Digital Text Message Reminders, Actions, Channels, And Minorities

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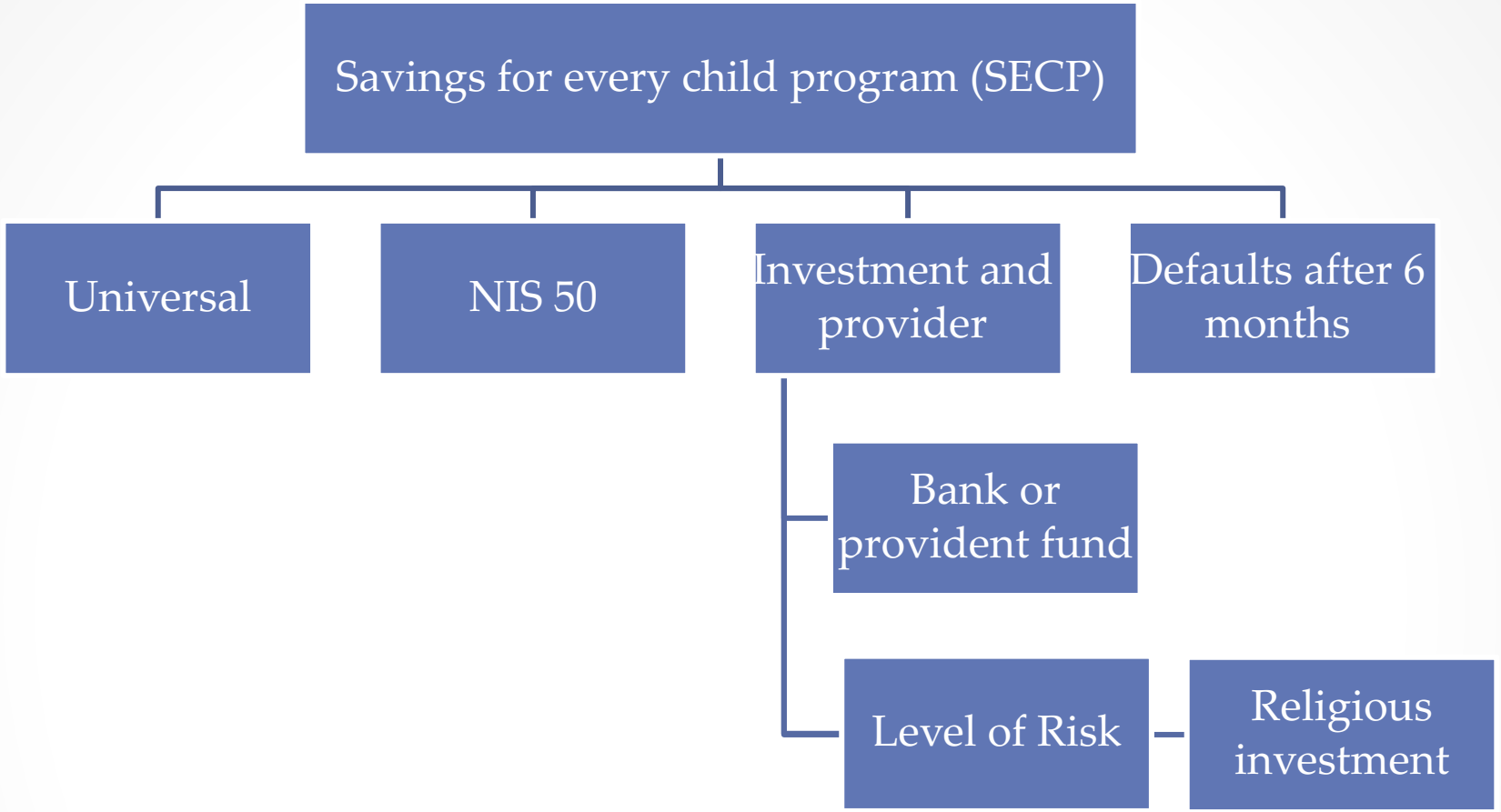
Outline

- Motivation and literature review
- Setup
- Research Questions
- Data
- Results
- Summary and conclusion

- Differences of effect of text messages on **different population**
- Specifically**, minorities**
- **Arab and Ultra-Orthodox Jews**



- **Universal, Defaults** under 15: Low risk investment fund with no additional deposits
- Can **actively enroll** by: **designated website, phone or physical branch**
- **Feb 2017: Text message with two weeks investigated period:**

"Did you hear about the SECP program? If you haven't enrolled yet you can use the attached link or call *2637"

Research questions – Is the effect the same for everyone?

