A roughly 19-basis-point decline in forecast dispersion is associated with a 1-unit increase in our index of economic surprise. This relationship indicates that a higher degree of surprise usually occurs in an environment of low forecast dispersion.

Figure 1. The new narrow: Forecast dispersion since the global financial crisis



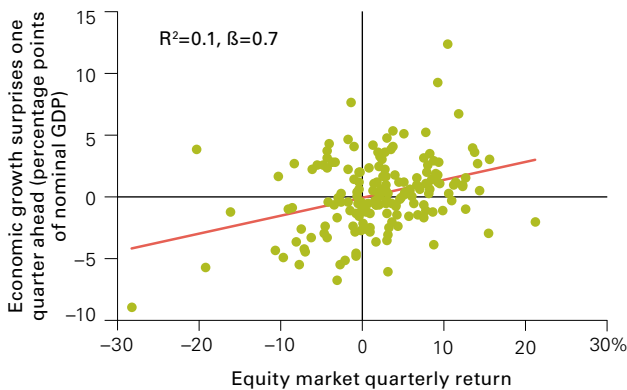
Notes: The GDP consensus data is for preliminary release of GDP. The x-axis represents the range of consensus GDP growth rate expectations, and the y-axis represents the probability associated with that rate. The graph displays the distribution of consensus GDP growth rates over two time periods, showing that the range of GDP consensus post-crisis is much narrower than it was pre-crisis.

Sources: Vanguard calculations, based on data from Thomson Reuters.

More surprise, more volatility

Economic surprises have a weak but positive correlation with market returns, as shown in **Figure 2**. Since the 1970s, a 100-basis-point surprise in quarterly GDP growth has been associated with about a 70-basis-point change in quarterly U.S. equity returns.

Figure 2. Economic surprises and equity returns



Notes: Economic growth surprises are defined as the difference between actual GDP and one-quarter-ahead GDP estimates by the U.S. Federal Reserve Bank of Philadelphia’s Survey of Professional Forecasters. Equity market returns are represented by the quarterly returns of the Dow Jones U.S. Total Stock Market Index, from 1971 through the third quarter of 2018.

Sources: Vanguard, based on data from the U.S. Federal Reserve Bank of Philadelphia, the U.S. Bureau of Economic Analysis (BEA), and Moody’s Data Buffet.

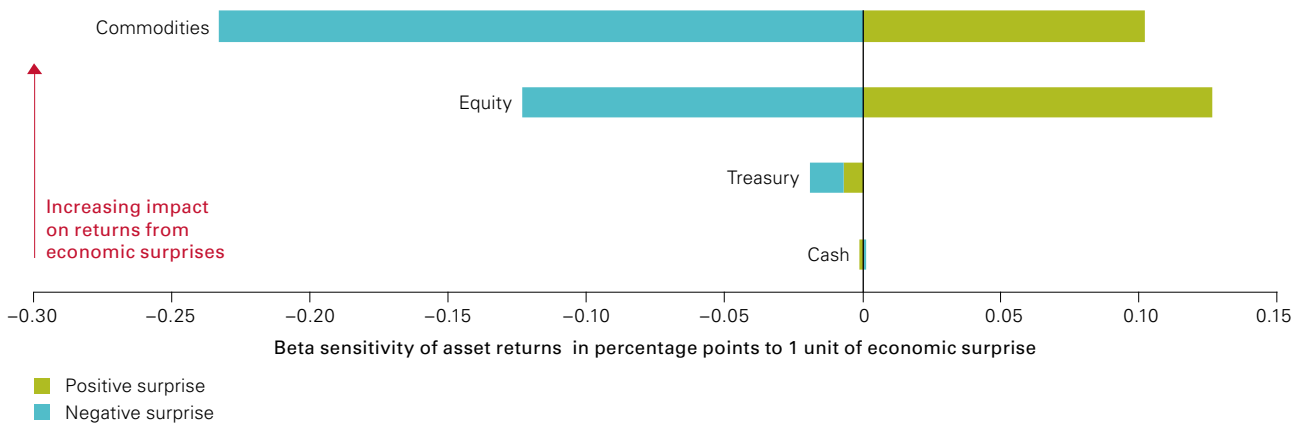
Economic surprises can be broadly classified as positive or negative. An economic surprise is positive when the actual data exceed expectations. When the data fall short of expectations, the surprise is negative.

