

BEN-GURION UNIVERSITY OF THE NEGEV
THE FACULTY OF HUMANITIES AND SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS

The Effect of a Transfer to Digital Tool for Expenditure Tracking on
Evaluated Success of Participants in Paamonim Intervention Program

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
MASTER OF ARTS DEGREE (M.A)

Roy Tvizer

UNDER THE SUPERVISION OF Dr. Miri Stryjan

BEN-GURION UNIVERSITY OF THE NEGEV
THE FACULTY OF HUMANITIES AND SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS

The Effect of a Transfer to Digital Tool for Expenditure Tracking on
Evaluated Success of Participants in Paamonim Intervention Program

Roy Tvizer

UNDER THE SUPERVISION OF Dr. Miri Stryjan

Abstract

The current paper incorporates two empirical methods aiming to detect the effects of a transfer to a digital tool used for expenditure and income tracking on participants in Paamonim non-profit organization intervention program, delivered to individuals and families who experience financial hardship. I suggested that the digital tool, featuring better accessibility and ease of use in comparison to the tool used beforehand, will impact positively on the measure of success in the intervention program, and on the financial behaviour of the participants, as can be observed by analysing Paamonim collected data on 4,340 families participated during the years 2017-2019.

In order to examine my hypothesis, I split the dataset into two groups; one that includes families that participated in the program while the old tool was available (Control group) and one that includes families the participated after the tool was replaced with the new one (Treatment group).

The results show a positive and significant coefficient on the gap between income and expenditure as last recoded by the participant in the intervention program, a better rate of participants that completed the program and evidence for long-term usage in the new tool. Although, I also found a negative coefficient on Treatment when I measured the income and expenditure records accuracy between both groups. Despite the significant results, the study has some limitations, such as the two groups are significantly different in many parameters when entering the program, and the data suffers from inaccuracy. The empirical methods I have used to overcome these issues can only partially address this.

Nevertheless, the study provides a new way to think and evaluate the contribution of transition to a digital platform in financial literacy programs. By adapting the concept of combination of technology with financial literacy, organizations around the world can achieve more effective results and improve their success rate, helping millions of people become more financial educated and managing their financial matters in a responsible and balanced way.

Table of Contents

1. Introduction	1
2. Literature Review	3
The Importance of Financial Literacy	3
Financial Literacy Trainings	5
The effectiveness of financial literacy programs	6
Transfer to mobile banking services	8
3. Intervention Program and Policy Change Description	9
Paamonim Intervention Program	9
The Policy Change	12
4. Data.....	14
5. Empirical method	21
6. Results.....	25
7. Conclusion.....	33
8. References	36
Appendix A	40
Appendix B	41

Figures Description:

Figure 1	Main results
Figure 2	Intervention Program structure
Figure 3	Old tracking tool screenshot
Figure 4	New tracking tool screenshot
Figure 5	Summarization of the main differences between tools
Figure 6	Descriptive statistics and T-tests results
Figure 7	OLS regression results (1)
Figure 8	NN matching regression results (1)
Figure 9	OLS regression results (2)
Figure 10	NN matching regression results (2)
Figure 11	OLS regression results (3)
Figure 12	NN matching regression results (3)
Figure 13	Histogram of usage in tool after program completion – Control group
Figure 14	Histogram of usage in tool after program completion – Treatment group
Figure 15	OLS regression results (4)
Figure 16	NN matching regression results (4)
Figure 17	OLS regression results (5)
Figure 18	NN matching regression results (5)

1. Introduction

Recent decades have seen growing public interest in people's ability to manage their financial matters. Global and regional organizations promote financial education through dedicated programs to help people acquire financial skills and learn better financial behaviour (EESC, 2016). The term financial literacy can be defined in different ways, ranging from financial awareness and knowledge, including of financial products, institutions, and concepts; financial skills, such as the ability to calculate compound interest payments; and financial capability more generally, in terms of money management and financial planning. In practice, however, these notions frequently overlap (Xu & Zia, 2012).

Being a veteran volunteer in "Paamonim", a non-profit organization that runs financial literacy programs in Israel, I learnt that one of the fundamentals for improving household financial state and behaviour, involving the record of one's monthly expenses on a regular basis and matching it with a balanced budget. In his book, "The 1-2-3 Money Plan" Gregory Karp (2009) explains that the key to success in financial planning is to diligently keep financial records and consistently towards the implementation of the plans that have been made (Kaye et al. 2014). "The Balance", a famous website, offers content related to personal finance, appointed the main reasons for that: 1. It helps to stick with budget constraints. 2. It helps reveal spending issues. 3. It helps to achieve financial goals and avoid debt.

As part of the intervention programs Paamonim offers to families in Israel, a tracking tool is commonly used to record monthly income and expenditure. In June 2018, the organization introduced a new, mobile based tracking tool that is accessible through every mobile device with internet connection, replacing a complex Microsoft Excel sheet used beforehand. Observing the implications of the new tool, in field work, on families participated in financial literacy programs in Paamonim, I was motivated to find the effects of the new tool on financial behavioral of participants in the organization financial literacy program. In other words, if and how the transfer to a digital tool helps to improve

participants' financial state following the organization's intervention program, while compared to a group of participants which used the old tool.

Research Question: What is the effect of a transition to a digital tool for expenditure tracking in the Paamonim program on evaluated success of the participants.

I used data collected by Paamonim, contains administrative and financial data about 4,340 participants in the intervention program who participated during the years 2017-2019, split into two groups- control and treatment, each has the same timeframe of one calendar year. The control group contained participants from year before the policy change, and the treatment group from after the policy change occurred and a year forward.

I hypothesize that the new tool would have a positive impact on the "success" a participant experience following the intervention, where "success" is measured by the gap between income and expenditure in the last recorded cashflow balance (referred as "Execution"), usually at the end of the program or later.

The data analysis contained some limitations: the treatment group is observed in a different year than the control group. Also, as found by running t-tests, the control and treatment group are significantly different in many parameters when entering the program. Additionally, the data suffers from inaccuracy as it is based on self-reported data.

I used two empirical methods to test my hypothesis: Ordinary Least Squares (OLS) regression, and Nearest Neighbour Matching (NNM) Method, while controlling demographic and financial characteristics. The OLS with controls, and the matching regressions, can partially address this, although it is likely that there is still some selection bias and omitted variables that affects the results.

The results show a positive and significant coefficient on the gap between income and expenditure last recorded by the participant in the intervention program, a better rate of participants that completed the program and evidence for long-term usage in the new tool. Nevertheless, I also found a negative

coefficient on Treatment when I measured the income and expenditure records accuracy between both groups.

The figure below shows the main results from this study. Columns numbered 1 to 6 shows the OLS regression results using different sets of controls and column number 7 shows the NNM regression results using exact matching on several variables.

<i>Figure 1</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Outcome Variables	No Controls	Baseline value of outcome	Demographic Information	Demographics + Baseline value	Program Features	Program Features + Baseline value	Nearest Neighbour Matching
Income and Expenditure Gap	816.4*** (313.2)	756.8** (309.6)	1,091*** (398.7)	995.7** (393.9)	694.8** (317.0)	652.4** (314.9)	1536.5** (450.8)
Filled Income and Expenditure	-0.306*** (0.0143)		-0.295*** (0.0169)		-0.386*** (0.0155)		-0.366*** (0.019)
Completed Program	0.0954*** (0.0142)		0.0909*** (0.0167)		0.0914*** (0.0144)		0.082*** (0.017)
Finish to Last Expenditure record	69.64*** (5.041)		67.52*** (5.943)		75.08*** (5.821)		72.853*** (6.837)

The following sections contains: (2) Literature review, (3) Description about the program and policy change, (4) Data, (5) Empirical method, (6) Results, (7) Conclusion.

2. Literature Review

In this literature review, I will go through the most relevant literatures that my paper contributes to:

(a) literature on the importance of financial literacy (b) literature on financial literacy programs around the world, (c) literature on the effectiveness of financial literacy programs, and (d) literature on the transfer to mobile banking services.

The Importance of Financial Literacy

Stakeholders, including policymakers, are concerned about consumers lack of knowledge in financial concepts and tools needed to make decisions most advantageous to their economic well-being. Ineffective money management can also result in behaviours that make consumers vulnerable to financial crises (Authority, 2017). Financial literacy is important in each household for day-to-day decision making, as it helps saving money, which later could be invested or saved for reaching goals that have been set. This includes simple decisions, such as: where to buy fast moving consumer goods,

what type of investment risk pension fund to select, etc. A high level of financial literacy might be beneficial not only for individuals or households, but also for countries' economic system (Greenspan, 2005).

However, it is easy to observe that most of the households lack financial literacy (Lusardi, A. ,2008). As described in OECD report (2009), A lack of financial literacy leaves people ill-equipped to make appropriate financial decisions, which could, in turn, have tremendous adverse effects on both personal and, ultimately, global financial resilience.

Financial literacy is crucial to help consumers save enough to provide adequate income in retirement while avoiding high levels of debt that might result in bankruptcy, defaults, and foreclosures. Those with high financial literacy plan for retirement and have double the wealth of people who do not plan for retirement (Lusardi & Mitchell, 2009). Conversely, those with low financial literacy borrow more, have less wealth, and end up paying unnecessary fees for financial products (ibid). In other words, those with lower financial literacy tend to buy on credit and are unable to pay their full balance each month and end up spending more in interest. This group also does not invest, has trouble with debt, and a poor understanding of the terms of their mortgages or loans. Even more worrisome, many consumers believe that they are far more financially literate than they really are (Ibid).

Sevim et al. (2012) tried to measure the effects of financial literacy on the borrowing behaviour of Turkish financial consumers, using both qualitative and quantitative research methods- questionnaires and in-depth interviews. The findings of the study infer that financial consumers belonging to different financial literacy levels behave differently about their borrowing decisions. Financial consumers with high financial literacy levels are expected not to demonstrate excessive borrowing behaviour and to demonstrate informed credit use (ibid), therefore emphasize financial literacy importance on borrowing behavior, that can lead to financial hardships.

