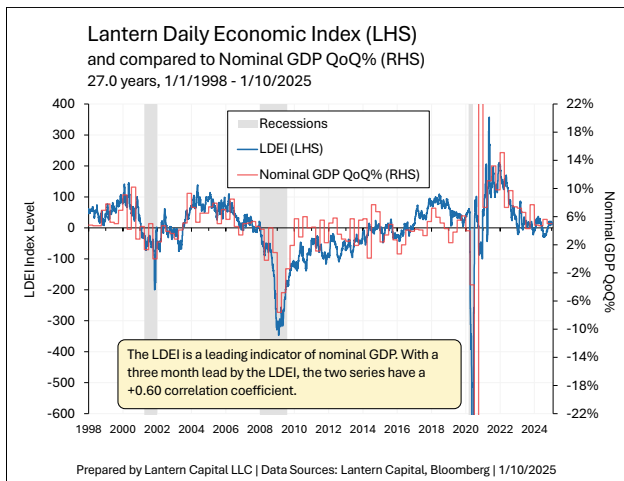


1/10/2025

## Lantern Daily Economic Index

A revolutionary new index measuring **the totality of the data** in real-time

- Provides the most meaningful and timely read on U.S. economic performance
- Correlates to U.S. Treasury yields and nominal GDP with a lead
- Measures growth of all economic data types



### 1. Summary

The Lantern Daily Economic Index (LDEI) measures real-time growth of all economic data segments: real, inflation, and sentiment/survey-based; reflecting “the totality of the data.”

Uniquely, economic data is applied to the index on the day it is released and combined with the rest of most-recently-released data. This is done to blend data with different frequencies and allow for the index’s daily calculation, but most importantly, present economic data when it is known and impacts markets.

This methodology allows the LDEI to measure *growth* in indicators *and* be real-time; something that hasn’t been done before. It allows the isolation of what was *known* about the economy between any two dates, such as how much the economy has improved since the last Fed meeting, or how well interest rates track economic data between two dates. These analyses aren’t possible with existing indices.

The Atlanta Fed’s [GDPnow](#) changes daily with new economic releases but uses a subset of data that directly influences *real* GDP; excluding inflation and “soft” survey/sentiment data. It isolates data into calendar quarters and isn’t a continuous index. The Citigroup Economic Surprise Index reflects all segments of economic data daily but is half-about what economists think the numbers will be. It isn’t a direct measure of economic performance (more in section 2 that follows.) And, the Chicago Fed National Activity Index ([CFNAI](#)), of which this index shares its general methodology and framework, is only calculated monthly and doesn’t include inflation data or much survey/sentiment data. 58% of the indicators in this index are not in the CFNAI. These indices leave an ambiguity about the economy which the LDEI clarifies.

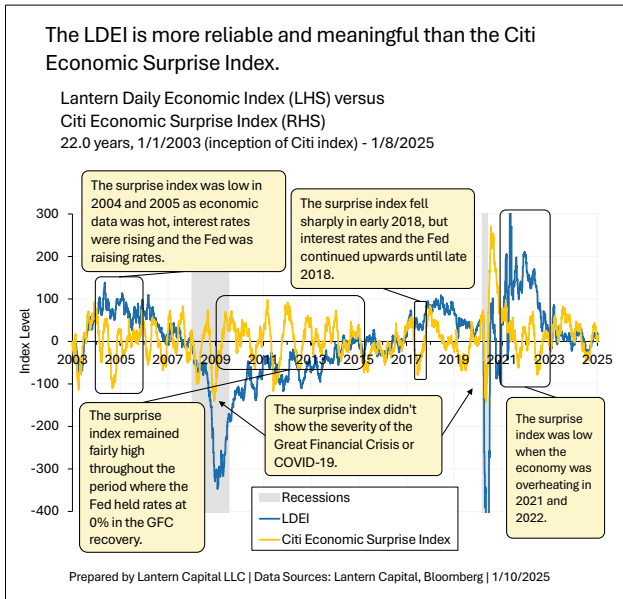
The LDEI is a weighted average of 45 widely-followed economic indicators that fall into seven categories of labor, industry, consumer spending and confidence, inflation, housing, income, and overall (GDP). The index is constructed to have an average of 0 and a standard deviation of 100. Individual economic data series are transformed and normalized into comparable time-series before being averaged with subjective fixed weights according to their perceived impact on markets and the economy. Included indicators are released with weekly, monthly, and quarterly frequencies. The index has been back-tested 27 years to 1998, covering three recessions including their approach and recovery. Indicators have been chosen for their renown, visibility, and duration.