To understand how assets respond to economic surprises, we regress returns of four broad asset classes on an “economic surprise index.”² U.S. equities and commodities represent high-risk asset classes. U.S. Treasury bonds and cash (USD) serve as proxies for low-risk assets. Our economic surprise index is a measure of surprise in four macroeconomic variables—GDP, the Institute for Supply Management (ISM) Manufacturing Index, retail sales, and employment measures.

Different asset classes react to economic surprises, both positive and negative, to different degrees (see **Figure 3**). The safe-haven assets—cash and Treasury bonds—are relatively insensitive to economic surprises. The returns of equities and commodities, by contrast, are keenly sensitive.

The intuition is straightforward. The return of a government-guaranteed, fixed income instrument such as a Treasury bond or bill is relatively easy to predict. The returns of stocks and commodities are more uncertain. An equity’s return depends on its future profitability, which depends in part on the economic environment. Commodity returns depend on supply-and-demand dynamics dictated by future economic conditions. An economic surprise results in an immediate reassessment of the conditions that will

Figure 3. How high- and low-risk assets respond to economic surprises



Notes: The figure displays the results of regressing asset return for each category on the economic surprise index. The index is an equal-weighted index of surprises in the following macroeconomic data series: GDP final release, GDP preliminary release, ISM Manufacturing Index, retail sales, and nonfarm employment. The bars represent the change in asset returns in response to a 1-unit change in the economic surprise index.

Sources: Vanguard calculations, based on data from the U.S. Bureau of Labour Statistics, the BEA, and the ISM.

² In constructing the economic surprise index, we limit ourselves to hard macroeconomic data variables that are widely followed by market participants. The variables are: GDP (both preliminary release and final release), retail sales, ISM Manufacturing Index, and month-on-month change in nonfarm employment. We explicitly exclude variables such as inflation, because surprises in this variable can suggest different interpretations, depending on the larger macroeconomic environment (i.e. an increase in inflation is favourable in a low-inflation environment and unfavourable in a high-inflation environment). We use equally weighted z-scores of surprises for the variables to calculate the economic surprise index on a monthly basis.

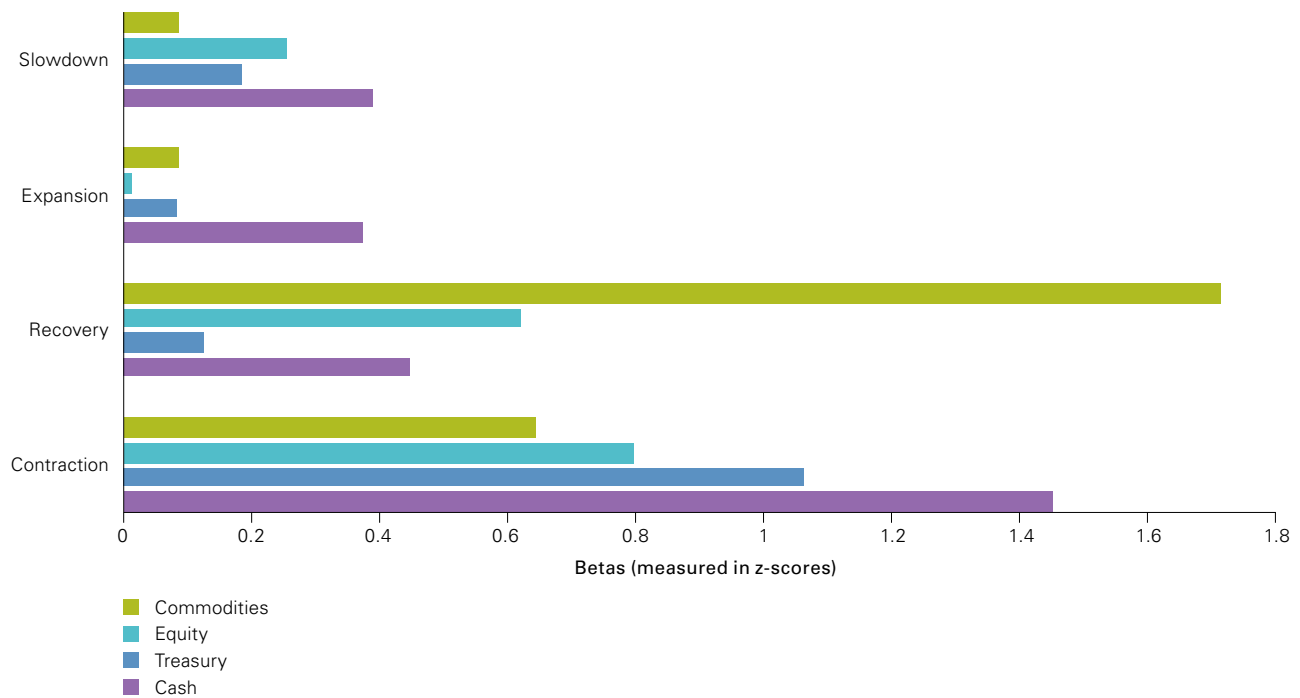
determine the value of these assets. The nuances in asset performance go deeper. An economic surprise during a contraction in the business cycle has a different impact than a surprise during a recovery.

