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Different Uses of Microfinance Among Conventional and Islamic Borrowers: Evidence from Jordan

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Abstract: This paper focuses on investment decisions made by microfinance borrowers in Jordan. While there has been a lot of literature concentrating on the level of investment after credit access was made available, there has been very limited research on the impact of Islamic microfinance. The amount of literature comparing Islamic financing and its conventional counterpart is even more uncommon. This study will look at how conventional and Islamic borrowers differ in their decisions pertaining to business investments, home improvement projects and consumer durable goods. Results show that microfinance loan take-ups do lead to a higher probability of business investments. In addition, it is found that the two groups of borrowers do not differ in investments regarding their microenterprises, but Islamic borrowers are less likely to invest in home improvement projects and purchase consumer durables. The findings suggest that there exists a substantial difference among investment decisions made by the two types of borrowers.

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1. Introduction

The development of microfinance has been crucial in the context of poverty alleviation and women empowerment in the developing world. Since its establishment in Bangladesh, the program has consistently grown at an exponential rate. In 2011, it is reported that around 100 million customers worldwide are borrowing from 10,000 microfinance institutions (Ahlin et al., 2011). The effects of microfinance on consumers' welfare has been extensively researched; however, several authors argue that microfinance has yet to reach its full potential, particularly in delivering credit access to the poorest of the poor (Morduch, 1998; Scully, 2004; Coleman, 2006). This is especially true in the Middle East, since it is estimated only 1% of the microfinance clients are living in this region of the world (Coleman, 2004). The lack of microfinance in the area can be explained by the existence of interest rates, or *riba*, which are charged on conventional loans. According to Shari'a Law, *riba* is strictly prohibited in Islam, preventing many people from participating in microcredit. For instance, the Consultative Group to Assist the Poor (2007) shows that the majority of respondents in Muslim countries choose not to partake in conventional microfinance practices due to religious reasons (El-Komi & Croson, 2011). Thus, Islamic microfinance has been introduced as an alternative to traditional lending methods. Due to its recent establishment, the practice of Islamic microfinance has not received much attention from researchers. Moreover, the literature comparing Islamic financing and its conventional counterpart is even more uncommon. This paper focuses on how investment decisions differ between conventional and Islamic microfinance borrowers.

Microfinance in Jordan was first started in the mid-to-late 1990's and has become one of the fastest growing sectors of the country's economy. In 2008, the sector has 144,232 active clients and a gross portfolio of about $127 million, accounting for 8.5% of the regional market (Saqfalhait, 2010). The majority of the microfinance clients in Jordan are women, whose financial status and living standards were greatly improved by the program. A large part of microcredit in the country consists of providing loans to both individuals and groups for financing existing projects or start-ups. A few MFI's in the region have also started giving out loans for consumer credit products such as

vehicle, education and home improvements (Saqfalhait, 2010). Despite ongoing success with the program, the sector is relatively new and still needs further attention from policy makers to become accessible to the poor.

The survey was conducted over the course of two months in Jordan, from June to August 2012. Participants were asked about fundamental events that took place from 2002 to 2012, pertaining to enterprise investments, home improvements, and consumer durables. The indicated time period was constructed based on the microfinance institution that the researchers worked with, since the bank was opened in 2006. The data analysis was done using a Linear Probability Model (LPM) with region-year fixed-effects. Standard errors were clustered at the region-year level to correct for the heteroskedasticity problem found in earlier versions of the model. The results show that there is an increase in the level of investment for business and home improvement associated with microfinance loan take-ups. Overall, there are no large discrepancies with how conventional and Islamic borrowers spend their loans. In addition, the only noticeable difference is that Islamic clients are less likely to purchase consumer durables and enroll their children in private schools.

2. Literature Review

2.1 Investment:

While various studies have found a negative relationship between microfinance take-up and poverty (Pitt & Khandker, 1998; Fernando, 2006; Khandker, 1999; Chowdhury et al., 2005), others have argued that the impact of microfinance appears to be small, particularly in the context of experiments (Coleman, 2006; Karlan & Zinman, 2009). Still, these studies use different methods of measuring poverty and improvement of welfare, including business profits, per capita income, and per capital expenditure. For example, Pitt and Khandker (1998) find strong evidence supporting the impact of microfinance on consumption smoothing and increase in household income in Bangladesh. By utilizing a quasi-experimental setting, annual household consumption expenditure was found to increase by 18 percent and 11 percent with a female and male borrower, respectively. Although using these measures can prove to be effective, Pellegrina (2011) claims that investment level is a better indicator of long-term effects of microfinance. In addition, Bage (2004) also argues that focusing on the level and types of investment is essential, since participating in productive activities can be seen

as the first step toward self-sustainability for low-income families. The practice of "unproductive lending" can sometimes drive the borrowers into even more debt, making them worse off than they were before (Karlan & Zinman, 2009). Thus, this study will concentrate on how borrowers spend their loans toward productivities, with a particular focus on business investments and home improvements.

The theories on the impact of microfinance suggest that investment and consumption levels depend heavily on how long it takes for the project returns to be realized, as well as how patient the household can be (Banerjee et al., 2010). The theory states that if a loan is borrowed to be consumed today, or to be invested in a project that will yield immediate returns, then an increase in consumption is found. However, if the loan does not yield immediate returns, Banerjee et al. (2010) finds a decrease in consumption in addition to an increase in short-term investment. The findings suggest that when research is done on the short-term effects of microfinance, only an immediate level of investment can be observed.

Thus, several researchers have focused on the level of investment as a proxy for welfare development and found significant impact. Using a randomized experiment to evaluate the impact of microfinance on investment in Morroco, Crepon et al. (2011) find that significantly more businesses were launched after microfinance was made available in the region. The purchases of durables, especially business durables, were also found to increase. However, the effect is only found on already existing activities, since no new businesses were opened after microfinance was made available to the region. These results suggest that microfinance does have a substantial impact on business-level outcomes. Nevertheless, it does not lead to a miraculous transformation of social conditions, as some literature has suggested. Rajbanshi et al. (2012) find similar results in Nepal by looking at the history of the household's investments. Although credit availability appeared to have no significant impact on the purchase of new machinery or land, it was found to have a positive correlation with the purchase of livestock and new physical retail space. Similarly, according to Karlan and Zimman's (2009) experimental study in Manila, which offers credit access to households previously rejected for a loan, there was little or no evidence supporting the increase in profits and business expansion. Correspondingly, using the same dataset with follow-up surveys from Pitt and Khanker

(1998), Morduch and Roodman (2009) find no significant impact of microfinance on welfare.

On the other hand, other studies have found contradictory results on the impact of microfinance. For example, Banerjee et al. (2010) find a significant effect of microfinance loans on the expansion of existing businesses, along with an increase in profitability and creation of new enterprises. Conducted using a randomized control trial in India, the study discovered that existing business owners were more likely to increase their purchase of durable goods, and consequently become more profitable. Despite these results, the authors find that those with low predicted propensity to start a business do not increase their durables spending, but choose to focus more on nondurable consumption instead. Other studies have also found that borrowers often invest in home improvement projects after the take-up of microfinance loans. For example, Berhane and Gardebroek (2011) learn that after the second round of borrowing, there is a positive and significant effect of microloans on housing improvement. The data were collected through a four-round panel survey on farm households in northern Ethiopia. It is estimated that borrowers are 46% more likely to invest in a major housing upgrade than non-borrowers in the sample. Since home improvement is a long-term investment, it is an indicator of welfare improvement of poor households. Similarly, McIntosh et al. (2011) attain the same results in India, Ghana, and Guatemala, where the probability of a major housing upgrade increases by 3.2% in the years after the take-up of microfinance loans. They also found that in the year the household takes out credit, the probability of business investments nearly triples from 8.1 to 20.9 percentage points (McIntosh et al., 2011).

Despite extensive research on the subject, the question on whether microfinance actually improves the level of investment of durables for its participant still remains ambiguous. Furthermore, there has been virtually no research comparing the effects of conventional microfinance to its Islamic counterpart. Therefore, looking at the investment decisions of the two types of borrowers crucial in the development of lending to the poor, especially in the Middle East.

