

The distributional impact of the pandemic

2nd Workshop on Household Finance and Housing

Sinem Hacıoğlu-Hoke (BoE), Diego R. Känzig (LBS) and Paolo Surico (LBS)

June 2021

The views expressed here are those of authors and do not necessarily reflect those of Bank of England or the Monetary Policy Committee, the Financial Policy Committee or the Prudential Regulation Committee.

Motivation

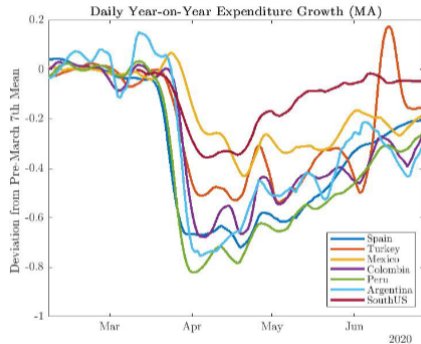
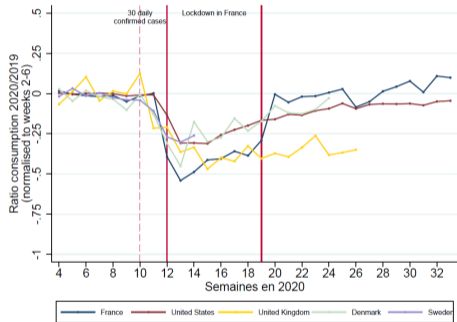
- **COVID-19** plunged the global economy into the **worst recession** since WWII
- With things evolving so **fast**, crucial to be able to track the economy in **real time**
 - **KEY** to calibrate and evaluate stabilization policies
- **Problem:** Traditional macroeconomic indicators only available at monthly/quarterly frequency

- Use **high-frequency transaction data** to analyze how the **pandemic** affects **household behavior**
- Richness of the data allows us to track both **consumption** and **income**
- Study the **distributional effects** of the pandemic and government policies

Burgeoning empirical literature

- **U.S.:** Baker et al. (2020); Chetty et al. (2020); Cox et al. (2020); Coibion, Gorodnichenko, and Weber (2020); Williams (2020)
- **Spain:** Carvalho et al. (2020)
- **France:** Bounie, Camara, and Galbraith (2020)
- **Scandinavia:** Andersen et al. (2020)
- **Ireland:** Hopkins and Sherman (2020)
- **Norway:** Aastveit et al. (2020)
- **Portugal:** Carvalho, Peralta, and Pereira dos Santos (2020)
- **China:** Chen, Qian, and Wen (2020)
- **U.K.:** **This paper**, Bourquin et al. (2020), Chronopoulos et al. (2020)
- and many more ...

Burgeoning empirical literature



Data

We use **transaction level data** from a large U.K. Fintech company (**Money Dashboard**)

- **Product:** Free app to manage household finances
- **Users:** Over 100,000 in total. About 15,000 in our sample (balanced panel)
- **Sample:** January 2019 to June 2020 – emphasis on the **first wave**
- **Level:** Every time a user transacts on an account linked to the app, the transaction is collected with time stamp and description (millions of transactions)
- **Tagging:** Data provider uses **machine learning techniques** to categorize transactions into over **200 categories**, for **spending, earnings and income**
- **Privacy:** Data anonymized by provider, we observe year of birth, partial postcode, gender

Unique features:

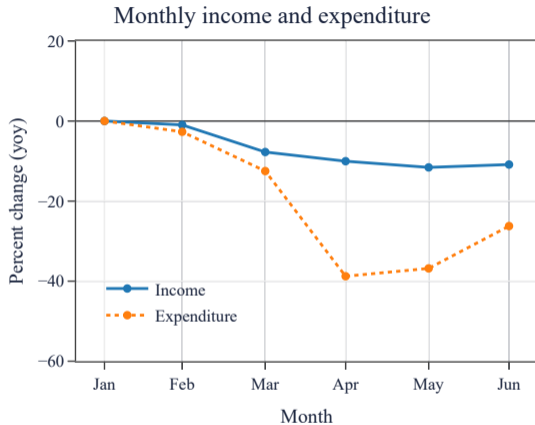
- **Complete picture** of household finances: users can link **all their accounts** in single platform
 - on average 4 accounts, 2 banks (current, credit, savings)
- **Little** measurement error
- Available in **real time**
- **But:** Sample not necessarily **representative**, only electronic transactions by younger and higher income individuals

▸ User selection

▸ Representativeness

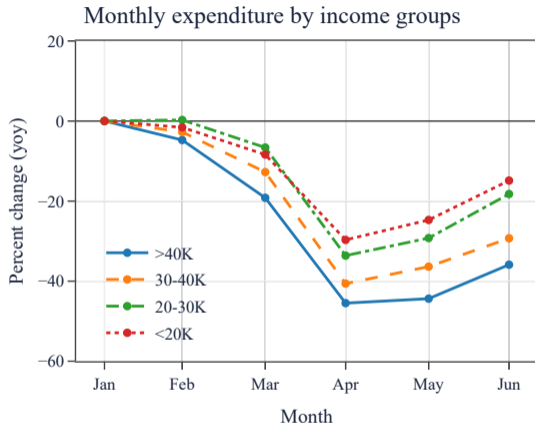
Results

On the shape of the recovery



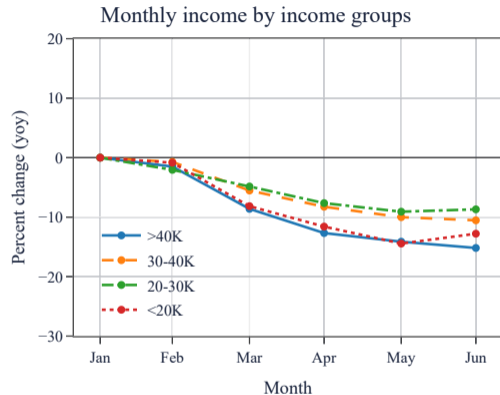
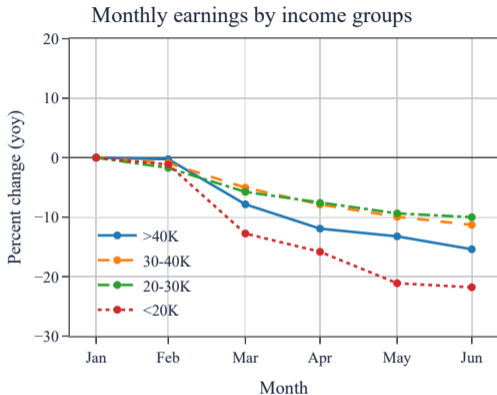
- Substantial drop in **total expenditure** which starts **before lockdown measures**
- Fall in **income** smaller but more persistent

Spending heterogeneity by income groups



- **Rich** have the **largest fall** in expenditures, **lower income individuals** cut expenditure by **less**
- Richer households can cut spending more as they spend more on **non-essentials**

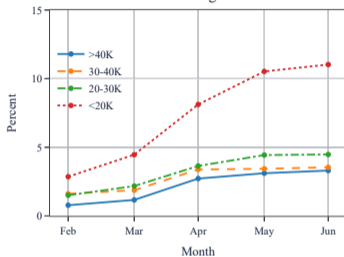
Earnings and income heterogeneity by income groups



- Lower income households experienced the **largest fall in earnings**
- **But** the **fall in income** is more muted and comparable to other groups

The role of government benefits

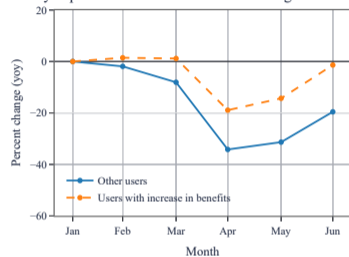
Share of users with increase in government benefits