The LDEI was originally created to provide a fundamental basis to movements in U.S. Treasury yields, but it also serves as the most up-to-date and meaningful summary of U.S economic performance for use by journalists, economists, policymakers, business-leaders, financial professionals, and observers.

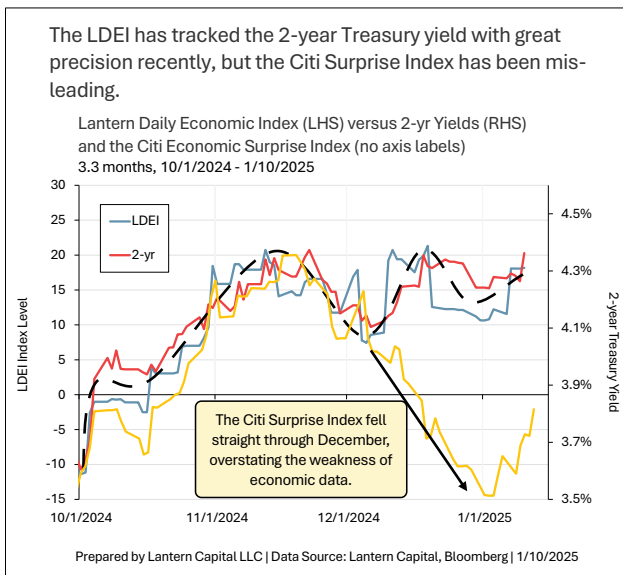
### 2. The LDEI is more reliable and meaningful than the Citi Economic Surprise Index

Currently, the Citi Economic Surprise Index is the “go-to” tool for a real-time read of the economy, but it reflects a tangential quantity to growth. The Citi index measures the difference between the average of where economists expect an economic number to be versus where the number is released. This often describes the magnitude of knee-jerk reactions in the

Treasury market, but it doesn't have a clear economic meaning beyond that. And, because economists' expectations variably shift up or down with the economic climate, the Citi index often doesn't show any greater magnitudes during recessionary or overheating economies. It also sometimes reports large magnitudes when economic data isn't moving much. The charts below highlight some of the discrepancies between the LDEI and Citi Economic Surprise Index.



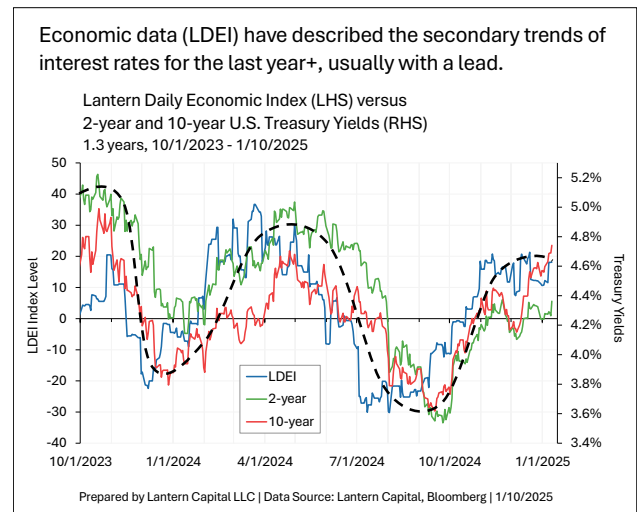
Recently, the LDEI has described 2-year yields with great precision while the Citi Economic Surprise Index has overstated economic data weakness making it unusable to compare with interest rates.



