Supporting Seniors: How Low-Income Elderly Individuals Respond to a Retirement Support Program

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Motivation

- Insufficient retirement savings expose elderly individuals to financial vulnerability
  - Extended life expectancy
  - Insufficient retirement savings in the working years
  - Rising cost of living and healthcare
- This prompts governments consider support measures, e.g. direct fiscal transfers.
- Important questions remain:
  - How do the elderly’s consumption respond to the transfer programs?
  - Relative effectiveness of transfer programs across subgroups of the elderly population?
  - Which is a good policy in terms of eligibility criteria, payment frequency, and distribution form?

This paper:

- We study the consumption response to the Silver Support Scheme, a means-tested elderly support program in Singapore.

- Main findings:
  - Elderly individuals increase spending by 0.7 dollars per dollar of subsidy received.
  - More liquidity-constrained recipients exhibit a higher MPC of 1, regardless of their income level. They also increase their spending immediately after the quarterly recurring subsidy payouts.
  - No evidence of labor supply reduction or other strategic behaviors.

- Implications for eligibility criteria, payment frequency, and distribution form in policy design.

The Silver Support Scheme in Singapore

- Quarterly cash payouts targeting low-income elderly individuals starting in 2016

- Singaporeans aged 65 and above who pass the means-testing are eligible:

1. Low pre-retirement cumulative income: Total contribution to the national pension savings system (CPF) $\leq$ 70,000 Singapore Dollar (SGD) by the age of 55.
2. Low current income including family support: Current monthly income per person in the household $\leq$ 1,100 SGD.
3. Limited housing wealth: Live in subsidized public residential housing (HDB) up to 5-room. Homeownership is restricted to one HDB apartment up to 4-room.

- Coverage: approximately the bottom 20% of elderly individuals.

The Silver Support Scheme in Singapore

- Quarterly subsidy in the form of direct bank transfer, ranging from 300 to 750 SGD based on size of HDB residence
- Total annual cost amounts to approximately 250 million USD in 2019.
- Quarterly subsidy starts in the quarter before the 65th birthday for an eligible individual and continues as long as this individual remains eligible. E.g., if Ms. Tan turns 65 on May 13, 2017, she starts to receive the subsidy in March 2017.
- Government notifies eligible individuals in advance of the first subsidy

Data

- Bank transactions of a random sample of 250,000 individuals from DBS (the largest bank in Singapore, covering 80% of population) in 2016-18
  - Bank account transactions: amount, date, inflow/outflow, transaction code
  - Automatic teller machine (ATM) transactions: additional info on location
  - Debit and credit card transactions: amount, date, merchant code
  - Monthly statement information of all accounts
  - Demographic characteristics: age, gender, educational attainment, marriage status, income, property type (public or private housing), postal area, nationality, ethnicity, and occupation

Sample construction

- The Silver Support subsidies are distributed via direct bank transfers. In the bank record, the subsidies are recorded with one designated transaction code.
- We construct the sample of recipients according to the program eligibility criteria:
  - Singaporeans
  - Have received at least one Silver Support subsidy in 2016-18
  - At least 64.75 years old at the time of the first subsidy
  - Live in the public housing (HDB)

→1,340 individuals

Characteristics of Silver Support Recipients

- Cash spending accounts for ~70% of total spending

Total spending and its composition:	Mean	Std. Dev.	50%
Monthly total spending (SGD)	1407.8	4056.8	634.8
Monthly cash spending (SGD)	965.2	1771.3	500
... including ATM cash withdrawal (SGD)	630.9	965.2	215
Monthly debit card spending (SGD)	114.2	287.4	0
Monthly credit card spending (SGD)	33.1	249.0	0
Monthly bill payment (SGD)	295.3	3390.5	0

- Low credit card ownership (12%), no credit card debt

Empirical approach

- Means test to determine eligibility for receiving the subsidies → non-recipients may not constitute a credible counterfactual for recipients.
- We restrict the analysis to include only the recipients (identified by the designated transaction code for Silver Support subsidies in bank transaction records).
- Identification relies on the variation in timing of program inception.

