Spending effects of fiscal transfers in a pandemic

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6th ECB biennial conference of fiscal policy & EMU governance

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Fiscal transfers during a pandemic

• Fiscal stimulus is important when monetary policy is constrained

- Impact of stimulus measures can vary depending on the context
- Covid-19 recession very different from previous recessions
 - Supply side restrictions
 - Infection risk
 - High saving rates

How do these factors impact the spending effect of fiscal transfers?

 $\Rightarrow\,$ We evaluate the German child bonus using daily scanner data

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Related literature

• Fiscal policy responses to Covid-19 pandemic

- Unconditional transfers to households in US (Parker et al., 2022; Karger and Rajan, 2021; Baker et al., 2023; Chetty et al., 2023)
- Large variation in MPCs between 10% and 46%
- Typically find larger effects for liquidity-constrained HHs
- Interaction between pandemic and stabilization policies
 - Feedback between economic activity and infections in macro models with epidemiological dynamics (Kaplan et al., 2020; Eichenbaum et al., 2021)
 - Fiscal multiplier of military spending muted by stay-at-home orders (Auerbach et al., 2022)

The German child bonus

• Direct transfer to families on top of regular child benefit

- ▶ 200€ per child in September 2020
- ▶ 100€ per child in October 2020
- ▶ 150€ per child in May 2021
- \Rightarrow Average total transfer of 675€
- Payment date within the month depends on child benefit number
- Automatic bank transfer to child benefit recipients
- Announcement in June 2020 received much media attention
- Tax treatment implies rich households do not benefit Tax treatment

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Data

- Scanner spending data (Source: GfK)
 - Detailed information on household purchases at daily frequency
 - Covers non-durable and semi-durable goods
 - Sample period: 2019 & July 2020 to June 2021
 - ▶ In-person and online shopping (12% of spending online)
 - Over 8000 households included in the sample
 - Roughly 20% of households have eligible children
- 7-day case incidence at county-day level (Source: RKI)
- Index at county-day level for Covid restrictions (Source: BMWI)
 - Closure of elementary, high schools and child care facilities
 - Closure of retail shops and restaurants
 - Mask mandates, night time curfews and social distance requirements

Summary statistics: household level

Summary statistics: county level

Identification using quasi-random payment dates

- Date of receipt of child benefit from GfK survey in January '21
- ② Use this information to infer date of receipt of child bonus
- Identify spending response in daily GfK spending data

(1)	(2)	(3)	(4)	(5)
last digit of child	child benefit in	child bonus in	child bonus in	child bonus in
benefit number	January 2021	September 2020	October 2020	May 2021
0	05.01.2021	04.09.2020	05.10.2020	05.05.2021
1	08.01.2021	07.09.2020	07.10.2020	06.05.2021
2	11.01.2021	08.09.2020	08.10.2020	07.05.2021
3	12.01.2021	09.09.2020	08.10.2020	10.05.2021
4	13.01.2021	10.09.2020	12.10.2020	11.05.2021
5	14.01.2021	11.09.2020	14.10.2020	12.05.2021
6	15.01.2021	14.09.2020	15.10.2020	17.05.2021
7	18.01.2021	16.09.2020	16.10.2020	18.05.2021
8	19.01.2021	18.09.2020	19.10.2020	19.05.2021
9	21.01.2021	21.09.2020	21.10.2020	21.05.2021

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	child benefit number	child benefit number
female	0.196	0.207
	(0.226)	(0.241)
age	0.000	0.003
-	(0.009)	(0.010)
East Germany	-0.010	-0.036
	(0.167)	(0.186)
number of eligible kids	-0.047	0.023
	(0.176)	(0.194)
household size	0.019	-0.021
	(0.139)	(0.152)
single	-0.198	-0.216
	(0.287)	(0.315)
college or more	0.178	0.121
	(0.181)	(0.204)
total spending in August	0.000	0.000
	(0.000)	(0.000)
household constrained	-0.328	-0.376
	(0.278)	(0.304)
low income	-0.124	-0.145
deside a second sound to	(0.173)	(0.196) 0.023
checks account weekly		
low wealth		(0.198) -0.083
low wealth		(0.181)
high analytical skill		-0.121
nigh analytical skill		(0.177)
high financial literacy		0.192
mgn mancial itteracy		(0.174)
Ν	1846	1474

