

## ANALYSIS – Economic effects of supply shocks

---

The economy is regularly affected by shocks, that is to say unexpected disruptions. On the supply side, a shock can arise when an unexpected event changes the conditions for producing and selling goods and services within one or more sectors. What effects this has on the economy will depend, for instance, on how large and important the sector is and how easily the shortfall can be replaced. If the shock is expected to be relatively short-lived, there may be motivation for the central bank to ‘see through’ it. But if the shock risks being prolonged, the central bank may need to act to clearly signal that it will not allow inflation to persistently exceed the target level.

---

### **Supply shocks tend to spread problems further**

A supply shock is an unexpected event that changes the scope for producing and supplying certain goods and services. It therefore affects the supply of certain goods and can be positive or negative. This analysis will mostly focus on negative shocks, which reduce the supply in the economy.

The world has recently been hit by several negative supply shocks. In 2020, for instance, a worldwide shortage of semiconductors arose as a consequence of the coronavirus pandemic. This affected a very large number of global industries and resulted in widespread price increases and long delivery times for these goods. Another current example is the war in the Middle East, which during spring 2026 caused a large shortage in the supply of oil, leading to considerable turbulence in commodity markets. One example of a positive supply shock could be when new technology makes it much cheaper to produce a particular product, such as electric cars.

Typically, supply shocks first affect the companies’ production of goods, services or both. Households are directly affected if they themselves buy the goods affected by the supply shocks. They are otherwise indirectly affected when the prices and the supply from companies change. Households were affected directly, for instance, by the shocks in the supply of oil, but indirectly by the shocks leading to the shortage of semiconductors.

Even when a supply shock only affects one or a few sectors, it can have significant spillover effects on the rest of the economy. It is precisely these spillover effects that make supply shocks important to central banks. The way the economy is affected by a supply shock in a specific sector is, in simple terms, due to three things, which are

described below.<sup>10</sup> The first is the economic size of the sector. The second is to what extent the economy can manage to replace the products there is a shortage of. The third is how important the sector is to the economy as a whole. The size of the effects therefore varies substantially between economies.

### **The larger the sector, the greater the effects**

The economic size of the sector can be measured as the size of its sales in relation to GDP.<sup>11</sup> The larger the share of the whole economy the sector represents, the greater the pass-through of shocks in the sector to GDP. But even though it may seem obvious that the size of the sector is important for how large the spread will be, this factor alone is not enough to bring about particularly large effects. The oil sector's sales in relation to GDP, for instance, are on average only a few per cent in many countries, and if it was only a question of the size of the sector, oil price shocks would not have a particularly large impact on the economy. But this contrasts with the widespread turbulence that oil price shocks tend to create in markets, stock exchanges and in the media. This leads us into the other two components.

### **The economy is less flexible in the short term than the long term**

The way that a supply disruption affects the economy as a whole also depends on how easy or difficult it is to adapt to the shortfall of the affected sector's products. The more difficult it is to replace the shortfall from this sector, the larger the pass-through will be to GDP. The pass-through will typically have the greatest effect in the short term, that is, directly after the disruption has occurred. One reason for this is quite simply that disruption often disappear of their own accord relatively quickly, as the causes behind them are often fairly short-lived. Conflicts in economically important regions, which are often peacefully resolved fairly quickly, are a good example of this.

Another reason why the effects are greatest immediately after the disruption is that it has often been unexpected. Companies have not expected it and therefore have not prepared for the shortfall when they made their production plans. In the short term, the economy is often a little rigid, which can make it difficult to adjust: contracts have been signed and it takes time to find new suppliers and change production.

In the slightly longer run, there are several ways to alleviate or even entirely eliminate the effects of the supply disruption. The goods that there is now a shortage of can, for instance, be replaced by other similar goods. Economists talk about substitutability, which is measured with the aid of what is known as the *substitution elasticity* for the product concerned. Substitution can occur in several ways. If a supply disruption in the commodity market only affects certain producers, for instance, the ones that are not affected can in some cases increase their production to compensate for the shortfall. When negative supply disruptions have affected important oil suppliers, for

<sup>10</sup> See D. Baqaee and E. Fahri (2019), "The Macroeconomic Impact of Microeconomic Shocks: Beyond Hulten's Theorem", *Econometrica* 87 (4).

