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## Commodity Price Movements and PCE Inflation

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*With the recent run-up in crop and energy prices—and the subsequent sharp reversal of these trends—the effects of commodity price movements on U.S. inflation merit renewed attention. A study of the contributions of grain and oil prices to the PCE index of inflation suggests that the effects are more modest than one might expect. Moreover, commodity price increases affect relatively few goods prices: Higher crop prices translate narrowly into price hikes for food, tobacco, and gardening supplies; rising oil prices mainly influence fuel, energy, and transportation prices.*

From June 2006 through June 2008, crude petroleum prices increased at an average annual rate of 40 percent, while grain prices grew still faster, at a 62 percent rate. Subsequent months, however, saw a reversal of these trends, with both oil and grain prices falling by 20 percent (60 percent annualized).<sup>1</sup>

To what extent do such swings in the price of these commodities affect the price of the “final” goods bought by U.S. consumers? And how great an impact do the commodity price movements have on an overall measure of U.S. inflation such as the PCE (personal consumption expenditures) index?<sup>2</sup>

In this edition of *Current Issues*, we address these questions in two steps. First, we use data on inter-industry purchases and sales to assess the importance of grains—or more broadly, crops—and oil and natural gas in the production of a variety of personal consumption goods and services. Specifically, we compute the share of the cost

of the final goods and services that is attributable to the output of the oil and farm industries. Second, we calculate the contribution that changes in the price of oil and grains make to PCE inflation, assuming that these changes are fully passed through along every stage in the production process. Although in this second step we focus on the impact of the June 2006-June 2008 commodity price increases on inflation, the effect of the declines in oil and grain prices that started in mid-2008 could be calculated in the same way and should be proportional.

Our findings indicate that crops accounted for about 1.0 percent of the cost of total personal consumption expenditures in 2006, while oil and gas made up 2.8 percent. If we consider only core PCE—personal consumption expenditures excluding food and fuel—then the cost share of crops falls to 0.3 percent and the share of oil and gas declines to 1.4 percent.

As for aggregate price growth, our results suggest that of the 3.2 percent annualized PCE inflation during the June 2006-June 2008 period, 0.4 percentage point can be attributed to crop price increases and 1.1 percentage points to increases in oil and gas prices, for a total of 1.5 percentage points. For core inflation, which was 2.2 percent (annualized), these figures are 0.1 and 0.6, respectively, for a total

<sup>1</sup> All commodity price data refer to U.S. producer prices and are through June 2008.

<sup>2</sup> We focus on the PCE index because it covers a broader set of goods and services than the more widely followed consumer price index.

of 0.7 percentage point. Thus, slightly less than half of the growth of the overall PCE in this period, and slightly less than a third of the growth in the core index, may be attributed to growth in the price of energy and crops.

The contributions of commodities to the rise in the core PCE index are more modest than one might expect—particularly in light of the common perception that rising fuel prices drive inflation in other goods and services. Moreover, our results suggest that commodity price increases affect a limited range of goods prices: Higher crop prices translate narrowly into price hikes for food, tobacco, and gardening supplies, while the influence of rising oil prices is confined largely to fuel, energy, and transportation prices. Hence, if persistent price increases are seen in core consumer goods and services, we can conclude that significant alternative inflationary pressures are at work.

### Commodity Price Increases

Between June 2006 and June 2008—the sample period examined in this study—prices of a broad range of commodities increased to record-high levels. Most notably, grain prices more than doubled and oil prices almost doubled.

Charts 1 and 2 put these trends in historical perspective. Chart 1 shows the prices of grains and crops over a ten-year period. In a pronounced break with their earlier behavior, grain prices rose 163 percent between June 2006 and June 2008. This increase also led to a rise in the price of the broader category of crops, which rose by 95 percent over the sample period. (Box 1 lists the commodities classified as components of crops.)

