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COVID-19 and the Economy: what are the lessons so far?

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Introduction

It is great to speak at the LSE this morning, which, along with other universities and research centres in the country, has been leading the social science and policy debate on the Covid-19 pandemic.

The scale and nature of the economic shock from Covid have been unlike anything policymakers in this country or in any advanced economy have faced in recent memory. We have had to quickly adapt to a rapidly changing situation, rethinking our assumptions as the data evolved and our understanding improved. That understanding has been guided by interactions with researchers in central banks and universities, who have contributed to a rapidly expanding body of analysis and modelling of Covid and its economic effects.

In my speech today, I will discuss some of the key insights I have taken from this research, and how it has informed my policy views over recent weeks, and will continue to do so as we exit lockdown. I will also touch on some of the many issues we still have to learn, so where more research is most urgently needed.

I will highlight three main points:

- While the existing economic knowledge helped us to think about some aspects of Covid-19, researchers have had to develop a variety of new ways to think about many other aspects. A vast new body of research has sprung up in response to Covid, combining epidemiology with macroeconomics. This is helping answer important policy questions about the interaction of the virus and people's behaviour; its economic effects; and the costs and benefits of different policies.
- Behavioural responses mean that the UK economic outlook will continue to depend on the global and domestic spread of Covid-19. Assuming prevalence gradually falls, my central case forecast is for GDP to follow an interrupted or incomplete 'V-shaped' trajectory, with the first quarterly step-up in Q3.¹ We are already seeing indications of a sharp recovery in purchases that were restricted only because of mandated business closures. But I think that this will be interrupted by continued risk aversion and voluntary social distancing in some sectors, remaining restrictions on activities in others, and in general, by higher unemployment.
- At our June MPC meeting, I thought that on balance and absent additional policy stimulus, demand would remain weaker than supply for some time, generating continuing disinflationary pressures. To counteract those pressures and bring inflation back up towards our 2 per cent target, I voted to loosen monetary policy by expanding the stock of asset purchases by £100 billion. As with the rest of the committee, I remain ready to vote for further action as necessary to support the economy and ensure inflation returns to target.

¹ Whether a recovery looks 'V-shaped' of course depends on the scale: a V-shaped recovery in annual data may look 'U shaped' in monthly figures. The initial step-up in activity is likely to begin in the period after the UK lockdown measures were relaxed.

Past epidemics and crises

As the enormity of Covid's effects on public health started to become clear in early 2020, policymakers had to quickly think through the likely effects on the economy.² A natural place to start was by looking at comparable historical events. These offered a guide to how persistent the economic effects were likely to be, as well as the specific mechanisms through which they would take place. At the same time, all crises are different, and Covid-19 has had economic effects that have not neatly followed any historical precedent.

The global spread of Covid-19 bears some similarities to past health crises, particularly the 1918-1920 flu pandemic. Despite some estimates suggesting that the 1918-1920 flu led to one of the largest economic crises of the century (Barro and Ursúa, 2008), it had been relatively little studied by economists. One partial reason is that it is not straightforward to isolate its effect on the economy, given its occurrence at the end of the First World War.

New studies of the economic impact of the 1918-1920 flu have quickly emerged and helped inform us about the possible persistence and size of the effects of Covid-19 and containment measures imposed. Barro, Ursúa and Weng (2020) found that it led to a sharp decline in output and consumption in those countries affected, with evidence that they did not fully recover, suggesting a persistent effect. Others have looked at differences across cities or regions in lockdowns imposed in 1918-1920, generally finding that these had large effects on activity or employment in the short run, but with conflicting results in the medium-term.³

There are also important differences between the 1918-1920 influenza pandemic and the current situation. The likelihood of deaths from the influenza pandemic was much higher for younger age groups relative to Covid-19. Containment measures also differed. Although lockdowns were commonplace a century ago, they were shorter and less strict than the ones we have just seen, without extensive business shutdowns.⁴ Given these differences, it was also instructive to examine more recent epidemics, even though these were less widespread across countries than Covid-19.

Recent outbreaks that had received attention from economists included those of the coronaviruses SARS in 2002-04 and MERS in 2012, as well as the H1N1 'swine flu' in 2009, and Ebola in 2014.⁵ These epidemics generally resulted in sharp downturns in the countries affected. Although consumption in sectors such as travel and tourism was affected for some time, the recoveries in aggregate output were relatively rapid, resulting in V-shaped trajectories towards the pre-outbreak trend. But these episodes represented a likely lower bound for the effects of Covid-19, given their far more limited global spread and consequently lower number of deaths (Ma, Rogers and Zhou, 2020). The MPC's May *MPR* scenario lay somewhere between

² See Tenreyro (2020a, 2020b, 2020c) for discussion of my views as the crisis evolved.

³ See Corriera, Luck and Verner (2020) and Lilley, Lilley and Rindali (2020) for the US, and Dahl, Hansen and Jensen (2020) for Denmark.

⁴ See Hatchett, Mercher and Lipsitch (2007).

⁵ Assessments of the economic effects include Siu and Wong (2004) and Keogh-Brown and Smith (2008) for SARS, and Ma, Rogers and Zhou (2020) for the other outbreaks.

these extremes – the downturn was more persistent than those after recent epidemics, but less so than after the 1918-20 pandemic.

Although past crises did not provide perfect comparators for the current episode, they were able to inform us about the types of economic channels that were likely to take place. There had also been some efforts to model the macroeconomic effects of public health crises, which could be calibrated to match some of the health consequences of Covid-19 in the UK.⁶ On the supply side, these studies suggested that there were likely to be reductions in labour supply for workers who were self-isolating, sick, or caring for others, in addition to any business closures mandated by the government. Productivity was set to fall in the short-term where changed working practices were less efficient, and in the long-term should any scarring take place due to business failures or higher unemployment. Internationally, we anticipated that the shutdown of supply chains would reduce capacity for production using imported intermediates.