When our regression controls for the business cycle, we see that both safe-haven assets and risky assets react more to economic surprises in the recovery and contraction phases (see **Figure 4**). We measure the asset's response to economic surprises in terms of the number of standard deviations (z-scores) from its mean response in all economic cycles. In periods of contraction, cash posts the most significant response to economic

surprises relative to its response in all environments. In absolute terms, however, cash returns are modest. In periods of recovery, commodities respond most strongly.

Although these results are statistically insignificant, they are suggestive of investor behaviour during periods of pronounced change in the economic outlook (Ben-Rephael et al., 2018). In periods of contraction and recovery, when the outlook is changing, investors are more sensitive to economic surprise, and there are wider asset price fluctuations. But when the outlook is more stable, investor reaction to economic surprise is muted.

Figure 4. Assets' response in different phases of the business cycle



Notes: The figure displays the results of regressing asset returns, converted to z-scores, for each category on the economic surprise index, while controlling for business cycles with the help of dummy variables. The bars represent the change in asset returns, as measured in z-scores, in response to a 1-unit change in the economic surprise index.

Sources: Vanguard calculations, based on data from the BLS, the BEA, and the ISM.

Can investors capitalize on surprise?

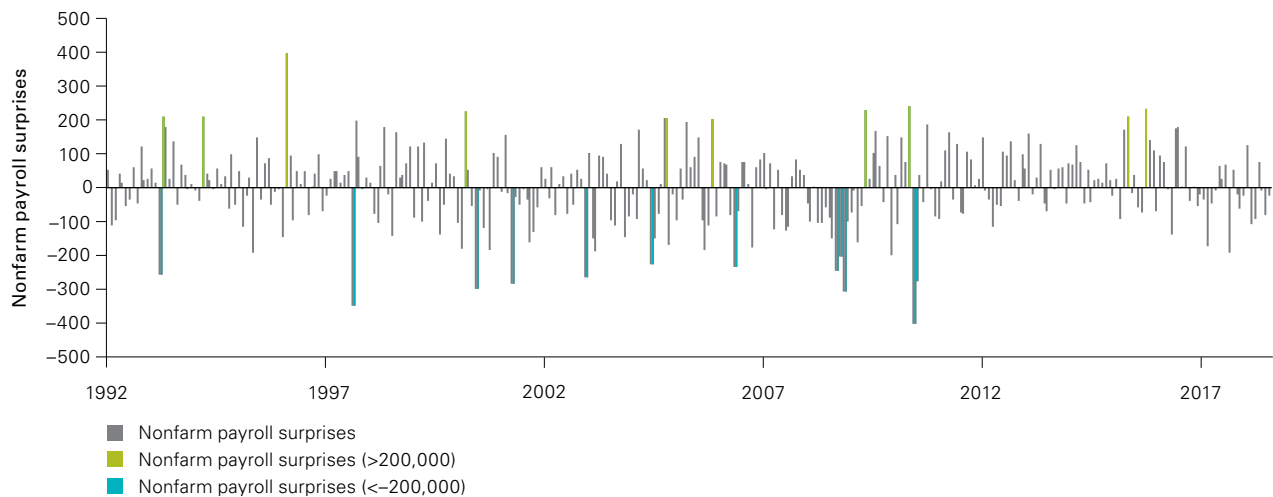
Economic surprises are just that—surprises. In **Figure 5**, we illustrate this through nonfarm employment surprises, obtained by regressing nonfarm payroll changes on the Vanguard Leading Economic Indicators (VLEI) series, a business cycle measure similar to those published by The Conference Board and the Economic Cycle Research Institute. There is no particular trend to the positive or negative surprises.