No correlation of child benefit number and observables

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Estimating the MPC: baseline specification

Difference-in-difference regression

$$y_{it} = \alpha_i + \gamma_{ct} + \beta \operatorname{Treat}_i \operatorname{Post}_{it} + \delta X_{ct} + \varepsilon_{it}$$

where

- *y_{it}*: spending by household *i* at date *t* normalized by average consumption of *i*
- α_i : household FE γ_{ct} : county x date FE
- *Treat_i*: dummy = 1 if household *i* eligible for child bonus
- $Post_{it}$: dummy = 1 if household *i* has received child bonus by day *t*
- X_{ct} : Covid case rate and restriction index at daily level
- ε_{it} error term clustered at the household level

Estimating daily spending effects

$$y_{it} = \alpha_i + \gamma_t + \sum_{k=-5, k \neq -1}^{13} \beta_k D_{it}^k + \varepsilon_{it}$$

where

- D_{it}^k : dummy indicating that payment of child bonus to household *i* on day *t* occurred *k* days ago
- Endpoints D_{it}^{13} and D_{it}^{-5} of effect window are binned to capture long-term effect before and after effect window
- Estimates to be interpreted relative to pre-treatment day k = -1
- Account for heterogeneous treatment effects due to differential treatment timing (Sun and Abraham, 2021)

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MPC estimates: September 2020

	(1)	(2)	(3)	(4)
	total spending	total spending	total spending	total spending
Treat × Post	0.105***	0.106***	0.109***	0.099***
	(0.028)	(0.028)	(0.029)	(0.031)
Household FE Date FE Covid controls	yes yes	yes yes yes	yes	yes
Date × county FE Covid controls × parent			yes	yes yes
MPC	0.117***	0.118***	0.122***	0.111***
	(0.031)	(0.031)	(0.032)	(0.034)
N	271530	271530	271500	271500
# cluster	9051	9051	9050	9050

• Convert β into marginal propensity to consume by

- Cumulating the percentage effect
- Multiply by mean spending to get € estimate
- Divide by average transfer received

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Daily spending effects: Sun and Abraham (2021)



similar results in standard event study

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Robustness checks

- Our results are robust to
 - including spending outliers
 - excluding households that likely do not benefit from child bonus
 - excluding households unsure about payment date
 - other transformations of outcome
- MPC increases to 21% over three months
- The child bonus did increase the number of contacts
- We do not find any effect
 - of the two policy announcements
 - in any month in 2019
 - of the child benefit on labor supply

Effect driven by non-durables and in-person spending

	(1) spending: semi-durables	(2) spending: non-durables	(3) spending: in-person	(4) spending: online
Treat × Post	0.010	0.106***	0.113***	0.212
	(0.066)	(0.027)	(0.028)	(0.142)
Household FE	yes	yes	yes	yes
Date × county FE	yes	yes	yes	yes
MPC	0.004	0.081***	0.119***	0.028
	(0.028)	(0.021)	(0.030)	(0.019)
N	195120	270240	271260	55560
# cluster	6504	9008	9042	1852

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Treatment heterogeneity by regional characteristics



Treatment heterogeneity by personal characteristics



No effect in October 2020 ...

