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Spending and saving during the COVID-19 crisis: evidence from bank account data

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Executive summary

The measures taken to help reduce the spread of COVID-19, resulting from both policy and consumers' changes in behaviour, have had major impacts on consumer spending patterns. In this briefing note, we explore how consumer spending has evolved, both during lockdown and in the recovery phase since. We document how different sectors of the economy have fared, and look at how spending has varied with the prevalence of COVID-19 cases across local areas. We also analyse how the closure of many businesses has led to 'forced saving', and explore how this, together with income falls, has affected the extent to which richer and poorer households have accumulated or decumulated savings over the crisis.

Our analysis uses anonymised user data from the Money Dashboard (MDB) budgeting app. These track transactions of app users in real time, allowing us to build a detailed picture of their spending patterns and financial balances from before the crisis to the end of September. We combine this with health-authority-provided data on case prevalence in the population to look at the effect of case rates on spending.

Key findings

- 1 The recovery in consumer spending following the easing of lockdown restrictions has been very partial. **Since the end of July, spending has stalled at around 90% of the level we would have expected in the absence of the pandemic.** Spending initially fell by around a quarter but gradually recovered through May and with the reopening of non-essential retail and hospitality in June and July.
- 2 **Local areas with low case counts have not recovered discernibly differently from those with high case counts.** Since the very early stages of lockdown, consumers' behaviour has borne very little relationship to being in an area with higher or lower prevalence of COVID-19 compared with the rest of the country. For example, overall

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spending in September was at 89% of its 2019 level, while in the local authorities with the fewest cases it was barely any different at 90%.

- 3 While the fall in total spending has yet to be unwound, changes in the composition of spending that we saw during lockdown have also proved persistent thus far. **Spending on groceries rose during lockdown and remains higher than in 2019; the opposite is true for spending on restaurants, pubs, holidays and transport, in which the recovery after reopening stalled at around the end of July.** One of the reasons why these persistent sectoral differences matter is the knock-on consequences for workers: for example, those in the still-struggling sectors are disproportionately low earners.
- 4 **There has been a persistent shift in shopping and payment habits during the crisis, away from cash and towards online-only merchants.** Even in August and September, cash use remained below half of normal levels, having plummeted after lockdown, whereas spending on online alternatives for goods bought in physical stores remained over a quarter higher.
- 5 **‘Forced saving’** – declines in spending on goods and services that were substantially affected or shut down by lockdown – **has been significant across the income distribution, but greater for higher-income households. Spending in unaffected sectors and those with close alternatives to physical retail rose across the income distribution,** but with proportionally larger increases for poorer households.
- 6 **Higher income groups appear to have accumulated more savings than in previous years during the crisis,** with falling spending from forced saving outweighing income falls. In contrast, the **poorest fifth have seen an average £170 per month decline in their bank balances** between March and September (£1,220 total and equivalent to 14% of pre-crisis income) relative to what we would expect in normal times, as income falls are not fully cancelled out by lower spending. This is likely to reflect both lower saving and higher debt.

1. Introduction

The COVID-19 pandemic has had huge impacts on economic life. These changes have been driven both by voluntary behaviour change and by government policy. Examples of the former include people having a reduced willingness to go to shops or restaurants in light of health concerns for themselves or for others, or having an increased desire to save for an uncertain future. Government has imposed restrictions on economic activity to protect public health and introduced economic policies to try to protect households and businesses from the worst of the ensuing effects.

In this briefing note, we analyse data on consumer spending and saving so far during the pandemic, in order to shed light on what we might expect as the crisis continues over the coming winter. We first set out how consumer spending has evolved for different types of goods and services, with a focus on highlighting what appear to be the persistent impacts of the crisis on spending patterns – broadly, those changes that appear to have outlasted the first tranche of social distancing measures, and that we might therefore expect to persist so long as the pandemic persists, irrespective of the ebbing and flowing of social distancing measures in different parts of the UK through the winter. Second, we analyse how spending patterns are associated with the local prevalence of the virus, giving an indication of the geographic impacts of future increases in COVID-19 cases on economic activity. Third, we bring together information on changes in spending across the income distribution with changes in income to examine what has happened to bank balances over the crisis. This provides some of the first hard evidence on the pandemic’s legacy for liquid forms of wealth, and some pointers as to what we might expect from a further period of severe economic restrictions over the winter.

For this analysis, we use anonymised user data from the Money Dashboard (MDB) budgeting app. These track the financial transactions of app users in real time: in this briefing note, we use data on transactions until the end of September 2020.

Related literature

A number of papers have analysed changes in spending patterns during phases of the pandemic, including some using the same MDB data source. Chronopoulos, Lukas and Wilson (2020) and Hacioglu, Känzig and Surico (2020) both provided early analyses of broad trends in spending patterns using MDB data up to June. Firth, Gathergood and Stewart (2020) analysed online versus offline spending in the MDB data, finding that much of the shift towards the former seen in the early part of the pandemic has persisted into August.

Jaravel and O’Connell (2020) used real-time data on supermarket purchases to measure the impact of the pandemic on inflation, while O’Connell, de Paula and Smith (2020) used the same data to precisely document the nature of the ‘panic buying’ seen in March.

Outside the UK, a number of researchers have turned to bank account data to provide a real-time assessment of spending patterns in the wake of the crisis. These include Chetty et al. (2020) documenting spending patterns in the US using credit and debit card data and finding that higher-income areas reduced spending (in proportional terms) considerably more than lower-income areas. Similar analysis with various transaction data sources has been conducted in China, Denmark, France, Iran, Japan, Mexico, Spain and Switzerland.¹

Data

The data we use are taken from the Money Dashboard budgeting app, which provides information on (anonymised) user finances from bank accounts, detailing each transaction (credits and debits) from all linked-in financial accounts (current accounts, credit cards and savings accounts). MDB uses an algorithm to categorise (or ‘tag’) transactions, into categories such as groceries, salary and fuel. The data also record precisely when transactions occur, allowing spending patterns to be closely matched to the timing of key developments in the crisis and in the financial circumstances of the app’s users. We use this information to build a rich dynamic picture of user spending over the crisis.

¹ For a list of such papers and others, see Firth, Gathergood and Stewart (2020).

When a user signs up to MDB, they provide their age, gender and postcode, and can then link in their financial accounts, including current accounts, credit cards and savings accounts. They can do this for their own accounts as well as those of a partner – and indeed they generally have a strong incentive to do so, since the purpose of the app is to help with budgeting and financial management. While we cannot guarantee that users have linked in all relevant accounts, we consider the data to be best thought of as measuring the finances of the ‘nuclear family’ – people plus their partners. For ease, we describe this unit as the ‘household’. A further discussion of this point, plus a detailed description of the data, is available in Bourquin et al. (2020).

Our working sample is largely based on those users having a consistent set of accounts linked into MDB and updated over our study period. Specifically, we require that every account that the user has that appears in the data in 2020 has been updated since the end of September 2020, and was used at some point in the six months prior to the start of 2020. We make analogous restrictions for accounts that appear in 2019, except they must have been updated since the end of December 2019. We then take the set of users who have accounts that meet these conditions over these two years. This gives us a sample of around 5,100 users. When we measure changes in spending or balances by income, we rank individuals using their income in the eight months prior to the period analysed. To measure 2019 spending by income, we therefore require that they also have a consistent set of accounts between May and December 2018. This reduces the sample when we split by income to around 3,800.

Spending categories and prices

We divide debit transactions in MDB into various categories to explore how spending patterns changed across different sectors of the economy during the lockdown and subsequent easing of restrictions. The main categories used are groceries, clothing / appearance, transport, holidays, restaurants / pubs / other recreation, takeaways and cash withdrawals. We also examine total consumer spending, which includes all expenditure except that on bills, taxes, school fees, and insurance and financial services.

These main spending categories are formed by allocating the default tags that MDB assigns to each transaction. We also construct a measure of spending on online ‘substitute’ retailers – online-only firms which sell products that can also be bought

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in shops, such as Amazon, ASOS and Ocado. A complete description of what is included in each category is given in the appendix.

In order to measure spending in real terms, we inflate to September 2020 using an index of prices. Specifically, we take the relevant monthly Consumer Prices Index (CPI) index from the Office for National Statistics (ONS) and linearly interpolate from monthly to weekly CPI. We use the most relevant CPI index components for each category, using food and drink for groceries for example, and the overall CPI index for total spending. In some cases where our spending categories are made up of several CPI components, we use a weighted measure of CPI based on ONS-provided CPI weights.

To better understand how the pandemic has impacted spending, we remove seasonal patterns in spending by comparing average spends for each week in 2020 with the same week in 2019.²

² We take the first week of each year as beginning on the first Monday of each calendar year.

