

Non-technical summary for ‘Sign Restrictions and Supply-demand Decompositions of Inflation’

By Matthew Read

What did I set out to do?

Changes in supply and demand can change the price of a good or service. Typically, an increase in supply causes the price to fall, whereas an increase in demand causes the price to rise. Economists are often interested in estimating how much price changes are driven by supply or demand ‘shocks’. This was a particularly important question following the COVID-19 pandemic and the rise in inflation in many advanced economies – was this due to supply or demand factors? And depending on the answer, how should monetary policy respond?

The contributions of supply and demand shocks can be estimated using econometric models. One popular approach requires making assumptions about how the economy works. One of these assumptions is that supply curves are upward sloping and demand curves are downward sloping (‘sign restrictions’). The appeal of this assumption is that there is general agreement that it is correct. A drawback, though, is that it does not allow us to exactly estimate the contributions of shocks. Instead, it only allows us to say that the contributions lie within a range. Researchers often sidestep this drawback by selecting a single estimate from this range, which raises questions about whether their conclusions would change if they selected a different estimate.

My research aims to clarify what we can learn about the contributions of shocks to price changes when making assumptions about the slopes of supply and demand curves. To do this, I focus on estimating contributions to:

- *the change in prices in each period* – for example, what was the contribution of supply shocks to inflation in the March quarter of 2022?
- *the variance of prices on average over time* – for example, how important were supply shocks for driving unexpected changes in US inflation on average since the 1980s?

I then use this framework to estimate the contributions of supply and demand shocks to US inflation.

What did I learn?

My research reveals two key findings:

1. The strength of the correlation between unexpected changes in prices and quantities is very important in revealing the relative importance of supply and demand shocks. When the correlation is strong, the data reveal the shape of the supply or demand curve, which may allow us to precisely estimate the contributions of shocks. Conversely, when the correlation is weak, a wide range of supply and demand curves could have generated the observed changes in prices and quantities.
2. In the context of US inflation, unexpected changes in prices and quantities are generally weakly correlated, both at the aggregate level and on average across different expenditure categories – meaning little can be learned about whether inflation is driven by supply or demand factors. But there are exceptions (e.g. a strong negative correlation for ‘food produced and consumed on farms’ means that price changes are almost entirely due to supply shocks).

What was my key takeaway?

While assumptions about the slopes of supply and demand curves may seem like an appealing avenue for estimating the importance of supply and demand factors in driving price changes, they often do not yield definitive conclusions. Stronger assumptions are likely required to determine the drivers of price changes.