	(1) total spending	(2) total spending	(3) total spending	(4) total spending
Panel A: €100 per chil	d payment in October	2020		
Treat × Post	0.000 (0.026)	0.001 (0.026)	0.006 (0.027)	-0.025 (0.032)
Household FE	yes	yes	yes	yes
Date FE	yes	yes		
Covid controls		yes		
Date x county FE			yes	yes
Covid controls x parent				yes
MPC	0.001 (0.064)	0.002 (0.064)	0.015 (0.066)	-0.061 (0.079)
N	280612	280612	280581	280581
# cluster	9052	9052	9051	9051

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... or in May 2021

	(5) total spending	(6) total spending	(7) total spending	(8) total spending
Panel B: €150 per child	payment in May 2021			
Treat × Post	0.006 (0.026)	0.005 (0.026)	0.000 (0.026)	-0.004 (0.033)
Household FE	yes	yes	yes	yes
Date FE	yes	yes		
Covid controls		yes		
Date x county FE			yes	yes
Covid controls × parent				yes
MPC	0.010	0.008	0.001	-0.006
	(0.043)	(0.043)	(0.044)	(0.055)
N	261764	261764	261733	261733
# cluster	8444	8444	8443	8443

Aggregate Effect of the child bonus

- Null effects push the aggregate 3-month MPC down to 9.3%
 - Assuming similar effects on durables and services: 3-month MPC of 24.5%
- What changed over time to push down the MPC?
 - Variation in transfer size unlikely to explain the null effects
 - Macro conditions were very similar
 - Covid situation was very different during 2nd and 3rd transfer

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Macro conditions over time



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Covid case rate over time



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Conclusions

• We estimate the spending effects of the German child bonus

- First transfer had a significant spending effect
- MPC higher in areas with lower Covid-19 case rates
- Second and third transfer had no discernible effect
 - Related to higher infection numbers

 \bullet Overall MPC of the transfers rather low: between 9% and 25%

- Stimulus less effective when case rates were high
- Same stimulus could have been archieved at lower cost
- Households saved substantial amounts of the transfer

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Tax treatment of child bonus

Rich households ultimately do not benefit from child bonus

- For each child, tax authority compares:
 - Sum of child benefit and bonus
 - Tax deduction through child-related income tax allowance ('Kinderfreibetrag' = part of your income that is not taxed if you have children)
- If (2) exceeds (1), summed over all children, household does not benefit from child bonus
- Example: Household with 3 children
 - ▶ Income up to €67.816 benefits fully from child bonus
 - ▶ Income between €67.816 and €105.912 benefits partially
 - ▶ Income above €105.912: no benefit from child bonus
- \Rightarrow Roughly 80% of households benefit in full from child bonus

 $\tt https://www.bundesfinanzministerium.de/Content/DE/FAQ/2020-07-29-FAQ-Kinderbonus-Entlastungsbetrag.html the statement of the statement of$



Spending by households with and without children **Deck**



Notes: Figure plots average monthly expenditure for households with and without children. Dotted line indicates child bonus payments.

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Summary statistics: household level

	households with children				h	ouseholds	without (children		
	mean	sd	min	max	Ν	mean	sd	min	max	Ν
female	0.86	0.34	0	1	1846	0.67	0.47	0	1	7607
age	44.26	8.95	19	77	1846	61.00	12.05	19	77	7607
East Germany	0.26	0.44	0	1	1846	0.28	0.45	0	1	7607
household size	3.45	1.04	1	10	1846	1.62	0.62	1	6	7607
single	0.13	0.34	0	1	1846	0.44	0.50	0	1	7607
college or more	0.27	0.44	0	1	1846	0.27	0.45	0	1	7607
income per capita	1394.29	544.68	250	2500	1846	1688.50	565.64	250	2500	7607
net wealth (in €1000)	90.56	141.67	0	500	1476	79.43	133.78	0	500	5859
household constrained	0.07	0.26	0	1	1846	0.07	0.25	0	1	7593
analytical skill	5.39	2.52	0	10	1845	5.30	2.63	0	10	7587
financial literacy	4.39	2.62	0	10	1845	4.35	2.71	0	10	7597
number of eligible children	1.50	0.70	1	6	1846					