In their work to assess the level of financial capability in the UK by a national survey and interviews, Atkinson et al. (2007) identified four domains of financial behaviours. (a) Managing Money – people's

ability to make ends meet, and their ability to keep track of their finances; (b) Planning Ahead - financial precautions taken for the future; (c) Choosing Products - choice and purchase of products; (d) Staying Informed - engagement with current economic developments.

Economists have long ago noticed and analysed the importance of budgeting (Barigozzi et al., 2009). Changing patterns of consumer spending are unavoidable, as aggressive marketing is affecting consumers behaviour. People must prioritize major needs in advance, other than temporary needs in the short term (Bird et al., 2014).

Financial Literacy Trainings

As concern about financial literacy has increased, so too have the number and variety of financial literacy training programs and program providers. A study commissioned by Fannie Mae found that two-thirds of the ninety financial literacy programs that it examined were begun in the 1990s and that three-fourths of those were initiated in the late 1990s or 2000 (Jurg & Siegenthaler & Jeremy, 2000). Some of the programs offering comprehensive information on savings, credit, and similar topics for a broad audience and others tailored to a specific group, such as youth or military personnel, or focused on a specific goal, such as home ownership or savings. The providers of financial literacy programs are a diverse group that includes employers, the military, state cooperative extension services, community colleges, faith-based groups, and community-based organizations.

Financial literacy can be defined as the ability to use knowledge and skill to manage financial resources in an effective way (Paillella, 2016). Titko and Lace (2013) describes financial literacy as a conceptual model containing six basic components: (a) Borrowings, (b) Personal Budgeting; (c) Economic Issues; (d) Financial Concepts; (e) Financial Service, (f) Investing. The first component, "Borrowings", related to the importance of saving and avoid debt and to the ability to make financial planning. The second component, "Personal budgeting", related to the understanding of budgeting based on the personal income. Third, "Economic issues", related to the understanding about economic issues in a specific country or worldwide. Forth, "Financial concept" related to the

understanding of basic financial concept. The fifth component, "Financial services" related to the knowledge about the current financial products and services available. The sixth component, "Investing" related to the knowledge in investment and risk of the investment (Ibid).

A qualitative research by Firli (2017) appointed the variables that influence financial literacy the most: (a) Personal Sociodemographic characteristics, (b) Financial Knowledge, (c) Financial Behaviour, (d) Financial Attitude, and (e) Financial Training. These variables can give implication in strategic management in order to improve financial literacy programs with concern in personal demographic characteristics, improve financial knowledge, financial behaviour, financial attitude, and increase financial training (ibid).

In his book, "The 1-2-3 Money Plan" Gregory Karp (2009) explains the three most important steps to money saving and improving financial behaviour in general: expenditure tracking, budgeting, and future planning. The key to success in financial planning is to diligently keep financial records and consistently towards the implementation of the plans that have been made (Kaye et al. 2014).

[The effectiveness of financial literacy programs](#)

The findings of studies about the effectiveness of financial literacy training have been mixed (Braunstein and Welch, 2002). For example, Bernheim and Garrett (2003) analysed unexploited surveys of employers in the US who sponsor pension during the 1990s, finding evidence that people who attend financial counselling programs subsequently make better financial decisions, especially those attendees with low income and education levels (ibid). Carlin and Robinson (2012), in a US based study which used a pseudo-randomized natural experiment in high-school and middle-school financial literacy training, have found some evidence that students who were exposed to literacy training made better financial decisions, greater financial sophistication and higher savings rates after the training program. The students were given a budget balancing exercise, and those in the treatment group are about 35% more likely to complete the exercise than those in the control group (ibid).

A research by Drexler et al. (2014) involved participants in a non-government organization training program for small businesses in the Dominican Republic. With the help from this organization and Dominican training experts, they develop a new program that taught the participants simple rules for financial decision making. The study suggested that improved knowledge of finance and financial accounting indeed has a positive effect on the growth of small businesses in an emerging market such as the Dominican Republic (ibid). More importantly, they found that the impact of such training crucially depends on the form in which financial literacy training is provided (ibid). The training program based on simple rules of thumb led to significant improvements in the way small businesses managed their finances relative to the control group that was not offered additional training. Businesses in the rule of thumb training were more likely to implement the material that was taught, keep accounting records, calculate monthly revenues, and separate their business and home financial records (ibid).

In contrast, Alhenawi and Elkhal (2013), examined the relationship between financial knowledge and long-term financial planning behaviour. They used a questionnaire designed to gauge financial knowledge and financial planning of U.S. households. The findings had shown that the correlation between knowledge and financial planning is low, albeit positive.

When considering the motives of individuals' or families' intention to participate in such financial literacy programs, A study by Shahrabani (2012) that collected survey data on Israeli college students found a higher positive attitude toward budgeting and personal financial management, a higher level of financial knowledge and higher income levels were also found to positively affect intention to control one's personal budget. Kidwell and Turrisi (2004) examine the determinants of college student money management decision-making using multi-variate model, and also found that negative affect; attitude, and past behaviour were significant determinants of intention to maintain a financial budget.

Transfer to mobile banking services

Transfer to mobile based technology in banking services in recent years made possible by technological advancements, which led to a broader usage of mobile services instead of traditional offline banking (Mortimer et al., 2015). Consumers are attracted to those technologies because of convenience, ease of use and cost savings in some cases (Anguelov et al. 2004).

There is some evidence that digital banking is associated with better household financial management. Hogarth et al. (2004) used a survey of consumer finances to find the contribution of various electronic banking technologies to financial management practices of U.S. households. Results revealed that, consumers' use of direct deposit, phone banking and computer banking are associated with better financial management.

A research by Servon et al. (2008) found a potentially powerful connection between technological literacy and financial literacy. They analysed a demonstration program mounted by a major U.S bank using both quantitative and qualitative data, and found some evidence that technological training and e-banking supports financial literacy—the ability of participants to see and work with their own money that the e-banking enables made the financial literacy training more compelling to participants.

It is also important to learn about user attitudes towards adoption of mobile technology to understand the crucial elements needed to make the transfer to mobile based technology services. Researches pointed out the main influences of users' intention of adoption of mobile financial services. An empirical research by Kim et al (2007) examined the adoption of mobile internet using the Value-based Adoption Model and data collected via an internet survey. Their results suggested mobile internet adoption is determined by the perceptions of the usefulness, enjoyment, fee and technicality of the technology offered. A perceived ease of use, one of the major factors, refers to an individual's assessment of the amount of effort needed to perform a task using a new technology (ibid).

Considering the evidence those researchers described, and the lack of studies measuring the effect of a combination of technology and financial literacy on financial behaviour, this study aims to exploit

the digitalization of an expenditure tracking tool in Paamonim financial literacy program, to measure the impacts of such transition on the evaluated improvement in financial behaviour of families participated in the program.

3. Intervention Program and Policy Change Description

Paamonim Intervention Program

"Paamonim" is an Israeli nationwide volunteer organization dedicated to helping families and individuals conduct their household finances with balance, responsibility, and integrity, thereby strengthening Israel's economic and social fabric. Paamonim offers workshops, lectures, consultations, etc., while the main program is a long-term intervention programs for families and individuals. Throughout this text, I will refer to individuals and families as "families".

With the help of its 3000 volunteers, Paamonim provides a wide range of solutions to thousands of Israeli families each year through its targeted economic recovery programs and offers information and tools for the public. In this study, I will focus on the major long-term intervention program for families. The study relies on data collected by both mentors and participants in the long-term intervention program, delivered by Paamonim organization.

The intervention program includes personal guidance, counselling, and supervision by volunteer mentors. Each mentor or pair of mentors works with one or two households who experience financial hardship. They help them get a clear picture of their situation, advise them what actions to take to improve it, and how to budget their expenses in long term view and live accordingly. Also, they guide them in how to deal with outstanding debt, and how to plan for the future.

The program has two objectives, the first is to attain financial recovery, and the second is to develop financial capabilities that would enable the families to act responsibly after the completion of the program, when the emphasis is on the latter.

Volunteers are required to go through an extensive training before they can mentor families. Throughout the intervention program they receive guidance from more experienced team leader.

Families turn to Paamonim on their own initiative. First, they fill an application form, within few weeks a trained volunteer from the local targeting team contact the family to get better understanding of the family needs, capabilities and motivation. The volunteer document his or her impression in the family file over Paamonim web interface, along with a recommendation to the relevant service the organization can offer the family. Waiting time for the service depends on demand and availability of volunteers in the local area.

The intervention program is available for anyone who seek help, following two conditions: first, a basic and steady stream of income. Following analysing of the dataset used in this paper, it appears most families that participate in the intervention program are middle-class, with average income level or above (In accordance to the average income measured by the National Insurance Institute of Israel).

Secondly, families must show high levels of motivation. The long-term intervention program not only requires plenty of resources from the organization but from the family too, therefore only those with high motivation and need will be assigned to mentors.

Typical intervention includes 6– 10 meetings and last usually between 4 to 10-months period, depending upon family needs. Meetings are being conducted mostly at the families' house, every 2-4 weeks, depending on different stages of the program. When necessary, families are offered a professional consulting with advisors on finance, mortgages, small businesses, pension, and legal - free of charge. Mentors may also escort families to the bank or be present while they negotiate with their lenders, but families are required to be active and to take responsibility for their action. Proactivity is defined as a key feature of the program, and unmotivated members may be dismissed from the program.

Intervention Program structure:

Figure 2			
Program Stage	Number of Meetings	Stage Typical Time Period	Description
1 st stage- Reception	0	Before starting	Submission of an application in Paamonim website.
2 nd stage- Reflection	1-2	1 month	Examination of current financial state.
3 rd stage- Budget and Execution	3-8	Two to eight months	Creating budget and manage to live accordingly. Recording every income and expenditure.
4 th stage – Recovery plan	1	1 month	Implementation of a permanent budget with consideration of debt and future plans.
Final stage- Ending Sessions	1		Conclusion, final guidelines and farewell.

