

Economics Group

Special Commentary

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The Dollar Can Really Nickel and Dime You on Inflation

Changes in the value of the U.S. dollar have ripple effects that are felt throughout the economy; this paper builds on past work our group has done examining the dollar's effect on prices. From its cycle high in December of 2016 through to the end of 2017, the trade-weighted value of the U.S. dollar shed more than 10 percent of its value. Global currency markets have had a choppy start thus far in 2018 as well, not unlike financial markets, but the dollar's decline has continued losing another 1.2 percent of its value so far this year and our currency strategy team anticipates a continued decline of roughly 2-3 percent in the value of the dollar against a basket of the currencies of our major trading partners throughout 2018 (Figure 1).

During other periods of dollar volatility throughout the current cycle, our group has done some work trying to explain the implications of dollar movement for different aspects of consumer inflation here in the United States.¹ In this piece we build on that work to gauge the extent to which dollar valuation influences broad categories of inflation: commodities, core goods and core services. We find that the value of the dollar is very important in understanding commodity prices, somewhat important when thinking about core consumer goods prices, and (perhaps intuitively) not terribly influential when it comes to pricing in the service sector.

Academic economic exercises often come with a “ceteris paribus” qualifier, meaning “all else equal” or “with other conditions remaining the same.” In practical application, of course, decision makers cannot hold other conditions the same, so we attempt to provide some real-world guidance as well.

Our currency strategy team anticipates a continued decline in the value of the dollar throughout 2018.

Figure 1

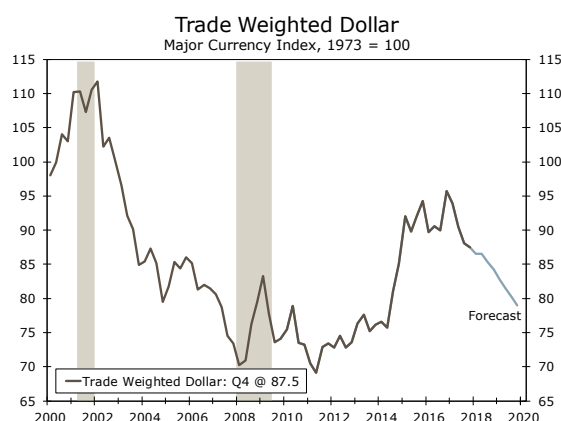
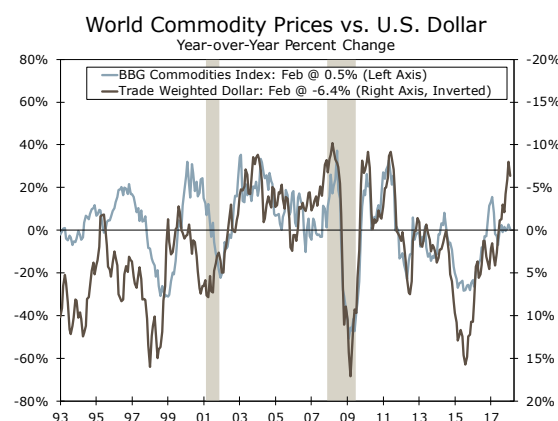


Figure 2



Source: Federal Reserve Board, Bloomberg LP and Wells Fargo Securities

¹ “Will Dollar Depreciation Lead to Higher Inflation?” (August 9, 2017) and “Global Effects on U.S. Consumer Price Inflation” (August 9, 2016), available upon request.



The dollar and commodity prices tend to move opposite directions due to most commodity contracts being priced in dollars.

Oil Flows and Oil Prices Flow-Through

Moves in the value of the dollar have been closely tied to changes in commodity prices. As illustrated in Figure 2, there is a strong, negative correlation between the trade-weighted value of the dollar and Bloomberg commodity index (-0.60 between 1993 and 2017). The dollar and commodity prices tend to move opposite directions due to most commodity contracts being priced in dollars. Changes in the dollar need to reflect fluctuations in the purchasing power of other currencies. As the dollar weakens, it costs less of a foreign currency to purchase the same amount of a commodity. The relationship is reasonably strong for energy (-0.32) and food-related commodities (-0.43).