2.2 Islamic Microfinance

In order to understand the structure of Islamic microfinance, it is important to look at the principles and instruments of the practice. The philosophy of Islamic

microfinance is based mainly on four principles of Shari'a Law: the prohibition of interest rates, risk-sharing, calculation of time-value of money, and the prohibition of taking excessive risk (El-Komi & Croson, 2011). The first principle, the prohibition of *riba* or interest rates, is the most important reason for low penetration rates in the Middle East (and North Africa). The Qur'an has explicitly stated this in Alle Imran: 130,

Devour not riba, doubled and multiplied; but fear Allah; that ye may (really) prosper.

The second principle, risk-sharing is promoted so that lenders and borrowers share the profits and losses during good and bad times (El-Komi & Croson, 2011). These two principles, when combined, mark significant reasons as to how Islamic and conventional microfinance differ. The third principle explains the motive behind the prohibition of *riba*, in that money can only be used as a medium of exchange as long as it is not invested in unproductive activities. The final principle prohibits *Gharar*, otherwise known as the practice of taking excessive risks, or taking part in speculative behaviors such as gambling (El-Komi & Croson, 2011).

There are several methods employed by microfinance institutions when lending to their clients. One of the most popular Islamic methods is the *murabaha* contract, where a product is sold to the borrower from the bank with an agreed markup price. Payments are often made in installments for a specific period of time (El-Komi & Croson, 2011). By utilizing this payment method, the financier must directly obtain the goods which will be given to the entrepreneur, eliminating the possibility of the borrower using the loan for alternative purposes (El-Komi & Croson, 2011). *Murabaha* has also been praised for being more effective than other methods employed by Islamic MFIs. Overall, this model is more cost-effective, has a lower margin of error, and provides immediate collateral for a MFI because the institution owns the goods until the last installment is paid (Akhter et al., 2009). It is also most suitable for working capital financing and fixed asset purchased project financing (Dusuki, 2008).

There are currently two studies that explicitly focus on the comparison of Islamic and traditional interest-based loans. El-Komi & Croson (2011) looked at this issue by developing an experiment with interest-based loan contracts (conventional) and profit-sharing contracts (Islamic). They find that compliance rates are significantly higher in the Islamic-compliant contracts than in the interest contract. Women are also

found to comply more than men; and moreover, religiosity is found to be positively correlated with compliance rates. From the results of the experiment, one can conclude that Islamic and conventional financing methods attract different types of borrowers, mainly based on their level of religiosity.

In order to test what method of financing microfinance clients would prefer, El-Gamal et al. (2012) propose an Islamically accepted model built on the rotating savings and credit association (ROSCA) scheme. The program was tested against the traditional interest-based loaning method in a "laboratory experiment in the field," using poor Egyptian households as their subjects. The authors find that take-up rates for the ROSCA design were 16% higher than the traditional "Grameen-style" method (91% compare to 75%). Overall, the ROSCA treatment was also found to have a statistically significant effect on both take-up and repayment rates, suggesting that subjects prefer this method of financing.

The conceptual framework of microfinance fully supports the social transformation results that many practitioners have claimed. However, studies differ greatly in their findings on impact evaluations through microfinance, and conventional microfinance is still inaccessible to one of the biggest poor populations in the world. It is estimated that about one-third of the world's poor is Muslim (El-Komi & Croson, 2011), and thus cannot take advantage of the current conventional microfinance banking system. Therefore, the development of Islamic microfinance could play a crucial role in poverty alleviation. The nature of Islamic microfinance itself differs significantly from that of conventional practices, introducing a new method of lending in the market. In addition, Islamic borrowers are also expected to be more religious and thus would self-select out of the conventional banking system due to the prohibition of usury in Islam. It is important to consider if the difference in the borrowers themselves would also lead to a fluctuation in the types of investment. This study focuses on two aspects of investment in microfinance. First, it is designed to look at whether Islamic and conventional invest in different types of businesses, and if so, whether one group spends more on those investments or not. Certainly, observing investment decisions in Jordan can give great insight as to how and why households choose to participate in microfinance.

3. Methodology

3.1 Microfinance Institutions and Areas of Survey

The research was conducted in Jordan over the course of two months, from June to August 2012. The data were collected primarily in the operating areas of National Microfinance Bank (NMB), a Jordanian private shareholding not-for-profit company. Established in March 2006, the bank opened three branches in Karak, Zarqa and Wehdat along with the disbursement of its first loan. NMB was founded based on a partnership between King Abdullah II Fund for Development, the Arab Gulf Program for Development (AGFUND), and two private sector investors. The organization's main goal is to target the poor by significantly increasing the productivity of the existing micro and macro entrepreneurs, with the primary focus on women. The institution only utilizes a direct-lending method and does not offer group lending.

In total, the bank operates in 11 branches in the country: Baqa'a, Deir Alla, Irbid, Karak, Madaba, Marka, Salt, Wehdat, Zarqa, Mafaq, and West Amman. Information on clients residing in the Mafraq area was not collected due to construction issues. The branches are located in 8 regions of the country.

One of the bank's main goals is to provide sufficient and reliable services, thus the MFI aims to simplify its procedure so that their clients can receive their loans within 24 hours. In addition, five conventional and Islamic loan products are designed to meet each of the client's needs. The values of the loans range from 200 to 25000JD (~282 – 2531USD). In addition, the institution offers several loan products, including educational, health, home-improvement, purchase of durable goods, and home-based business loans. Since any loan over 3500JD (~4943USD) requires the business owner to have an operating license, this research focuses primarily on home-based business loans under the capped amount. Although NMB offers both conventional and Islamic methods of financing, the number of Islamic borrowers is actually very small. Thus, the researchers partnered with another MFI to gather information on Islamic clients.

The sample of Islamic loan borrowers was taken from the Development Employment Fund (DEF), a public governmental establishment. DEF was founded in 1989, currently operating with twelve branches in the nation. These branches are located in Amman, Mafaq, Ajlun, Jarash, Ma'an, Tafailah, Karak, Irbid, Zarqa, Balqa, Madaba, and Aqaba. In order to meet each of its client's specific needs, DEF provides both conventional and Islamic microfinancing methods. Both NMB and DEF only offer

banking services and are not involved with entrepreneurial or management training. Since the sample of conventional and Islamic borrowers is taken from two different operating banks, the main concern is the inherent heterogeneity between the groups. Fittingly, the eligibility requirements for the two institutions are the same: to be eligible to receive a loan, the borrower must live in the same region as one of the branches. Specifically, a borrower must (1) be a Jordanian citizen or legal resident who can provide the bank with a Jordanian guarantor, (2) be at least 18 years and not exceed 65 years of age at the last installment due date, (3) have a legal financing purpose, (4) have a good reputation, and (5) be willing and able to provide the bank with the minimum personal guarantees as requested for each product.

3.2 Survey Methodology and Data Description

The data on conventional borrowers were collected in the cities of Karak, Zarqa, Wehdat, Baquaa, Salt, Marka, Madaba, and Irbid (Wehdat, Marka are in Amman). Islamic borrowers were randomly selected in the branches of Amman, Irbid, Karak, Madaba, and Zarqa. These branches were chosen so that they can be matched up against the conventional borrowers in the sample.

In order to look at the type and level of investment a borrower tends to make, an event-study methodology called Retrospective Analysis of Fundamental Events Contiguous to Treatment (RETRAFECT) was utilized. The method was developed by Rajbanshi et al. (2012) for the purpose of analyzing the discrepancy between the claims of large microfinance impact by development practitioners and the far smaller impacts found in experimental studies. Under this method, only a single cross-sectional survey was needed to create a retrospective panel dataset of the history of the household. The technique offers various benefits to the researchers, since impact evaluation can be undertaken ex-post, with no firm requirement for a specific control group. However, RETRAFECT also calls for a rigid set of requirements. Fittingly, our study fits in the framework. Specifically, the program has existed for a number of years (DEF was established in 1989 whille NMB was opened in 2006). Moreover, microfinance programs have also been phased over time in different regions, along with a stable population with little geographical movement. Thus, it can be concluded that RETRAFECT was appropriate for this study.