Staggered inception of the subsidies

	Freq	%	Cumulative %
July 2016	869	64.85	64.85
September 2016	46	3.43	68.28
December 2016	44	3.28	71.57
March 2017	28	2.09	73.66
June 2017	27	2.01	75.67
September 2017	28	2.09	77.76
December 2017	99	7.39	85.15
March 2018	28	2.09	87.24
June 2018	32	2.39	89.63
September 2018	27	2.01	91.64
December 2018	112	8.36	100.00
Total	1,340	100.00	

Empirical approach

- Means test to determine eligibility for receiving the subsidies → non-recipients may not constitute a credible counterfactual for recipients.
- We restrict the analysis to include only the recipients (identified by the designated transaction code for Silver Support subsidies in bank transaction records).
- Identification relies on the variation in timing of program inception.
- Treatment group: subsidy recipients who start to receive the subsidies at one time
- Control group: other subsidy recipients who start to receive the subsidies at different times

Baseline panel regression specification

$$y_{i,t} = \mu_i + \pi_{ym} + \delta_{dow} + \beta \times Post_{i,t} + \varepsilon_{i,t}$$

- $y_{i,t}$: Dollar amount of spending of individual i on day t
- Post = 1 for the calendar days since individual i starts to receive the subsidy (program inception)
- β measures the impact of the Silver Support subsidies on daily spending
- Individual fixed effects μ_i : remove unobserved time-invariant individual heterogeneity (e.g. individual consumption preference)
- Year-month fixed effects π_{ym} : absorb seasonal variations in aggregate consumption expenditures and the average impact of all other concurrent aggregate factors
- Day-of-week fixed effects δ_{dow} : control for the weekday vs weekend differences
- Standard errors: robust, clustered at the individual level

Average spending response (dollar amount)

	(1) Total spending	(2) Cash spending	(3) Debit card spending	(4) Credit card spending	(5) Bill payment
Post	**7.348*** **	**5.868*** **	0.463	-0.0584	1.286***
	[6.17]	**[5.95]**	[1.63]	[-0.47]	[2.66]
Individual FEs	Yes	Yes	Yes	Yes	Yes
Day of week FEs	Yes	Yes	Yes	Yes	Yes
Year-Month FEs	Yes	Yes	Yes	Yes	Yes
R^2	0.0866	0.0460	0.0458	0.0466	0.215
No. of observations	1,463,272	1,463272	1,463,272	1,463,272	1,463,272

Economic magnitude

- Silver Support recipients increase their total spending by 7.35 dollars per day; the additional spending corresponds to approximately 16% of the average daily spending in the pre-subsidy period
- Increase in cash spending accounts for more than 80% of the additional spending

Average spending response (marginal propensity to consume)

$$y_{i,t} = \mu_i + \pi_{ym} + \delta_{dow} + \beta_{MPC}\left(Post_{i,t} \times Daily\ Subsidy\ Amount_i\right) + \varepsilon_{i,t}$$

	(1) Total spending	(2) Cash spending	(3) Debit card spending	(4) Credit card spending	(5) Bill payment
Post × Daily Subsidy Amount	**0.693*** **	**0.586*** **	0.0486**	-0.00557	0.0541
	[7.06]	**[7.13]**	[2.19]	[-0.61]	[1.35]
Individual FEs	Yes	Yes	Yes	Yes	Yes
Day of week FEs	Yes	Yes	Yes	Yes	Yes
Year-Month FEs	Yes	Yes	Yes	Yes	Yes
R^2	0.0866	0.0460	0.0458	0.0466	0.215
No. of observations	1,463,272	1,463,272	1,463,272	1,463,272	1,463,272

Falsification tests

1. Could the results driven by unobserved age-specific and income-specific trends?
   - Null result in matched old non-recipients (Singaporeans in the same age cohorts as recipients and with similar levels of financial resources) → rule out unobserved age-specific trends as an alternative explanation.
   - Null result in matched young non-recipients (low-income Singaporeans that are younger than recipients) → rule out unobserved income-specific trends as an alternative explanation.