2. Spending during the crisis

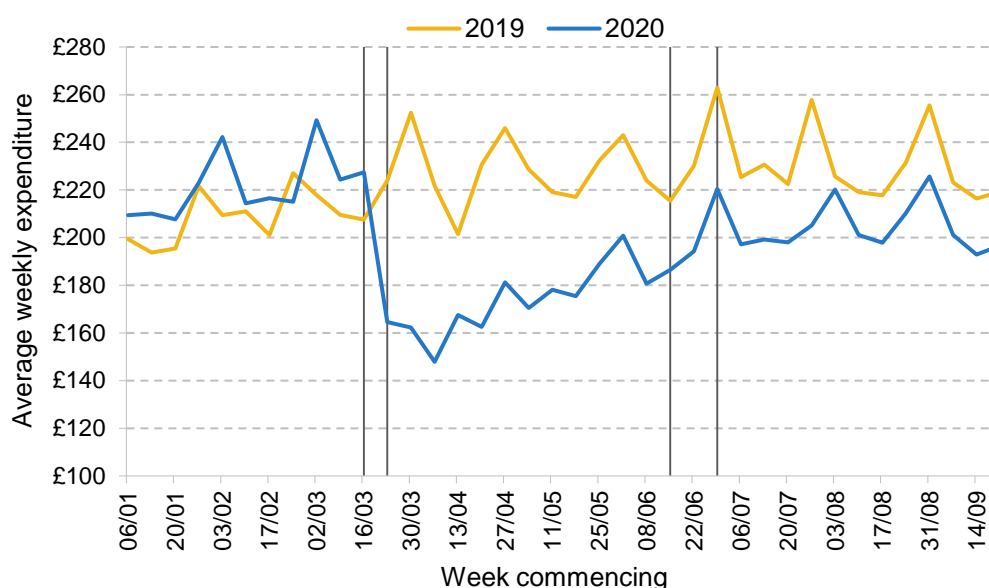
In this section, we investigate how spending has evolved over the course of the crisis on a week-by-week basis, up until the end of September. There are four key dates when policy in England changed, which we indicate on each chart:³

- 16 March – introduction of ‘social distancing’. Government guidance is for everyone, including those without symptoms, to stop non-essential contact and unnecessary travel, and to work from home if they can.
- 23 March – introduction of ‘lockdown’. The population is instructed to stay at home, and only leave for a limited set of purposes. Pubs, restaurants, cinemas, other recreational venues, hotels, and shops selling ‘non-essential’ goods are closed.
- 15 June – non-essential retail shops are reopened, though pubs and restaurants remain closed.
- 4 July – pubs, restaurants, hairdressers, hotels and cinemas are reopened.

We begin by looking at the overall level of consumer spending over time in Figure 2.1. Spending in January, February and the first half of March this year was very similar to (although slightly higher than) that seen in 2019, at around £220 per household per week on average. In the week social distancing began, spending dropped sharply by over a quarter from £227 to £165 on average, eventually falling to a low of £148 two weeks later in early April. Spending remained subdued until mid May, before slowly increasing as lockdown restrictions began to ease. By late June, spending had returned to nearly 85% of 2019 spending levels. Since the end

³ Policy varied slightly across the nations of the UK with respect to the precise dates of lockdown easing. In Scotland, non-essential retail reopened two weeks later than in England, on 29 June. In Wales this occurred one week later than in England on 22 June, and in Northern Ireland it was a few days earlier on 12 June. In Scotland, restaurants could reopen on 15 July, 11 days later than in England. In Wales this occurred on 13 July for outdoor eating and 30 July indoors, and in Northern Ireland it occurred a day before England, on 3 July.

Figure 2.1. Total average weekly spending



Note: See the appendix for full details of spending categorisation. Spending is inflated to September 2020 prices using total monthly CPI interpolated to the weekly level.

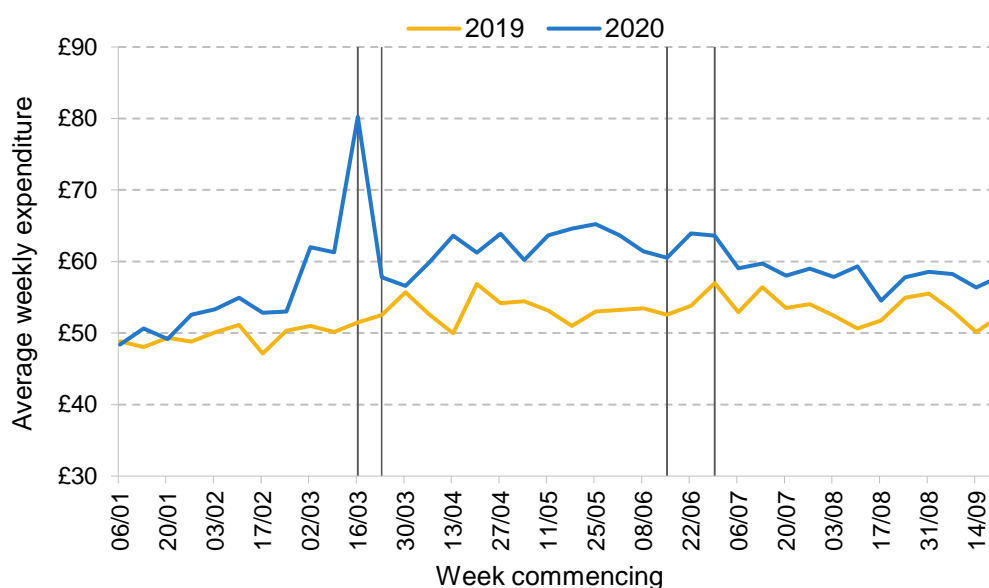
Source: Authors' calculations using Money Dashboard data available on 16 October 2020.

of July through to the end of September, spending has flatlined at around 90% of 2019 levels.

We now turn to analysing differences across spending categories. As we look across these, three common factors emerge:

- For categories of spending that involve physical interaction, spending patterns often change prior to lockdown when shops and other venues were actually closed, and in some cases prior to social distancing advice.
- While much of the change in spending over the period seems to be driven by policy, this is truer for lockdown than for subsequent reopening: though the former led to very sharp declines in spending for many goods and services, the increase after reopening was considerably more gradual.
- Many of the changes in spending seem to have partially persisted, with September showing a plateau in spending – in some categories at a higher level than pre-pandemic, in some lower. This may be indicative of the crisis leading to longer-run changes in spending patterns.

Figure 2.2. Average weekly spending on groceries



Note: See the appendix for full details of spending categorisation. Spending is inflated to September 2020 prices using monthly CPI for food and drink, interpolated to the weekly level.

Source: Authors' calculations using Money Dashboard data available on 16 October 2020.

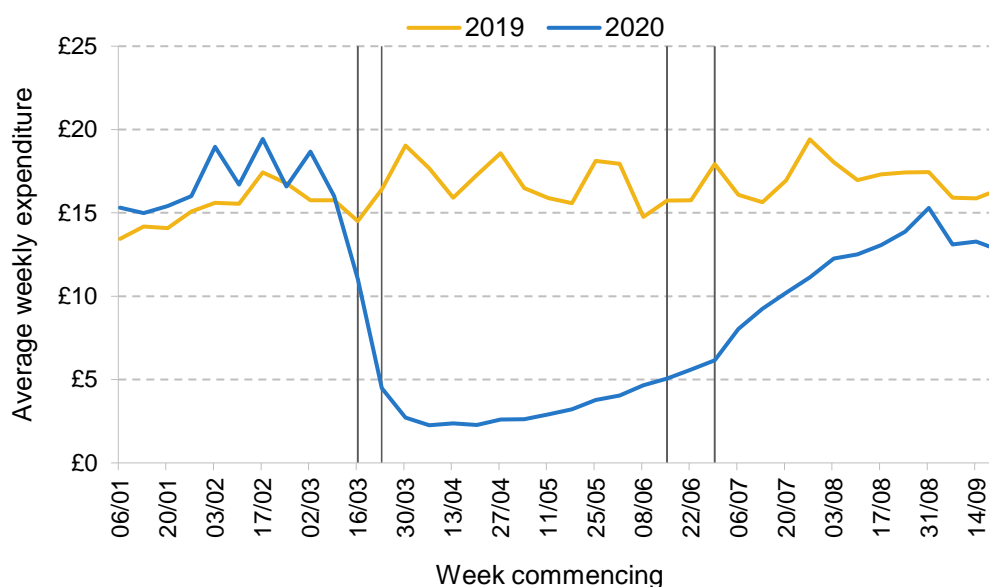
Average spending on groceries is shown in Figure 2.2. Grocery spending jumped several weeks before the introduction of social distancing, rising 17% in the first week of March and continuing to rise by another 31% in the week in which social distancing was introduced. As suggested in other analysis, there was extensive stockpiling by households anticipating shortages as a result of the pandemic which cumulatively averaged around £50 per household over the three weeks for which spending was elevated before lockdown. Spending fell back quite rapidly after the initial stockpiling period, in the week full lockdown began, as supermarkets saw shortages and households perhaps began using up some of their stockpiles.

