



BANK OF ENGLAND

Speech

Monetary policy during pandemics: inflation before, during and after Covid-19

Speech given by

Silvana Tenreyro, External Member of the Monetary Policy Committee

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Introduction

Good afternoon and welcome to my first webinar speech as an MPC member. As we all know, I am giving this speech virtually because we are in the midst of a global health crisis triggered by the Covid-19 pandemic. Just like many others in the country who are able to, the MPC is now carrying out its responsibilities remotely.

I will use this speech to discuss three topics:

- First, the likely effects of Covid-19 on the global and the UK economy. The data we have so far suggest that the drop in aggregate spending already taking place will be extremely large. This is partly by design: to safeguard public health and long-run prosperity, governments around the world have temporarily closed some sectors of the economy and limited consumption and production. Given the nature of the shock, the effects are likely to be highly heterogeneous across different sectors and occupations.
- Second, the policy response of the MPC, which makes up just one part of a much broader economic policy response by the Bank and by the government. Consistent with our remit, the aim of our policy actions has been to ensure that the economic effects prove temporary, by minimising business failures and job losses that could cause a lasting reduction in the supply capacity of the economy. Our policy changes should also help to support demand in sectors of the economy still operating, and help offset any persistent negative effects on demand.
- Third, inflation. The MPC's policy decisions are framed by its primary objective of price stability, defined as the 2% CPI inflation target. During Covid-19, large, temporary changes in relative prices and consumption expenditure shares will make inflation data difficult to interpret. We may be able to learn more about how inflation will evolve after Covid-19 by better understanding the behaviour of inflation before the crisis started. I put forward some explanations for subdued price inflation despite strong unit labour cost growth in the period before Covid-19. These relate to structural changes in the economy that might be accelerated by current developments. Current policy actions will help counterbalance some of this underlying weakness in inflation.

Recent developments in the economy

In a short space of time, Covid-19 and its spread around the world have moved from a potential risk to the dominating issue at home and abroad. The virus and the required containment policies have been driving movements in financial markets, as well as almost every decision for households and businesses.

Although we do not yet have data on the overall size of the impact, we have a good understanding of the multitude of ways in which the pandemic is already affecting the economy. One difficulty in predicting the

exact scale lies in assessing the combined effects of the many new policies to both contain and offset some aspects of the shock. But as time progresses, we are increasingly seeing the effects start to appear in more of our key economic data, as well as in additional high-frequency indicators that are being produced by colleagues at the Bank and by the ONS.¹

As occurs following many shocks to the global economy, the effects of Covid-19 appeared early on in forward-looking financial markets. There have been record moves in a range of financial markets and a sharp increase in volatility, and for a period, some disruption in market functioning. Risky asset prices have tumbled globally as profit expectations have been cut and, for some companies, default probabilities have risen. Unlike in 2008, the banking sector has not been disproportionately affected, partly reflecting actions taken by the FPC since then to enhance the resilience of the UK financial system.² As a result, we have not seen the sharp reductions in credit supply we saw during the financial crisis. But increases in corporate bond spreads and falls in collateral values are nonetheless feeding through into some reduction in credit provision.

The virus and containment policies have had a range of effects on supply and demand in the economy, on a massive scale. Work and consumption have ceased in a number of sectors given new public health measures, and have been scaled back in many others. This will directly impact supply and demand for these sectors. These falls in activity are partly by design, of course, given necessary public health measures.³

Some economists have debated the extent to which these effects constitute a reduction in each of supply or demand. The reality is that both are likely to fall sharply in affected sectors. Indeed, not even the triggering shock could be characterised as pure supply or pure demand. The closure of businesses could be considered a fall in supply, as it lowers hours worked and output for those firms, even if consumers would have otherwise continued buying their products. But it seems likely that even without restrictions, demand would also have fallen sharply, or even stopped completely, in many social consumption sectors, given the increased risk of Covid-19 transmission. Indeed, the fall in demand was clear in high-frequency indicators such as restaurant bookings and retail footfall, which fell sharply even before the government's decision to close restaurants and shops. Independently of how one classifies the triggering shock, the channels can affect both supply and demand.

Given the scale of the shock, it will not be possible to avoid further consequences for the economy. There will be a fall in employment where businesses fail or workers are made redundant. These occurrences should be ameliorated by the policy measures that have been put in place, but will not be prevented in full. The fall in output in the most affected sectors will be amplified by losses in income and increases in uncertainty for many other sectors not directly affected. Falls in activity across the world, and the associated

¹ See ONS: [Coronavirus, the UK economy and society, faster indicators: 16 April 2020](#).

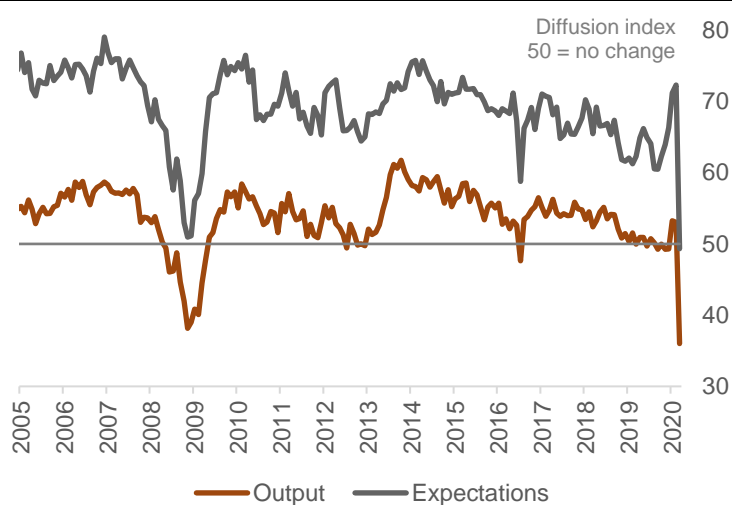
² As set out in the FPC statement released on 9 April, with Tier 1 capital levels more than three times higher than at the start of the global financial crisis major UK banks have shown in repeated stress tests their ability to absorb, by using their capital buffers, very severe market shocks and UK and global recessions more severe than the financial crisis.

