

Truflation BEA PCE Price Index (TruPCE)

Methodology

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1. Executive Summary

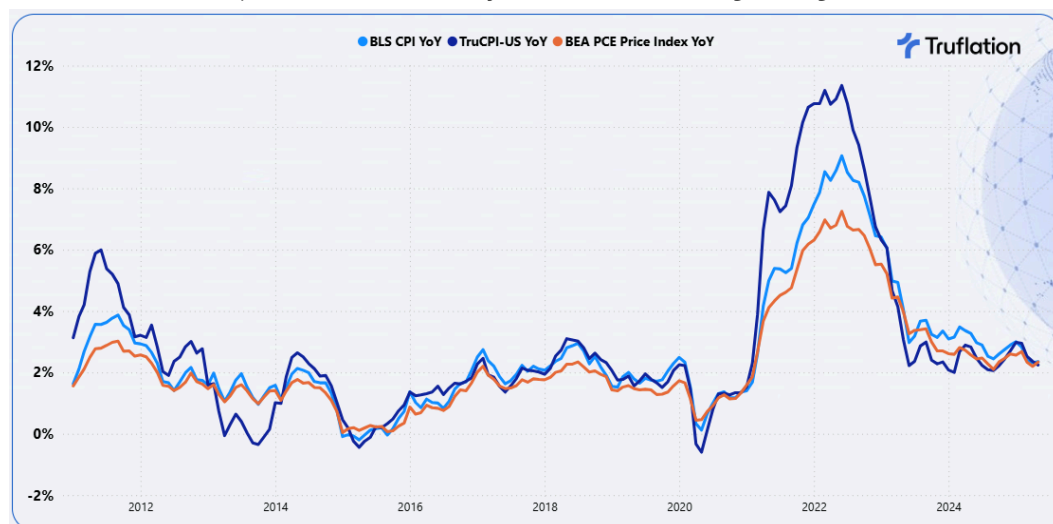
In economic analysis, understanding the ebb and flow of an economy's health is of paramount importance. Economic indicators serve as critical guideposts, enabling policymakers, business leaders, and retail investors to navigate an increasingly complex financial landscape.

These indicators provide insight into current economic conditions, help anticipate future trends, and inform decisions with far reaching implications. Among them, measures of inflation are particularly significant due to their direct influence on purchasing power, monetary policy, and overall economic stability.

Within the landscape of inflation measurement, three prominent indicators stand out: the Bureau of Economic Analysis (BEA) Personal Consumption Expenditures Price Index (PCE PI), the Bureau of Labor Statistics Consumer Price Index (BLS CPI), and Truflation's alternative real-time U.S. inflation index. Each offers a distinct lens through which to assess the evolving dynamics of price changes across the economy.

Because these indices are constructed using different methodologies, they exhibit varying behavior over time. Exhibit 1 presents the year-over-year monthly growth rates of all three indices from January 2011 through May 2025. While the magnitude and direction of these measures differ, the Truflation U.S. CPI Inflation Index, on average, responds approximately 41 days ahead of the BLS CPI and 61 days ahead of the BEA PCE, reflecting its real time methodology.

Exhibit 1 – CPI-Urban, PCE Price Index & Truflation Index: Percentage change at annual rates



Source: Bureau of Economic Analysis, Bureau of Labor Statistics & Truflation

Following the launch of the Truflation BLS CPI Index, there has been growing interest in the development of a Truflation BEA PCE Index, reflecting the Federal Reserve's reliance on the Personal Consumption Expenditures (PCE) Price Index as its primary measure of inflation for monetary policy decisions. This index provides Truflation users with a leading indicator of the BEA PCE PI release, offering earlier insight into upcoming inflation prints.

2. The Bureau of Economic Analysis PCE Price Index

Consumer spending is a critical driver of the U.S. economy and a key component of gross domestic product (GDP). The Personal Consumption Expenditures (PCE) framework provides valuable insight into consumer purchasing behavior and savings patterns. The Bureau of Economic Analysis (BEA) uses consumer spending data to construct its primary inflation gauge, underscoring the index's central role in economic analysis.

