

INVITATION TO TAKE ACTION: REGULATORY ACT, DIGITAL REMINDERS, MINORITIES AND ACTIONS

Maya Haran Rosen^{a,b†} and Orly Sade^{a, †}

^a Finance Department, Business School, The Hebrew University of Jerusalem, Israel

^b The Bank of Israel, P.O. Box 780, Jerusalem 91007, Israel

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1. Abstract

We use a natural experiment regarding a mandatory savings accounts program designated for one's children, to investigate the effect of a short text message sent via mobile phones on actively enrolling to the program and depositing additional funds. The text message in this setting acts as both an invitation to take action (reminder), as well as a mechanism for lowering transaction costs by an embedded link in the message, which allowed easy access to a designated website to enroll to the program. This setting allows us to investigate the magnitude of the effect of the text message as a reminder and as a mechanism for lowering transaction costs. Current understanding of the effect of both text messages and reminders on less privileged segments of the population is still very limited. Our unique setting enables us to focus on minorities with low digital literacy, as well as cultural and language frictions that might affect the text messages' effectiveness. We are also able to investigate the effect of the text message by the parent's level of financial literacy. As technology advancements emerge, the interaction of the appliance by which messages are sent, the messages effect on individual's behavior, and the size of this effect for different segments of the population is of increasing interest.

† E-mail addresses: maya.haran@mail.huji.ac.il (M. Haran Rosen) and orlysade@huji.ac.il (O. Sade)

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2. Introduction

Encouraging the population to save more is a topic of growing interest. Different kinds of nudges and choice architectures are being investigated as mechanisms to raise savings.² Reminders are one possible mechanism to encourage savings that is being investigated as it is both simple and cheap.³ The effect of reminders on savings behavior is one sub-filed in a growing, more general line of literature on the effects of reminders on many financial behaviors.⁴ Theoretically, reminders raise the salience of an issue and hence increase the probability that individuals will take action. While certain reminders and other encouragements based on mechanism designs may be effective for the overall population, our understanding of their effect on targeted, less privileged segments of the population is still very limited. Additionally, as technology advancements and fintech applications emerge, these advancements mitigate certain costs, yet may introduce other costs and intensify certain limitations. Hence, identifying the different relevant costs and investigating the interaction of nudges and the use of digital platforms, as well as investigating the sensitivity of the effect of this interaction on different sections of the population is of interest. This is especially true for investigating the effect on minorities.

Our setup is a natural experiment regarding a newly formed child development account (CDA) program.⁵ In 2017 the Savings for Every Child Program (SECP) was installed by the Israeli National Insurance Institute (NII). The program opened a savings account for every Israeli child under the age of 18, to which the government deposits monthly amounts. In the initial installation period there were 6 months before defaults went into effect. Although defaults were set in place, during these 6 months parents could have chosen to actively enrol in the program and specifically choose whether to transfer additional funds

² For example: Benartzi et al. 2017, Madrian (2014), Datta and Mullainathan (2014), Thaler and Sunstein (2009). Specifically, there are also many papers on nudges aimed at increasing savings, for example: Carroll et al. (2009), Ashraf et al. (2006), Thaler and Benartzi (2004), Madrian and Shea (2001)

³ Notable examples of papers on the effect of reminders on retirement savings includes Bauer et al. (2018), Choi et al. (2017), Benartzi et al. (2017), and also on other personal savings Loibl et al. (2018), Karlan et al. (2016a), Clark et al. (2017a) among others.

⁴ Reminders have been found to affect additional financial behaviors other than savings (e.g. Ben-David et al (2019), Gabaix (2019), Heffetz et al. (2016), Bracha and Meier, 2014), Stango and Zinman (2014).

⁵ CDAs are a tool that aims to help households save using a designated government sponsored program which allows to easily open a saving account. These programs can be accompanied by other government incentives to save that range from tax incentives, matching, and governmental deposits (e.g. Sherraden (1991), Clancy et al. (2016), Loke and Sherraden (2009)).

to the SECP account, to select an investment provider where the funds can be saved (bank or investment fund), and to choose the investment track where savings will be invested. During the installation period there was a major media campaign regarding the program. After the media campaign subsided, on February 6th and 7th the NII sent mobile phone text messages to a sub-sample of Israeli households. The message included a question on whether parents have already actively enrolled into the program and included a direct link to the designated website to enroll. Following this, there was a two-week period where no other measures were taken by the NII to encourage enrollment. We use this setup as a natural experiment study case.

The academic literature discusses two main frictions for taking actions and having attention to the issue at hand. The first friction is observation costs⁶, which influence the salience of the information and include information search costs. The second friction stems from transaction costs⁷. Transaction costs may impede or delay individuals from taking a course of action, due to issues such as the cognitive complexity of the task, or the duration of the time spent on the task.⁸ Usually, reminders are referenced in the literature as affecting actions and attention by lowering observation costs. In our setting, the text message acts both as an invitation to take action/reminder that lowers observation costs, and as a mechanism that lowers transaction costs via the use of the embedded link and the designated website.

Specifically we investigate the following questions:

What is the effect of a short text message sent via mobile phones on actively enrolling to a savings accounts program designated for one's children?

Does the text message raise the probability that overall, more money will ultimately be saved via the program?

Who are the segments of the population that are more or less affected by the text message?

The specific characteristics of Israeli demographics (the Ultra-Orthodox Jewish population

⁶ Andersen et al. (2020), Gabaix (2019), Bordalo et al. (2018), Caplin et al. (2018), Hirshleifer et al (2009), DellaVigna and Pollet (2009) among others.

⁷ Abel et al. (2013), Alvarez et al. (2012), Veldkamp (2011)

⁸ There are also frictions that stem from preferences such as myopia, or hyperbolic discounting, which can be modeled as transaction costs.

and the Arab population—10% and 19% of the 2019 population, respectively) enables us to focus on two minorities with low socio-economic status, yet very distinct characteristics. One investigated minority (Ultra-Orthodox Jews) have low digital literacy as well as cultural frictions that mitigate their ability to use digital media, and the other (Arabs) have, in addition to low digital literacy, other cultural frictions and language barriers affecting enrollment.

Does the effect of the text messages on active enrollment depend on the individual's financial literacy? We investigate the effect of the text messages on those that had higher objective financial literacy (actual knowledge) and higher subjective financial literacy (confidence in one's financial knowledge).

Do the text messages affect the channel of enrollment to the program? (as the text message is sent to mobile phones, does this translate to greater enrollment via mobile phones?).

We used two data sources for our primary investigation. First, we obtained rich and unique administrative data from the NII on all the children in Israel, including almost 40 thousand parents who received the text message. The data includes information on enrollment choices and includes information on household's characteristics such as parent's income, education, age, number of children, and minority affiliation. The data also includes a description of the appliance used to enroll to the program (such as mobile phone, computer, among others). Second, for a subsample, we also gathered information from an NII telephone survey on parent's objective financial literacy (actual knowledge) and subjective financial literacy (confidence in one's knowledge).

We find that the mobile text message raised the proportion of parents active enrollment in the program (actively choosing some specification of the program instead of defaulting – either where the funds were saved, in what investment track or if additional funds were added) from 2.5% to 5.8% during a period of two weeks following the reacceptance of the SMS reminder. This is consistent with the growing academic literature that documents that reminders can make a difference by reducing limited attention.

The text message affected any active enrollment and hence had a positive effect on all available choices including depositing additional funds. However, when investigating the

effect of the reminder only on parent's that actively enrolled, we find that parents that received a reminder were less likely to deposit additional funds than parents who actively enrolled on that time period and did not receive a reminder. It seems that those that were encouraged to actively enroll by the text message had less of an ability to save more (probably due to liquidity constraints or other higher transaction costs).

The mobile text message had a positive effect on minorities' active enrollment, yet, it was smaller than for the general population in most specifications. The weaker effect of the reminder on minorities might be because of language, technological or cultural frictions. The lower reacceptance to reminders of different segments in the population, and especially minorities with low socio-economic backgrounds can cause long term differences in inequality. This is especially true in a program such as the SECP program where defaults provide lower wealth in the long term (lower deposits from parent's and less risky investment tracks).

We also find unique evidence that the effect of the text message was positive for those with higher subjective financial literacy. As found in earlier studies (Haran Rosen and Sade (2019)), subjective financial literacy has a larger effect on activeness in a regulatory financial campaign. We believe this is because it proxies individual's transaction costs. Meaning that those with high subjective financial literacy probably have lower actual or expected transaction costs related to financial issues and hence are more effected by the SMS reminder shock to attention. Objective financial literacy had an insignificant effect on active enrollment to the program following the reminder.

We find that the mobile text message affected the channel of enrollment. Among those that actively enrolled, the proportion of parents actively enrolling by a mobile phone was raised from 16% for those that did not receive a text message to 29% for those that received a text message. For robustness checks, we conducted an on-line experiment using survey data that provides further evidence that mobile text messages raise active enrollment by the use of mobile phones. The experiment also shows that sending messages by emails might have similar effects, as both mobile reminders and emails allow people to make immediate choices on their mobile phones by clicking on a link.

Our findings regarding the increase of the proportion of those who actively enroll to the program using a mobile phone suggest that the text message effected not only observation costs but also transaction costs by allowing individuals to easily access the designated website by the attached link in the message. Our findings also allow us to investigate the different magnitude of these frictions in different segments of the population and specifically minorities.

Using behavior economics to understand what works or not for policy implications is an upcoming field, as well as the use of field experiments to evaluate specific policies.⁹ We contribute to this line of research by providing information from a natural field experiment and a survey experiment on a mechanism that affects the activeness of the population to a financial policy. Our research also enriches the debate on the effect of policy measures on different segments of the population. We find the text messages are an effective tool for active enrolment for both the general population and minorities in a developed country. But, that they are less effective for the minorities investigated.

Usually research in the field is done either on high socio-economic status populations in the developed world or on developing countries. This unique setup provides additional academic insights as well as a practical use.

Additional, we provide novel outcomes when we decompose the effect of the mobile text reminder to two segments. The setting allows us to quantify the effect of text messages on observation and transaction costs via choices made using a mobile phone. We also contribute to the financial literacy literature as we investigate the effect of the reminder on those with objective and subjective financial literacy.

The paper is organized in the following way: Section 2 provides a literature review on reminders, section 3 describes the setting of the program and experiments, section 4 presents the data, section 5 provides general statistics of parent's choices in the SECP, afterword section 6 provides the methodology used, section 7 shows our results, and section 8 concludes.

⁹ Hendren and Sprung-Keyser (2020), Duflo, E. (2017), Madrian (2014), Statman (1995)) among others.

3. Literature review -Reminders

3.1. Limited attention and reminders

The academic literature discusses two main frictions for taking actions and having attention to the issue at hand. The first friction stems from **observation costs** (Gabaix (2019), Andersen et al. (2020), Bordalo et al. (2018), Caplin et al. (2018), Hirshleifer et al (2009), DellaVigna and Pollet (2009)), which influence the salience of the information and include information search costs and competing stimuli. The second friction stems from **transaction costs** (Abel et al. (2013), Alvarez et al. (2012), Veldkamp (2011)) which influence the difficulty of making a task and being active such as cognitive complexity of the task as well as time spent on the task. Transaction costs can be actual transaction costs or the expectations of costs that prevent individuals from taking actions. There is also a strain of research which explains limited attention from preferences that effect the utility function, but these can also be modeled as transaction costs (Andries and Haddad (2020), Pagel (2018), O'Donoghue and Rabin (2001), O'Donoghue and Rabin (1999), Laibson (1997)). As a conceptual illustration, attention can happen if the individual is aware/observes the issue (m) and her utility from making an action ($E(U)$) is higher than her costs ($E(C)$). If attention equals to zero or lower no action will be taken.

$$Attention = m * (E(U) - E(C))$$

From the literature we know that theoretically reminders should affect attention by lowering observation costs, as they raise the salience of the issue and can mitigate forgetfulness and procrastination (Karlan et al. (2016a), Gabaix 2019, Ericson (2017)). There is usually no reference to the effect of the SMS reminder to lowering transaction costs.

As reminders effect observation costs (or digital transaction costs), they should have a smaller effect on those with high transaction costs (actual or expected) because these individuals still remain with higher costs than utility. In former research we showed that high transaction costs are related to low objective financial literacy, and to a larger extent to low subjective financial literacy, and that those with higher financial literacies tend to be more active in consumer financial regulation (to a larger extent than those with high objective financial literacy) (Haran Rosen and Sade (2019)). And there are many papers

presenting evidence that having higher financial literacies (either objective or subjective) and general confidence and efficacy effect activity in financial contexts.¹⁰

3.2. Reminders – empirical evidence

Empirically there is large evidence of a positive effect of reminders for many financial actions: payment of fees and credit (Medina (2020), Ben-David et al. (2019), Laudenbach et al. (2018), Heffetz et al. (2016), Bracha and Meier (2014), Cadena and Schoar (2011)), retirement savings (Bauer et al. (2017), Choi et al. (2017), Benartzi et al. (2017), Dolls et al. (2016), take-up of social benefits (Finkelstein and Notowidigdo (2019), Guyton et al. (2017), Bhargava and Manoli (2015), Strawczynski and Myronichev (2015)), and attendance in financial education programs (Sanders et al. 2019). To the matter at hand, reminders have been found to specifically have a positive effect on savings behavior (Loibl et al. (2018), Karlan et al. (2016a)). There is also evidence that reminders that included an effect that lowers transaction costs (by providing a tool to easily submit forms) had an additional beneficial effect (Bhargava and Manoli (2015)).