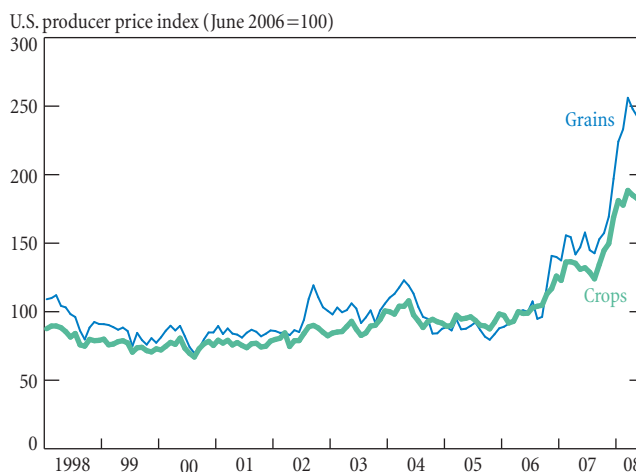
Chart 2 shows the prices of crude petroleum (oil) and natural gas, also over a ten-year period. Oil in June 2008 was more than five times as expensive as it was ten years before. After spiking in the second half of 2005, natural gas prices declined substantially through September 2007.<sup>3</sup> However, between September 2007 and June 2008, prices more than doubled. As a result, natural gas prices were 97 percent higher in June 2008 than they were two years earlier.

Like oil and crops, commodities such as metals experienced substantial price growth in the June 2006-June 2008 period. Indeed, not only were the increases for these individual commodities unprecedented by historical standards, they all occurred at the same time.

There are several possible explanations for the rising commodity prices.<sup>4</sup> One is the depreciation of the U.S. dollar.

<sup>3</sup> The 2005 spike is attributable mainly to the natural gas supply disruptions caused by hurricanes Katrina and Rita. According to Energy and Environmental Analysis, Inc. (2005), 40 percent of U.S. natural gas production occurs in the Gulf Coast region. Katrina and Rita resulted in a temporary 50 percent decline in offshore natural gas production there. Natural gas prices consequently soared in fall 2005 and slowly returned to lower levels when supply stabilized.

Chart 1  
Crop and Grain Prices, January 1998-June 2008



Sources: U.S. Department of Labor, Bureau of Labor Statistics; author's calculations.

Most commodity prices are quoted in dollars. The trade-weighted dollar exchange rate decreased by 11 percent from June 2006 to June 2008.<sup>5</sup> This decline would encourage foreign buyers, whose currencies were worth more in terms of dollars, to pay more U.S. dollars for commodities. A dollar depreciation in principle could therefore help to boost commodity prices. However, the increases in commodity prices through June 2008 were very much larger than the decline in the U.S. dollar exchange rate.

A second explanation is a marked increase in global demand for commodities, driven largely by emerging economies such as China and India. This trend poses a major concern for oil in particular. Johnson, Crawford, and Bunker (2004) describe how world oil consumption since 1990 has outpaced oil discoveries. Such a rise in demand relative to supply would lead to persistent price escalation.

Third, temporary decreases in supply, which are very specific to certain commodities, could account for the upturn in prices. For example, disruptions to the wheat crop in Australia and a number of other regions reduced the 2007 harvest and triggered higher prices. However, this particular reduction in supply is most likely temporary and will probably be offset by increased production in response to current prices. In fact, the Food and Agriculture Organization of the United Nations (2008) forecasts a record output level for cereals for 2008, a 3.8 percent increase from 2007.

<sup>4</sup> Krugman (2008) offers a useful discussion of these explanations. One that is not considered here is a direct link between commodity price movements and longer term inflation expectations.

<sup>5</sup> See the Federal Reserve Bank of St. Louis database FRED (Federal Reserve Economic Data), series DTWEXB, at <<http://research.stlouisfed.org/fred2/>>.

