President's Message: Energy sector provides important context for broader economy

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It was my pleasure last November to host our annual Energy Conference with President Rob Kaplan and his team at the Federal Reserve Bank of Dallas. Combined, our two Federal Reserve districts serve an area of the central United States that accounts for almost half of the nation's energy production. This area includes the key energy-producing states of Oklahoma, Texas and Wyoming, and accounts for around 60% of U.S. oil and gas production, as well as nearly 60% of the electricity generated by wind power.

Obviously, energy plays an important role in our regional economies and employs a substantial number of workers, but it is also a central component of national economic activity with implications for monetary policy and the environment in which monetary policy operates. It is a direct component of economic output through production, employment and investment in the sector. At the same time, monetary policy, through its effect on interest rates and asset prices, has implications for the energy sector, primarily by shaping aggregate demand, but also through its impact on commodity prices and perhaps the structure of the industry.

Given that the channels linking energy to the overall economy are incredibly complex and wide-ranging, I'll focus on four sectors—manufacturing, agriculture, government finances and consumers—which I believe illustrate the broader point: that an understanding of energy sector developments is essential for understanding economic developments more generally, and therefore give context for monetary policy.

Manufacturing: Natural gas and U.S. comparative advantage

Energy is an important input into manufacturing, and fluctuations in the price and availability of energy have important spillovers for the sector. One aspect of this is how the decline in the price of natural gas relative to oil has boosted the comparative advantage of U.S. manufacturing over the past decade, and how an increase in the relative price of natural gas could unwind that advantage.

As technological advances led to a sharp increase in U.S. natural gas production starting in 2006, the higher supply pushed down the price of natural gas relative to the alternatives and led industries to substitute towards natural gas and away from other energy sources. This was true for utilities, as has been well reported, but also manufacturers. The decline in the relative price of natural gas boosts the competitiveness of U.S. manufacturing, in part because U.S. manufacturers tend to use natural gas more extensively than their foreign competitors, who are often more oil-dependent.

This comparative advantage is apparent in the performance of U.S. exports. From 2006 to 2019, the United States became a leading exporter of gasoline and petroleum products and captured market share around the world. Overall, spillovers from low natural gas prices were likely an important support for U.S. exports in recent years and a contributor to the strength of economic growth.

Recent developments, however, threaten this comparative advantage. This year, benchmark oil prices have declined as natural gas prices have increased, in part as falling U.S. oil production has cut back on the supply of associated natural gas production. The relative price of Henry Hub natural gas to West Texas Intermediate crude oil fell by almost half over the period from 2006 to 2019, but ticked up by almost a third this year. If such a shift in relative prices were to persist, and futures markets suggest that it will, certain U.S. exports are likely to suffer a decline in competitiveness, and the aggregate economy is likely to face an additional headwind as we continue our recovery.

Agriculture: Electric cars don't need ethanol

The agricultural sector is also subject to spillovers from the energy sector, in part because agriculture is an energy-intensive industry, but also even more directly through ethanol. Corn used for ethanol accounts for more than a third of U.S. corn production. For perspective, the acreage devoted to corn destined for ethanol is equivalent to about 50,000 square miles, or two-thirds the area of Nebraska. With demand for ethanol largely dependent on the demand for gasoline, fluctuations in gasoline consumption have important implications for the farm economy. As the pandemic compressed gasoline demand, there were immediate spillovers to the agricultural economy, and demand for ethanol fell off sharply.

In addition to the cyclical linkages, longer-term trends in energy usage also have ramifications for the agricultural sector. As motor vehicles have become more fuel efficient, domestic demand for ethanol has flattened out, even as increased exports have continued to support production. Looking farther ahead, quick advances in the technology around electric vehicles, as well as aggressive government mandates promoting electric vehicles in China and elsewhere, pose further challenges to the long-run outlook for ethanol. Somewhat ironically, the push toward electric vehicles is likely a significant threat to what is currently one of the largest sources of renewable energy in the United States.

Government: Finances under threat

As energy-dependent states well understand, the performance of the energy sector also significantly affects state tax revenues and spending. Although severance taxes only make up around 1% of state tax revenues nationally, they play an outsized role in many energy-dependent states. During the current crisis, most states have faced substantial budget shortfalls as tax collections have fallen in almost every revenue category and pandemic-related government spending has risen. In energy states, sharp drops in severance taxes have exacerbated these pandemic-related budget shortfalls. Thus, state governments in energy states are struggling. Large reserve funds can help to offset some of the decline in tax revenues, but most of these states will also be forced to make spending cuts over the next couple of years, likely creating a further headwind to the recovery.

In the longer term, many state governments in energy states will continue to look for ways to not only diversify their economies, but also to diversify their revenue streams. This will be particularly important for states that rely on revenue from commodities that are expected to face continued downward pressure over the longer term such as coal and natural gas.

Consumers: Are gasoline price shocks a thing of the past?

Historically, particularly following the oil shocks of the 1970s, the most discussed, and perhaps most important, spillover from the energy sector has been the effect of gasoline prices on consumer spending. With households dependent on gasoline for transportation, changes in oil prices have a direct impact on household budgets. Higher gasoline prices decrease the amountthat can be spent on other goods, which can be a drag on consumption and the economy. Similarly, lower gasoline prices boost the resources available to buy other goods and have historically supported consumption.

How important a gasoline price shock is to consumers depends on the share of gasoline in total expenditures. The lower the share of gasoline in total expenditures, the less important and the less likely that a change in gas prices will have a meaningful effect on overall consumption. Over time, the amount of household budgets devoted to gasoline has been falling, from about 4% in the 1980s to only about 2% in 2019, suggesting a declining importance of oil price shocks to overall macroeconomic volatility.

The COVID-19 shock could further loosen the grip of gasoline prices on consumers' budgets and reduce the already lowered sensitivity of consumption to changes in the price at the pump. The pandemic dampened demand for gasoline as the volume of commuting fell off sharply with the rise in unemployment and increase in the number of employees working from home. Gasoline sales in April were off by a third of their pre-pandemic level.

While mobility has increased with the lifting of stay-at-home restrictions, gasoline demand remains well below normal levels, according to the Energy Information Administration and Affinity Solutions. One thing that seems unlikely to ever bounce back fully is the amount of commuting. With many workplaces offering, or likely to offer, increased workplace flexibility, not

only is gasoline demand likely to be lower, but it is also likely to be more elastic. More elastic demand (with the caveat that not all jobs are tele-workable) should lower the volatility of overall consumption in response to gasoline price shocks.

Putting it all together, developments in the energy sector have widespread effects across the economy, both transmitting and amplifying near-term cyclical shifts, but also leading to longer-term structural trends. Energy shapes the context for economic growth and inflation, in both the near-term and long-run, arguing for monetary policymakers to keep a close eye on energy dynamics.