While consumers are not buying barrels of oil and bushels of wheat, they are purchasing refined energy products and processed/prepared foods which all start as “raw commodities.” It doesn’t take long for changes in oil prices to affect what consumers pay at the pump (Figure 3). The CPI energy index rises 20 basis points for every one percent rise in oil prices (both measured year-over-year).²

There is also a flow-through to what consumers pay for food, but it lags. A 1 percent increase in the Commodity Research Bureau (CRB) food index over a given year raises the year-over-year rate of CPI food inflation by 6 basis points with about a six-month lag.³ That might not sound like a lot, but agricultural commodity prices are given to pronounced price swing of more than 10 percent a year, so even 6 basis points can quickly become more than half a percentage point of food inflation (Figure 4). If the pass-through here feels small, it may have to do with the fact that roughly half of CPI food inflation is “away from home” and thus it is as much a measure of service costs as it is of the food itself.

Figure 3

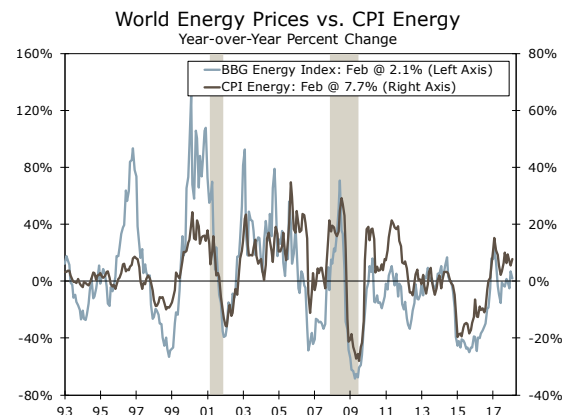
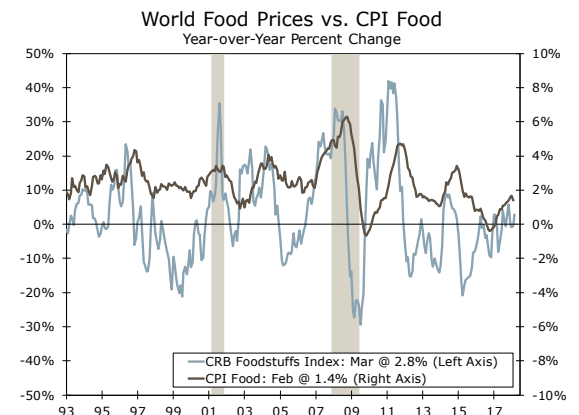


Figure 4



Source: U.S. Department of Commerce, Bloomberg LP, CRB and Wells Fargo Securities

Engage Your Core

By our reckoning, there is as much to learn about the economy by spending time with business leaders as there is in pouring over troves of statistics and data. One thing we have learned to anticipate in these meetings is the inevitable eye roll that comes when the discussions turn to core inflation, which strips away volatile food and energy costs. “Who doesn’t need food and energy?” is the familiar refrain.

The rationale for keeping tabs on core inflation is that food and energy prices are both susceptible to temporary major swings that can mute the useful price signals from the economy. This makes core inflation more closely watched by central bankers in the short run. In addition, monetary policy authorities, including the Federal Reserve, have limited scope to influence factors that drive

² Using a quarterly OLS model, the coefficient between the year-over-year change in oil prices and the rate of CPI energy inflation from 1993 to 2017 is 0.196 and is significant at the 1 percent level. Full econometric results available on request.

³ Using an OLS model, the coefficient between the year-over-year change in the CRB foodstuffs index and the rate of CPI food inflation from 1993 to 2017 is 0.063 with a two quarter lag and is significant at the 1 percent level. Full econometric results available on request.

these price swings (think crop failure or OPEC-directed supply changes in oil markets). So to what extent are core consumer prices impacted by changes in the value of the U.S. dollar?