1. **Reception** – Family submission of an application, then assigned to the program based on needs and volunteers' availability.
2. **Reflection**- examination of current financial state- income, expenditure, and debt, based at least on the prior three calendar months, calculated on a yearly basis point of view.
3. **Budget and execution** – Creation and implementation of an initial budget. Guided by the mentors, the budget will be prepared based on the family's needs, with the aim of reaching balance. Budget is divided into different sections to achieve better control over expenditure. The family will be required to record all its income and expenditure and control its cash flow (income minus expenditure) balanced, in accordance to budget plan. This stage is designed to help the family maintain balanced ongoing expenditure, acquire basic financial skills and awareness to their financial state. Also, this stage prepares the ground for the next stage and will determine the family's ability to maintain its debt and future plans. In this study, this stage will have the main focus, as I will examine family's success in the intervention program by measuring the cash flow at its last recorded income and expenditure tracking, as will be described deeply in section 5.

- Recovery Plan** – Implementation of a permanent budget with taking into account the debt. This stage requires broad approach to the adjustment of positive cash flow (income minus expenditure) to debt service payments. This stage also includes sometimes debt consolidation, waiver or deployment so the family could successfully maintain financial stability in the future.
- Ending Sessions** – Conclusion of the intervention program, final tips and guidelines for financial management after the completion of the program.

The Policy Change

Expenditure tracking is a mandatory and important part of the program and used to evaluate the families' success in meeting budget requirements. As part of stage three described above, the family is required to record expenses and income in Pammonim dedicated tracking tool, on a daily, weekly or monthly basis. As part of the program, mentors will evaluate the accuracy of records at least once a month by comparing it with actual financial state, reflected in the family's bank account.

In June 2018, Paamonim announced a new digital tool, replacing a complex Microsoft Excel sheet used beforehand. Once announced, as default, any family that entered the program introduced with the new tool. The transfer to the new tool is regarded as the policy change. In this paper, I aim to measure the effect of the policy change on the last recorded gap between income and expenditure, such record presumed as a measure of success in the intervention program.

The Old Tracking Tool – "Rishumon" (Excel based tool)¹

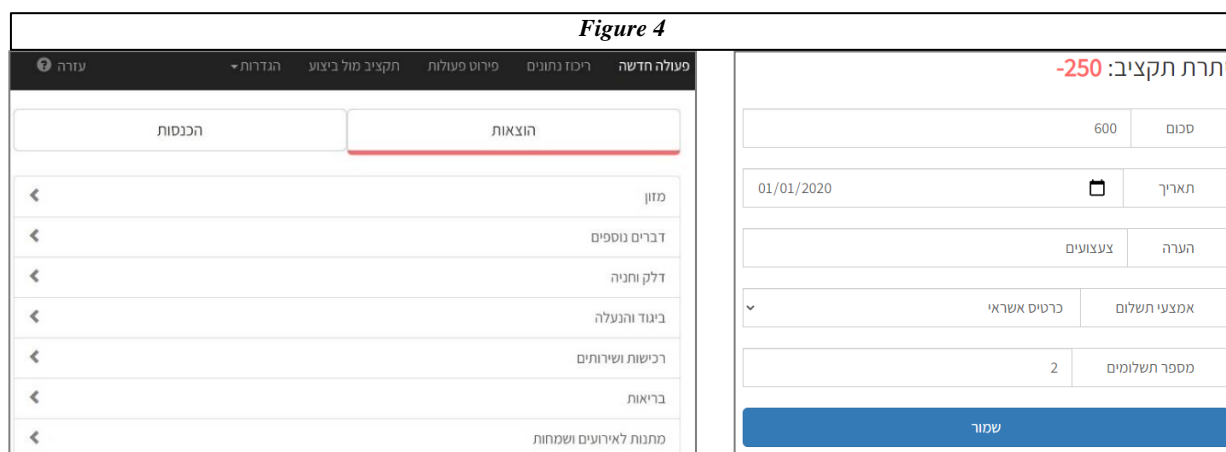
Figure 3

הכנסות			רישום חודשי הוצאות תקופתיות					רישום חודשי הוצאות שוטפות					הוצאות חודשיות קבועות		
15,300	תקניב טווחון להכנסות		יתרה חודשית	סכום	מניע	שם ההוצאה	יום	יתרה חודשית	מניע	שם ההוצאה	יום	2,799	מניע	שם ההוצאה	
ביצוע	תקניב	שם ההכנסה	11,034	העסקה	תקניב מיומן להוצאות תקופתיות בתוספת יתרה מחדש קודם	4,918	תקניב מיומן להוצאות שוטפות בתוספת יתרה מחדש קודם	2,090	2,097	מספח	2,799	מניע	שם ההוצאה		
7,796	7,756	1	10,772	262	262	11	4,158	760	11	מזון	2,090	2,097	מספח		
-	-	2	10,672	100	100	12	4,123	35	11	סניגוריות	65	96	מספח		
4,043	5,138	1	10,606	66	66	12	4,088	35	11	שטות	-	-	מספח		
526	526	2	10,219	-	387	12	3,978	110	12	סופר פארם	180	180	מספח		
-	-	קצבאות ילדים	9,994	225	225	14	3,753	225	14	מזון	113	113	מספח		
-	-	קצבאות נוספות	9,994	29	29	14	3,483	270	14	דלק וחניה	150	150	מספח		
-	-	סיוע בשכר דירה	8,965	1,000	1,000	14	3,448	35	14	סניגוריות	163	163	מספח		
-	-	מזונות	8,915	50	50	14	3,348	100	14	שטות	-	-	מספח		
1,000	1,500	הכנסה נוספת	8,884	31	31	14	3,298	50	14	שטות	-	-	מספח		
-	380	עזרה מרחוקים	8,879	3	3	14	3,158	140	14	שטות	-	-	מספח		
13,365	15,300	סכ"מ	8,754	125	125	18	3,110	48	20	סניגוריות	-	-	מספח		
-1,935	-	הפרש בין תקניב וביצוע	8,635	119	119	23	3,015	95	20	מזון	2,448	2,799	סכ"מ		
			8,465	170	170	20	2,959	56	20	מזון	351	351	הפרש בין תקניב לביצוע		

¹ The figure shows the main sheet used. Tables rows contains a drop list of expenditure sections and an empty column for numeric input. Tables order from right to left: fixed expenses, variable expenses, periodic expenses, income.

The old tracking tool was based on Microsoft Excel file. Families accessed the tool only through a computer. Although no specific technological expertise was required to operate it, the file complexity of containing lots of lines and sheets, were difficult for some to handle. The tool allowed the families to see the total remaining budget after every expense being recorded. After completing a full month recording, families could see summaries and graphs, helping them and their mentors evaluate the ability of standing in budget constraints. Each month the mentors had to upload the file to the family file in Paamonim web interface. Mentors ability to monitor expenses recording during the month was limited, as it required the family to send the updated version every time. Pursuant, monitoring budget overruns was only possible in month period intervals.

The New Tracking Tool – "Rishumit" (web-based tool)



The new expenditure and income web-based tracking tool, announced in June 2018, is accessible from any electronic device with internet connection. The tool is operating similar to a mobile application, with simple, user friendly interface. With better accessibility, families could record expenses close to the moment it occurred, through a mobile phone.

The tool has similar features and uses as the old tool, although it introduced a few new ones. In each expense recording, family can see the remaining budget for the specific section, fill notes and payment method. The new tool synchronizes automatically with Paamonim web interface; therefore, mentors can monitor family's expenses recording and budget overruns in real time and advise them accordingly.

Figure 5 below summarizes the main differences between the tools:

Figure 5		
Feature	Old tool	New tool
Accessibility	A complex Excel file. Accessible from a computer only.	User friendly web interface. Accessible from any digital device.
Remaining budget display	Total remaining budget only.	Remaining budget for each expense section.
Updating a budget	Manually.	Automatically through family's file.
Synchronization	Uploading manually every month.	Automatically.
Mentors monitor ability	Family required to send the file, usually every 2-4 weeks.	Mentors can monitor family's recording in real time online.

As pointed out in Drexler et al. paper (2014), simplicity can improve financial behaviour. Therefore, my hypothesis is that the transfer to mobile based technology for recording income and expenditure will lead to improvement in families' ability to control their budget, maintain positive cashflow and avoid debt.

In this paper, I will describe the Intention to Treat (ITT) effect on a few outcome variables, in an attempt to measure the success in the program by comparing between two defined groups, one that contained families' participated in the intervention program while the old tool was in use (the control group), and second group which contained families' participated while the new tool was in use (the treatment group).

Success in the program can be defined by many ways, in this paper, I will regard success as how well a family improved its monthly cashflow (gap between income and expenditure), as reflected in their last income and expenditure recording (Execution Gap), while controlling its baseline value – the gap between income and expenditure as recorded in the beginning of the program (Reflection Gap).

4. Data

Data used in this research was provided by Paamonim non-profit organization through its web-based platform and contains administrative and financial data on participants in the long-term intervention program, who participated during the years 2017-2019. The data was gathered by both families and

mentors that took part in the intervention program. It is important to note that due to the fact the data is mostly self-reported, it partly suffers from inaccuracies and some of variables were not usable.

The data consists of two types of measurements:

1. Administrative data: The data contains demographic information of 4,621 families that participated in the intervention filled by them on the application form before entering the program. Also, it includes financial information of the same participants. Using those variables provided by the organization, I also created dummy variables in order to get the clearest results out of the data, those are highlighted in *Italic style* in Figure 6 below. The main variables are highlighted bold.
2. Questionnaires: The second type of data contains two datasets contains a total of 4,340 questionnaires filled fully or partly by the families participated in the program. The first dataset, which serves as the baseline, contains questionnaires collected right at the beginning of the program (n=2,304) and second dataset contains follow up questions and feedback (n=1,888), filled by the families after the program ends. The questionnaires are both quantitative and qualitative, designed by the organization and formed around three main issues: management, consumption habits, and sense of competence regarding financial abilities and resources.

