

State Street PriceStats®

PriceStats® provides high-frequency measures of inflation and real exchange rates drawn from prices on millions of items sold by online retailers.

Over the past five years, we have found that this source of data can generate timely insights into key economic variables and the performance of a range of investments.

This real-time pulse of global economic trends helps investors anticipate and evaluate the impact of inflation, including the impact on monetary policy and the degree of exchange rate misalignments.

As the dynamics of global economies shift, anticipating and evaluating the impact of inflation and relative prices has become increasingly important for investors. However, most traditional measures are published at relatively low frequencies and with significant lags, making it difficult to measure macroeconomic trends on a timely basis.

A high-frequency view of inflation across major global economies

Through our partnership with PriceStats, we deliver a range of daily inflation and Purchasing Power Parity (PPP) indices, which provide timely insights into key macroeconomic trends. Published daily with a three-day lag, the PriceStats series are available at a higher frequency and with a shorter publication lag than most official statistics.¹

PriceStats' methodology is based on an extensive body of research by Massachusetts Institute of Technology professors Alberto Cavallo and Roberto Rigobon. Started as an academic initiative

¹ The PriceStats PPP series is a daily series that is published monthly.

called the "Billion Prices Project," PriceStats uses Web-scraping technologies to monitor and collect daily prices on more than five million items sold by online retailers around the globe. From these online prices, PriceStats constructs daily measures of inflation and real exchange rates.

By providing a high-frequency view of inflation and relative prices across major economies, PriceStats can help you get ahead of major shifts in inflation trends and build dynamic strategies that improve portfolio return and manage risk. Through our research portal, IR³, you can access PriceStats' suite of indicators — the daily inflation series and the PPP series — along with macro strategy insights derived from these measures.

PriceStats' key advantages include:

- **Timeliness.** The PriceStats series are published at a higher frequency (daily) and with a shorter lag (three days) than most official measures.
- **Comparability.** PriceStats uses a consistent statistical methodology through time and across countries. Trends in the series reflect changes in the data rather than changes or differences in methodology.
- **Economic and investment insights.** Due to the nature of online prices, trends in PriceStats often anticipate trends in official measures, which may be useful for investment decisions.



PriceStats Daily Inflation Series

An innovative approach to anticipate major inflation trends

PriceStats produces daily inflation series for more than 20 individual countries and a number of regional aggregates. Derived from online prices, the PriceStats Daily Inflation Series helps capture headline inflation across major world economies.

Using online prices to measure inflation

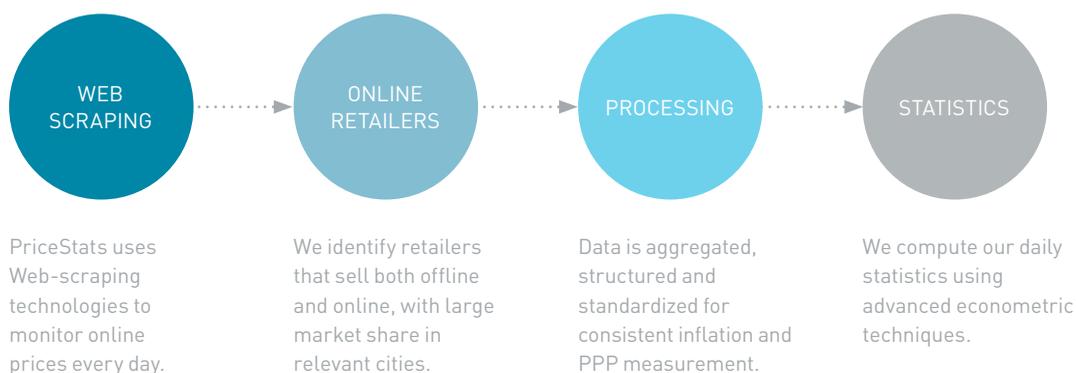
Research by professors Alberto Cavallo and Roberto Rigobon shows that online data can successfully measure inflation in a variety of countries. In economies where online transactions are common, online and offline prices tend to be closely related. Even in countries where Internet retailing is a small share of transactions, retailers tend to tie online prices to offline prices.