The quick answer is: not much. The effect of a weaker dollar on U.S. inflation is more evident in rising commodity prices than through core consumer products. That is not to say that there is no relationship. A simple regression analysis confirms that a weaker dollar leads to a statistically significant rise in the cost of imported consumer goods.⁴ Higher import prices, in turn, are associated with a significant increase in the core goods component of the CPI. As illustrated in Figure 5, the magnitude of these effects, however, are fairly small and take about a year to reach their maximum impact.⁵

Figure 5

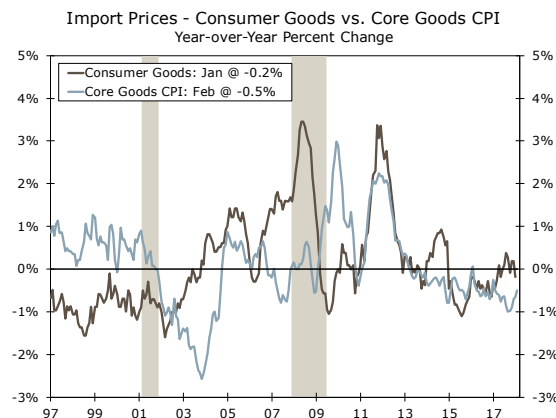
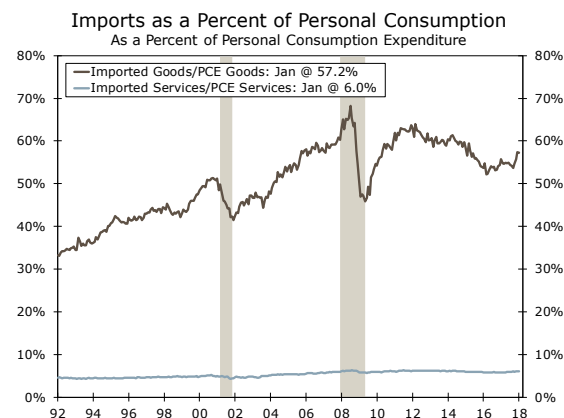


Figure 6



Source: U.S. Department of Labor, U.S. Department of Commerce and Wells Fargo Securities

The inverse relationship between the dollar and import prices for consumer goods stems from two channels. First, a weaker dollar makes it more expensive to buy imports that are invoiced in foreign currencies. Second, if imports are already invoiced in dollars, a weaker dollar would squeeze the profit margins of foreign sellers when their sales are exchanged into their home currency. As a result, foreign sellers may raise prices to protect margins.

Why then only a small effect on core consumer goods? According to the Bureau of Labor Statistics, the government entity behind the CPI report, only 5 percent of goods in import prices are priced in a foreign currency.⁶ That means in order for most imported consumer goods prices to move with the dollar, companies have to actively change prices.

Services, which account for roughly three-quarters of the core index, are even more insulated from dollar fluctuations. Whereas more than half of consumer goods are imported, just shy of 6 percent of services are bought from overseas (Figure 6). Not surprisingly given the small share of imports and that services rely even less on raw commodities as inputs to production, the dollar is not a significant factor in core consumer services inflation.

Putting It All Together

With non-food and energy items accounting for almost 80 percent of the consumer price index, the impact of the weaker dollar on inflation will be somewhat limited. However, when factoring in food

The effect of a weaker dollar on U.S. inflation is more evident in rising commodity prices than through core consumer products.

Only 5 percent of goods in import prices are priced in a foreign currency.

⁴ Using an OLS model, the coefficient between the year-over-year change in major trade weighted dollar index and the rate of import price inflation for consumer goods from 1996:Q4 to 2017:Q4 is -0.050 with a two quarter lag and is significant at the 1 percent level. Full econometric results available on request.