During the survey period, the enumerators were trained to ask the participants about fundamental events that took place during the period of 2002 to 2012. Such events include investment in businesses (purchase of new machinery, inventory or livestock, expansion to the store space, and hiring of new employees), home improvement projects (new bedrooms, walls, or a major floor or toilet upgrade), and the purchases of major consumer goods (a new TV, stove, car, air conditioning/fan unit, or fridge). These events will then be recorded in discrete terms, either taking a value of 0's or 1's, with a value of 0 indicating the absence of such investments and 1 otherwise. Since the event window is rather long (11 years), extra measures were undertaken to ensure the accuracy of the participants' responses. Under the circumstance that the subjects cannot remember the exact year of the event, other major incidents in the households were recalled to help them remember. These events include childbirth, marriage or the hospitalization of a family member. By matching the investment events with these memorable episodes, we were able to minimize the error associated with asking subjects to recall past incidents.

The sample constitutes 223 households; 145 of which are conventional borrowers, while 78 are Islamic borrowers. Females make up the majority of the interviewed participants, as they represent 76.2% of the sample. While most conventional borrowers are female (93.1%), the majority of the Islamic borrowers are males (55.1%). This is due the fact that NMB exclusively targets women, while DEF does not. Level of education varies within the sample, with the majority having finished secondary school (10 years of schooling) and high school (12 years of schooling); these two categories amount for 67% of the subjects. The educational attainment level remains relatively consistent between the two groups, with most of the participants having finished secondary school or high school. However, the Islamic borrowers in the sample seem to have a higher level of education, with 15% having completed a four-year bachelor degree, while only 6% of the conventional counterparts have. 58.89% of the participants are unemployed, while 24.11% of them are working full-time on their project. The households exhibit similar economic status, as the reported mean monthly income is 415JD (~586USD), ranging from 90JD to 2550JD (~127 - 3600USD) per month. There is not much discrepancy between the two groups, as mean monthly income is 427.3JD (~603USD) for conventional borrowers and 399.9JD(~565USD) for

the Islamic group. 51.35% of all the households in the sample have a business, while the rest do not. The average size of a household is 5.8, with the smallest family having 1 person and the biggest family consisting of 6 persons.

While the current loan size of our conventional clients range 150 to 3500JD (~211 – 4140USD), with a mean of 620JD (~875USD), Islamic borrowers have a much larger portfolio, ranging from 300 to 3500JD (~423USD), with a mean of 1439.5JD (~2032USD). Although the data set consists of several socioeconomic characteristics such as: household income, current loan sizes, the number of family members… these are collected with a cross sectional survey. Thus, this information was not used for running a panel regression[1]

Descriptive statistics of the dependent variables and the control variables are given in table 1A, 1B, and 1C.

Table 1B: Normalized Summary Statistics for Fundamental Events

	Sample		Conventional Borrower		Islamic Borrowers	
Variables	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
All business investment	0.38	0.49	0.40	0.49	0.35	0.48
All home improvement	0.51	0.50	0.57	0.50	0.39	0.49
All home durable goods	0.70	0.46	0.74	0.44	0.64	0.48
Private School	0.22	0.42	0.25	0.44	0.17	0.38

Table 1B describes the normalized summary statistics for fundamental events. Overall, around 38 percent of the sample have purchased some type of business durable goods, while 51 percent have invested in a major home improvement project, and about 70 percent of them have bought a major consumer good. Table 1B has also found that around 20 percent of the participants have sent their children to private school during the indicated time period. The variable private school was included as a dependent variable because it represents social and long-term investments, rather than physical capital investments. Especially in Jordan, where public school is free and mandatory for the first 10 years of education, the enrollment of children in private school indicates an investment in future generations.

Table 3 compares the summary statistics between the two types of borrowers. Overall, we do not see much discrepancy between the two groups. However, a two-tailed T-test shows that conventional borrowers are more likely to purchase new inventory, do a major floor upgrade, and buy various types of consumer durable goods.

[1] The limitations of this research will be discussed later in the paper

3.3 Empirical Model

The model is calculated using a Linear Probability Model with a region-year fixed-effects. An LP model is preferred since the probability of the listed fundamental events are rather low, thus the likelihood of the predicted values fall outside the range of 0 and 1 is low as well (Rajbanshi, 2012). Moreover, when flat panel datasets are used with fixed-effects estimation, more robust estimates are produced with an LP model (Chamberlin, 1979). There are two types of borrowers in the regression: conventional and Islamic; thus, a dummy variable indicating the type of loans they took out was included. Regional and year fixed-effects are included in the regression to account for the composite error problem existed in panel data. The model estimates the following:

$$Y_{ijt} = \alpha_{jt} + BX'_{it} + \sum_{t=\bar{t}-k}^{\bar{t}+k} \beta_{it} C_{it} + \varepsilon_{ijt}$$

Variable Y_{ijt} represents the fundamental event with a value of 1 indicating that the event occurs for household *i* living in city *j* at time *t* (in this case, a business investment, home improvement project, purchase of household durables, or private school enrollment). The independent variables consist of the appropriate fixed-effect levels, α_{jt}, a vector of control variables, X', and the event window of 5 years. Here $\bar{t}$ represents the year of the participant obtaining the loan, and k represents the window of 2 years before and after take-up. Two types of models were employed in the results: a region fixed-effects and a region-year fixed-effects model. The control variables include a dummy variable for the sex of the participants, age, the squared of age, a female dummy, the number of children in the household under the age of 11, and the Islamic borrower dummy. Robust standard errors at the region-year level were included to correct for heteroskedasticity within the sample.

The hypotheses tested are as follows:

H_o: Investments do not increase in the year of microfinance loan take-up

H_a: Investment *do* increase in the year of microfinance loan take-up

And:

H_o: There is no significant difference between the types of investment that conventional and Islamic borrowers tend to make.

H_a: There *is* a significant difference between the types of investments that conventional and Islamic borrowers tend to make.

4. Results: Different Uses of Microfinance Loans

4.1 Model 1: Region fixed-effects

The results are presented in several table and graphs, including tables 2A to 2C, 3-4 and figures 2A to 2D.

Table 2A represents the change of probability of business investments a household would make, including the purchase of a new machinery, expansion of the store space, a large purchase in inventory, new livestock, or hiring of new employees. From the regression table, we can conclude that the year of microfinance take-up is highly significant for the purchase of new machinery and any type of business investments, at 5% and 10% levels, respectively. It is predicted that during the year of take-up, the probability of a household buying new machines for their business increases by 4.2 percentage points. On the other hand, the probability of any business investment would increase by 6.9 percentage points during the year of take-up. It is also predicted that during the second year after loan take-up, there is an increase in the probability of the households buying large supplies of inventory for their stores. The results are similar for any type of business investment, where the probability increases by 7.7 percentage points in the 2 years after taking out a loan. These findings indicate that borrowers are most likely investing in their businesses with their loans, and then deciding to increase their inventory stock once their income has risen. The variable of interest here is the Islamic dummy, which is non-significant and near zero for all dependent variables. Thus, it is suggested that there does not exist a different between how conventional and Islamic borrowers spend their loans. The conclusion here is consistent with the practice of Islamic microfinance, where clients are only using their loans on their microenterprises.