³ Eichenbaum *et al* (2020) present an economic model where a sharp slowdown in GDP is optimal given the public health benefits of containment policies. Taking a slightly different perspective, Bullard (2020) has suggested that the expected reduction in US GDP should be described as an investment in public health, rather than a normal recession.

breakdown of supply and demand chains, will weigh on trade and investment. Labour supply or productivity will also fall for many workers who fall ill or are required to self-isolate, care for others, or work less efficiently remotely. Housing transactions and investment will stall.

In the data, we have started to see some indications of the scale of some of these effects. Falls in the PMI output surveys suggest record drops in activity, although the usual statistical relationships cannot be reliably used to predict exactly how large, given the unprecedented nature of the current shock (**Chart 1**). The rise in the Universal Credit claims also suggests a very sharp reduction in employment, although the government's job retention scheme and the Bank and government's lending schemes for businesses should prevent this from being as large as would be predicted by past relations between growth and employment.

Chart 1: Composite output and expectations PMIs



Source: IHS Markit/CIPS

An important aspect of the economic effects of Covid-19 is that they will be highly asymmetric. Firms that relied on social interaction or non-essential visits have had to close down temporarily, while others that can offer services remotely or by delivery have been less directly affected. Recent analyses have highlighted the different ways spending might be affected in sectors that can remain open.⁴ On the one hand, firms that offer substitute products will see demand increase: for example, purchases of food from supermarkets instead of cafes and restaurants; or streaming of films or television in place of cinema trips or live entertainment. But on the other hand, all sectors will suffer from falls in demand owing to lower income and increased uncertainty elsewhere in the economy. In my view, the latter effect is likely to dominate.

⁴ See Guerrieri *et al* (2020), Kaplan *et al* (2020) and Faria e Castro (2020).

Monetary policy

The front line of combatting the challenges of Covid-19 comprises the extraordinary efforts of NHS health professionals, carers and volunteers across the UK. But as I have discussed, the virus and the interventions necessary to reduce its spread are also having the large effects on the UK economy. Economic policy should seek to minimise the resulting disruptions for households and businesses. The aim is to enable the economy to return to its pre-Covid-19 potential once public health risks subside.

Monetary policy is only one small part of the overall economic policy response. The economic disruption from Covid-19 and its containment affect particular industries and businesses far more than others. Monetary policy, which affects the whole economy, cannot tackle such difficulties alone. (For example, monetary policy cannot perfectly insure individual businesses and households to protect them against suffering lower incomes.) That is why, importantly, the MPC has coordinated its actions with those of the Bank's other policy committees; and why the Bank has in turn coordinated with the UK government and with central banks and authorities overseas. There has been a vast array of government and Bank of England schemes launched to address different aspects of the crisis.

Consistent with its remit, the MPC has also taken a number of policy actions at speed over the past few weeks. In my view, the rationale for these responses differs somewhat from our usual focus on the balance of near-term demand and supply. The nature of the economic shock from Covid-19 is very different from those to which the MPC has previously had to respond. A crucial aspect is that much of its economic impact should ultimately prove temporary: many businesses that were viable and jobs that were needed before Covid-19 will be so again after it passes. A key task for policy in the interim is to try to minimise those business failures and reduce job losses that would otherwise lead to persistent scarring effects. By doing so we want to prevent any lasting reduction in the supply capacity of the economy and help offset any persistent negative effects on demand. As I will come on to discuss, this is consistent with the MPC's primary objective to maintain price stability. It also helps achieve our secondary objective, to support the economic policy of Her Majesty's Government, including its objectives for growth and employment.

The MPC's policy actions have involved reducing Bank Rate from 0.75% to 0.1%, introducing a Term Funding scheme with additional incentives for Small and Medium-sized Enterprises (TFSME) and increasing the size of our asset purchase programme, or quantitative easing, by £200 billion. These decisions should assist with the broader objectives of economic policy in a variety of ways.

First, a reduction in the cost of credit will increase cash-flow for many borrowers, which, combined with the other Bank and government schemes to offer loans and maintain incomes, should support households and help firms avoid having to scrap capital, lay off workers, or go out of business.

Second, we have also seen extreme volatility and sharp asset-price falls in financial markets. This had included some disruption in gilt markets, partly attributable to a general shift by investors in all currencies towards US dollars, influenced in turn by the dollar's status as the global reserve currency. Our policy actions should help mitigate some of the unwarranted tightening in financial conditions these moves would otherwise cause.

Finally, while supply and demand in many sectors of the economy have been temporarily halted, other businesses have been able to continue to operate while following current social-distancing regulations. These include many businesses which operate mainly or entirely online, such as online retail; or sectors that have been able to switch temporarily to online working, such as education or some business services. Looser monetary policy can help offset falls in spending in these sectors that might otherwise arise due to reduced incomes and greater uncertainty.⁵ It can also potentially boost output in other sectors where relative demand has increased, particularly for firms with some flexibility to refocus their production.