2. Could the observed response simply be random? Ruled out by bootstrap test (500 iterations)

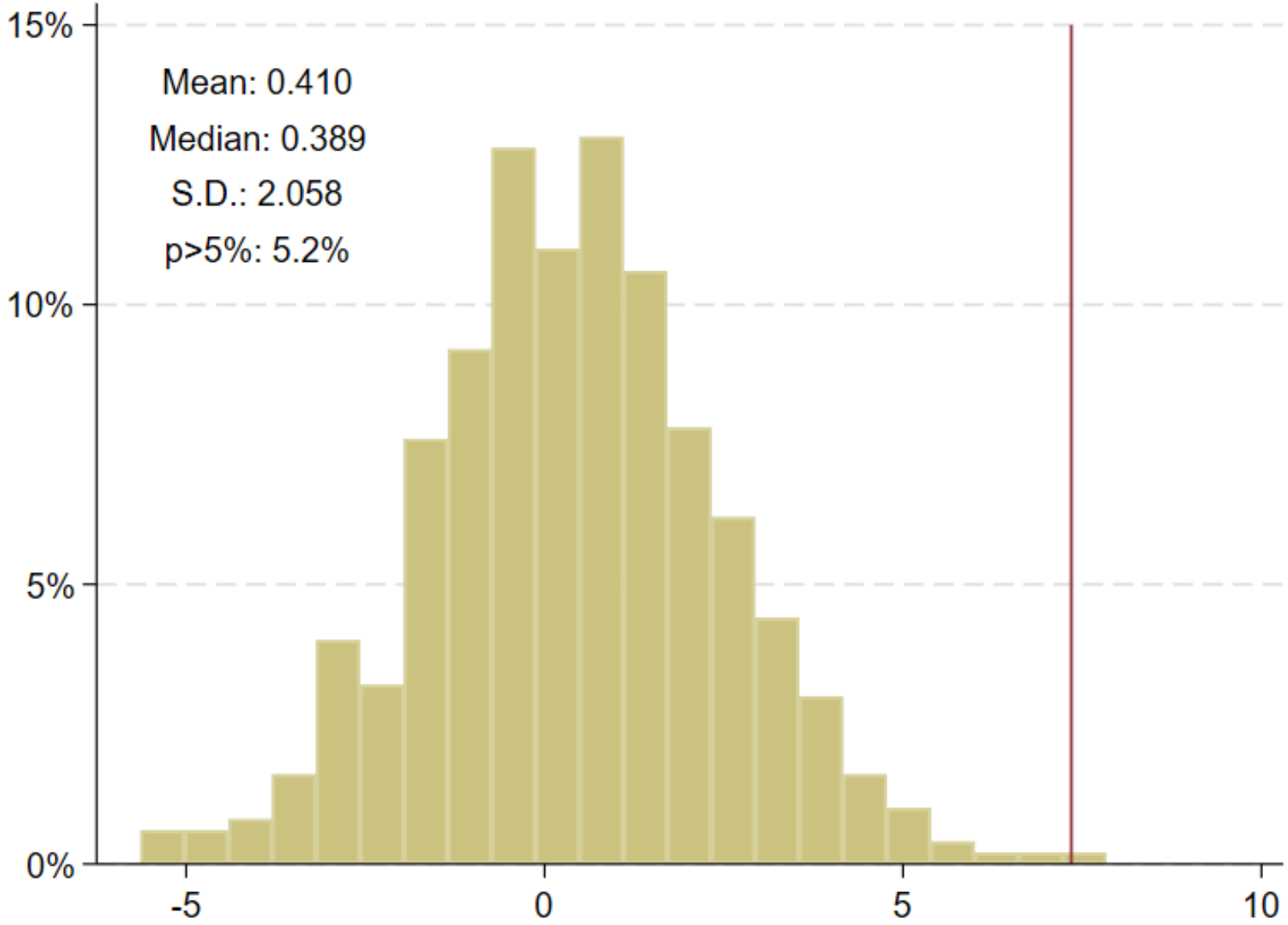
Falsification test (1): No effect in matched non-recipients

	(1) Using old non-recipients	(2) Using young non-recipients
Post Pseudo Program Inception	1.183 [0.88]	1.634 [1.45]
Individual FEs	Yes	Yes
Day of week FEs	Yes	Yes
Year-Month FEs	Yes	Yes
R^2	0.0757	0.0657
No. of observations	1,516,461	1,517,830

Addressing unobserved age-specific and income-specific trends

- Null result in matched old non-recipients (Singaporeans in the same age cohorts as recipients and with similar levels of financial resources) → rule out the impact of unobserved age-specific trends.
- Null result in matched young non-recipients (low-income Singaporeans that are younger than recipients) → rule out the impact of unobserved income-specific trends.

