Buy Now Pay Later Credit: User characteristics and effects on spending patterns

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Harvard Business School

Background and Motivation

Consumers have substantial demand for short term unsecured credit

Source: Federal Reserve Bank of New York

As is evidenced by the close to $1 Tr in outstanding unsecured consumer loans in the U.S.

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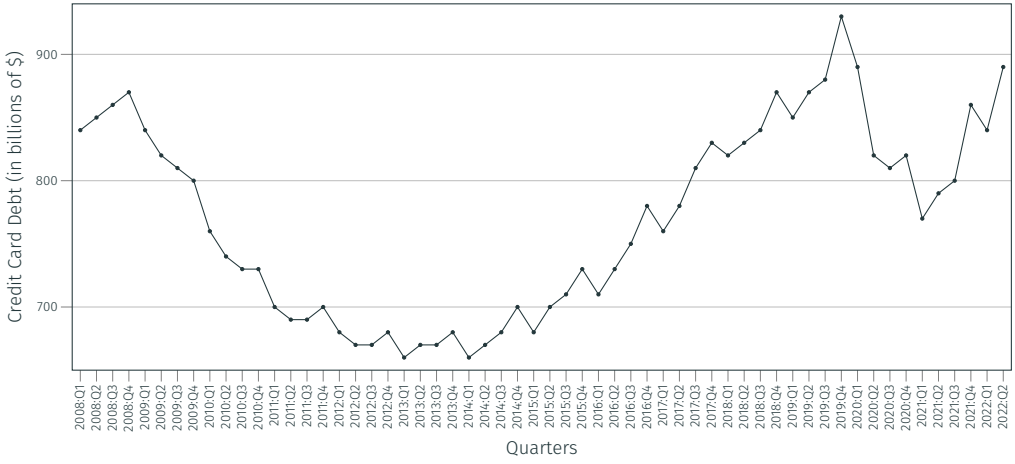

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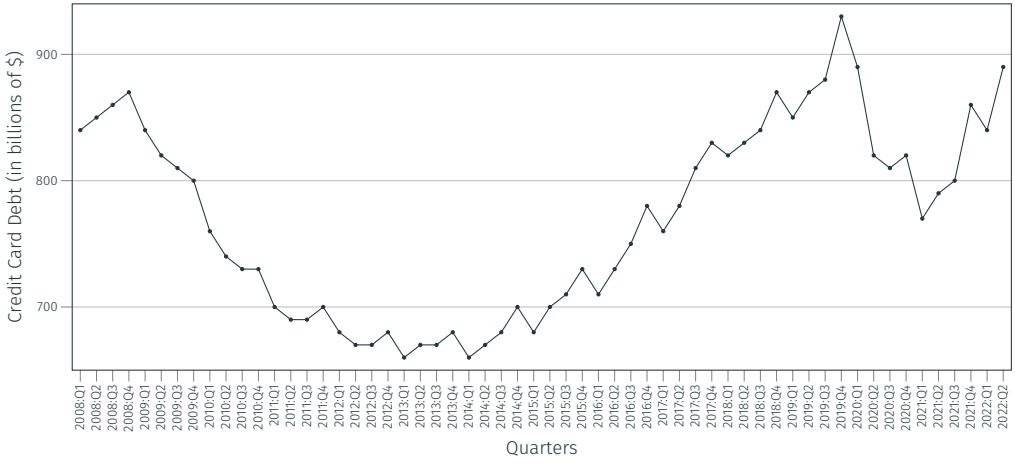

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In recent years Fintech firms have started offering a new short term unsecured credit product

Point of sale credit or “Buy Now Pay Later” credit has 3 distinguishing features → BNPL loans are:

- Not revolving lines of credit but are instead installment loans with a down-payment which is due at the point of sale and a fixed repayment schedule
- Offered through retailers and tied to price of the product
- Offered with easy lending terms i.e. no credit checks, zero interest, no credit bureau reporting

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“Pay-in-4” is the most popular BNPL product

How does “Pay-in-4” work?

- 25% of the purchase price is required at the time of purchase.
- 3 additional equal payments are required every 2 weeks thereafter.
- i.e. suppose I purchase a $100 sweater using BNPL “pay-in-4”
  - $25 is paid at the date of purchase
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- Buy Now Pay Later (BNPL) firms have created one of the fastest-growing segments in consumer finance.
- According to Worldpay, BNPL accounted for 2.1% – or roughly $97b – of global e-commerce transactions in 2020, and is expected to double to 4.2% by 2024.

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In this paper we provide a first look into BNPL market with two objectives:

1. We use transactions level bank account and credit card data to provide insights about BNPL use.
2. We study consumer responses to new Fintech credit products, adding to the existing literature studying consumer spending responses to income and liquidity.

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BNPL can have both positive and negative welfare effects

- On the one hand, in a setting with credit constraints, additional access to credit can help smooth consumption.
- On the other hand, additional access to credit can cause overspending relative to long run preferences if consumers have:
  - Self-control problems
  - An incomplete understanding of contract terms
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Preview of results

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Background

In the U.S. there are 5 main BNPL providers that capture >95% of of the market

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BNPL Provider	Credit Check	Pay-in-4 Option?	Late fees	Non Pay-in-4 Option?	Interest Rates	Negative Reporting	Positive Reporting
Affirm	Yes – Soft	Yes	None	Yes	0–30%	Yes	Yes
Afterpay	No	Yes	$8/max 25%	No	NA	No	No
Klarna	Yes – Soft	Yes	max 25%	Yes	0–20%	Yes	No
Quadpay	Yes – Soft	Yes	$7/max $21	No	NA	Yes	No
Sezzle	Yes – Soft	Yes	$10	No	NA	Yes	Yes

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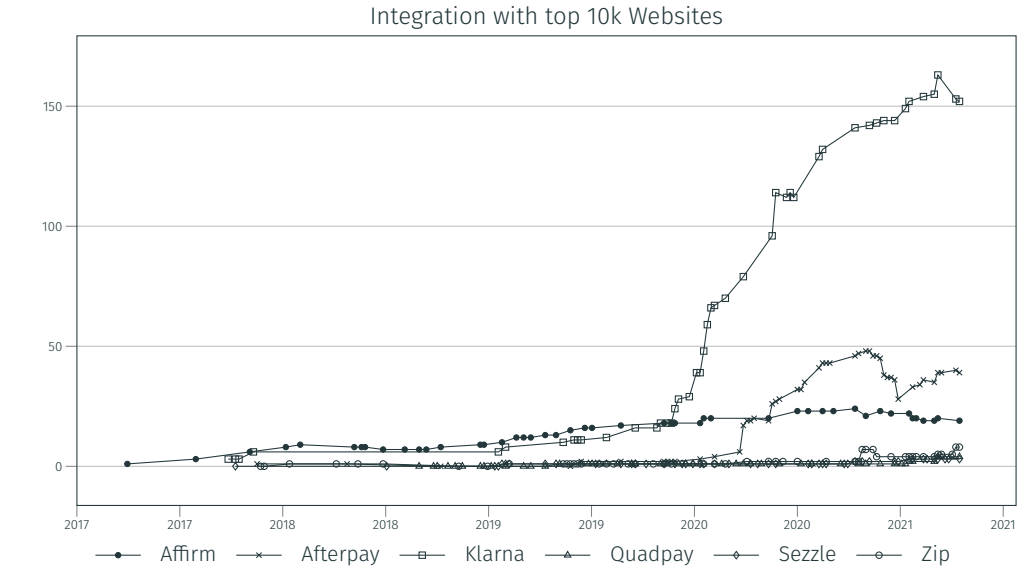

Data & Patterns of BNPL Use

Transactions level data

1. We are able to observe BNPL use through bank account and credit card transactions level data for around 10 million active users in the U.S.
2. We identify BNPL transactions by making use of merchant classification provided by the data aggregator plus manual searches of transactions descriptions.
3. We also select a random sample of 200k BNPL and 200k non-BNPL users within the same city of residence and income class to conduct our main analysis.