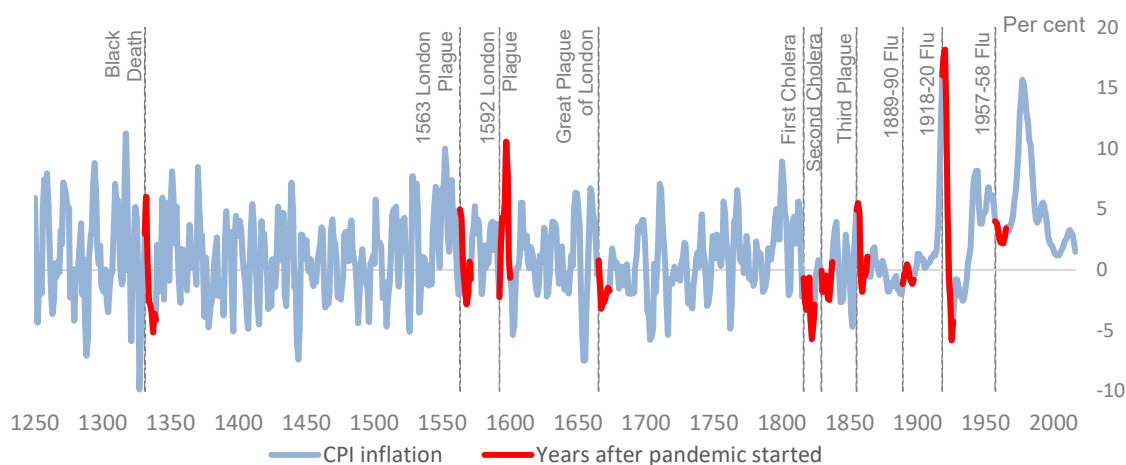
On the demand side, uncertainty and confidence channels were likely to weigh on investment and consumption. Even absent business closures, it was also likely that consumption demand would fall sharply in social-consumption sectors such as tourism, hospitality and live entertainment, as quickly became clear in some of the high-frequency indicators in February and March. The sharp global slowdown was also expected to depress demand for UK exports.

With a range of channels affecting supply and demand, a crucial question for policymakers was whether Covid-19 would generate inflationary or disinflationary pressures. This was difficult to judge purely from historical precedents, for two reasons. First, the balance of demand and supply effects depends on the nature of the health effects and the health policy response, which differ from previous epidemics. The labour supply reduction owing to workers' illness or mortality has been far lower than during the 1918-20 flu, for example, and lockdowns were shorter and less strict.⁷ Second, the effect of past episodes on aggregate demand and inflation depended on the monetary and fiscal policy response and regime at the time. To cleanly identify the effect of the health crisis itself on inflation, we need to control for these responses.

⁶ At the start of the crisis, helpful existing studies included McKibbin and Sidorenko (2006), Keogh-Brown *et al.* (2009), Smith *et al.* (2009), Verikios *et al.* (2016) and McKibbin and Fernando (2020). Since then a large amount of new literature has emerged exploring different aspects of the crisis and its transmission to the economy, as discussed in the remaining sections of the speech.

⁷ On the demand side, precautionary reductions in consumption may have been expected to have been lower than viruses with higher mortality rates, such as SARS or Ebola.

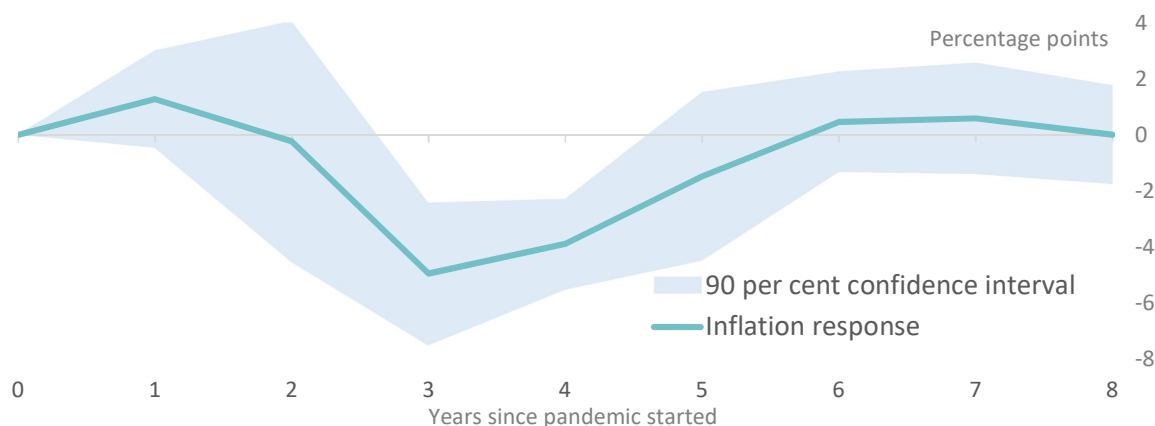
Chart 1: Annual UK CPI inflation, 5 year rolling averages, per cent



Sources: Thomas and Dimsdale (2017); Jordà, Singh and Taylor (2020) and Bank calculations.
Notes: Red lines highlight the first eight years following the start of each pandemic or epidemic.

Those caveats aside, some recent research has attempted to use long-run historical data to assess the impact of past pandemics on key macroeconomic variables. Jordà, Singh and Taylor (2020) use data from pandemics going back to the Black Death to estimate the average impact on equilibrium interest rates. They look at long-run impacts, which should be less susceptible to the impact of monetary policy, and find that pandemics tend to reduce r^* or the equilibrium interest rate. If Covid-19 has the same effect, it would imply lower levels of interest rates than before would be consistent with meeting the inflation target. Forthcoming work by Bank staff, using a similar method, uses historical inflation data from the UK (**Chart 1**) and seven other countries to estimate the response of inflation to pandemics (Bonciani and Braun, forthcoming). The results suggest that these episodes typically led to persistent declines in inflation (**Chart 2**).