Unfortunately, only 1,295 families filled both questionnaires and even fewer (n=1,122) filled it fully. As the act of completion of those surveys can be seen as an indication of family's motives and seriousness in completing the program successfully, I decided not to use this data. Although I did not use the families' answers on the surveys, I used a dummy equal to one if the family filled any of the questionnaires as a motivation factor.

I split the administrative dataset of 4,340 families that participated in the intervention program between May 2017 to June 2019, into control and treatment groups in a way that each group has the same timeframe of one calendar year, while excluding two months period when the policy change has occurred. The Control group (n=2,093) defined by families who entered the intervention program between May 2017 to April 2018. The Treatment group (n=2,247) is defined by families who entered

the program between July 2018 to June 2019, after the policy change that occurred in June 2018. It is important to mention that after the policy change was occurred, every family that started the program was introduced the new tool by default, unless requested otherwise. The entering date is determined by the reflection stage date, as it occurred in the first meeting and considered the foundation of the program.

Figure 6 below shows descriptive statistics and t-tests between control and treatment groups for all relevant variables. For convenience presentation purposes, I organized the data in three conceptual groups: (a) Demographic information (b) Program features (c) Quantitative measures. Next, I will explain the main variables (highlighted in bold), in most of them I used to answer the research question.

Figure 6	Descriptive Statistics					T-Test				
Key: Main Variables, Dummy Variables	N	mean	sd	min	max	N- Control group (0)	N- Treatment group (1)	Mean 0	Mean 1	P Value (!=0)
Variables	<u>Demographic Information</u>									
City Socio Score 1-10	3,497	5.915	2.11	1	9	1,693	1804	6.042	5.797	.001
Children Home	4,067	2.235	1.54	0	26	1,951	2116	2.119	2.342	0
Welfare	4,340	0.078	0.27	0	1	2,093	2247	0.073	0.082	.308
Returning Family	4,340	0.106	0.31	0	1	2,093	2247	0.111	0.103	.393
Single Parent	4,340	0.125	0.33	0	1	2,093	2247	0.116	0.133	.082
Mother Age	4,157	39.74	10.71	0	81	1,995	2162	40.2	39.311	.007
Immigrant	4,340	0.226	0.42	0	1	2,093	2247	0.233	0.219	.249
Immigrate after age 15	4,340	0.161	0.37	0	1	2,093	2247	0.172	0.15	.059

<u>Program Features</u>										
Meetings Number	4,340	6.659	3.92	0	35	2,093	2247	6.564	6.747	.124
Waiting Time for Mentor	4,221	51.28	45.34	1	743	2,028	2193	48.744	53.62	.001
Filled Baseline or follow-up Questionnaire	4,340	0.668	0.47	0	1	2,093	2247	0.714	0.625	0
Did Reflection	4,340	0.961	0.19	0	1	2,093	2247	0.984	0.94	0
Did Budget	4,340	0.802	0.40	0	1	2,093	2247	0.748	0.85	0
Filled Execution	4,340	0.553	0.50	0	1	2,093	2247	0.712	0.41	0
Mentor Experience	4,219	3.941	4.09	1	38	2,031	2188	3.9155	3.966	.6865
Days from Program Completion to Last Execution	2,053	-1.232	116.24	-322	793	1,180	873	-30.844	38.79	0
Completed Program	4,340	0.676	0.47	0	1	2,093	2247	0.627	0.72	0
Program Length (days)	4,161	163.12	108.83	0	1021	2,047	2114	169.714	156.74	0

<u>Quantitative Measures</u>										
Reflection Income	4,340	15,401	7,349	0	88,100	2,093	2247	15,531.52	15,279.62	.259
Reflection Expenditure	4,340	15,804	7,372	0	73,371	2,093	2247	16,084.19	15,542.35	.016
Reflection Gap	4,340	-402.6	4,427	-59,371	46,326	2,093	2247	-552.67	-262.73	.031
Reflection Gap Filtered	4,119	-286.9	4284.2	-59,371	46,326	2,034	2085	-428.87	-148.42	.036
Debt Repayment	4,340	1,756	2,467	0	43,164	2,093	2247	1,517.82	1,977.72	0

Total Debt	4,340	96,909	152,897	0	2,447 k	2,093	2247	81,897.5	111,000	0
Execution Income	2,704	16,879.2	10,463.6	-1,128	131,588	1,553	1151	18,051.93	15,296.83	0
Execution Expenditure	3,613	10,752.4	8,626	1	125,171	1,674	1939	14,248.74	7,733.96	0
Execution Gap	2,651	3,314	7,785	-24205	105,391	1,542	1109	2,972.33	3,788.7	.007
Execution Gap Filtered	2,400	3,341	7,729.3	-18,191	105,391	1,489	911	2,962.87	3,960.3	.002
Baseline Questionnaire (Tracking Expenses)	2,304	3.108	1	1	5	1,104	1200	3.06	3.15	.095
Follow-up Questionnaire (Tracking Expenses)	1,880	4.165	1	1	5	1,055	825	4.16	4.17	.709
Baseline Questionnaire (Confidence)	2300	3.092	1.14	1	5	1,103	1197	3.10	3.08	.614
Follow-up Questionnaire (Confidence)	1882	3.912	0.87	1	5	1,057	825	3.92	3.906	.763

Treatment	4,340	0.518	0.500	0	1	2,093	2,247	-	-	-
------------------	-------	-------	-------	---	---	-------	-------	---	---	---

City Socio Score 1-10 - Based on the original variable City, measuring the socioeconomic ranking published by the Central Bureau of Statistics in 2015. Some cities ranking was missing (n=3,497). Higher score means a higher socioeconomic city status, a score of one means a very low socioeconomic status and score of 10 reflect the highest status. Both control and treatment groups have a similar average socioeconomic score of about 6 out of 10, with insignificant difference between the groups.

Children Home- Number of children which lives at the same household with their parents. Collected from families' self-submitted application form (n=4,067). Variable can receive zero or any positive number. Both control and treatment groups have a similar average amount of between 2 and 3 children at home, with insignificant difference measured between the groups.

Returning Family- Gets 1 if the family participate in more than one intervention program. Collected automatically by Paamonim web interface (n=4,340). In general, 10.6% of the families participated more than once in the program, although the t-test has shown that the control group contained a larger part of returning families of 11.1% compared with 10.3% of the families in the treatment group.

Single Parent- A dummy variable which gives 1 for single parent families, when meeting two terms: Family Status is "divorced" or "single" and number of children is bigger than 1 (n=4,340). As shown in Figure 6 above, 13.3% of families entered the program after the policy change are single parents compared to 11.6% of families in the control group.

Mother Age- Collected from families' self-submitted application form (n=4,157). Transformed from the variable year of birth as the difference from the year the family entered the program to the year of birth. The average age of mothers entered the program is about 40 years with a standard error of 10, and insignificant difference between the control and treatment groups. Comparing this variable with father age, I assumed this variable is better to use, as single parent are usually women.

Immigrated after 15- A dummy variable which gets 1 if at least one of the parents was immigrated after the age of 15 (n=4,340). Based on the difference between the original variables "Year of Immigration" and "Year of Birth". Data shows that 17.2% of the families in the control group consist of at least one parent that immigrated after the age of 15, compared to 15% in the treatment group. I decided to select the age of 15 based on the evidence (Schaafsma and Sweetman, 2001) that suggested immigrants who arrive at an older age will suffer more from language related difficulties, which assumed as an important determinant of economic integration.

Meetings number- Collected automatically by Paamonim web interface (n=4,340). On average, families in the control group had 6.5 per program, while the families in the treatment group, on average, participated in slightly more meetings – 6.7 meetings per program.

Waiting time for mentor (n=4,221)- Based on the difference between two original variables; Date of Application Submission and Date of Reflection stage (indicate the beginning of the program). I assume that the longer the family wait for the service, the less motivation it would have to start and complete the program. On average, families had to wait for around 50 days to the beginning of the program, with insignificant difference between the groups.

Filled Baseline or Follow-up Questionnaire- A dummy variable equals to one if the family filled at least one of the baseline or follow-up questionnaires, in the beginning or the end of the program. Data shows that greater part of the families in the control group (71%) filled at least one of the

questionnaires, compared to 62% of the families in the treatment group, although insignificant in the t-test results.

Filled Execution – A dummy variable equals to one if both income and expenditure execution records are greater than zero. Data shows that 71.2% of families in the control group filled the execution while only 41% of the families in the treatment group filled it. I assume the main reason for such drop related to the automation process, eliminating the need of the mentor manually upload of the execution form (excel file) to the web interface, therefore creating automated empty execution records if the family didn't record their income or expenditure.

Mentor Experience- Based on the original variable Mentor ID, counting the number of families a specific mentor was associated with in the dataset (n=4,219). The average mentor had experienced four families, although there is a small difference between the groups.

Days from Program Completion to Last Execution – Based on the amount of days that passed from the date of family's last meeting to the date of its last recoded execution. Families in the control group, on average, stopped to record expenses a month before the program ended, while the families in the treatment group managed to continue record on average 38 days following the program completion.

Completed Program - A dummy variable equals to one if a family meet the requirements of more than one meeting and completing these stages: Reflection, Budget and Execution (n=4,340). On average 68% of the families managed to complete the program under this definition, without significant difference between the groups.

Debt Repayment- The monthly amount a family paid as a debt service during the intervention program (n=4,340). Data shows an average of 1,518 NIS monthly debt repayment for a family in the control group, while families in the treatment group had to pay a higher average amount of 1,978 NIS per month.

Reflection Gap (Baseline Value of Outcome, n=4,340) – The gap between income and expenditure (NIS) in the reflection stage. The reflection stage defined as the beginning of the program, as described further at Section 3. The major dependent variable used in this study is the gap between income and expenditure in the last recorded execution (Execution Gap). To measure how successfully a family improves its financial skills as a result of the intervention, I control for the baseline value. On average, both groups started the program with a negative cashflow, as their monthly expenses exceeded income.