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Population summary statistics by BNPL use/year

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	As of December							
	2017		2018		2019		2020	
	BNPL user		BNPL user		BNPL user		BNPL user	
	No	Yes	No	Yes	No	Yes	No	Yes
Mean, %								
Renter	8.7	12.3	8.9	13.1	9.4	13.8	10.0	15.2
Credit card user	43.4	37.6	42.5	35.8	43.8	35.1	39.4	32.7
Active saver	10.6	9.4	10.3	11.1	9.6	11.7	6.3	7.9
$400 buffer	68.6	67.3	69.6	67.6	68.9	65.8	73.9	74.2
Paid overdrafts	4.9	7.6	4.3	8.0	4.0	9.2	3.0	7.7
Median, $								
Salary	3,639	3,687	3,534	3,659	3,676	3,736	4,355	4,512
Essential spending	443	747	462	795	509	849	486	861
Discretionary spending	277	498	284	531	320	559	282	549
Bills	261	387	273	415	291	437	287	442
Retail spending	202	435	206	462	254	529	278	611
Credit transactions	5,428	5,936	5,400	6,021	5,801	6,472	6,741	7,878
Debit transactions	5,287	5,951	5,598	6,355	6,142	6,922	6,312	7,500
Sample size	254,018	28,008	251,162	30,933	227,763	32,272	178,961	29,719

User summary by providers

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	As of December 2019				
	Affirm	Afterpay	Klarna	Quadpay	Sezzle
Mean, %					
Renter	14	14.6	14.1	16.8	15.1
Credit card user	40.1	28.3	32.2	25.6	28.7
Active saver	11.8	12.8	11.2	10.7	10.8
$400 buffer	71.8	60.4	62.8	57.9	60.9
Paid overdrafts	7.9	11.7	10.6	12.8	11.1
Median, $					
Salary	4,199	3,311	3,524	3,211	3,421
Essential spending	908	836	859	815	907
Discretionary spending	602	574	594	565	573
Bills	475	428	439	433	449
Retail spending	562	547	547	555	644
Credit transactions	7,447	5,817	6,193	5,670	5,947
Debit transactions	7,929	6,241	6,593	6,076	6,326
Users (out of 260,035)	16,745	14,570	10,577	2,242	4,628

Decision tree analysis highlighting User characteristics associated with BNPL use

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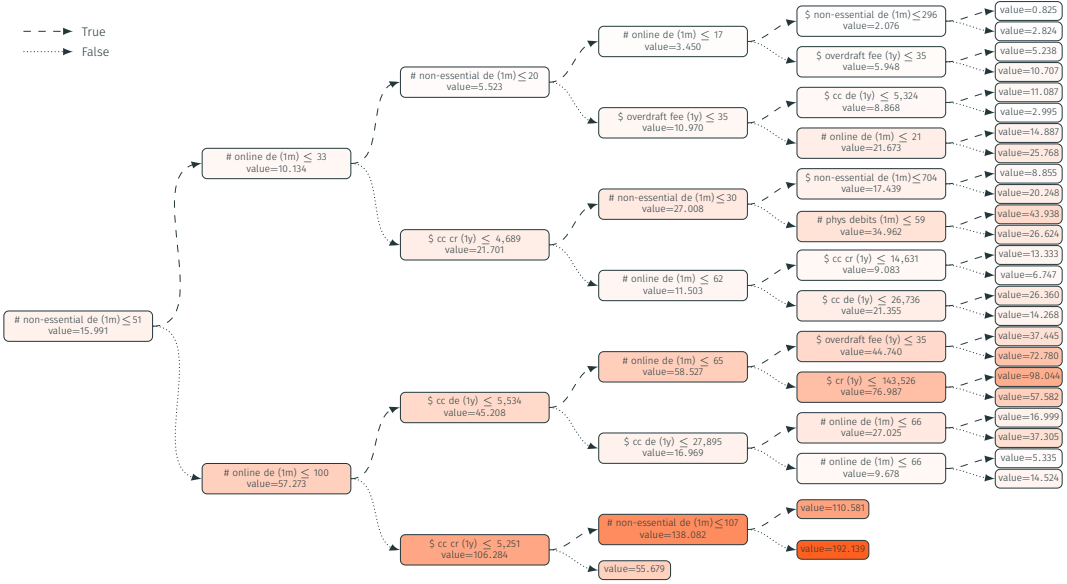

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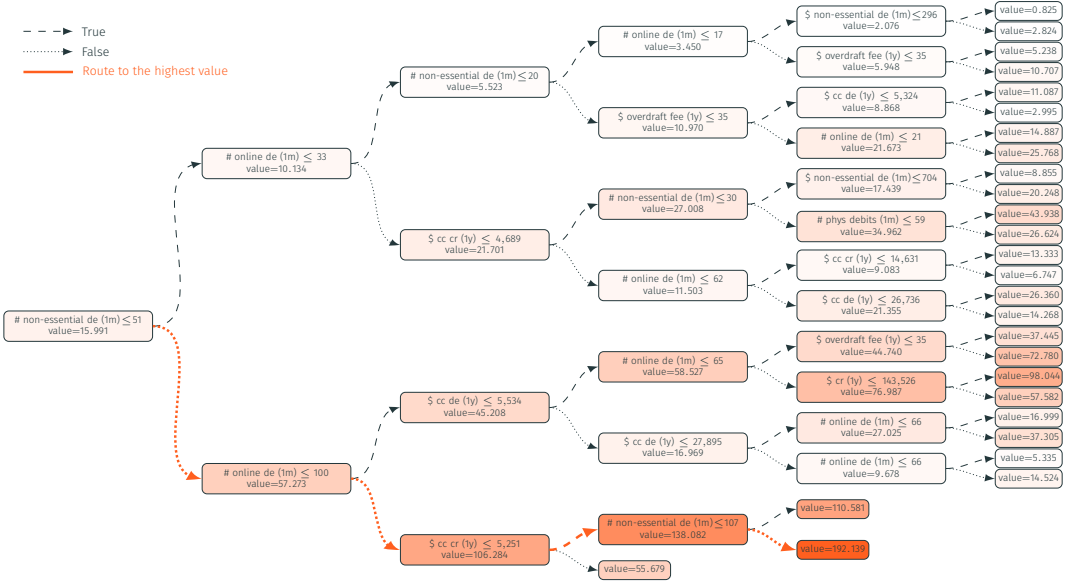

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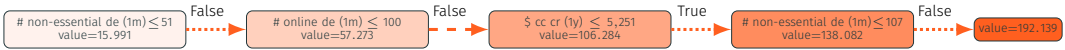

Decision tree analysis highlighting User characteristics associated with BNPL use

BNPL users tend to:

- Spend more on non-essential goods
- Shop more online
- Use credit cards less

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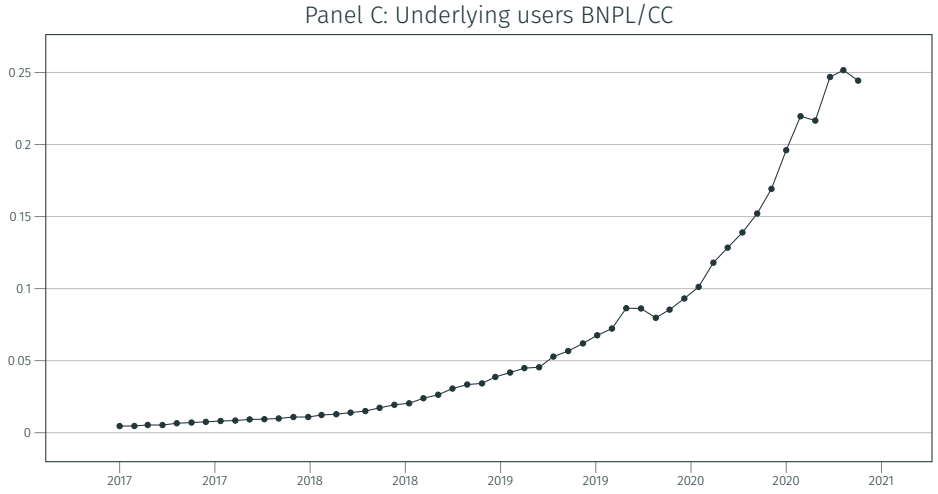

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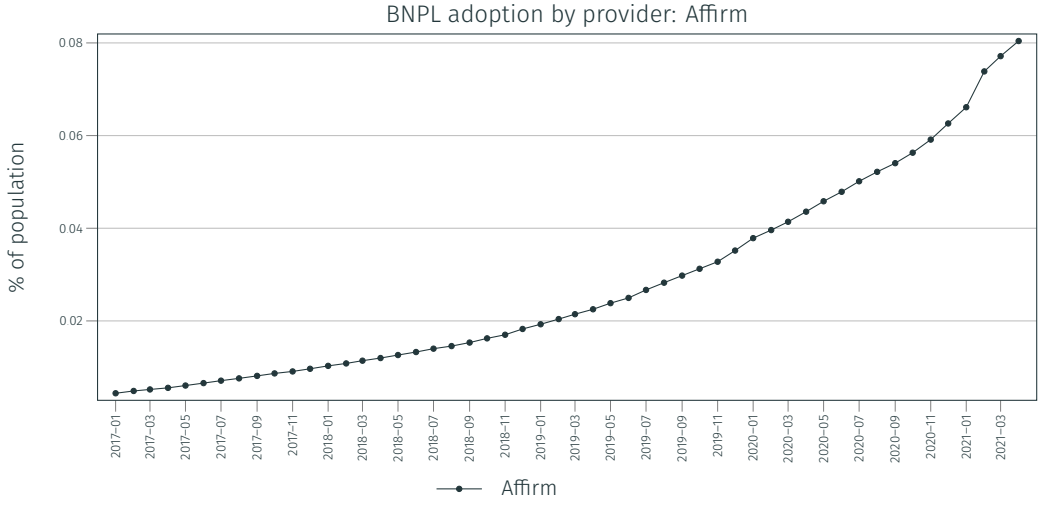

