

Applying Economic Theory to the Pandemic

What do Keynes and the AD-AS model tell us?

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Introduction

Economists have built a lot of economic models to help us understand how the economy works, and what should be done when a variety of problems arise. Policy makers are now facing an entirely new and novel economic crisis, so it makes some sense to look at what economic theory might be able to tell us about the problem, because that in turn might be able to guide us toward an effective policy response to the pandemic. Not all economic models are going to apply in this case, but in general, there appear to be two models that are particularly useful for understanding how to respond to this pandemic. The first one uses the classic model developed by Keynes to describe how depressions can develop and the second uses the model of aggregate demand and aggregate supply (the AD-AS model) to analyze what type of shocks we are currently experiencing as a result of the pandemic.

Applying Keynes

The first model is classic Keynesianism (framed a little differently), where economic fluctuations are largely determined by the interaction of savings and investment. If investment is larger than savings, then the economy gradually grows over time, however, if savings is larger than investment then the economy gradually shrinks over time. If we say, for example, that in this pandemic about 10% of the economy completely shuts down, then this means people are spending about 10% of GDP less on goods and services, which at the beginning means they save an additional 10% of GDP. If, for this example, savings is usually 20% of GDP, and investment is usually 20% of GDP, then savings grows to 30% of GDP. When this happens, savings is higher than investment and the economy begins to shrink.

One of the key insights of Keynes was that even if there is only an initial 10% shock, the fact that savings is higher than investment means the economy will keep shrinking month after month until savings equals investment again. If savings is proportional to income, then in order for savings to become equal to investment at 20% of GDP after it initially rose to 30% of GDP, then the economy needs to shrink to two thirds of its original level in order for it to finally stop contracting. In general then, Keynes tells us that a moderate initial shock of 10% of GDP can easily turn into a massive depression where the economy shrinks by 33%. This is why the joke in economic policy circles is that everyone is Keynesian in a foxhole,(1) where once an economy faces a significant economic shock, the prospect of that moderate shock turning into a major depression overcomes any ideological reluctance to have the government intervene in the economy.

That is in fact exactly what the government should be doing. Keynes tells us that in order to avoid a major depression from a moderate economic shock, the government should start running huge deficits

to offset the gap between savings and investment. If the difference between the two is 10% of GDP, then the government should run deficits worth 10% of GDP. The government should use that money to replace the lost income from the initial rise in savings as completely and as quickly as possible, so that the decline in spending in this month does not lead to a large decline in income the next month, that in turn leads to further declines in future months. This is the way to avoid a major depression.

Applying the AD-AS Model

The second economic model that provides us with some key insights is the model of aggregate demand and aggregate supply (the AD-AS model). This model gives us a graph that looks like a standard demand curve and supply curve except with aggregate put at the front of each label. In this model, there are demand shocks and supply shocks, where declines in demand cause the aggregate demand curve (AD) to shift left, lowering output and lowering prices. In this model, there are also supply shocks, where a decline in supply causes the aggregate supply curve (AS) to shift left, causing output to go down and prices to go up.

The question for economic policymakers then is does this pandemic represent a demand shock or a supply shock? The answer is that it depends on the industry. Clearly, some industries are experiencing a pure demand shock, like oil, where corporations still have no trouble producing the good, but nobody wants to buy it, so less of it is produced and prices go way down. In some cases, though, there are supply shocks, like pork, where people still want to buy pork from the grocery store, but pork processing plants are shut down because of the virus, and pork does not get to the store shelves anymore (at least before President Trump invoked the Defense Production Act to restart pork processing facilities again). This type of shock also reduces output, but in this case, prices go up. Most industries are not going to be as clear cut, where it is going to be a combination of a demand shock and supply shock. Restaurants are likely somewhere in between, where governors are issuing orders that ban them from opening to in house customers (a supply shock) but at the same time nobody wants to go to restaurants for fear of getting the virus (a demand shock). If a demand shock and supply shock are happening at exactly the same time, then production and output of a good goes down, but prices stay approximately the same.

Overall, in theory, we should be able to see if we are seeing more demand shocks or supply shocks from the pandemic by looking at the overall price level. If prices go down overall, then we are seeing more demand shocks, if prices go up overall, then we are seeing more supply shocks. So far, we have seen a massive disruption in output and employment, but only a moderate decline in prices (with the exception of oil),(2) which perhaps means we are largely seeing both a demand shock and a supply shock happening at the same time, but perhaps a bit more weighted towards a demand shock.

If we are seeing a demand shock and a supply shock happening at the same time, then this also teaches us one more key lesson. If both shocks are occurring and we are able to solve one of the problems, this will only lead to a limited increase in production and a corresponding change in price. For example, if Democrats want to pass another big round of stimulus that raises aggregate demand in the economy (beyond say replacing lost income), but still do not do anything about the supply restrictions, then output and employment will go up some, but this will also cause prices to go up, which limits the overall increase in production. At the same time, if Republicans want to unilaterally remove all business restrictions overnight, this could solve the problem of our supply shock and output and employment will

improve as a result, but this effect will also be limited because people will not necessarily want to return to their stores and buy more goods, and business will be forced to lower prices.

The main lesson from the aggregate demand / aggregate supply model then is that we are likely experiencing some pure demand shocks and some pure supply shocks, but that if we really want to improve the economy, we need to solve the demand and supply shocks simultaneously. This way businesses can reopen and people want to spend money at them. The way to do this, of course, is to reduce the infection rate of the virus, so that people are less afraid of getting the disease themselves and policymakers do not need to close businesses anymore. Ultimately then, the solution to the economic problem is fundamentally a public health one, where the best thing we can do to improve output and employment is to get rid of the disease as quickly as possible.

Conclusion

Fortunately, economic theory does have some lessons to provide the decisions makers of today. Keynes tells us that a moderate economic shock can easily turn into a severe depression if governments fail to strongly intervene in the economy, because the economy will keep shrinking until savings equals investment again. That means governments need to take decisive action to replace lost income as quickly as possible for those who lost their job in order to avoid this painful downward spiral. The AD-AS model tells us that we are likely experiencing a variety of different shocks, some pure demand shocks and some pure supply shocks, but that most of the shocks are a combination of the two occurring at precisely the same time. That means if we want to get the economy back to where it was before the pandemic, then we are going to have to solve both problems simultaneously, which will likely have to happen by solving the public health problem at hand and getting rid of the disease as quickly as possible.

End Notes

#1 – This commonly repeated sentiment comes from Nobel Prize Winner Robert Lucas Jr. – “I guess everyone is a Keynesian in a foxhole.” who was quoted by Justin Fox in “Bob Lucas and the comeback of Keynesianism’ published in Time magazine on Oct 28, 2008.

#2 – In April of 2020, the Consumer Price Index declined by 0.8% for all items and by 0.4% for all items excluding food and energy. The large 0.8% one month decline for all goods is quite dramatic, but this primarily reflects the massive decline in oil prices, which more than offset a general increase in food prices that happened the same month. Once oil and food prices are removed from the calculation, then you still get what would be a steep one month decline under normal circumstances, but is relatively moderate given the 16.4% decline in retail sales, and the 14.7% unemployment rate for April.

References

Sly, James. 2020. “Economic Policy During and After a Pandemic.” Unpublished Working Paper, June.