The size of the effect of the reminders differ by the setting characteristics. These include the type of saving vehicle (lump sum, periodic, voluntary or not, and if there are available defaults), population involved (young/ old, developed/developing countries and high or low socio-economic status), information and nudges incorporated in the message (reminders sometimes include behavioral nudges, additional information, and even monetary incentives), and which information is being highlighted by the reminder.¹¹ We investigate a universal CDA savings vehicle aimed at the general population which

¹⁰ Objective financial literacy and retirement savings: Hilgert et al. (2003), Clark et al. (2017b) and Uppal (2016); for a review, see Lusardi and Mitchell (2014). Objective financial literacy and funds fees: Hastings and Mitchell (2020), Hastings et al. (2011)), and Hastings and Tejada-Ashton (2008). Objective financial literacy and wealth management: Stango and Zinman (2009), Hilgert et al. (2003), and Lusardi (2008). Financial confidence was found to be important in Van Rooij et al. (2012), Parker et al. (2012), Lusardi and Mitchell (2007, 2017), Lusardi and Beeler (2007) and, using different measures, Hadar et al. (2013), Barber and Odean (2001). Objective financial literacy and financial confidence significantly influence financial behavior: Allgood and Walstad (2012). And, efficacy and confidence effect financial behavior as well (Das et al. (2020), Kuhnen and Meltzer (2018)).

¹¹ Some papers find that reminders can also have a negative effect on outcomes as they may crowd out the salience of other information and considerations not highlighted by the reminders (Damgaard and Gravert (2018), Medina (2020), Bracha and Meier,(2014) or highlight the bad behavior (Thunström et al. 2018). One recent paper showed a limited effect of reminders on loan payments in microlenders in the Philippines (Karlan et al. et 2015).

included period savings and a reminder with relatively minimal information. Even though CDA is a type of savings mechanism that allows individuals to easily access savings and its use is encouraged by the government, there is relatively little research on the effect of reminders for saving in these vehicles. One study on CDA programs in the US found a positive effect for reminders on savings but as it investigated a small sample size and given that the programs were based on voluntary periodic savings, the reminder provided an outcome with a relatively low significance and economic effect (Loibl et al. (2018)).¹²

Some of the papers provide evidence that there is heterogeneity in the effect of reminders on different individuals; Reminders might affect only some individuals. Additionally, in some the reminder can have a negative effect on outcomes as it might crowd out other relevant issues. There are not many papers who focus on differences of the reacceptance of the SMS reminder by individual or household characteristics. For example, Heffetz et al. (2016) found that letter reminders help one type of people to pay fines earlier and maybe avoid small fees but the second type which are more financially illiquid/procrastinators are not affected by reminders. Stango and Zinman (2014) find that a survey reminder to overdrafts had a larger effect on individuals with lower education and lower subjective financial literacy.¹³ Bracha and Meier (2014) find that a reminder with information on credit scores sent to those with high credit scores, increased their past-due amounts, while it lowered these amounts when sent to those with low credit scores.

There can be great economic significance for reminders on early savings program participation. First, inertia effects saving behavior (Cronqvist et al. (2018), Madrian and Shea (2001), Beshears et al (2009), and when forced to make an active choice, individuals tend to save more (Carroll et al. (2009)). In the “Save more for tomorrow” program it was found that initial activeness had a large effect on long-term savings outcome (Thaler and Benartzi (2004)).¹⁴ It should be noted that in our setting the SECP reminder was a surprise

¹² The paper even provides evidence that a reminder that included a behavioral nudge aimed at accountability has a marginal negative effect on overall savings.

¹³ They emphasize the need for further investigation of this effect, which could be mechanical as overdraft fees are higher for this subsample.

¹⁴ It should be noted that sometimes activeness of individual is not optimal (Hurwitz et al. (2020), Lusardi and Mitchell (2017), Benartzi (2001), Statman (1995) and depends on complexity of the decision as well as individual’s financial literacy.

and hence expected to be effective for forgetfulness as well as for procrastination (Ericson (2018)).

3.3. Digital platforms and actions

The literature also informs us about the connection between digital platforms and actions. While, on one hand, Fintech advancements can be overwhelming for users, on the other hand, they lower information costs by allowing easy access to once costly information, thus reducing inattention (Levi and Benartzi, (2020), Benartzi and Lehrer (2015), Carlin et al. (2017), Goldfarb and Tucker (2017)). The research provide evidence that younger individuals and males are more likely to use fintech advancements. It has also been found that Individuals decision making process on digital platforms is different than on non-digital platforms (Hurwitz et al. (2020), Karlan et.al (2016b)). There has also been research on the effect of reminders sent from fintech platforms on fees and credit (Ben-David et al. (2019), Medina (2020)). In our unique setting active enrolment can be done on a digital platform but can also be done personally in an NII branch or by phone. We emphasis the reminder's effect on using a mobile phone to enrol to the program online.

3.4. Contributions to the literature

We add to the literature on the effect of SMS reminders on savings behaviour using a large and unique sample from a developed country that includes information on household's characteristics for both the general population and minorities.¹⁵ Additionally, we provide empirical evidence that SMS reminders affect individual's action both because they effect the salience of the issue and because choices can be easily made digitally by a mobile phone. We are also able to calculate the effect of the reminder on observation and transaction costs by minority affiliation which have digital, cultural and language barriers. The research's rich data also allows us to also investigate the effect of the reminder by parent's financial literacy and enlightening our understanding of the mechanism by which these reminders affect attention.

¹⁵ SMS text reminders have been found to have a positive effect on savings by Karlan et al. (2016a), but as the savings deposits in this research were done by physically providing cash to the bank deposit, the text reminders did not effect the transaction costs.

4. Setup

4.1. The Savings for Every Child Program (hereinafter SECP)

The Savings for Every Child Program (hereinafter SECP) came into effect in January 2017. The program states that every Israeli child under the age of 18 gets an account opened under their name, to which the government deposits NIS 50 each month.¹⁶ The program is administered by the National Insurance Institute of Israel (NII). Although defaults were set in place, parents can choose to actively enrol in the program and choose to transfer an additional NIS 50 from their monthly child allowance to the SECP account, select an investment provider where their children's SECP funds are deposited, and choose an investment track. Parents can choose between deposits into lower-yield bank savings accounts or managed investment funds that tend to have higher average rates of return, although returns may vary depending on the fund selected. Parents can choose between low-, medium-, and high-yield investment tracks, as well as religious investment accounts (Sharia and Halakhic) that are compliant with Islamic or Jewish religious principles, respectively, and typically have lower rates of return. Except for the cases of a child's severe illness or death, accumulated savings in SECP accounts can be accessed after a child reaches 18 years of age, with parental permission. No parental permission is required to withdraw the funds after the age of 21. Additionally, several bonuses embedded in the program at different points in the child's life until the age of 21 provide additional increases in savings and encourage children and their parents to keep funds in the SECP accounts for a longer time period.

Eligibility for the funds started in May 2015 but the funds were transferred starting January 2017. During the initial installation of the program, for children born before 2017, parents could make an active enrolment choice between mid-December 2016 and the beginning of June 2017, until automatic defaults were set place. The default savings vehicle was a low-return investment fund for children under the age of 15 and a bank savings account for those 15 years old or older. For new-borns after January 2017 the defaults come into effect after 6 months. Active enrolment in the SECP program can be

¹⁶ A USD 1 is about NIS 3.5 during the period of investigation.

done online, via phone, or in-person. During the initial 6 months installation of the program in 2017 before defaults came into effect, active enrolment rates started high during January when the initiation of the program was accompanied by a widespread media campaign. By the end of January active enrolment rates dropped.

4.2. The text message reminder

During February 6th and 7th 2017, a sample of parents annexed to two large branches¹⁷ who did not make an active choice up until that point received an SMS text reminder from the NII. These parents were chosen from two geographical areas in the country but not by any other attribute. The geographical area of the two branches have a relatively high minority population of Arabs and Ultra-Orthodox Jews. These branches were picked because of an initial low enrolment rate of these minorities to the program. In 90% of cases, the father was the one that received the SMS reminder. The SMS reminder included a short message: "Did you hear about the SECP program? If you haven't enrolled yet you can use the attached link or call *2637" and a direct link to the designated SECP enrollment website.

On February 20th, the NII continued to send SMS reminders to parents that did not make an active choice regarding their children savings and where not a part of the sample from the beginning of the month. This means, that the period of February 6th to February 19th was a period of natural experiment where only a relatively random sample of families received a reminder about actively enrolling in the SFEC program. We know that until February 19th, the NII did not perform any other active measures to increase enrollment, giving us a two-week period to cleanly investigate the effect of the reminders.

We stipulate that the reminder had a positive effect on active enrollment, but to a lower extent on depositing additional savings as the later entails higher transaction costs (liquidity frictions). Additionally, we stipulate that the text reminder should have had an

¹⁷ The Beer-Seva branch and the Bnei-Brak branch. The Beer-Seva branch is more peripheral, includes more rural localities, and serves a large Arab community as well as a large Jewish community. The Bnei-Brak branch provides service to a large Ultra-Orthodox Jewish community as well as other urban communities in Israel's geographical center.

additional effect on digital transaction costs because of the embedded link in the message, and should have raised enrollment by mobile phones.

4.3. Israeli minorities' characteristics

Israel has specific characteristics suitable for investigation the effect of SMS reminders as it is a developed country with relatively high digital literacy in the general population, but with high-income inequality. Israel has two relatively large well-defined minorities groups; the Ultra-Orthodox Jewish population and the Arab population (10% and 19% of the 2019 population respectively).¹⁸ These two minorities have a very high poverty rate. 42% of Ultra-Orthodox households and 45% of Arab households lived in poverty in 2018.¹⁹ Both minorities exhibit lower digital literacy than the general population.²⁰ Only 33% of Ultra-Orthodox Jews and 53% of Arabs have a personal Internet subscription, compared with a 75% national average (Israel's Expenditure Survey for 2018). In addition, each of these minorities has a specific characteristic that can affect their reacceptance of SMS reminders. The Ultra-Orthodox community has a cultural friction as they have a cultural aversion from digital media. They try to reduce their use of digital media and most do not have the ability to access internet connections or receive text messages from their phones (they receive a voice mail instead that reads aloud the text message). The Arab population is a minority that speaks a different language than the general population and have language frictions. Specifically, the language by which the SMS reminders were sent was in Hebrew while the Arab population speaks Arabic. Both communities also have lower financial literacies than the general population as found in earlier surveys (CBS financial literacy survey and in Haran Rosen and Sade (2019)), and the NII telephone survey investigated in this paper. Among other things, the later shows that the proportion of the Arab and Ultra-Orthodox community with high objective financial literacy (14% and 10% respectively) and high subjective financial literacy (15% and 11% respectively) is lower than their general proportion in the survey (18% and 15%

¹⁸ All Data on Israel's demographics is from Israel's Central Bureau of Statistics (CBS).

¹⁹ Less than half of the medium household income.

²⁰ The Program for the International Assessment of Adult Competencies (PIAAC) 2014–2015 survey of workers' competence in a digital environment shows that Israeli adults have a slightly lower than average grade (274) than the OECD average (279). Further, the Jewish population's grade is 280, while the Arab population's is 238.

respectively). The two NII branches chosen to receive the initial SMS reminders were targeted because a large proportion of the parent's in these branches come from Arab and Ultra- Orthodox minorities. We will investigate the effect of the reminder on these minorities separately than the general population as these frictions and specific characteristics affect their reacceptance to SMS reminders.

The effect of the reminder on minorities' observation and transaction costs should have been different than the effect on the general population because of the unique characteristics of the populations described above. The differences we expect between the populations are summarized in the following table:

	On observation costs	On digital transaction costs	On general transaction costs
Arab	Lower- language barriers	Lower - lower digital literacy	Lower- lower financial literacies and cultural frictions
Ultra- Orthodox	? – cultural frictions might mitigate the effect of an SMS reminder but as the reminder could have been sent to this population via voicemail, the effect on observation costs might actually have been larger than for the general population	Lower - lower digital literacy and cultural frictions	Lower- lower financial literacies and cultural frictions

Hence, we expect that the effect of the SMS reminder on different segment of the population should be:

	(1)	(2)	(3)	(4)
	Choices with respect to own community	Digital choices with respect to own community	Choices with respect to general population	Digital choices with respect to general population
General population	Reminder should have a positive affect and lower observation costs and digital transaction costs	Reminder should have a positive affect and lower digital transaction costs		
Arab population	Reminder should have a positive affect and lower observation costs and digital transaction costs	Reminder should have a positive affect and lower digital transaction costs	Reminder should have a less positive effect on this population because of higher transaction costs and a lower effect on observation costs	Reminder should have a less positive effect on this population because of higher transaction costs (digital literacy)
Ultra-Orthodox population	Reminder should have a positive affect and lower observation costs and digital transaction costs	Reminder should have a positive affect and lower digital transaction costs	? effect of reminder because this population has higher transaction costs but maybe the reminder had a larger effect on observation costs	Reminder should have a less positive effect on this population because of higher transaction costs (digital literacy and cultural frictions)

5. The Data

Data for this research comes from the NII administrative data on all eligible accounts.