The PCE Price Index is compiled monthly and measures changes in the prices consumers pay for goods and services. As a broad gauge of inflation in the U.S. economy, it reflects whether prices are rising or falling and how consumer spending behavior evolves in response to those changes.

The PCE Price Index provides:

- Headline PCE Price Index, which includes all categories
- Core PCE Price Index, which excludes food and energy prices
- Services PCE Price Index, which excludes food and energy prices
- Goods PCE Price Index, which excludes food and energy prices

The core PCE Price Index is often used to identify underlying inflation trends, as food and energy prices tend to be more volatile and can obscure longer-term price movements.

The BEA calculates the PCE Price Index using current-dollar PCE values and reports the total each month. Consumer spending within the PCE framework is divided into goods and services, with further subcategories:

- *Durable Goods*: Motor vehicles and parts, furnishings and durable household equipment, recreational goods and vehicles, and other durable goods

- *Nondurable Goods*: Food and beverages purchased for off-premises consumption, clothing and footwear, gasoline and other energy goods, and other nondurable goods
- *Services*: Housing and utilities, healthcare, transportation services, recreation services, food services and accommodations, financial services and insurance, and other services

According to the BEA, the majority of PCE—valued at market prices including sales taxes—comes from household purchases of new goods and services from private businesses. The PCE also includes household purchases of goods and services from government entities.

In addition, PCE captures spending by nonprofit institutions serving households, household purchases of used goods, and purchases of goods and services by U.S. residents while traveling abroad.

A distinguishing feature of the PCE is its inclusion of expenditures made on behalf of households by third parties. These include employer-sponsored health insurance, medical care financed through government programs, life insurance expenses, and pension plan contributions.

PCE Price Index Methodology

The PCE Price Index draws on multiple data sources, including the U.S. Census Bureau's Monthly Retail Trade Report and the Service Annual Survey. It also incorporates data from the Bureau of Labor Statistics, particularly the Consumer Expenditure Survey, to estimate housing-related price changes.

Methodologically, the PCE Price Index is a chained index, meaning it uses a formula that compares prices across successive periods while frequently updating expenditure weights. This chaining process allows the index to better capture shifts in consumer behavior, including short-term substitution effects in response to price changes.

The index is primarily weighted using data from business surveys, which are generally considered more reliable than consumer surveys. This approach further enhances the PCE Price Index's ability to reflect real-world spending patterns.

It is important to distinguish between Personal Consumption Expenditures and the PCE Price Index. PCE measures the total value of consumer spending on goods and services, while the PCE Price Index measures changes in the prices of those goods and services over time. The PCE Price Index therefore serves as the indicator of inflation or deflation between periods.

The PCE Price Index is the Federal Reserve's preferred measure of inflation for monetary policy decisions. The Federal Reserve favors the PCE Price Index because it:

- Better captures changes in consumer spending behavior, including substitution between goods
- Covers a broader range of consumer expenditures
- Allows for historical data revisions as more comprehensive information becomes available

3. Truflation Assessment and Critique of the BEA PCE Price Index

The primary objective of both metrics is to track changes in the prices of goods and services over time, thereby providing insight into consumers' purchasing power and overall economic health. These measures play a critical role in informing economic policy decisions and guiding business strategy.

The Personal Consumption Expenditures (PCE) framework estimates aggregate spending across a broad range of goods and services intended to represent typical consumption patterns. Given that consumer spending accounts for approximately two-thirds of U.S. gross domestic product, as reported by the Bureau of Economic Analysis (BEA), the PCE serves as a key indicator of overall economic conditions.