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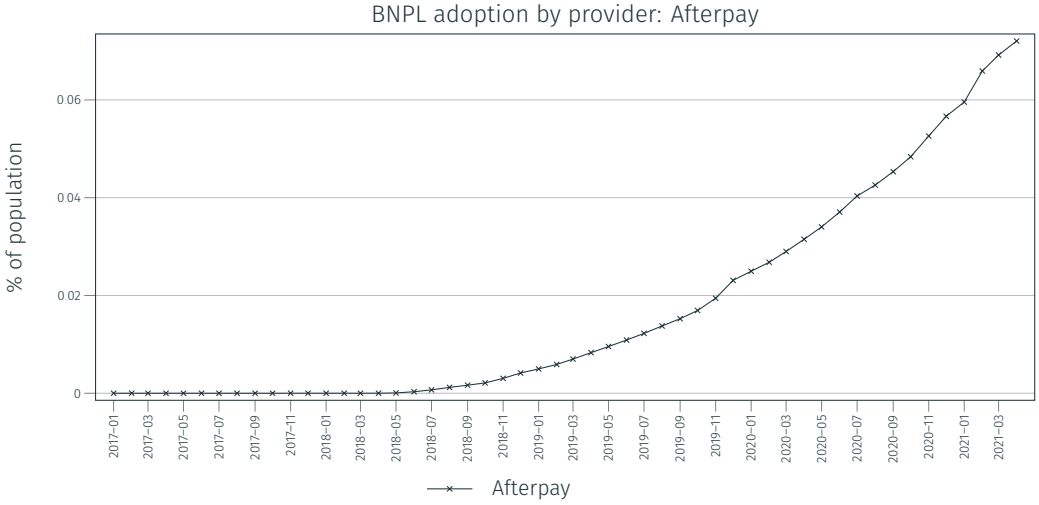

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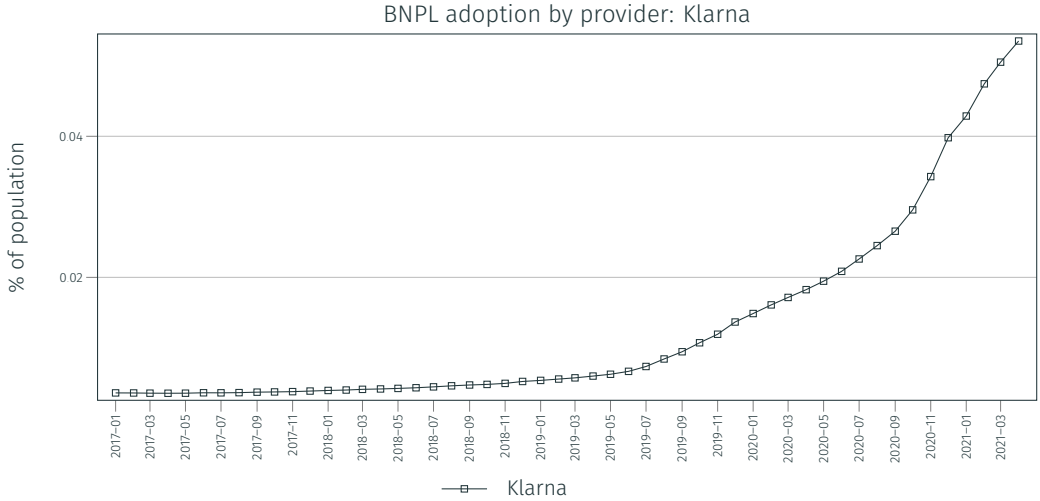

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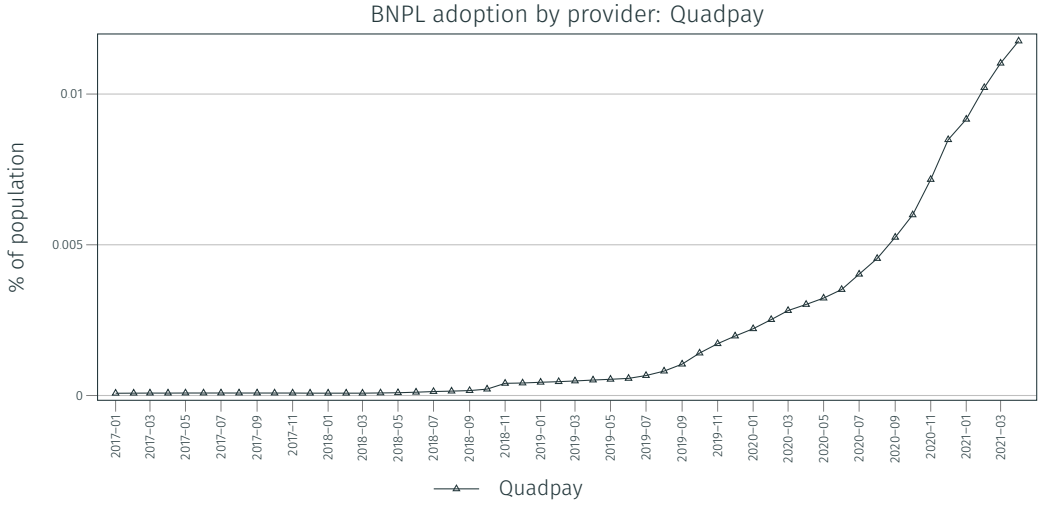

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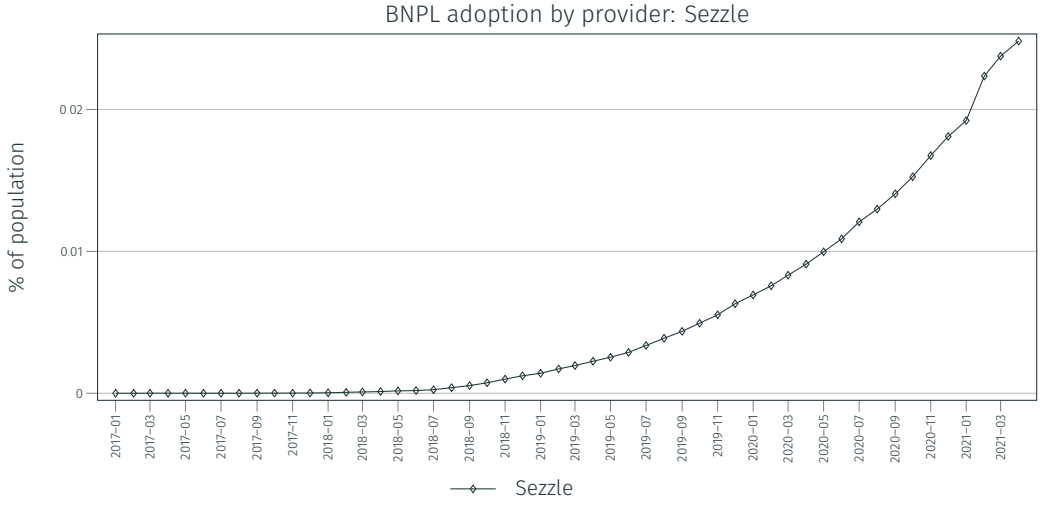

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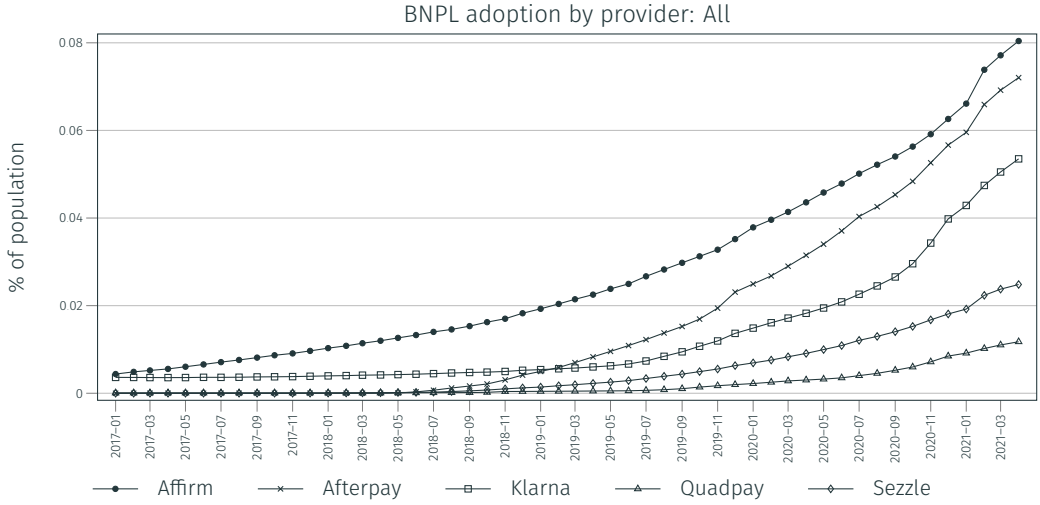