- **Does an SMS text message make a difference on actively enrolling to the SECP?**
  - **Any active enrollment?**
  - Probability that overall, **more money** will ultimately be saved via the program? (Additional 50 NIS, High risk/yield investment track) (Grinstein et al. 2019)

Research questions – Is the effect the same for everyone?

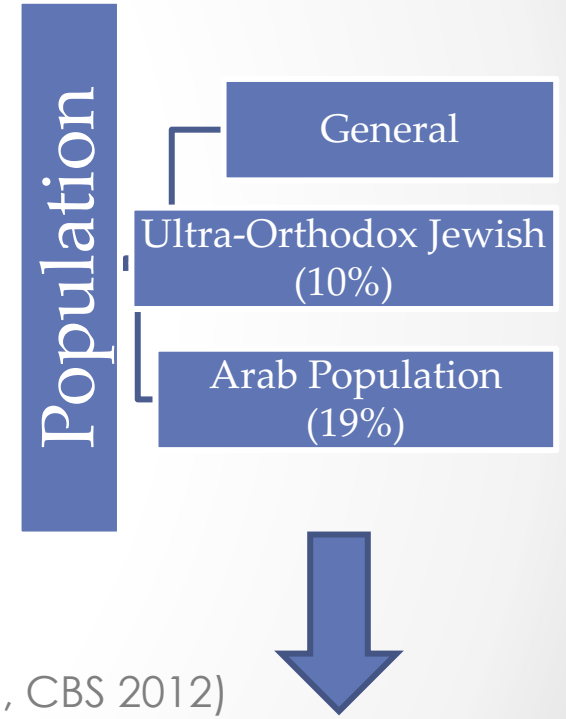
- **Is it the same for all populations?**
  - **Minorities**

Research questions – Is the effect the same for everyone?

- **potential channels that may cause differences**
  - **Culture (and language)**
  - **Socio-econ**: Income and education
  - **Digital frictions** – Choices made by Smartphone
  - **Financial literacy and trust** – Overall affect and by minorities

Minorities

- **Arab population** – Ethnic minority
  - 45% live in poverty
  - 53% have internet subscription (vs. 75% average)
  - Cultural + language frictions
- **Ultra Orthodox Jews** – United community
  - 42% live in poverty
  - 33% have internet subscription
- **Both have low financial literacy** (Haran Rosen and Sade (2019)), CBS 2012)



Beer Sheva and Bnei Brack

Data – Administrative data

Rich administrative data

includes information on: age, number of children, income, education, marital status, minority affiliation

First born child

Children under 15

Observations: 886,920

Received SMS: 39,286

Data – NII telephone survey

- 10,000 invited
- 4,838 observations
- Objective and subjective financial literacy, Trust
- Integrated with administrative data

Methodology

- **Concern: Sample selection**
- **Solution: Matching**

Methodology

- **Nearest Neighbour matching**
  - Main matching
  - mother's wage, father's wage, mother's academic education, father's academic education marital status of parents, parents number of children, age of child, and minorities affiliation
  - Replace, 1:1
  - **60,363 observations with 37,293 treated observations and 23,070 non-treated**
  - **Additional minority and survey matched data sets**

Methodology

- Average treatment affect

$$Y_i = \beta_0 + \beta_1 * I_i + \beta_2 * X_i * I_i + \beta_3 * X_i + \epsilon_i$$

- $I_i =$ Text message dummy
- X_i
  $= Parent's\ characteristics\ (Including\ minority\ affiliaction)$
- **OLS**
- Logit/hazard rate/cox

Methodology

- Investigate:
  - **Any active** enrollment choice
  - Depositing **additional NIS 50**
  - **Higher yield/risk**
  - Choose by using a **mobile phone**