Despite its recognized strengths, the PCE Price Index is subject to several notable limitations:

- *Overly Broad Coverage:* Due to its expansive scope, the PCE Price Index may reflect spending beyond what households directly purchase. The index includes household purchases from government entities, expenditures by nonprofit institutions providing services to households, purchases of used goods, and spending by U.S. residents abroad. It also captures expenditures made on behalf of households by third parties, such as employer-sponsored health insurance, government-funded medical care, life insurance expenses, and pension contributions. Collectively, these inclusions can introduce distortions into measured price movements.
- *Publication Lag:* The PCE Price Index is released monthly and reflects inflation trends from the prior period. As a result, it may not fully capture the most recent changes in economic conditions.
- *Data Revisions:* PCE data are subject to periodic revisions as more complete information becomes available. While revisions enhance

long-term accuracy, they can complicate real-time analysis for policymakers, investors, and economists who rely on stable data.

- *Reliance on BLS Housing Measures:* Housing data within the PCE Price Index are sourced from the Bureau of Labor Statistics, primarily through the owners' equivalent rent (OER) concept derived from the Consumer Expenditure Survey, as well as rental price data collected through the CPI Housing Survey covering approximately 40,000 rental units. In contrast, Truflation's BEA PCE Price Index incorporates actual home purchase prices by factoring in mortgage payments, offering a more direct and timely reflection of housing costs faced by consumers.

Exhibit 2 presents a comparison between the BEA PCE Price Index and the Truflation Index, highlighting key methodological differences and resulting variations in inflation measurement.

Exhibit 2 – Comparison between the BEA PCE Price Index vs Truflation Inflation Index

	Personal Consumption Expenditure Price Index	Truflation Index
Publication	Bureau of Economic Analysis	Truflation
Data Source	Census Bureau's Monthly Retail Trade Survey & the BLS Consumer Price Index; Housing Survey	Market price data from 30+ data sources
# of Data Points	Data not available	15+ million items
Publish Frequency	Monthly	Daily
Markets/Indexes	Headline, Core, Goods & Services, Categories & Subcategory	Headline, Core, Goods, Services, Categories & Subcategories
Weighting	Flexible	Flexible
Substitution	Yes; Chain-type	Not needed
Calculation	$\frac{(\text{PCE in the current period} - \text{PCE in the previous period})}{\text{PCE in the previous period}} \times 100\%$	$\frac{(\text{Truflation in the current date} - \text{Truflation in the previous date})}{\text{Truflation in the previous date}} \times 100\%$
Exclusions	Prices of homes sold for residential purposes	Household purchases of used goods, Purchases of goods and services by US residents in foreign countries and 3 rd party spending
Main Users	Federal Reserve, Economists, Analysts & Financial institutions.	Economists, Analysts, Financial institutions, Retail Investors, Web3 etc

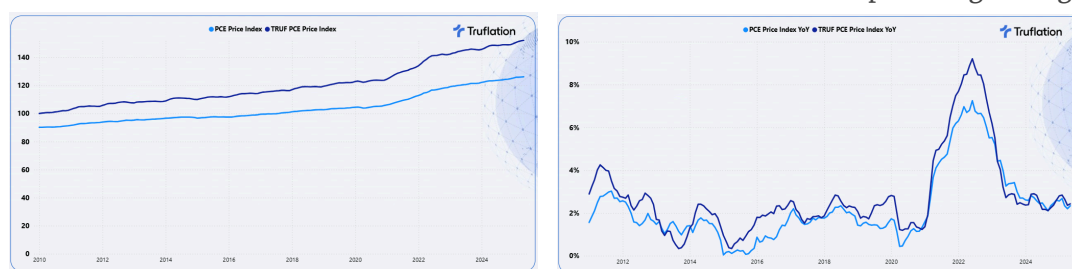
4. Truflation BEA PCE Price Index Framework

Truflation has emerged as an alternative data provider, offering a fresh perspective on inflation dynamics through the use of real-time price data. Drawing from more than 30 independent data sources, Truflation tracks over 15 million prices of goods and services across the United States. These data are validated, harmonized, and processed using open-source algorithms to deliver a transparent and accurate daily snapshot of changes in consumer prices. This approach enables individuals, investors, businesses, and institutions to make more informed decisions based on unbiased and verifiable information.