The inflation target

While recent policy actions will help support households and businesses through the crisis, the primary objective set out in the MPC's remit is to maintain price stability, measured by the 2 per cent target for CPI inflation. Low and stable inflation is an essential pre-requisite for longer-term economic prosperity. It enables individuals to make informed decisions about saving and spending. And it allows households, businesses and governments to finance their spending without introducing inflation risk premia to their borrowing costs.

While its near-term focus has been on helping the economy bridge through the temporary disruption, the MPC will continue to ensure price stability. It also remains ready to take whatever further actions are necessary.

Our recent policy decisions will help ensure price stability by mitigating any deflationary pressures arising from recent events. I have discussed a range of negative effects of the crisis on demand and supply. But in those sectors that are still operating, the negative effects on demand are likely to be larger. Despite the policy responses, we will not be able to avoid a rise in unemployment, which will weigh on real wage growth across the economy. Moreover, we were starting from a position of subdued inflationary pressures. All of these factors mean that the type of looser monetary policy needed to support households and businesses will also contribute to meeting our inflation target over time.

It is also conceivable that some large changes in relative prices affect inflation in the other direction. Moreover, sterling has depreciated, and fiscal policy has been loosened, both of which will push up on inflation, other things equal. As it did in the past, if there were an overshoot, the MPC would need to assess the speed with which to return inflation to target, within the flexible inflation targeting framework it operates.

⁵ See Guerrieri *et al* (2020) and informal discussions by Krugman (2020) and Rowe (2020), for an elaboration of these channels.

The reason that policy can follow such a strategy is that the consistent operation of the framework has been successful in anchoring inflation expectations at our 2% target. In order to meet our target it will be crucial to keep these expectations anchored. One way my colleagues and I on the MPC will endeavour to do so is by clearly communicating how inflation is likely to evolve during and after Covid-19, explaining how and when our policy actions will bring it back to target. With that in mind, I will now make some points about CPI inflation.

Inflation during Covid-19

CPI inflation stood at 1.7% in February and is likely to remain slightly below target in the March reading. But these data were collected before the spread of the virus and its economic impact had reached their current levels. Before recent developments, inflation was already set to fall some way further below our target over 2020, partly as a result of falls in energy and utility price inflation. Since then, the collapse in oil prices has made it likely that inflation will fall below 1% in the next couple of months. Beyond that, the MPC will be discussing the outlook for inflation in the May Monetary Policy Report.

What I would stress at the moment, is that it will be more difficult to interpret the inflation data during the current crisis. While Covid-19 is still widespread and with current social distancing measures in place, CPI inflation is not going to be as informative as usual about the balance of supply and demand in the economy. This is because of the conceptual challenges that will affect price measurement during the current crisis.

The ONS has highlighted that some of the necessary changes to their work will impact measurement of some statistics, including data on prices.⁶ For example, price collection from visiting shops and businesses has now stopped, with prices instead being collected remotely or online. The ONS has already taken steps to provide new faster indicators of online prices, which will be helpful data. But an additional difficulty is that price collection will also be impossible for many goods and services sold by the businesses (or even entire sectors) which have temporarily shut down.

The key conceptual challenge is that there have been large shifts in spending patterns, which will change the representative household consumption basket. Spending on social consumption has stopped almost completely, for example, while spending on essentials from supermarkets has increased markedly. These changes will be largely temporary, but while they persist, interpretation of the data will be particularly difficult. There are also likely to be considerable shifts in the prices of some goods still in high demand relative to those no longer being purchased. Moreover, as I will come on to discuss, some of the changes in spending patterns may prove to be more persistent.

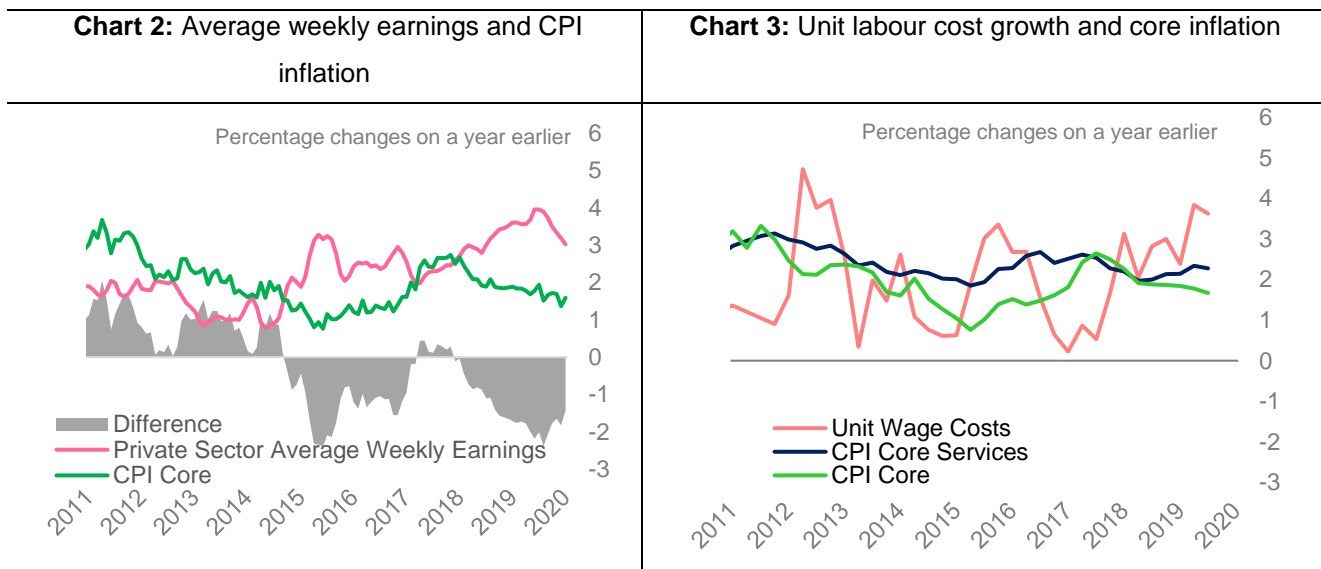
The exact effect of these issues, or even the sign of their effect, is going to be difficult to gauge. The MPC will continue to communicate clearly the factors that are influencing inflation and how long they might persist.