Table 1 - Made any choice by February 19th

	Full sample (1)	Arab (2)	Ultra-Orthodox (3)	Non-Minority (4)
Text message	0.12***	0.06***	0.06***	0.15***
	(0.01)	(0.01)	(0.02)	(0.01)
Message*Arab	-0.05***			
	(0.004)			
Message*Ultra-Orthodox Jew	-0.05***			
	(0.004)			
Message*Income	0.00	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Message*Mother academic	-0.004	0.01*	-0.002	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Message*Father academic	0.01	0.002	0.002	0.01
	(0.01)	(0.01)	(0.02)	(0.01)
Message*Number of children	-0.001	-0.001	-0.003	-0.002
	(0.002)	(0.002)	(0.003)	(0.002)
Message*Child age	-0.002***	-0.001*	0.001	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Message*Parents married	-0.02***	0.002	-0.03	-0.03***
	(0.01)	(0.01)	(0.02)	(0.01)
Non-interaction Controls	Y	Y	Y	Y
Constant	0.004***	0.004	-0.001	0.003
	(0.001)	(0.01)	(0.02)	(0.01)
Observations	60,363	23,560	13,329	22,850
R^2	0.03	0.02	0.01	0.05

Note: *p<0.1 **p<0.05 ***p<0.01

Table 2 – Choose to add additional funds by February 19th

	Full sample	Arab	Ultra-Orthodox	Non-Minority
	(1)	(2)	(3)	(4)
Text message	0.07***	0.02***	0.02*	0.08***
	(0.01)	(0.004)	(0.01)	(0.01)
Message*Arab	-0.04***			
	(0.003)			
Message*Ultra-Orthodox Jew	-0.03***			
	(0.003)			
Message*Income	0.00***	0.00*	0.0000**	0.00***
	(0.00)	(0.00)	(0.0000)	(0.00)
Message*Mother academic	0.003	0.01***	0.0000	0.004
	(0.01)	(0.005)	(0.01)	(0.01)
Message*Father academic	0.01**	0.01	0.01	0.01
	(0.01)	(0.01)	(0.02)	(0.01)
Message*Number of children	-0.001**	-0.001	-0.004*	-0.003*
	(0.002)	(0.001)	(0.002)	(0.002)
Message*Child age	-0.001***	-0.001**	0.001	-0.002***
	(0.001)	(0.0004)	(0.001)	(0.001)
Message*Parents married	-0.01***	-0.0000	-0.001	-0.02***
	(0.01)	(0.003)	(0.01)	(0.01)
Non-interaction Controls	Y	Y	Y	Y
Constant	0.001	0.003	-0.0003	0.0001
	(0.0003)	(0.003)	(0.01)	(0.005)
Observations	60,363	23,560	13,329	22,850
R^2	0.03	0.01	0.01	0.03
Note:	*p<0.1**p<0.05***p<0.01			

Table 3 - Choose high yield/risk track by February 19th

	Full sample	Arab	Ultra-Orthodox	Non-Minority
	(1)	(2)	(3)	(4)
Text message	0.03***	0.003***	0.01	0.03***
	(0.004)	(0.001)	(0.01)	(0.005)
Message*Arab	-0.03***			
	(0.002)			
Message*Ultra-Orthodox Jew	-0.02***			
	(0.002)			
Message*Income	0.00***	0.00	0.0000**	0.00***
	(0.00)	(0.00)	(0.0000)	(0.00)
Message*Mother academic	0.003**	-0.0001	-0.003	0.01***
	(0.004)	(0.002)	(0.002)	(0.004)
Message*Father academic	0.01***	-0.0001	0.01	0.02***
	(0.005)	(0.002)	(0.01)	(0.005)
Message*Number of children	0.001*	-0.0001	-0.002*	-0.0003
	(0.001)	(0.0003)	(0.001)	(0.001)
Message*Child age	-0.001***	-0.0002*	0.0004	-0.002***
	(0.0004)	(0.0001)	(0.0004)	(0.0004)
Message*Parents married	-0.003*	-0.0004	-0.0003	-0.004
	(0.004)	(0.001)	(0.01)	(0.005)
Non-interaction Controls	Y	Y	Y	Y
Constant	0.0002	0.00	0.00	0.001
	(0.0004)	(0.001)	(0.01)	(0.004)
Observations	60,363	23,560	13,329	22,850
R^2	0.03	0.001	0.01	0.03
Note:		*p<0.1**p<0.05***p<0.01		