Box 1

### Components of Commodity Aggregates

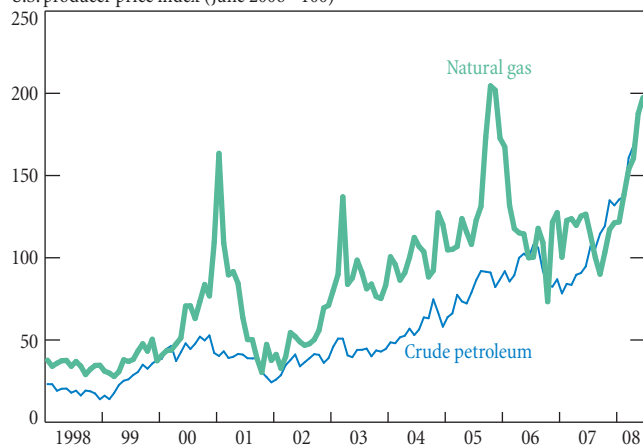
There is no direct match between commodities in the input-output tables used to calculate input shares and commodities in the producer price index (PPI) used to calculate prices. The table below shows the match between commodities that we use to calculate our results.

Input-Output Commodities	PPI Commodities
Crops	Fruits and melons, fresh/dry vegetables, nuts Grains Raw cotton Hay, hayseeds, oilseeds
Oil and gas	Crude petroleum (domestically produced) Natural gas

Chart 2

### Energy Prices, January 1998-June 2008

U.S. producer price index (June 2006=100)



Source: U.S. Department of Labor, Bureau of Labor Statistics.

Finally, increased speculation in the commodities futures markets may have helped to elevate prices. Masters (2008) discusses the growing importance of “index speculators” in these markets, and explains how the growth of their exposure coincided with the 2006-08 run-up in commodity prices.

Regardless of the source, the escalation in commodity prices between June 2006 and June 2008 could clearly affect inflation. We therefore determine the degree to which such price increases accounted for inflationary pressures. As a first step, we assess the importance of commodity prices for the price of final goods, or personal consumption expenditures.

### Commodity Input Shares of Personal Consumption

Consumers do not pay commodity prices directly because they do not buy commodities, such as crude petroleum or wheat, directly. Instead, they buy goods that are produced using commodities as inputs. To what degree commodity price increases lead to consumption price increases depends significantly on the importance of the commodities for the production of goods. Moreover, when one considers the importance of particular inputs for the production of final goods, it is essential to take into account the entire supply chain.

Consider gasoline and oil. For each dollar spent on gasoline in 2006, 40 cents paid for the output produced by oil refineries,<sup>6</sup> 3 cents was attributable to the transportation of gasoline to the gas station, 34 cents was revenue for gasoline wholesalers, and the remaining 23 cents went to the owner of the gas station in the form of profits and to pay for expenses such as operation of the station.

These figures might suggest that crude petroleum made up 40 percent of the price of gasoline in 2006. However, only 51 percent of refinery revenue that year reflected the cost of crude petroleum inputs; the remainder covered the refineries’ labor and equipment costs. The input share of crude oil in gasoline was therefore only about 21 percent.

In addition to the oil inputs from the refineries that supply the gasoline, oil is used to produce the fuel needed to transport the gasoline as well as to produce other inputs used by the refineries and the wholesale, retail, and transportation sectors that contribute to the supply of gasoline. The oil needed for these other inputs makes up about 4.6 percent of the cost of gasoline. Therefore, the total input share of oil in gasoline for all stages of the supply chain is 25.6 percent.

To calculate the input share of commodities in the production of *all* categories of consumption goods, we rely on data on inter-industry purchases and sales in the United States. Specifically, we turn to the widely used 2006 input-output tables compiled by Chentrens (2007) for the Bureau of Labor Statistics (BLS).<sup>7</sup> (Box 2 describes the calculations underlying the commodity input shares.) We consider the inputs in the BLS input-output tables that best match the commodities experiencing large price increases over the June 2006-June 2008 period. Grains are part of crop inputs in the inter-industry accounts; crude petroleum is part of oil and gas.<sup>8</sup>

<sup>6</sup> Oil refineries are part of the industry category petroleum and coal products manufacturing.

<sup>7</sup> These tables are used by the BLS for its employment outlook projections. They also underlie the U.S. KLEMS data set that is often used for industry-level productivity studies (see Jorgenson and Stiroh [2000]).