In April and May, spending on groceries remained elevated, likely reflecting greater time spent at home and the shutting of restaurants. The gap with previous years narrowed considerably once pubs and restaurants reopened however, although grocery spending remained somewhat above levels in previous years even by the end of September. This may partially reflect more people working from home and a jump in food prices caused by a reduction in multi-buy offers, as explored by

Jaravel and O’Connell (2020).⁴ The increase in spending has varied across the income distribution: between January and September, the poorest fifth of households increased their grocery spending by 21%, compared with 11% for the richest fifth. This result is potentially relevant for the current debate around free school meals: even with meal vouchers being provided during the holidays for the period we analyse, grocery spending has increased considerably more for poorer households.

Figure 2.3 shows the dramatic fall in spending on restaurants, pubs and other recreation as almost all businesses in this category were forced to close during the lockdown. Spending began falling sharply in this area during the week social

Figure 2.3. Average weekly spending on restaurants, pubs, and other recreation



Note: See the appendix for full details of spending categorisation. Spending is inflated to September 2020 prices using weighted monthly CPI for recreation and catering services, interpolated to the weekly level.

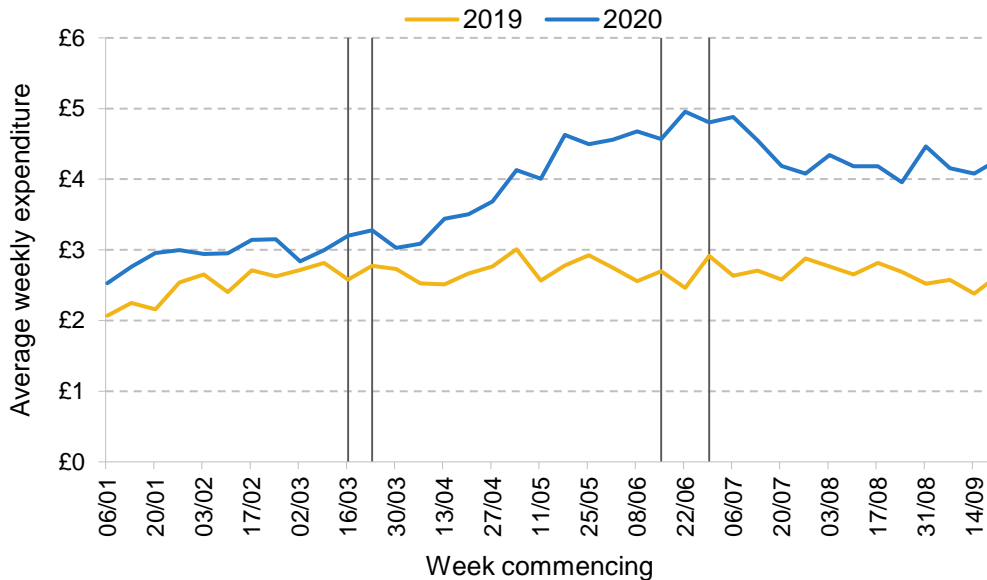
Source: Authors’ calculations using Money Dashboard data available on 16 October 2020.

⁴ Some variation in grocery spending changes by age was seen too, with the spending of the old generally increasing by more than that of the young early on in the crisis, and remaining more persistently high. During March 2020, those aged 52–65 spent 38% more on groceries than in January 2020, compared with 29% for those aged 22–35. In July 2020, the equivalent figures were 30% and 16% respectively.

distancing was introduced, perhaps indicating that behaviours were changing voluntarily even before government guidance changed; and it then plummeted to almost nothing as full lockdown was introduced. After these kinds of venues reopened, we saw a steady but not sudden growth in spending. The recovery seemed to level off in September at around 80% of 2019 levels (in some cases this may be related to venues in ‘local lockdown’ cities remaining closed). Although spending by households did not rise dramatically during August, the month in which the Eat Out to Help Out Scheme was running, we only see the consumer side of transactions and so the income received by hospitality venues may still have risen. The decline in spending even in proportional terms showed a clear distributional pattern: between January and September, the poorest households only cut their spending on this category by 6%, compared with 26% for the richest.

Mirroring the decline in spending on restaurants, takeaway spending rose by over 50% a few weeks after lockdown began as consumers shifted spending away from restaurants (Figure 2.4). It continued to rise until pubs and other venues were reopened, after which it experienced a modest fall, but remained around 60% above pre-crisis levels through August and September. This elevated level of spending in

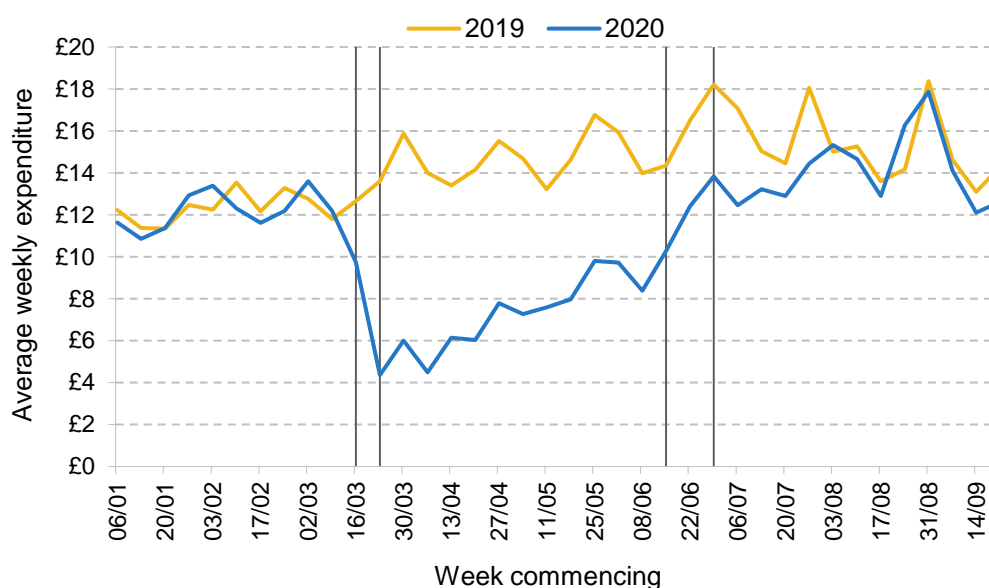
Figure 2.4. Average weekly spending on takeaways



Note: See the appendix for full details of spending categorisation. Spending is inflated to September 2020 prices using monthly CPI for takeaways, interpolated to the weekly level.

Source: Authors’ calculations using Money Dashboard data available on 16 October 2020.

Figure 2.5. Average weekly spending on clothing and appearance



Note: See the appendix for full details of spending categorisation. Spending is inflated to September 2020 prices using monthly CPI for clothing and footwear, interpolated to the weekly level.

Source: Authors' calculations using Money Dashboard data available on 16 October 2020.