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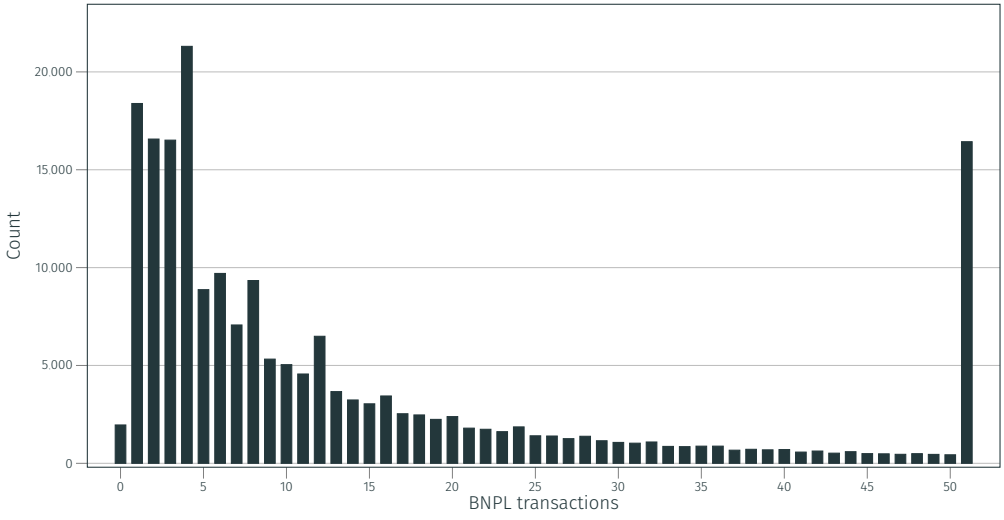

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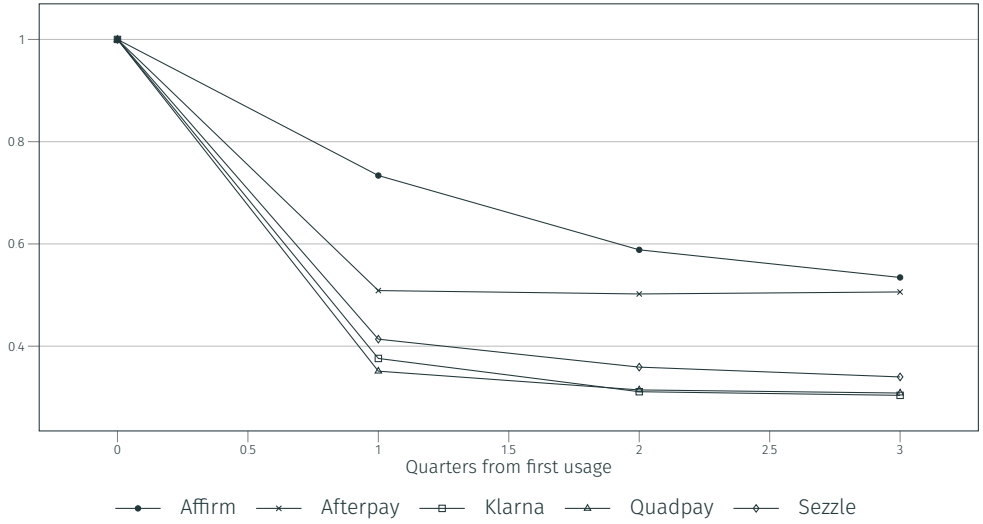
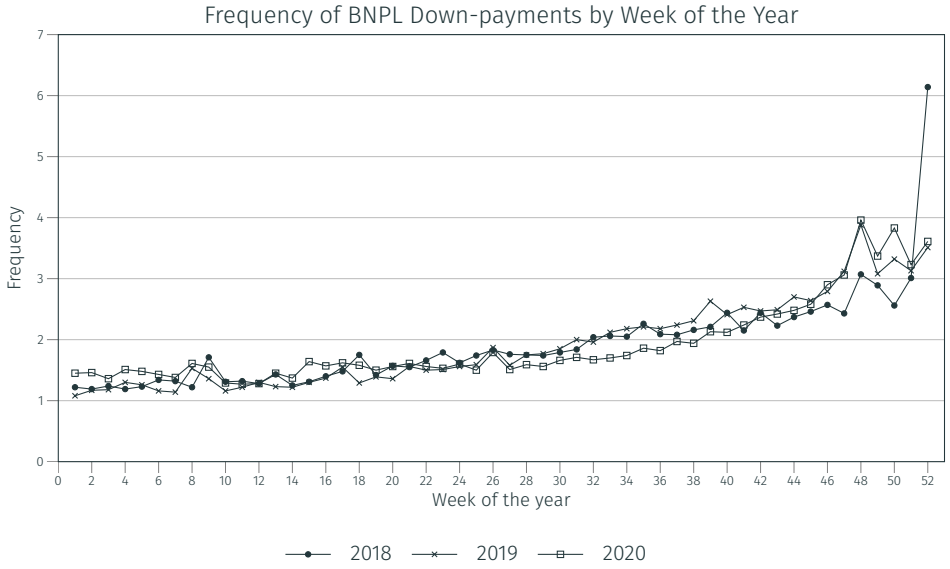


People use BNPL more during the holiday period



What should we expect?

In a traditional model, access to zero-interest unsecured credit has two immediate effects

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We investigate both effects in detail.

BNPL access and spending

Within user difference in differences analysis

- We begin our analysis by documenting spending responses to first time BNPL use.
- Specifically we run regressions of the following form at the calendar week level:

$$y_{it} = \alpha_{it} + \sum_{k=-12}^{24} \gamma_k \mathbb{1}\{\text{First\_BNPL\_i} - t = k\} \times Tit + \varepsilon_{it}$$

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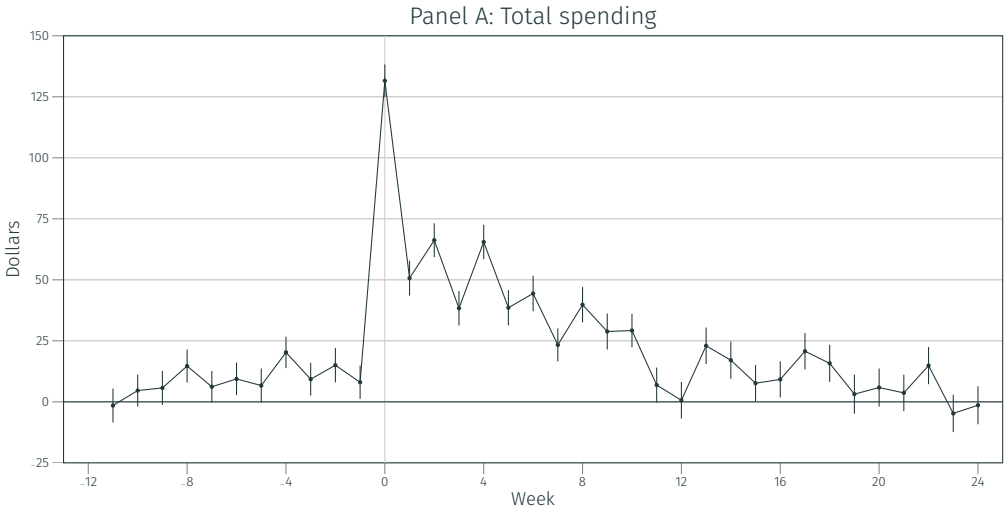

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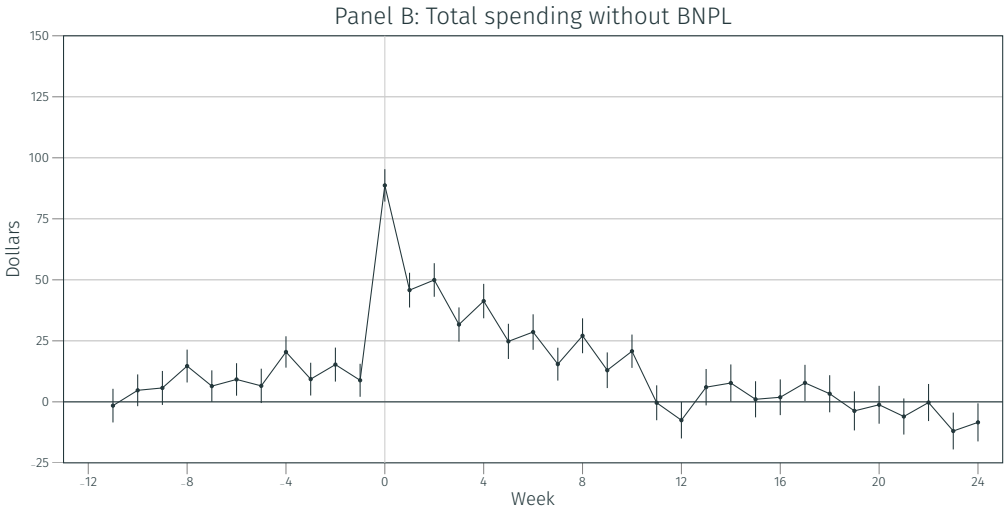

