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Inflation Measures and Their Differences

Inflation is the rate of change in the price level of an economy. In the United States, several measures of inflation are used to gauge, among other things, the effectiveness of monetary policy. The Federal Reserve's dual mandate, of price stability and full employment, explicitly indicates that inflation is an important metric for measuring policy outcomes. Moreover, the adoption of a specific inflation target of 2% provides a definitive rate by which to gauge the efficacy of policy. Nonetheless, the Government produces several measures of inflation that can differ from one another over periods of time. Among the price levels, there are three major ones:

1. the GDP Deflator,
2. the Personal Consumption Expenditures price index (PCE),
3. and the Consumer Price Index (CPI)

The three aforementioned indices differ from one another, although they tend to trend in the same direction over time. As seen in the graphs below, the differences are both in levels and in changes. In general, the divergence is attributed to differences in the weights and scopes of the indices.

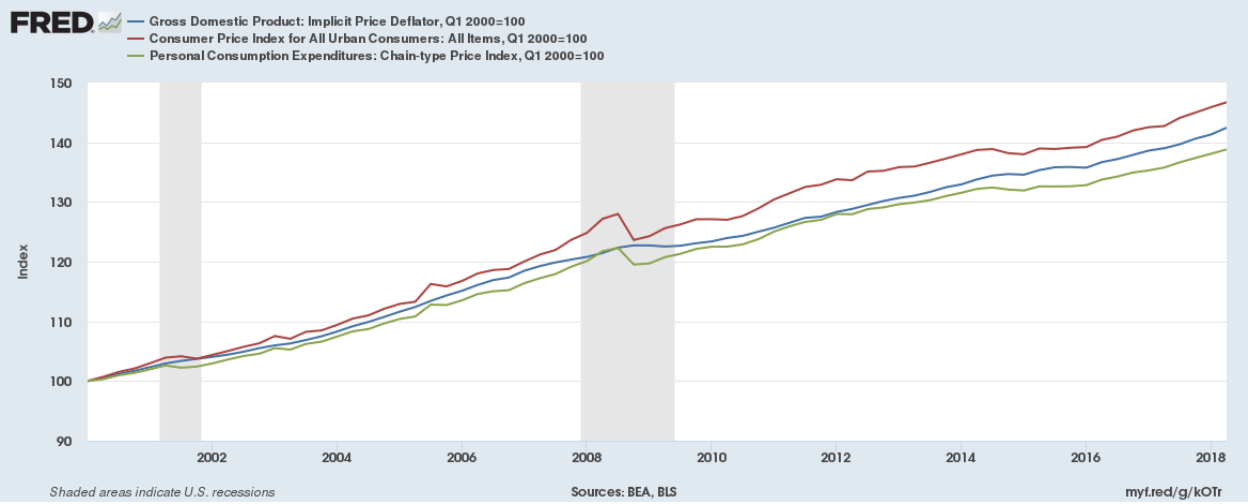

Figure 1 Inflation measures (levels) Source: FRED FED

Figure 1 above shows the time series of the different indices indexed to a common year for comparison purposes. The GDP deflator runs somewhat in between the CPI and the PCE, while the CPI tends to behave in a manner similar to that of the PCE, albeit at a higher level. This becomes clearer when looking at Figure 2 below, which demonstrates that PCE and CPI inflation rates tend to track each other, but at different magnitudes. The deflator tends to exhibit the most stability, as

shown by its reduced volatility relative to the other two indices. Regardless, there are meaningful differences among the measures and such variation should be addressed.