The data covers all the children under the age of 18 in Israel. The data includes

information on choices made in the SECP, which platform was used to make choices (digital/non-digital), the date on which choices were made, an indication if a family member received an SMS reminder, the date the SMS reminder was sent, as well as administrative data on the household's characteristics and attributes. Household' attributes include marital status of the parents²¹, number of children, age of each child, parent's age²², parent's income, parent's education, and minority affiliation.²³

To deal with the issue of the dependence between observations, we only considered choices made for the first-born children so choices between observations are not co-dependent. Additionally, we partitioned on children's age and considered only children that were under the age of 15 in the beginning of 2017. This means that the choices for the children were made based on the same default option –a low risk investment fund.

We focused on the period of February 6th and February 19th where the natural experiment occurred, and the population was split between those who received an SMS reminder and those that did not receive a reminder. The sample includes 886,920 accounts where no active choices was made until February 6th.²⁴ Out of these for 39,286 accounts, the parents of the child received an SMS reminder and for 23,469 accounts, an active enrolment choice was made by February 19th. General statistics of the main variables are presented in Appendix 1.

In addition to administrative data, between July and December of 2017, the NII administered a telephone survey to a random sample of parents of SECP-eligible children during the initial installation. The information from the telephone survey was added to the administrative data. Of approximately 10,000 families that were invited to participate in the survey, 4,838 parents completed the survey; a response rate of nearly 50%. The survey includes additional information on households including the parent's objective and subjective financial literacy. We use the term *objective financial literacy* to describe *objective* knowledge regarding general financial issues and we based our measure on a common measure in the academic literature (an index of the number of correct answers to

²¹ If the child's parents are married to each other.

²² Parents average age.

²³ Classified using an NII classification based mostly on residential address.

²⁴ Accounts include siblings and the number of unique parents is smaller.

three financial questions first presented by Lusardi and Mitchell (2007)). The basic questions in the index have been shown to accurately differentiate naïve from sophisticated respondents.²⁵ We use the term *subjective* financial literacy to refer to confidence in one's own knowledge of financial issues. People with high subjective financial literacy feel they understand financial issues to a very large extent\large extent. Like objective knowledge, subjective confidence can affect a person's financial behavior.

Another data source we used is experimental data that allows us to gain additional evidence on the link between reminders and channel by which actions were made. We ran the experiment in November 2019 using four online surveys, each on a representative samples of the Israeli population. Altogether, we had 3,021 observations. Each survey had a different wording of a question that poses that if the NII was providing the general population with benefits, what medium would you use to claim the benefits? The available answers where: using the option of a mobile phone, a computer, calling the NII phone number, going physically to an NII branch, or none of the above. All questions also stated that the there is an accompanied media campaign which provides information on the relevant website and phone number to claim benefits. The four differences in the question were an additional sentence describing how you received this information:

- The first stated that additional to the media campaign, you received an SMS text message from the NII with a link to the relevant website to claim the benefit (753 observations).
- The second stated that additional to the media campaign, you received an email from the NII with a link to the relevant website to claim the benefit (756 observations).
- The third stated that additional to the media campaign, you received a letter (snail mail) from the NII which included information on the link to the relevant website to claim the benefit.
- The fourth did not provide an additional sentence (750 observations).

²⁵ And are stable over time: Stango and Zinman (2020)

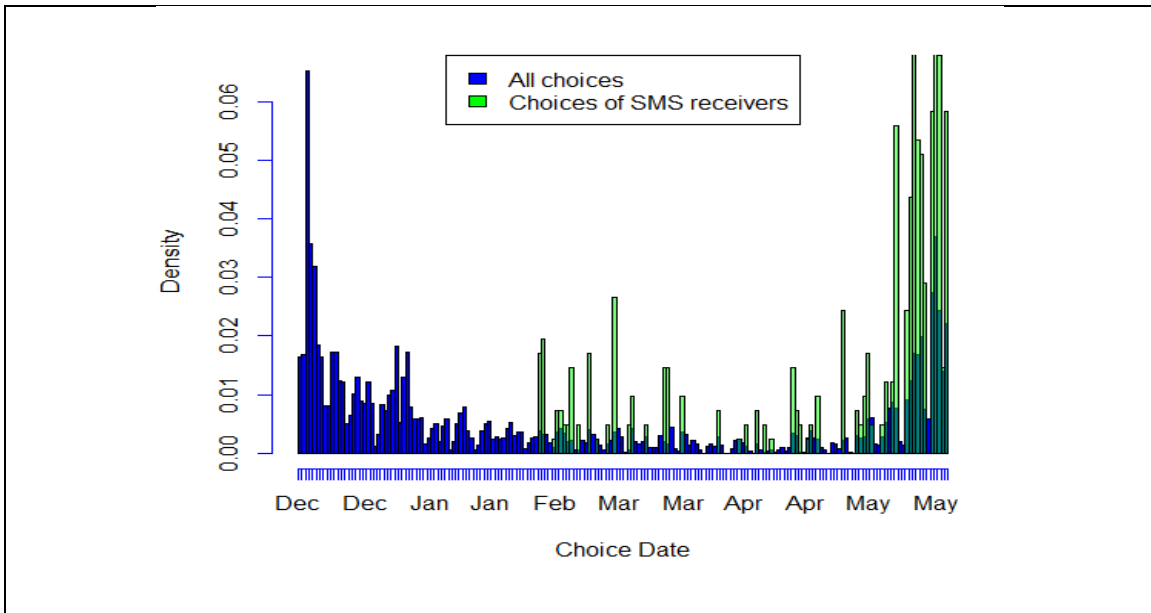
As all four questions determine that awareness of the benefits exists it allowed us to capture more cleanly the effect of how the channel by which you receive the information affects the channel by which you make an active enrollment choice. We believe that this exercise allows us to estimate the effects of SMS reminders on transaction costs.

6. Descriptive statistics

We researched active enrolment for SFEC accounts. We define active enrolment if the account holder conducted at least one of the following: choosing a provider, an investment track, choosing to deposit or not to deposit an additional NIS 50, and finally entering the website and actively choosing the default option. During the whole period of the first 6 months installation of the program before the defaults came into effect, there had been an active enrolment choice in 74% of accounts. For 52% of the accounts, parents choose to actively deposit an additional 50 NIS out of the government child allowance. Despite general high levels of program enrolment and participation, economically vulnerable households—minorities, less-educated, and less-employed households—tended to engage less with the program while usually opting out of depositing extra funds (Haran Rosen et al. (2019) and Grinstein-Weiss et al. (2019)).

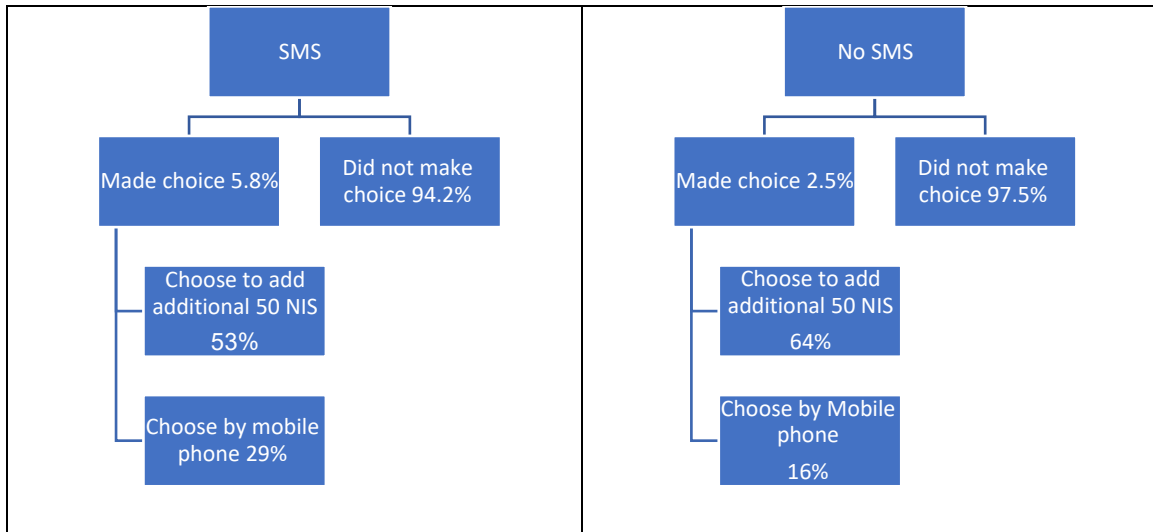
Most choices were made during the first two weeks of installation and the last two weeks before defaults came into effect (Figure 1). These periods were accompanied by a widespread media campaign. When looking at the period of the natural experiment (between February 6th to February 19th), when no active media campaign took place, we can see general low activeness in the population.

Figure 1 – Histogram of dates when choices were made for all the sample and for those that their parents received an SMS reminder



Initial simple statistics provide intuition of the large effect of the SMS reminders on the population (Figure 2). We found differences between the activeness of parents that received an SMS and those that did not. During the period of February 6th to February 19th, 2.6% of those who did not choose up until that moment made an active enrolment choice and 1.7% choose to deposit an additional NIS 50. 5.8% of those that received an SMS reminder made an active choice and 3.1% choose to deposit an additional NIS 50 a month. We also find higher rates of people using mobile phones for making active choices: 29% of those that made an active choice and received an SMS reminder choose by a mobile phone, while only 16% of those that actively enrolled but did not receive a reminder choose by a mobile phone.

Figure 2 – Diagram of choices for all the sample and for those that their parents received an SMS reminder



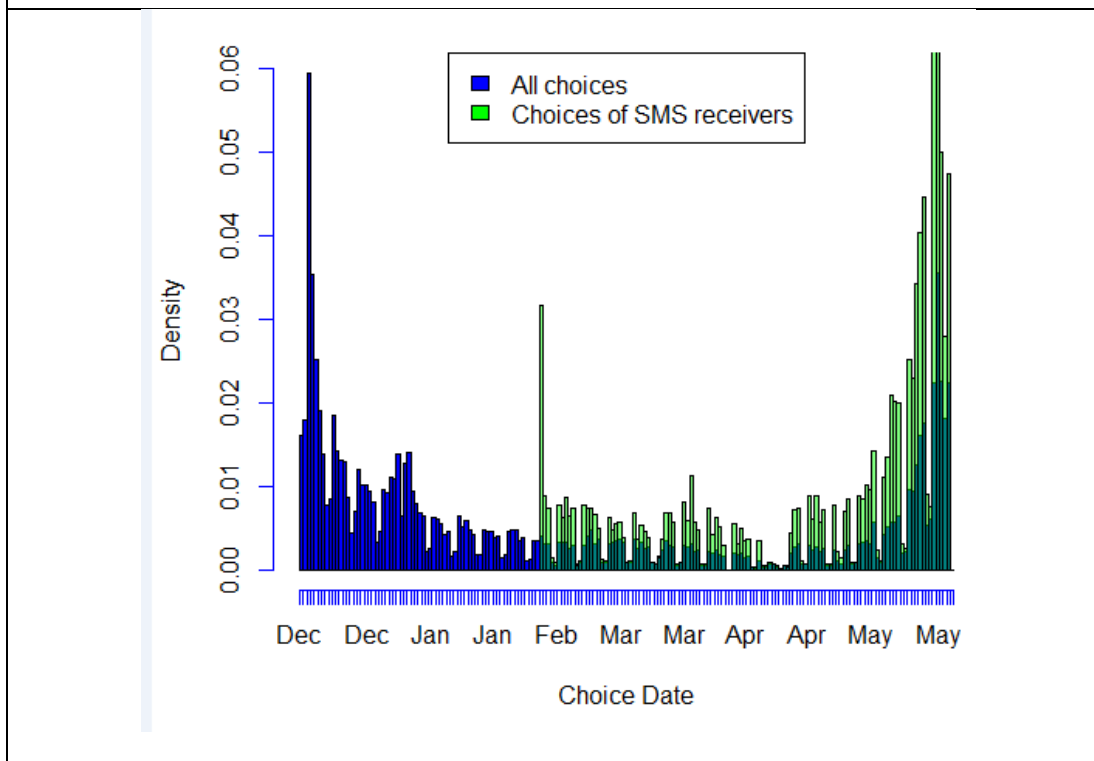
When further investigating how indeed individuals made an active choice we see that the population who actively enrolled after receiving an SMS reminder, not only used their mobile phones at a higher rate, but were altogether less digital than the population who made a choice and did not receive an SMS reminder (Table 1). This difference probably stems from sample selection as the population that received an SMS reminder were from lower socioeconomic status and low digital literacy groups. Figure 3 provides initial insight to the fact that choices made by using a mobile phone were clustered immediately after receiving the SMS reminder.

Table 1- Choices made between February 6th and 19th

	Did not receive an SMS reminder	Received an SMS reminder
Computer	54%	31%
Mobile phone	16%	29%
Tablet	7%	3%
Other*	23%	37%

*Other includes either making a choice directly by the NII (calling the NII or by entering a branch) or when the device is not traceable.

Figure 3 - Choices made by a mobile phone after February 6th 2017 for all those who did not actively enrol until that date and for those whose parents received an SMS reminder



7. Methodology

The parents that received an SMS reminder were chosen by affiliation to two NII branches that provide services to relatively large minority populations. This means that when comparing between parents who received an SMS reminder and those who did not receive a reminder, they might not be completely comparable, as sample selection issues might affect outcomes. To deal with this potential concern we use a matching exercise in order to make sure the comparison is between similar groups of parents.