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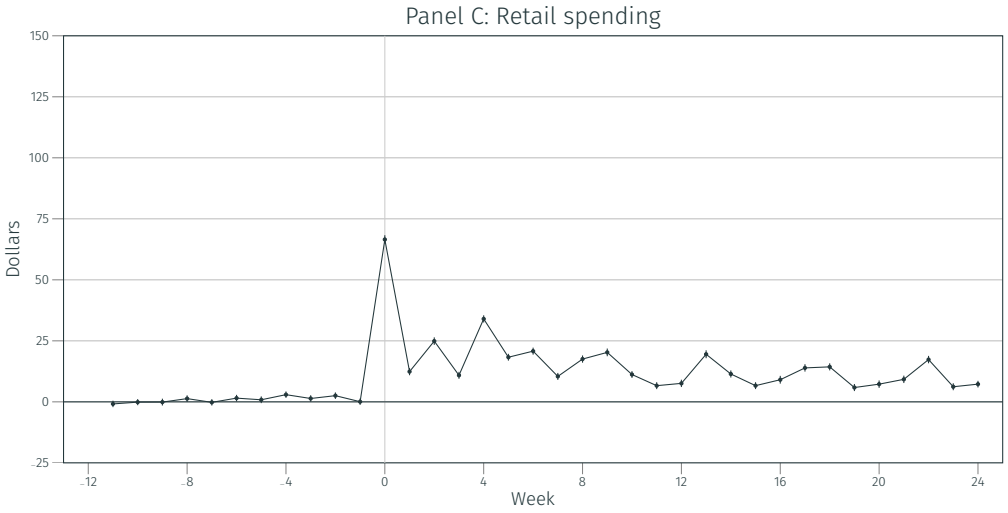

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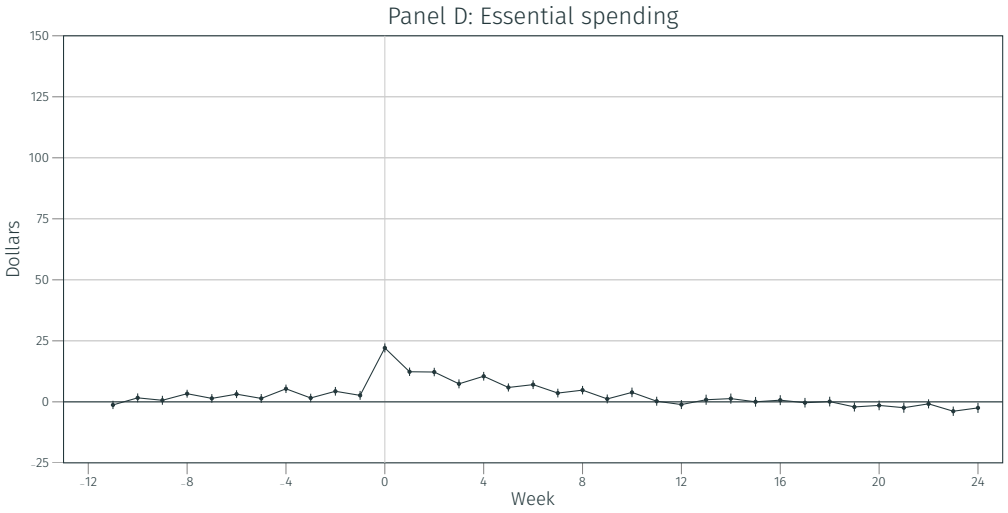

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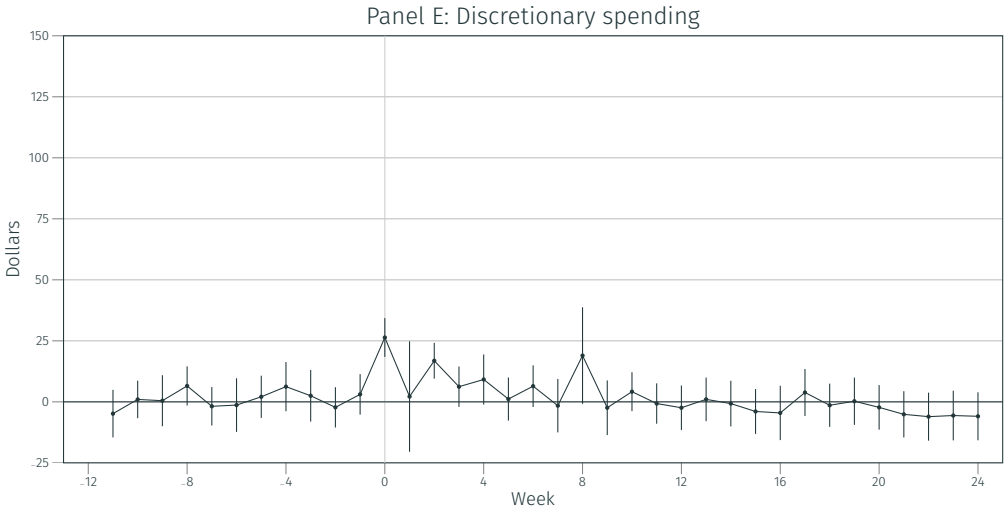

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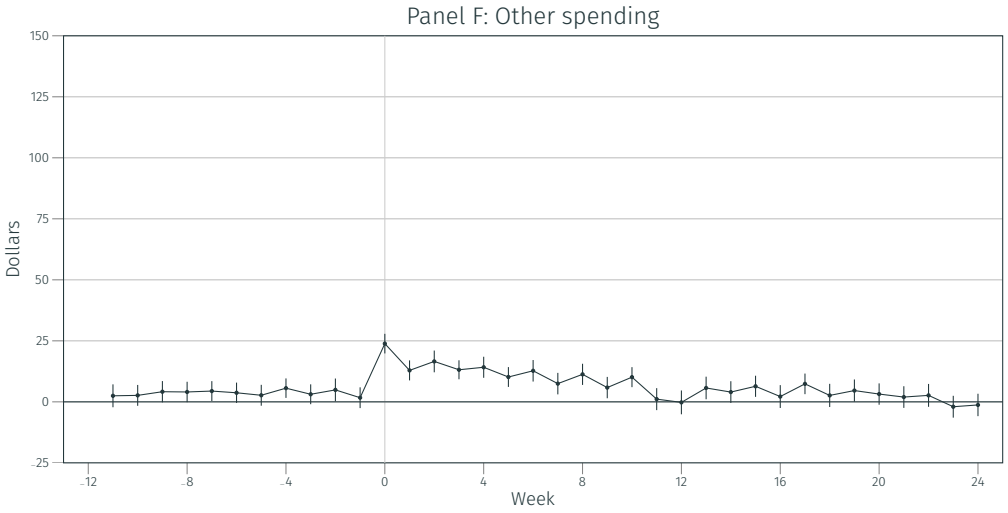

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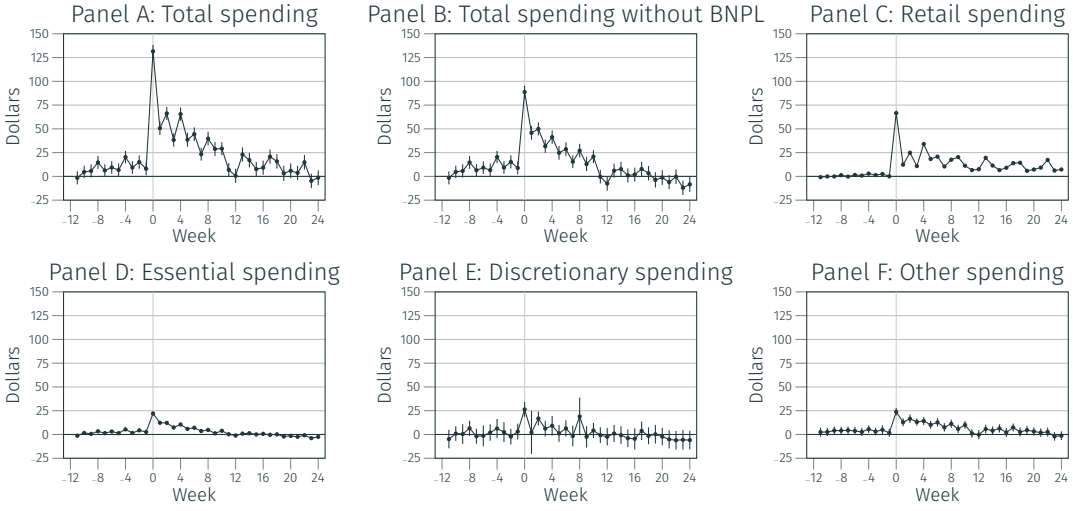