August is despite the Eat Out to Help Out Scheme subsidising restaurant over takeaway food.⁵

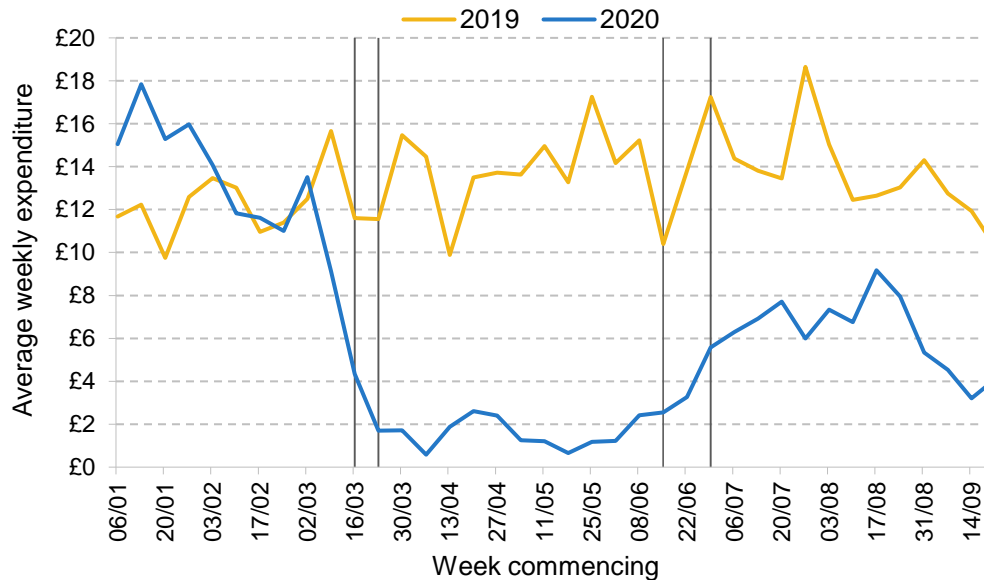
As with restaurants and pubs, clothing stores were forced to shut down during the lockdown, and the effect of this is clear in Figure 2.5. We see some of this fall occur in the week before shops were forced to close. As lockdown continued through April and May, spending on clothing and appearance steadily rose to around 60% of normal levels, possibly thanks to increasing use of online retail, with larger rises for younger consumers. However, once non-essential retail reopened in June, there was a more sustained rebound and – unlike many other spending

⁵ Takeaway spending is the category that shows the most substantially different pattern by age: for consumers under 50, spending in June was about 70% higher than in January, while for those above 50 it had almost tripled – though from a considerably lower starting point. And while younger consumers did not start increasing their spending until late April, for older consumers the rise began a week or two prior to social distancing, and has persisted through to August and September. This earlier and more sustained change among older consumers may reflect greater concerns about catching the virus at restaurants: they also showed slightly larger declines in spending on restaurants, pubs and other recreation in the week before social distancing.

categories – spending on clothing and appearance had returned by August to around levels seen in 2019.

Holiday spending shows a decline even prior to social distancing, perhaps as households anticipated that lockdown-type measures were likely to come in and make holidaymaking difficult. Figure 2.6 shows that spending was down by 40% on the previous year in the week before social distancing was announced, falling to a third of 2019 levels in the first week of social distancing. Unsurprisingly, there was little spent on holidays throughout April, May and early June, with spending always below 20% of 2019 levels. This changed once hotels were able to reopen at the start of July, but once again the recovery is much slower than the decline had been in March, and spending in this area remained well below half of normal levels in September, suggesting that greater domestic travel did not fully make up for the inability to travel to most international destinations without quarantining on return. Overall, during the first 38 weeks of 2020, spending on holidays was around £250 for the average household, compared with over £500 during the first 38 weeks of 2019, and the decline is even more dramatic just focusing on the period from March onwards.

Figure 2.6. Average weekly spending on holidays

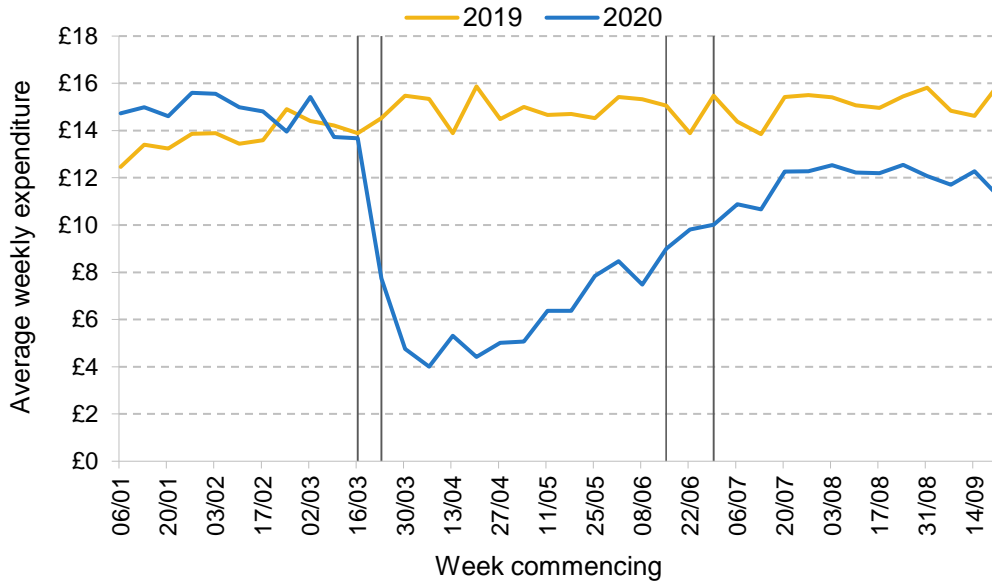


Note: See the appendix for full details of spending categorisation. Spending is inflated to September 2020 prices using weighted monthly CPI for package holidays, air transport and accommodation services, interpolated to the weekly level.

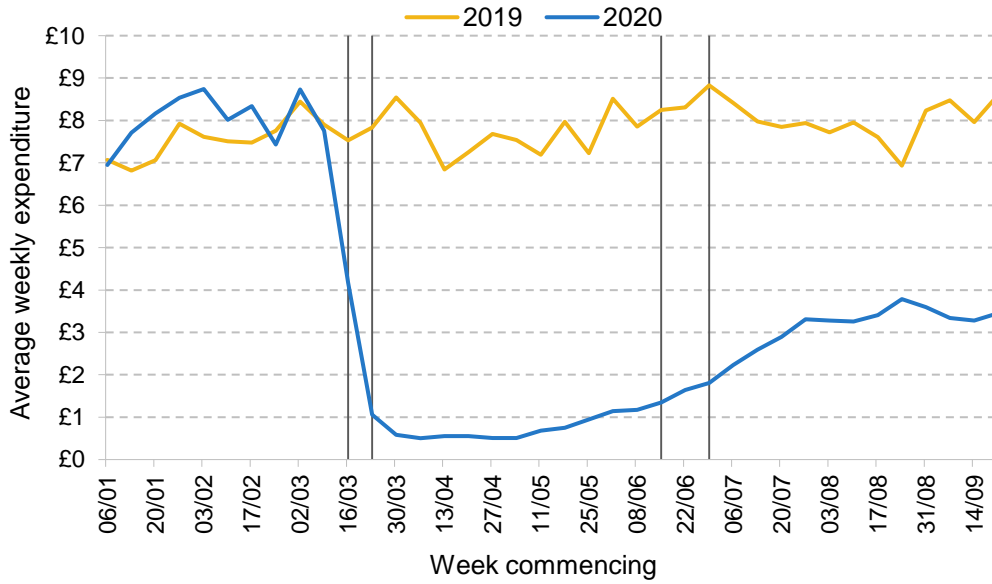
Source: Authors' calculations using Money Dashboard data available on 16 October 2020.

Figure 2.7. Average weekly spending on transport

(a) Driving



(b) Public transport



Note: See the appendix for full details of spending categorisation. Spending is inflated to September 2020 prices using monthly CPI for personal transport (for driving) and a weighted measure of monthly CPI for rail and road passenger transport (for public transport), interpolated to the weekly level.

Source: Authors' calculations using Money Dashboard data available on 16 October 2020.

We now turn to transport spending. Figure 2.7 shows spending related to driving (largely fuel; top panel) and public transport (bottom panel). Both unsurprisingly declined sharply in the wake of lockdown as travel was both less needed (e.g. for work or shopping) and discouraged by government guidance. However, there is an important difference in the timing of the declines. Public transport spending fell to just over 50% of 2019 levels in the week social distancing began, whereas spending on driving did not start falling until a week later, once full lockdown began.