Table 2B displays the results for home improvement projects. Although it is established that Islamic borrowers can only use their loans on business investments, we are assuming that by taking out a loan, it promotes the ease of other investments. In other words, money is freed up for other uses and investments. Contrary to previous results, it is shown here that the year of take-up is insignificant in explaining the probability of a household making an investment related to the building of a new

bedroom, major walls, floor, and toilet upgrade. The year of take-up is significant for the variables of other and any home improvement projects. However, the probability is rather small (3.2 and 4.3 percentage points for other home improvement projects and any project, respectively). When comparing the coefficient for the year of take-up and the year before, no substantial difference is observed for any type of improvement project. Thus, we can conclude that in the year of loan take-up, there is no significant increase for the probability of home improvement. However, it is observed that during the second year after the first microloan, the probability of other and any home improvement projects increases by 11.5 and 12.5 percentage points, respectively. These results are highly significant at the 1% and 5% levels, suggesting a lag effect of microfinance loans. In other words, most households would wait for their income to increase and then start investing on home improvements. This is a reasonable assumption since many have speculated that the long-term effects of microfinance would not be recognized until a few years later. On the other hand, the Islamic borrower dummy coefficient is not significant for any variables, suggesting that there is no difference within home improvement preferences between conventional and Islamic clients. The results can be explained along with the previous models, where we find that most borrowers would tend to invest in their businesses when they receive their loans, and then do a major home upgrade once their income level has increased.

For the category of consumer durable goods, we observed that during the year of take-up, there is no significant increase in the probability of any investments. However, we can see that in the one year after a loan has been received, there is an indication of increase in the purchase of any consumer durables. The results also indicate a lagged effect in microfinance, where consumption on durable goods is increased in the years after credit availability. In particular, the study found that the probability of a household buying any type of consumer durable good is 6.2 percentage points higher. The Islamic borrower dummy variable is significant as well, suggesting that a small variance exists between the types of investment Islamic and conventional borrowers make. Specifically, Islamic borrowers are 3.9 percentage points less likely to purchase any major consumer goods.

So far, we have not seen any major discrepancies between the types of investments that conventional and Islamic borrowers tend to make after their loan take-

up. The findings suggest that even with different methods of financing and principles that the two models are based upon, we continue to see consistencies regarding the investment decisions of the borrowers. However, we have only looked at the decisions regarding physical capital level investments, and have ignored other types of investments that could potentially improve the living conditions of the subjects. Thus, in the next regression, we will look at the probability of children going to private school after the take-up of a microfinance loan in a household.

The socioeconomic effects of microfinance are measured in table 3, represented by the probability of children being enrolled in private school before and after the take-up of microfinance loans. We found that the take-up of microfinance loans does not increases the probability of children enrolled in private school. The variable age is significant at the 1% level as well, suggesting that older parents are more likely to put their children in private schools. The female variable is found to have a statistically insignificant impact on the probability of children going to private school. This conclusion contradicts earlier literature, which often posits that women show a stronger preference for educating their children (Behrman & Rosenzweig, 2002). The dummy variable for Islamic borrower is also insignificant, suggesting that the type of loan a household takes out does not have any effects on private schooling. Overall, these estimates are consistent with what we have found earlier. Thus, we can conclude that both conventional and Islamic borrowers tend to use their loans toward physical capital and long-term investments.

4.2 Model 2: Region – Year Fixed-Effects Model

The region fixed-effects model suggests that microfinance would lead to a higher probability in all types of investments; however, the probabilities are relatively inconsistent and thus the results are rather erratic. Furthermore, a region fixed-effects model is not reliable since it does not take into account the time factor. For example, while participants are more likely to remember events in recent years than what happened 10 years ago, a region-year fixed-effects model will be to eliminate the endogeneity problem during the event window. Second, a the region-year model can also be used as a tool to better differentiate the effects of microfinance and other factors influencing investment decisions in Jordan, such as overall better economic conditions in Jordan. The results of the model are presented in Tables 4A-D.

The results of region-year fixed-effects model on business-level outcomes are presented in Table 4A. Specifically, it is observed that during the year of microfinance take-up, the probabilities of a household purchasing new machinery and any business investment are highly significant at the 1% level. The results hold for any type of business investments as well, suggesting that microfinance borrowers are putting their loans toward productive activities, such as investing in their microenterprises. The signs are positive as expected, showing that investments do increase once a client has taken out a loan. Overall, there is a 3.7 percentage points increase in the probability of business investment during the year of take-up. The results also show that one year after the household has received a loan, the probability of them buying large quantity of inventory actually decreases, significant at the 1% level. In particular, microfinance borrowers are 4.3 percentage points less likely to purchase new inventory the year after take-up. The model also indicates that female entrepreneurs are less likely to purchase livestock and hire new employees. The coefficients suggest that female participants are more interested in using their loans on other types of investments. The variable of interest is the Islamic dummy variable, which is negative and significant for increased in the purchase of inventory, livestock, and any business investment. In particular, Islamic borrowers are 2.5 percentage points less likely to invest in their businesses. The results might seem puzzling at first, since Islamic loans can only be used for business-level purposes, and the goods are obtained directly from the microfinance institutions. However, the negative sign in all business investment is due to the differences in increased in new inventory and livestock for the two types of borrowers. Specifically, Islamic borrowers are 1.4 and 0.6 percentage points less likely to purchase inventory and livestock. The results are reasonable since these types of goods are perishable, and thus cannot be leased out through a microfinance institution. Thus we can conclude that for the types of goods that a MFI would lend to an Islamic borrowers, there is no observed differences within business investments. Age is also found to be positively correlated with the level of investment, suggesting that older participants are more likely to put their loans toward productive activities. Overall, female participants are found to be less inclined to invest in their businesses. This suggests that female borrowers are more concerned with using their loans toward other types of activities.

Table 4B shows the regression results for the Linear Probability model on Home Improvement Projects. Overall, the results do not display any trend in home improvement investments before and after loan take-up. The table shows that one year after the take-up of a loan, a household is actually decreasing their level of toilet upgrade. Thus, we can conclude that when taking the averages of the years, there is no correlation between microfinance and the probability of home improvement projects. The age of the participant is also positive and significant, indicating them older borrowers are more worried about their living conditions than younger participants. The Islamic dummy variable is insignificant at every level of home improvement, except for the any home improvement variable. The results suggest that Islamic borrowers are less likely to invest their homes as their conventional counterparts. The findings are in accordance with the theory of Islamic banking, where Islamic loans can only be used for business investments. The female dummy variable here is significant for new walls, suggesting that female borrowers are less likely to invest in new walls.

The results for consumer durable goods greatly differ from what we found in the region fixed-effects model (Table 4C). Specifically, there is no significant increase in the probability of investment during or after the year of loan take-up. Moreover, the results show that during the year of take-up, the probability of the household investing in consumer durables other than a new television, fridge, car, stove, or air conditioning unit decreases by 2.8 percentage points. Thus we can conclude that once the time-constant unobserved effect is eliminated, the increased in the level of investment for consumer durable goods observed in the previous models disappear. The results suggest that these observed increase in the purchase is due to better economic conditions overall in Jordan, not because of microfinance. The coefficient of the age variable for the purchase of a new TV, fridge and any consumer durable goods are also positive and significant at the 5% and 10% levels, indicating that older borrowers are more inclined to invest in the purchase of household durables. The Islamic dummy variable is shown to be significant and negative for other and any consumer durable goods, which means that Islamic borrowers are less likely to invest in these types of assets. In particular, Islamic borrowers are 3.0 percentage points less likely to purchase any type of consumer durables.

The regression on the variable private school is consistent with what we have found in the region fixed-effects model. In particular, we find that during and after the year of take-up, there is no association between microfinance and the enrollment of children in private schools. This is due to the fact that if a borrower wanted to put their children in a private school, he or she would have done so with or without microfinance. Second, the age of the participant is highly significant, implying that other parents care more about their children's education. The table also suggests that older and more educated participants are more likely to enroll their children in a private institution. The Islamic variable is insignificant, suggesting that Islamic borrowers are as likely to put their children in private school. Overall, we do not see any effects of microfinance on private school enrollment.

These estimates can be further examined by looking at the graphs presented by figures 2-5. The x-axis plots the years before and after the take-up of a microfinance loan, and the y-axis represents the value of the point estimates, as well as the lower and higher 95% confidence intervals.

For business investments (Figure 2A), we see a consistent upward trend in the years before loan take-up and a downward trend right after. This could be explained by that the fact that many took out loans simply just to invest in their businesses. The next graph, 2B, shows that there is no correlation between microfinance take-up and the probability of home improvements. For consumer durable goods (Figure 2C), the results are very similar: there exists no consistent trend in the years before and after the year the households receive a loan. Lastly, the probability of children enrolling in private school seems to be very sporadic (Figure 2D). We can see that there are no effects of microfinance on private school enrollment. Thus, one might argue that enrollment could potentially be explained by a change in household economic status overall, not because of the take-up of microfinance loans.

