

Higher Prices: Supply Bottlenecks, Robust Demand, or Both? Lessons from Energy Markets for
the Broader Economy

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The views expressed by the author are her own and do not necessarily reflect those of the Federal Reserve System, its governors, officers or representatives.

Thank you for attending this year's Energy Conference, hosted jointly by the Kansas City and Dallas Federal Reserve Banks. A lot has happened since we convened last November, including the widespread distribution of vaccines and a further reopening of the economy. The virus continues its disruptive presence, though to lesser degree. For the economy, the key development has been a seemingly abrupt transition from a world of demand shortfalls to one of supply constraints. Surging demand over the course of 2021, supported by aggressive fiscal policy and accommodative monetary policy, has pushed on a supply side that continues to suffer pandemic-related disruptions.

The combination of resurgent demand and constrained supply has pushed up prices, both in energy markets and in the broader economy. The price of oil has doubled over the past year, with WTI increasing from about \$40 a barrel to over \$80 a barrel, while domestic natural gas prices have risen almost 150 percent. Aggregate inflation also has picked up significantly, rising to 4.4 percent over the 12 months ending in September, the fastest pace in over 30 years and considerably higher than the 1.1 percent rate recorded last November. While higher energy prices have contributed to this increase, when its impact is excluded, inflation still remains elevated at 3.7 percent.

With increasing prices dominating headlines, the central question confronting economic forecasters and policymakers at the Fed is just how long this elevated inflation will persist. The answer to this question depends fundamentally on how long the current tightness in the economy continues, and, in turn, the outlook for both supply and demand. While movements in energy prices are frequently attributed to supply developments, the importance of supply for broader price movements had been increasingly called into question prior to the pandemic. A long period of lackluster demand growth following the 2008 financial crisis accompanied by muted inflation had taken some emphasis off the role of supply constraints in determining the level of inflation. Just prior to the pandemic, the importance of the relationship between supply and inflation had reached a low point. After decades of viewing the relationship between the unemployment rate and inflation (summarized by the Phillips Curve) as a central constraint on how hot the economy could run without sparking inflation, many questioned the continued relevance of this constraint.

Today, I would like to briefly touch on the price dynamics in both energy markets and the overall economy before considering what lessons the energy market might provide for the

consideration of price dynamics in the overall economy, and then end with some thoughts on the outlook for monetary policy.

Recent Developments

Across a variety of energy commodities, developments in both supply and demand have led to rapid price increases. For oil, a reopening economy has pushed up demand, with global oil consumption rapidly returning to pre-pandemic levels, significantly lifting crude prices. Despite higher prices, U.S. oil producers appear wary to ramp up production on the heels of the collapse in prices early in the pandemic. OPEC has also shown restraint, sticking to previously agreed production quotas, even as prices have climbed. The price moves for natural gas have been even more dramatic, especially in Europe, where low inventories coming off an especially cold winter last year and weak renewable production during the summer coupled with resurgent demand—in part as climate considerations shifted electrical generation away from coal—have led to surging prices.

Likewise, we see the interaction of demand and supply dynamics creating price pressures in the broader economy. Fiscal transfers in the United States have supported incomes and spending. This has been particularly true for goods, as the pandemic led consumers to rotate consumption from in-person services towards purchases for their homes. Strong demand has led to a remarkable increase in prices for durable goods, which rose over 7 percent in the previous 12 months following 25 years of consistent price declines.

Supply disruptions have also contributed to the rise in prices. Notably, shortages of semiconductors have constrained output in a number of industries, including automobiles. Snarled global supply chains have pushed up shipping costs and disrupted the production of a wide variety of goods. Supplier delivery times have slowed dramatically, not only for manufacturers but also for service providers, in part as shipping times from Asia to the West Coast have doubled, and transit costs have skyrocketed. The number of ships waiting to unload at Long Beach has become a commonly cited economic indicator. Inventories have been depleted, with the retail inventory-to-sales ratio running 30 percent below its historic average and at all-time lows.