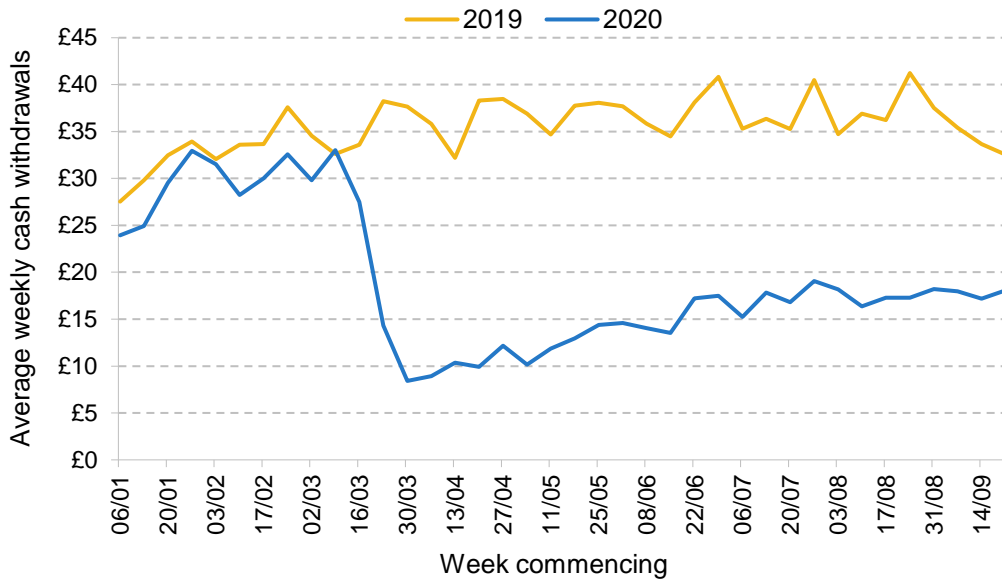
Public transport spending declined by much more than spending on driving, only being 5–10% of 2019 levels through much of April and May, whereas spending on driving fell to roughly a third of normal levels. While spending related to driving steadily rose from early May onwards, public transport spending remained subdued much longer, and only really started to pick up in June. By August, spending on driving was 20% below its 2019 level, where it remained through September, while spending on public transport was 60% below normal levels. That both remain lower than last year reflects higher levels of working from home and lower levels of shopping and mobility; that public transport has recovered so much less may be indicative of it being perceived to have greater health risks.⁶ Overall transport spending declined by more for the richest fifth of households (30% fall) than the poorest (20%).

We next explore how payment patterns have changed throughout the pandemic, with spending shifting from cash to other forms of payment and from physical stores to online.

Figure 2.8 starkly demonstrates how payment methods have changed during the pandemic period. By the end of March, cash withdrawals had fallen to below a third of their pre-pandemic level, a far greater proportional decline than the fall in overall spending. This reflects not just reduced spending, but also spending moving online or to card payments in an effort to reduce spread of the virus through handling cash. Although average weekly cash withdrawals recovered gradually with the reopening of non-essential retail, they have changed little since late June and in August and September remained below half of the level seen in 2019 – perhaps indicative of the crisis accelerating an already existing trend.

⁶ By September, overall transport spending (driving plus public transport) had fallen by 24% for those aged 22–35, and by 32–34% for older consumers. Again, it is possible that these differences are in part driven by differing health concerns.

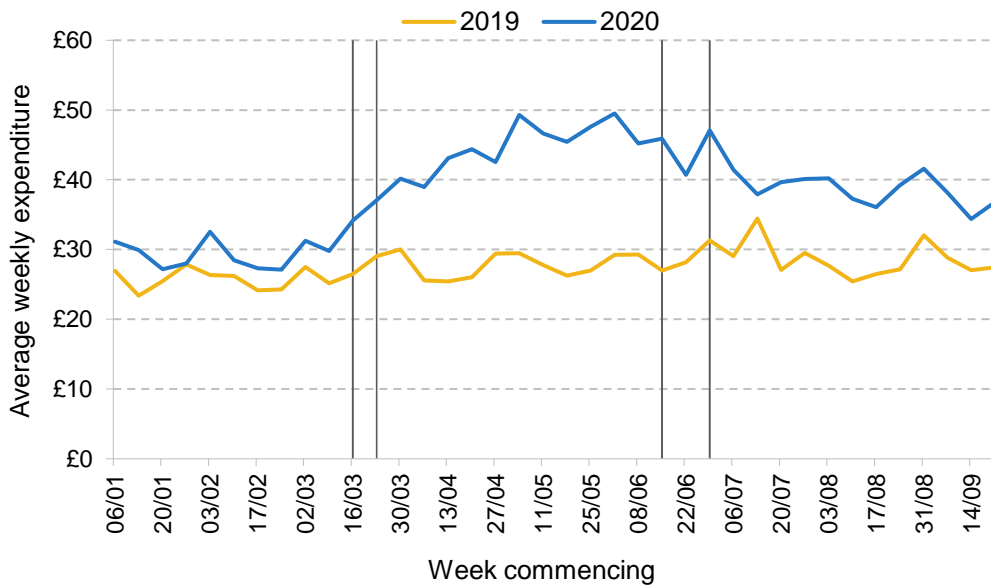
Figure 2.8. Average weekly cash withdrawals



Note: Cash withdrawals are inflated to September 2020 prices using total monthly CPI, interpolated to the weekly level.

Source: Authors' calculations using Money Dashboard data available on 16 October 2020.

Figure 2.9. Average weekly spending on online-only retailers



Note: See the appendix for full details of spending categorisation. Spending is inflated to September 2020 prices using total monthly CPI, interpolated to the weekly level.

Source: Authors' calculations using Money Dashboard data available on 16 October 2020.

We now turn to spending on the online-only retailers described earlier, which exclusively sell online but sell products that can also be bought in physical shops. We see in Figure 2.9 that, following the introduction of social distancing, consumers switched from physical retail to online stores, leading to spending in May being 70% higher than that seen in 2019.

With the reopening of non-essential retail, a partial switch back towards physical retail appears to have occurred, with online ‘substitute’ spending declining somewhat – but this change seems to have stalled and, by September, spending was still up almost a third on the equivalent period from 2019 (compared with a difference in January and February of around 15%). Firth, Gathergood and Stewart (2020) discuss trends in online and physical retail in more detail, and argue that the switch to online spending may be a long-run consequence of the pandemic.

We now analyse how much each of these categories contributed to the fall and subsequent recovery in total spending. Table 2.1 shows changes in spending during the ‘decline’ (January 2020 to April 2020) and the ‘recovery’ (April 2020 to September 2020) – with changes split around April because that was the month when total spending was at its lowest. For each spending category, the table shows average changes in spending, and then the share of the total decline or total recovery which that category contributes.

Reduced spending on recreation, holidays and transport all made significant contributions to the decline, as did lower cash withdrawals. Because grocery spending rose over the period, it served to partially stem the decline. In broad terms, the recovery was a mirror image of the decline, with those categories with larger spending falls in the earlier period experiencing larger increases in the later one. Cash withdrawals, spending on holidays and transport spending somewhat go against that pattern: all of them saw a considerably larger fall than they did a recovery. Grocery spending did not contribute to the recovery period.

Table 2.1. Decomposition of decline and recovery in monthly spending

Category of spending	Decline (Jan – Apr)		Recovery (Apr – Sep)	
	Change	Contribution	Change	Contribution
Groceries	£43	–18%	£0	0%
Restaurants, pubs & other recreation	–£62	25%	£51	23%
Takeaways	£2	–1%	£5	2%
Clothing & appearance	–£29	12%	£37	17%
Holidays	–£63	25%	£12	5%
Transport	–£80	32%	£50	23%
Cash	–£77	31%	£36	16%
Other	£18	–7%	£31	14%
Total	–£247	100%	£222	100%

Note: See the appendix for full details of spending categorisation.

Source: Authors' calculations using Money Dashboard data available on 16 October 2020.

3. Spending and local virus prevalence

Clearly, falls in income and closures of shops and other outlets are behind much of the decline in spending we have documented. However, it is also plausible that fears about catching the virus may have caused people to alter their spending patterns. In this section, we investigate how spending patterns are associated with the *local* prevalence of COVID-19 – over and above any response to the national prevalence. This helps build a fuller picture of how local incidence of the virus affects economic activity.

Our approach is as follows. We measure, for each week, the average spending in each English local authority⁷ that week relative to the local authority's average spending in the first nine weeks of the year (i.e. pre-crisis). We then match in official data on the number of positive cases per 100,000 people in the local authority in that week (as with all such data on positive test results, this will unfortunately not be an entirely consistent series as it will reflect expansions in testing capacity over time⁸). In each week, we then run a statistical regression in

⁷ We exclude other UK nations because of difficulties in aligning the dates for cases data, with data reported separately by public health bodies in each nation.