4.3 Robustness Check: Household-Level Fixed-Effects

As a robustness check, we performed a household-level fixed-effects model on business investments. Overall, even when taking into account a household's average propensity to invest in their enterprises, the results show significant and positive increase in new machinery purchase in the year of take-up. In particular, households are 4.3 percentage points more likely to invest in new machinery in the year of loan receipt.

Thus, even when we control for the average likelihood of buying new machinery, there is still a significant relationship between microfinance and business investments.

4.4 Model with Interaction Terms

Additional results are presented in Table 7, showing an LP model with region-year fixed-effects on selected investments. The main difference with this table is that interaction terms for the leads and lags and the Islamic dummy variable are included in the regression. In particular, we see that Islamic borrowers are less likely to purchase any business durables, as well as other consumer durable goods. However, the table shows that in the year of loan take-up, Islamic participants are only less likely to invest in a major floor upgrade or purchase consumer durables. These results are consistent with the theory of Islamic microfinance, since Islamic loans can only be used for business purposes. However, the table does demonstrate some very interesting results. Most notably, we observe that in the two years after loan receipt, Islamic borrowers are 6.6 percentage points more likely to purchase an air conditioning unit and 12.7 percentage points more likely to buy any consumer good. The differences indicate a lagged effect of microfinance for Islamic borrowers in particular, where they might be doing better in the years after the take-up of microfinance.

6. Discussion

The paper focuses on the impact of microfinance on investment decisions in Jordan, particularly in the regions that the National Microfinance Bank of Jordan is currently operating. The information on conventional and Islamic borrowers was collected to explore the impact of microcredit loans on their decision to invest in business development, home improvement projects, or purchases of consumer goods. A linear probability model is used to estimate the overall probability of these events; robust-cluster standard errors were utilized to correct for heteroskedasticity. Two methods of fixed-effects estimation were used; however, the region-year fixed-effects model yields a more reliable set of results.

Overall, it is observed that there is an increase in the probability of investment during the years of microfinance take-up. In particular, the probability of business investments increase by 3.7 percentage points during the year of loan receipt. The results indicate that borrowers are putting their loans toward productive activities. On the other hand, we do not find any relationship between microfinance take-up and the

level of home improvement and consumer durable investments. The model shows that microfinance borrowers are diverting funds away from consumption toward business investments. The results found in this study are consistent with Rajbanshi et al. (2012) and McIntosh et al. (2011), which find that during the year of credit take-up, there is a significant and large impact of microcredit on several areas of enterprise investment. Our study is also very consistent with Rajbanshi et al. (2012) since there is no observed increased in the probability of home improvements and consumer durables after loan take-up. This suggests that microloan does lead to significant increase in income and consumption. As a result, we can conclude that investments do increase with microfinance availability. On the other hand, the study is very different from that of Rajbanshi et al. (2012): while Rajbanshi et al. (2012) focuses on smaller loans sizes, averaging to US$192, the subjects in our study have an average loan size of $1386. While the effects found in our study seem to be small, they are larger than those found in experimental studies (Karlan & Zinman, 2009; Morduch & Roodman, 2009).

In addition, the model did not find a difference in the type of investments that conventional and Islamic borrowers tend to make. While conventional borrowers are 1.9 percentage points more likely to invest in any business project, they are also found to be more likely to purchase consumer durables. However, these results tend to be pretty inconsistent and thus should be treated with caution when taken into consideration. For example, the reason why the probability for business investments is lower is due to purchase of inventory and livestock, the types of investments that MFI's cannot provide to Islamic borrowers. The lower probability in consumer durables is reasonable since Islamic borrowers are only using their loans on business investments.

While the study does offer new perspectives on the way borrowers in Jordan spend their loans, there exist several shortcomings within the model. First, since the study was only conducted over the course of two months, with the panel data collected from a single cross-sectional survey, the researchers could not control for several aspects of the subjects. For example, a history of household income and loan sizes was impossible to collect. Being able to control for income and loan sizes would allow the research to be able to differentiate the magnitude of investments and the economic status of the subjects. Since only the current loan size and income information was available, the results from the panel dataset would have been different if these controls

were included in the regression. Second, a possible source of bias could come from the fact that the two types of borrowers come from two different MFI's. The bias is minimized since the two institutions have the same eligibility requirements. However, the ideal case is where the information of two types of borrowers is gathered from the same institution. Lastly, the survey was conducted before and during the holy month of Ramadan, where one third of the borrowers were interviewed before Ramadan and the rest during. Since Ramadan represents a period of time of fasting and intense religious practice, the behavior of the participants could be different from a normal time period.

Yet, despite these limitations, we can still observe a substantial effect of microfinance. Moreover, since the effects are still in place when controlling for time-constant unobserved endogeneity, the subjects in the study do exhibit better living standards once microfinance was made available. In summary, the large and significant increase in probability of enterprise investment is a good indication how microfinance is operating in the Hashemite Kingdom of Jordan.

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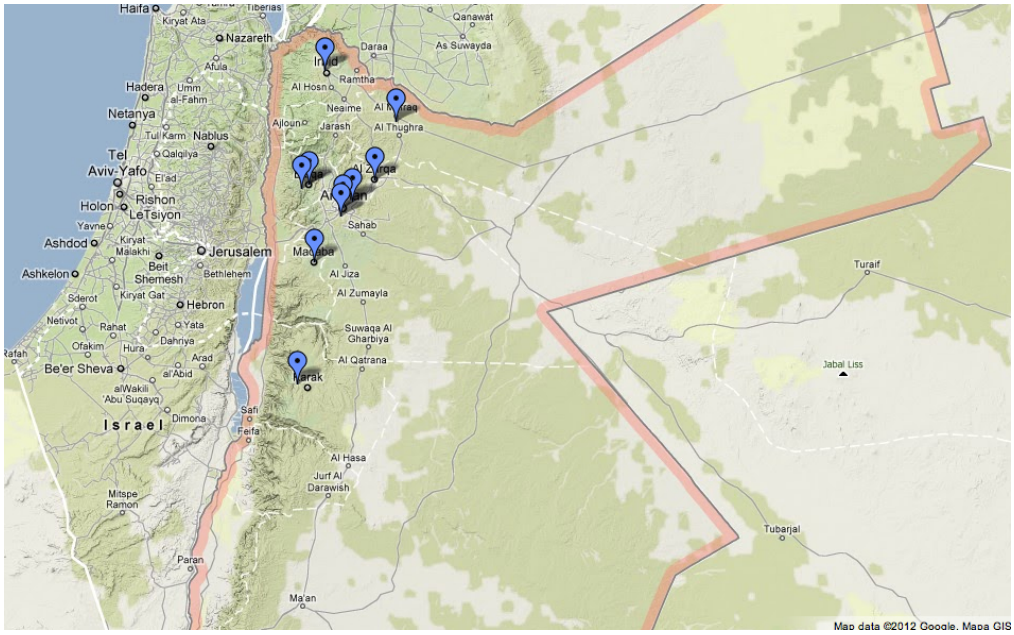