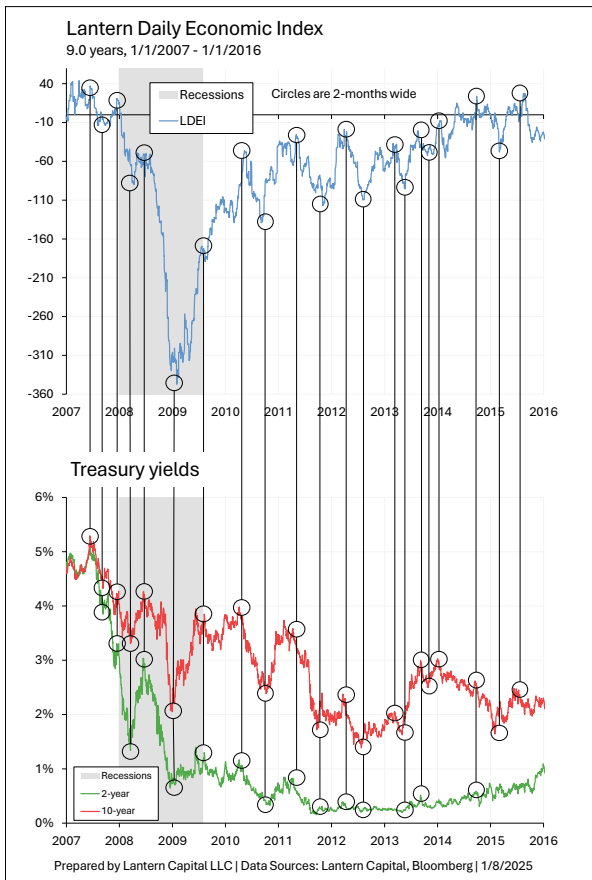
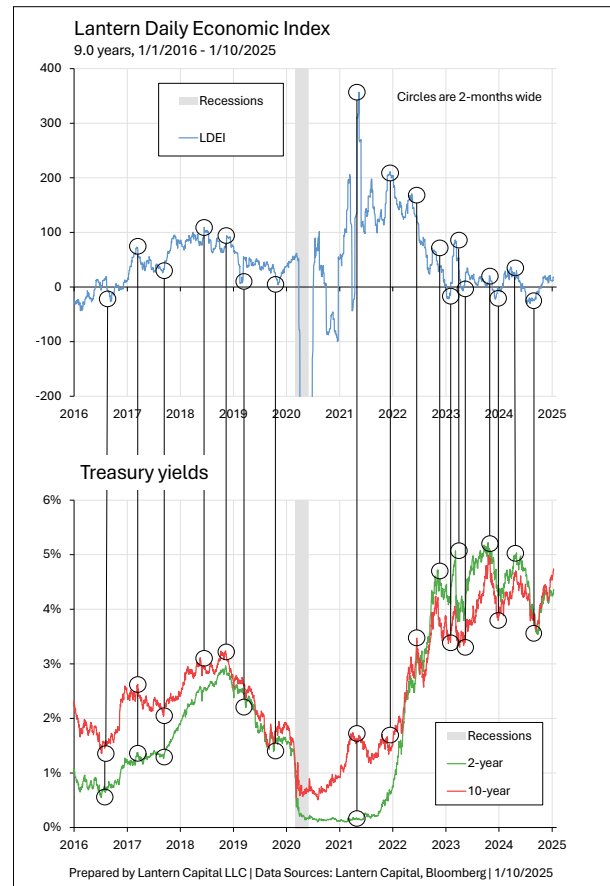
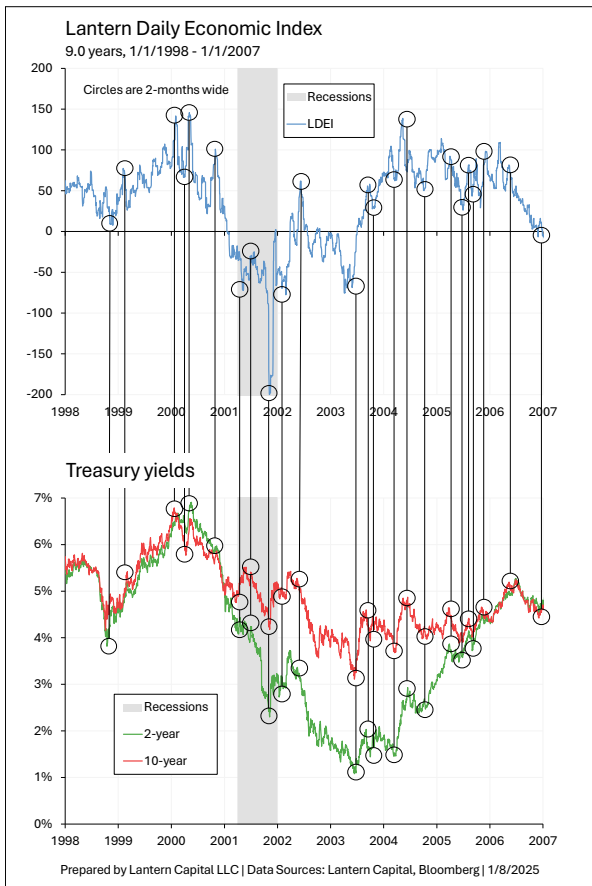
### 3. The LDEI provides a strong basis for movements in U.S. Treasury yields