⁸ In the later part of the period we look at, the greater availability of testing means that such case counts are probably a better measure of the true health situation. But these data are likely sufficient for describing what the consumers understood about the prevalence of the virus in their local area – since case counts were the only source of information – and this is what is likely to drive spending patterns.

which we associate the proportional change in spending with the number of positive cases in the local authority, controlling for the local authority's pre-crisis spending.⁹

In order to get a sizeable sample of users in each local authority, we move away from using the balanced panel of users and instead now use all the users that appear in the data. As our focus is to compare spending between local authorities within a given week, having a changing sample of individuals over time should no longer matter so long as the change in the nature of that sample does not vary *between* local authorities. As a check, we conducted a similar exercise using the balanced panel, and reassuringly the patterns are not substantially changed.¹⁰

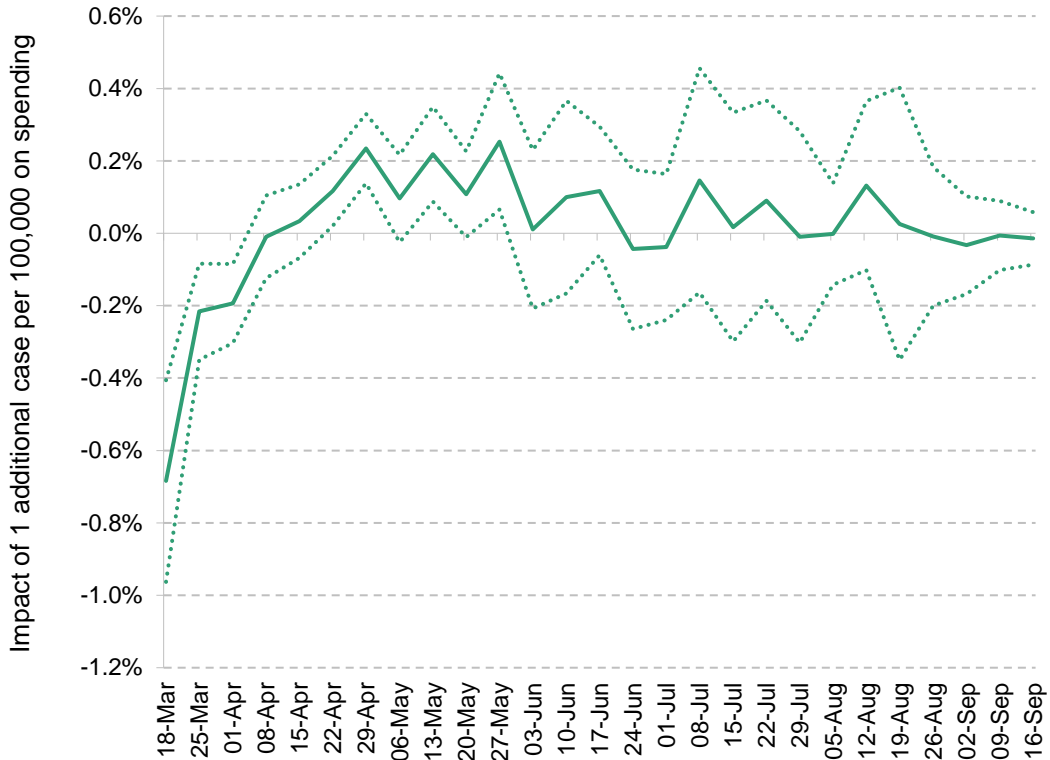
Figure 3.1 shows the relationship between local spending and the local prevalence of positive cases over time. Specifically, it shows in each week the association between one additional case per 100,000 population in a local authority and the proportional change in local authority spending. For context, in the week that lockdown began, around half of English local authorities had no cases and the local authority at the 75th percentile had 5 cases per 100,000 population; by the week commencing 22 April, the median local authority had far more cases, at 38.9 per 100,000 population.

At the beginning of the pandemic, the relationship between cases and spending was negative. In the week commencing 18 March, the median local authority in England had no recorded cases, while the local authority at the 75th percentile had 5 per 100,000. This difference was associated with a fall in spending of 3.4%. This was driven by lower spending in particular on transport, and to a lesser extent clothing & appearance and restaurants, pubs & recreation. It was also concentrated in London – excluding London local authorities from the regression notably reduces the strength of the correlation.

⁹ We have also tried controlling for local lockdowns. This is challenging because of the variation in the exact nature of the restrictions that local lockdowns have entailed. However, simply entering a dummy into the regression for weeks in which the local authority was in some form of local lockdown makes very little difference to our results. Future work will examine the effects of local lockdowns in more detail.

¹⁰ Specifically, rather than measuring differences in spending at the local authority level, we measure differences between a user's pre-crisis spending and spending in that week. The shape of the results is very similar, except they are noisier (as one would expect given a bigger sample) and generally show a modestly more positive relationship between cases and spending.

Figure 3.1. Estimated impact of an additional positive COVID-19 case per 100,000 residents in a local authority on spending



Note: The solid line shows the central estimate; the dotted lines show 95% confidence intervals.

Source: Authors' calculations using Money Dashboard data available 16 October 2020.

However, the relationship between local caseloads and spending quickly weakened, with no significant relationship present by mid April. There was then a brief period where, if anything, it seems that more cases were associated with higher spending, but the relationship is weak and barely statistically significant. From the end of May right up until the end of September, there has been essentially no relationship between local cases and spending. Looking at the crisis as a whole, more cases are associated with slightly lower spending on restaurants, pubs & other recreation, and slightly more online spending, though the magnitudes of these associations are small.

It is worth emphasising that these results do *not* tell us about the overall relationship between COVID-19 cases and spending. Most importantly, this approach does not allow us to analyse the extent to which consumers respond to the *national* rather than local case count, since we only measure the relationship between the latter and

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spending. Consumer spending may well be responding to the national case count – what our results suggest is that the difference between local and national prevalence has not, at least since a few weeks into the crisis, had a significant impact on consumer decisions.

4. Spending and saving across the income distribution

Spending across the income distribution

One cause of the documented declines in spending is what might loosely be termed ‘forced saving’. More precisely, when a sector of the economy shuts down, consumers who would otherwise have spent money on it must either substitute towards spending on something else or increase their saving. As shown in Crawford et al. (2020) the spending patterns of households in different parts of the income distribution will tend to be impacted differently by sector shutdowns, because they spend their money on different things.

To be clear, in general, although households that are ‘forced’ to save in this sense may end up with higher wealth at the end of the crisis, that does not represent a positive thing for them overall: presumably in most cases they *wanted* to incur that spending because it bought something they valued, and so they have lost out by being unable to spend that money at a time when they would otherwise have chosen to. The one major case where they may have genuinely gained is some reduced transport spending: those who can work from home and thus save on commuting costs have been ‘forced’ to save, but commuting was really a work-related expense rather than a consumption good.

To get a handle on how forced saving has affected households across the income distribution, we split spending into four groups based on how affected they were by

government restrictions during the initial lockdown period, alongside cash withdrawals:¹¹

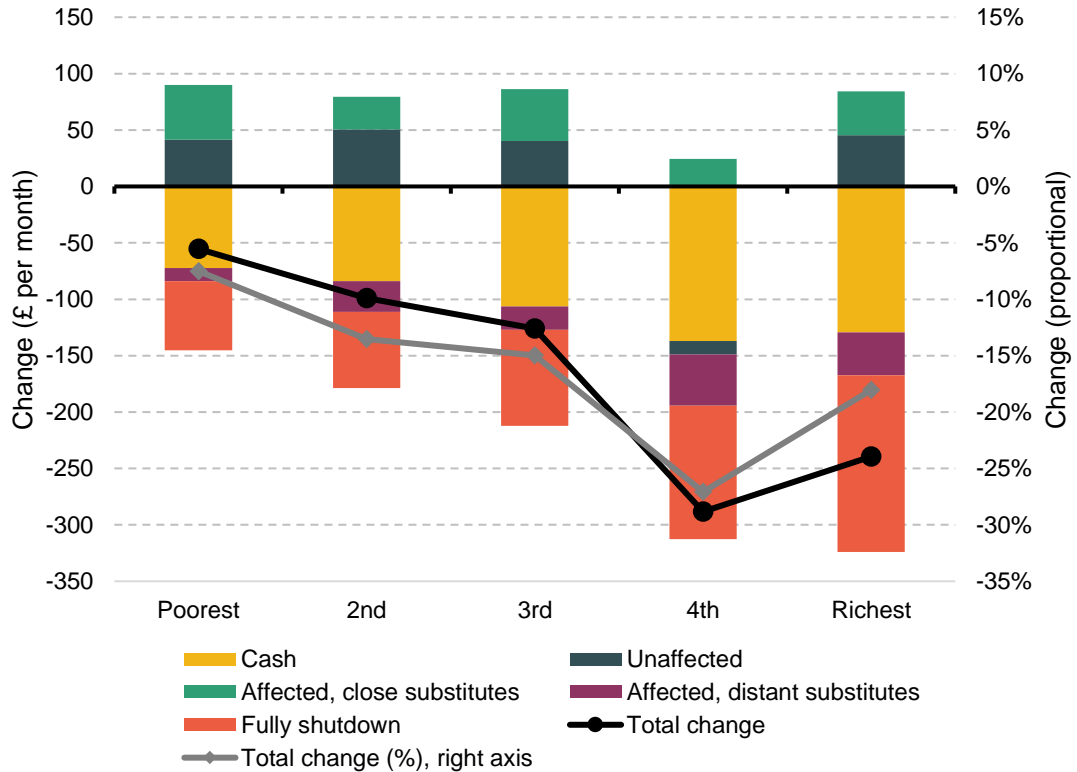
- Unaffected – sectors that have remained open and largely unaffected throughout the crisis, such as groceries.
- Affected, close substitutes – sectors some parts of which were shut down during lockdown, but where other very similar goods or services (‘substitutes’) remained open throughout. For example, clothes are in this category: while in-person clothes shopping was largely shut down during lockdown, it was still possible to shop for clothes online – a relatively close substitute.
- Affected, distant substitutes – as with the above group, except where the substitute is less similar. For example, we include restaurants and takeaways in this category – the former were shut down but the latter not, and the services they provide are somewhat similar but clearly not identical.
- Fully shut down – sectors that were entirely shut down, with no substitutes available: for example, childcare.
- Cash withdrawals – many businesses stopped accepting cash payments over the course of the pandemic to reduce transmission risk. This means that cash withdrawals have fallen, but the implication for forced saving is ambiguous. Some cash will have been spent in establishments that were shut down, but other cash use will have been replaced by spending on cards in the above categories.