Chart 2: Estimated response of inflation to a pandemic across 8 countries



Source: Bonciani and Braun (forthcoming).

Notes: Line represents local projections. Shaded areas are 90 per cent confidence bands. Countries included are the UK, Italy, Germany, France, the Netherlands, Spain, Japan and the USA.

Macroeconomics and epidemiology

As Covid-19 started to exert a massive impact on economies around the world, so economists have responded by directing their research efforts towards its effects. A spate of new papers have added to our standard macroeconomic models some of the key features from basic epidemiological models. These have produced insights into how the health and economic effects of the virus were likely to interact, as well as on the economic costs and benefits of different containment policies.

At their core, modern macroeconomic models contain firms that make decisions on employment, investment and production, and individuals who make two key decisions: how much to work; and how much to spend or save. The canonical (SIR) epidemiological model, simulates the spread of a virus by differentiating between individuals who are susceptible (S), infected (I) and recovered (R) from the illness.⁸ The models include assumptions, of varying degrees of complexity, governing how individuals move between the different virus states. Over the past few months, new ‘Epi-Macro’ papers, influenced especially by Eichenbaum, Rebelo and Trabandt (2020), have married together these two classes of models. In the combined Epi-Macro framework, susceptible individuals consider the risk of becoming infected when choosing how many hours to work and how much to consume. This modelling led to at least two sets of important insights for macroeconomic policymakers.

The first important set of lessons was about the economic effects, costs and benefits of different virus containment policies such as lockdowns. By modelling how individuals would behave absent any health intervention, Eichenbaum, Rebelo and Trabandt (2020) are able to simulate the extra reduction in economic activity from introducing lockdowns. In turn, however, reduced economic activity feeds back into slower spread of the virus. Optimal government policy institutes containment measures that would slow near-term economic output even more, generating a larger recession, in order to reduce virus contagion.

When lockdowns were implemented around the world, the modelling insights suggested that we should view them differently from a normal recession, with some describing them instead as a one-off investment in public health.⁹ As understanding of the virus has improved, other papers have modelled more complex policies, where lockdowns or self-isolation is encouraged or mandated for some industries, age groups, or combined with different testing strategies. See for example Acemoglu *et al.* (2020).¹⁰

The second important lesson was that even absent any public health containment policy, individuals would voluntarily reduce their consumption and restrict labour supply. While the virus was transmitting widely, individuals faced some risk of catching it when consuming (e.g., shopping or attending functions). Assuming the infection risk could not be fully mitigated, one natural response to this, captured by the models, was to

⁸ Kermack and McKendrick (1927).

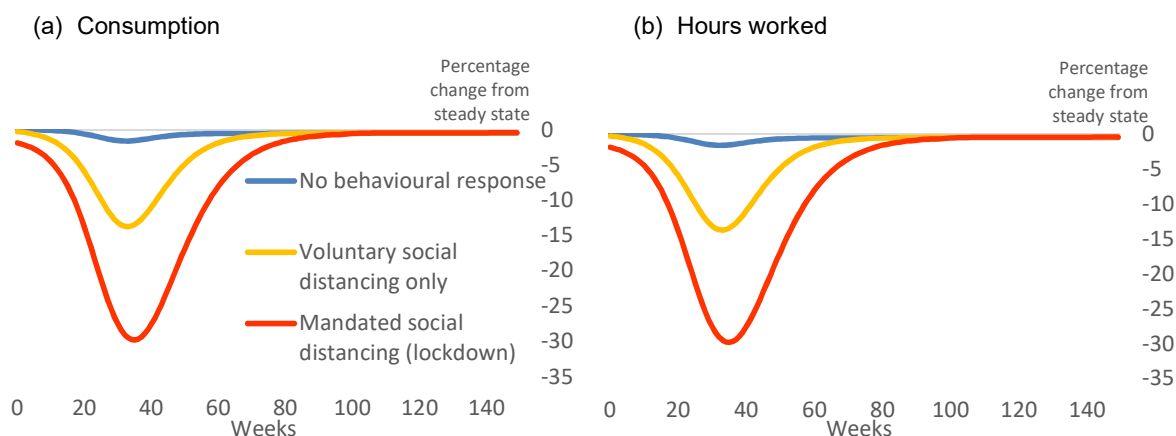
⁹ Bullard (2020).

¹⁰ See also Baqaee *et al.* (2020) and Glover *et al.* (2020).

consume less.¹¹ The MPC included some of this ‘voluntary social distancing’ in the scenario in our May report. The behaviour weighed on consumption and only gradually unwound over 2020 and 2021. In the model, a similar mechanism applies to the labour supply decision, although in reality many workers do not have the same flexibility to vary their working hours as their consumption spending.

Modelling by Bank staff illustrated how voluntary social distancing could affect consumption in the UK (Cantore *et al.*, forthcoming). **Chart 3** shows their simulations of an epidemic, using model similar to Eichenbaum, Rebelo and Trabandt (2020). The blue lines show the case where people continue working and consuming as normal, despite the risk of infection. The red lines simulate what happens with mandated containment measures, such as lockdowns, which lead to a reduction in infections and deaths. And the yellow lines show how the economy responds with no official containment measures, but when people respond to lower their own individual risk. Although stylised, the model simulations suggest that while consumption falls most under an imposed lockdown, a large fraction of the decline may have occurred anyway due to voluntary social distancing, even absent official measures. This scenario also results in fewer infections than with no behavioural response, although more than under a lockdown.¹² The scenarios shown here are V-shaped – by assumption, consumption and hours return to their previous trends. But variants of the model can also explore more persistent voluntary social distancing or scarring effects.

Chart 3: Simulations from stylised ‘Epi-Macro’ model under different behavioural responses



Source: Cantore *et al.* (forthcoming).