Figure 1: Map of Survey Areas

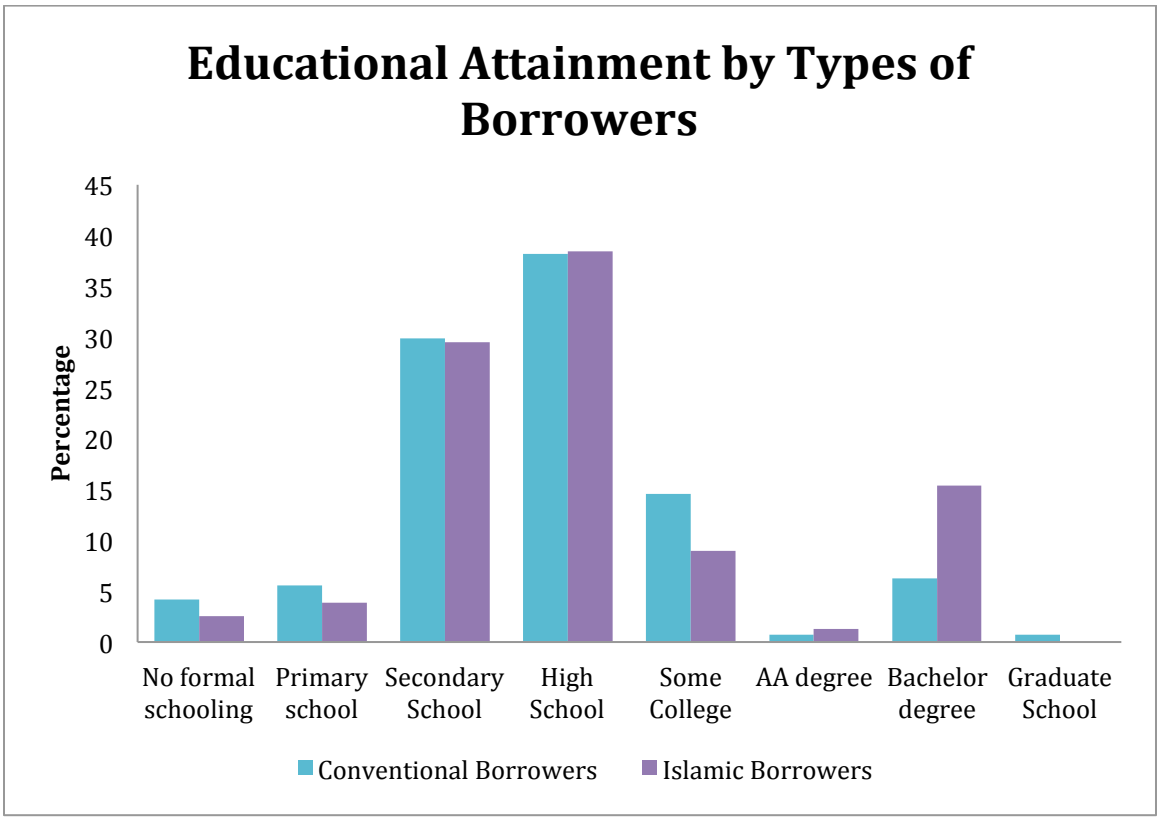

Figure 3: Educational Attainment by Types of Borrowers

Table 1C: Summary Statistics for Conventional and Islamic Borrowers

	Conventional Borrowers		**Islamic Borrowers**		**Two-tailed T Tests**
Dependent Variables	Mean	Standard Deviation	Mean	Standard Deviation	
New machinery	0.01	0.12	0.02	0.12	-0.10
Expansion	0.01	0.08	0.01	0.08	-0.91
Increased in inventory***	0.02	0.14	0.01	0.08	2.63***
Purchase of livestock	0.01	0.07	0.00	0.05	1.01
Hiring of new employee	0.01	0.08	0.01	0.08	-0.38
Any Business Investment	0.05	0.22	0.04	0.20	1.15
New bedrooms	0.01	0.09	0.00	0.07	1.02
Walls	0.01	0.08	0.01	0.08	-0.38
Major floor upgrade*	0.01	0.10	0.00	0.06	1.79*
Major toilet upgrade	0.01	0.11	0.01	0.09	0.90
Other household improvement*	0.04	0.20	0.03	0.16	1.67*
Any Home Improvement*	0.05	0.23	0.04	0.19	**1.92***
TV	0.03	0.18	0.03	0.18	0.06
Fridge	0.03	0.18	0.02	0.16	0.97
Car	0.01	0.09	0.01	0.12	-1.14
Stove	0.02	0.14	0.01	0.12	0.76
Air conditioning/Fan unit	0.02	0.13	0.01	0.12	0.47
Other household purchases*	0.03	0.18	0.02	0.14	1.66*
Any Consumer durable goods	0.10	0.30	0.08	0.27	1.57
Private School	0.10	0.30	0.08	0.27	1.53
Control Variables					
Age of Participant	31.39	9.85	32.57	10.69	0.143
Age Squared					
Female Dummy***	0.93	0.26	0.45	0.50	**9.51*****
Islamic Dummy					
Education	2.85	1.31	3.13	1.48	-1.4515
Credit Availability	0.64	0.48	0.71	0.45	**-3.8546*****
Children under 6	0.75	0.88	0.69	0.90	0.80
Children between 6 - 11**	0.84	0.99	0.72	1.01	**2.42****

Table 2A: OLS Region Fixed-Effects on Business Investments

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	New Machinery	Store Expansion	Increase in Inventory	Purchase of Livestock	Hiring of New Employee	Any Business Investment
2 years before	0.010	0.011	-0.028***	-0.006*	0.010	-0.009
	(0.011)	(0.011)	(0.008)	(0.003)	(0.011)	(0.009)
1 year before	0.033***	-0.005*	-0.006	-0.006*	0.009	0.018
	(0.007)	(0.003)	(0.005)	(0.003)	(0.006)	(0.015)
Year of take-up	0.042**	0.025	0.008	0.009	-0.003	0.069*
	(0.016)	(0.020)	(0.015)	(0.008)	(0.003)	(0.033)
1 year after	0.010	0.020	-0.005	0.002	0.001	0.021
	(0.013)	(0.015)	(0.020)	(0.006)	(0.009)	(0.038)
2 years after	0.017	0.007	0.055*	0.005	-0.008**	0.077*
	(0.012)	(0.015)	(0.024)	(0.014)	(0.003)	(0.033)
Age of participant	0.003***	0.001	0.001	0.002**	0.001*	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)
Age squared	-0.000***	-0.000	-0.000	-0.000**	-0.000	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Islamic Dummy	0.000	0.002	-0.016	-0.006	-0.007	-0.022
	(0.007)	(0.004)	(0.009)	(0.006)	(0.011)	(0.022)
Female Dummy	-0.012	-0.006	0.003	-0.007	-0.016	-0.025
	(0.010)	(0.004)	(0.004)	(0.004)	(0.012)	(0.020)
Education	0.004**	0.000	-0.001	0.001	0.002*	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Number of children (<6)	0.001	0.002	-0.001	0.002	-0.000	0.004
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.005)
Number of children in school (6-11)	-0.002	-0.004**	-0.001	-0.002	-0.000	-0.009**
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)
Credit Availability	0.000	0.005*	0.022**	0.002	0.002	0.032***
	(0.004)	(0.003)	(0.007)	(0.001)	(0.002)	(0.006)
Constant	-0.044***	-0.011	-0.011	-0.020	-0.009	-0.090***
	(0.012)	(0.006)	(0.015)	(0.011)	(0.011)	(0.023)
Observations	2,398	2,398	2,398	2,398	2,398	2,398
R-squared	0.020	0.014	0.022	0.009	0.011	0.036
Number of branch	8	8	8	8	8	8

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2B: OLS Region Fixed Effects on Home Improvement Projects

