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US Economic Research

Creating domestic inflation

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- To broaden our inflation coverage, we construct an inflation index that is weighted toward expenditure items with a high level of domestic value added – Domestic CPI. This index allows us to differentiate, in part, the portion of inflation driven by domestic supply and demand versus that portion driven by the evolution of supply and demand abroad. As a by-product of this work, we create a tradable CPI measure. Both measures exclude energy.

- We believe Domestic CPI can help us identify sources of inflation or deflation pressures in the US. Because prices determined primarily in domestic markets tend to evolve somewhat slower than tradable inflation, Domestic CPI may be useful for understanding the underlying trend in inflation. In addition, the index allows us to more closely follow the net influence of external shocks, such as a Chinese exchange rate devaluation, on overall US inflation. That is, we can measure more directly the effect of such moves on US prices beyond their direct effect on imported goods prices.

- Our results show Domestic CPI at a steady 2.4% y/y, in line with the historical trend of the series. The measure does not raise any warnings about weakness or overheating. Keep in mind that the high level of the series relative to the Fed's target is not the focus point; rather, we take signal from the level of the series relative to its recent trend. Tradable CPI declined 0.5% y/y in June, in line with the more subdued global inflationary pressures, as well as the drag on imported inflation from the stronger dollar.

- In addition, we review a number of inflation indexes created by various regional Federal Reserve banks to help better judge current inflation dynamics. Domestic price pressures are stable and broadly balanced at present across these measures, suggesting that concerns over a sustained downward trend in prices should begin to wane.

Defining your core

To broaden our inflation coverage, we construct an inflation index that is weighted toward expenditure items with a high level of domestic value added – Domestic CPI. This index allows us to differentiate, in part, the portion of inflation driven by domestic supply and demand versus that portion driven by the evolution of supply and demand abroad. As a by-product of this work, we create a tradable CPI measure.

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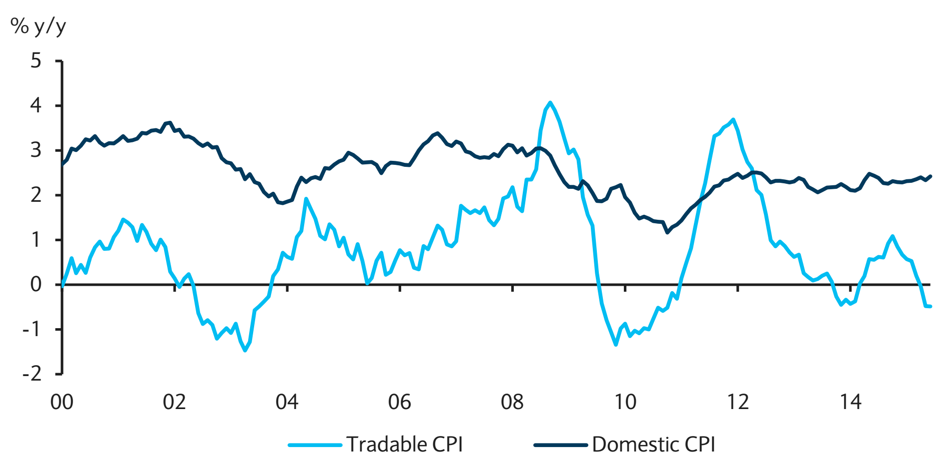
The Fed uses a variety of inflation measures in its efforts to understand the underlying true direction of inflation. The Fed tends to look through transitory price changes to discern those price movements that best forecast PCE inflation. But the Fed inflation indexes vary widely in content. The breadth and shifting nature of these indexes reflect the Fed's judgment over which prices are most indicative of current inflation dynamics at any point.

Although the target for the Fed is headline PCE near 2% over the medium term, the Fed communicates its views on inflation through the lens of core PCE, as it believes price changes driven by the highly volatile food and energy are likely to be transitory. In the past, the Fed has drawn attention to other measures of inflation: excluding tech goods, excluding the prices of motor vehicles, or the various alternatives produced by the *Cleveland Fed*.