The effect of voluntary social distancing has been evident in some of the UK consumption data.¹³ In the run up to the UK lockdown at the end of March, retail footfall and various indicators of social consumption such as restaurant bookings all fell sharply, even though businesses were still open at the time (**Chart 4**). As the lockdown ends, the extent to which this behaviour weighs on consumption again is a key uncertainty for the

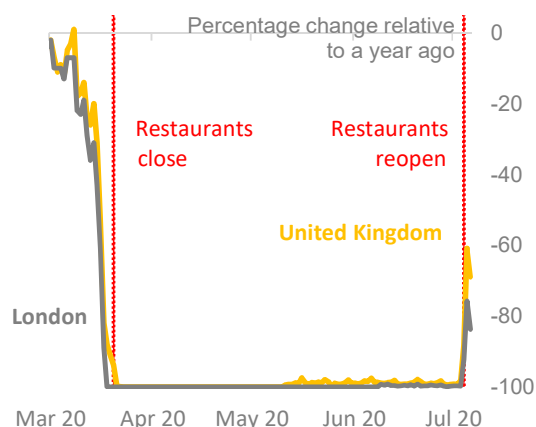
¹¹ Some versions of the models capture the fact that some purchases can still be made online, but for others this is difficult or impossible, as I discussed in Tenreiro (2020c).

¹² See also Céspedes, Chang, and Velasco (2020) for a model of this trade-off.

¹³ It has been less clear that it has had a large effect on the labour market. Average hours worked have fallen to a series low, but evidence from the Bank’s Agents suggest this is due to enforced falls in labour demand, rather than active choices by workers themselves.

MPC. Since lockdown measures have begun to be lifted, we have seen consumption pick up in sectors where risks of catching the virus are small. But even after the reopening of many businesses, the early signs are that social consumption is not recovering as quickly (**Chart 5**). Indeed, even within social spending, the limited pickup so far has been partly down to substitution towards businesses able to offer products that involve less contact.

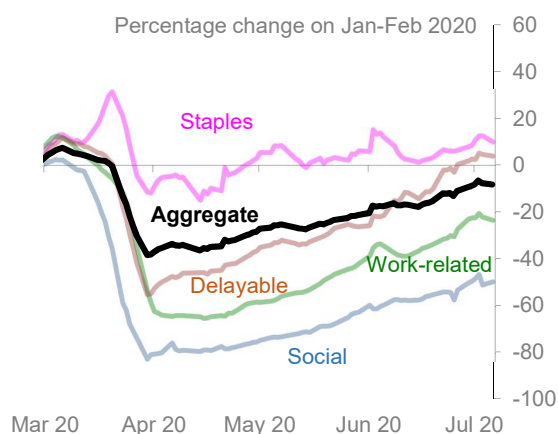
Chart 4: Restaurant bookings



Source: OpenTable.

Notes: Seated diners at restaurants from online, phone and walk-in bookings.

Chart 5: CHAPS spending

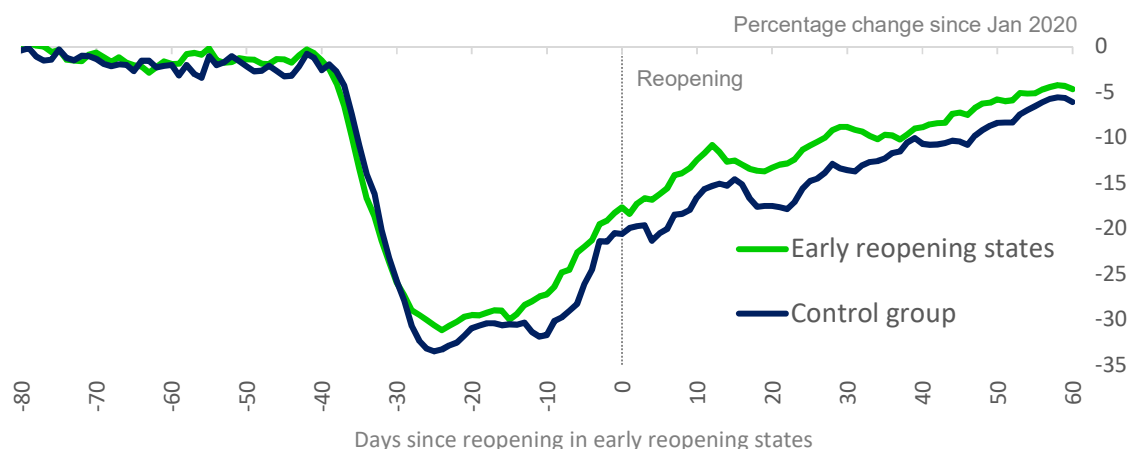


Source: Bank of England and Bank calculations.

Notes: CHAPS data are based on a sample of around 100 UK companies' payments received from their merchant acquirers on a daily basis. These payments reflect the sales that companies make through debit and credit card purchases, which are summed to estimate rolling seven-day revenues. For definitions of the different consumption groups see the May 2020 *MPR*. Data shown to July 8.

Consumer behaviour is difficult to predict, especially in response to extreme or rare events such as the current crisis. Both imposed lockdowns and voluntary social distancing cause reductions in activity, but both are also more likely to take place when Covid 19 is more prevalent in the community. Disentangling these effects is tricky. One useful way of gauging their relative size is to compare across regions, since the virus has spread and lockdowns have been introduced or relaxed at different times in different places. Using US real-time data, Chetty *et al.* (2020) show that consumer spending evolved very similarly in different US states, irrespective of when they decided to lockdown, and whether they decided to reopen (**Chart 6**). Using mobile phone data on US shopping trips, Goolsbee and Syverson (2020) find that legal restrictions explain only around one-tenth of the reduction in retail footfall, with individual choices explaining the vast majority.

Chart 6: Real-time consumer spending data before and after reopening in US states



Source: Chetty *et al.* (2020) and Bank calculations.

Notes: Simple average of seasonally-adjusted percent change in real-time measure of consumer spending in states that partially reopened businesses between April 20th and May 4th and in a matched control group, as identified in Chetty *et al.* (2020).