Monthly government benefits by income groups

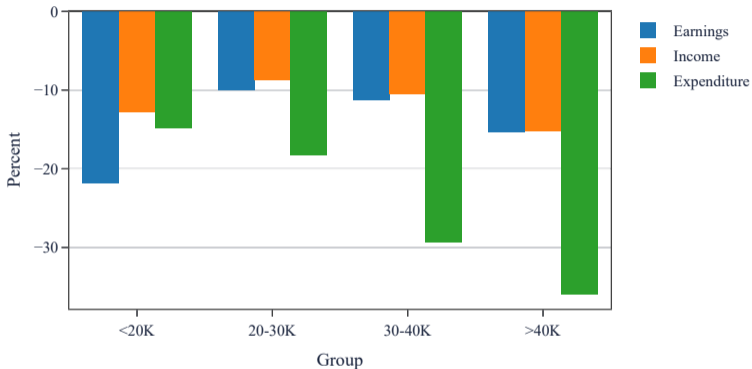


Monthly expenditure of users with increase in gov. benefits



- **Government benefits** increased disproportionately for **low income** group, both along extensive and intensive margin
- Beneficiaries **cut consumption by less** than other households

Implied personal savings by income groups



- **Higher income** groups **increase savings** substantially, much **more** than the **low income individuals** [▶ Savings](#)
- Without the help of **government benefits**, **low income individuals** had to **dissave** [▶ Additional results](#)

Conclusion

Take aways

1. **Spending decline** started **before** lockdown and social distancing measures
2. Drop in expenditure **driven by the rich**: account for almost half of it
3. **Low income individuals** suffer **largest drop** in earnings but **cut spending much less** as most of their basket is on essentials
4. Heterogeneity in **savings**: **Richer** households **increased** their savings substantially, but **lower income individuals** would have had to dissave
5. **Government benefits** played crucial role for **low income individuals** whose labor income dropped more than their spending

Thank you!

Our results

1. **Rich** cut spending the most and **drive** the **drop in aggregate consumption**: account for almost half of it
2. **Poor** suffer **largest drop** in earnings but **cut spending much less**
3. Reason: income of poor falls much less than their earnings because of **government benefits**
4. Heterogeneity in **savings**: **Richer** households **increased** their savings substantially, **poor** had to dissave in absence of benefits

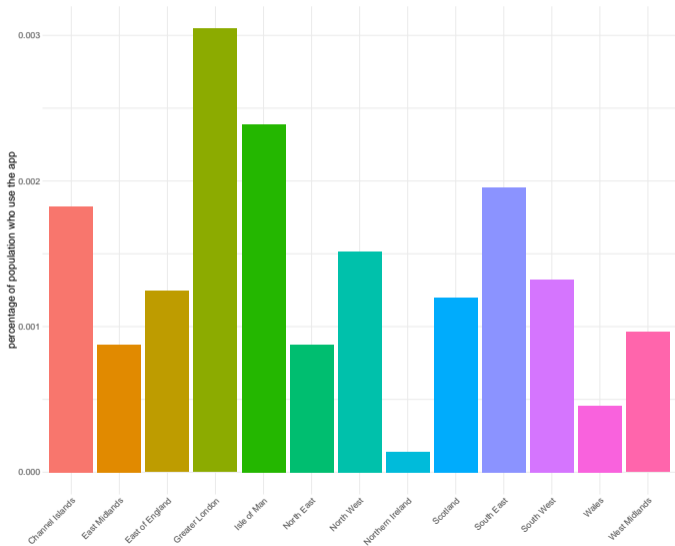
We focus on users that

- have at least one current account
- transact at least 200 pounds in debits and have a minimum of 5 transactions in each month in our sample (Jan 2019 - June 2020)
- have refreshed their account in July 2020
- exclude business accounts
- additional restrictions on tagged total expenditure and income