Naturally there is some judgement involved in categorising spending into these groups. A complete list of what is included in each group is available in the appendix.

We calculate average monthly spending on the different categories between March and September in 2019 and 2020, and Figure 4.1 shows the difference between the

¹¹ We exclude transactions relating to investments in shares and pensions, money put away in savings accounts, and transactions relating to the receipt or repayment of personal loans, since these do not represent transactions that fundamentally change a user’s financial balance. We also exclude all transactions on the spending side for which there was no tag. Later on, when we look at income, regular untagged credits into accounts are counted as income that is not identified by MDB. For our main analysis, all transfers that we are able to identify are excluded. The full set of transaction tags that are excluded are listed in the appendix.

Figure 4.1. Difference in average monthly spending, March to September, between 2019 and 2020, by income quintile



Note: See the appendix for full details of spending categorisation. Spending is inflated to September 2020 prices using total monthly CPI.

Source: Authors' calculations using Money Dashboard data available 16 October 2020.

two for each quintile of the income distribution. Users are categorised into income quintiles according to their average monthly income from May to December of the preceding year.¹²

Spending on categories we classify as unaffected or affected but with close substitutes generally increased across the distribution (reflecting, for example, the higher spending on groceries seen throughout the period). In absolute terms these changes were fairly flat across the distribution, and so in proportional terms they

¹² Specifically, we take average monthly income as calculated from MDB for the final eight months of the year prior to that in which spending took place. This is done on the smaller sample that extends back into 2018, as described in Section 1. Income quintiles are then defined using thresholds from the official Households Below Average Income (HBAI) 2018–19 data. We do not include those whose income is below the 5th or above the 95th percentile of the HBAI income distribution.

were larger for poorer users. Spending on affected goods and services with more distant substitutes fell for all income groups, but these declines were larger (in absolute and proportional terms) for higher-income users. Spending on fully shut-down sectors – the clearest instance of ‘forced saving’ – also fell substantially, with bigger falls (again absolute and proportional) among higher-income users. In absolute though not in proportional terms, there were also larger falls in cash withdrawals for those with higher incomes.

This adds up to larger declines in total spending for higher-income users, both in absolute terms and proportional to 2019 spending. These differences are relatively large: whereas for the poorest users spending fell only by 7% on average, it fell by 27% for those in the fourth quintile and by 18% for those in the top quintile. This is consistent with the American experience where spending fell by more in higher-income areas (Chetty et al., 2020). This is likely because the poor tend to spend relatively more on essentials as a share of their total spending, as was explored by Crawford et al. (2020).

Changes in savings across the income distribution

These declines in spending, together with the changes to incomes previously documented in Bourquin et al. (2020), are likely to have had substantial consequences for households’ savings. It is this question we turn to now. Throughout this discussion, we refer to ‘saving’, but by this we mean ‘net’ saving: an increase in net saving can be caused by higher gross savings, but equally can be caused by lower debt.

The MDB data allow us to analyse how bank balances have changed over the period, with some caveats.¹³ For example, one set of transactions for which it is unclear whether they reflect a genuine change in net savings are transfers to or from a bank account not linked in to the user’s MDB account. On the one hand, some may be transfers to or from an unlinked bank account owned by the user, in which

¹³ Some changes in bank account balances might not reflect a genuine change in saving. For example, if a household purchases some shares using funds in a current account, the bank account balance will fall but the household’s total assets remain unchanged. Similarly, taking out a loan increases one’s bank account balance (in the short run), but this is offset by an equal increase in debt liabilities. We strip out these sorts of transactions, and focus on changes in bank account balances that reflect actual changes in net savings. We list the full set of transactions that we exclude in the appendix. If a user makes a transfer between two of their bank accounts (e.g. from a current account to a savings account) and both accounts are linked into MDB, we can see both ‘sides’ of the transfer and so these do not make any difference to our measure of net savings.

case they do not represent a real change in net savings. On the other hand, some may be transfers to or from someone outside the household (perhaps including rent payments), in which case they do. In the below, we ignore these transfers, assuming that they go to and from a user's (unlinked) accounts. We also conduct the analysis where we make the reverse assumption: this makes very little difference to the patterns we see.

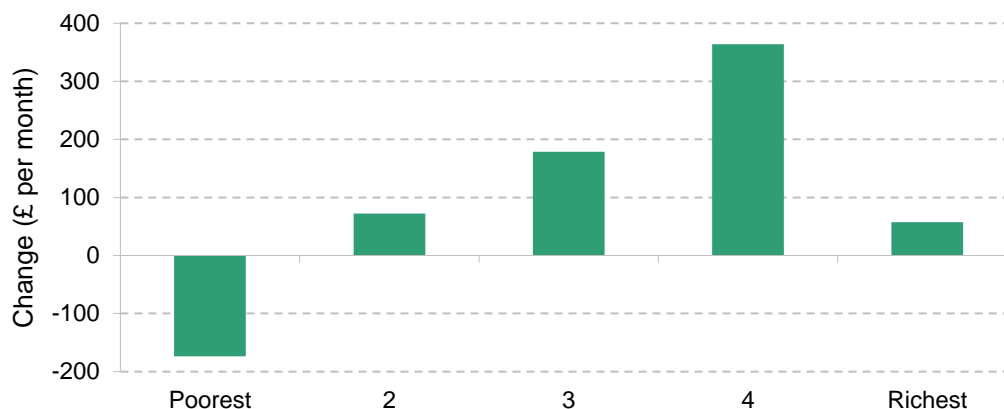
It is also worth emphasising that we are only looking at changes in net savings of fairly liquid savings – those connected to bank accounts. Thus, we do not include, for example, changes in the value of stock portfolios, house prices or outstanding mortgages. These are likely to have had a material effect on the net assets of some households, with large swings in stock indices and property values seen over the COVID-19 crisis.

Overall, April was a period of high saving – consistent with it being the lowest-spending month – with average saving levels about £260 per month higher than one might have expected based on the pre-crisis trend. Savings rates then fell somewhat, but nonetheless remained elevated across May to July. However, in August and September, they dropped down to roughly in line with, or even slightly below, where we might have expected given pre-crisis trends.

Figure 4.2 illustrates the cumulative effect of these patterns across the income distribution, showing the difference between average monthly saving in March to September 2020 and the same period in 2019. When looking at all but the top quintile, we see a clear relationship – higher income groups have saved more than lower ones, with the poorest quintile (20%) of users seeing a £170 per month decline in their saving (or increase in their debt) relative to normal – equating to £1,220 over the period – and the middle 60% seeing an increase. In broad terms, the picture is therefore one of higher-income households accumulating savings while lower-income ones decumulate. This is consistent with survey evidence on reported changes in savings (Brewer and Gardiner, 2020).

The decline in net saving relative to normal for the poorest quintile is relatively large, especially given that in many cases these households may have had little savings to start with. This may reflect one of a number of things. First, in some cases it is likely to be an increase in debt, rather than a decline in gross savings. Second, because of the way we are treating transfers (see above), bank transfers from family and friends are not counted as income and so, implicitly, we assume

Figure 4.2. Difference in average monthly saving, March to September, between 2019 and 2020, by income quintile



Note: Saving is inflated to September 2020 prices using overall monthly CPI.

Source: Authors' calculations using Money Dashboard data available 16 October 2020.

that they have to be paid back. Third, it is possible that low-income MDB users have greater savings than the low-income population at large.