Execution Gap- The Gap between income and expenditure (NIS) in the family's last recorded execution (n=2,651). Families can record executions far after the program ends. On average, families in both groups performed a better cashflow after the program ended, improving their monthly cashflow by more than 3,000 NIS compared to the average Reflection Gap. This Variable is the main outcome variable I have used, assumed to be the best estimator available in the data for family "success", as described further in section 3.

Execution Gap Filtered- Based on the variable Execution Gap, but income or expenditure below 3,593 NIS threshold, has been filtered out. The threshold determined by the minimum income required for household to maintain itself above the poverty line, as determined in the "Poverty Report", published in 2018 by the National Insurance Institute of Israel. Due to the fact the organization do not accept families with income below this threshold, this filtration meant to avoid some of the incorrect records.

Reflection Gap Filtered- Based on the variable Reflection Gap, but income or expenditure below 3,593 NIS threshold, has been filtered out. Explanation for the filter is mentioned above.

Treatment- A dummy variable which equals to one if the family entered the intervention program after the policy change, between July 2018 to June 2019, thus by assumption, received the new digital tool as default. Approximately 52% of the families in the dataset is within the treatment group.

5. Empirical method

There are two treatment effects concepts commonly used in the econometric literature- Intention to Treat (ITT) and The Effect of Treatment on Treated. According to Fisher et al. (1990), the Intention to Treat (ITT) analysis includes all subjects in the groups to which they were assigned, regardless of their adherence with the entry criteria, regardless of the treatment they actually received, and regardless of subsequent withdrawal from treatment or deviation from the protocol (ibid). The effect of treatment on the treated (ETT) perceived as the effect of withholding an action that has in fact been implemented (Shpitser and Pearl, 2012).

Unfortunately, the data do not include an indication on which of the families in the treatment group, that entered the program after the policy change described in Section 3, actually used the new digital tool, i.e. treated. Each family in the treatment group entered the program introduced with the new tool by default but could potentially request the new tool or use paper and pen, to record their income and expenditure.

I sampled 200 random family IDs from the dataset, representing a family file in the web interface program of Paamonim, and checked manually if a family used the new tool or not. Only 170 of them recorded their income and expenditure, but I found that out of the sample of families who entered the program after the policy change and had a recorded execution (n=85), only about 6% of the families did not use the new tool. This random test can somehow strengthen the idea that the majority of the treatment group were indeed treated but is insufficient to decide that the whole treatment group, used the new tool and was in fact effected by the treatment. Therefore, I decided to measure the effect of the ITT.

To do that, I considered a commonly used method that attempt to control for unobserved variables that estimates causal effects - Difference-in-differences (DD), aided by longitudinal data- panel data that track the progress of the same subject in successive months or years. The structure of the dataset

contains repeated cross-section data by defining the control and treatment groups by different periods they have entered the program. Although, comparison based on DD method can be biased by selection.

A naive approach would compare the outcome variable in control and treatment groups measuring the DD between the outcome and the baseline variable, neglecting the potential external and internal impacts on the intervention program, such as macroeconomic environment changes or re-organization processes in Pammonim organization. This comparison would be likely biased by selection, since unobserved differences across different times could also affect outcomes. Therefore, I decided not to use this method. Instead, I control over the baseline value of the outcome variable while using two different methods.

I used two empirical methods to measure the ITT effect on the treatment group. First is a robust linear regression method called Ordinary Least Squares (OLS). The method estimates the relationship between the dependent (Y) variable with the independent variables (X_1, \dots, X_j) by minimizing the sum of the squares in the difference between the observed and predicted values of the dependent variable configured as a straight line (Goldberger, 1964). Geometrically, this is seen as the sum of the squared distances, parallel to the axis of the dependent variable, between each data point in the set and the corresponding point on the regression surface—the smaller the differences, the better the model fits the data (ibid). In this method, the coefficient can tell about the relationship between X and Y. Independent variables also being used to control important factors in the regression.

The OLS method have a lot of advantages, such as simplicity and applicability. Moreover, if the Gauss-Markov conditions apply, it will be the best unbiased linear estimator (Puntanen et al., 1989). Nevertheless, the term of the spherical errors, that implies the error term has uniform variance (homoscedasticity) and no serial dependence, is been violated in the data I have. Heteroskedasticity occurs when the amount of error is correlated with an independent variable. As I try to use the outcome variable Execution Gap, when controlling for the baseline outcome variable Reflection Gap, it is fair to assume heteroskedasticity will occur when using these variables. Also, as a linear estimator it is

sensitive to outliers, and because the data is mostly self-reported by the families who participated in the program, there are a lot of mistypes and inaccuracies. For those reasons, I searched for a second method to support the OLS results and overcome the challenges of data inaccuracy and heteroskedasticity.

The second empirical method I used is the Nearest Neighbor Matching (NNM). Nearest neighbor matching (Rubin, 1973) generally selects k matched controls for each treated unit (often, $k=1$). The simplest nearest neighbor matching uses a “greedy” algorithm, which cycles through each treated unit one at a time, selecting the available control unit with the smallest distance in terms of propensity score to the treated unit (Caliendo et al., 2008).

The method has some advantages over OLS, since it uses almost no assumptions about the data, and use proximity between units in the data, therefore allowing to compare similar groups in terms of demographics and financial status. Nevertheless, it is still sensitive to outliers and to irrelevant attributes.

Generally, greedy matching performs poorly with respect to measuring average pair differences when there is intense competition for controls and performs well when there is little competition (Rubin, 1973). Using only the NNM method, would cost in the loss of control variables and observations, therefore, I used both methods, first the OLS method to get the basic results controlling over all relevant variables, and secondly the NNM to validate those results by overcoming some of the issues OLS regressions have, even though I used fewer control variables.

When implementing those two methods I had to consider the most relevant variables available in order to control effectively over the outcome variable in the regression. Therefore, I used correlation test to check that the independent variables are not correlated with one another or with the dependent variable. Also, my choice of control variables was guided by balance checks of treatment and control group, I have used the variables that were not as significantly different between the two groups as control

variables in the OLS and NNM regressions. Below are the independent and dependent variables I have used in the regressions, for further explanations for each variable please see Section 4.

<u>Independent Variables:</u>	Justification for use as a control variable
Children Home	More children assumed to cause greater expenses to the family.
Mother Age	Older people considered more ill-equipped regarding financial literacy (Henager et al. 2016).
Single Parent	Families with single income assumed to struggle more with budget constraints.
Returning Family	Family that repeat the program assumed to struggle with changing of habits.
Immigrated after 15	Immigrations can deal with economic hardships that native would not.
City Socio Score 1-10	Correlated with income and financial literacy levels.
Baseline Outcome Value	The better a family performed on the beginning of the program the better it assumed to perform at the end of it.
Meetings Number	Longer program and mentor's guiding can positively effect "success".
Mentor Experience	Greater experience of the mentor can lead to better outcomes in the program.
Waiting time for Mentor	Longer waiting time for the service can cause lower motivation levels.

<u>Dependent Variables:</u>	Justification for use as a dependent variable
Execution Gap	Represents the financial status of a family at the end of program and measure how successfully it managed to improve its cashflow.
Filled Execution	To examine if and how the motives of recording income and expenses have changed following the policy change.
Completed Program	To examine increase or decrease in motivation reflected by the completion of the program, following the policy change.
Days from Program Completion to Last Execution	To examine how the policy change effected the willingness to continue use the tool after the end of the program. Assumed to help maintain awareness to budget constraints.

Next, in the results section, I will describe the results for the measured ITT effect on several variables to evaluate the impact of the digital transition of Paamonim expenditure tracking tool on:

- (1) participants' success in improving monthly cashflow balance,
- (2) expenditure records accuracy,
- (3) program completion rate, and
- (4) long-term usage.

6. Results

Below I detailed the results for the measured ITT effect on four different dependent variables: (1) Execution Gap, (2) Filled Execution, (3) Completed Program and (4) Days from Program Completion to Last Execution.

(1) ITT Effect on "Execution Gap" variable

Looking at the data available, I decided the best way to address my research question is by using Execution Gap as the dependent variable in the regressions. The most common way Paamonim use to examine how successfully a family performed in the intervention program is by calculating the difference between income and expenditure gap in the last recorded execution (Execution Gap) and income and expenditure gap in the beginning of the program (Reflection Gap). Since family's ability to maintain positive cashflow will determine its ability to serve debt and save for the future, it is important to pay attention to this variable.

As described in Section 5, instead of using the DD method, I chose to run an OLS regression where I control the baseline value – Reflection Gap. I regressed the dependent variable on six different set of controls: (1) No controls (2) Baseline value of outcome variable (3) Demographic Information (4) Demographic Information and Baseline value (5) Program Features (6) Program Features and Baseline value.

Figure 7 below shows the ITT effect in an OLS regression on the dependent variable **Execution Gap**:

<i>Figure 7</i>	(1)	(2)	(3)	(4)	(5)	(6)
	No Controls	Baseline value of outcome	Demographic Information	Demographics + Baseline value	Program Features	Program Features + Baseline value
Observations	2,651	2,651	1,925	1,925	2,591	2,591
Variables						
Treatment	816.4*** (313.2)	756.8** (309.6)	1,091*** (398.7)	995.7** (393.9)	694.8** (317.0)	652.4** (314.9)
Children Home			-89.28 (109.8)	-33.17 (112.7)		
Mother Age			28.54 (20.72)	28.96 (20.03)		
Single Parent			-1,493*** (436.6)	-1,492*** (438.5)		
Returning Family			228.7 (701.0)	284.0 (698.3)		
Immigrated after 15			441.5 (503.9)	349.3 (510.0)		
City Socio Score 1-10			-80.51 (106.6)	-68.62 (107.1)		
Baseline Outcome Value (Mean=2,972 NIS)		0.224*** (0.0494)		0.239*** (0.0633)		0.191*** (0.0452)
Meetings Number					87.05** (37.87)	89.07** (37.97)
Mentor Experience					-12.19 (30.60)	-19.83 (30.12)
Constant	2,972*** (185.8)	3,082*** (179.5)	2,571*** (922.9)	2,529*** (903.8)	2,399*** (346.0)	2,507*** (337.9)

The coefficient on Treatment is positive, large, and significant in all six regressions. In other words, families in the treatment group had a significantly higher value on the Execution Gap- family's last recorded income minus expenditure, than the control group. When controlling only for the baseline value (Reflection Gap), the coefficient was highly positive, meaning the treatment group performed better in maintaining the gap between income and expenditure. While the average execution gap in the control group who used the old tool, is 2,972 NIS, on average, families in the treatment group which used the new tool were able to save additional 756.8 NIS a month.