<sup>8</sup> The fact that the input-output accounts do not treat oil and gas as separate inputs is relevant for the interpretation of some results below.

Box 2

**Calculation of Commodity Input Shares<sup>a</sup>**

From the input-output accounts, we can obtain a commodity-commodity use table that measures the fraction of a dollar of (gross) output of a commodity attributed to the use of the  $n$  different commodities as intermediate inputs. We denote this matrix by  $A$ , where the  $(i,j)^{th}$  element is the fraction of intermediate input shares of commodity  $i$  in the output of commodity  $j$ .

Crop prices and oil and gas prices are gross output prices for these commodities; therefore, we do not want to account for the inputs used in their production. The commodity prices already reflect that fact. Thus, we set the columns of  $A$  associated with crops and with oil and gas equal to zero.

We can also obtain the composition of a dollar of personal consumption expenditures (of different types). We let the column vector  $b$  contain this composition, such that the  $i^{th}$  element of  $b$  is the share of commodity  $i$  in personal consumption expenditures. We define  $r$  as an  $(n \times 1)$ -vector, the  $i$ -th element of which is the input share of commodity  $i$  in personal consumption expenditures. Then we can calculate

$$r = (I_n - A)^{-1}b,$$

where  $I_n$  is an  $(n \times n)$ -identity matrix.

The commodity input shares of crops and oil and gas for the production of personal consumption expenditures are the two elements of  $r$  associated with crops and with oil and gas, respectively. This method of accounting for commodity input shares means that the estimates presented in the text do not include the input share of oil and gas in the production of crops and vice versa.

<sup>a</sup> This discussion does not address the treatment of imports. For the results presented in the text, we treat imports of different commodities as different inputs. We assume that imports of commodities flow through the U.S. economy in much the same way that domestically produced commodities do.

The total input shares of the commodities for different categories of personal consumption expenditures are listed in columns 1 and 2 of the table below.

To understand this methodology fully, consider the 1.00 percent input share of crops in total PCE expenditures: For every dollar of personal consumption expenditures in the United States in 2006, about one cent can be traced back to the cost of crops used at all stages of production along the supply chain. This amount includes the costs of domestically produced and imported crops.

Not surprisingly, crops are most important for the production of food: 5.3 percent of the price of food bought by U.S. consumers in 2006 can be attributed to the crops used in production. Crops are also an input in the production of “other non-durables,” a category that includes tobacco products and flowers, pots, and plants. Overall, however, crops are

used almost solely for food and do not account for any substantial fraction of expenditures in other PCE categories. Indeed, the crops input share for core PCE—consumer expenditures on goods and services other than food and energy—is less than a third of its input share for total PCE: 0.3 percent compared with 1.0 percent.

Also not surprisingly, oil and gas inputs figure importantly in only three PCE categories: gasoline, fuel oil, and other energy goods; utilities in household operations; and transportation. The BLS input-output tables do not treat crude petroleum and natural gas as separate inputs. However, it is likely that crude petroleum is more important for gasoline, fuel oil, and other energy goods and that natural gas is more important for utilities. In any case, oil and gas inputs together do not account for more than 1.5 percent of any of the remaining PCE categories except food. In the aggregate, this results in a 1.4 percent input share for core PCE and a 2.8 percent share for total PCE—suggesting that energy is only about half as important for core inflation as it is for total inflation.