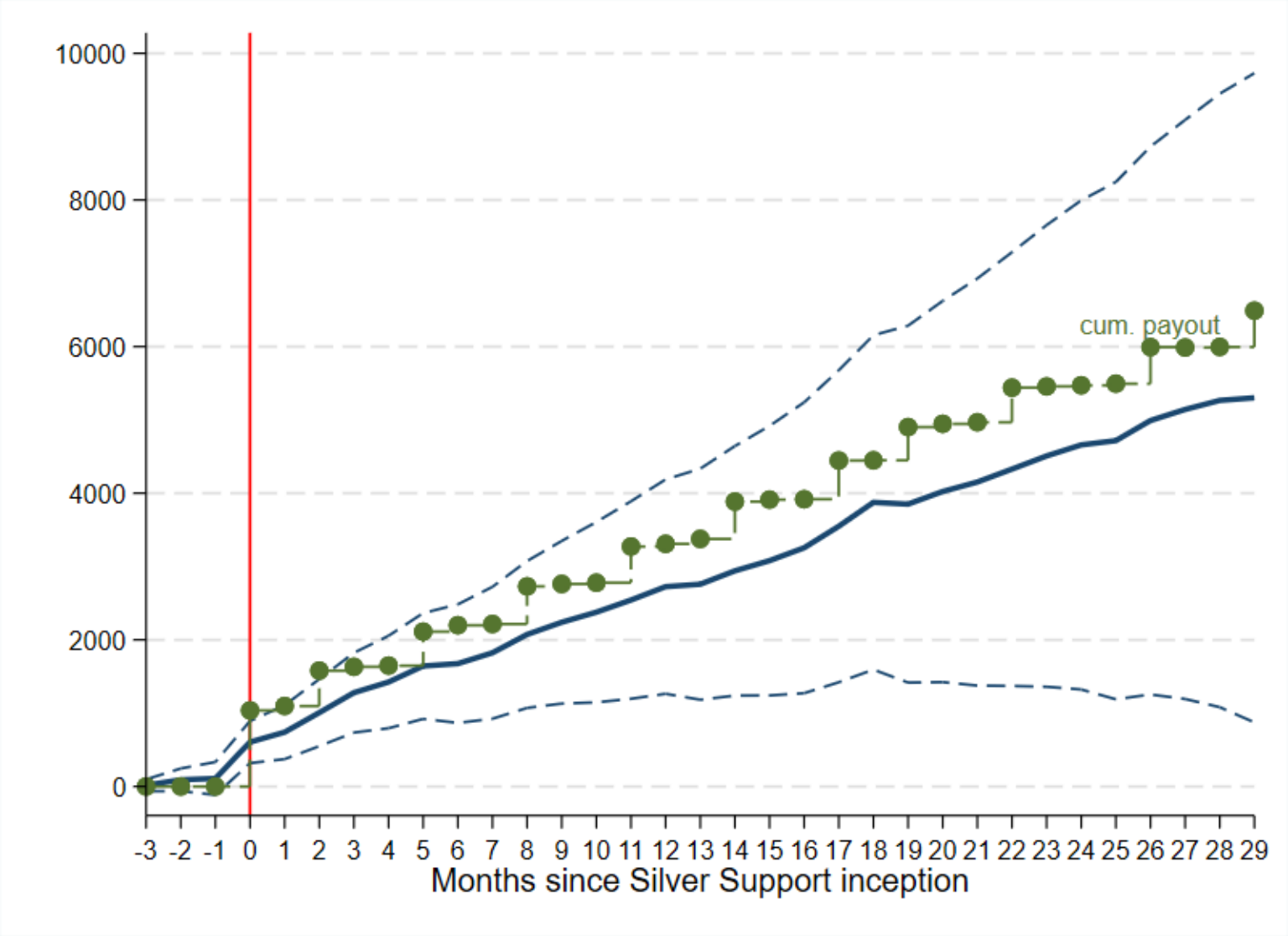
Falsification test (2): Bootstrap test



Dynamic spending response to program inception

$$y_{i,t} = \mu_i + \pi_{ym} + \delta_{dow} + \sum_{s=-3}^{T} \beta_s \times \mathbb{I}_{i,sm} + \varepsilon_{i,t}$$