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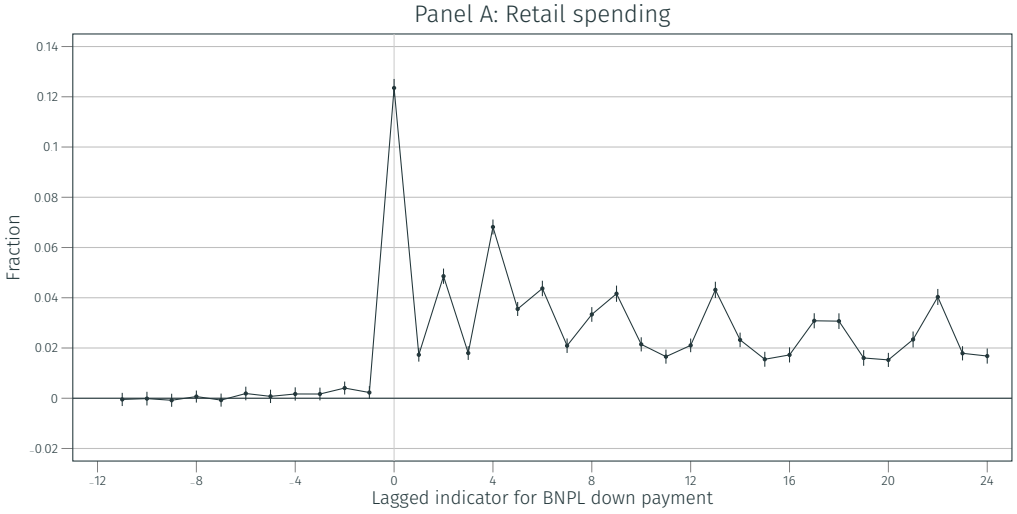

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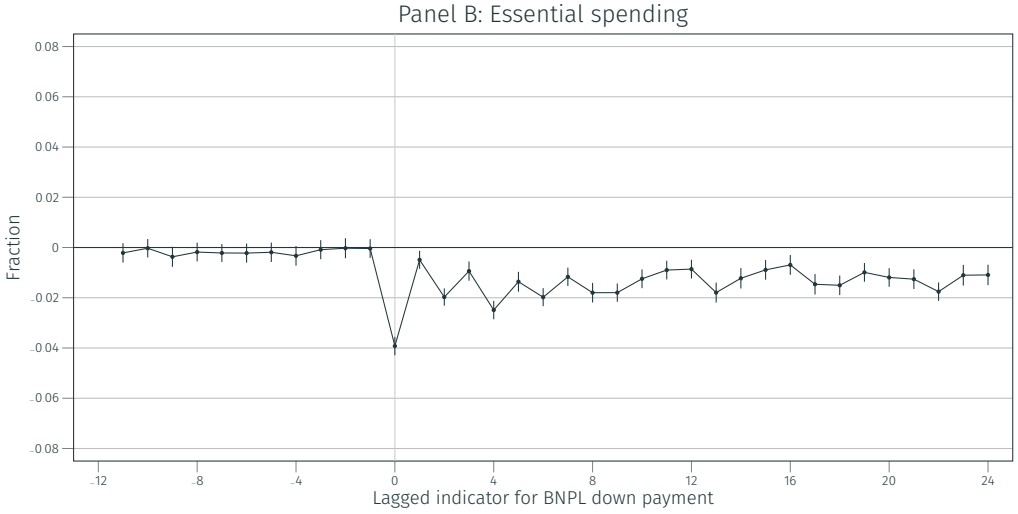

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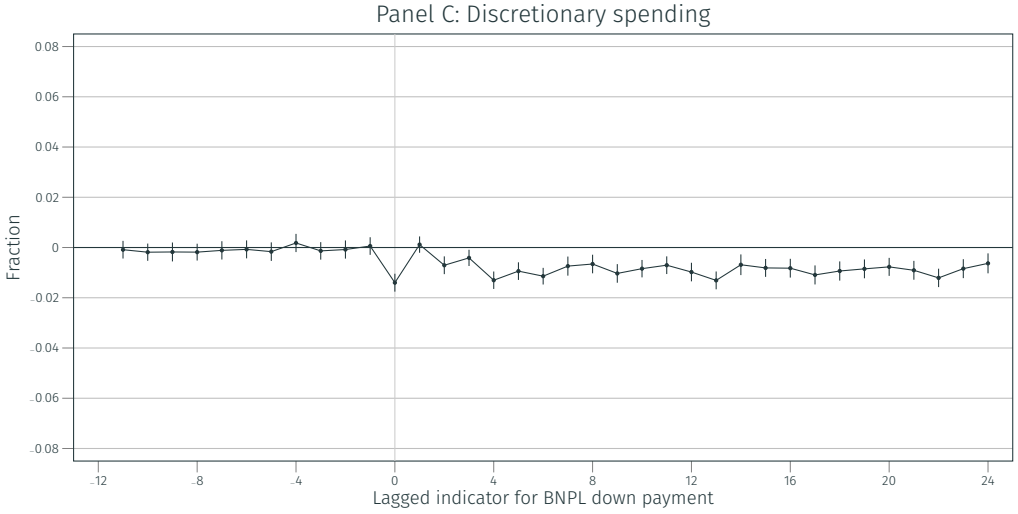

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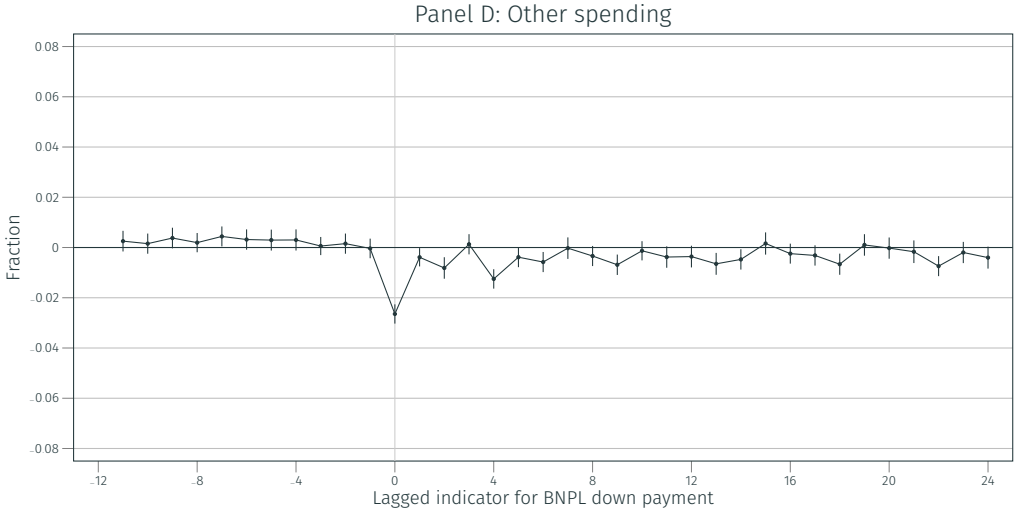

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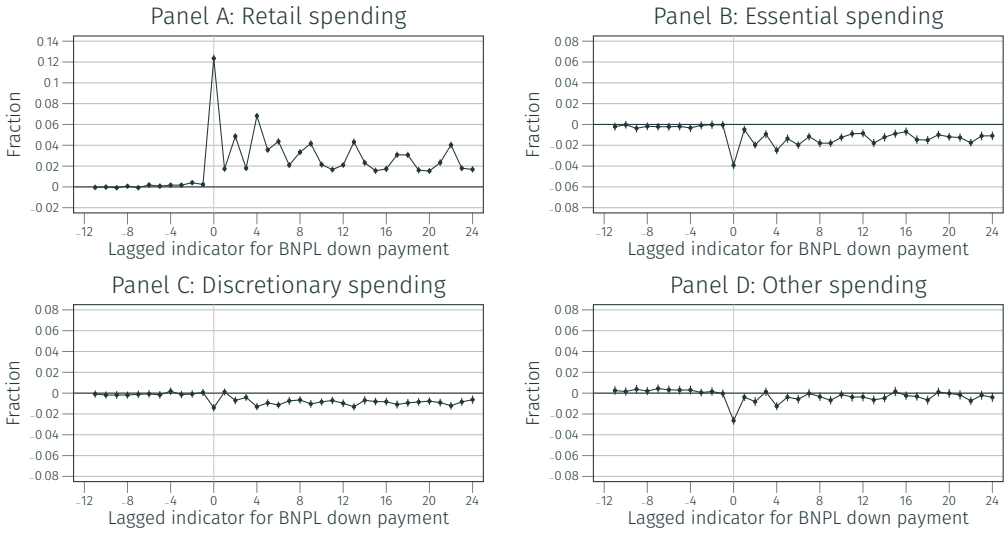