Of course, the belief that motivates tactical asset allocation strategies—indeed, any active strategy—is that a surprise to the consensus can be foreseen by a prescient analyst. How prescient would an investor need to be to capitalize on economic surprises?

We answer this question with a simple simulation based on economic data over the past 25 years:

- We start with a \$1,000 investment in a base portfolio of 60% U.S. equities and 40% U.S. bonds.³
- In advance of a positive economic surprise, we allocate 80% of the portfolio to equities and 20% to bonds.
- In advance of a negative economic surprise, we allocate 40% of the portfolio to equities and 60% to bonds.

Figure 5. No rhyme or reason: Economic surprises are random



Notes: Nonfarm payroll surprises are defined as the residuals from vector autoregression of actual nonfarm payroll changes on VLEI. Extreme negative surprises (blue bars) are defined as moves in the nonfarm payroll of less than -200,000, and extreme positive surprises (green bars) are defined as upward movement of nonfarm payrolls by more than 200,000.

Sources: Vanguard, based on data from the BEA.

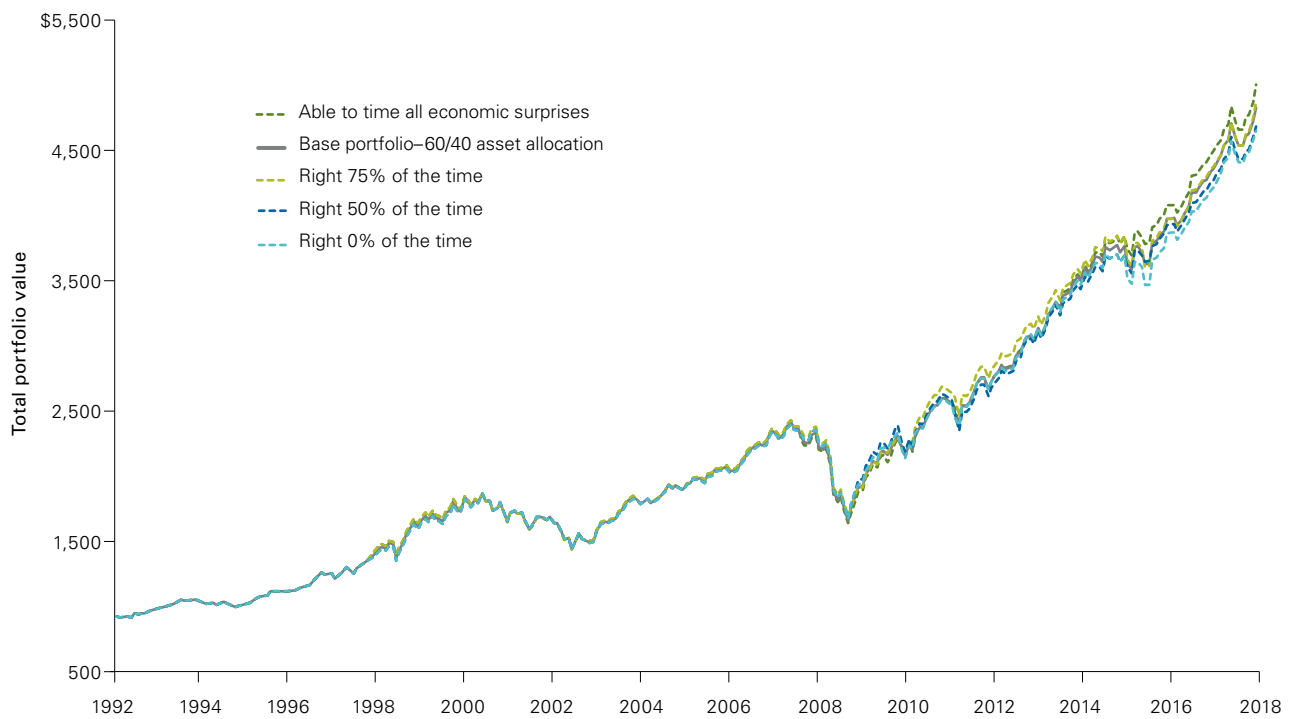
³ The index used to proxy equity returns is the MSCI USA Index; the index used to proxy bond returns is the Bloomberg Barclays U.S. Aggregate Bond Index. We use monthly return data to calculate different scenarios.