In response to growing demand for a PCE aligned inflation measure, Truflation has launched the Truflation BEA PCE Price Index. This index maps price data from Truflation's 30+ data partners directly to the PCE Price Index product hierarchy and applies the corresponding PCE expenditure weights to each category. By replicating the structure of the official PCE while leveraging real-time data. The index provides an average lead time of approximately 29 days relative to the BEA PCE Price Index.

As shown in Exhibit 3, which compares monthly index levels and year over year percentage changes for the TruPCE Price Index and the BEA PCE Price Index from January 2011 through December 2025, the two indices exhibit a high degree of consistency and strong alignment in both trend and magnitude

Exhibit 3 – TruPCE Price Index vs. BEA PCE Price Index: Index levels & YoY percentage changes



Source: Bureau of Economic Analysis & Truflation

Alignment of Data.

A linear regression analysis was conducted to examine the relationship between the TruPCE Price Index (independent variable) and the BEA PCE Price Index (dependent variable). The resulting correlation coefficient, measured on a scale from -1 to +1 to indicate the strength and direction of the relationship, was 0.951450, reflecting an exceptionally strong positive correlation between the two indices.

In addition, the regression produced an R-squared (R^2) value of 0.905258. The R^2 score, also known as the coefficient of determination, measures the proportion of variation in the dependent variable explained by the independent variable. In this case, the result indicates that approximately 90% of the variation in the BEA PCE Price Index is explained by movements in the TruPCE Price Index, demonstrating the model's strong explanatory power and the close alignment between the two measures.

Data Methodology & Calculations

The TruPCE Price Index is built on the underlying methodology and calculation framework of the TruCPI-US Index, incorporating rigorous guardrails to ensure that index movements reflect genuine underlying price changes rather than structural or methodological distortions. For a detailed explanation of the data collection process, quality controls, category weightings, and the overall methodological framework, please refer to the TruCPI-US Index Methodology.

To achieve the results observed in the regression analysis, Truflation first aligns all TruCPI-US data from its 30+ data partners to the official product categorization of the BEA PCE Price Index. This process involves mapping each dataset to the PCE defined product hierarchy, as shown in Exhibit 4, and applying the corresponding BEA PCE expenditure weights to the Truflation data.

Exhibit 4 – PCE Price Index Product Hierarchy

Personal Consumption Expenditure (PCE) Price Index		Weights
Total		
	Goods	32.88%
	Durable Goods	8.65%
	Motor vehicle and parts	2.96%
	Furnishings and durable household equipment	2.19%
	Recreational goods and vehicles	2.89%
	Other durable goods	0.61%
	Non Durable Goods	24.23%
	Food and beverages purchased for off premise consumption	9.01%
	Clothing and footwear	3.02%
	Gasoline and other energy goods	1.98%
	Other nondurable goods	10.21%
	Services	67.12%
	Household consumption expenditures (for services)	63.86%
	Housing and utilities	17.46%
	Health care	17.86%
	Transportation services	3.72%

		Recreation services	4.05%
		Food services and accommodations	6.40%
		Financial services and insurance	0.52%
		Other service	13.86%
		Final consumption expenditure of nonprofit institutions serving hholds	3.26%

Source: Bureau of Economic Analysis

Because Truflation does not directly capture consumption expenditures of nonprofit institutions serving households, this component is sourced from the PCE and incorporated into the TruPCE Price Index to ensure comprehensive alignment with the official BEA PCE framework.

5. The Output Metrics

The Truflation BEA PCE Price Index is updated on a daily basis and produces the following indexes:

- Truflation BEA PCE headline index value (current day)
- Truflation BEA PCE headline index value (one year prior)
- Year over year percentage change in the headline index
- Index values for each category and sub category (current day)
- Index values for each category and sub category (one year prior)
- Year over year percentage change for each category and sub category
- Full historical time series

The Truflation BEA PCE Price Index, along with all associated category and sub category indices, are available through multiple delivery channels including the Truflation Dashboard, APIs, FTPs and other data feeds. The level of data granularity and historical depth accessible to users depends on their subscription tier. At Truflation's highest subscription level, the Enterprise Solution, users have access to the full suite of indices.