Here, we construct a new inflation index that is weighted toward expenditure items with a high level of domestic value added, Domestic CPI (Figure 1). We believe this measure provides a relatively clean signal regarding what price changes are driven by domestic forces, and while the indexes are not substitutes for other measures of inflation, they may help the Fed and other researchers determine the underlying inflation trend, which may, in turn, help determine the components of current inflation most likely to influence the medium-term inflation outlook.

FIGURE 1

Steady strides in Domestic CPI suggests that inflation trend is within its historical norm



Source: BLS, Haver Analytics, Barclays Research

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A measure for non-tradable inflation

We construct a Domestic CPI measure. As a by-product of this work, we also create a Tradable CPI index. We believe Domestic CPI is useful for gauging underlying inflation pressures. By indentifying the trend in inflation, the index can provide a signal over the likely path of inflation, over and above the signal in headline or core measures.[1]

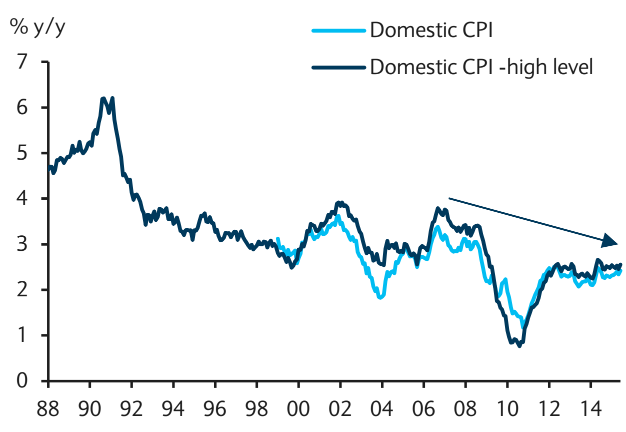
We construct this new inflation measure on CPI rather than PCE price items. Although the Fed targets PCE explicitly, CPI price measures are more timely and demand significantly more market focus. In addition, the Fed often monitors other measures of inflation pressures based on CPI rather than PCE price items; for instance, the Cleveland Fed median and trimmed mean measures of inflation. We think this is because it also believes that CPI based measures have powerful signalling power about the path of inflation.

We use the BEA's Survey of Current Business[2] to rank goods based on import penetration, keeping with our underlying thesis that international traded goods will be most heavily influenced by external shocks. We remove goods and services with high levels of import penetration and which we judge to be most influenced by international demand.

Because the Domestic CPI index excludes many large durable goods, domestic services dominate the index, but not more so than they dominate the core CPI index. Shelter costs account for about 45% of Domestic CPI compared with about 42% in core CPI. The large weight on housing costs seems appropriate, given our goal of thinking about Fed policy and its effects. Shelter costs are driven directly and indirectly by monetary policy, through mortgage interest rates and the general evolution of domestic prices.

FIGURE 2

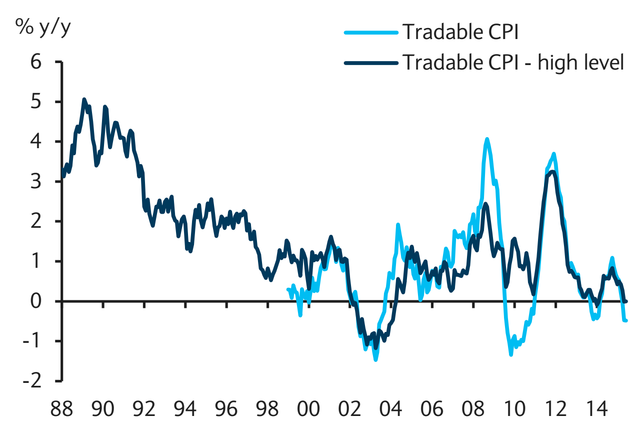
Domestic CPI using low and high level price items



Source: BLS, Haver Analytics, Barclays Research

FIGURE 3

Tradable CPI using low and high level price items



Source: BLS, Haver Analytics, Barclays Research

[1] We model our index on inflation measures created by the Reserve Bank of New Zealand. The Bank produces a non-tradable index as they believe it shows how domestic demand and supply conditions are affecting consumer prices, isolating an important transmission mechanism for monetary policy. In New Zealand, these subindexes are reported along with headline and other measures of core as a key part of the Bank's inflation monitoring and communication.