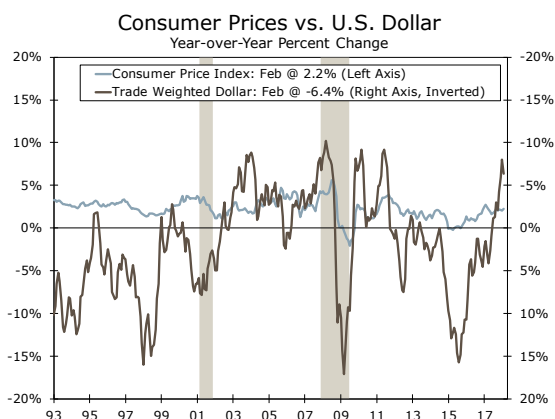
⁵ Using an OLS model, the coefficient between the year-over-year change in the import price index for consumer goods and the rate of CPI core goods from 1993 to 2017 is 0.222 with a four quarter lag and is significant at the 1 percent level. Full econometric results available on request.

⁶ Kristen Reed. "Impact of the Strengthening Dollar on U.S. Import Prices in 2015," *Bureau of Labor Statistics Beyond the Numbers* 5, no. 12 (2016).

A 1 percent decline in the dollar would bump up the year-over-year rate of CPI inflation by 4 bps.

and energy, the dollar stands to play a clearer role in overall inflation (Figure 7). Adding the major trade-weighted dollar index to an OLS model of inflation shows that a 1 percent decline in the dollar would bump up the year-over-year rate of CPI inflation by 4 bps.⁷ With our currency strategy team expecting the dollar to decline another 2-3 percent between now and the end of the year, the overall decline in the greenback from its December 2017 peak would be roughly 6 percent. That implies dollar depreciation stands to add about two-tenths of a percent to headline CPI inflation, all else equal.

Figure 7



Source: U.S. Department of Labor, Federal Reserve Board and Wells Fargo Securities

Ceteris Is Seldom Paribus

A lot of economic “rules” come with the qualifier *ceteris paribus*, Latin for “other things remaining the same.” Practically, factors do not remain static in a dynamic economy. This may explain why the dollar/price relationship has varying degrees of pass-through effect. Take capital goods, for example. A lot of capital goods are still imported. We recently upgraded our outlook for equipment spending on the basis of improved business sentiment, faster global growth and the various measures geared toward capital spending in the December Tax Cuts and Jobs Act. That required a concomitant increase in our imports forecast as well.

A weaker dollar may imply steeper prices for imported capital goods, but is it the dollar that is driving that price increase or is it the increased demand for capital goods globally with improved growth? The IMF recently offered an interim update to its World Economic Outlook forecast ratcheting-up global growth to 3.9 percent for 2018 and 2019.⁸

The broader growth backdrop and resulting monetary policy decisions must be taken into account when evaluating changes in the dollar with consumer prices. For example, when adding the dollar directly to a basic model of core goods inflation, a *stronger* dollar is associated with *higher* inflation (albeit the effect is very small). The positive relationship is likely linked to the fact that when inflation is rising, the Federal Reserve is often raising interest rates, which in isolation would lead to a stronger dollar.

The current environment is therefore somewhat unique. The Federal Reserve is now clearly in a tightening cycle. If anything, U.S. monetary policy is set to tighten more quickly this year with another four rate hikes and the Federal Reserve’s balance sheet declining over the course of the year. Therefore, with stronger demand growth *and* a weaker dollar, could the impact on inflation be even greater?

⁷ See appendix for full econometric results.

⁸ International Monetary Fund. “World Economic Outlook Update: Brighter Prospects, Optimistic Markets, Challenges Ahead,” 2018.

The broader growth backdrop must be taken into account when evaluating changes in the dollar with consumer prices.