### Contribution of Commodity Prices to Inflation for Different Personal Consumption Expenditure (PCE) Categories

Percent, Except As Noted

PCE Category	Input Share		Percentage Point Contribution to PCE Inflation		Annualized Inflation, June 2006-June 2008 (5)
	Crops (1)	Oil and Gas (2)	Crops (3)	Oil and Gas (4)	
Annualized inflation, June 2006-June 2008 (percent)			39.50	40.10	
Total expenditures	1.00	2.85	0.39	1.14	3.2
Less food and energy	0.31	1.38	0.12	0.56	2.2
Durables	0.11	1.23	0.04	0.49	-1.5
Motor vehicles	0.08	1.19	0.03	0.48	-0.4
Furniture and household equipment	0.13	1.23	0.05	0.49	-4.5
Other durables	0.11	1.28	0.04	0.51	2.1
Non-durables	3.46	5.89	1.37	2.36	4.7
Food	5.27	2.05	2.08	0.82	4.4
Clothing and shoes	0.16	1.02	0.06	0.41	-1.2
Gasoline, fuel oil, and other energy goods	0.11	25.60	0.04	10.28	18.6
Other non-durables	1.94	1.59	0.77	0.64	1.4
Services	0.13	2.19	0.05	0.88	3.4
Housing	0.11	0.87	0.04	0.35	3.2
Household operations	0.10	10.69	0.04	4.29	5.0
Transportation	0.07	2.72	0.03	1.09	3.9
Medical care	0.14	1.44	0.06	0.58	3.0
Recreation	0.28	1.40	0.11	0.56	2.2
Other services	0.10	1.30	0.04	0.52	3.6

Sources: U.S. Department of Labor, Bureau of Labor Statistics; U.S. Department of Commerce, Bureau of Economic Analysis; author's calculations.



Having established the input shares of crops and of oil and gas for different PCE categories, we now consider the amount of PCE inflation attributable to the price increases in these commodities.

### Implications for PCE Inflation

How much would the prices of different PCE categories have risen if the commodity price increases between June 2006 and June 2008 had been fully passed through to consumers via the supply chain? The answer represents the commodity price contribution to PCE inflation. This contribution can be calculated as the input share of a commodity times the percentage increase in the commodity price.<sup>9</sup>

The increase in the price of crops from June 2006 through June 2008 was 39.5 percent (annualized). When we combine crude petroleum and natural gas prices in one price index, we calculate that oil and gas prices increased 40.1 percent (annualized) over the period.<sup>10</sup>

Columns 3 and 4 of our table present the percentage point contributions of crops and oil and gas to PCE inflation from June 2006 to June 2008. For comparison, we report the actual inflation rate for these PCE categories in column 5. As the table shows, crop price increases account for about half of recent food price increases. Moreover, these increases also account for about half of the price increases in the “other non-durables” category, which includes tobacco and gardening supplies.

While it is informative to consider the PCE categories that are most affected by crop prices, more insight can be gained from examining the categories that are only minimally affected. Because crops have a low input share for all PCE categories except food and non-durables, crop price increases do not seem to have a pronounced effect on PCE inflation beyond these two categories.

As a result, crop price increases over our sample period account for only 0.12 percentage point of the observed 2.2 percent annualized rate of core PCE inflation. When one includes food (and energy), the increases account for 0.39 percentage point of the 3.2 percent annualized rate of total PCE inflation.

<sup>9</sup> Technically speaking, this calculation yields the inflation contribution of the commodity in a fixed-weighted Laspeyres price index, with weights based on 2006 inter-industry purchases and sales. The commodity input shares reported in our table are calculated for 2006 input prices. Using these shares as the basis of our analysis implies that the calculations might pick up inflationary pressures that are mitigated by producers substituting away from relatively expensive inputs. In this sense, our analysis is subject to what economists call standard substitution bias, which leads to an overestimation of the contribution of commodity price increases to PCE inflation. See Diewert (2001) for an extensive review of the related price index and index number theory.

<sup>10</sup> This index is based on the 2008 relative weights of crude petroleum and natural gas in the producer price index.

Rising oil and gas prices have a more widespread effect on PCE inflation than do rising crop prices, but even in the case of energy prices, the large inflation contributions are concentrated in just three PCE categories. Energy price increases account for 10.3 percentage points of the 18.6 percent annualized increase in the price of gasoline and related goods from June 2006 to June 2008. They also account for the vast majority (4.3 percentage points out of a total of 5.0 percentage points) of price increases in household operations and a third of the growth in transportation prices.

Beyond these three oil-intensive categories, the 40.1 percent rate of growth of oil and gas prices over the sample period translates into only about a 0.5 percentage point contribution to PCE inflation for most other categories. Overall, oil and gas price increases contributed 1.1 percentage points to the 3.2 percent rate of total PCE inflation during the period and half as much to the 2.2 percent rate of core PCE inflation.