Covid-19 and distributional issues

One of the most striking aspects of the economic effects of Covid-19 is how uneven they have been. In order to comprehend these effects, we need to understand well its impact on people consuming from, and working in, different industries and occupations. To do so we need to use models with, in the economics jargon, heterogeneity.

In the past, macroeconomic research had been criticised for often assuming away important distributional issues. Fortunately, there has been much progress introducing heterogeneity into macroeconomics over the past couple of decades, partly enabled by advances in computing power, as I previously discussed in a speech in 2018.¹⁴ Entering the Covid-19 crisis, economists were therefore well prepared to explain and predict many of its key effects. I would pick out three areas in which there have been important insights from these literatures.

First, models of multiple sectors told us that although the direct effects of Covid-19 on output were concentrated in some industries, these could lead to large spillovers in other sectors.¹⁵ Even if the initial reduction in output was due to falls in supply, these second-round spillovers would affect aggregate demand, making it likely to fall more than aggregate supply. Guerrieri *et al.* (2020) model this phenomenon explicitly: when there are multiple sectors, reductions in supply in some sectors, for example due to business closures, lead to falls in income for their employees. This causes a subsequent reduction in demand for goods

¹⁴ Tenreyro (2018).

¹⁵ Even within industries, the shock may have heterogeneous impacts on different firms, given their starting balance sheet positions. See van Horen (2020) for a summary of the literature on the factors affecting firms' ability to withstand the shock.

produced in unaffected sectors.¹⁶ The fall in demand can be larger than the initial fall in supply, which is not the case when all sectors are affected equally. In a different setting, Baqaee and Farhi (2020) use a multi-sector model with a detailed input-output structure to present scenarios in which the ‘omnibus of supply and demand shocks’ lead to spillovers across different sectors.¹⁷

In the UK data, we saw sharp enforced falls in consumption during the lockdown, but for most categories of consumption, these have now largely unwound. On the face of it, this might suggest that the spillovers to consumption from falls in income have been small in practice. However for most workers, by far the largest potential fall in income arises if they are made unemployed. And although a great number of workers have unfortunately already lost their jobs, many others have been able to maintain much of their income during the crisis via the government’s Coronavirus Job Retention Scheme. The likelihood of large spillovers to aggregate demand will depend strongly on the outlook for the labour market over the coming quarters.

A second insight relates to the fact that job losses and income reductions are likely to fall disproportionately on low-income households. Since they tend to spend a larger share of their income, this could have greater subsequent effects on spending for those households than if the losses had been spread more equally, even if the implications for aggregate consumption may not be as large. Kaplan, Moll and Violante (2020) model how low income, low wealth households suffer the worst economic consequences from the virus and containment policies. Hacıoglu, Känzig and Surico (2020) present UK data showing that the percentage falls in income have been largest for more economically vulnerable groups.

Chart 7: GDP and remote working by sector, ordered by average weekly earnings



¹⁶ There is also a more direct negative effect if goods in the unaffected sectors are complements with the products in the affected ones.
¹⁷ Baqaee and Farhi (2020) argue, using a quantitative model, that the disinflationary pressures so far in the US data are consistent with a mixture of both aggregate supply and demand shocks. With only supply (demand), more extreme inflation (deflation) would have been likely. Brinca, Duarte and Faria-e-Castro (2020) attempt to empirically identify the balance of labour demand and supply shocks in each sector in the US, and find about two-thirds of the fall in hours were due to falls in labour supply.

Sources: ONS and Bank calculations.

Notes: Left hand panel shows change in monthly GDP between December 2019 and May 2020, for each of the mainly market sectors (A-N, R and S). Right hand panel shows the share of the sector that had ever worked from home in 2019, according to that ONS annual population survey. Sectors are ordered by Average Weekly Earnings including bonuses in the April 2020 Labour Market Statistics.

The reasons low-income households have been more affected relate to some of the other distributional issues. Many service-sector industries, such as hospitality, where the risk of spreading Covid-19 is thought to be higher, are also relatively low wage. Since these industries have faced stronger imposed or voluntary social distancing measures, they have generally suffered greater than average losses in output from the Covid crisis (**Chart 7**). These have also been the industries where firms have furloughed the largest shares of their employees using the Coronavirus Job Retention Scheme. Some of the worst hit sectors are those in which working from home is difficult or impossible, which is likely to have amplified some of the disparities (**Chart 7**). They are also sectors with higher female employment shares, which may lead to greater job losses among women than men.¹⁸

A third important distributional concern in the current crisis arises because Covid-19 leads to quite different health outcomes for different age-groups. These differences need to be taken into account when considering the amount of voluntary social distancing that is likely to take place. For example, younger age groups are likely to cut consumption less than older ones if they take into account their lower risks from the virus. This might reduce the amount of voluntary social distancing, and therefore increase the incremental impact of lockdowns on spending. Several papers have also suggested that a better balance between maintaining economic activity and reducing the spread of the virus may be possible with containment measures and incentives targeted by age.¹⁹ For example, Argente, Hsieh and Lee (2020) find that in South Korea, policies that disclosed detailed location data of Covid cases reduced foot traffic in neighbourhoods in which they lived or had travelled.²⁰ Using these findings in their SIR model suggests that such policies could reduce case numbers with a lower economic cost than lockdowns, although this must be weighed against costs from loss of privacy. The economic gains come from encouraging self-selection into voluntary social distancing among demographics and in locations where risks are highest.

Outstanding issues

Drawing on the latest economic research, policymakers have learnt a great deal about the effects of Covid-19 over the past few months. But there remain many uncertainties and unanswered questions.²¹ Making progress towards answering them will likely be a two-way process, with policymakers taking lessons from the latest research, and researchers learning from practical policy decisions and their impact. There are a few areas where I think we still have much to learn, and which in my view should be a near-term priority.

¹⁸ See Alon *et al.* (2020), who also discuss how women appear to have been disproportionately affected given higher demands in the household, including childcare and home schooling. They also suggest that there may be some offsetting longer-term effects that promote gender equality, such as a shift towards more flexible work arrangements.