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Summary statistics: county level

	mean	sd	min	max	Ν
September 2020					
unemployment rate	5.71	2.27	2.10	16.00	403
share of labor force in short-time work	4.60	2.43	1.03	20.87	403
Covid-19 incidence	10.92	9.73	0.00	112.27	1203
stringency index	32.32	5.04	20.72	42.74	1203
October 2020					
unemployment rate	5.51	2.24	1.90	15.60	40
share of labor force in short-time work	4.13	2.26	0.95	20.13	40
Covid-19 incidence	48.04	46.13	0.00	322.34	1243
stringency index	30.92	4.57	21.20	57.07	1243
May 2021					
unemployment rate	5.37	2.25	1.90	14.80	40
share of labor force in short-time work	4.73	2.10	0.00	18.88	40
Covid-19 incidence	90.29	57.24	2.34	541.64	1243
stringency index	52.81	14.92	6.06	66.28	1243

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Daily spending effects: two-way fixed effect model **Daily**



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Including top and bottom 1% of spending distribution \blacksquare

	(1)	(2)	(3)	(4)
	total spending	total spending	total spending	total spending
Treat × Post	0.108***	0.108***	0.111***	0.103***
	(0.029)	(0.029)	(0.029)	(0.031)
Household FE Date FE Covid controls	yes yes	yes yes yes	yes	yes
Date × county FE Covid controls × parent		-	yes	yes yes
MPC	0.120***	0.121***	0.124***	0.115***
	(0.032)	(0.032)	(0.033)	(0.035)
N	274620	274620	274590	274590
# cluster	9154	9154	9153	9153

Excluding HHs that likely did not benefit from bonus (Deck)

	(1)	(2)	(3)	(4)
	total spending	total spending	total spending	total spending
Treat × Post	0.100***	0.100***	0.102***	0.093***
	(0.030)	(0.030)	(0.031)	(0.033)
Household FE Date FE Covid controls	yes yes	yes yes yes	yes	yes
Date × county FE Covid controls × parent		-	yes	yes yes
MPC	0.111***	0.112***	0.113***	0.103***
	(0.033)	(0.033)	(0.034)	(0.037)
N	249330	249330	249300	249300
# cluster	8311	8311	8310	8310

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Excluding households unsure about payment date **Gack**

	(1)	(2)	(3)	(4)
	total spending	total spending	total spending	total spending
Treat × Post	0.141***	0.142***	0.156***	0.141***
	(0.038)	(0.038)	(0.040)	(0.043)
Household FE Date FE Covid controls	yes yes	yes yes yes	yes	yes
Date × county FE Covid controls × parent		·	yes	yes yes
MPC	0.156***	0.156***	0.173***	0.155***
	(0.042)	(0.042)	(0.044)	(0.048)
N	247260	247260	247230	247230
# cluster	8242	8242	8241	8241

- This seems to slightly reduce measurement error
- \bullet MPC estimate rises to between 15% and 17%

Outcome variable: inverse hyperbolic sine Gack

	(1)	(2)	(3)	(4)
	IHS total spending	IHS total spending	IHS total spending	IHS total spending
Treat × Post	0.076***	0.076***	0.088***	0.073***
	(0.021)	(0.021)	(0.021)	(0.023)
Household FE Date FE Covid controls	yes yes	yes yes yes	yes	yes
Date \times county FE Covid controls \times parent		-	yes	yes yes
MPC	0.084***	0.085***	0.098***	0.081***
	(0.023)	(0.023)	(0.024)	(0.025)
N	271530	271530	271500	271500
# cluster	9051	9051	9050	9050

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Outcome variable: ln(total spending + 1) (back)

	(1) $\log total spending + 1$	(2) log total spending + 1	(3) log total spending $+ 1$	(4) log total spending + 1
Treat × Post	0.066*** (0.018)	0.066*** (0.018)	0.077*** (0.018)	0.072*** (0.019)
HH FE	yes	yes	yes	yes
Date FE	yes	yes		
Covid controls		yes		
Date x county FE			yes	yes
Covid controls x parent				yes
MPC	0.076***	0.076***	0.089***	0.083***
	(0.021)	(0.021)	(0.022)	(0.023)
N	269160	269160	269130	269130
# cluster	8972	8972	8971	8971

Outcome variable: spending in levels (back)