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	New Bedrooms	Major Walls Upgrade	Major Floor Upgade	Major Toilet Upgrade	Other Home Improvement Projects	Any Home Improvement Project
2 years before	0.007	0.004	0.008	0.002	0.002	0.007
	(0.011)	(0.009)	(0.009)	(0.011)	(0.019)	(0.020)
1 year before	-0.010***	0.011	0.016	0.009	0.032	0.035*
	(0.001)	(0.010)	(0.014)	(0.013)	(0.025)	(0.020)
Year of take-up	0.006	0.009	0.008	0.005	0.032*	0.043***
	(0.007)	(0.008)	(0.008)	(0.005)	(0.015)	(0.016)
1 year after	0.016	0.012	0.001	-0.016***	0.008	0.037*
	(0.014)	(0.009)	(0.009)	(0.004)	(0.012)	(0.021)
2 years after	0.003	-0.004	0.030	0.022	0.119**	0.128***
	(0.010)	(0.003)	(0.018)	(0.019)	(0.035)	(0.025)
Age of participant	-0.000	0.002**	0.001*	0.002	-0.001	0.000
	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)	(0.003)
Age squared	0.000	-0.000**	-0.000**	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Islamic Dummy	-0.004	-0.003	-0.003	-0.004	-0.005	-0.010
	(0.003)	(0.004)	(0.006)	(0.006)	(0.015)	(0.012)
Female Dummy	-0.004	-0.013***	-0.000	-0.006	-0.003	-0.012
	(0.005)	(0.002)	(0.006)	(0.003)	(0.011)	(0.012)
Education	-0.002	-0.001	-0.001	-0.002	0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
Number of children (<6)	0.003	0.004*	0.003	0.002	0.004	0.012**
	(0.003)	(0.002)	(0.003)	(0.003)	(0.006)	(0.005)
Number of children in school (6-11)	-0.003*	0.001	0.002	-0.000	-0.005*	-0.006
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)
Credit Availability	0.007**	-0.000	0.003	0.006	0.025***	0.031***
	(0.002)	(0.001)	(0.003)	(0.004)	(0.006)	(0.011)
Constant	0.013	-0.012	-0.016*	-0.021	0.018	0.010
	(0.018)	(0.007)	(0.009)	(0.018)	(0.031)	(0.045)
Observations	2,365	2,365	2,365	2,365	2,343	2,365
R-squared	0.008	0.011	0.012	0.008	0.028	0.033
Number of branch	8	8	8	8	8	8

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2C: OLS Region Fixed-Effects on Consumer Durable Goods

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	New TV	New Fridge	New Car	New Stove	Air Conditioning Units	Other Consumer Durable Goods	Any Consumer Durable Goods
2 years before	-0.027**	-0.025	-0.001	-0.178	-0.025***	-0.038**	-0.077***
	(0.011)	(0.020)	(0.010)	(0.151)	(0.006)	(0.012)	(0.016)
1 year before	-0.028***	-0.003	-0.002	-0.178	-0.002	-0.000	-0.011
	(0.008)	(0.012)	(0.010)	(0.156)	(0.013)	(0.029)	(0.026)
Year of take-up	0.018	0.013	0.006	1.067	-0.006	-0.001	0.034
	(0.012)	(0.013)	(0.008)	(1.074)	(0.011)	(0.016)	(0.026)
1 year after	-0.003	0.016	0.007	-0.134	0.007	0.009	0.062***
	(0.021)	(0.029)	(0.009)	(0.183)	(0.020)	(0.022)	(0.015)
2 years after	0.039	-0.008	0.039	-0.156	0.009	0.009	0.051
	(0.022)	(0.026)	(0.024)	(0.142)	(0.020)	(0.037)	(0.049)
Age of participant	0.003	0.003***	0.001*	0.072	0.000	0.003	0.009**
	(0.002)	(0.001)	(0.000)	(0.066)	(0.001)	(0.002)	(0.003)
Age squared	-0.000	-0.000**	-0.000	-0.001	0.000	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Islamic Dummy	-0.008	-0.016	0.001	-0.224	-0.008	-0.025**	-0.039*
	(0.009)	(0.009)	(0.004)	(0.217)	(0.009)	(0.009)	(0.017)
Female Dummy	-0.011***	-0.006	-0.014***	0.067	-0.005	-0.018**	-0.025**
	(0.003)	(0.005)	(0.003)	(0.062)	(0.004)	(0.006)	(0.009)
Education	-0.001	-0.003	0.000	-0.049	-0.002	0.001	-0.004
	(0.002)	(0.002)	(0.002)	(0.046)	(0.002)	(0.002)	(0.006)
Number of children (<6)	0.001	-0.004*	0.005*	0.024	-0.000	-0.002	0.001
	(0.004)	(0.002)	(0.003)	(0.037)	(0.003)	(0.004)	(0.008)
Number of children in school (6-11)	0.001	-0.000	0.003*	-0.127	0.001	-0.002	0.004
	(0.003)	(0.001)	(0.001)	(0.125)	(0.002)	(0.003)	(0.005)
Credit Availability	0.026***	0.025**	0.006	0.086	0.021**	0.036***	0.095***
	(0.007)	(0.008)	(0.004)	(0.078)	(0.007)	(0.008)	(0.012)
Constant	-0.027	-0.021	-0.008	-0.941	0.008	-0.030	-0.095
	(0.034)	(0.014)	(0.009)	(0.954)	(0.012)	(0.030)	(0.065)
Observations	2,365	2,354	2,354	2,365	2,344	2,354	2,327
R-squared	0.012	0.011	0.014	0.006	0.009	0.019	0.046
Number of branch	8	8	8	8	8	8	8

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: OLS Region Fixed Effects on Private School Enrollment

VARIABLES	Private School Enrollment
2 years before	0.004
	(0.029)
1 year before	0.028
	(0.032)
Year of take-up	0.031
	(0.025)
1 year after	0.053
	(0.036)
2 years after	0.055
	(0.043)
Age of participant	0.010***
	(0.002)
Age squared	-0.000***
	(0.000)
Islamic Dummy	0.025
	(0.016)
Female Dummy	-0.004
	(0.017)
Education	0.025***
	(0.004)
Number of children (<6)	0.022***
	(0.007)
Number of children in school (6-11)	0.035***
	(0.006)
Credit Availability	0.064***
	(0.013)
Constant	-0.294***
	(0.039)
Observations	2,376
Number of branch	8
Number of years	0
R-squared	0.115

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4A: OLS Region-Year Fixed-Effects on Business Investments

VARIABLES	(1) New Machinery	(2) Store Expansion	(3) Increase in Inventory	(4) Purchase of Livestock	(5) Hiring of New Employee	(6) Any Business Investment
2 years before	0.011	0.008	-0.016*	0.004	0.003	0.002
	(0.007)	(0.008)	(0.009)	(0.004)	(0.006)	(0.020)
1 year before	0.028**	-0.015**	-0.009	-0.002	0.017	0.016
	(0.011)	(0.006)	(0.011)	(0.002)	(0.011)	(0.019)
Year of take-up	0.039***	0.011	-0.009	0.005	-0.001	0.037*
	(0.014)	(0.010)	(0.011)	(0.005)	(0.005)	(0.022)
1 year after	0.008	0.005	-0.043***	0.000	0.004	-0.025
	(0.014)	(0.013)	(0.014)	(0.005)	(0.008)	(0.026)
2 years after	0.015	-0.010	-0.009	-0.001	0.009	0.006
	(0.013)	(0.011)	(0.015)	(0.001)	(0.010)	(0.026)
Age of participant	0.003***	0.001	0.001	0.002**	0.001	0.007***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Age squared	-0.000***	-0.000	-0.000	-0.000**	-0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Islamic Dummy	-0.004	0.000	-0.014**	-0.006*	-0.008	-0.025*
	(0.007)	(0.005)	(0.006)	(0.003)	(0.008)	(0.014)
Female Dummy	-0.011	-0.005	0.004	-0.007*	-0.015*	-0.024
	(0.008)	(0.005)	(0.005)	(0.004)	(0.009)	(0.014)
Education	0.004*	0.000	-0.002	0.001	0.002**	0.004
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
Number of children (<6)	0.000	0.001	-0.003	0.001	-0.001	-0.000
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.005)
Number of children in school (6-11)	-0.003	-0.003	-0.001	-0.001	-0.000	-0.007*
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.004)
Credit Availability	-0.011*	-0.001	0.008	0.009	-0.001	0.004
	(0.005)	(0.003)	(0.006)	(0.006)	(0.002)	(0.007)
Constant	-0.033*	-0.000	0.007	-0.026**	-0.006	-0.054
	(0.018)	(0.014)	(0.023)	(0.012)	(0.013)	(0.037)
Observations	2,398	2,398	2,398	2,398	2,398	2,398
R-squared	0.014	0.007	0.011	0.008	0.011	0.012
Number of Region-Year	88	88	88	88	88	88

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4B: OLS Region-Year Fixed Effects on Home Improvement Projects