⁶ See ONS: [Consumer price inflation, UK: February 2020](#), and ONS: [COVID-19 and the production of statistics](#).

To make sure inflation expectations remain consistent with the target, this will include setting out how we intend to ensure price stability. These issues do mean, however, that inflation in the near-term may be a particularly noisy indicator of where inflationary pressures are likely to settle after the current crisis abates. In order to better predict that, I think it is useful to understand inflation behaviour prior to recent developments.

Inflation before Covid-19

Prior to the onset of Covid-19, and since around the middle of 2018, inflationary pressure in the UK had been subdued. Measures of core inflation had stayed at rates below those consistent with the inflation target. This weakness in core inflation was at odds with far stronger data on wages and, given weak productivity growth, also at odds with strong growth in unit labour costs (**Charts 2 and 3**). Measures of domestic labour costs had been growing at rates faster than would typically be consistent with meeting the inflation target.



Source: ONS and Bank calculations

This puzzle of high labour cost growth coupled with weak price pressures had also been evident in other advanced economies, including the euro area and the US. Indeed, it may be that in the UK we would have faced this puzzle earlier, but underlying weakness in core inflation was initially offset by the exchange-rate driven boost to inflation in 2016.

I had suggested several possible causes for weak price inflation in past speeches.⁷ These have included falling desired markups or increased competition; mismeasured productivity growth; and lower price inflation in other productive inputs.

Based on some new work, I would like to show some preliminary evidence suggesting how two of these factors could help shed light on the recent relation between labour costs and CPI inflation. In doing so, I

⁷ See Tenreyro (2019, 2020)

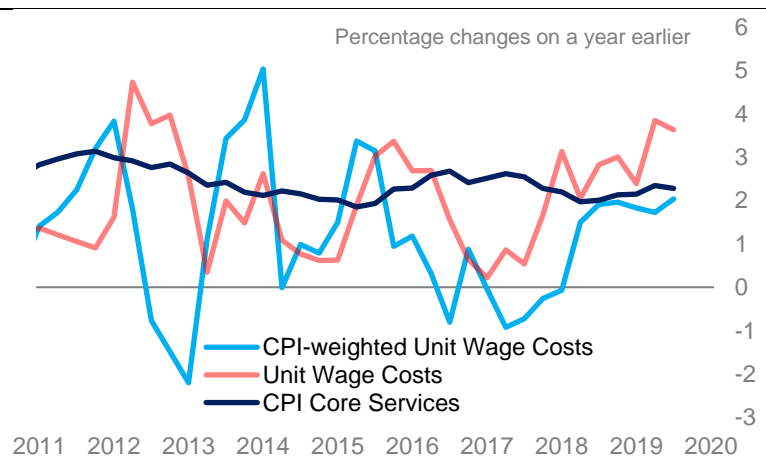
hope to provide some insights into how current events might have some more persistent impacts on inflation. These suggestions are not intended to be definitive explanations or forecasts. Rather, I hope to stimulate more research and thinking into how different structural issues might impact inflation during the current crisis and beyond.

CPI-weighted labour costs

The first explanation I will discuss is the importance of the CPI basket for how labour costs impact inflation. I will show evidence that unit wage costs (measured as average weekly earnings divided by labour productivity) had risen more slowly for goods and services in the CPI basket than they had for the economy as a whole. This may be one reason why CPI inflation remained subdued, despite strong unit wage cost growth for the whole economy. The finding relates partly to differences in wage growth, but even more so to differences in productivity growth across industries. While not mismeasurement *per se*, measured productivity growth has been stronger in consumer goods producing sectors than in aggregate. Thinking about how the consumption basket relates to inflation behaviour may be crucial over the coming years, given the vast changes we are currently seeing in spending patterns.

We usually measure labour costs using aggregate data, but I would argue that we might wish to focus more on the costs facing firms directly producing goods and services in the CPI basket. Our typical measures of unit wage costs are constructed by dividing average (mean) weekly earnings across the whole economy (or private sector) by aggregate or market-sector productivity. But these measures still contain an implicit weighting: arithmetically, the growth rate of mean earnings is affected more by wage growth in high-wage sectors such as manufacturing than in low-wage ones such as retail. However, the goods sold directly to households by manufacturers make up only 7% of their consumption basket. So fluctuations in domestic manufacturing wages are not likely to have a large direct effect on consumer prices. By contrast, retailers have a weight of 28%, and hence play a much larger direct role.