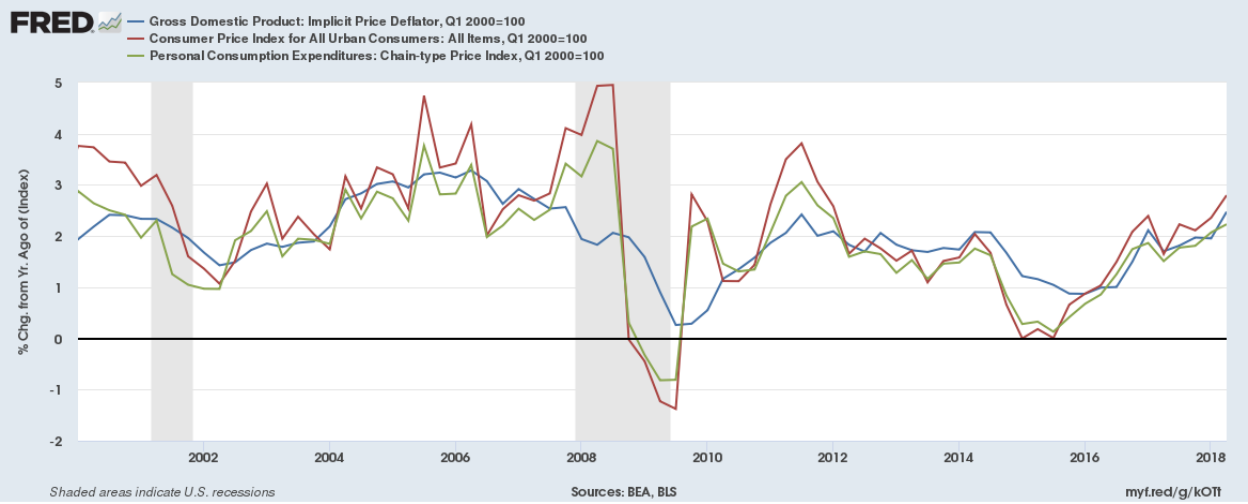

Figure 2 Inflation measures (changes) Source: FRED FED

Before delving into the variation among the indices, it's important to quickly separate the GDP deflator from the other two measures. The deflator is perhaps the broadest measure of inflation, as it captures the price of everything in the economy, and not solely the prices faced by consumers. As noted above, the deflator has tended to be the most stable of the inflation measures. In addition, it differs from the CPI and PCE due to it is not being based on a fixed basket of goods and services. In other words, the basket is allowed to fluctuate with the consumption and investment patterns of the economy. The CPI and PCE, on the other hand, measure consumer prices and are based on a fixed basket of goods; thus they are more commonly compared to one another.

Differences between the PCE and the CPI

Weight and scope differences explain the bulk of the variation between these two indices. In terms of scope, the major distinction is whether the index covers "out-of-pocket" expenditures exclusively or not. In other words, does it measure prices consumers face or the prices that businesses charge consumers?

In general, the CPI covers "out-of-pocket" prices faced by consumers. For example, if insurance premiums increase, that would be covered in the CPI. However, if healthcare providers begin to increases their charges to insurance providers, such would not be captured in the CPI. Nonetheless, persistent price changes would eventually filter their way into "out-of-pocket" prices, so it's expected that they would pass through to CPI. The Bureau of Labor Statistics constructs the CPI based on a survey of households. This index focuses on measuring prices consumers face rather than prices that businesses charge. Conversely, the PCE tracks the prices of what businesses charge. The Commerce Department produces this index based on a survey of businesses. For instance, if healthcare providers begin to charge more for services these changes would be reflected in the PCE irrespective of

whether they make their way through to higher premiums or co-pays. Another major distinction between the indices lies in the weights given to the different items included in them.

The CPI and PCE assign different weights to the components that make up their respective indices. The major categories with the largest deviations from one another are housing, medical care, and other goods and services. The table below outlines the differences among the categories:

	Weights in Percentage Points		
Expenditure Category	**PCE**	**CPI**	**PCE**
All items	100.00	100.00	-
Food and beverages	12.90	15.00	2.10
Housing	**23.60**	**42.20**	**18.60**
Shelter	16.40	33.20	16.80
Other housing	7.20	9.00	1.80
Apparel	3.80	3.10	(0.70)
Transportation	10.40	15.30	4.90
Medical care	**22.00**	**8.40**	**(13.60)**
Recreation	7.60	5.70	(1.90)
Education and communication	6.20	7.10	0.90
Other goods and services	**13.40**	**3.20**	**(10.20)**

Table 1 Weights as of 2015 Source: BEA presentation 2017[1]

As shown in the table above, housing carries a weighting in the CPI of nearly double its weighting in the PCE. Conversely, medical care has a relative importance in the PCE of over twice that of the CPI. The differences here are due to how each respective index treats specific categories. In the case of housing, the CPI uses “Owners’ equivalent rent” to handle owner-occupied housing. In sum, the CPI tracks the rents of homes similar to ones that are owner-occupied and then counts those as the prices owners pays themselves, hence the term “Owners’ equivalent rent.”

As discussed above, the Government provides various measures of inflation. These metrics attempt to track distinct price levels within an economy. The GDP deflator is the broadest measure of prices, while the PCE and CPI focus on consumer prices. The deflator is not based on a fixed basket of goods and services, while both the PCE and CPI are. The divergence between CPI and PCE can be explained by differences in both scope and weight. That is, what they measure and what importance it is given within the respective index.

Naturally, the choice of index will provide different measures of inflation and thus lead to different conclusions. Thankfully, the Fed has already clarified this issue. According to a Federal Open Market Committee (FOMC) statement following its meeting in January of 2012, the inflation target of 2%

[1] Brown, Kyle. "Comparing Price Measures- The CPI and the PCE Price Index". NABE 14th Annual Economic Measurement Seminar, 2017.

should be viewed as measured by the "annual change in the price index for personal consumption expenditures or PCE."[2] In other words, the Fed is more concerned with targeting PCE inflation than CPI inflation, which is more widely used, and is employed to price TIPs and adjust benefit transfers.

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[2] https://www.federalreserve.gov/faqs/money_12848.htm