There are also widespread reports that a lack of available labor is curtailing production in many industries, contributing to kinks in the supply chain and pushing up prices. A number of

indicators point towards a tight labor market. Reported unfilled job openings are at record levels, while the rate at which workers are quitting their jobs, a typical sign of a tight labor market, is at an all-time high. Wage growth has also accelerated, particularly for lower-income hourly workers.

It is important to note that the tightness in the labor market could prove temporary as a sizable number of people, about 5 million, remain out of work relative to before the pandemic. These workers are roughly split between those reporting being unemployed and those who report no longer being in the labor force. Non-college educated women with children represent a large portion of those that have dropped out of the labor force, suggesting that disruptions to childcare remain a barrier to work for many. In particular, daycare capacity appears to have fallen 10 percent relative to pre-pandemic levels. A full recovery of the labor market appears unlikely until childcare normalizes.

Lessons from Energy Markets for the Broader Economy

With the broad economy running into supply constraints to an extent that we have not witnessed for some time, judging the outlook can be particularly challenging. Looking to the experience of energy markets, where supply developments have long been an important component of price fluctuations, we see several lessons that may inform today's experience.

One lesson from the history of oil price movements is that it can be very difficult to disentangle the role of supply versus demand. Prices are determined by the intersection of supply and demand, and the price impact of any particular supply disruption will depend importantly on the underlying strength of demand. The sharp fall in oil prices in 2014 occurred against the backdrop of both a rapid increase in supply associated with the growth of U.S. shale oil production and relatively weak growth in oil demand as the global economy continued its slow recovery from the financial crisis. These two factors interacted to cut the price of WTI in half, from over \$100 a barrel to around \$50 a barrel, over the second half of 2014.

Another lesson from oil markets is that precautionary motives are an important determinant of current demand and prices. News of an actual or perceived supply shortfall can lead to a desire to increase stockpiles, amplifying the price increase from any given supply disruption. For example, the OPEC shocks of the 1970s led to an increase in demand for oil inventories (and full gas tanks) which then helped maintain higher prices. Similarly, in the

broader economy I am hearing anecdotes of firms responding to today's supply challenges by over-ordering and accumulating precautionary inventories of the necessary inputs to production, including semiconductors and steel. As firms attempt to shore up their supply chains and move away from a just-in-time production model, the incentive to carry higher inventories could further support prices across a broad variety of goods.

Lessons for Monetary Policy

This history of energy price movements has informed the conduct of monetary policy. In particular, energy price shocks have played a key role in developing the thinking around how monetary policy should respond to elevated inflation, particularly inflation that appears to arise from supply developments. The oil price shocks in the 1970s, the run up in oil prices in the mid-2000s, and the collapse in prices in 2014 all provide context for how monetary policy should respond to inflation developments with an important supply component. In particular, experience with energy prices has largely formed the basis for arguments that monetary policy should not react to increases in overall inflation driven primarily by supply developments. I would characterize these arguments along two related lines. First, monetary policy should look through temporary increases in inflation. Second, monetary policy should not respond aggressively to increases in inflation resulting from a shift in relative prices.

Along the first dimension, given that it takes some time for changes in the stance of monetary policy to affect inflation, it is often argued that policymakers should look through temporary changes in inflation. It is this argument that led to the creation and widespread usage of measures of core inflation that exclude energy and food prices. Given the frequency of temporary shocks to energy and commodity price inflation that are often attributed to supply, core inflation is likely to offer a better measure of underlying or trend inflation and thus is thought to provide an important guide to monetary policy. This argument was prevalent in 2014 and 2015 when a sharp decline in oil prices pulled down overall inflation, and the Federal Reserve at the time argued that policy should look through this decline on the assumption that the dip was temporary.