As expected, the baseline value of outcome is positively correlated with the outcome, families who did better at the beginning of the program also did better at the end. But more importantly, even when I control for this variable, the positive and significant coefficient on Treatment remains. which can

reassure the result, since it means that the difference in performance between Treat and Control groups is not caused by them being different at the baseline, i.e the value of Reflection Gap.

Controlling for demographics and baseline value, increased the coefficient to 995.7 NIS, mainly due to the variable Single Parent that had a strong negative effect on the outcome. Controlling program features and baseline value, lowered the coefficient to 652.4 NIS, although it remained relatively high and significant.

Age has found to have a positive coefficient on the outcome variable Execution Gap. Higher number of children at home have a negative coefficient, as one would expect. Families who did more than one intervention (Returning Family), although considered to be somehow weaker in financial management capabilities, performed better than average. Immigration also have a positive coefficient, and those families performed better.

I also found some counter intuitive aspects in the results, families who live in higher socioeconomic ranked cities were found to perform lower than average, but can be explained by a lack of motivation, since most families with higher income might deal with less stress than lower income families regarding financial hardships.

As part of the empirical method I described in Section 5, I chose to use the Nearest Neighbour Matching method (NNM) to test the ITT effect and validate the OLS results. I used exact match for the following variables: City Socio Score, Single Parent, and Immigrated after Age 15. I decided to match on these variables for two main reasons; first, to preserve as much observations as possible in the NNM regression, and second to include the variables which have the most control effect. I also matched for the baseline value of the outcome variable- Reflection Gap, to achieve more accurate results, corresponding with the OLS results.

Figure 8 below presents the results of the NNM regression:

<i>Figure 8</i>	Coefficient (n=1993)
ITT Effect on Execution Gap	1536.512*** (450.772)

The coefficient found using the NNM regression is highly positive and significant. When matching the control variables and examine similar groups in data, I received a higher coefficient than showed by the OLS regression. While the mean of the execution gap in the control group, who used the old tool is 2,972 NIS, on average, families in the treatment group which used the new tool were able to save additional 1536.5 NIS a month.

I also used the filtered data of Execution Gap and Reflection Gap to measure the ITT effect on the dependent variable Execution Gap Filtered. The filtered data contained only families whose income and expenditure in execution and reflection records was higher than 3,593, as mentioned in Section 4.

I found that by filtering out the assumed incorrect filled executions, the coefficient had increased. Results for regression on the filtered variable (See Appendix A) showed that the coefficient when controlling for the baseline filtered value is 1,041 NIS, and 1,491 NIS when controlling also for demographics. when controlling for program features and the filtered baseline value the coefficient was 960.3 NIS.

(2) ITT effect on "Filled Execution" Variable

The old tool required the mentors to actively insert family's monthly record to Paamonim web interface, obligating the mentor to supervise over family's records accuracy at least once a month. The new tool synchronize automatically with the interface, allowing the mentor to supervise easily and multiple times a month over family's records accuracy, but at the same time eliminates their obligation to manually check the record's accuracy before uploading it to the system as they would do with the old tool. As the automation process made the supervision of mentors a choice rather than an obligation, it could lead to incorrect or incomplete recording of the execution records.

I suggested that the new tool is likely to have a negative effect regarding execution recording, meaning the percentage of families in the treatment group that have recorded both income and expenditure in the last execution is likely to be lower than in the control group.

With the aim of finding the answer, I ran OLS and NNM regressions using the same demographics controls as the of the Execution Gap regression described earlier. I also used *Filled Q1/Q2* variable as a motivation control variable, and *Mentor Experience* and *Waiting Time for Mentor* as program features which can affect the outcome.

Figure 9 below shows the ITT effect in an OLS regression on the outcome variable **Filled Execution**:

<i>Figure 9</i>	(1)	(2)	(3)
	No Controls	Demographics	Program Features
Observations	4,340	3,140	3,466
Variables			
Treatment	-0.306*** (0.0143)	-0.295*** (0.0169)	-0.386*** (0.0155)
Children Home		0.00441 (0.00561)	
Mother Age		0.000550 (0.000832)	
Single Parent		-0.0450 (0.0276)	
Returning Family		-0.0364 (0.0286)	
Immigrated after 15		-0.0379* (0.0219)	
City Socio Score 1-10		0.00263 (0.00424)	
Mentor Experience			0.00285 (0.00192)
Waiting Time for Mentor			-0.000126 (0.000177)
Filled Q1/Q2			0.105*** (0.0202)
Constant	0.711*** (0.00991)	0.684*** (0.0424)	0.668*** (0.0227)
Average in control group	0.712		

The coefficient is highly negative and significant in all three regressions. When controlling demographic information, families in the treatment group were 29.5% less likely to record income and expenditure in the last execution recoded. Controlling over program features increased the negative

effect to 38.6%, mainly due to the strong positive effect of the perceived family's motivation control variable- Filled Q1/Q2, indicating whether a family answered at least one of the questionnaires it was given in the beginning and end of the program.

The following results show that although families were able to maintain higher execution gap in the treatment group, the recording rate of the execution itself was lower.

I also tested the ITT effect with NNM method, with exact matching on the following variables: *City Socio Score 1-10, Children Home, Single Parent Immigrated after 15, and Filled Q1/Q2*.

<i>Figure 10</i>	Coefficient (n=2705)
Simple ITT effect on Filled Execution	-0.366*** (0.019)

The coefficient found using the NNM is slightly higher than the effect found with the OLS regression, suggesting families in the treatment group were 36.6% less likely to record income and expenditure in the last execution recoded compared to the control group.

(3) ITT effect on "Completed Program" variable

Another interesting subject to cover is whether the policy change affected the percentage of families which completed the program. Families face a hard time going through the intervention, dealing with debt, limited budget and the obligation of consistently recording expenses. Therefore, motivation often drops during the program.

To find the ITT effect, I used both OLS regression and NNM. I ran three different regressions: (a) No controls (b) Control over demographic information (c) Control over program features. Demographic controls are as used in previous regressions. Regarding to the program features, I used Mentor Experience, Debt Repayment and Waiting Time for Mentor as control variables. I believe those controls will have the most effect on the dependent variable, since those can indicate about external motivation.

Figure 11 below shows the ITT effect in an OLS regression on the dependent variable **Completed Program**:

<i>Figure 11</i>	(1)	(2)	(3)
	No Controls	Demographics	Program Features
Observations	4,340	3,140	4,134
Variables			
Treatment	0.0954*** (0.0142)	0.0909*** (0.0167)	0.0914*** (0.0144)
Children Home		0.00981* (0.00554)	
Mother Age		-0.00115 (0.000832)	
Single Parent		-0.0433 (0.0269)	
Returning Family		-0.102*** (0.0283)	
Immigrated after 15		-0.0340 (0.0221)	
City Socio Score 1-10		0.00311 (0.00403)	
Mentor Experience			-0.00420** (0.00183)
Waiting Time for Mentor			-0.000420** (0.000165)
Debt Repayment			0.00000550* (0.00000318)
Constant	0.627*** (0.0106)	0.660*** (0.0417)	0.670*** (0.0160)
Average in control group	0.627		

Treatment coefficient is positive and significant in all three regressions. While on average 62.7% of families in the control group succeed in completing the intervention program, families in the treatment group were 9.5% more likely to complete it. When controlling demographic information, families in the treatment group were 9.09% more likely to finish the program. Controlling over program features conclude similar coefficient of 9.14%. Even when I added different controls on the variable, the positive and significant coefficient on Treatment remains, which can reassure the result.

I also test the ITT effect with NNM method, with exact matching on the following variables: *City Socio Score 1-10, Children Home, Single Parent Immigrated after 15, and Filled Q1/Q2.*

Figure 12	Coefficient (n=2705)
Simple ITT Effect on Completed Program	0.082*** (0.017)

The coefficient found using the NNM is lower than the effect showed by the OLS regression, although still positive and significant. Families in the treatment group were 8.2% more likely to complete the intervention program.

(4) ITT effect on "Days from Program Completion to Last Execution" variable

Another important factor to measure is if the new tool encourages families to use it after the completion of the program. I suggest that the improved ease of use and accessibility as well as other factors described in Section 3 shall impact positively on that variable. To measure the effect of the treatment I used the variable Days from Program Completion to Last Execution, defined as the count of days passed since the last meeting, perceived as the termination date of the program, to the date of the last recorded execution. As can be told from the descriptive statistics in Figure 6, the data indicates that on average, most of the families stopped using the expenditure tracking tool before the program ended. This could have caused by structural bias in the data, but since it happens in both the treatment and the control group, I decided to use that data.