Chart 4: Unit wage costs and CPI-weighted unit wage costs



Source: ONS and Bank calculations

The observations above indicate how a CPI-weighted measure of labour costs could potentially be more relevant for CPI. **Chart 4** shows a measure of unit wage costs weighted according to each sector’s share of final output sales in the CPI basket (in blue), compared to a typical aggregate measure of unit wage costs (in pink). The weights of each sector are given in **Table 1**.⁸ Over the past few years, CPI-weighted unit wage costs have been growing at a lower rate and exhibited a slower pick-up, more in line with relatively subdued rates of price inflation than aggregate labour costs.⁹

Table 1: CPI weights by sector (2015)

Industry	Code	CPI weight
Agriculture, Forestry, Fishing & Mining	A, B	1%
Manufacturing	C	7%
Electricity & Water supply	D,E	5%
Construction	F	0%
Wholesale and Retail	G	28%
Transport and Storage	H	7%
Accommodation and Food	I	14%
Information and Communication	J	5%
Finance and insurance	K	8%
Real estate	L	12%
Professional, Scientific & Admin and Support	M, N	2%
Other services	O, P, Q, R, S	11%

Source: ONS and Bank calculations

Interestingly, only the smaller part of the divergence between the two measures is driven by differences in wage growth. **Table 2** compares CPI-weighted wage growth to average weekly earnings growth, and shows that wage growth was 0.5 percentage points weaker in the consumer sectors than the average in 2019, and only 0.2 percentage points weaker in 2018. The remainder of the divergence is caused by sectoral differences in productivity growth.

⁸ The CPI weights are constructed from the 2015 ONS input-output tables, using the share of each sector’s final output in households’ consumption of domestic goods at basic prices. Consumption also excludes imputed rents, an estimate of financial intermediation services indirectly measured (FISIM), and consumption of non-market-sector output. Sectors are split at the CPA product code level.

⁹ In Tenreyro (2018), I made the point that wage growth had been higher for the finance sector, which was perhaps less relevant for CPI. And in Tenreyro (2019), I argued that market-sector productivity growth, also more directly relevant for CPI than, had been higher than whole-economy productivity growth.

Table 2: Unweighted and CPI weighted AWE and productivity per head, year on year growth rates

		2011 -									
Growth rate		2019	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unweighted	Wages	2.3	1.8	1.7	1.0	1.4	2.7	2.6	2.3	3.2	3.6
	Productivity	0.2	0.7	-1.7	-0.5	0.1	0.5	0.7	1.5	0.4	0.4
	Unit wage costs	2.1	1.1	3.5	1.6	1.3	2.2	1.9	0.8	2.7	3.3
CPI weighted	Wages	2.2	1.3	1.8	1.4	1.9	2.5	2.8	2.2	3.0	3.1
	Productivity	1.0	-0.8	1.1	0.0	0.1	0.2	2.4	2.6	1.6	1.4
	Unit wage costs	1.3	2.2	0.8	1.5	1.7	2.3	0.4	-0.5	1.3	1.9

Source: ONS and Bank calculations

Since 2016, productivity has grown around one percentage point faster in the consumer-weighted sectors than in aggregate. In the aggregate data, productivity has remained stagnant, even as wage growth has picked up in the period since the EU referendum. But in final production sectors for the CPI basket, productivity growth picked up to its strongest rates of growth since before the crisis. This difference arises partly from the higher weight given to the retail sector, where growth in productivity per head has averaged 4½% over the past three years, and lower weight given to manufacturing, where productivity has fallen.

There are different explanations for the relative weakness in unit wage cost growth in CPI-producing sectors. Some relate to particularly productive firms or sectors: there has been a wave of recent research on the rise of so-called ‘superstar firms’.¹⁰ A shift in the market share of sectors like retail from small high-street stores to larger chains, or notably, online giants such as Amazon, has served to boost the sector’s productivity. This occurs because the firms gaining market share are able to operate more efficiently at larger scale. Reports from the Bank’s Agents also suggest that some retailers have responded to increases in the National Living Wage by investing in productivity improvements, which may also have increased within-firm productivity growth in the sector. A complementary explanation is that aggregate productivity growth weakness has been concentrated in a small number of sectors: largely manufacturing and finance. But neither of these sectors has a particularly large weight in the CPI basket, so this productivity weakness has only a small impact on consumer-weighted labour costs.

The role of the CPI basket can partially explain the relative weakness of inflation over the recent past but it may not resolve the puzzle completely. Although labour costs in sectors with low weights may be less directly important for CPI, this is not to say that they have no impact. Sectors such as manufacturing and finance, for example, export significant shares of their output. Although weaker productivity growth in these sectors may not have large direct effects on CPI via unit wage costs, it could do so indirectly via the exchange rate, since weaker export productivity is likely to weigh on the pound.¹¹

¹⁰ Autor *et al* (2017)

¹¹ See Broadbent *et al* (2019) for a model exploring how changes in relative productivity of tradeable goods affect the exchange rate and the economy.

Sectors that are more important for production than consumption also tend to produce goods and services that are used as intermediate inputs in production, so their labour costs may still feed through indirectly into the CPI via the cost of those inputs.¹² It is therefore possible that this weighting scheme simply shifts the puzzle upstream in the supply chain.¹³ Nonetheless, given some of the data challenges in measuring and predicting input prices, costs and markups, the exercise I show here offers an alternative method of examining only the direct relationship between the CPI and labour costs.