Channels

- Digital Frictions
- Trust
- Financial literacy – Subjective and Objective

Digital Frictions

Table 4 — Choose by Smartphone by February 19th

	Full sample (1)	Arab (2)	Ultra-Orthodox (3)	Non-Minority (4)
Text message	0.04***	0.01**	0.01	0.06***
	(0.01)	(0.004)	(0.01)	(0.005)
Message*Arab	-0.02***			
	(0.002)			
Message*Ultra-Orthodox Jew	-0.02***			
	(0.002)			
Message*Income	0.00***	0.00	0.0000**	0.00
	(0.00)	(0.00)	(0.0000)	(0.00)
Message*Mother academic	-0.003	0.02***	-0.005*	-0.01**
	(0.004)	(0.004)	(0.003)	(0.004)
Message*Father academic	0.002	0.01**	0.001	-0.0003
	(0.004)	(0.005)	(0.01)	(0.005)
Message*Number of children	-0.001**	-0.0001	-0.002*	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Message*Child age	-0.001***	-0.001	0.0003	-0.002***
	(0.0004)	(0.0003)	(0.0005)	(0.0004)
Message*Parents married	-0.001	0.004	-0.001	-0.003
	(0.004)	(0.003)	(0.01)	(0.004)
Non-interaction Controls	Y	Y	Y	Y
Constant	0.001***	0.003	0.00	0.001
	(0.001)	(0.003)	(0.01)	(0.004)
Observations	60,363	23,560	13,329	22,850
R^2	0.02	0.01	0.01	0.02
Note:		*p<0.1**p<0.05***p<0.01		

Made Choice by February 19th – Additional Survey Sample

Any active enrollment choice

	Full sample	Arab	Ultra-Orthodox	Non-Minority
	(1)	(2)	(3)	(4)
Text message	0.05**	-0.07	0.02	0.03
	(0.06)	(0.05)	(0.03)	(0.05)
Text message*Trust	0.15***	0.25***	0.53***	-0.06
	(0.05)	(0.05)	(0.07)	(0.11)
Text message*Low Subjective financial literacy	-0.10***	-0.22***	-0.18***	-0.004
	(0.08)	(0.06)	(0.05)	(0.10)
Text message*Low Objective financial literacy	-0.07**	-0.01	-0.003	0.01
	(0.07)	(0.06)	(0.04)	(0.07)
R^2	0.06	0.14	0.27	0.07

Choose to add additional 50 NIS

	Full sample	Arab	Ultra-Orthodox	Non-Minority
	(1)	(2)	(3)	(4)
Text message	0.05**	-0.06*	0.02	0.04
	(0.06)	(0.04)	(0.02)	(0.05)
Text message*Trust	0.09***	0.15***	0.52***	-0.04
	(0.04)	(0.04)	(0.06)	(0.09)
Text message*Low Subjective financial literacy	-0.09***	-0.17***	-0.15***	-0.06
	(0.05)	(0.04)	(0.04)	(0.09)
Text message*Low Objective financial literacy	-0.07***	-0.01	-0.02	-0.05
	(0.06)	(0.04)	(0.03)	(0.06)
R^2	0.06	0.13	0.33	0.07

Conclusion and Discussion

- **Unique data and setup**
- **Text message have a positive affect on enrollment**
  - Active enrollment
  - Additional funds
  - Risk/yield
- **Minorities less affected**

Conclusion and Discussion

- **Channels above and beyond socio-econ:**
  - Higher digital frictions
  - Minorities with high levels of trust and subjective financial literacy more repentant to text message
    - Trust less important for digital choice but objective financial literacy more important
  - Robust: smaller affect when more peripheral. affects remain when controlling for liquidity.

Conclusion and Discussion

- Reminders **important tools** with potential shortcomings
- May contribute **to inequality** in the long run

  - **Digital frictions** –for both minorities
  - **Language and cultural barriers**
  - Financial literacy – **confidence and not knowledge**
  - **Trust**

Thank you!!!