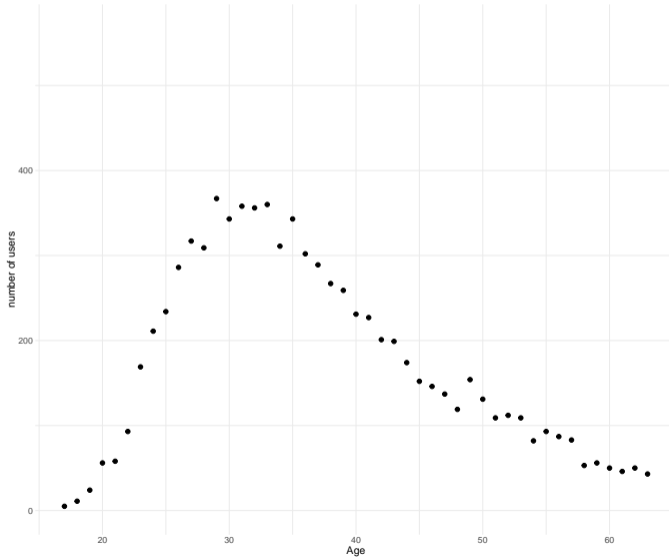
Table 1: Summary statistics

	Mean	p10	p25	p50	p75	p90
<i>User Characteristics</i>						
#Banks	2.30	1.00	1.00	2.00	3.00	4.00
#Accounts	4.38	1.00	2.00	4.00	6.00	8.00
Age	37.90	26.00	30.00	36.00	44.00	53.00
Salary	2669.05	1080.92	1636.51	2327.32	3297.48	4374.32
<i>Monthly Transactions</i>						
#Transactions	100.20	44.00	64.00	92.00	126.00	164.00
Total expenditure	1475.87	458.21	731.96	1190.62	1880.62	2768.53
Nondurables	554.85	122.04	240.21	439.43	764.68	1139.19
Durables	140.19	6.57	16.97	46.95	124.96	317.02
Services	836.99	218.18	367.57	622.38	1029.21	1609.66
Groceries	311.08	40.83	107.31	236.14	443.05	683.18
Restaurant	110.63	13.19	32.75	73.20	141.20	234.84
<i>Monthly Mortgage and Rent Payments</i>						
Mortgage payments	935.52	295.07	483.85	749.11	1102.15	1592.76
Rents	762.60	90.95	300.00	576.00	945.00	1472.66

Regional distribution



Age distribution



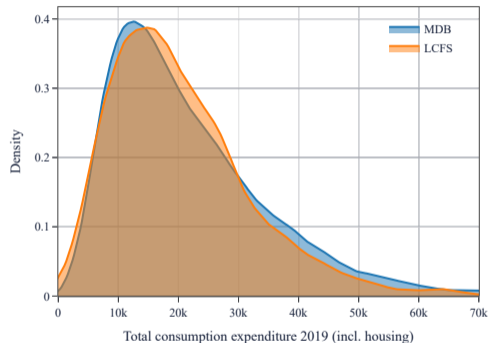
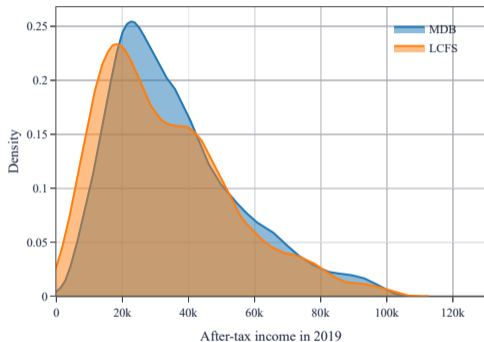
◀ Back

MDB population

- is more likely to be based in London
- is somewhat younger
- have somewhat higher income