[2] Clinton P. McCully, June 2011, "*Trends in Consumer Spending and Personal Savings*"

More or less history: The tradeoffs

The availability of disaggregated data for various components of CPI constrains how far back we can look at the evolution of Domestic and Tradable CPI. Using our preferred detailed disaggregated method, we can build a history of about 15 years. However, allowing for less disaggregation in the components included allows us to build indices that go back to 1988 (Figures 2 and 3).

The price trends as depicted by the high level and detailed disaggregated indices are broadly the same. This is especially so for Domestic CPI and indicates that this measure has been similarly stable in the past. In addition, the current rate of price increases is at the lower end of its historical range, which is in keeping with the subdued overall inflation in the economy after the recession. In addition, this supports our expectations for a gradual, but not rampant, pickup in inflation pressures for the remainer of 2015 and 2016.

In recent history, Domestic CPI has run below the high level series by 0.1-0.2pp. The divergence is driven by the inclusion of certain goods price components (ie, new vehicles, used cars and trucks, alcoholic beverages) where annual inflation is running well below services inflation. We think there is value in including these price items in Domestic CPI as they reflect predominantly domestic demand and labor cost developments. For example, 80% of cars sold in the US are produced domestically and even those cars produced abroad are likely priced in large part for the US consumer.

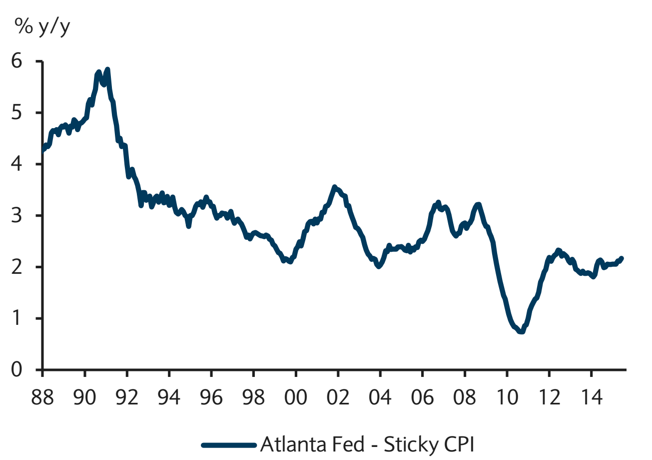
Tradable CPI is a more volatile series, and becomes even more so if detailed disaggregation is used to construct the index. Currently, Tradable CPI is running about 0.5pp below the estimate according to the high level. The largest discrepancy between the two series occurs during 2010, when the light blue line shows prices declining 1.3% y/y, while the dark blue line shows prices rising 1.6% y/y.

Other core measures: Distinguishing trend from noise

Various FOMC participants look to a wide range of inflation indices when forming views on the inflation outlook. Below, we review a few that attempt to gauge underlying inflation pressures and to sift out noise from volatile components that do not signal future movements in inflation.

FIGURE 4

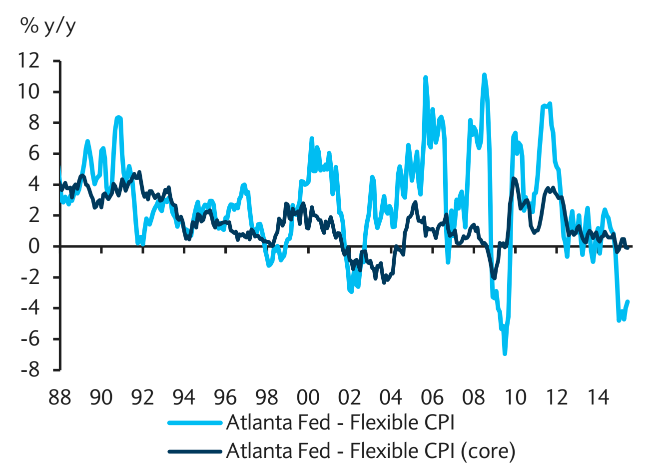
Atlanta Fed's measure of 'Sticky CPI' displays similar trends to our measure of Non-tradable inflation