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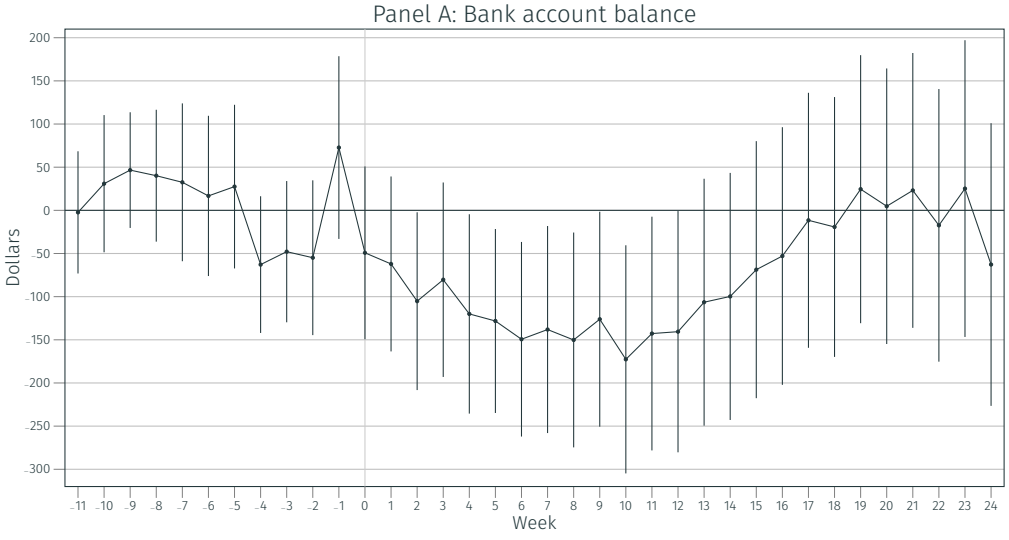

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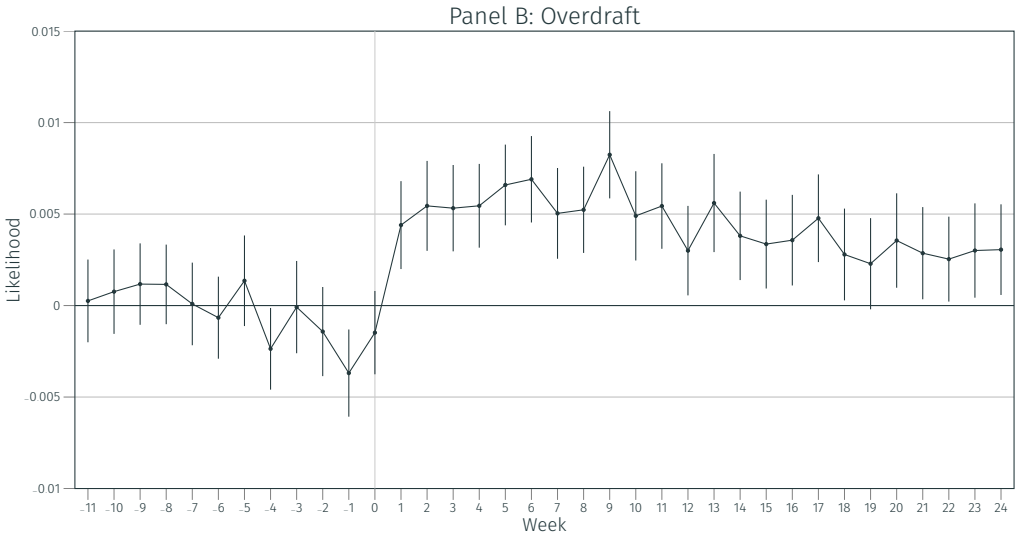

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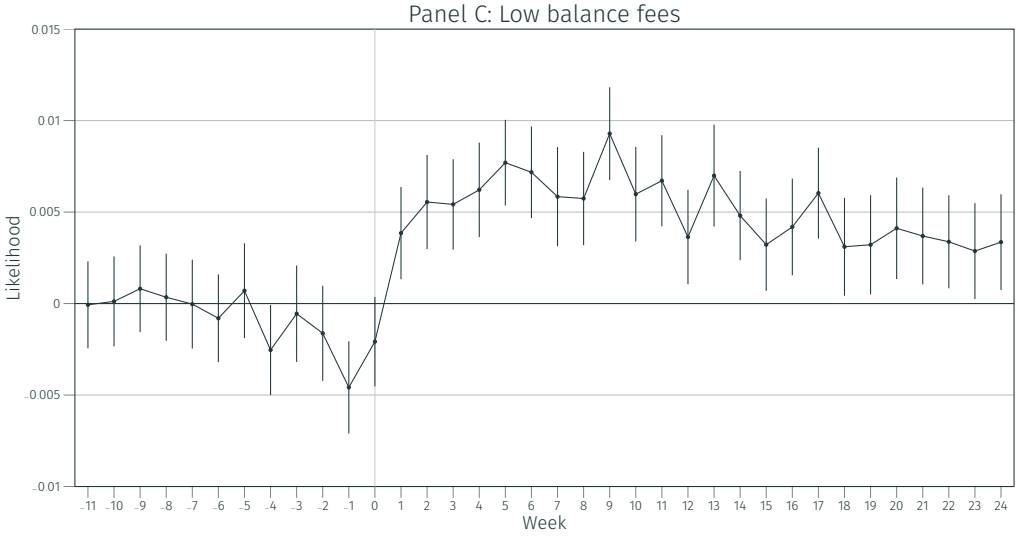

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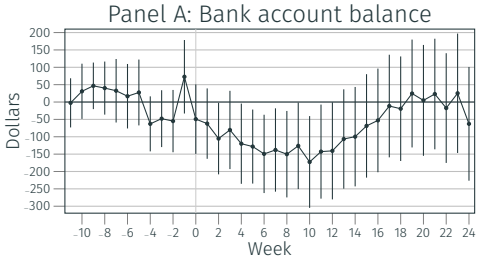

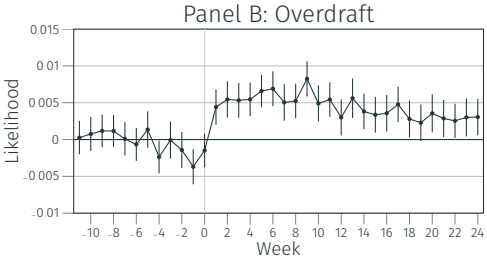

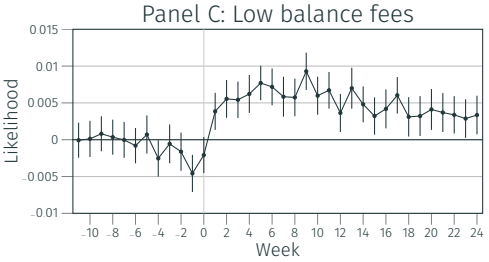

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We make use of heterogeneity in the timing of BNPL adoption by retailers

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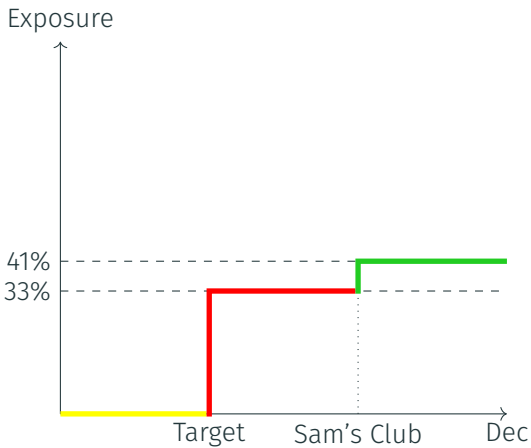

We use this binary exposure instrument to estimate coefficients in the structural equation:

$$y_{it} = \alpha_{it} + \beta \text{Post}_{it} + \varepsilon_{it}$$

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Examples of major retailers identified as offering BNPL in our data

Retailer	Customers %	Revenue bn. $
Target	49.1	52.6
Bed Bath & Beyond	19.1	5.0
Michaels	18.8	2.7
Sam's Club	17.2	22.4
GameStop	12.7	2.6
IKEA	11.6	4.5
Nordstrom	11.5	15.0
Etsy	10.7	3.0
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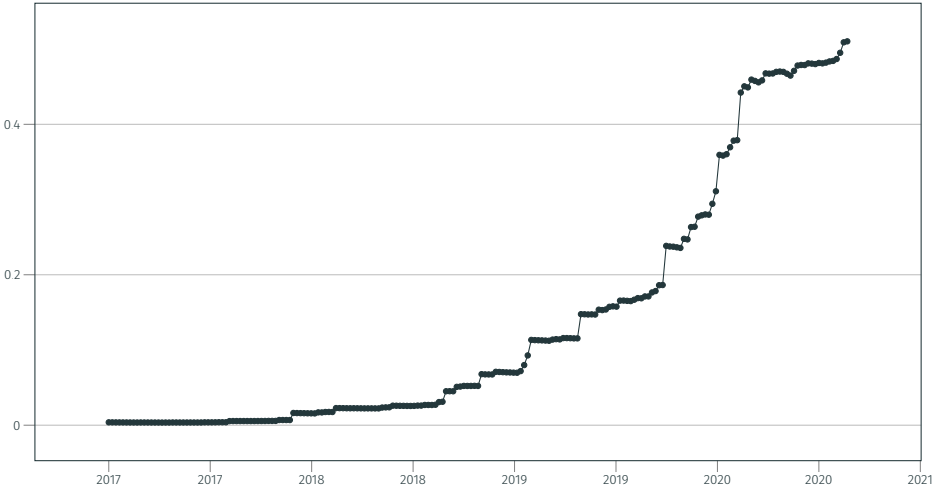