¹⁹ Acemoglu *et al.* (2020) and Glover *et al.* (2020).

²⁰ Location data was collected from contact tracing, as well as mobile phone and credit card records.

²¹ These questions relate not only to the economics of Covid, but also to the epidemiology of the virus, on which the economic effects will depend.

Many of the macroeconomic studies I have discussed have been theoretical, but as the data comes in, we will need to continue to test and validate different hypotheses. By necessity, the initial findings on Covid-19 came largely from modelling work, as well as insights from similar historical episodes. Since official data are published with a lag, economists and statisticians also quickly adapted, making use of new real-time data sources.²² As the data continue to come in, it will be essential to keep devising empirical strategies to identify the effects of the virus and improve our understanding of different containment measures.

Interpretation of the aggregate data will be complicated by various practical and conceptual difficulties. Standard empirical techniques for analysing and forecasting macroeconomic time series may become less appropriate in the face of such extreme movements in the data, although economists are already coming up with ways to address these challenges.²³ On the data side, I have previously discussed the many difficulties affecting CPI inflation measurement and interpretation.²⁴ Elsewhere, data on average wages and productivity will be skewed by large compositional effects, since layoffs are likely to be concentrated in low-wage sectors with low measured productivity.

For monetary policymakers, one of the most important issues to understand will be any changes in the transmission of policy brought about by Covid-19. We already know that the role of monetary policy in meeting the remit was quite different from usual during the lockdown period. With many businesses closed owing to public health policy, no amount of expansionary monetary policy could boost activity in those sectors. An unusually large part of the transmission of interest-rate policy was instead aimed at mitigating cash-flow difficulties by lowering borrowing costs and providing liquidity.

As the economy opens up, we will need to understand the extent to which monetary (as well as fiscal) policy is still able to boost demand as normal. Even as legal restrictions on businesses are removed, it may be that voluntary social distancing hinders the ability of policy to increase activity in some sectors, and potentially in aggregate. Guerrieri *et al.* (2020) and Baqaee and Farhi (2020) both find that aggregate demand policy injects less stimulus than usual after negative sectoral shocks in their models. My own conjecture is that some of the sectoral changes we are seeing could limit the usefulness of empirical estimates of the aggregate transmission mechanism, including relationships such as the aggregate Phillips curve.

A closely related question is what, in an ideal world, optimal economic policy *should* do. For the MPC, the answer is straightforward – we will strive to meet our mandate by achieving the 2 per cent inflation target. For broader economic policy, research can tell us, in the context of an economic model with given assumptions on societal preferences, what might be optimal for welfare. The answers may depend on whether some of the changes in behaviour and attitudes toward risk that we have seen are temporary or permanent. If transitory, policies that return the economy as close as possible to its pre-crisis path may be preferable. If permanent, then policies will instead need to facilitate the transition to new patterns of demand and supply.

²² See the recent speech by Haldane (2020) and references therein.

²³ See Lenza and Primiceri (2020) and Primiceri and Tambalotti (2020), for example.

²⁴ Tenreiro (2020c).

The current outlook

Turning back to monetary policy, the challenge for the MPC is to assess how Covid-19, the lockdown, and its subsequent easing will interact to determine the outlook for demand, supply and inflation. The MPC will be publishing its collective view in August, but ahead of that, I would like to set out my own thinking, including the reasons behind my vote in June to expand our asset purchase programme by a further £100 billion.

The latest monthly GDP data suggest we are on track for a reduction of nearly 25% in 2020 Q2, relative to the 2019 Q4 peak. This still looks to be less severe than in the illustrative scenario the MPC published in May, but I do not read too much into the precise figure – neither its absolute weakness, nor the downside surprise in the latest monthly data. Activity was extraordinarily weak during the lockdown, but a large part of this was a direct consequence of business closures and other public health restrictions. The scale of the GDP fall largely reflects the timing and the extent of lockdown measures, and the same will be true for the initial step in the recovery in output as businesses reopen. For purchases that were constrained only by the lockdown, we should initially see a relatively ‘V-shaped’ jump in activity beginning in Q3.

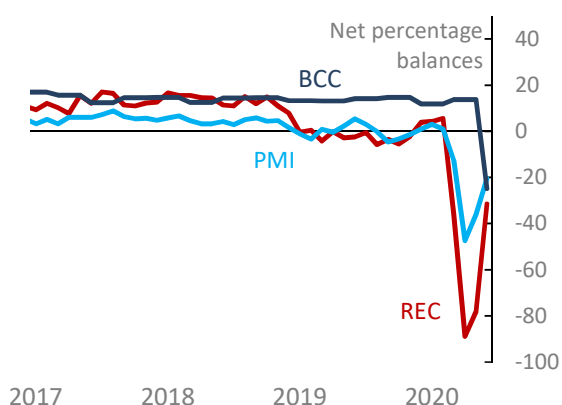
The key uncertainty is how much the ‘V’ will be interrupted by other factors weighing on demand and supply. Two near-term ones stand out. First, the possible feedback from higher unemployment, particularly in some badly affected sectors, to lower aggregate demand, and if persistent, to lead to greater scarring. Second, effects of voluntary or mandated social distancing on demand and supply in social consumption sectors.

The imminent rise in the unemployment rate was not yet visible in the official labour market data for April, but more timely indicators suggest it will soon be visible in the headline numbers. Vacancies have dried up and the employment survey balances are consistent with a sharp fall in employment in the rest of Q2, even if they cannot reliably inform us about its scale (**Chart 8**). Higher unemployment in some sectors is likely to feed in to lower demand for goods and services produced in others, especially if layoffs are concentrated in households less able to borrow to continue spending. Unemployment would already be far higher if it were not for the sizeable uptake of the Coronavirus Job Retention Scheme. But the latest indications from the Bank’s Agents suggested a further risk that many furloughed workers would not be reabsorbed into employment as the scheme is wound down. Recent large-scale redundancy announcements are consistent with this, although the new Job Retention Bonus may mitigate the risk for some workers.