Source: Federal Reserve Bank of Atlanta, Haver Analytics, Barclays Research

FIGURE 5

Flexible CPI is much more volatile and points to substantial downward pressures in recent months



Source: Federal Reserve Bank of Atlanta, Haver Analytics, Barclays Research

The FRB of Atlanta publishes two measures of inflation that are of interest to us, a sticky-price composite of the CPI and a flexible-price CPI (Figures 4 and 5). Their research finds that sticky prices appear to incorporate expectations about future inflation to a greater degree than prices that change on a frequent basis[3]. Flexible prices, however, respond more strongly to economic conditions – for instance, economic slack. The Atlanta Fed Flexible CPI includes energy prices, but Flexible Core CPI (dark blue line in Figure 5) is closer to the trend displayed in our Tradable CPI index and points to this measure as an only modest drag on overall inflation.

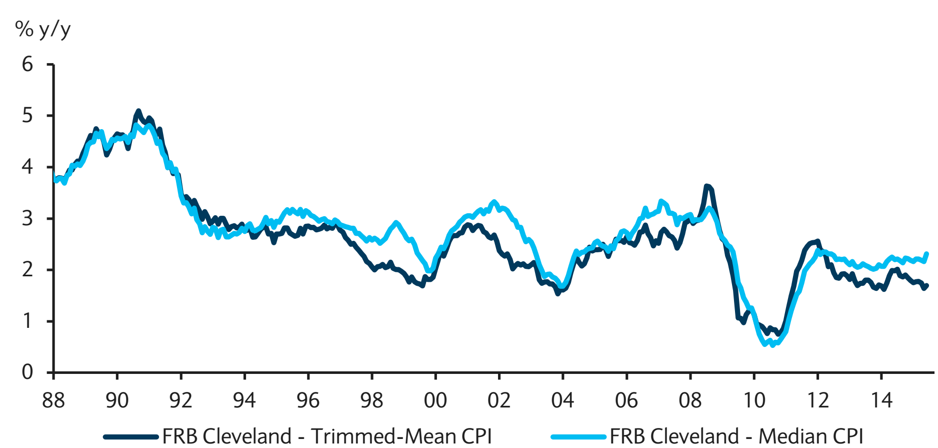
Sticky measures of inflation do a better job of signaling where inflation will be in the future, even though they may not be as responsive to economic conditions as more flexible measures of inflation. This is because of their close correlation with consumers' inflation expectations. Similarly, we in believe Non-tradable CPI (less volatile) is a better gauge of underlying domestic price strength that is responding to domestic demand strength, as well as to consumer expectations about future price changes.

Another way to gauge the underlying rate of inflation, rather than looking at the whole consumer basket, is to calculate the median price change experience by consumers. This is a measure that staff at the FRB of Cleveland produce. Using a set of categories, and sorting them from the lowest to the highest price change, the median CPI uses the middle or median price change as its estimate of the underlying rate of inflation[4]. A similar result can be achieved by looking at a trimmed mean measure of CPI (Figure 6). This method of measuring underlying price pressures yields similar results to other ones we have considered so far.

A unifying theme of the various inflation measures considered in this report is that domestic price pressures are stable and broadly balanced at present. These measures suggest that domestic inflation may be in the lower end of its historical range. However, it does not show tendencies that a sustained downward trend is very likely from here.

FIGURE 6

Cleveland Fed measures of CPI suggest inflation is stable, albeit on the lower end of its historical range



Source: Federal Reserve Bank of Cleveland, Haver Analytics, Barclays Research

[3] Michael F. Bryan and Brent Meyer, May 2010. '*Are some prices in the CPI more forward looking than others? We think so*'.