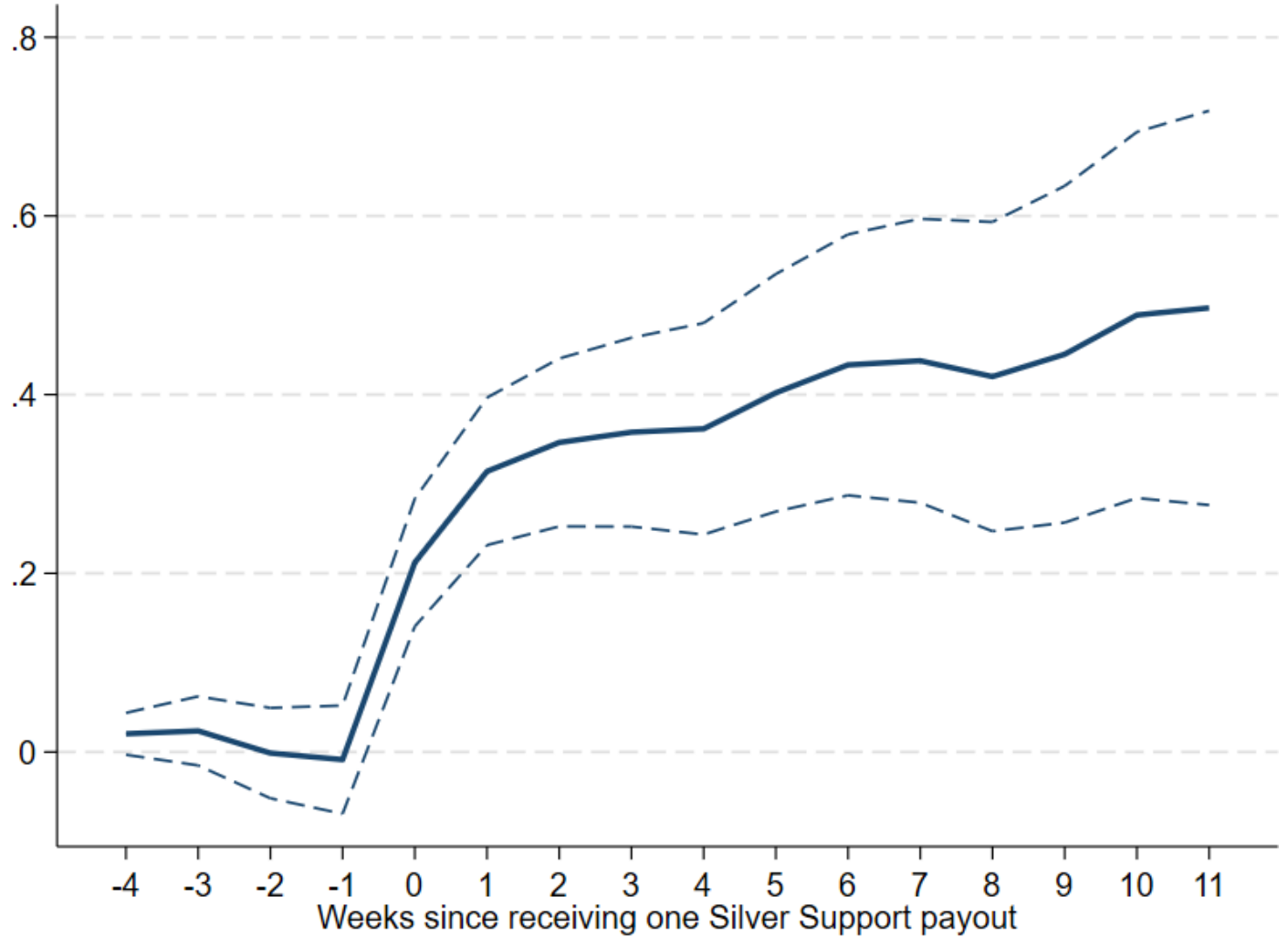
Cumulative spending response: $b_s = \sum_{s=-3}^{T} 30 \cdot \beta_s$



Dynamic spending response to recurring payments

$$y_{i,j,t} = \mu_i + \pi_{ym} + \delta_{dow} + \sum_{s=-4}^{11} \beta_s \times \mathbb{I}_{i,j,st} \times Subsidy\ Amount_{i,j} + \varepsilon_{i,t}$$