The persistence of higher unemployment will partly depend on how long voluntary and mandated social distancing weigh on activity. On the demand side, as the lockdown is eased, I expect voluntary social distancing to continue to drag on consumption in sectors where the perceived risk of spreading Covid-19 remains high, such as hospitality and travel. Recent survey data suggests a majority of people would still be uncomfortable going to indoor restaurants or cinemas, for example (**Chart 9**). For goods and services involving social interaction, evidence from other countries suggests that a key determinant will be the actual prevalence of the virus. The effects of voluntary social distancing will therefore depend on whether case

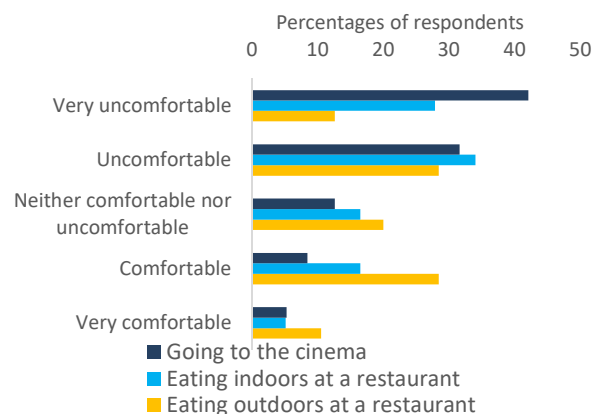
numbers continue to decline. Assuming they do, there is still likely to be some lag between confirmed cases and perceived risks, although behaviour could also be affected by recent fiscal measures to boost social consumption spending. On the supply side, there could be negative effects on productivity in some occupations. These could stem from mandated social distancing, which may reduce the amount that can be produced in a given space; or from remote working being less efficient for some workers.²⁵

Chart 8: Employment survey balances



Source: BCC, IHS Markit/CIPS, KPMG/REC *Report on Jobs* and Bank calculations.
 Notes: BCC (employment expectations over the next three months), IHS Markit/CIPS (PMI composite employment index) and KPMG/REC (index of demand for new staff). All series are monthly, except BCC which is quarterly.

Chart 9: Survey on going to restaurants/cinemas



Source: ONS.
 Notes: Survey taken July 2 to July 5. Question: At this time, how comfortable or uncomfortable would you be about eating indoors at a restaurant?

On balance, these uncertainties suggest to me considerable downside risks for demand relative to supply. The global outlook remains weak, given the continued spread of the virus around the world and especially its resurgence in the US. This global picture, together with significant uncertainty and a subdued outlook for consumption will all serve to drag on business investment. Last but not least, the risk of a second wave domestically or abroad brings additional uncertainty into the outlook. Highly supportive fiscal policy will make government spending the main offsetting component of GDP.

Putting this demand outlook together with the pre-existing weakness in core inflation, we are likely to see disinflationary pressures for some time. Headline inflation will continue to weaken in the near term, given a continuing sizeable impact from lower energy prices, and a negative contribution from the recent cut in VAT. Although these effects on headline inflation should prove temporary, in order to use up spare capacity and bring inflation back to target, policy needs to continue to support aggregate demand through the crisis. This should also benefit the supply-side of the economy, by acting to offset business failures and persistently high unemployment, which would ultimately feed through into lower potential output. Although fiscal policy is providing significant support to the economy and to individual workers and sectors, monetary policy also has a role to play to try to maintain aggregate demand in line with supply and ensure price stability.

²⁵ See Haskel (2020) for a detailed discussion of this point, also suggested in Tenreyro (2020c) and in the May *MPR*.

In June I therefore voted with the majority of the MPC to increase our stock of asset purchases. Lower gilt yields and higher asset prices induced by QE will lead to some aggregate demand stimulus, although the low prevailing level of the yield curve may reduce the impact somewhat, relative to some of the MPC's previous asset purchase announcements. As with the rest of the committee, I remain ready to vote for further action as necessary to support the economy and ensure inflation returns to target.

References

Acemoglu, D, V Chernozhukov, I Werning and M D Whinston (2020), “Optimal Targeted Lockdowns in a Multi-Group SIR Model,” *NBER Working Paper No. 27102*.

Alon, T M, M Doepke, J Olmstead-Rumsey and M Tertilt (2020), “The Impact of COVID-19 on Gender Equality,” *NBER Working Paper No. 26947*.

Argente, D O, C-T Hsieh and M Lee (2020), “The Cost of Privacy: Welfare Effect of the Disclosure of COVID-19 Cases,” *NBER Working Paper No. 27220*.

Baqae, D and E Farhi (2020), “Nonlinear Production Networks with an Application to the Covid-19 Crisis,” *NBER Working Paper No. 27281*.

Baqae, D, E Farhi, M Mina and J Stock (2020), “Evaluating the economics and epidemiology strategies for reopening the economy,” Harvard University Working Paper.

Barro, R and Jose F Ursúa (2008), “Macroeconomic Crises since 1870,” *Brookings Papers on Economic Activity*, vol. 39, pp. 255-350.

Barro, R, Jose F Ursúa and J Weng (2020), “The Coronavirus and the Great Influenza Pandemic: Lessons from the “Spanish Flu” for the Coronavirus’s Potential Effects on Mortality and Economic Activity,” *NBER Working Paper No. 26866*.

Brinca, P, J B Duarte and M Faria-e-Castro (2020), “Measuring Sectoral Supply and Demand Shocks During COVID-19,” *FRB St. Louis Working Paper No. 2020-011*.

Boncini, D and R Braun (forthcoming), forthcoming Bank Underground Post.

Bullard, J (2020), Interview with Bloomberg, available at <https://www.bloomberg.com/news/articles/2020-03-22/fed-s-bullard-says-u-s-jobless-rate-may-soar-to-30-in-2q>.