How **representative** is the data? [◀ Back](#)

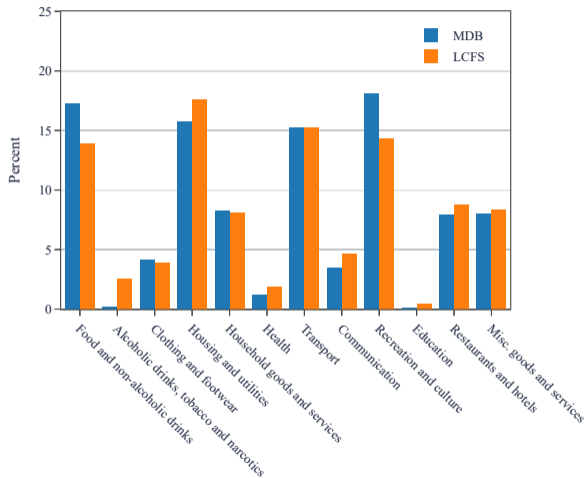
Income and consumption distribution



MDB **income** and **consumption distribution** align well with the LCFS

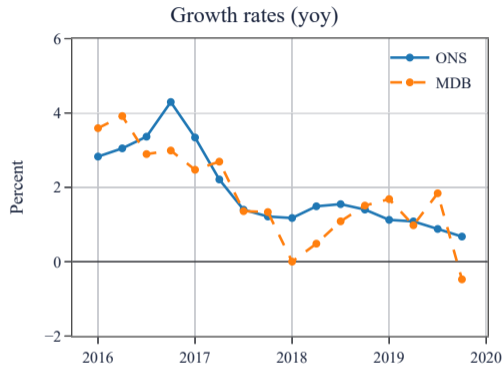
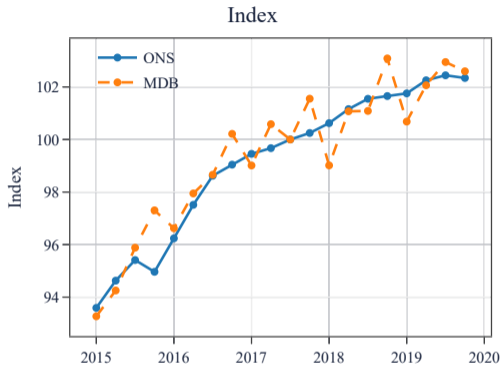
[◀ Back](#)

COICOP categories



Consumption in main **COICOP** categories in MDB fairly similar to the LCFS

National accounts on Consumption: 2016-2020



Correlation of 0.79 in the yoy growth rates of household expenditure from national accounts and aggregated MDB series [◀ Back](#)

The role of cash

We only capture electronic transactions and ATM withdrawals. But:

- **Card usage:** 98% (65%) of adults holds a debit (credit) card
- **Cash vs electronic payments:** less than 25% of payments are done by cash.
Only 9% by 2028

Data likely **representative** of the current transaction environment

Contribution to overall drop in spending by income group

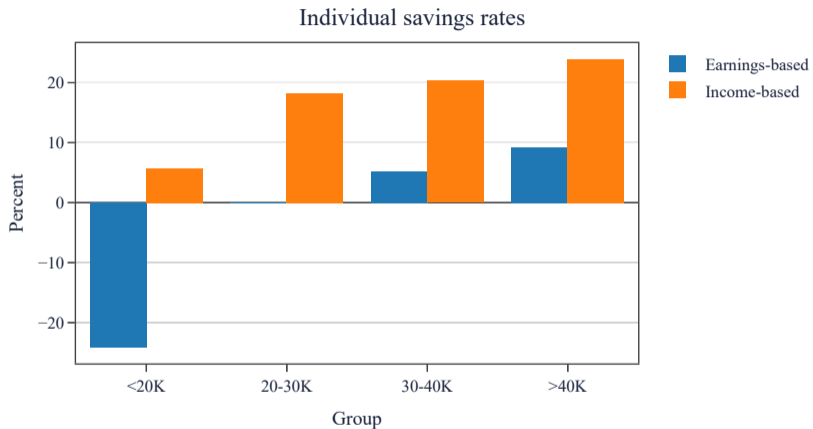
Table 2: Percentage spending decline by groups of the ex-ante income distribution