Cumulative MPC out of subsidies: $b_s = \sum_{s=-4}^{T} 7 \cdot \beta_s$



Heterogeneity in the response to program inception

$$y_{i,t} = \mu_i + \pi_{ym} + \delta_{dow} + \sum_{g=1}^{N} \beta_{MPC,g}\left(\mathbb{I}_{i,g} \times Post_{i,t} \times Daily\ Subsidy\ Amount_i\right) + \varepsilon_{i,t}$$

	(1)	(2)	(3)
MPC of male recipients	0.700***		
	[6.14]		
MPC of female recipients	0.690***		
	[5.01]		
MPC of higher-income recipients		0.676***	
		[6.38]	
MPC of lower-income recipients		0.727***	
		[4.30]	
MPC of higher-liquidity recipients			0.383***
			[3.45]
MPC of lower-liquidity recipients			1.123***
			[7.66]
Individual FEs	Yes	Yes	Yes
Day of week FEs	Yes	Yes	Yes
Year-Month FEs	Yes	Yes	Yes
R^2	0.0866	0.0866	0.0866
No. of observations	1,463,272	1,463,272	1,463,272

Heterogeneity in the response to program inception

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	(4)
MPC of higher-income & higher-liquidity recipients	**0.369*** **
	[3.11]
MPC of higher-income & lower-liquidity recipients	**1.078*** **
	[6.16]
MPC of lower-income & higher-liquidity recipients	0.414**
	[2.09]
MPC of lower-income & lower-liquidity recipients	1.274***
	[7.09]
Individual FEs	Yes
Day of week FEs	Yes
Year-Month FEs	Yes
R^2	0.0866
No. of observations	1,463,272

Heterogeneity in the response to program inception

$$y_{i,t} = \mu_i + \pi_{ym} + \delta_{dow} + \sum_{g=1}^{N} \beta_{MPC,g}\left(\mathbb{I}_{i,g} \times Post_{i,t} \times Subsidy\ Amount_i\right) + \varepsilon_{i,t}$$

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MPC of higher-income & higher-liquidity recipients	0.369***
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MPC of lower-income & lower-liquidity recipients	**1.274*** **
	[7.09]
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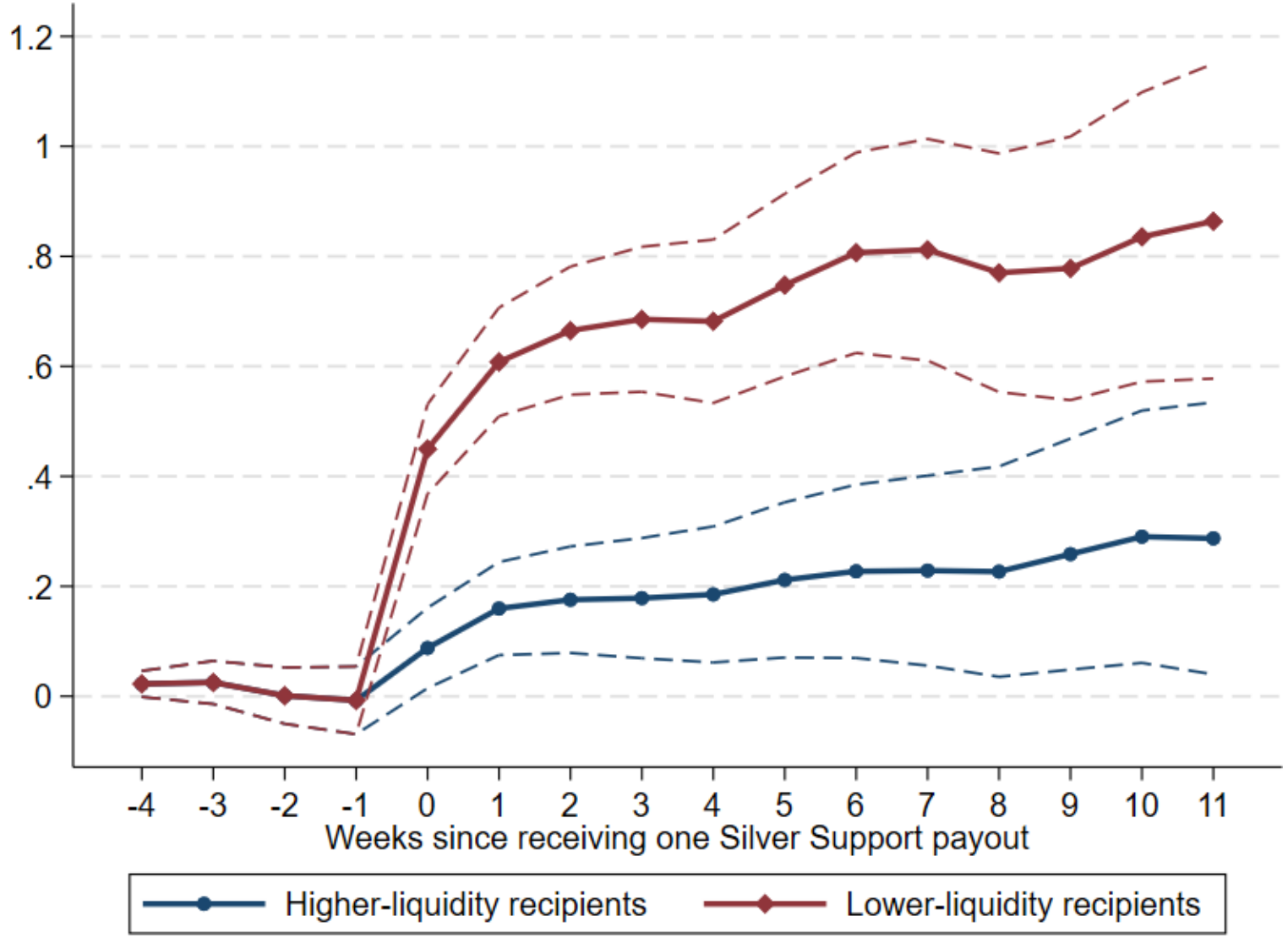
Day of week FEs	Yes
Year-Month FEs	Yes
R^2	0.0866
No. of observations	1,463,272