The top quintile have on average seen little change in their saving, because of two forces. First, as seen in Figure 4.1, their spending has not declined as much as the fourth quintile's. Second, their income during March to September 2020 was a bit lower than it was in 2019, whereas the fourth quintile has had little change in income.¹⁴

¹⁴ Bourquin et al. (2020) showed that median income changes in each quintile were roughly even across the income distribution between January and May. Mean income changes, however, show slightly larger declines at the top. These ultimately feed through to less positive changes in monthly savings for this quintile.

5. Conclusion

Overall, several things from our analysis speak to how the economy might pan out over the coming months and how policymakers might wish to respond.

The dramatic declines in spending brought about by the pandemic have been well documented but are presented starkly here, with spending falling by as much as a quarter relative to normal levels. There has been much debate about the form of recovery that has been and will be seen going forwards. Our analysis of spending suggests that whilst a significant rebound did indeed initially materialise, it was certainly not as quick as the effects of lockdown and, since the end of July, there has been little further recovery. An economy operating at 90% or less of normal levels of spending in the medium term would clearly be exceptionally damaging to businesses, government tax revenues and ultimately the economic well-being of the country.

These declines have not been felt equally across sectors. For example, groceries and takeaway food saw increases in spending during lockdown, while transport, holidays, and restaurants, pubs & other recreation saw substantial declines. Importantly, we show that while these changes started to undo after reopening, the reversal appears to have stalled, with little change between the end of July and the end of September. Spending in the former sectors has plateaued at an elevated level relative to 2019, and spending in the latter sectors at a lower level. While these patterns may have implications for where targeted support going forwards is most needed, to the extent that these changes are permanent they also have consequences for which firms are viable in the long run – something that the government should keep in mind as it designs packages of support.

At least after a few weeks into the crisis, spending seems to have been remarkably insensitive to whether the consumer lives in an area with a low or high caseload. This could suggest a lack of knowledge about local infection rates among consumers, or that consumers do not respond much to that information. We do see spending clearly respond to policy interventions, and it is entirely plausible that national factors (including the national case count) drive spending decisions. We

will learn more about the impact of policy interventions as greater variation in policy emerges through the new tier system.

Our analysis also sheds light on the distributional impacts of the crisis. There have been widespread reports of large savings accumulation during the crisis, as shutdowns in much of the economy ‘forced’ a cut in spending for many households which saw little change in income. We show that higher-income households have accumulated more savings than they normally would. This has implications for the impact of the crisis on wealth inequality. It also suggests that higher-income households may be better placed to weather any future shocks as the crisis continues – a factor which should be borne in mind when designing future support schemes.

Appendix

Table A.1. MDB tags contained in each spending category

Category of spending	Tags contained in spending category
	Spending categorisation (Section 2)
Groceries	Toiletries, Alcohol, Food, Groceries, Household, Supermarket
Restaurants, pubs & other recreation	Dining or Going Out, Concert & Theatre, Dining and drinking, Museum/exhibition, Social club, Sports event, Zoo/theme park, Cinema, Gym Membership, Hobby Club Membership, Lunch or Snacks
Takeaways	Take-away
Clothing & appearance	Appearance, Clothes – Designer or Other, Accessories, Designer clothes, Jewellery, Clothes – Everyday or Work, Clothes, Dry cleaning and laundry, Shoes, Child – Clothes
Holidays	Holidays, Flights, Holiday, Hotel/B&B
Driving	Fuel, Parking or Tolls, Parking, Road Charges, Vehicle Hire, Vehicle Running Costs, Breakdown Cover, Service / Parts / Repairs, Vehicle Tax
Public transport	Public Transport, Taxis or Vehicle Hire, Taxi
Cash	Cash withdrawals

<p>Other (also included in total spending for Section 2)</p>	<p>Entertainment, TV, Media, Books / Magazines / Newspapers, Games and gaming, Media bundle, Mobile app, Music, Personal Electronics, TV / Movies Package, Gifts or Presents, Donation to organisation, Flowers, Gifts – other, Hobbies or Activities, Art Supplies, Course and Tuition Fees, Gambling, Gym Equipment, Hobbies – other, Hobby Supplies, Musical Equipment, Photography, Sports Club Membership, Sports Equipment, Stationery & consumables, Memberships, Child – Toys, Clubs or Other, Children – other, Toys, Pet – Everyday or Food, Vet, Pet – Toys, Training, Other, Home, Appliances or Electrical, Device rental, Art, Antiques or Other, Art, Household – other, Furniture, Furnishing, Gardens, Garden, Home and garden – other, Lighting, Home DIY or Repairs, DIY, Tradesmen fees, Electrical equipment, Postage / Shipping, Printing, Software, Stationery, Web hosting</p>
<p>Online alternatives (merchant based)</p>	<p>Amazon, ASOS, boohoo, eBay.co.uk, Jacamo, Moonpig, Next Directory Online, Ocado, PayPal</p>
<p>Forced saving categorisation (Section 4)</p>	
<p>Unaffected</p>	<p>Medical, Dental, Eye Care, Medical treatment, Toiletries, Alcohol, Entertainment, TV, Media, Media bundle, Mobile app, Music, TV / Movies Package, Vet, Pet – Toys, Training, Food, Groceries, Household, Supermarket, Postage / Shipping, Printing, Software, Web hosting, Hire Purchase, Road charges, Breakdown cover, Vehicle tax</p>

Affected, close substitutes	Appearance, Clothes – Designer or Other, Accessories, Designer clothes, Clothes – Everyday or Work, Clothes, Shoes, Enjoyment, Books / Magazines / Newspapers, Games and gaming, Personal Electronics, Gym Equipment, Photography, Sports Equipment, Stationery & consumables, Child – Clothes, Child – Toys, Clubs or Other, Children – other, Toys, Home, Appliances or Electrical, Furniture, Furnishing, Gardens, Furniture
Affected, distant substitutes	Jewellery, Beauty products, Dental treatment, Eye care, Dining or Going Out, Dining and drinking, Take-away, Gifts or Presents, Flowers, Gifts – other, Hobbies or Activities, Art Supplies, Gambling, Hobbies – other, Hobby Supplies, Musical Equipment, Lunch or Snacks, Pet – Everyday or Food, Home DIY or Repairs, DIY, Electrical equipment, Vehicle, Stationery
Fully shut down	Dry cleaning and laundry, Hairdressing, Health, Beauty treatments, Personal Care – Other, Spa, Concert & Theatre, Museum/exhibition, Social club, Sports event, Zoo/theme park, Cinema, Cycling, Gym Membership, Sports Club Membership, Flights, Holiday, Hotel/B&B, Child – Everyday or Childcare, Childcare Fees, Device rental, Garden, Tradesmen fees, Vehicle purchase, Transport, Driving Lessons, Fuel, Parking or Tolls, Parking, Public Transport, Taxis or Vehicle Hire, Taxi, Vehicle hire, Vehicle Running Costs, Service / Parts / Repairs

Other (spending) for forced saving	Physiotherapy, Donation to organisation, Course and Tuition Fees, Education – other, Hobby Club Membership, Memberships, School fees, Art, Antiques or Other, Art, Household – other, Home and garden – other, Lighting, Refunded purchase, Rewards/cashback, Winnings, Insurance, Contents or Other Insurance, Home appliance insurance, Home insurance, Income insurance, Insurance – other, Life insurance, Mobile phone insurance, Payment Protection Insurance, Health insurance, Dental insurance, Pet Insurance, Vehicle insurance, Motorbike Insurance, One-off or Other, Banking Charges, Bank charges, Interest charges, Penalty charges, Business Expenses, Administration – other, Business Accommodation, Expenses, Legal, One-off or Other Payment, Financial – other, Fines, Tax Payment, Credit Card, Credit card repayment, Store card repayment, Student loan repayment, Transfers, PayPal account
Income	Benefits, Family benefits, Other benefits, Dividend, Interest income, Irregular Income or Gifts, Bursary, Student Loan funds, Pension, Work pension, Rental income (room), Rental income (whole property), Salary or Wages (Main), Salary (secondary)
Transaction tags excluded from analysis of balances	Sharedealing account, Investment – other, Current account, Savings (general), ISA, General savings, Car fund, Savings, Unsecured loan repayment, Secured loan repayment, Personal loan, Payday loan, Repayments, Pension or Investments, Unsecured loan funds, Payday loan funds, Mortgage release, Investments or Shares

Note: These categories are based either on the transaction or on merchant tags within the Money Dashboard data. The income measure used is supplemented by an algorithm we have designed for identifying regular credits into accounts.

Source: Money Dashboard data.

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