	(1)	(2)	(3)	(4)
	total spending	total spending	total spending	total spending
MPC	0.134***	0.134***	0.135***	0.131***
	(0.048)	(0.048)	(0.047)	(0.046)
Household FE Date FE Covid controls	yes yes	yes yes yes	yes	yes
Date × county FE Covid controls × parent			yes	yes yes
N	274620	274620	274590	274590
# cluster	9154	9154	9153	9153

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Regression analysis: Announcement effect

 $\ln c_{it} = \alpha_i + \gamma_{ct} + \beta \operatorname{Treat}_i \operatorname{Announcement}_t + \varepsilon_{it}$

where

- c_{it} total consumption spending by household i on day t
- α_i : household FE; γ_{ct} : county x date FE
- Treat_i: i eligible for child bonus
- Announcement_t: post policy announcement
- ε_{it} error term clustered at the household level

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No effect of policy announcements (back)

	spending: semi-durables	spending: semi-durables	spending: semi-durables	spending: semi-durables
Panel A: Announcement of th	ne September & Octo	ober 2020 payments		
Treatment × Announcement	-0.033 (0.097)	-0.033 (0.097)	0.023 (0.102)	0.012 (0.108)
Household FE Date FE Covid controls	yes yes	yes yes	yes	yes
Date x county FE Covid controls x parent		yes	yes	yes yes
MPC	-0.006 (0.019)	-0.007 (0.019)	0.005 (0.020)	0.002 (0.021)
N # cluster	112115 6595	112115 6595	112081 6593	112081 6593
	total spending	total spending	total spending	total spending
Panel B: Announcement of th	ne May 2021 paymen	t		
Treatment \times Announcement	0.061 (0.039)	0.061 (0.039)	0.062 (0.040)	0.035 (0.045)
Household FE Date FE	yes yes	yes yes	yes	yes
Covid controls Date × county FE Covid controls × parent		yes	yes	yes yes
MPC	0.067	0.067	0 060	
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No effect of regular child benefit Lack

Are our estimates picking up response to regular child benefit?



- Estimate same model for September 2019
- Parents received child benefit, but no child bonus

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Spending effects of fiscal transfe

Was there substitution to online spending? Lack

	(1) in-person spending: low cases	(2) in-person spending: high cases	(3) online spending: low cases	(4) online spending: high cases
Treat × Post	0.175***	0.036	0.012	0.429**
	(0.040)	(0.046)	(0.218)	(0.214)
HH FE	yes	yes	yes	yes
Date × county FE	yes	yes	yes	yes
MPC	0.176***	0.035	0.002	0.046**
	(0.040)	(0.045)	(0.031)	(0.023)
p-value of difference	0.0)24	0.1	.71
N	135497	135249	27220	28234
# cluster	6645	7124	1364	1480

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No effect on labor supply back

$$h_{it} = \alpha_i + \gamma_t + \beta \operatorname{Treat}_i \operatorname{Childbonus}_t + \varepsilon_{it}$$

- *h_{it}*: weekly hours worked
- Treat_i: Dummy for eligible households
- *Childbonust*: Dummy for September & October 2020
- *α_i*: household FE
- γ_t : survey wave FE

	(1)	(2)	(3)
	hours worked: respondent	hours worked: partner	hours worked: total
Treat × Child Bonus	0.134	0.496	0.228
	(0.338)	(0.446)	(0.531)
Household FE	yes	yes	yes
Month FE	yes	yes	yes
mean	34.882	35.224	54.974
N	7282	4611	7282
# cluster	2885	1824	2885
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MPC in the medium term (back)

	(1)	(2)	(3)
	1-month estimation	2-month estimation	3-month estimation
	sample	sample	sample
Treat × Post	0.109***	0.058**	0.046*
	(0.029)	(0.026)	(0.027)
Household FE	yes	yes	yes
Date × county FE	yes	yes	yes
MPC	0.122***	0.161**	0.210*
	(0.032)	(0.072)	(0.121)
N	271500	552111	823732
# cluster	9050	9051	9052

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More contacts due to increased economic activity **back**