Heterogeneity in the response to recurring payments



Characteristics of spending: ATM withdrawal locations

	(1) Total ATM withdrawal	(2) Close to home	(3) Far from home	(4) Close to food courts
Post	3.437***	0.725	3.184***	1.368***
	[4.73]	[1.32]	[4.47]	[2.76]
Individual FEs	Yes	Yes	Yes	Yes
Day of week FEs	Yes	Yes	Yes	Yes
Year-Month FEs	Yes	Yes	Yes	Yes
R^2	0.0468	0.0430	0.0519	0.0339
No. of observations	1,463,272	1,090,820	1,090,820	1,463,272

Characteristics of spending: Retail purchases

- Data: Nielsen Homescan dataset, which tracks the purchases of a broad basket of consumer packaged goods from all retail outlets for a sample of households
- Construct treatment and control groups using Nielsen's available age and income bracket indicators
  - Treatment group: in the lowest income group & the eldest age group
  - Control group: in lowest income group & the second eldest age group
- We proxy the timing of program inception by July 2016, the inaugural Silver Support subsidy.
- Difference-in-differences analysis of spending change
- Findings: proxied recipients in the treated group increase their spending, especially on food items, and expand the product, brand, and category variety of their consumption.

Labor supply and housing responses

	Labor supply		Residential moves		
	(1)	(2)	(3)	(4)	(5)
	Receive positive salary	Log salary	Change postal area	Change dwelling type	Change ownership status
Post	-0.00639	0.0255	0.000275	-0.000199	-0.000335
	[-0.56]	[1.17]	[0.36]	[-0.42]	[-0.50]
Individual FEs	Yes	Yes	Yes	Yes	Yes
Year-Month FEs	Yes	Yes	Yes	Yes	Yes
R^2	0.742	0.791	0.0351	0.990	0.0429
No. of observations	49,558	11,843	48,169	48,169	48,169

- Null result in both extensive margin and intensive margin of labor supply → contrary to the notion that subsidies provide disincentives to work
- Null result in residential moves → rule out strategic downsizing

Implications for policy design (1): Criteria in the means test

- Subsidy programs in the form of a guaranteed income level may substantially reduce incentives to work and may result in large efficiency costs.
  → we find no evidence of labor supply reduction.
- Recipients would downsize their apartments to qualify for larger subsidies.
  → we find no evidence of residential moves.
- Overall, our results reveals that the subsidy program achieves the targeted support among the recipients with little side effects.