We used Mahalanobis' matching for our main method. Mahalanobis' matching is a type of propensity score matching using calipers which provides outcomes with less bias (more similar covariate distributions) than nearest neighbour matching (Rosenbaum and Rubin (1985)), and is more suited when there is a large database and a relatively small amount of variables to match on (Stuart (2010)). The propensity score from the matching

exercise is the probability that a parent with given characteristics (that are used in the matching process) received an SMS reminder from the NII. The caliper required that the matching of parents that received and did not receive an SMS reminder is done only if the log-odds of their propensity score are within 0.25 standard deviations. Within this caliper, parents are matched to minimize the sum of the Mahalanobis' distance between matched partners. We allow the matching to be done with replacements which lowers bias and leads to better matches, although it increases variance (Abadie and Imbens (2011)).

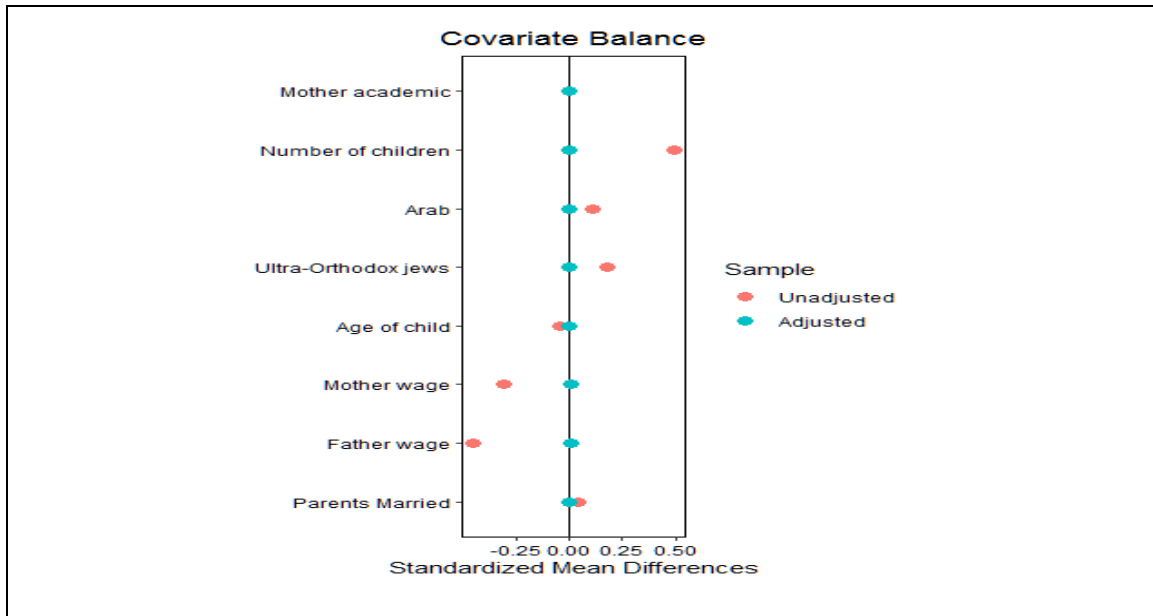
The main matching exercise uses the following eight variables to match between the treatment group (received an SMS reminder in early February) and the non-treatment group (did not receive an SMS reminder until February 20th): mother's wage, father's wage, mother's academic education,²⁶ marital status of parents, parents number of children, age of child, and minorities affiliation dummies.²⁷ Eight variables were chosen for the main specification as the Mahalanobis matching process is optimal for matching exercises with up to eight variables.²⁸ For a summary on the similarity of the treated and non-treated group after weighted adjustments see Figure 4. The final matched database has 68,920 observations with 37,286 treated observations and 31,634 non-treated observations.

Figure 4 – Standardized mean difference of matched variables, before and after adjustments

²⁶ Indicators of Both Mother's and Father's academic attainment. For the main matching exercise, the father's academic education was not used in order to remain under nine variables. For robustness exercises that used a nearest neighbor propensity score matching, where the amount of variables is less constrained, we used the father's academic education variable in the matching process. The quality of the academic attainment drops for individuals over the age of 50. As we investigate choices for first born child, the variables quality is high. Nonetheless for robustness tests we limit the data to individuals under the age of 45 and outcomes are very similar.

²⁷ Dummy variables for Arabs and Ultra-orthodox Jews.

²⁸ Mahalanobis' distance matching has been found to work the best with less than eight variables (Rubin (1979), Zhao (2004))



For robustness checks we added information on the locality where parents live based on indices published by the Israeli Central Bureau of Statistics (CBS) to the matching process: socio-economic index,²⁹ periphery index,³⁰ and rural status of the locality.³¹ We also used an alternative matching method using a propensity score matching procedure that utilizes the nearest neighbour with and without replacements, and Mahalanobis' distance matching without replacement, which all provided similar outcomes as expected when using a big data base (Pan and Bai (2015)). Robust outcomes are not presented unless stated otherwise and are available at request.

As described above we expect that the effect of the reminder on minorities might have been different. In order to further investigate this issue and other effects of the population characteristics we used two additional investigation methods. For the first, we ran a

²⁹ Calculated using data from the 2013 national survey on demographic and standard-of-living features of the population in each locality, such as data on income, level of education, level of employment, and national insurance allowances given to the population in each locality. Each locality is given a ranking between 1 and 10. This variable can be used to characterize localities and their population on average but is a noisy proxy for individual data. It should be noted that in the main matching exercise there seems to be some sample selection in the data and that the SMS reminder variable has a negative 0.32 correlation with the socio-economic locality index. This selection does not change the size and significance of the SMS reminder coefficient that remain similar in the robustness exercise.

³⁰ Calculated using data from 2015 and grades localities' proximity to economic activity or potential for activity. Each locality is given a ranking between 1 and 10.

³¹ Calculated using data from 2015 and indicates if a locality is rural or not.

different matching exercise for each minority to investigate the effect of the SMS reminder for each segment of the population. We then ran all the regressions on the new data sets for each segment of the population. The observations for each data set is 24,314 for the non-Ultra-Orthodox population, 18,870 for the Ultra-Orthodox population and 25,780 for the Arab population. We further conducted an additional matching exercise on the NII telephone survey population in order to investigate the interaction effect of financial literacy and the SMS reminder. As this data set has much fewer observations we used a propensity score matching exercise and added more variables to the matching exercise.³² The overall survey matched data base provided 1,135 observations. After the matching exercise all of these additional matched data sets are balanced and the standardised mean differences of the matched variables are less than 0.1. The additional matching exercises provide additional information sets, but provided a considerably smaller amount of observations that prevented us from investigating all the drill downs of available choices we present for the main matching exercise.

Using the matched data, we used three main methods to investigate the effect of the SMS reminder on active enrolment to the SECP. The first is a Kaplan-Meier hazard rate model that provides evidence of the aggregate effect of the reminder on active enrolment over time and provides a useful visual output. Uncensored, the Kaplan-Meier curve provides the un-parametric distribution function associated with the empirical measure in the sample. We used right censoring as we do not look at all of the available periods where choices could have been made as we solely focus on choices in the first two weeks after the reacceptance of the initial SMS reminder, before more reminders were set out and more actions were taken.

The second method is a logit model that we used to investigate the effect of the reminder and parents' characteristics variables on active enrolment in the program.

The third method we used for robustness checks and to investigate the size effects of the covariates on the probability of active enrolment is the Cox proportional models. The Cox model provides hazard ratios of the effect of the covariates on the event by using a

³² The matching was done on the following additional variables: father's academic attainment and parent's age.

maximum partial likelihood estimates of the model parameters. When the Cox model is inapplicable we present size effect of the logit regressions using odds-ratios.

Using a logit and Cox model on the matched data we aimed to quantify the average treatment effect (ATT) and cumulative effect respectively of receiving an SMS reminder on actively enrolling in the SECP program. The specification of the main regressions is as follows: for each set of parents i we regress each outcome (y_j), dummy value of 1 or 0 for the different outcomes, on parents' characteristics:

$$\text{logit}(P) = \log\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 * I_i + \beta_2 * X_i * I_i + \beta_3 * X_i + \epsilon_i$$

where $P = Pr(Y_i = 1 | I_i, X_i)$, Y_i is the outcome variable for parents i for three outcomes: (1) Actively enrolling in the SECP program (choosing a provider, choosing an investment track, choosing to deposit an additional NIS 50 to the child's account, or actively choosing not to deposit additional funds), (2) Depositing an additional NIS 50 to the child's account, or 3) Actively enrolling to the program while using a mobile phone. We focus outcomes that include aggregate enrollment and not for choosing specific investment tracks or provider as they might be affected by choice architecture (Sethi-Iyengar et al. (2004), Thaler and Sunstein (2009)). We ran the regressions for making the active enrollment choices by February 7th, February 10th, February 19th, and between February 10th and February 19th. We use these specifications to see the time effect of the SMS reminder. I_i is an indicator if the parents received an SMS text reminder. Although we used a matching exercise and the treatment and untreated groups are supposed to have similar attributes, for additional caution we added controls for parents' characteristics. We denote by X household's i 's characteristics that were also used in the matching process.³³ We also add interactions between parents' minority affiliation and the SMS text reminder indicator, for which we expected that the SMS reminders would affect differently as these are unique populations with frictions that might affect participation in the program. For the estimation on the different population segments, all available

³³ In robustness specifications we added variables for the household's locality indices or additional variables that include an indicator if the father has academic attainment as well as parent's average age. As these variables are highly correlated with other household's characteristics they were not used in the main specifications.

interactions between household's characteristics and the SMS reminder are presented. For the survey sample we only present interactions with the parent's objective and subjective financial literacy as we are limited by the small sample size.

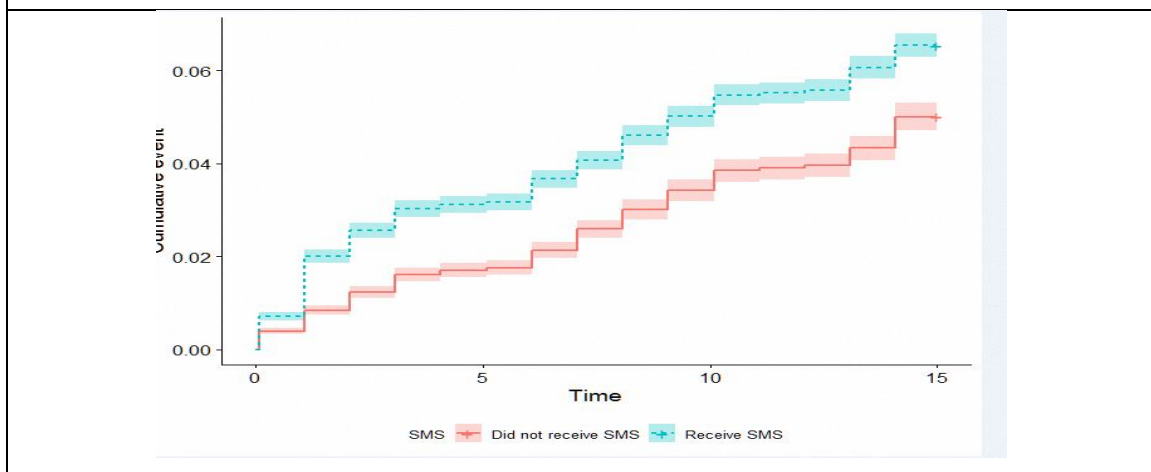
8. Results

7.1 The effect of SMS reminders on choices made in the SECP

8.1.1. Any active enrolment choice

The Kaplan-Meier estimates on the two weeks following the reacceptance of the SMS show that parents that received the SMS reminder had a higher cumulative probability of actively enrolling in the SECP (Figure 5). This higher probability is immediate and around 1.5 basis points and stays relatively stable throughout the two weeks. When we estimate the Kaplan-Meier for longer periods, although we know that this estimation might be tainted because of measures the NII took to raise enrollment, we still see a gap between the population that received the SMS reminder earlier and either those that received the reminder later on or had no reminder at all. This provides evidence, although non-conclusive that the reminder's affect was long term.³⁴

Figure 5- Kaplan-Meier estimations for any active enrollment to the program after February 6th for those that received an SMS reminder and those who did not



³⁴ In Heffetz et al. (2016) they do not find in a long-term effect but mostly that it makes individuals take action earlier on. It might be that in the SECP setup the earlier reacceptance of the reminder makes individuals more receptive to the general media campaign for a longer period of time and hence the reminder had a long term affect.

Outcomes from the logit regression that we ran on making any enrolment choice show that the effect of the SMS reminder is positive and statistically significant at the 1% level (Table 2).³⁵ We can also tell from these regressions two main outcomes: 1) that as expected, the SMS had a different effect on minorities. The effect of the SMS reminder was mitigated for both the Arab and the Ultra-Orthodox minorities. This outcome will be further investigated in section 7.2. 2) The effect of the SMS reminder seems to deplete over time. As the SMS reminders were sent on February 6th and 7th the largest economic effect can be seen on the days the reminder was sent (column (1) in Table 2. The effect diminished when looking at longer periods (column (2) and (3)) and when looking at the last 10 days of the observed period (column (4)). Robustness regressions that included additional household characteristics including the household's locality indices also provided similar outcomes to the main specification presented in Table 2.³⁶

The Cox model provides evidence that the effect of the SMS reminder increased active enrollment by 213% for the period of the initial two weeks investigated (Table 3).³⁷ The Cox model also presents evidence of differences between the minorities and the general population in their general activity during the investigated period between February 6th and 19th.