[4] J. Church and K. J. Steward, Dec 2013. *The consumer price index and the 'median CPI'* for a summary of how the 'median CPI' is calculated.

Appendix

Our preferred measures of Domestic and Tradable CPI are constructed using components of CPI at a disaggregated level. In the case of Domestic CPI, although core services components carry most of the weight, we also include series such as food consumed in restaurants, various vehicle prices (that we believe are influenced more from domestic demand than international prices), medical care commodities. In addition, we use recreation related goods and services, whose price movements we believe reflect the health of the US consumer.

For the Tradable index, we consider a larger number of components, as can be seen from Table 1 below. We think this level of granularity allows us to better isolate those price components that respond more to external shocks in prices and less to monetary policy. For both measures, we exclude prices of energy goods and services. The base year for the indices is January 1998.

Once we have established the baskets of goods and series we want to include in each index, we use the BLS methodology to re-aggregated the data (fixed-weight Laspeyres price index). As a result, we then allow for the relative importance of each component to vary according to price changes in that series.

Domestic CPI (about three quarters of the total CPI basket) has a significantly lower import penetration component and has historically been more stable than Tradable CPI (Figure 1). We believe this measure is more likely to respond to monetary policy action, and it is more likely to trigger policy action. Tradable CPI (about one fifth of the total CPI basket) has a high concentration of imported prices. Shocks in these series tend to originate from movements in international prices and are exogenous to the US economy. From the tradable and non-tradable indices, we have excluded the energy components (energy commodities as well as energy services). A list of the series used in our tradable and non-tradable inflation indices can be found in the Appendix.

In constructing the ‘Domestic CPI-high level’ indices, we focus on measures such as food at home and core services. Similarly for ‘Tradable CPI – high level’ we consider core goods more broadly, as well as food at home (Table 2). For both, we exclude the energy components.

TABLE 1

Components of Non-tradable and Tradable CPI used to construct the low level disaggregation indices

Domestic price items	Relative importance in Total CPI	Relative importance in Domestic CPI	Standard deviation	Tradable price items	Relative importance in Total CPI	Relative importance in Tradable CPI	Standard deviation
Shelter	32.8	44.7	1.2	Food at home	8.3	45.8	2.0
Medical Care services	5.9	8.1	1.8	Window & floor covering	0.3	1.5	1.8
Transportation services	5.7	7.8	1.7	Furniture & bedding	0.8	4.2	2.1
Education & Comm.	6.4	8.7	0.5	Appliances	0.3	1.5	2.6
Recreation services	3.8	5.2	0.7	Other houshold equip.	0.5	2.6	1.8
Household services	2.1	2.8	1.5	Tools	0.7	3.9	1.2
Other personal services	1.8	2.4	2.8	Housekeeping supplies	0.8	4.6	1.9
Food away from home	5.8	7.9	0.9	Apparel	3.3	18.4	2.2
New vehicles	3.5	4.8	1.7	Vehicle parts	0.4	2.4	2.1
Used cars and trucks	1.7	2.3	5.4	Pets & their products	0.6	3.6	2.7
Medical care	1.8	2.4	2.1	Sporting goods	0.4	2.2	1.8
Alcohol	1.0	1.4	1.8	Photographic equipment	0.1	0.3	4.2
Tobacco	0.7	1.0	7.5	Other recreational goods	0.4	2.0	1.3
Recreation reading mat.	0.2	0.3	1.7	Personal computers	0.3	1.5	7.7
Education books and	0.2	0.3	1.7	Computer software	0.1	0.4	2.8
				Telephone Hardware etc.	0.1	0.3	3.0
				Personal care goods	0.7	3.9	1.6
				Miscellaneous	0.2	1.0	1.7

Source: BLS, Haver Analytics, Barclays Research

TABLE 2

Components of Domestic and Tradable CPI used to construct the high level disaggregation indices

Non-tradable CPI	
Price items	Food away from home, Core services
Tradable CPI	
Price items	Food at home, Core goods

Source; BLS, Haver Analytics, Barclays Research

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