- We further analyze whether individuals strategically change their income and housing profiles prior to the 65th birthday to qualify for the subsidy program.

Neither high- nor low-income individuals change their labor supply when they turn 65.

$$y_{i,ym} = \mu_i + \pi_{ym} + \beta \cdot Post64_{i,ym} + \varepsilon_{i,ym}$$

	Lower-income people turning 65		Higher-income people turning 65	
	(1)	(2)	(3)	(4)
	Receive positive salary	Log salary	Receive positive salary	Log salary
Post the 64th birth month	-0.0114	-0.00215	-0.00260	0.0108
	[-1.20]	[-0.10]	[-0.81]	[1.14]
Individual FEs	Yes	Yes	Yes	Yes
Year-Month FEs	Yes	Yes	Yes	Yes
R^2	0.808	0.828	0.910	0.816
No. of observations	14,799	4,805	61,822	22,702

Little change in housing across income groups

$$y_{i,ym} = \mu_i + \pi_{ym} + \beta \cdot Post64_{i,ym} + \varepsilon_{i,ym}$$

	Lower-income people turning 65			Higher-income people turning 65		
	(1)	(2)	(3)	(4)	(5)	(6)
	Change postal area	Change dwelling type	Change ownership status	Change postal area	Change dwelling type	Change ownership status
Post the 64th birth month	-0.000641	-0.0000591	0.000161	0.00106	-0.000246	0.000659
	[-0.43]	[-0.05]	[0.12]	[1.31]	[-0.35]	[0.54]
Individual FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FEs	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.0584	0.918	0.0778	0.0714	0.874	0.0806
No. of observations	14,799	14,799	14,799	61,822	61,822	61,822

Implications for policy design (1): Means testing criteria

- In sum, we find no evidence of strategic behaviors prior to turning 65 years old, suggesting that the criteria used in the means test are likely to be manipulation-proof. This desirable feature is related to the criterion on cumulative income by age 55 in the means test, which is based on historical data and leaves no room for manipulation closer to 65.

- In heterogeneity analysis, we find that liquidity is a more important driver for the consumption response than income in both program inception and recurring payment cycles. Incorporating liquidity in the means test can improve targeting constrained individuals.

Implications for policy design (2): Payment frequency

- Frequency of benefit disbursements to those eligible matters as recipients do not fully smooth their consumption.
- We document a concave-shaped consumption response to recurring subsidy payments where the first week response accounts for approximately 40% of the 12-week cumulative spending response.
- Implications: government could improve consumption smoothing by splitting quarterly payments into smaller, more frequent payments.
- Our results and implications are consistent with existing studies, e.g., Dobkin and Puller (2007), Mastrobuoni and Weinberg (2009), LaPoint and Sakabe (2019).

Implications for policy design (3): Distribution form

- Cash: unrestricted use
  - Give the recipients maximum flexibility
  - May induce excessive spending
- Voucher: restricted use
  - Target specific spending
  - Cannot be used to weather negative shocks
- We compare the Silver Support Scheme's direct cash approach with an earlier program in Singapore that targets the same elderly demographic group but takes the form of vouchers for medical and health insurance expenses.
- Using card spending data, we find that even the most disadvantaged recipients of the medical vouchers do not increase their spending upon receiving the vouchers significantly, economically or statistically.
  → These results imply that the medical and health insurance expenditure vouchers do not stimulate consumption. A cash/bank transfer disbursement is more effective than a voucher disbursement in stimulating consumption.

Conclusion

- Focus: How do low-income elderly individuals respond to a retirement support program?
- Findings:
  - Average MPC out of subsidies is 0.7.
  - More liquidity-constrained recipients exhibit a higher MPC of 1, regardless of their income level. They also increase spending immediately after recurring subsidies.
  - No side effects on labor supply or housing.
- Implications:
  - Means-testing criteria that are costly to manipulate deter strategic behaviors.
  - Frequent payments and cash/bank transfer disbursement facilitate consumption smoothing.

Thank you!

Reach out to tianyue.ruan@nus.edu.sg!