Table 2- Logit regression for actively enrolling during relevant time period

	<i>Dependent variable:</i>			
	Feb 7	Feb 10	Feb 19	Feb 10 to 19
	(1)	(2)	(3)	(4)
Received SMS	1.35***	1.10***	0.82***	0.50***

³⁵ When comparing the regression to one without a dummy variable for the SMS reminder, the R² of the regression is halved.

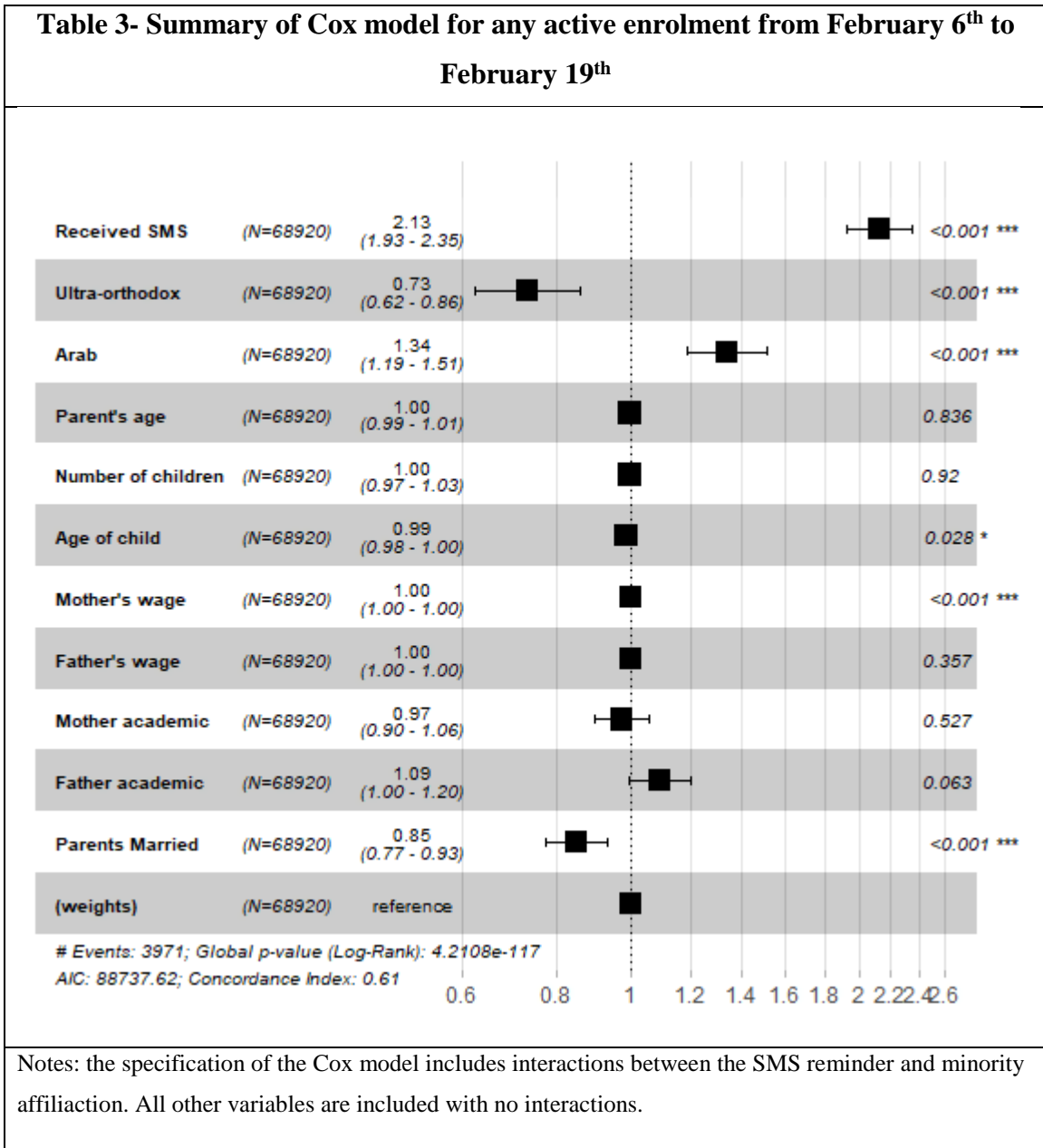
³⁶ In these regressions the general effect of the SMS reminder and the time trends were unchanged. For the regressions with the locality, indices there were slight changes to the interaction effect of the SMS reminder and the Arab dummy variable. This might be because locality indices might be capturing some of the Arab minority effect as these variables are highly correlated.

³⁷ The odds ratio estimation from the logit regression presents similar evidence. Receiving an SMS reminder increased active enrolment by over 380% in the immediate period after receiving the SMS reminder and was 220% for whole two week period.

	(0.11)	(0.08)	(0.06)	(0.08)
Received SMS*Ultra-orthodox	-1.23***	-0.89***	-0.61***	-0.30**
	(0.20)	(0.15)	(0.10)	(0.13)
Received SMS*Arab	-0.76***	-0.88***	-0.89***	-0.81***
	(0.16)	(0.12)	(0.08)	(0.11)
Ultra-orthodox	-0.18	-0.30**	-0.35***	-0.38***
	(0.17)	(0.13)	(0.08)	(0.11)
Arab	0.08	0.23**	0.23***	0.20**
	(0.15)	(0.10)	(0.07)	(0.09)
Number of children	-0.06**	-0.05**	-0.01	0.01
	(0.02)	(0.02)	(0.01)	(0.02)
Age of child	-0.01	-0.01	-0.01***	-0.02**
	(0.01)	(0.01)	(0.005)	(0.01)
Mother's wage	0.0000***	0.0000***	0.0000***	0.0000**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Father's wage	0.0000	0.0000	-0.0000	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Mother academic	-0.005	0.05	-0.03	-0.09
	(0.08)	(0.06)	(0.04)	(0.06)
Parents Married	-0.25***	-0.20***	-0.18***	-0.15**
	(0.08)	(0.06)	(0.04)	(0.06)
Constant	-4.35***	-3.81***	-2.87***	-3.41***
	(0.13)	(0.10)	(0.07)	(0.09)
Mcfadden Pseudo R square	0.04	0.03	0.02	0.01
Observations	68,920	68,920	68,920	68,920
Log Likelihood	-5,318.11	-8,182.13	-14,824.84	-9,316.53
Akaike Inf. Crit.	10,660.23	16,388.26	29,673.67	18,657.06

Note:

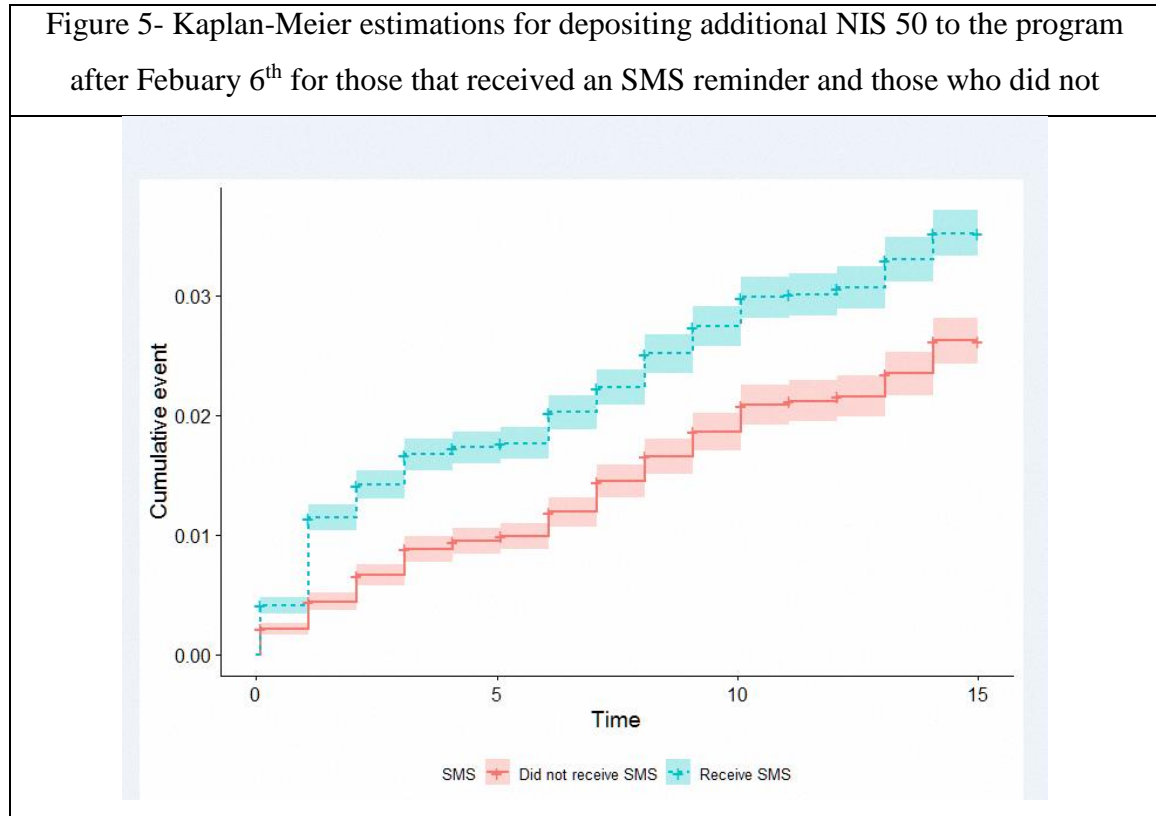
* ** *** p<0.01



8.1.2. Choosing to deposit additional funds to SECP

The Kaplan-Meier estimates on the two weeks following the reacceptance of the SMS, provide evidence that parents that received the SMS reminder had a higher cumulative probability of depositing additional funds to the program of about 1 percentage point

(Figure 6). The effect in this setting seems to be immediate, and similar to the effect on any enrolment choice. When looking at longer periods we find additional evidence that the effect of the reminder is long term.



Outcome indicate a positive effect (significant at the 1% level) of the SMS reminder on choosing to deposit additional NIS 50 (Table 4). Similarly to any enrolment choice, the SMS reminder's effect on choosing to deposit additional funds had a depleting time trend and was not as strong for minorities. The Cox-model shows that the magnitude of the effect of receiving an SMS reminder on depositing additional savings is large and reaches 189% for the investigated two weeks period (Table 5).³⁸ The magnitude of the reminder's effect is slightly lower in this setting than for any active choice.

Table 4 - Logit regression for depositing additional 50 NIS during relevant time period

³⁸ The odds ratio estimation from the logit regression presents similar evidence. Receiving an SMS reminder increased active enrolment by over 350% in the immediate period after receiving the SMS reminder and was 197% for whole two-week period.

Dependent variable:

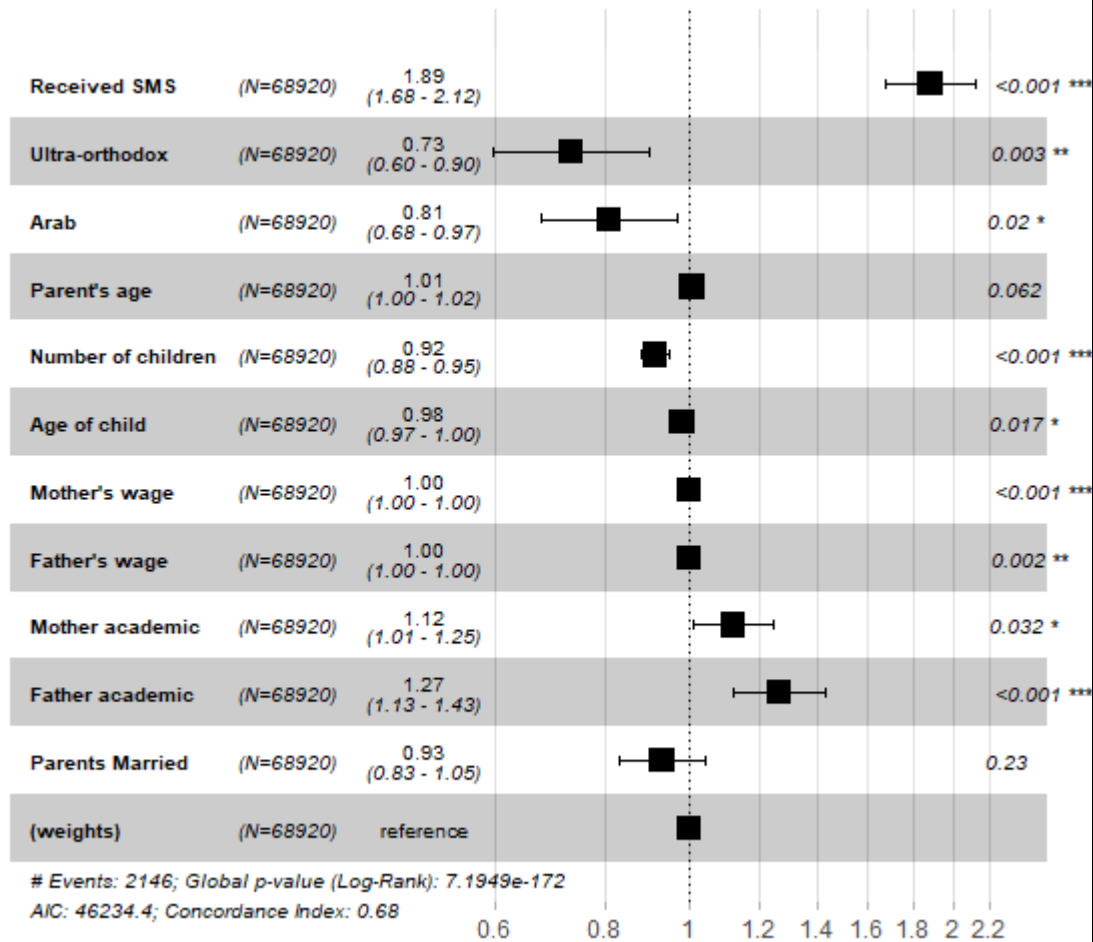
	Feb 7	Feb 10	Feb 19	Feb 10 to 19
	(1)	(2)	(3)	(4)
Received SMS	1.27*** (0.13)	0.92*** (0.10)	0.68*** (0.07)	0.41*** (0.09)
Received SMS*Ultra-orthodox	-1.12*** (0.25)	-0.82*** (0.19)	-0.58*** (0.12)	-0.32* (0.17)
Received SMS*Arab	-0.41* (0.25)	-0.68*** (0.17)	-0.85*** (0.12)	-0.93*** (0.16)
Ultra-orthodox	-0.16 (0.21)	-0.38** (0.15)	-0.43*** (0.10)	-0.48*** (0.13)
Arab	-0.51** (0.22)	-0.34** (0.14)	-0.27*** (0.09)	-0.26** (0.12)
Number of children	-0.18*** (0.04)	-0.13*** (0.03)	-0.09*** (0.02)	-0.06** (0.02)
Age of child	0.002 (0.01)	-0.004 (0.01)	-0.01** (0.01)	-0.02** (0.01)
Mother's wage	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)
Father's wage	0.0000** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000** (0.0000)
Mother academic	0.23** (0.10)	0.25*** (0.08)	0.15*** (0.05)	0.06 (0.07)
Parents Married	-0.19* (0.11)	-0.15* (0.09)	-0.09 (0.06)	-0.01 (0.09)
Constant	-4.85*** (0.16)	-4.20*** (0.12)	-3.34*** (0.08)	-3.91*** (0.11)

Mcfadden Pseudo R square	0.06	0.05	0.04	0.03
Observations	68,920	68,920	68,920	68,920
Log Likelihood	-3,207.88	-4,997.63	-9,074.03	-5,509.81
Akaike Inf. Crit.	6,439.77	10,019.27	18,172.05	11,043.61

Note:

* p < 0.05
 ** p < 0.01
 *** p < 0.001

Table 5- Summary of Cox model for depositing additional NIS 50 from February 6th to February 19th



Notes: the specification of the Cox model includes interactions between the SMS reminder and minority affiliation. All other variables are included with no interactions.

It seems that the higher rate of parent's choosing to deposit additional funds stemmed from higher enrolment rates and not from parents specifically choosing to add additional funds. When looking only at parents who made an active enrolment choice, the effect of the SMS reminder on choosing to deposit additional funds seems to have an adverse effect on the choice to deposit additional funds (Table 6). The sign of the coefficient is negative and statistically significant for making a choice by February 10th and February 19th. For the other two periods the coefficient is negative but not statistically significant. The interactions of receiving an SMS reminder and minorities' affiliations are not statistically significant. For this specification the Cox model is inapplicable as we look at a sample where we cannot use a hazard rate model as all the individuals in the dataset made an active enrolment choice. The odds ratio effect of receiving an SMS reminder for the two specifications where the variable has a statistically significant effect is around 70%. We interpret this outcome to mean that those who made an active enrolment choice following the SMS reminder entail higher transaction costs for depositing additional funds. These transaction costs stem from liquidity constraints.³⁹

Table 6 - Logit regression for depositing additional NIS 50 - out of those who actively enrolled during the relevant time period

	<i>Dependent variable:</i>			
	Feb 7	Feb 10	Feb 19	Feb 10 to 19
	(1)	(2)	(3)	(4)
Received SMS	-0.06	-0.39**	-0.27**	-0.18
	(0.25)	(0.20)	(0.13)	(0.17)
Received SMS*Ultra-orthodox	0.05	0.08	0.02	-0.02
	(0.44)	(0.33)	(0.21)	(0.27)
Received SMS*Arab	0.41	0.34	-0.02	-0.29
	(0.37)	(0.27)	(0.18)	(0.24)

³⁹ It should be noted that we find similar outcomes in size and significance for parents that actively choose an investment provider. Nonetheless, there is a difference when looking at the sample of those that made an active enrollment choice. In this sample, the SMS reminder is no longer statistically significant but it is still negative, similarly to the coefficient of the SMS reminder for depositing additional funds.

Ultra-orthodox	0.23 (0.38)	-0.12 (0.28)	-0.20 (0.18)	-0.26 (0.23)
Arab	-0.86*** (0.33)	-1.01*** (0.24)	-0.81*** (0.15)	-0.71*** (0.19)
Number of children	-0.25*** (0.06)	-0.19*** (0.04)	-0.16*** (0.03)	-0.13*** (0.04)
Age of child	0.04** (0.02)	0.02 (0.01)	0.01 (0.01)	0.001 (0.01)
Mother's wage	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)
Father's wage	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)
Mother academic	0.55*** (0.17)	0.41*** (0.13)	0.35*** (0.09)	0.28** (0.13)
Parents Married	0.04 (0.18)	0.11 (0.14)	0.16* (0.10)	0.23* (0.13)
Constant	0.01 (0.30)	0.40* (0.23)	0.30** (0.15)	0.26 (0.19)
Mcfadden Pseudo R square	0.13	0.13	0.12	0.12
Observations	1,025	1,717	3,617	1,900
Log Likelihood	-630.45	-1,066.16	-2,325.42	-1,255.11
Akaike Inf. Crit.	1,284.91	2,156.32	4,674.84	2,534.22

Note:

* p < 0.1
** p < 0.05
*** p < 0.01

7.2 Differences in effect of SMS reminder by household's characteristics

The regression tables described in the following section present the outcomes of the regression we ran for the additional data sets that provide richer information on the

population characteristics. The first used the administrative data and separate matching exercises for each segment of the population (Non-orthodox Jewish population, Arab population, and Ultra-Orthodox Jewish population). The second used data from the NII telephone survey and a matching exercise which allowed us to focus on the interaction effects of the SMS reminder and financial literacy. However, because of smaller sample sizes we were unable to investigate all the enrolment choices investigated above.

7.2.1 Administrative data - Household's characteristic investigation

In these regression we interact between the parent's and the child's characteristics and the SMS reminder dummy. In the regressions in the earlier section, we did not use all the households' characteristics interactions with the SMS reminder as these characteristics seem to have different effects for different segments of the population and bundling them up together can be misleading as we will discuss shortly. Additionally, the added interaction variables and the smaller data sets do not allow us to delve into specific enrolment choices as in the regressions presented above. For the sack of convenience and in order to get bigger samples for the sub-populations, we present the regressions for actively enrolling to the SECP for each segment of the population as well as for all the population for the one period of the full two weeks between February 6th and February 19th (Table 7).

Table 7 presents that the size of the effect of the SMS reminder variable is similar to that described above in the general population, but it is smaller for the Arab population and actually larger for the Ultra-Orthodox population segment. The effect of the SMS reminder for the minorities, the Ultra-Orthodox population as well as the Arab population, changes largely when specifications change.⁴⁰ This is probably because of the way logit coefficient work which depend on the full regression presentation. Hence when we change the regression the coefficient range changes. The changes can also stem from differences in how the minority's specific characteristics are catching some of the combined overall effect (age, poverty, academic achievement, number of children etc.)

⁴⁰ The coefficient for the Ultra-Orthodox population drops from 1.66 to 1.33 when an interaction is added for parent's age and father's academic attainment and drops to 0.21 when we than subtracted the interaction with father's academic attainment (all significant at least at the 0.1 level. For the Arab population the effect is more mitigated and the coefficient moves to 0.96 and 0.41 respectively (significant at the 0.01 level).

and we cannot identify the effect of these characteristics cleanly. For most specifications, the coefficient of the reminder for the Ultra-Orthodox population was relatively high and was lower for the Arab population. Additionally, when looking at active enrolment for all the available period to make choices before defaults came into effect, the size of the coefficient of the SMS reminder variable and the interaction with the Ultra-Orthodox and the Arab population become more stable and provide further evidence that in the long term the SMS reminders were the most effective for the Ultra-Orthodox community and had a lower impact on the Arab population.

This could mean that for the Ultra-Orthodox population the effect of the reminder is similar to that of the general population, but the smaller effect found in earlier regressions on the full sample stems from the overall lower enrolment of this population and not from the effect of the reminder. For the Arab population, it might be that the fact that the SMS was in Hebrew and not Arabic effected the reacceptance of the Arab population to the reminder. It can also be that cultural frictions and low trust in government lowered the effect of the reminder. As both minorities have low digital literacy and relative low usage of mobile phones (especially the Ultra-Orthodox population which has cultural frictions for using the internet and might not have been able to use the link in the message) also effected the reacceptance of the reminders by these populations. These outcomes might be unique to the Israeli minorities but the lessons learned here are probably also relevant to minorities in other countries who have language, cultural, trust and digital frictions.

Overall, Table 7 provides evidence that the SMS reminder was less effective for families from higher socio-economic status (wages or academic attainment⁴¹) for most segments of the population as well as for when the parents are married. This is true for many specifications and segments of the population, although the effect is not always statistically significant. The former might stem from the sample selection – those with high socioeconomic status who know what and how to actively enrol already did it in the beginning of the available time to make an active choice. It can be that the reminder less effected those who continued to wait and did not actively enrolled in the beginning

⁴¹ The effect for academic attainment remains similar for all population other than the Ultra-Orthodox population when adding to the regression an interaction for the SMS reminder with the father's education attainment variable but the effect disperses between the two academic interactions.

because they might have wanted to make a more informed choice after consulting and processing relevant information or they procrastinate more. Another reason can be that this population is more informed of frauds and are more suspicious of using links and information presented in SMS reminders. These frictions can all be conceptually represented as higher transaction costs. For the marital status outcome, it might be that SECP choices for children need to be discussed and agreed upon both parents that diminishes the reminder's effect. This friction can be interpreted as either higher transaction costs or higher observation costs. There is also some evidence in some specifications that the interaction of the reminders with the child's age is negative, providing further evidence that transaction costs play a part in the limited attention. Participating in the program for younger children provides more utility, which might overcome transaction costs, but for older children the utility is not high enough.

It should also be noted that for the Arab population the effect of the interaction of the SMS reminder and wages on action taken is positive and statistically significant for some specifications.⁴² It might be that that language friction are lower for those with higher wages, who might work with Hebrew speaking populations. For the Arab population there is also a statistically significant positive effect although not economically large for the interaction between the SMS reminder and the child's age. Differences for the Ultra-Orthodox population are not statistically significant but this might be because of the small sample size. These outcomes provide further evidence that there are differences between the segments of the population that should be taken into account if the regulation aims to reach all segments of the population.

The effects of the interactions of the reminder with household's characteristics stay similar for choosing to deposit additional funds and when using the Cox model specification for both enrolment and deposit choices.⁴³ As stated above, it was not

⁴² For an immediate response by February 10th in the table's specification and also when an interaction with parent's age is added to the regression.

⁴³ For depositing additional funds there is more evidence of a transaction cost effect reflecting in a negative effect for the child's age and number of children which is also statistically significant in some specifications. For all segments of the population the effect of the interactions between the reminder and household characteristics are not as robust. This is probably because the small sample effected the significance of the outcomes. Nonetheless, the sign of the interactions as well as significance in some specifications are evidence that the characteristics described above also effected other enrolment choice in similar directions.

possible to investigate enrolment choices for those who actively enrolled because of the small sample size.