Second, there is a large literature suggesting that monetary policy should not respond aggressively to changes in relative prices.¹ The logic is that relative prices serve as important signals that help to reallocate economic resources to sectors that are relatively tight from sectors that have excess slack. Of course, this reallocation could be achieved with offsetting changes in prices, an increase in prices in the tight sectors and a decrease in prices in slack sectors, which, in theory, could leave overall inflation about unchanged. However, in reality, firms in slack sectors have often found that cutting prices, and particularly wages, is difficult. Thus, with incomplete adjustment in slack sectors, relative price changes often end up pushing up overall inflation. Theory suggests it is better for policymakers to accept this increase in inflation, which should be temporary, than to tighten policy and restrict overall activity in an effort to force offsetting price declines in shrinking sectors. This argument was frequently made in the mid-2000s as oil prices rose steadily and lifted overall inflation, due to perceived shifts in supply and demand in the oil sector. Even as higher oil prices contributed to higher overall inflation, it was argued that policymakers should look through this temporary increase in inflation rather than force adjustments on other sectors of the economy.

The Outlook for Monetary Policy

How might these lessons apply today? The timeframe for resolving bottlenecks and the scope of categories reflecting price pressures make the answer to this question less than straightforward.

Disruptions that initially appeared to be temporary bottlenecks driving up prices now look as if they may be more long-lasting, with widespread reports suggesting that supply chains will not recover until well into 2022. Additionally, while in the spring the increase in prices was being driven by select categories of goods and services, more recently the increase in prices has become generalized, and is apparent across a broad swath of the economy. Through May, both the percent of consumer expenditures showing large increases in prices and the percent of expenditures showing large decreases in prices were historically elevated. However, in recent months, prices that had been depressed by the pandemic, including hotel accommodations and airfares, have rebounded, even as prices for goods that have seen price spikes—for example used

¹ Including a paper presented at this year's Jackson Hole Symposium. [Monetary Policy in Times of Structural Reallocation \(kansascityfed.org\)](https://www.kansascityfed.org/monetary-policy-in-times-of-structural-reallocation)

cars, appliances, and furniture—remain elevated. As a consequence, currently 50 percent of an average household's expenditure basket is now experiencing unusually higher prices.

As supply chains heal and demand eases, there is reason to expect inflation will eventually moderate, but it is also clear that the risk of a prolonged period of elevated inflation has increased. The argument for patience in the face of these inflation pressures has diminished.

This week, the Federal Reserve started the process of normalizing the stance of monetary policy by announcing its intention to end asset purchases. The Committee plans to decrease the pace at which it is purchasing Treasury securities by \$10 billion a month and agency mortgage-backed securities by \$5 billion a month, laying out a trajectory for ending these purchases by the middle of next year.

It is important to note that while the pace of asset purchases is slowing, the cumulative effect of these purchases is arguably the more substantive force acting on the economy. Since March of last year, the Federal Reserve has purchased more than \$4 trillion of securities, pushing our total asset holdings to \$8.5 trillion dollars. These asset holdings are depressing longer-term interest rates most relevant for households and businesses and thereby are providing a significant amount of accommodation. And, importantly, this accommodation will persist even when tapering is complete.

As the adjustment of asset purchases gets underway, the focus of attention will naturally shift to the path of the policy rate. Since last December, the Committee has stated that it expects to keep the policy rate near zero until the labor market has reached levels consistent with maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time.

Taken together, monetary policy remains highly accommodative in an economy where inflation is elevated and labor markets have yet to fully recover. With both supply and demand factors clearly at play, the choices for policymakers will be complicated as uncertainty remains high for how temporary or persistent these frictions will prove to be.

In most circumstances, the Federal Reserve's dual mandate objectives for maximum employment and stable prices are in alignment, so that the Fed's policy actions support both objectives simultaneously. There are however times when the objectives can appear to be in conflict. And now might be one of those times with inflation running well ahead of its longer-run average and labor markets appearing to have further room to recover. While the current

economic alignment certainly adds complexity for policymakers, ending asset purchases is an important first step along the path to policy normalization as we balance our long-run objectives and seek to promote sustainable growth and financial stability.