While our focus is on the contributions of commodity prices to PCE inflation over the past two years, we note that the behavior of energy prices has differed from that of food prices over the longer term. Oil and gas prices were already increasing at a much higher rate than PCE inflation over almost all of the last decade; from June 1998 through June 2006, crude petroleum prices rose at a 24 percent annualized rate and natural gas prices climbed at a 14 percent rate. Hence, energy costs were already contributing a substantial amount to PCE inflation before June 2006.

Crop prices, however, followed a different course over the past decade. In the eight years preceding June 2006, they increased at a modest 2.4 percent annualized rate. Their inflation rate thus accelerated by more than 37 percentage points from June 2006 to June 2008.

Combining the effects of crop prices and oil and gas prices, we find that food- and energy-related commodity prices explain 1.5 percentage points of total PCE inflation and 0.7 percentage point of core PCE inflation in the ten-year period examined. In other words, the combined growth in crop and energy prices accounted for a little less than half of the growth of overall PCE inflation in the June 2006-June 2008 period and a little less than a third of the growth in the core index. The difference between these two amounts is approximately equal to the actual difference between total and core PCE inflation since June 2006.

Taking these results at face value, we can derive some simple rules-of-thumb for estimating the inflation effects of a rise in crop and energy prices. First, 10 percent annualized inflation in crop prices accounts for about 0.10 percentage point annualized inflation for total PCE and 0.03 for core PCE. Second, 10 percent annualized inflation in oil prices accounts for 0.29 percentage point of annualized inflation

for total PCE and 0.14 for core PCE. These same rules-of-thumb should apply to the calculation of the inflation effects of a *decline* in crop and energy prices; for example, a 10 percent annualized drop in energy prices should account for a 0.29 percentage point decline in total PCE inflation.

Our results also suggest that commodity prices—and particularly energy prices—are not the controlling force in core inflation dynamics that they are sometimes assumed to be. As we have seen, growth in crop and energy prices accounted for a little less than half of overall PCE inflation in the June 2006-June 2008 period. Moreover, the contributions of these commodity prices to inflation were largely confined to a narrow range of goods and services. Accordingly, very substantial increases observed in PCE inflation beyond food, energy, utilities, and transportation are unlikely to be attributable to grain, soy, oil, or natural gas price increases.

### Other Considerations

Our results provide evidence of the direct effect of commodity price increases passing through to consumer prices. Yet some important issues that could lead to an over- or underestimation of the effect merit attention.

One is the assumption we make about the timing of the pass-through used for our calculations. Specifically, our study assumes that the commodity price increases between June 2006 and June 2008 were fully passed through to PCE prices. Evidence suggests, however, that delays in pass-through from commodity prices to consumer prices differ substantially across goods categories.

The effect of oil prices on consumer prices, especially on the price of gasoline, has been studied extensively. As Brown and Yücel (2000) show, the bulk of oil price increases is reflected in gasoline prices within four weeks. However, oil price declines take several months before they are reflected in consumer prices. Crop price increases affect consumer prices over approximately a year, as the increases attributable to higher crop input prices pass slowly through the U.S. supply chain.

Evidence on delays is also important for assessing the effect of a moderation of commodity prices on PCE inflation. Suppose that crop and oil prices had stabilized at roughly mid-2008 levels. Barring any changes in other inflationary pressures, the results above suggest such a stabilization would reduce total PCE inflation by about 0.7 percent and core PCE inflation by 0.5 percent in 2009 relative to 2007 and 2008.

A second issue concerns the channels through which commodity price increases could indirectly trigger more widespread inflation—for example, by increasing noncommodity factor costs, by affecting profit margins, and by raising import prices.