The figures below show the distribution of the variable in both control and treatment groups:

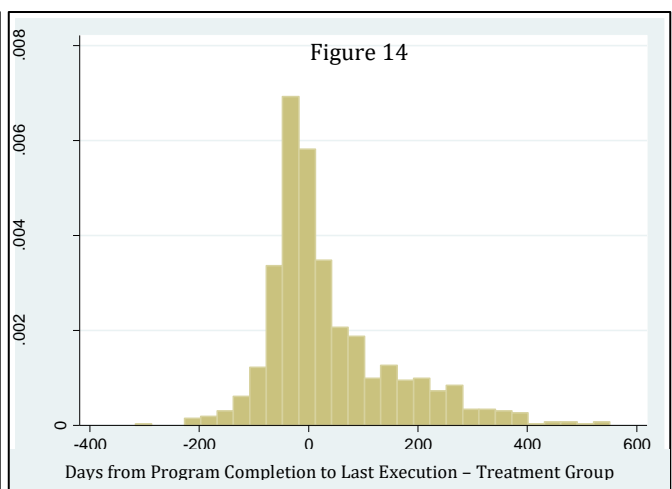
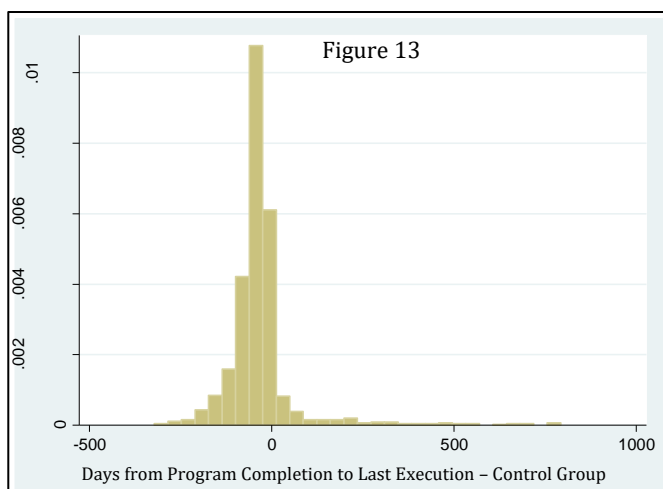


Figure 13 shows the distribution of the variable in the control group and Figure 14 shows the distribution in the treatment group. As the histograms shows, over the two groups, most families stopped using the tracking tool around the same time they complete the intervention, meaning zero days or less of usage after completing the program. Nevertheless, families in the treatment group which used the new tool, were more likely to continue using it after the program ends.

I also performed an OLS regression and NNM to evaluate the ITT effect. The results of the OLS showed a significantly positive coefficient of 67.5 to 75.1 days, depending on the controls applied, implying families in the treatment group used the recording tool on average more than two months after the control group has stopped. NNM results were similar and conclude a significant positive coefficient of 72.8 days. The full results appear in Appendix B.

7. Conclusion

In the recent years, there has been a growing interest in academic researches for the effectiveness of financial literacy programs around the world (Braunstein and Welch, 2002; Bernheim and Garrett, 2003; Carlin and Robinson, 2002; Drexler et al, 2014; Alhenawi and Elkhal, 2013). Additionally, researchers have tried to measure the connections and effects of digital banking on financial literacy (Hogarth et al., 2004; Servon et al., 2008).

In this study I measured the effect of a policy change involving the introduction of a new expenditure and income tracking tool used by participants in Pammonim non-profit organization long-term intervention program. The new tool, introduced in June 2018, replaced an excel based tool and featured easier to use and convenient user experience, allowing participants to record their expenses through their mobile phones.

I used data collected by Paamonim, contains administrative and financial data about 4,340 participants in the intervention program who participated during the years 2017-2019, split into two groups, each has the same timeframe of one calendar year. The control group contained participants from the 12

month period before the policy change, and the treatment group from the 12 month period after the policy change.

My hypothesis in this study was that the new tool should have a positive impact on the "success" family experience following the intervention, where "success" is measured by the gap between income and expenditure in the last recorded cashflow balance (referred as "execution"), usually at the end of the program or later.

I have used two empirical methods to test the hypothesis: Ordinary Least Squares regression, and Nearest Neighbour Matching Method. Results have showed a high and significant positive coefficient on income and expenditure gap, even when controlling for demographic information, different program features, or the baseline value of outcome – the gap between income and expenditure at the early stage of the program (Reflection Gap). By that, suggesting that the difference in performance between treatment and control groups is not caused by them being different in baseline values. Additionally, results indicate a better rate of participants finish the program and evidence for long-term usage in the new tool. Nevertheless, I found a negative treatment coefficient when I measured the income and expenditure records accuracy, implying a disadvantage in controlling the actual implementation of expenditure tracking.

The study has some limitations though; the treatment group is observed in a different year than the control group. Also, as found by running t-tests, the control and treatment group are significantly different in many parameters when entering the program. Additionally, the data suffers from inaccuracy as it is based on self-reported data. The OLS with controls, or the matching regressions, can only partially address this. It is likely that there is still some selection bias and omitted variables that affects the results.

The ideas proposed in this study should be further investigated in an experimental setup. Nevertheless, the study provides a new way to think and evaluate the contribution of transition to a digital platform

in financial literacy programs. By adapting the concept of combination of technology with financial literacy, organizations around the world can achieve more effective results and improve their success rate, helping millions of people become more financial educated and managing their financial matters in a responsible and balanced way.

8. References

- A. J. Murphy, "Financial Plan for Your Life and Career Goals," *Simulation*, vol. 29, pp. 128–130, 2002.
- Anguelov, Christoslav E., Marianne A. Hilgert, and Jeanne M. Hogarth. 2004. *U.S. Consumers and Electronic Banking, 1995-2003*. Federal Reserve Bulletin, 90 (Winter): 1–18.
- Alhenawi, Y. (2013). *Financial literacy of US households: Knowledge vs. long-term financial planning*. Financial Services Review, 22.
- Atkinson, A., McKay, S., Collard, S., & Kempson, E. (2007). *Levels of financial capability in the UK*. *Public Money and Management*, 27(1), 29-36.
- Authority, F. C. (2014). Consumer credit and consumers in vulnerable circumstances. <https://www.fca.org.uk/publications/research/consumercredit-and-consumers-vulnerable-circumstances>, last accessed, 27(01), 2017.
- Barigozzi, M., et al. 2009. *The distribution of households consumption-expenditure budget shares*, European Central Bank, Working Paper Series 1061: 22–39.
- Bernheim, Douglas and Daniel Garrett (2003). "The Effects of Financial Education in the Workplace: Evidence from a Survey of Households," *Journal of Public Economics*, 87, pp. 1487-1519.
- Braunstein, S., & Welch, C. (2002). *Financial literacy: An overview of practice, research, and policy*. Fed. Res. Bull., 88, 445.
- C. L. Bird, A. Şener, and S. Coşkuner, "Visualizing financial success: planning is key," *Int. J. Consum. Stud.*, vol. 38, no. 6, pp. 684–691, 2014.
- Caliendo, M., & Kopeinig, S. (2008). *Some practical guidance for the implementation of propensity score matching*. *Journal of economic surveys*, 22(1), 31-72.
- Drexler, A., Fischer, G., & Schoar, A. (2014). *Keeping it simple: Financial literacy and rules of thumb*. *American Economic Journal: Applied Economics*, 6(2), 1-31.

- European Economic and Social Committee (2016), *Financial education strategies and best practices within the European Union*, <https://www.eesc.europa.eu/sites/default/files/resources/docs/qe-02-16-362-en-n.pdf>
- Firli, A. (2017). *Factors that influence financial literacy: a conceptual framework*. In IOP Conference Series: Materials Science and Engineering (Vol. 180, No. 1, p. 012254).
- Carlin, B. I., & Robinson, D. T. (2012). *What does financial literacy training teach us?*. The journal of economic education, 43(3), 235-247.
- Fisher LD, Dixon DO, Herson J, Frankowski RK, Hearn MS, Peace KE. *Intention to treat in clinical trials*. In: Peace KE, editor. Statistical issues in drug research and development. New York: Marcel Dekker; 1990. pp. 331–50.
- Goldberger, A. S. (1964). *Econometric theory*. Econometric theory.
- Greenspan, A. (2005). The importance of financial education today. *Social Education*, 69(2), 64-66.
- Henager, R., & Cude, B. J. (2016). *Financial Literacy and Long-and Short-Term Financial Behavior in Different Age Groups*. Journal of Financial Counseling and Planning, 27(1), 3-19.
- J. J. Kaye, M. Mccuiston, R. Gulotta, and D. a Shamma, “*Money Talks : Tracking Personal Finances*,” Proc. 32nd Annu. ACM Conf. Hum. factors Comput. Syst. - CHI '14, pp. 521–530, 2014.
- Jurg K. Siegenthaler, and Jeremy Ward (2000). *Personal Finance and the Rush to Competence: Financial Literacy Education in the U.S*. Institute for Socio-Financial Studies. Fannie Mae Foundation.
- Karp, G. (2009). *The 1-2-3 money plan the three most important steps to saving and spending smart*. Upper Saddle River, N.J: FT Press.
- Kidwell, B., & Turrisi, R. (2004). *An examination of college student money management tendencies*. Journal of Economic Psychology, 25, 601–616.
- Kim, H., Chan, H.C. and Gupta, S. (2007), “*Value-based adoption of mobile internet: an empirical investigation*”, Decision Support Systems, Vol. 43 No. 1, pp. 111-126.

- Lusardi, A. 2008. Household Saving Behavior: *The Role of Financial Literacy, Information and Financial Education Programs*. London: Blackwell.
- Lusardi, A., & Mitchell, O. S. (2009). *Financial literacy: Evidence and implications for financial education*. Trends and issues, 1-10.
- Mortimer, G., Neale, L., Hasan, S.F.E. and Dunphy, B. (2015), “*Investigating the factors influencing the adoption of m-banking: a cross cultural study*”, International Journal of Bank Marketing, Vol. 33 No. 4, pp. 545-570.
- OECD (2009), *Financial Literacy and Consumer Protection: Overlooked Aspects of the Crisis*, OECD Publishing, <http://www.oecd.org/finance/financial-markets/43138294.pdf>
- P. Babiarz and C. a. Robb, “*Financial Literacy and Emergency Saving,*” J. Fam. Econ. Issues, pp. 1–11, 2013.
- Puntanen, S., & Styan, G. P. (1989). *The equality of the ordinary least squares estimator and the best linear unbiased estimator*. The American Statistician, 43(3), 153-161.
- Rubin, D. B. (1973). *The use of matched sampling and regression adjustment to remove bias in observational studies*. Biometrics, 185-203.
- Schaafsma, J., & Sweetman, A. (2001). *Immigrant earnings: age at immigration matters*. Canadian journal of Economics, 1066-1099.
- Servon, L. J., & Kaestner, R. (2008). *Consumer financial literacy and the impact of online banking on the financial behavior of lower-income bank customers*. Journal of Consumer Affairs, 42(2), 271-305.
- Shahrabani, S. (2012). *The effect of financial literacy and emotions on intent to control personal budget: A study among Israeli college students*. International Journal of Economics and Finance, 4(9), 156-163.
- Shpitser, I., & Pearl, J. (2012). *Effects of treatment on the treated: Identification and generalization*. arXiv preprint arXiv:1205.2615.