Cost decomposition

My second explanation for the recent weakness in inflation relative to labour costs is the role of other inputs in production. When we are trying to measure slack and marginal cost growth in the economy, it often makes sense to focus on the labour market, which is the most important and easiest to measure input. But there are several other inputs, such as land, energy and intermediate products. Inflation in one of these, commercial rents, has recently been far weaker than labour cost growth, which may have dragged on CPI inflation. Again, these effects will be important to understand, as some of the structural trends that have weighed on rent inflation may be accelerated by the current crisis.

There are several good reasons why we normally focus on the labour market when we are trying to estimate slack in the economy. Even though there are other inputs, in principle we should often be able to infer their costs by looking at a single representative input. If costs diverge, firms should optimally substitute towards cheaper inputs, bidding their prices up.¹⁴ Labour is the input where costs are easiest to measure: we have comprehensive data on wages in the economy. It is also the largest primary input in production, so it is usually the main source of excess demand or supply. And of course, employment is explicitly referenced in the secondary objective in the MPC's remit.

There are also times when focusing exclusively on the labour market can be misleading. There may be persistent divergences between labour cost growth and the inflation rates of other input costs. Some inputs may be fixed in the short run, or inputs may be complements rather than substitutes. In the long-run, substitutability may lead trends to re-converge, but policy may need to act before that happens in order to meet the inflation target.

As an alternative to looking only at labour costs, one can construct a measure of cost growth that is weighted to reflect the importance of different inputs in production. I will now turn to showing a preliminary attempt at doing so using UK data. This is not intended to be definitive – I use some crude proxies for some input cost

¹² The key difference between the measure shown here and alternative measures of consumer sector costs and margins I and the MPC have previously shown is that the version constructed here does not attempt to account for the primary input shares of intermediates in production. It is a measure of direct cost pressures influencing the CPI basket, rather than the sum of direct and indirect cost pressures across the whole economy, weighted by their CPI intensity.

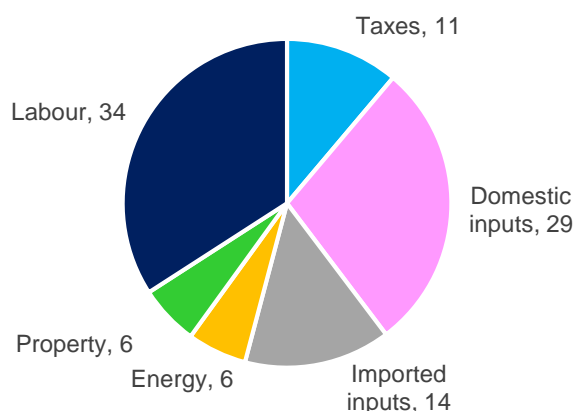
¹³ For example, while CPI-weighted unit wage cost growth has been lower than aggregate unit wage cost growth, this suggests that unit wage cost growth for intermediate input production is likely to have been higher than aggregate unit wage cost growth. If these costs were not passed on as higher input price growth, then intermediate-producing sectors have faced high labour cost growth without correspondingly strong price inflation.

¹⁴ See Rotemberg and Woodford (1999).

measures. Hopefully the idea I highlight is one that can be expanded on and improved in future work. I again weight the cost growth measures by the importance of each sector for the CPI basket.¹⁵

The aggregated weights for each input are shown in **Chart 5**. Labour input is the most important, making up one-third of the measured costs. But sizeable fractions of inputs also consist of each of imported and domestic intermediates. I also split out two particularly important intermediates: commercial rents and energy. Finally, I include taxes, which make up 11% of the cost base.

Chart 5: Cost decomposition weights, CPI-weighted average across all industries

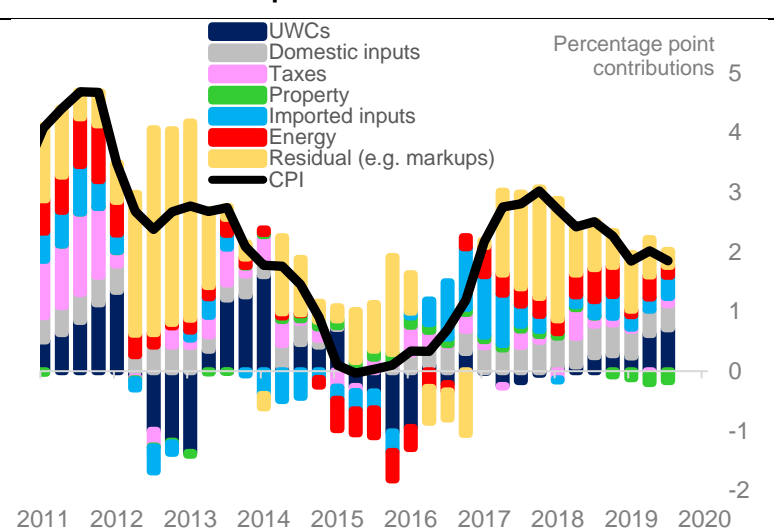


Source: ONS and Bank calculations

The cost decomposition is shown in **Chart 6**. Consistent with my earlier points, the increase in labour cost growth over the past couple of years pushes up on inflation, but by less than one would have inferred from looking solely at aggregate unit wage costs. This is partly due to the distribution of unit wage cost growth, as discussed in the previous section, but also simply from giving labour costs a weight lower than 100%. The contributions of energy and taxes are as expected. Taxes contribute positively to inflation in 2011, following the 2010 and 2011 rises in VAT from 15% to 20%. A small, but persistent drag over the past year comes from negative commercial rent inflation, which has been weakening since around 2015.