**Table 7 – Logit regression for actively enrolling between February 6th and 20th,
Population partition**

<i>Dependent variable made choice by Feb 19</i>				
	Non-Ultra-Orthodox Jewish population	Arab population	Ultra-Orthodox Jewish population	All Sample
	(1)	(2)	(3)	(4)
Received SMS	1.48*** (0.14)	0.48*** (0.18)	1.66*** (0.51)	1.43*** (0.11)
Received SMS*Ultra-orthodox				-0.54*** (0.11)
Received SMS*Arab				-0.85*** (0.09)
Received SMS*Number of children	-0.0000 (0.0000)	0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)
Received SMS*Age of child	-0.0000 (0.0000)	0.0000** (0.0000)	-0.0000 (0.0000)	0.0000 (0.0000)
Received SMS*Mother's wage	-0.23* (0.12)	0.10 (0.23)	-0.02 (0.17)	-0.05 (0.09)
Received SMS*Father's wage	-0.01 (0.05)	-0.07* (0.04)	-0.08 (0.07)	-0.06** (0.03)
Received SMS*Mother academic	-0.03** (0.01)	-0.05*** (0.02)	0.03 (0.03)	-0.03*** (0.01)

Received	-0.47***	-0.13	-1.30**	-0.22**
SMS*Parents	(0.14)	(0.15)	(0.51)	(0.09)
Married				
Controls without interactions	Y	Y	Y	Y
Constant	-3.15***	-3.18***	-4.35***	-3.26***
	(0.12)	(0.14)	(0.46)	(0.09)
Mcfadden	0.03	0.01	0.01	0.02
Pseudo R square				
Observations	24,314	25,780	18,870	68,920
Log Likelihood	-6,171.18	-5,661.96	-2,981.02	-14,797.35
Akaike Inf. Crit.	12,370.35	11,351.93	5,990.05	29,630.70

Note:

7.2.2 Telephone survey matching exercise – Financial literacy investigation

The NII telephone survey data allows us to investigate the interaction effect between the SMS reminder and objective and subjective financial literacy but the small sample size limits the possible investigations and the ability to delve into specific enrollment choices. We present the regression for actively enrolling to the SECP, for choosing to deposit additional funds, and for choosing by a mobile phone for the one period of the full two weeks between February 6th and February 19th (Table 8). The first two regressions on any active enrollment and depositing additional funds (Table 8 columns (1) and (2)), include the controls from the previous regression in section 7.1 on household's characteristics (without interactions) but for the regression on making an active choice using a mobile phone we did not include these controls because when they are all used perfect separation of probabilities (either 1 or 0) occurs which causes biased estimators. Hence, the regression only uses an interaction between the SMS reminder and financial literacies (Table 8 column (3)).

The first two regressions for any active enrollment or additional deposits, column (1) and column (2) respectively, provide a similar outcome: the interaction between the SMS reminder and subjective financial literacy is positive and statistically significant, but the interaction between the SMS reminder and objective financial literacy is not significant. These outcomes are robust and remain similar in size and strength for different specifications and when using the Cox model, including when investigating shorter durations of time, when using less controls, as well as when using other measures of financial literacies.⁴⁴ For actively enrolling using a mobile phone in column (3), we could not find in this small data set any statistically significant outcomes.

As stated above, reminders effect observation costs and hence they should have a smaller effect on those with high transaction costs (actual or expected) who remain with higher costs than utility. The fact that having higher subjective financial literacy has a positive interaction with the SMS reminder promotes the fact that the former can be interpreted as a proxy for these transaction costs. This interaction helps understand the mechanism by which the reminder effects behavior and financial literacy effects attention. Additionally, minorities have lower financial literacies that can be interpreted that these populations have higher transaction costs and this is in line with the other outcomes described above.

Table 8 - Active enrollment in the SECP program- NII telephone survey sample

	<i>Choose by Feb 19 Dependent variable:</i>		
	Active enrollment	Additional deposits	Choose by mobile phone
	(1)	(2)	(3)
Received SMS*Subjective financial literacy	0.92*** (0.30)	0.97*** (0.35)	0.32 (0.82)
Received SMS*Objective financial literacy	-0.37 (0.32)	0.33 (0.38)	0.80 (0.94)

⁴⁴ Instead of the indexes themselves, we used dummies for either low or high financial literacies for those answering that they have low or very low understanding of financial issues or for those that answered correctly either no answer or all three.

Subjective financial literacy	-0.82*** (0.24)	-0.71*** (0.26)	0.18 (0.67)
Objective financial literacy	0.80*** (0.26)	0.48* (0.27)	0.20 (0.79)
Received SMS	-1.26 (0.81)	-2.96*** (1.06)	-1.26 (2.87)
Constant	-1.26 (0.81)	-2.096** (0.990)	-6.51*** (2.15)
Control for household's characteristics	Y	Y	N
Mcfadden Pseudo R square	0.08	0.1	0.08
Observations	1,128	1,128	1,128
Log Likelihood	-214.92	-156.92	-39.70
Akaike Inf. Crit.	459.85	343.84	91.40

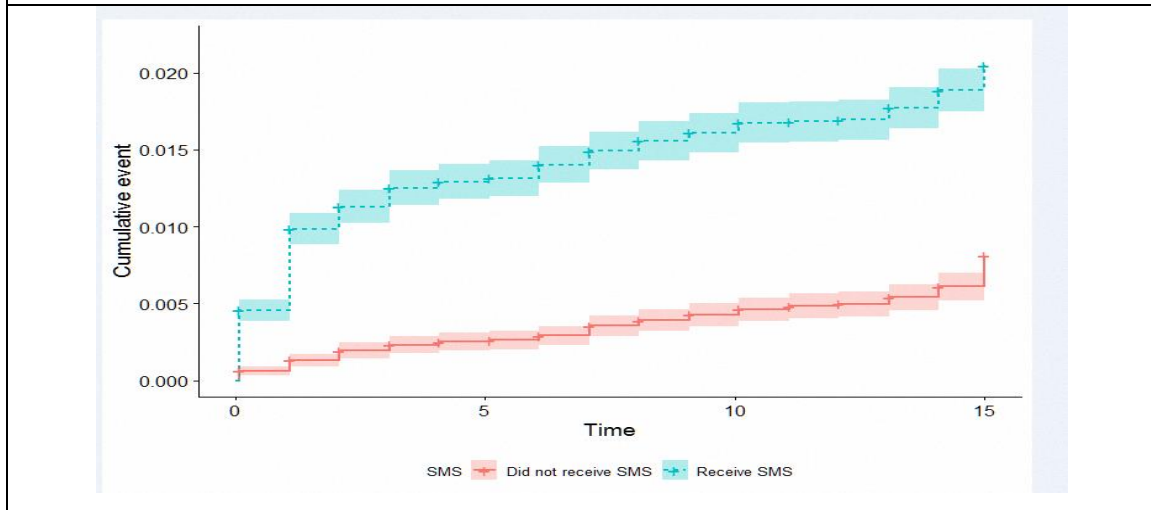
Note:

7.3 The effect of SMS reminders on the channel by which active enrolment is done

7.3.1 Survey main matching data

As the SMS reminder was sent to phones with a link, those using mobile phones could have clicked the link in order to actively enrol to the program. The administrative data allows us to see which appliance was used to enrol to the program and investigate if part of the heightened enrolment rate following the reception of the reminder stems from the easier facilitation of choice from using the link in the reminder. The Kaplan-Meier estimates on the two weeks following the reacceptance of the SMS, provide evidence that parents that received the SMS reminder had a higher cumulative probability of using a mobile phone to actively enrol to the program. The effect here seems to be immediate during the first two days. As before, there is also an indication that this effect is long term and stays for the duration of the initial installation of the program before defaults went into effect.

Figure 7- Kaplan-Meier estimations for enrolling by a mobile phone after February 6th, for those that received an SMS reminder and those who did not



We interpret that the higher use of mobile phones in program enrolment following the reception of the SMS reminder stemmed from the fact that transaction costs were lowered because parents were able to make a choice on the appliance from which they received the reminder while using the attached link. As all choices by parents who received a reminder were more prevalent during the investigated period, choices made by mobile phone were also more prevalent (Table 9). With respect to other appliances used to actively enrol (computers, non-digital; not presented), those that received an SMS reminder used a mobile phone to actively enrol to a larger and more statistically significant extent. As expected, this effect depleted over time. The probability of making a choice using a mobile for parents who received an SMS reminder for the two-week period was 440% higher than for those who did not receive a reminder (Table 10).⁴⁵ For making a choice by a mobile phone the SMS reminder effect is positive and statistically significant for all segments of the population except for the Ultra-Orthodox population, where it is not statistically significant. This is an indication of the mitigated effect of the reduction of transaction costs when using an SMS reminder for minorities who have cultural frictions to using digital media. This might also be because of these frictions this

⁴⁵ The odds ratio of the effect for the full two weeks period is 560%, but this is also affected by the large negative effect of the reminder on minorities (odds-ratio of interactions around 40%).

population received the reminder by voice mail and hence, it could not affect transaction costs for using the attached link.

Table 9 – Used a mobile phone to actively enroll during the relevant time period

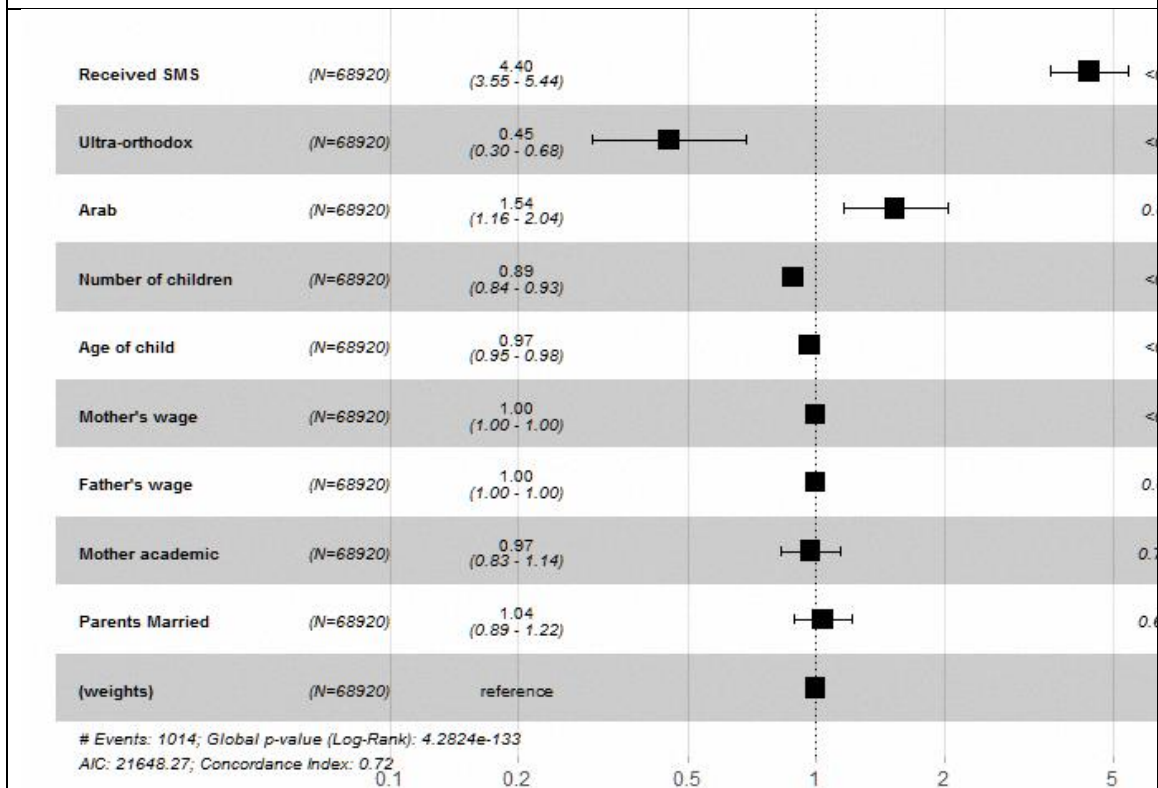
	<i>Dependent variable:</i>			
	Feb 7	Feb 10	Feb 19	Feb 10 to 19
	(1)	(2)	(3)	(4)
Received SMS	2.57*** (0.26)	2.21*** (0.20)	1.73*** (0.13)	0.98*** (0.19)
Received SMS*Ultra-orthodox	-0.37 (0.71)	-0.88** (0.45)	-0.84*** (0.30)	-0.53 (0.41)
Received SMS*Arab	-1.21*** (0.35)	-1.17*** (0.26)	-1.11*** (0.19)	-1.16*** (0.29)
Ultra-orthodox	-1.46** (0.68)	-0.99** (0.41)	-0.86*** (0.26)	-0.78** (0.34)
Arab	0.54 (0.33)	0.47* (0.25)	0.37** (0.17)	0.29 (0.24)
Number of children	-0.11*** (0.04)	-0.11*** (0.03)	-0.12*** (0.03)	-0.15*** (0.05)
Age of child	-0.03** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.04*** (0.02)
Mother's wage	0.0000** (0.0000)	0.0000** (0.0000)	0.0000*** (0.0000)	0.0000* (0.0000)
Father's wage	0.0000 (0.0000)	0.0000** (0.0000)	0.0000*** (0.0000)	0.0000 (0.0000)
Mother academic	-0.03 (0.12)	-0.03 (0.10)	-0.04 (0.08)	-0.06 (0.15)

Parents Married	0.05	0.01	0.05	0.15
	(0.13)	(0.11)	(0.09)	(0.17)
Constant	-6.31***	-5.63***	-4.79***	-5.34***
	(0.29)	(0.22)	(0.16)	(0.24)
Mcfadden Pseudo R square	0.09	0.09	0.07	0.04
Observations	68,920	68,920	68,920	68,920
Log Likelihood	-2,327.67	-3,071.84	-4,324.11	-1,767.04
Akaike Inf. Crit.	4,679.34	6,167.67	8,672.22	3,558.07

Note:

* ** *** p<0.01

Table 10- Summary of Cox model for using a mobile phone to enroll to the program between February 6th to February 19th



Notes: the specification of the Cox model includes interactions between the SMS reminder and minority affiliation. All other variables are included with no interactions.