	(1)	(2)	(3)	(4)
	number of shop	number of shop	number of shop	number of shop
	visits	visits	visits	visits
Treat × Post	0.030***	0.030***	0.031***	0.023**
	(0.009)	(0.009)	(0.009)	(0.010)
Household FE Date FE Covid controls	yes yes	yes yes yes	yes	yes
Date × county FE Covid controls × parent		·	yes	yes yes
Additional shop visits	0.665***	0.666***	0.706***	0.524**
	(0.202)	(0.202)	(0.208)	(0.222)
N	274620	274620	274590	274590
# cluster	9154	9154	9153	9153

- The transfer increased number of shop visits
- Trade-off between stimulus and higher infection risk

Heterogeneity by financial literacy and analytical skill was

	(9) high analytical	(10) Iow analytical	(11) high financial literacy	(12) Iow financial literacy
Treat × Post	0.099** (0.045)	0.115*** (0.039)	0.124*** (0.041)	0.116*** (0.042)
Household FE	yes	yes	yes	yes
Date x county FE	yes	yes	yes	yes
MPC	0.111**	0.128***	0.144***	0.124***
	(0.050)	(0.043)	(0.048)	(0.045)
p-value of difference	0.7	95	0.7	57
N	118950	151440	136530	134070
# cluster	3965	5048	4551	4469

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Effect driven by areas with low case rates **back**

	(1) low Covid-19 incidence	(2) high Covid-19 incidence	(3) Iax Covid-19 restrictions	(4) strict Covid-19 restrictions
Treat × Post	0.165***	0.039	0.113**	0.115***
	(0.041)	(0.047)	(0.045)	(0.040)
Household FE Date × county FE	yes yes	yes yes	yes yes	yes yes
MPC	0.189***	0.042	0.122**	0.132***
	(0.047)	(0.051)	(0.049)	(0.045)
p-value of difference	0.0)36	0.8	388
N	135651	135336	141620	129880
# cluster	6649	7129	5446	5149
	(5) low unemployment rate	(6) high unemployment rate	(7) low share of labor force either unemployed or in short-time work	(8) high share of labor force either unemployed or in short-time work
Treat × Post	0.091**	0.134***	0.100***	0.121***
	(0.038)	(0.044)	(0.039)	(0.043)
Household FE	yes	yes	yes	yes
Date × county FE	yes	yes	yes	yes
MPC	0.102**	0.147***	0.117***	0.126***
	(0.043)	(0.049)	(0.045)	(0.045)
p-value of difference	0.4	185	0.883	
N	135390	136110	135630	135870
# cluster	4513	4537	4521	4529
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Effect by individual characteristics **Deck**

	(1) HH constrained	(2) HH unconstrained	(3) low income	(4) high income
Treat × Post	0.271* (0.153)	0.103*** (0.030)	0.130*** (0.037)	0.061 (0.050)
Household FE	yes	yes	yes	yes
Date × county FE	yes	yes	yes	yes
MPC	0.251* (0.142)	0.116*** (0.034)	0.134*** (0.039)	0.081 (0.066)
p-value of difference	0.	355	0.4	83
N # cluster	14640 488	252390 8413	125730 4191	145230 4841
	(5) Iow wealth	(6) high wealth	(7) one child/small transfer	(8) two or more children/large transfer
Treat × Post	0.107** (0.053)	0.127*** (0.044)	0.087** (0.037)	0.151*** (0.043)
Household FE	(0.053) ves	(0.044) ves	ves	(0.043) ves
Date x county FE	yes	yes	yes	yes
MPC	0.114** (0.057)	0.150*** (0.053)	0.136** (0.058)	0.124*** (0.035)
p-value of difference	0.	637	0.8	61
N	93390 3113	116040 3868	253020 8434	244350 8145

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6th ECB biennial conference

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Higher income losses for HHs with children

	(1)	(2)	(3)
	income drop since	same income as in	income increase since
	February 2020	February 2020	February 2020
household with eligible children	0.036***	-0.034***	-0.002
	(0.009)	(0.010)	(0.005)
mean	0.295	0.648	0.057
N	10831	10831	10831
# cluster	10831	10831	10831

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