¹⁵ The decomposition is calculated using the proportions of different inputs in production of each sector's output in the 2016 input-output tables. Sectors are split at the CPA product code level. Labour input costs are estimated as AWE divided by productivity per head; imported intermediates as the UK goods and services import deflator (excluding fuels and the impact of MTIC fraud); domestic intermediates as a weighted average of PPI and SPPI; property as a weighted average of IPD rental values for retail, office and industrial properties; energy as the CPI energy index; and taxes as the total basic price adjustment.

Chart 6: Cost decomposition of CPI inflation



Sources: ONS, IPD and Bank calculations

The yellow residual bars can be interpreted as a measure of the contribution to inflation of firms' markups over costs. Taken at face value, they suggest that markups were squeezed initially following the increase in import price inflation from 2016, before recovering in 2017 and 2018 as cost increases were passed through to CPI. This is broadly consistent with analysis and estimates discussed in MPC statements and forecasts over the past few years. The yellow bars contribute positively for much of the past decade. This is what we would expect on average, given a share of prices will consist of firms' margins, and that prices should increase in line with the inflation target. Some of the larger contributions will also reflect a period in which the economy had been recovering from significant excess supply after the financial crisis, and firms may have been seeking to rebuild margins. These bars are also quite volatile, however, perhaps reflecting the fact that they include various kinds of measurement error. For example, any differences between the true rates of input cost growth and the proxies used in the decomposition will show up in the residual.

Table 3: Estimated cost of different production inputs, annual growth (per cent)

	2011-2019 averages	2011	2012	2013	2014	2015	2016	2017	2018	2019
<i>Unit wage costs</i>	1.3	2.9	-0.2	3.0	0.6	2.1	0.2	-0.3	1.9	1.9
<i>Domestic inputs</i>	1.7	4.7	2.1	1.3	0.0	-1.7	0.5	3.4	2.9	2.1
<i>Property</i>	0.0	-0.4	-0.5	-0.7	0.4	1.1	1.3	1.0	-0.5	-3.4
<i>Taxes</i>	2.3	10.0	0.6	2.7	2.4	-0.2	2.2	1.0	1.4	-1.0
<i>Imported inputs</i>	1.2	4.0	-0.7	1.1	-2.5	-2.0	4.2	4.2	1.4	1.4
<i>Energy</i>	3.0	13.0	4.2	3.8	-1.2	-7.6	-1.5	6.1	6.7	3.4

Sources: ONS, IPD and Bank calculations

Over the past couple of years, a key puzzle for the MPC had been the divergence in the growth rates of different measures of domestically generated inflation, and in particular between strong unit wage costs and subdued core services inflation. Focusing just on the domestic inputs in **Chart 6**, suggests that one explanation for this may be the recent drag on cost growth from negative commercial rent inflation. Since 2017, the contribution from commercial rents has fallen by 0.25 percentage points, offsetting around half of the increase in unit wage costs. While unit wage cost growth picked up to nearly 2 per cent in 2019, commercial rents fell by 3.4 per cent (**Table 3**). The timing of these moves also fit with the period over which core inflation measures had been subdued.

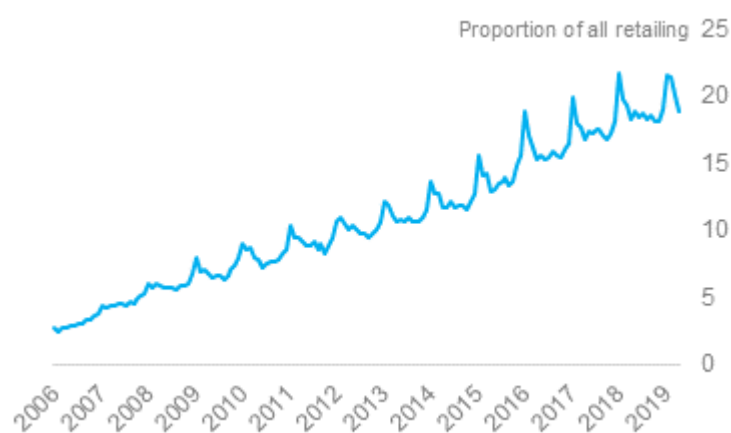
There are a range of possible explanations for the weakness in rent inflation over the past few years. Some are cyclical: most of the downturn corresponds to a period in which demand growth had slowed, partly due to the period of uncertainty and slower real income growth following the EU referendum. But there are also more structural drivers. Reports from the Bank's Agents suggested that many high-street retailers were losing market share to online retail, which fed through into a reduction in demand for prime rental space. The emergence of new companies leasing offices and shared working spaces has also increased the supply of office rental space, while more efficient use of space and increased remote working have reduced demand.

Inflation after Covid-19

I have offered two complementary explanations for subdued UK inflation in the period before Covid-19: weaker unit wage cost growth in consumer sectors, driven by stronger productivity growth; and weak inflation in the cost of other inputs, particularly rents. But the reason to look back is to better understand where we are heading. I have argued that both explanations were partly driven by structural factors affecting the way we work and consume. While it is impossible to know with certainty how the current pandemic is going to affect our lives in the long-run, it seems plausible that it may accelerate some of these changes.¹⁶ Although ultimately, these changes should not have permanent effects on cost and price inflation, they may lead to effects that persist for some time.