The Balance. "*Why You Need to Track Expenses to Become Aware of Your Spending*.
<https://www.thebalance.com/is-it-important-to-track-my-expenses-2385679>." Accessed September 29, 2020.

Titko, J.; Lace, N. 2013. *Financial Literacy: Building a Conceptual Framework*. Proceedings of the 11th international conference Liberec Economic Forum 2013. Sychrov, 585–592.

Xu, L., & Zia, B. (2012). *Financial literacy around the world: an overview of the evidence with practical suggestions for the way forward*. The World Bank.

Appendix A

Figure 15 below shows the ITT effect in an OLS regression on the dependent variable **Execution Gap**

Filtered:

<i>Figure 15</i>	(1)	(2)	(3)	(4)	(5)	(6)
	No Controls	Baseline value of outcome	Demographic Information	Demographics + Baseline value	Program Features	Program Features + Baseline value
Observations	2,400	2,331	1,761	1,710	2,353	2,287
Variables						
Treatment	997.4*** (335.5)	1,041*** (343.1)	1,342*** (426.1)	1,419*** (437.6)	920.9*** (344.2)	960.3*** (352.8)
Children Home			-50.13 (115.0)	8.804 (120.8)		
Mother Age			35.41* (20.33)	33.07 (20.56)		
Single Parent			-1,574*** (450.8)	-1,445*** (461.9)		
Returning Family			60.40 (734.7)	40.93 (757.4)		
Immigrated after 15			389.2 (537.1)	341.4 (560.0)		
City Socio Score 1-10			-98.24 (113.1)	-104.2 (117.3)		
Baseline Outcome Value		0.188*** (0.0482)		0.202*** (0.0609)		0.180*** (0.0487)
Meetings Number					113.7*** (39.49)	117.4*** (40.10)
Mentor Experience					5.357 (31.22)	-6.503 (31.11)
Constant	2,963*** (188.9)	3,033*** (182.6)	2,335** (929.2)	2,425** (942.1)	2,126*** (357.0)	2,206*** (351.0)

Figure 16 below presents the results of the NNM regression:

<i>Figure 16</i>	Coefficient (n=1877)
Simple ITT Effect on Execution Gap Filtered	1740.339*** (489.274)

Appendix B

Figure 17 below shows the ITT effect in an OLS regression on the dependent variable **Days from**

Program Completion to Last Execution:

<i>Figure 17</i>	(1)	(2)	(3)
	No Controls	Demographics	Program Features
Observations	2,053	1,497	1,768
Variables			
Treatment	69.64*** (5.041)	67.52*** (5.943)	75.08*** (5.821)
Children Home		-0.278 (2.051)	
Mother Age		1.190*** (0.335)	
Single Parent		-17.50* (9.062)	
Returning Family		-6.196 (10.46)	
Immigrated after 15		2.995 (8.684)	
City Socio Score 1-10		2.442 (1.499)	
Mentor Experience			-0.613 (0.539)
Meetings Number			-1.826*** (0.706)
Filled Q1/Q2			31.76*** (6.901)
Constant	-30.84*** (3.072)	-88.76*** (14.31)	-40.31*** (8.820)

Figure 18 below presents the results of the NNM regression:

<i>Figure 18</i>	Coefficient (n=1360)
Simple ITT effect on Days from Program Completion to Last Execution	72.853*** (6.837)

תוכן עניינים

1.....	הקדמה	1
3.....	סקירת ספרות	2
3.....	חשיבות חינוך פיננסי	3
5.....	תוכניות חינוך פיננסי	5
6.....	אפקטיביות התוכניות לחינוך פיננסי	6
8.....	מעבר לבנקאות דיגיטלית	8
9.....	תוכנית הליווי והסבר על שינוי המדיניות	9
9.....	תוכנית הליווי של פעמונים	9
12.....	שינוי המדיניות	12
14.....	נתונים	14
21.....	שיטות מחקר	21
25.....	תוצאות	25
33.....	מסקנות ודיון	33
36.....	ביבליוגרפיה	36
40.....	נספח א'	40
41.....	נספח ב'	41

תיאור הטבלאות/האיורים :

	Figure 1
תוצאות עיקריות	Figure 1
סיכום מבנה תוכנית הליווי	Figure 2
צילום מסך של כלי המעקב הישן	Figure 3
צילום מסך של כלי המעקב החדש	Figure 4
סיכום ההבדלים העיקריים בין הכלים	Figure 5
סטטיסטיקה תיאורית ומבחני T	Figure 6
תוצאות רגרסיית OLS (1)	Figure 7
תוצאות רגרסייה NNM (1)	Figure 8
תוצאות רגרסיית OLS (2)	Figure 9
תוצאות רגרסייה NNM (2)	Figure 10
תוצאות רגרסיית OLS (3)	Figure 11
תוצאות רגרסייה NNM (3)	Figure 12
היסטוגרמה המתארת את השימוש בכלי המעקב לאחר סיום התוכנית – קבוצת הבקרה	Figure 13
היסטוגרמה המתארת את השימוש בכלי המעקב לאחר סיום התוכנית – קבוצת הטיפול	Figure 14
תוצאות רגרסיית OLS (4)	Figure 15
תוצאות רגרסייה NNM (4)	Figure 16
תוצאות רגרסיית OLS (5)	Figure 17
תוצאות רגרסייה NNM (5)	Figure 18

תקציר

המאמר שלפניכם משלב שתי שיטות מחקר במטרה לאמוד את השפעות המעבר לכלי דיגיטלי המשמש לרישום הכנסות והוצאות' על משתתפים בתוכנית הליווי של עמותת פעמונים, אשר משתתפים בה יחידים ומשפחות המתמודדים עם קשיים בניהול הכלכלי של משק הבית. אני משער כי הכלי הדיגיטלי, המציע למשתמשים נוחות שימוש וזמינות טובה יותר מהכלי שהיה בשימוש קודם לכן, ישפיע באופן חיובי על מדד ההצלחה של המשתתפים בתוכנית, ויביא לשיפור בהתנהגות הפיננסית שלהם, כפי שניתן לנתח מתוך נתונים שנאספו בידי פעמונים על 4,340 משפחות שהשתתפו בתוכנית הליווי בין השנים 2017-2019.

במטרה לאמוד את השפעת הכלי החדש, פיצלתי את מאגר הנתונים לשתי קבוצות; האחת מכילה משפחות שלקחו חלק בתוכנית בתקופה בה הכלי הישן היה בשימוש (קבוצת הבקרה), ואילו קבוצה שנייה מכילה משפחות שלקחו חלק בתוכנית בתקופה שלאחר החלפת הכלי הישן לכלי הדיגיטלי (קבוצת הטיפול).

התוצאות הראו השפעה חיובית ומובהקת על הפער הנמדד בין הכנסות להוצאות ברישום המתועד האחרון שמשפחה ביצעה, שיפור מובהק באחוז המשתתפים שסיימו את תהליך הליווי וכן עדות היכולה להצביע על שימוש ממושך יותר בכלי הרישום לאחר סיום התוכנית. למרות זאת, מצאתי גם השפעה שלילית על איכות ודיוק הרישום.

על אף התוצאות המובהקות, קיימות מספר מגבלות; קבוצת הטיפול השתתפה בתוכנית בתקופה שונה מקבוצת הביקורת, שתי הקבוצות שונות בפרמטרים רבים הנמדדים בכניסה לתוכנית, וקיימים אי דיוקים וחוסרים רבים בנתונים מאחר ורובם מבוססים על דיווח עצמי. שיטות המחקר בהן עשיתי שימוש במחקר זה יכולות להתגבר רק על חלק מהמגבלות המצוינות.

עם זאת, מאמר זה מספק דרך חדשה לחשוב ולהעריך את התרומה של שילוב פלטפורמות דיגיטליות בתוכניות חינוך פיננסי. על ידי אימוץ הרעיון לשילוב טכנולוגיה במסגרת תוכניות אלו, ארגונים ברחבי העולם יוכלו להשיג תוצאות אפקטיביות יותר ולשפר את אחוזי ההצלחה של משתתפים בתוכניות חינוך פיננסי. בעזרת כך, יוכלו לסייע למיליוני אנשים בשיפור השכלתם הפיננסית ובניהול אחראי ומאוזן יותר של כלכלת המשק הבית.

אוניברסיטת בן-גוריון בנגב
הפקולטה למדעי הרוח והחברה
המחלקה לכלכלה

השפעת המעבר לכלי דיגיטלי למעקב אחר הוצאות והכנסות על הצלחתם הנאמדת של
משתתפים בתוכנית הליווי של פעמונים

חיבור זה מהווה חלק מהדרישות לקבלת התואר "מוסמך למדי הרוח והחברה" (M.A.)

מאת: רועי טוויזר

בהנחיית: ד"ר סטריאן מירי

אוניברסיטת בן-גוריון בנגב
הפקולטה למדעי הרוח והחברה
המחלקה לכלכלה

השפעת המעבר לכלי דיגיטלי למעקב אחר הוצאות והכנסות על הצלחתם הנאמדת של
משתתפים בתוכנית הליווי של פעמונים

חיבור זה מהווה חלק מהדרישות לקבלת התואר "מוסמך למדי הרוח והחברה" (M.A.)

מאת: רועי טוויזר

בהנחיית: ד"ר סטריאן מירי