Income group	Share of users	Share in expenditure	Contribution to decline
< 20K	23.8	17.5	9.8
20 – 30K	28.6	20.9	16.3
30 – 40K	23.0	26.9	28.6
> 40K	24.6	34.7	45.3

Note: The table reports the share of users by after-tax income groups of (i) below 20K, (ii) between 20 to 40K, (iii) from 30k to 40K, and (iv) above 40K, based on their 2019 income distribution. It also reports these income groups' share in aggregate total expenditure in the second quarter of 2019 (third column) and how much each group contributes to the decline in spending in the second quarter of 2020 relative to the same period of 2019 (fourth column). Total expenditure has been deflated by the U.K. CPI.

- Large drop in aggregate consumption **driven** by the spending cuts by **high income** group

Heterogeneity in savings rates

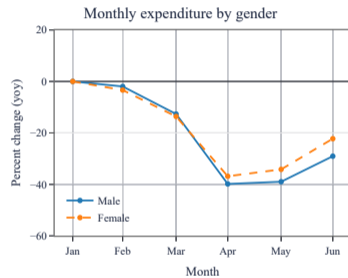
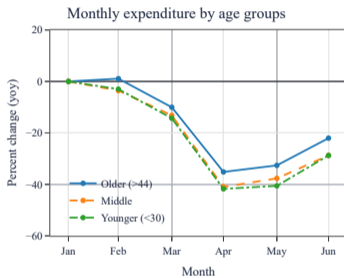
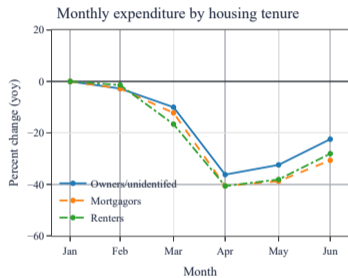


Heterogeneity in savings rates

- All income groups have **increased** their savings
- The **rich** have increased their savings much **more** than the **low income individuals**
- Without the help of **government benefits**, **low income individuals** had to **dissave**
- **Financial income** boosted the savings of the **rich**

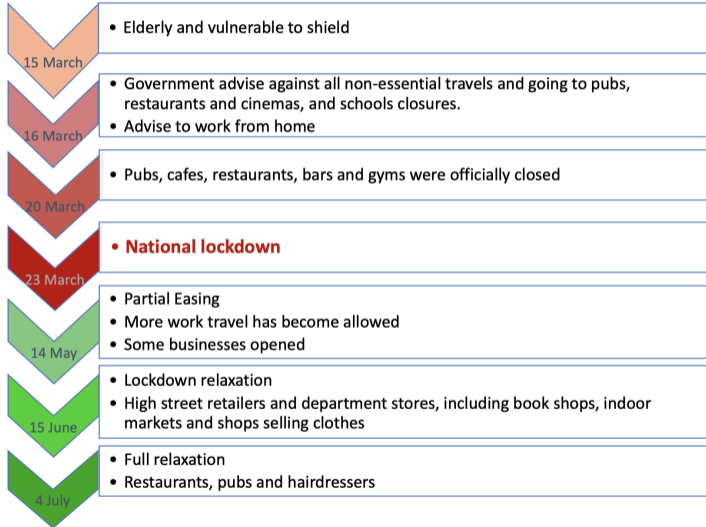
⇒ **Creating** new and **increasing** existing **inequalities**