Cantore, C, F Di Pace, R Masolo and S Miranda-Agrippino (forthcoming), forthcoming working paper.

Céspedes, L F, R Chang, and A Vélasco (2020), “Macroeconomic Policy Responses to a Pandemic”, Working Paper.

Chetty, R, J N Friedman, N Hendren, M Stepner and The Opportunity Insights Team (2020), “How Did COVID-19 and Stabilization Policies Affect Spending and Employment? A New Real-Time Economic Tracker Based on Private Sector Data,” *NBER Working Paper No. 27431*.

Correia, S, S Luck and E Verner (2020), “Pandemics Depress the Economy, Public Health Interventions Do Not: Evidence from the 1918 Flu,” Working Paper.

Dahl, C M, C W Hansen and P S Jensen (2020), “The 1918 epidemic and a V-shaped recession: Evidence from municipal income data,” CEPR Covid Economics.

Eichenbaum, M, S Rebelo and M Trabandt (2020), “The macroeconomics of epidemics,” *NBER Working Paper No. 26882*.

Glover, A, J Heathcote, D Krueger, JV Rios-Rull (2020), “Health versus wealth: On the distributional effects of controlling a pandemic,” *NBER Working Paper No. 27046*.

Goolsbee, A and C Syverson (2020), “Fear, Lockdown, and Diversion: Comparing Drivers of Pandemic Economic Decline 2020,” *NBER Working Paper No. 27432*.

Guerrieri, V, G Lorenzoni, L Straub and I Werning (2020), “Macroeconomic Implications of COVID-19: Can Negative Supply Shocks Cause Demand Shortages?” *NBER Working Paper No. 26918*.

Hacioglu, S, D Känzig and P Surico (2020), "Consumption in the time of Covid-19: Evidence from UK Transaction Data," CEPR Discussion Paper No. 14733.

Haldane, A (2020), "The second quarter," speech delivered online, available at <https://www.bankofengland.co.uk/speech/2020/andy-haldane-the-second-quarter-webinar>

Haskel, J (2020), "Remarks on Covid-19 and Monetary Policy," speech hosted by the Brighton Chamber of Commerce via Zoom, available at <https://www.bankofengland.co.uk/speech/2020/jonathan-haskel-brighton-hove-chamber-of-commerce>

Hatchett, R J, C E Mecher and M Lipsitch (2007), "Public health interventions and epidemic intensity during the 1918 influenza pandemic," *Proceedings of the National Academy of Sciences of the United States of America*, vol. 104, no. 18.

Kaplan, G, B Moll and G Violante (2020), "Pandemics according to HANK," Working Paper.

Kermack, W O and A G McKendrick (1927), "A Contribution to the Mathematical Theory of Epidemics," *Proceedings of the Royal Society of London*, series A, vol. 115, no. 772.

Keogh-Brown, M R and R D Smith (2008), "The economic impact of SARS: how does the reality match the predictions?" *Health Policy*, vol.88, no. 1.

Keogh-Brown M, S Wren-Lewis, W J Edmund, P Beutels and R D Smith (2009), "The Possible Macroeconomic Impact on the Economy of an Influenza Pandemic," University of Oxford Department of Economics Discussion Paper Series No. 431.

Jordà, O, S R Singh and A M Taylor (2020), "Longer-run Economic Consequences of Pandemics," *NBER Working Paper No. 26934*.

Lenza, M and G Primiceri (2020), "How to Estimate a VAR after March 2020," Working Paper.

Lilley, A, M, Lilley and G Rinaldi (2020), "Public health interventions and economic growth: Revising the Spanish flu evidence," Working Paper.

Ma, C, J H Rogers and S Zhou (2020), "Modern Pandemics: Recession and Recovery," Working Paper.

Markel, H, H B Lipman and A Navarro (2007), "Nonpharmaceutical Interventions Implemented by US Cities During the 1918-1919 Influenza Pandemic," *JAMA*.

McKibbin W and R Fernando (2020), "The Global Macroeconomic Impacts of COVID-19: Seven Scenarios," Working Paper.

McKibbin and A Siderenko (2006), "Global Macroeconomic Consequences of Pandemic Influenza," Working Paper.

Primiceri, G and A Tambalotti (2020), "Macroeconomic Forecasting in the Time of COVID-19," Working Paper.

Siu, A and R Wong (2004), "Economic Impact of SARS: The Case of Hong Kong," *Asian Economic Papers*, vol. 3, no. 1.

Smith, R D, M R Keogh-Brown, T Barnett and J Tait (2009), "The economy-wide impact of pandemic influenza on the UK: a computable general equilibrium modelling experiment," *BMJ* 339:b4571.

Tenreyro, S (2018), "Models in macroeconomics" speech delivered at the University of Surrey.

Tenreyro, S (2020a), Remarks given at a panel discussion at the 2020 US Monetary Policy Forum, available at <https://www.chicagobooth.edu/-/media/research/igm/events/usmpf/2020/silvana-tenreyro-remarks-for-2020-mpf-panel.pdf>.

Tenreyro, S (2020b), Annual Report for the Treasury select Committee, available at <https://www.bankofengland.co.uk/news/2020/march/silvana-tenreyro-annual-report>.

Tenreyro, S (2020c), "Monetary Policy during pandemics: inflation before, during and after Covid-19," speech delivered online.

Thomas, R and N Dimsdale (2017), "A Millennium of UK Data", Bank of England OBRA dataset, available at <http://www.bankofengland.co.uk/research/Pages/onebank/threecenturies.aspx>

van Horen, N (2020), "Covid-19 Briefing: Corporate Balance Sheets", Bank Underground post, available at <https://bankunderground.co.uk/2020/06/09/covid-19-briefing-corporate-balance-sheets/>

Verikios, G, M Sullivan, P Stojanosvski, J Giesecke and G Woo (2016), "Assessing Regional Risks From Pandemic Influenza: A Scenario Analysis," *The World Economy*.