Anticipating trends in official inflation

Our research suggests that, in addition to measuring inflation effectively, online prices often anticipate official inflation trends by several months. This is due, in part, to our ability to collect, process and publish data faster than official statistics. It is also because online prices tend to adjust faster to aggregate shocks, since:

- Online prices are easier to change.
- Online consumers are less price-sensitive.
- Online retailers face intense, contemporaneous competition.

PriceStats uses online prices and innovative technology to measure inflation trends



PriceStats Purchasing Power Parity Series

Measuring real exchange rate valuations

Purchasing Power Parity is an economic theory of exchange rate valuation, but one that has been difficult to test accurately. Studies rely on either inflation indices that encompass many non-tradable goods or good-specific metrics that are subject to other biases. Using online prices, however, we can compute the relative cost of a large basket of identical goods in each country versus the US and signal deviations from purchasing power equilibrium.

For targeted countries, we publish the following series each month:

Real exchange rate	We provide the US dollar cost of a basket of identical goods for each country relative to the US. A measured real exchange rate (RER) that is far from its historical levels indicates that there will be pressure to adjust on both the nominal exchange rates and relative prices.
Components of the real exchange rate	We separate the two components of the RER — the nominal exchange rate and the relative price levels — between each country and the US. This helps us understand where the movements in the RER come from, and whether the relative prices compensate for movements in the nominal exchange rate (or vice versa).

Our measures of RERs have two primary advantages:

A large basket of identical goods, aggregated using common methodology	Our RERs use a common basket of at least 250 product categories matched across countries including food, electronics and fuel, avoiding biases typically found in single-item calculation or methodologies based on consumer price indexes.
High frequency	Our series represents the first real-time measures of PPP in the market. Many alternative sources of PPP views are updated with significantly lower frequency (from six months to three years apart).

For more information,
please contact:

North America: Dale Haver
DVHaver@statestreet.com

EMEA: Simon Wakelin
SWakelin@statestreet.com

APAC: Henry Quek
henry.quek@statestreet.com

Investment insights from the PriceStats series

Our strong qualitative and quantitative frameworks help you use PriceStats' content for investment decisions.

Interpreting online inflation

Inflation in Focus is a monthly guide to online inflation trends for global financial market participants and policymakers alike. The PriceStats series are used alongside official statistics to pinpoint when inflation expectations, economic activity or interest rates may be out of sync with the trends identified by our online metrics.

Over the past five years, *Inflation in Focus* has produced many actionable insights. These range from broad views of global inflation trends (including the breakdown across developed and emerging economies and the impact of global food and fuel prices) to market-specific opportunities (such as identifying numerous occasions where economists' or market-based measures of inflation in a particular country were either too high or too low). Our monthly guide has also

highlighted potential turning points in economic activity and indicators of economic surprises, warned of deflation trends that ultimately resulted in policy moves, and alerted investors to the rapid pass-through of exchange rate depreciations into consumer prices in emerging-market economies (which ultimately prompted policy tightening).

Sample investment applications

Using the anticipatory capabilities of the PriceStats series, we have developed proof-of-concept applications spanning a range of investment strategies. In analyzing simple, systematic trading rules, we have found that the PriceStats series contain information that goes above and beyond other widely followed metrics.

For example, as an investor, you may want to allocate dynamically between inflation-linked bonds and nominal bonds. We've developed an illustrative application that uses the US PriceStats Daily Inflation Series to scale exposure to Treasury Inflation-Protected Securities (TIPS) versus nominal bonds.

PriceStats offers an innovative approach

PriceStats' high-frequency view of inflation and relative prices across major economies can help you anticipate shifts in inflation trends, measure exchange rate valuations and build dynamic strategies to improve portfolio return and manage risk.

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