Spending by housing tenure, age and gender

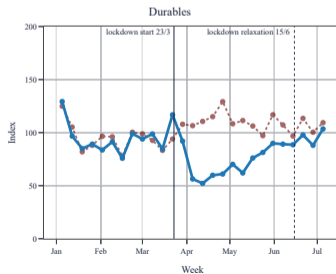
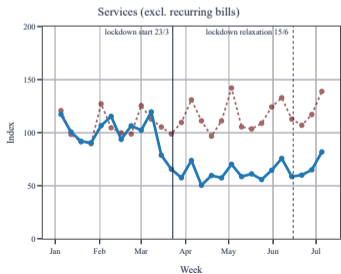
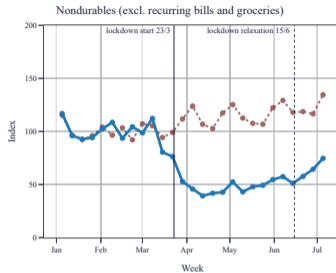
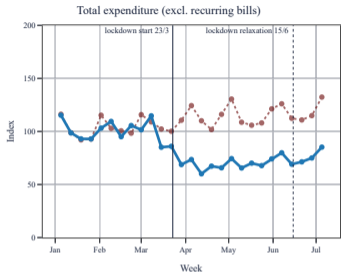


◀ Back

Covid timeline in the U.K.



Fears and uncertainty versus lockdown effects, 2019 vs 2020



Fears and uncertainty versus lockdown effects

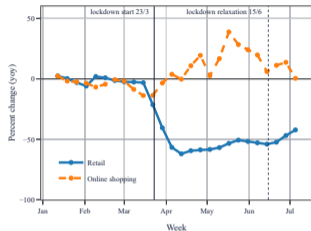
- Most of the **decline in spending** occurred **before** the lockdown and social distancing measures
 - Consistent with **precautionary behavior** because of fears regarding health and economic uncertainty
- Little sign of any significant recovery after partial ease in May, only modest improvement in June

▸ Sectoral results

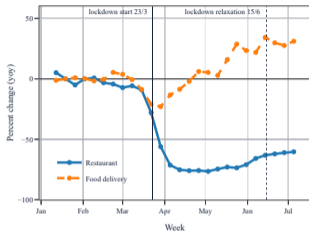
▸ Regional results

Which sectors are losing and which ones are gaining?

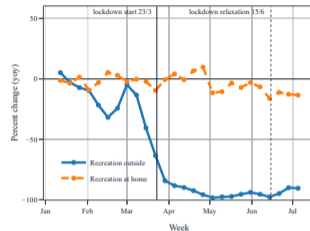
Retail and online shopping (Amazon & Ebay)