Treasury yields are more influenced by their fundamentals, economic data, than is appreciated. This index's primary purpose is to serve as a tool to monitor yields versus economic data to justify their movement, point to other factors influencing them, and identify where imbalances are built-up. The index broadly shows that primary and secondary trends in interest rates are often defined by primary and secondary trends in economic data.

Movements in Treasury yields have been heavily influenced by economic data over the last year (following chart). The recent pattern has been that the index (economic data) will reach an inflection point, which slowly changes the Fed's narrative which then affects Treasury yields. This leading quality makes the LDEI a helpful forecasting tool.



A similar, but varying correlation extends across the 27-year history of the index. In the following three sets of charts, circles have been placed over major turning points in the LDEI. Lines are drawn down to where that point meets Treasury yields. Not every peak or trough in data matches a peak or trough in interest rates, but a lot do.



**Analysis:** Comparing the dates of index peaks and troughs to interest rate peaks and troughs shows that for the entire history, the index lags 2-year or 10-year yield peaks and troughs by 4 business days on average. However, in the last five years, this ordering has switched, such that the index leads peaks or troughs in the 2-year by 8 business days or 2 business days ahead of the 10-year on average.

#### 4. Long-term Correlations

Of the Treasury yield curve, the LDEI is correlated best to the 2-year (see following table.) Correlations improve to Treasury yields with the LDEI leading by 3-months. The LDEI is well correlated to real and nominal GDP; with an improvement by leading it. The Citi Economic Surprise Index doesn't have a correlation to Treasury yields. It is meaningfully correlated to GDP with a 3-month lead, but not correlated concurrently.

## Correlation coefficients between LDEI and Citi Surprise Index to Treasury yield curve and GDP

Name	LDEI		Citi Surprise Index	
	Concurrent	3-mo. Lead by LDEI	Concurrent	3-mo. Lead by Citi
Fed Funds Target (mid-point)	0.29	0.35	0.00	0.01
3-month Bill Yield	0.32	0.37	0.02	0.01
12-month Bill Yield	0.34	0.39	-0.02	-0.02
2-year Yield	0.35	0.39	0.01	-0.02
5-year Yield	0.31	0.33	-0.02	-0.04
10-year Yield	0.21	0.21	-0.06	-0.06
30-year Yield	0.11	0.09	-0.08	-0.08
Real GDP	0.24	0.50	-0.05	0.41
Nominal GDP	0.32	0.60	-0.06	0.41

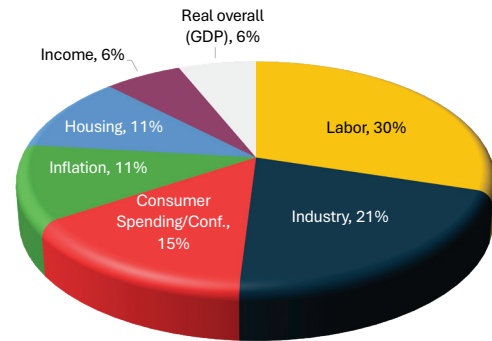
LDEI correlation measured from 1/1/1998 through 01/10/2025  
 Citi Surprise Index correlation measured from 1/1/2003 (inception) through 1/10/2025