<sup>11</sup> This insight is known as Hulten's theorem, as it was proved by Charles Hulten in 1978. See C. Hulten (1978): "Growth accounting with Intermediate Inputs", *Review of Economic Studies*. 45 (3).

example, Saudi Arabia has on several occasions been able to increase its production to reduce the shortage of oil. This happened during the Kuwait war, which mitigated both the increase in the oil price and the negative effects. But it took around three months to compensate for most of the shortfall. The oil price remained very elevated for a whole nine months, as it was not possible to quickly replace the entire shortfall. This gave rise to lower GDP than would otherwise have been the case.

Another way of substituting is that new producers of the same product, or a variation of it, enter the market. How quickly this can happen varies substantially between sectors, but it will not be able to happen immediately in any case. When the shortage of semiconductors arose, the forecast was that it would take several decades to get production of semiconductors underway in Sweden or Europe.

The economy can also adapt through technological advances. When negative supply shocks reduce the supply of oil and the oil price soars, this increases the incentives to speed up technological developments and, in this way, make the economy less oil-dependent.<sup>12</sup> This leads to more energy-efficient cars and machinery and better opportunities to heat houses. It is partly this technology development that has led to oil intensity – that is, the oil consumed in relation to the size of the economy – being much lower now than it was in the 1970s. Economies are therefore not as sensitive to oil shortages today as they were in the 1970s. A negative supply disruption can therefore entail something positive, but this does not come for free. Increasing energy-efficiency has historically had a cost in terms of lower economic growth during and after periods with disruptions to the oil supply.

### **If more people need the goods the effects are greater**

The third factor that is important for what effects a supply shock will have is how important the affected sector's products are for the economy. A sector with many branches in the economy is classed as more important. The more important a sector is, the greater the impact on GDP when this sector suffers a supply disruption. Disruptions concerning oil and energy differ in principle from all other supply shocks because the sector is so important. As energy and oil are used by all companies and consumers, supply disruptions in this sector can potentially have a large impact on GDP. Goods that are only one other company, for instance an industrial chemical, are less important. Semiconductors are fairly important, but less so than oil.

### **So what do supply disruptions imply for monetary policy?**

For a central bank, a shock on the supply side is more difficult to manage than a demand shock. Monetary policy affects demand in the economy through various transmission mechanisms but cannot solve the problem with the shortfall generated by the supply shock. If monetary policy responds to the higher inflationary pressures

---

<sup>12</sup> See J. Hassler, P. Krusell, and C. Olovsson. 2021, "Directed Technical Change as a Response to Natural-Resource Scarcity", *Journal of Political Economy*, 129 (11).

that supply shocks typically cause, it risks distorting demand.<sup>13</sup> As a negative supply shock also means that activity in the economy declines, a clear trade-off arises for the central bank. If the policy rate is cut to support the economy, there is a risk that inflation will increase further. If the policy rate is instead raised to push down inflation, it will slow down the already low activity in the economy even further.

A further aspect is that the price of many commodities, such as oil and gas, can change rapidly. As described above, changes in commodity prices are often temporary and then do not require any monetary policy measures. Moreover, monetary policy works with a lag, which means that it takes time before it has an impact on inflation and the real economy. The oil price, on the other hand, is relatively flexible, and can in many cases already have fallen back when monetary policy actually begins to have an impact. These arguments indicate that central banks, in cases where the shock is assessed to be short-lived and have a low risk of spillover effects, should 'see through' supply shocks and not react to them.

Even if the supply shocks can correct themselves faster than during the horizon within which monetary policy acts, it is difficult to know in advance whether a supply shock will be short-lived or prolonged. The problem for central banks arises when supply shocks risk becoming prolonged, and the economy's ability to adapt (as described above) is expected to be slow. Then the risk increases that the shock and the price upturn will spread broadly to other prices, to inflation expectations and wages, that is, that indirect effects and secondary effects will arise. As monetary policy acts with a lag, it must therefore be based on forecasts of future economic developments. If the assessment is that the supply shock risks being prolonged and the economy's ability to adapt is low, with increased risk of a broad price upturn, it may thus be motivated for the central bank to act to safeguard the inflation target.

---

<sup>13</sup> Moreover, the price increase that follows on from a supply shock is economically efficient: if the supply of oil falls while demand is unchanged, the price needs to rise for demand to be able to match supply. The supply shock gives rise to a real phenomenon, where the price of the affected product rises to signal an increased shortage.