¹⁶ This argument is similar to one recently put forward by Bell and Slaughter (2020), who also suggest focusing on where current developments run alongside patterns that were visible pre-crisis. They also highlight a shift away from high-street retail, focusing on the labour market implications.

Chart 7: Share of retail sales purchased online each quarter (per cent)



Sources: ONS

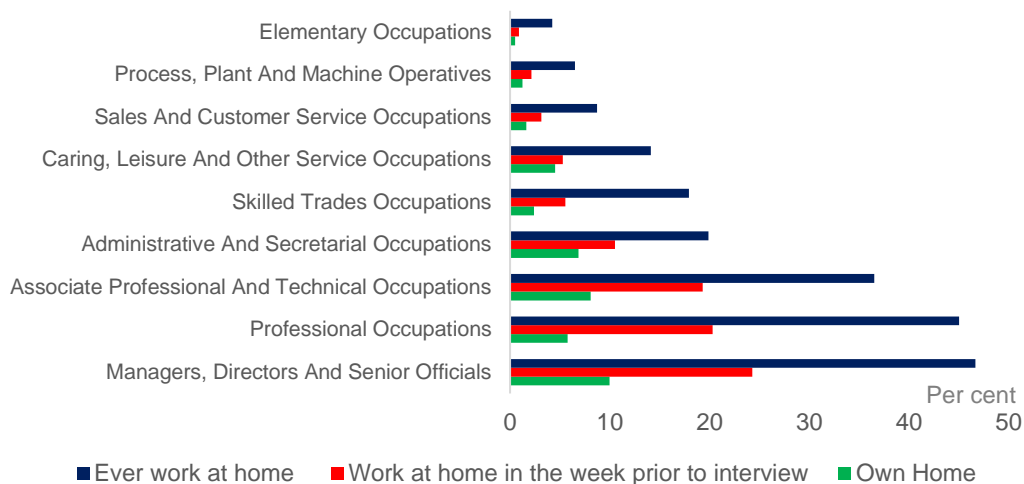
First, if weaker unit cost growth in consumer facing sectors relates to the growth of (more efficient) online retail, then we might expect to see this effect supercharged by recent developments. **Chart 7** shows that there had been an upward trend in the share of retail sales purchased on the internet over the past decade or so, rising from less than 5% in 2007 to over 20% in 2020. That figure will almost certainly shoot up in the March and April data, when new social distancing regulations started to affect consumer behaviour.

Some of these behavioural changes will be temporary. Survey evidence in 2019 suggested that 83 per cent of consumers still preferred to shop in person, so it seems likely that many of those will return to the high street. But given the prior upward trend, there may also be many others who decide to increase their online shopping after the crisis is over. If this leads to overall efficiency gains, either because large online firms such are more productive, or because retailers such as supermarkets are able to more efficiently serve consumers using online services, then this effect could weigh on retail unit wage costs and on CPI inflation for as long as these trends in consumer behaviour persist.¹⁷

Second, a large shift to online retail coupled with an acceleration in remote working could lead to further prolonged weakness in commercial rent inflation. Rents in the retail sector have been particularly weak in recent years, falling by 5% in the year to end 2019. The larger the shift to online retail, the greater the reduction in demand for high-street locations, and the more rent inflation is likely to fall. There may also be changes from the firms themselves that reduce commercial rental demand: many sellers have been forced to develop virtual replacements for services previously offered in person, such as online lectures instead of classroom teaching.

Chart 8: Working from home by occupation

¹⁷ Although if these changes also lead to increases in concentration and market power, there may be offsetting effects either from higher markups, or from reduced innovation and investment leading to lower firm-level productivity. See Haldane *et al* (2019) for a discussion.



Source: ONS

These changes in consumer and firm behaviour could be augmented by changes in worker behaviour.

Chart 8 shows that in 2019, that the share of workers who could work from home, proxied by those that ever do, ranged from below 10 per cent in some occupations to nearly 50 per cent in others. But a far smaller share in each occupation were actually doing so regularly: less than half of those who could work from home had done so in the preceding week. The overall proportion of workers regularly working from home has been increasing over the past few years, but at a relatively gradual pace. These numbers will have increased sharply since March, however, following the introduction of new social-distancing regulations. Again, part of this effect will be temporary: some workers will prefer returning to their offices when it is safe to do so. Others may be less productive working remotely. But yet others may find they prefer more regular remote working. Employers may also be alive to the potential cost savings of encouraging (or requiring) greater working from home, especially if they have opted to invest in technologies to facilitate it. A reduction in office use could also weigh persistently on demand for rental space and rents, which may feed through into lower cost inflation and a period of weaker price inflation.

Finally, we are currently witnessing some dramatic changes in the consumption basket. While many of these may reverse when businesses reopen, there are also likely to be some permanent effects on the goods and services we consume: international travel may not recover to its previous trend, for example. Although the direction of the effect is unclear, these changes have the potential to affect measured inflation for some time, since different sectors have different average inflation rates.

Conclusion

Covid-19 is having unprecedented effects on all of our lives. The MPC, co-ordinating closely with other policymakers in the Bank and in government, will do whatever it can to minimise the economic disruption that the crisis could cause for households, businesses and financial markets. Consistent with our remit, we will

continue to set policy in order to achieve price stability and anchored inflation expectations. Today I have discussed some explanations for the persistent weakness in inflation in the period before Covid-19. While we do not know how the world will look afterwards, these explanations offer insights into how some of the changes it brings may affect inflation over time and how the MPC may need to respond.

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