Prepared by Lantern Capital LLC | Data Sources: Bloomberg, Lantern Capital | 1/10/2025

### 5. Composition

The LDEI is divided into seven categories as shown in the chart below. Labor is the biggest category as it is one of the two mandates of the Fed (full employment). Most economic activity passes through an industry and is the second-biggest category. The health of the labor market has a big influence on consumer spending and confidence, the third-biggest category. Consumer spending (Personal Consumption Expenditures) is 68% of expenditure-based GDP. Inflation is the fourth-biggest category and the second of the Fed's two mandates (stable prices). Housing comes in next as it is a large contributor to GDP (estimated to be [15-18% of GDP](#).) Income and wages are the sixth-largest contributor. Personal Income is 86% of the mirror-image equivalent of expenditure-based GDP, GDI (Gross Domestic Income), but does not typically lead economic activity. The overall category, real GDP, is mostly picked up in the categories above, but still often surprises the market when it comes out and changes thinking.

### Weights of Categories in the Lantern Daily Economic Index



Industry is split between 48% service-sector indicators and 52% manufacturing-sector indicators. An effort has been made to boost the impact of service-sector indicators to better represent the service-sector heavy U.S. economy compared with relatively-few indicators representing it.

Other relevant composition percentages are 74% hard-data versus 27% soft-data and 71% government data versus 29% non-governmental data.

There are sub-indices for each category as well as ones representing hard-data, soft-data, everything but inflation, and an equal-weighted core-12 index of the biggest (by weight) 12 indicators in the index.

### 6. Construction

The index is constructed using the broad methodology of the [Chicago Fed National Activity Index](#). Indicators are transformed for stabilization, normalized to be comparable, subjectively weighted (fixed-weights), and averaged together. The weighted average is then normalized to have an average of 0 and standard deviation of 100.

A detailed explanation of the LDEI's construction and methodology, a list of indicators, their weights and transforms is contained in technical documentation for the index, available through a non-disclosure agreement.

### 7. Development

The LDEI went through three versions in its development in 2024. An explanation helps describe how indicator continuity and revisions are handled.

First version, April 2024: To represent what economic data was at its first release (i.e., not subsequently revised), the first version of the index used "first release" data where available, which are usually stored in first derivative form of month-over-month percentage change to one decimal point. This version

was abandoned because it limited what transform was used to stabilize data (e.g., percentage change vs.  $\Delta \ln$ ) and had low decimal accuracy. It was also non-continuous, meaning that if an indicator was subsequently revised as most indicators are, that revision was lost.

Second version, August 2024 (used version): The second version of the index uses “as-revised” data throughout; measuring from the original nominal economic indicator; for instance, the dollar amount of retail sales less autos. Periodic index re-bases are handled seamlessly (for example: Industrial Production, real GDP), the data is readily available, and revisions to past data are reflected as revisions to the index.

Third version, October 2024: The third version of the index reflected original release data as well as any revisions presented at that time. This allowed the indicators to be continuous while using “first release” data. It was abandoned because revisions (particularly benchmark revisions like recent NIPA revisions for five years) would often cause a tremendous bump for one month followed by a reversal in the subsequent month. It was also cumbersome and error-prone, including a complex procedure to track when indices are re-based.

Comparisons between the index using originally released data (versions 1 and 3) and revised data (version 2) showed that peaks and troughs occurred at mostly the same time. Ultimately, capturing first release data was not considered crucial to the effectiveness of the index. The second version was chosen as the production version of the LDEI.

## **8. Availability**

Historical data, sub-indices, real-time updates, and attribution reports are limited to clients, strategic relationships, and members of the media. Wider distribution is being explored. Look for weekly updates [lanterncapital.com/ldei](https://lanterncapital.com/ldei) and many analyses using the index on [lanterncapital.com](https://lanterncapital.com).

## **9. Contact**

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Formed in 2021 and located in Denver, Colorado, [Lantern Capital](https://lanterncapital.com) manages portfolios and provides consulting advice on U.S. Treasuries and interest rate futures using a long-term historical, business-cycle, and economic-data centric approach.