The TruPCE Index was launched on July 29, 2025 with historical data extending back to January 1, 2010.

In addition to the headline Truflation BEA PCE Price Index and its category and sub category indices, the underlying price level data enables the construction of a suite of specialized sub indices that provide deeper insights into inflation dynamics. These include:

Sub-Indices	Definition / Methodology
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Truflation BEA PCE Core Index (TruPCEc-US)	Core inflation measures the change in prices excluding the volatile categories of food and energy prices which are subject to sudden price shocks providing a clearer picture for monetary policy by focussing on the broader, more stable inflation pressures. It reflects the underlying persistent price trends.
Truflation BEA PCE Goods Index (TruPCEg-US)	Goods inflation measures the change in prices of physical products purchased by consumers, such as food, clothing, electronics, vehicles, and household items within the core categories thus excludes the volatile goods from food and energy. It reflects how the cost of tangible goods evolves over time and is influenced by factors like supply chain disruptions, raw material costs, production expenses, and retail pricing trends.
Truflation BEA PCE Services Index (TruPCEs-US)	Services inflation tracks the change in prices for non-tangible products or services, including education, transportation, health care, insurance, utilities, housing and leisure activities within the core categories, thus excluding the volatile services from food and energy. It captures shifts in the cost of services provided to consumers and is affected by labor costs, regulatory changes, demand for services, and operational expenses.

6. Truflation BEA PCE Price Index Benefits

The TruPCE Price Index combines real-time data, methodological transparency, and close alignment with the BEA's official PCE framework to deliver a high-accuracy, forward-looking inflation benchmark for institutional and retail users.

- **Aligned with the BEA PCE Framework:** The index mirrors the official BEA PCE Price Index hierarchy and expenditure weights, including detailed breakdowns across durable goods, nondurable goods, and services. This structural alignment enables seamless comparison and confident substitution in analytical models.
- **Real-Time, High-Frequency Inflation Tracking:** Built from more than 30 independent data sources covering over 15 million prices, the index is updated daily. This allows users to monitor inflation dynamics continuously rather than waiting for monthly PCE releases.
- **Institutional-Grade Accuracy and Predictive Power:** With a 95.1% correlation and a 90.5% R^2 score relative to the official BEA PCE Price Index, the TruPCE Price Index provides a statistically robust, high-fidelity proxy suitable for macroeconomic analysis, investment models, and policy assessment.
- **Daily-to-Monthly Conversion for Forecasting:** Daily index values are converted into monthly averages, enabling direct comparability with official PCE releases and providing meaningful lead-time insight to

anticipate upcoming inflation prints and potential Federal Reserve actions.

- **Improved Representation of Housing and Healthcare Costs:** The index incorporates transaction-level housing and healthcare data, reducing reliance on lagged or survey-based measures such as owners' equivalent rent. This improves accuracy in some of the most influential components of consumer spending.
- **Faster Market Response and Risk Management:** Traders, risk managers, hedge funds, and DeFi platforms can integrate the index into dashboards and models to react more quickly to evolving inflation trends.

7. Summary

The TruPCE Price Index is a real-time inflation benchmark designed to closely track and anticipate movements in the BEA's official PCE Price Index. Built on daily price data from 30+ independent sources and aligned to the BEA PCE product hierarchy and weights, it delivers a transparent and timely view of inflation dynamics.

With a 95.1% correlation and a 90.5% R^2 score relative to the official PCE, the index provides institutional grade accuracy while offering meaningful lead-time insight ahead of monthly releases. The TruPCE Price Index enables faster, more informed decision-making for investors, analysts, and policymakers through high-frequency, transaction-level inflation data.

8. Version History

Version	Date Released	Notes
1.0	July 29, 2025	Genesis of the Truflation BEA PCE Price Index
1.1	February 24, 2026	Updated Truflation & BEA PCE Weights