When investigating choices only for those who choose to actively enrol, the positive and statistically significant effect remains (Table 11). Meaning, those who received an SMS reminder were much more likely to make a choice using a mobile phone especially in the immediate days following the reception of the reminder. The odds ratio of receiving an SMS reminder for actively enrolling to the program via mobile phone is over 650% in the immediate period following the SMS reminder and stays over 180% for the whole period. This indicates that the SMS reminder had a significant and strong economic effect on lowering transaction costs for using a mobile phone to actively enrol in the program. The regressions also indicate that the effect of the SMS reminder on transaction costs is smaller for both minorities, and surprisingly, not only for the Ultra-Orthodox population which has higher cultural frictions for using digital media.

Table 11- Used a mobile phone to actively enroll - out of those who actively enrolled during the relevant time period

	<i>Dependent variable:</i>			
	Feb 7 19	Feb 10	Feb 19	Feb 10 to 19
	(1)	(2)	(3)	(4)
Received SMS	1.89*** (0.30)	1.69*** (0.22)	1.28*** (0.15)	0.63*** (0.21)
Received SMS*Ultra-orthodox	0.54 (0.75)	-0.45 (0.48)	-0.52* (0.31)	-0.33 (0.43)
Received SMS*Arab	-0.76* (0.40)	-0.55* (0.30)	-0.52** (0.21)	-0.66** (0.32)
Ultra-orthodox	-1.29* (0.71)	-0.57 (0.44)	-0.45 (0.28)	-0.37 (0.37)
Arab	0.69* (0.38)	0.45 (0.28)	0.34* (0.19)	0.30 (0.27)

Number of children	-0.05 (0.06)	-0.08* (0.04)	-0.12*** (0.03)	-0.18*** (0.06)
Age of child	-0.01 (0.02)	-0.02 (0.01)	-0.02 (0.01)	-0.02 (0.02)
Mother's wage	0.0000 (0.0000)	0.0000 (0.0000)	0.0000* (0.0000)	0.0000 (0.0000)
Father's wage	0.0000** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000 (0.0000)
Mother academic	-0.03 (0.17)	-0.11 (0.13)	-0.03 (0.10)	0.03 (0.16)
Parents Married	0.48*** (0.17)	0.38*** (0.14)	0.30*** (0.11)	0.30 (0.19)
Constant	-2.18*** (0.34)	-2.00*** (0.26)	-1.97*** (0.18)	-1.89*** (0.26)
Mcfadden Pseudo R square	0.11	0.1	0.07	0.04
Observations	1,025	1,717	3,617	1,900
Log Likelihood	-630.31	-1,014.32	-1,889.06	-781.31
Akaike Inf. Crit.	1,284.61	2,052.63	3,802.13	1,586.62

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

It is also interesting to note that the higher rate of choices made by a mobile phone are accompanied by a lower rate of choices made by a computer for those who made an active enrolment choice (regression not presented),⁴⁶ but did not decrease the rate of choices made using a non-digital medium (regression not presented). This indicates that the lowered transaction cost affected only the digitally oriented population but not those who prefer to make choices via the physical branch or by phone.

⁴⁶ When we ran a regression on decisions that were made by a mobile phone out of those who made an active enrollment choice digitally, we saw the tradeoff between the usage of mobile phones and computers: the coefficient of the mobile phone dummy variable was positive and statistically significant.

7.3.1 Experimental survey data

Additional evidence we collected using experimental survey data provides further evidence that SMS reminders seem to have an effect on the transaction costs for using mobile phones to actively enrol to programs/claim benefits (Table 12). The results of the experimental survey data show that people stated that they would claim benefits using their mobile phone at a statistically significant (at the 5% level)⁴⁷ higher rate (17%- 21%) when they received a hypothetical SMS message with a link, with respect to when they received a hypothetical message by regular mail or when they did not receive a hypothetical additional message other than being exposed to a hypothetical general media campaign. People also stated that they were just as likely to claim benefits using a mobile phone if they got a message by an email or by an SMS reminder. Thus, the experiment provides evidence that the reminder's effect on transaction costs via the added link, is only relevant for the digitally oriented population. The experiment also shows that sending messages by emails might have similar effects on transaction costs as they also allow people to make immediate choices on their mobile phones by clicking on a link. Ultra-Orthodox individuals in the sample were less likely to use a digital platform to actively enroll in all 4 interventions validating the notion that they have higher cultural digital frictions even in an online digital survey. The survey did not have specific information on the Arab community, as this population is not represented well in online surveys. It should be noted that people who stated they would choose by a mobile phone were younger and more male as expected from the literature.

Table 12-Experiment survey outcome

Claim Benefits using a Mobile phone	Claim Benefits using a Computer	Claim Benefits using a Phone Conversation	Claim Benefits by going physically to a branch	None of the above
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⁴⁷ Using a proportion test

Intervention group 1- SMS text message	35%	47%	7%	7%	3%
Intervention group 2- email	35%	48%	7%	7%	2%
Intervention group 3- mail	30%	57%	6%	6%	1%
Intervention group 4- no additional message	29%	52%	9%	9%	2%

8.4. Calculating observation and transaction costs

We now use the different results to calculate the magnitude of SMS reminders effect on observation and digital transaction costs and on the different segments of the population. We estimate the effects of SMS reminder using a conceptual calculation as following:

$$\Delta Attention = \Delta Observation costs + \Delta Digital Transaction costs$$

We assume that attention in this context is active enrolment, the change in digital transaction costs can be evaluated by the growth in the number of parents using a mobile phone to actively enrol, and the change of observation costs can be evaluated by the growth of parents actively enrolled not by a mobile phone. The percentage of parents actively enrolled from the matched sample of parents who did not receive an SMS reminder is used as a baseline. Hence, we will estimate this "equation" by the following methodology for each segment of the population where:

$$\Delta Active enrollment = \Delta Active enrollment$$

$$\Delta Observation costs$$

$$= \Delta Active enrollment not by mobile phone$$

* percentage of parents actively enrolled not by mobile phone who did not receive a reminder

ΔDigital Transaction costs

= ΔActive enrollment by a mobile phone

* percentage of parents actively enrolled by mobile phone who did not receive a reminder

For the calculation, we measure the Δs effect using the Cox model estimates (which are similar in magnitude to the odds-ratios from the logit model estimations).

For the general population / full sample– Any choice:

$$161\% * 84\% + 440\% * 16\% = 206\%^{48}$$

For the Arab population:

$$0.67\% * 85\% + 151\% * 15\% = 80\%^{49}$$

For the Ultra-Orthodox Jewish population:

$$115\% * 90\% * +172\% * 10\% = 121\%^{50}$$

Hence, to sum the specific costs size out of the overall effect is:

	Observation costs	Digital transaction costs
General population	66%	34%
Arab population	28%	72%
Ultra-Orthodox population	86%	14%

Meaning that for the general population the SMS reminder raised active participation by around 200% while two thirds stemmed from lowering observation costs and a third from lowering digital transaction costs. For minorities the overall effect is lower and even negative for the Arab population but also the composition of the effect from the different costs is different. Both minorities had a smaller but similar effect stemming from lower transaction costs. We interpret this mitigated effect as stemming from higher digital frictions both these population have. However, while this caused the relative effect

⁴⁸ This number is very similar to 213% that is the Cox model estimation on any active enrollment and presented in section 7.1.1.

⁴⁹ Identical to the Cox model estimation on any active enrollment and discussed in section 7.2.1.

⁵⁰ Identical to the Cox model estimation on any active enrollment and discussed in section 7.2.1.

stemming from observation costs from the overall effect of the reminder to be higher than the general population's for the Ultra-Orthodox community it was actually smaller for the Arab population. This is because for the Arab population – the effect on observation costs was negative. This can be because of additional language and cultural barriers this population has, which diminished the effect on observation costs and caused a negative effect.

When performing the same exercise on choosing to deposit additional 50 NIS, the effect on both observation and digital transaction costs is lower than for any enrolment choice emphasising the fact that this choice entails higher transaction costs and mitigates the effect of the SMS reminder.

Although these estimations are a rough estimation, they provide relatively consistent outcomes on the magnitude of the overall effects. They also provide an evaluation of the effect of the reminder on the different populations and highlight where frictions might be higher.

9. Conclusion and Discussion

In this paper, we estimate the effect of an SMS reminder with an embedded link to a designated website on actively enrolling in the SECP, a government based saving accounts with small monthly deposits to all children in Israel under the age of 18 that is managed through the NII social security system. We used matching based exercises for those that received a reminder and those who did not for a two week period where there was no active media campaign and no other measures were taken by the NII to raise enrollment. We then estimate the effect of the reminder on actively enrolling to the program using logit, Cox proportional hazard model and the Kaplan-Meier hazard model. Our setting is unique as it allows investigating the effect of the reminder on a large population using rich administrative and survey data. The setting also allows us to look at a population that originally seem to have some frictions in actively enrolling as these are not those that made an early enrollment during the beginning of the program which was accompanied by a widespread media campaign. Meaning, we investigate a sample of the

population that had more frictions to actively enroll in the program. We find a strong economic effect that seems to continue throughout the investigated period.

The SMS reminder effected active enrollment and raised active enrollment in the program from 2.5% to 5.8% during a period of two weeks after the reacceptance of the SMS reminder. A change that raises participation by an estimated 213% from the Cox model. The SMS reminder effect on choosing to deposit additional funds is more mitigated. It seems that those who were pushed to actively enroll by the SMS reminder had less of an ability to save (liquidity constraints or other higher transaction costs).

The effect of the SMS reminder on minorities was also mitigated. This can be because of language or cultural frictions as well as digital frictions. The different response of the different segments in the population to the reminder is important as it can cause long-term differences in inequality. If the government uses nudges largely, especially in financial consumer regulation and minorities are much less repentant to these nudges, in the long term this can have a regressive effect on opportunities and wealth. This is especially true in a program such as the SECP program where the defaults will provide lower wealth in the long term (lower deposits from parent's and less risky investment tracks). Active enrollment can also affect the way these populations address and trust financial institutions and regulations in wider contexts.

We also find that reminders have a larger effect on those with high subjective financial literacy and we stipulate that this be because individuals with low financial literacy have higher transaction costs detaining them from active enrollment. This outcome can support a need for more infrastructure and general literacy emphasizing confidence in the financial field in the population in order to make consumer financial regulations and nudges more effective. Another policy implication can be that regulatory campaigns need to be accompanied by an explanation that might help boost confidence and allow individuals to actively participate in programs.

We find evidence that the SMS reminder effected not only observation costs but also transaction costs by raising the proportion of those who actively enroll to the program by using a mobile phone. This proportion was raised to 29% of those that received an SMS

reminder relative to 16% of those who did not receive a reminder. An additional survey shows that sending an email reminder might cause a similar shock to transaction costs.

We also provide a conceptual estimation that shows that for the general population the SMS reminder mostly affects observation costs (2/3 of size of effect) but also has a non-negligible effect on digital transaction costs (1/3 of size of effect). The estimation also shows that because of higher digital frictions the SMS reminder's effect on minorities' transaction costs is much lower. It also seems that because of language frictions the reminder's effect on the observation costs of the Arab population is even negative-causing higher frictions, which lowers the overall effect of the reminder on this population.

Nudges can be effective tools to strengthen policy outcomes but nudges need to be investigated and calibrated in order to understand their effect on outcomes (Benartzi et al. 2017, Madrian (2014), Datta and Mullainathan (2014)). The low costs of using reminders and the significant effect these reminders have on participation should make reminders a more prevalent tool that accompanies many financial regulations. These outcomes provide evidence that reminders can have a large roll in raising participation rates in governmental programs. The outcomes also allow us to understand the shortcoming of such a tool and which populations are less receptive to it.

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Appendix 1

Statistic	N	Mean	St. Dev.	Min	Max
Choose by Bank	886,920	0.250	0.433	0	1
Deposit additional 50 NIS	886,920	0.526	0.499	0	1
Mother's age	875,108	35.872	7.622	1	78
Mother works	886,920	0.677	0.468	0	1
Mother's wage	886,920	5,966.655	7,729.783	0	668,333
Mother Academic	886,920	0.414	0.493	0	1
Father's age	838,550	38.965	8.288	5	102
Father works	886,920	0.773	0.419	0	1
Fathers wage	886,920	11,059.410	14,034.740	0	1,816,496
Father academic	886,920	0.281	0.449	0	1
Number of children	886,920	2.309	1.341	1	18
Parents average age	886,920	37.469	7.737	1	98
Parents Ultra-Orthodox	886,920	0.091	0.288	0	1
Parents Arab	886,920	0.215	0.411	0	1
Parents married	886,920	0.801	0.399	0	1
CBS Socio economic index	886,136	5.194	2.202	0	10
CBS Periphery index	885,828	6.809	2.227	0	10
Child age	886,920	7.456	4.796	0	15
Active enrollment choice	886,920	0.753	0.431	0	1
By Feb 7th	886,920	0.006	0.075	0	1
By Feb 19th	886,920	0.027	0.161	0	1
By Feb 10th	886,920	0.011	0.105	0	1
Between Feb 10 th and 19 th	886,920	0.016	0.124	0	1
Received SMS	886,920	0.044	0.206	0	1
Choose where to invest funds	886,920	0.680	0.467	0	1
Choose by Smartphone	886,920	0.069	0.253	0	1
By Feb 10th	886,920	0.002	0.047	0	1
By Feb 19 th	886,920	0.005	0.068	0	1
By Feb 7th	886,920	0.001	0.035	0	1