Factor costs mainly consist of labor compensation costs and capital costs. Since an increase in commodity prices leads to higher consumer prices, it may well work to boost the growth of wages (and, ultimately, labor costs) as workers attempt to maintain their real incomes in the face of a rising cost of living. However, because wage growth has been quite stable over the last few years, this channel has evidently not been operative—although, given the increase in unemployment in 2008, wage growth could conceivably have fallen had commodity price gains not put upward pressure on prices. In terms of capital costs, it is hard to trace any clear conceptual relationship between commodity prices and financing costs or the acquisition costs of capital goods—except for the influence that commodity prices have on the cost of producing capital goods, which is probably quite small.

Profit margins, the second channel, are not likely to rise in response to commodity price increases. The increases in the June 2006-June 2008 period coincided with a slowdown in U.S. economic activity, which has a damping effect on profits.

As for the third channel, import prices, a surge in commodity prices not only leads to price increases in the United States, it is also likely to boost prices of goods produced abroad. Imports of oil and gas, crops, coal, and metal are already included in the commodity input shares reported in the table. We therefore implicitly assume that U.S. producer price increases for commodities closely follow increases in international commodity markets. If commodity prices raise domestic production costs of consumer goods in the United States, they most likely also put upward pressure on the costs of imported goods. Unfortunately, we cannot account for the importance of commodity inputs to the cost of imports in the same way that we can for goods produced in the United States. Such a calculation would require detailed international input-output information that is not available.

We can, however, consider the import share for different PCE categories. Applying a method similar to the one used to determine commodity input shares, we calculate that 9.2 percent of the cost of total PCE in 2006 could be traced back to imported final goods as well as to the imported intermediates used to produce them.<sup>11</sup> Imports contribute mainly to goods PCE rather than to services PCE. If the price of these imports increased at the same rate as PCE prices did in response to surging commodity prices, these commodity effects would have added an effect of about 0.04 percentage point for crop prices and 0.11 percentage point for oil and gas prices to total PCE inflation over the June 2006-June 2008 period.<sup>12</sup> These figures suggest that the effect of commodity

<sup>11</sup> The figure does not include crop and oil and gas imports.

<sup>12</sup> McCarthy (1999) documents that changes in import prices take about two years to affect consumer prices fully.

price increases on PCE inflation through import prices is rather limited.

However, because much energy-intensive manufacturing activity has shifted abroad, it is not unreasonable to assume that U.S. imports are more energy-intensive than domestically produced goods and services. In that case, the effect of commodity prices on U.S. inflation through higher import prices might be more substantial than our informal calculation suggests.

Indeed, in terms of an effect on import prices, the exchange rate is more influential than commodity prices. Because most commodities are traded on international markets in U.S.-dollar-denominated prices, changes in the dollar exchange rate affect commodity prices. Thus, commodity price increases should not be considered independently of exchange rate movements. However, disentangling these factors would require analytical tools that are beyond the scope of our study.

## Conclusion

This article evaluates the importance of commodity price increases for PCE inflation over the June 2006-June 2008 period. Our analysis of the role of commodities in the production process of personal consumption goods and services shows that crops accounted for about 1.0 percent of the cost of inputs needed to produce a dollar of total PCE in 2006; oil and gas accounted for 2.8 percent. Crops represented 0.3 percent of core PCE and oil and gas 1.4 percent.

When we combine our calculations with price data, we find that of the 3.2 percent annualized total PCE inflation from June 2006 to June 2008, 0.4 percentage point can be attributed to crop price increases and 1.1 to rising oil and gas prices. For core PCE inflation, which was 2.2 percent (annualized), the figures are 0.1 and 0.6 percentage point, respectively.

These results reveal that the combined effect of food- and energy-related commodity price increases accounts for almost the entire inflation differential between total PCE and core PCE observed over the period examined. Moreover, our results indicate that the effects of crop and oil price increases

are concentrated in a narrow range of goods prices. Crop price increases mainly affect food inflation; they affect tobacco and gardening supplies slightly. Rising oil prices add primarily to fuel, utility, and transportation prices.

We conclude that increases in PCE inflation beyond food, energy, utilities, and transportation are unlikely to stem from increases in grain, soy, oil, or natural gas prices. If higher prices are observed in core consumer goods and services, other inflationary pressures are undoubtedly at work.

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