To evaluate, we look at the relationship between the dollar and CPI inflation during the previous and current economic expansions. This eliminates periods of extreme financial market turmoil when investors are flocking to the dollar for safety, such as in the aftermath of the September 11 attacks or the global financial crisis. During the 2002-2007 expansion, a weaker dollar was associated with weaker inflation.⁹ That period, however, coincided with globalization coming into full force, with China joining the WTO, as well as the final years of the most recent productivity boom.

Looking at the current expansion, where globalization has by some measures been in retreat and productivity has languished, the relationship between CPI inflation and the dollar has been negative. Whereas our entire sample period suggests a one percent decline in the dollar would be associated with a 4 bps point increase in CPI inflation (year-over-year), the relationship has strengthened in recent years to where the dollar would add 6 basis points to inflation in the post-recession environment.

As a result, we view the weaker U.S. dollar as an important source of upward pressure on inflation this year. It is worth noting, however, that the dollar's impact on inflation still pales in comparison to other variables. Slack remains an important driver, even if the timing and magnitude of the relationship may be more difficult to discern in today's environment (as was discussed at length during the last FOMC meeting). A one-tenth decline in the gap between the unemployment rate and "full employment" carries about double the importance of a one percent decline in the dollar on headline inflation. Even more influential are consumer inflation expectations and the recent behavior of inflation. Inflation is highly correlated with recent past values, making the trend in inflation move only slowly. Yet with expectations rising and unemployment and the dollar declining, the overall trend for inflation is higher.

Conclusion: Small Impact May Be All the Fed Needs

In less than four months, the current economic expansion will begin its 10th year. For much of that time period, sustained consumer price inflation of 2.0 percent has been a fleeting objective for monetary policy makers. With a confluence of factors having recently nudged inflation tantalizingly close to target, we considered in this paper the role a weakening U.S. dollar will likely play. We find the effect of a weaker dollar on inflation is more evident in rising commodity prices than through core consumer goods, but it is a factor in both. A 1 percent decline in the dollar would bump up the year-over-year rate of CPI inflation by 4 bps. From the dollar's peak in December 2017 to where our currency strategy expects it to be by the end of this year the dollar's decline will be roughly 6 percent. As a result, the boost to inflation from dollar depreciation should be about two-tenths of a percent; that may be just enough to achieve the Fed's 2.0 percent target.

We view the weaker U.S. dollar as an important source of upward pressure on inflation this year.

⁹ Only at a high cutoff for significances (p-value 0.099). Full econometric results available on request.

APPENDIX

CPI Regression

Using quarterly data from 1993 to 2017, we estimate the following regression for CPI inflation:

$$\Delta cpix_t = -\frac{1.52}{(3.86)} - \frac{0.092}{(2.44)} ur_t + \frac{0.691}{(5.31)} ex_t + \frac{0.785}{(6.44)} \Delta core + \frac{0.014}{(6.422)} \Delta wti - \frac{0.038}{(4.14)} \Delta dol_{t-1} + \varepsilon_t$$

$R^2 = 0.789$ $DW = 0.78$

where $\Delta cpix$ = year-over-year change in the U.S. CPI

ur = U.S. unemployment rate minus the Congressional Budget Office estimate of the natural rate of unemployment

ex = short term consumer inflation expectations, measured by the University of Michigan median expectations for inflation 12 months ahead

$\Delta core$ = year-over-year change in the U.S. core CPI

Δwti = year-over-year change in the U.S. CPI

$\Delta dollar$ = year-over-year change in the U.S. major trade-weighted dollar index

The regression analysis shows that a 100 bps decline in the gap between the actual unemployment rate and natural rate of unemployment raises CPI inflation by 9 bps. More impactful is the change in short term inflation expectations, where a 100 bps rise increases CPI inflation by 69 bps, and recent trend in inflation, where a 100 bps rise in the year-over-year rate of core inflation raise CPI inflation by 79 bps. The effects from oil and the dollar are smaller. A 100 bps rise in the year-over-year change in WTI raises CPI inflation by only one bps, while a 100 bps decline in the year-over-year change in the dollar raises CPI inflation by 4 bps after one quarter.

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