Post-BNPL availability, total spending increases

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	Total Spend		
	Fixed Effects	Reduced Form	TSLS
Post	40.16***		60.47***
	(1.39)		(10.74)
Exposure		7.512***	
		(1.479)	
KP Wald F Stat			1,163

Post-BNPL availability, total spending increases

	Retail Spend		
	Fixed Effects	Reduced Form	TSLS
Post	20.16***		53.58***
	(0.37)		(2.68)
Exposure		6.758***	
		(0.449)	
KP Wald F Stat			1,220

Post-BNPL availability, total spending increases for non CC users

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	Total Spend					
	Credit Card User			Not a Credit Card User		
	Fixed Effects	Reduced Form	TSLS	Fixed Effects	Reduced Form	TSLS
Post	31.81***		−1.844	41.52***		68.26***
	(1.512)		(16.68)	(1.567)		(10.57)
Exposure		−0.168			8.869***	
		(1.517)			(1.533)	
KP Wald F Stat			690.4			959.3

Post-BNPL availability, total spending increases for non CC users

	Retail Spend					
	Credit Card User			Not a Credit Card User		
	Fixed Effects	Reduced Form	TSLS	Fixed Effects	Reduced Form	TSLS
Post	18.75***		42.26***	20.45***		57.08***
	(0.391)		(4.132)	(0.394)		(2.650)
Exposure		3.943***			7.468***	
		(0.443)			(0.455)	
KP Wald F Stat			734			991

Post-BNPL availability, the consumption basket shifts towards retail spending and away from other discretionary type spending

Post-BNPL availability, the consumption basket shifts towards retail spending and away from other discretionary type spending

	Retail Spend/Total		
	Fixed Effects	Reduced Form	TSLS
Post	0.0335***		0.0629***
	(0.0005)		(0.0035)
Exposure		0.00697***	
		(0.00045)	
KP Wald F Stat			1,165

Post-BNPL availability, the consumption basket shifts towards retail spending and away from other discretionary type spending for cc users as well

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	Retail Spend/Total					
	Credit Card User			Not a Credit Card User		
	Fixed Effects	Reduced Form	TSLS	Fixed Effects	Reduced Form	TSLS
Post	0.0290***		0.0447***	0.0369***		0.0720***
	(0.000535)		(0.00578)	(0.000563)		(0.00430)
Exposure		0.00381***			0.00806***	
		(0.000517)			(0.000531)	
KP Wald F Stat			680.1			892.7

Post-BNPL availability, liquidity declines and unsecured borrowing increases

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Post-BNPL availability, liquidity declines and unsecured borrowing increases

	Balance Estimate		
	Fixed Effects	Reduced Form	TSLS
Post	−659.4***		−997.2**
	(63.9)		(408.7)
Exposure		−123.9**	
		(51.4)	
KP Wald F Stat			1,163

Post-BNPL availability, liquidity declines and unsecured borrowing increases

	Overdraft Fee		
	Fixed Effects	Reduced Form	TSLS
Post	0.00263***		0.00473***
	(0.00026)		(0.00161)
Exposure		0.000588***	
		(0.000203)	
KP Wald F Stat			1,163

Post-BNPL availability, liquidity declines and unsecured borrowing increases – for non CC users

Post-BNPL availability, liquidity declines and unsecured borrowing increases – for non CC users

	Balance Estimate					
	Credit Card User			Not a Credit Card User		
	Fixed Effects	Reduced Form	TSLS	Fixed Effects	Reduced Form	TSLS
Post	−833.1***		−894.2	−462.9***		−1.663***
	(110.4)		(1.136)	(54.49)		(360.9)
Exposure		−81.46			−216.0***	
		(103.5)			(47.53)	
KP Wald F Stat			690.4			959.3

Post-BNPL availability, liquidity declines and unsecured borrowing increases – for non CC users

	Overdraft Fee					
	Credit Card User			Not a Credit Card User		
	Fixed Effects	Reduced Form	TSLS	Fixed Effects	Reduced Form	TSLS
Post	0.00157***		−0.00123	0.00269***		0.00458**
	(0.000242)		(0.00227)	(0.000361)		(0.00232)
Exposure		−0.000112			0.000595*	
		(0.000207)			(0.000304)	
KP Wald F Stat			690.4			959.3

BNPL access and consumption smoothing

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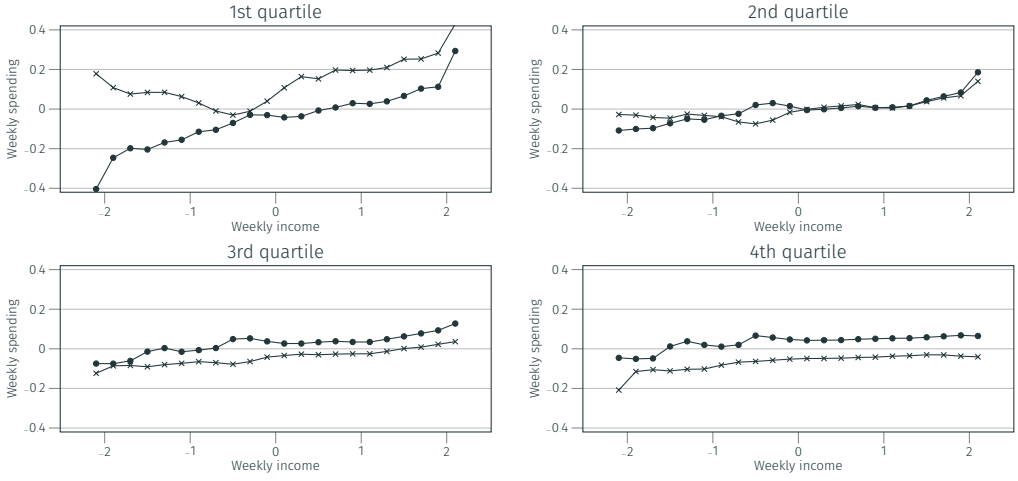

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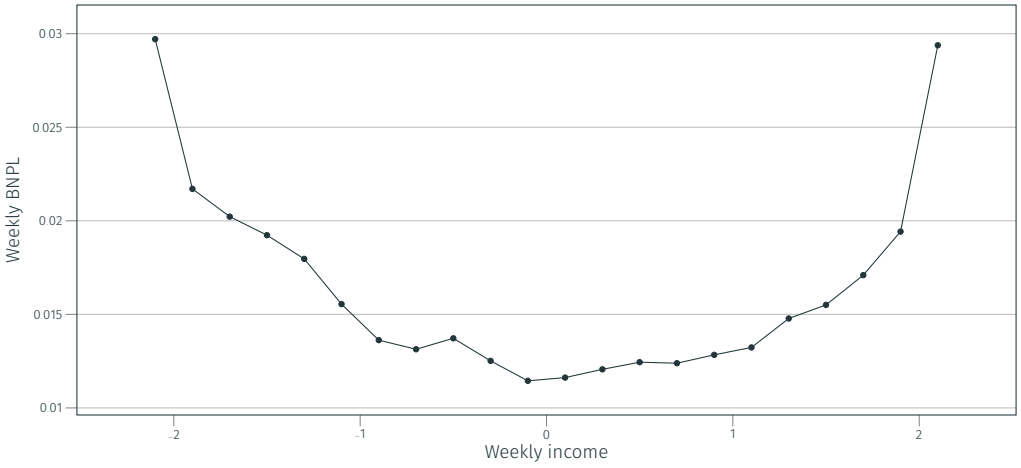

Taking stock of our findings

We find that BNPL access is associated with:

1. Increased spending
2. A flatter relationship between spending and income
3. A shift in spending towards retail goods (for all users)
4. An reduction in liquid buffers (for those with less access to liquidity ex ante)

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The “liquidity fly paper effect”

Our findings are also consistent with a “liquidity flypaper effect”

BNPL disproportionately provides liquidity for retail purchases

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Ad-hoc budgeting rules or mental accounting combined with consumer myopia i.e.

1. consumers budget a certain amount for, say, clothing expenditure in each period.
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Work in progress to pin down the “liquidity flypaper effect”

1. Do people “code” BNPL repayments like other bill payments?
   - We can observe spending patterns around bill payments and see if patterns are similar for BNPL repayments.
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Wrap up

1. We find that BNPL use is associated with:
   - Increased spending
   - smoother spending relative to income
   - increased allocation towards retail goods
2. We argue that these findings are consistent with increased credit access causing a reduction in the precautionary savings motive and also a “liquidity flypaper effect”
   - Increased retail liquidity leads to increased retail spending
   - Mis-coding of repayments as retail spending can create a persistent increase in retail allocation.
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   - Mis-coding of repayments as retail spending can create a persistent increase in retail allocation.
   - This additional spending is financed with existing liquidity
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