Figure 6 displays the results. Not surprisingly, the portfolio of the omniscient investor (able to time all economic surprises) generates slightly better returns, outperforming the base portfolio (60/40 asset allocation) by 0.2 percentage points per year over the 25-year period. Absent omniscience, however, the results quickly deteriorate. An investor would need to successfully trade on 75% of economic surprises to earn returns similar to those of the base portfolio, 7.4% per year. If the investor had been no more prescient than a coin flipper, accurately trading on 50% of the economic surprises, the portfolio's returns would have fallen to 7.3% per year. And if the investor had gotten everything wrong? The initial investment of \$1,000 would have received 7.2% year-on-year returns, about 0.2 percentage points below the base portfolio. However, these returns do not include

transaction costs incurred in rebalancing portfolios to take advantage of the economic surprises. Needless to say, those costs would further reduce these returns.

How achievable is a 75% success rate, the threshold for a successful timing strategy? Not very. The parallel is inexact, but estimates of security selection skill among equity fund managers (Sorensen, Miller, and Samak, 1998) suggest that a success rate of 54% equates to annualized excess returns of 2.61%–5.59%. In the 25 years ended 2017, only 6% of the equity funds in Morningstar's database produced annualized excess returns in that range. In competitive investment markets, a success rate of 75% is unlikely.

Figure 6. Bad odds on timing surprises



Note: The scenarios are based on the MSCI USA Index and the Bloomberg Barclays U.S. Aggregate Bond Index.

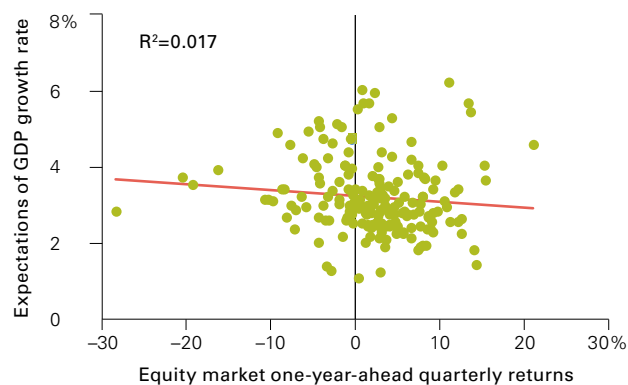
Sources: Vanguard calculations, based on data from the BEA, the BLS, Bloomberg, and Thomson Reuters.

In the long run, surprises don't matter

The odds of capitalizing on a short-term economic surprise are long. But what about long-term portfolio strategies? Do short-term surprises hint at long-term risk-reward dynamics that can inform strategic asset allocation decisions? In a word: no. Surprises don't matter for long-term returns.

The accumulation of short-term surprises can change the longer-term outlook, raising or reducing an economy's growth prospects and, potentially, expected asset returns. But in the global financial markets' near-instantaneous arbitrage mechanism, the same surprises that are difficult to profit from in the short term are immediately priced into long-term expectations (Davis et. al., 2010). As **Figure 7** demonstrates, expectations do not forecast stock market returns. The same surprises that have a visible impact on short-term market returns are irrelevant in the long term.

Figure 7. Today's surprise makes no difference tomorrow: Economic expectations are priced in and do not matter in the long term



Notes: *Expectations of GDP growth rate* is the one-year-ahead GDP estimate by the U.S. Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters. Equity market returns are represented by the quarterly returns of the Dow Jones U.S. Total Stock Market Index, from 1971 through the third quarter of 2018.

Sources: Vanguard calculations, based on data from the BLS, the BEA, and Thomson Reuters.

Conclusion

Since the end of the global financial crisis, economic performance has been consistent with investors' narrow expectations. As the post-crisis economic environment evolves, these expectations may be vulnerable to surprise.

Our analysis of the relationship between economic surprises and asset returns yields two insights: First, the odds of successfully trading on surprises are low. Second, what can seem consequential in the short run is irrelevant to the long-term investor. Short-term surprises are quickly priced into long-term expectations, and these long-term projections have almost no relationship to future returns.

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