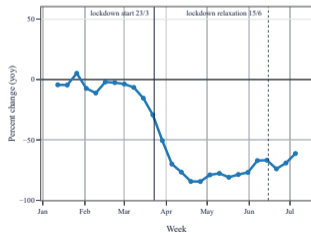
Restaurants and food delivery



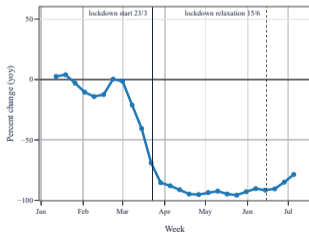
Recreation outside and at home



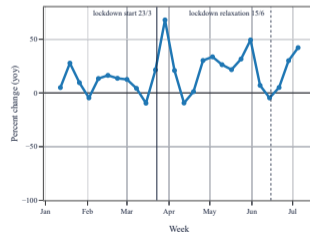
Transportation & fuel



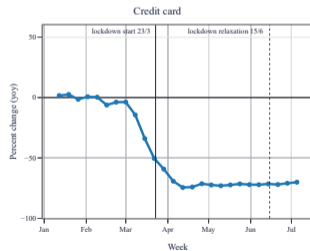
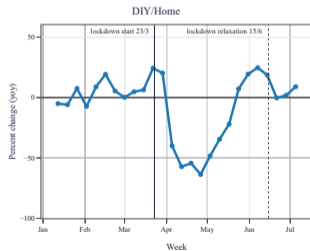
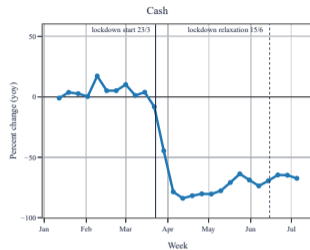
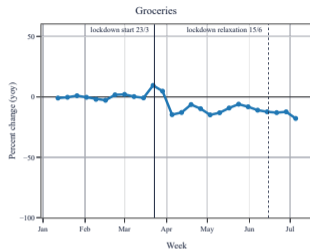
Travel & holidays



Alcohol & tobacco



Additional sectors

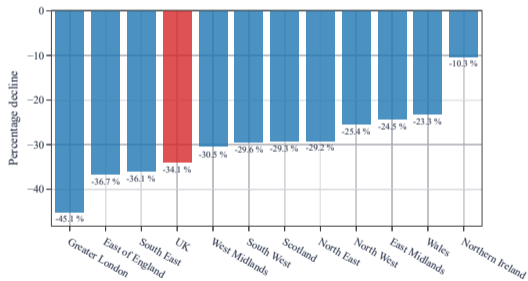


Which sectors are losing and which ones are gaining?

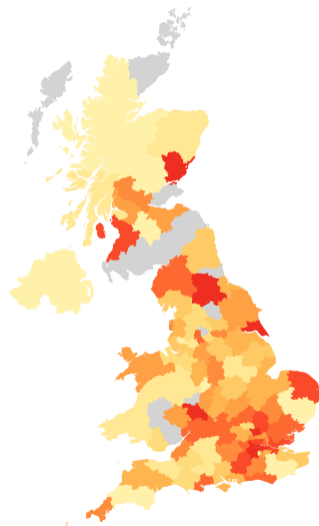
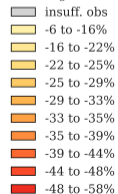
- Pervasive sectoral heterogeneity
- **Retail, restaurant and transportation** hit the most
- Online shopping, food delivery and alcohol & tobacco made most gains

◀ Back

Regional variation in spending



Percentage decline



Regional variation in spending

Table 4: Regional regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Covid-19 deaths	-0.0728* (0.0366)			-0.0718 (0.0372)	-0.0508 (0.0341)		-0.0498 (0.0347)
furloughed workers		0.535 (0.443)		0.506 (0.437)		0.530 (0.438)	0.510 (0.438)
higher-income users			-0.546*** (0.135)		-0.505*** (0.134)	-0.546*** (0.136)	-0.505*** (0.134)
Constant	-0.258*** (0.0315)	-0.472*** (0.136)	-0.186*** (0.0338)	-0.410** (0.139)	-0.157*** (0.0429)	-0.344* (0.138)	-0.310* (0.141)
Observations	108	108	108	108	108	108	108
Adjusted R^2	0.028	0.001	0.104	0.028	0.113	0.105	0.114

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Dependent variable: percentage decline in regional spending over Q2 2020 relative to Q2 2019. Sources: the variable 'Covid-19 deaths' refers to the number of Covid-19 deaths per 1,000 inhabitants and is available from the ONS; 'furloughed workers' stands for the share of furloughed workers as reported by HMRC; 'higher-income users' is the share of users with after tax income above £40,000 in 2019 from the MDB sample. The 107 geographical areas are determined on the basis of the first two digit of MDB users' home post code. We exclude areas for which there are only 15 users or less.

Regional variation in spending

- Substantial regional heterogeneity
- Most affected areas are Greater London and South East, Northern Ireland and Wales are less affected
- **Share of higher-income users** is a significant and robust **predictor** of decline in spending

◀ Back