VARIABLES	(1) New Bedrooms	(2) New Walls	(3) Major Floor Upgade	(4) Major Toilet Upgrade	(5) Other Home Improvement Projects	(6) Any Home Improvement Project
2 years before	0.004	0.009	0.004	0.011	0.007	0.018
	(0.010)	(0.007)	(0.008)	(0.013)	(0.014)	(0.019)
1 year before	-0.014**	0.001	0.004	-0.009	-0.000	-0.005
	(0.005)	(0.006)	(0.008)	(0.006)	(0.018)	(0.020)
Year of take-up	-0.003	0.003	-0.001	-0.006	-0.001	0.006
	(0.008)	(0.008)	(0.007)	(0.008)	(0.017)	(0.016)
1 year after	0.004	0.001	-0.004	-0.015**	-0.022	-0.009
	(0.011)	(0.005)	(0.007)	(0.007)	(0.015)	(0.021)
2 years after	-0.013	-0.004	0.008	0.004	0.036	0.035
	(0.010)	(0.009)	(0.013)	(0.016)	(0.023)	(0.028)
Age of participant	-0.000	0.002**	0.001*	0.002**	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Age squared	-0.000	-0.000**	-0.000**	-0.000*	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Islamic Dummy	-0.005	-0.005	-0.006	-0.005	-0.011	-0.019*
	(0.004)	(0.004)	(0.005)	(0.004)	(0.010)	(0.010)
Female Dummy	-0.004	-0.013**	0.000	-0.005	-0.001	-0.010
	(0.005)	(0.006)	(0.005)	(0.005)	(0.012)	(0.012)
Education	-0.002	-0.001	-0.001	-0.002*	0.000	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
Number of children (<6)	0.003	0.003	0.002	0.001	-0.002	0.006
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.006)
Number of children in school (6-11)	-0.003**	0.000	0.003	0.000	-0.004	-0.005
	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)
Credit Availability	0.001	0.002	0.005	-0.001	-0.012	-0.011
	(0.010)	(0.008)	(0.007)	(0.008)	(0.010)	(0.012)
Constant	0.022	-0.011	-0.014	-0.013	0.062	0.061
	(0.023)	(0.011)	(0.015)	(0.016)	(0.039)	(0.039)
Observations	2,365	2,365	2,365	2,365	2,343	2,365
R-squared	0.007	0.008	0.007	0.006	0.005	0.005
Number of Region-Year	88	88	88	88	88	88

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4C: OLS Region-Year Fixed-Effects on Consumer Durable Goods

VARIABLES	(1) New TV	(2) New Fridge	(3) New Car	(4) New Stove	(5) Air Conditioning Units	(6) Other Consumer Durable Goods	(7) Any Consumer Durable Goods
2 years before	0.009	-0.021	-0.008	0.033	-0.020**	-0.007	-0.038*
	(0.015)	(0.014)	(0.009)	(0.059)	(0.008)	(0.011)	(0.021)
1 year before	-0.040***	-0.006	-0.010	-0.080	-0.016	-0.008	-0.043*
	(0.013)	(0.019)	(0.008)	(0.068)	(0.010)	(0.013)	(0.025)
Year of take-up	0.005	0.001	0.002	0.803	-0.020	-0.028**	-0.014
	(0.020)	(0.018)	(0.009)	(0.802)	(0.013)	(0.014)	(0.025)
1 year after	-0.001	0.003	0.010	-0.405	-0.023	0.012	-0.004
	(0.015)	(0.017)	(0.015)	(0.413)	(0.019)	(0.025)	(0.024)
2 years after	0.022	-0.038**	0.003	-0.228	-0.009	-0.010	-0.013
	(0.027)	(0.017)	(0.013)	(0.230)	(0.020)	(0.023)	(0.034)
Age of participant	0.003*	0.003*	0.001	0.078	-0.000	0.003	0.009***
	(0.002)	(0.002)	(0.001)	(0.076)	(0.001)	(0.002)	(0.003)
Age squared	-0.000	-0.000	-0.000	-0.001	0.000	-0.000	-0.000**
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Islamic Dummy	-0.002	-0.011	0.000	-0.180	-0.004	-0.019**	-0.030**
	(0.009)	(0.009)	(0.005)	(0.165)	(0.006)	(0.009)	(0.014)
Female Dummy	-0.011	-0.006	-0.014**	0.074	-0.004	-0.016*	-0.022
	(0.011)	(0.009)	(0.006)	(0.085)	(0.007)	(0.009)	(0.017)
Education	-0.001	-0.003	0.000	-0.051	-0.002	0.001	-0.005
	(0.003)	(0.003)	(0.001)	(0.048)	(0.002)	(0.003)	(0.005)
Number of children (<6)	-0.000	-0.005	0.003	0.022	-0.002	-0.005	-0.006
	(0.005)	(0.004)	(0.002)	(0.030)	(0.003)	(0.005)	(0.007)
Number of children in school (6-11)	0.002	0.000	0.004	-0.116	0.001	-0.002	0.007
	(0.004)	(0.003)	(0.003)	(0.118)	(0.002)	(0.003)	(0.006)
Credit Availability	-0.018	-0.014	-0.008	0.135	-0.008	0.005	-0.010
	(0.016)	(0.014)	(0.005)	(0.158)	(0.005)	(0.007)	(0.021)
Constant	0.008	0.016	0.008	-1.029	0.042**	0.000	0.006
	(0.027)	(0.026)	(0.011)	(1.149)	(0.020)	(0.029)	(0.046)
Observations	2,365	2,354	2,354	2,365	2,344	2,354	2,327
R-squared	0.007	0.006	0.008	0.004	0.005	0.007	0.009
Number of Region-Year	88	88	88	88	88	88	88

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4D: OLS Region-Year Fixed-Effects on Private School

	(1)
VARIABLES	Private School Enrollment
2 years before	0.002
	(0.027)
1 year before	0.007
	(0.027)
Year of take-up	0.003
	(0.029)
1 year after	-0.013
	(0.026)
2 years after	-0.030
	(0.027)
Age of participant	0.012***
	(0.002)
Age squared	-0.000***
	(0.000)
Female Dummy	-0.001
	(0.010)
Education	0.024***
	(0.004)
Number of children (<6)	0.021***
	(0.008)
Number of children in school (6-11)	0.040***
	(0.009)
Credit Availability	-0.003
	(0.018)
Islamic Dummy	-0.027
	(0.017)
Constant	-0.240***
	(0.054)
Observations	2,376
R-squared	0.056
Number of Region-Year	88

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: OLS Region-Year Fixed-Effects on Selected Investments

VARIABLES	(1) New Machinery	(6) Any Business Investment	(3) Major Floor Upgrade	(3) New Car	(5) Air Conditioning Units	(6) Other Consumer Durable Goods	(7) Any Consumer Durable Good
2 years before	0.012	-0.004	0.004	-0.006	-0.028***	-0.012	-0.063**
	(0.010)	(0.015)	(0.010)	(0.008)	(0.008)	(0.010)	(0.024)
1 year before	0.028*	0.011	0.008	-0.007	-0.011	-0.001	-0.029
	(0.014)	(0.024)	(0.011)	(0.010)	(0.014)	(0.023)	(0.032)
Year of take-up	0.032*	0.018	0.009	-0.008	-0.028*	-0.013	-0.015
	(0.016)	(0.025)	(0.010)	(0.008)	(0.014)	(0.017)	(0.036)
1 year after	0.003	-0.032	-0.002	-0.002	-0.019	-0.019	-0.010
	(0.013)	(0.032)	(0.010)	(0.014)	(0.016)	(0.030)	(0.024)
2 years after	0.007	0.012	0.018	0.020	-0.032	-0.029	-0.057
	(0.017)	(0.036)	(0.021)	(0.020)	(0.026)	(0.034)	(0.041)
Age of participant	0.003***	0.007***	0.001	0.001	-0.000	0.003	0.009***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
Age squared	-0.000***	-0.000***	-0.000**	-0.000	0.000	-0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Islamic Dummy	-0.008	-0.035**	-0.000	-0.001	-0.010	-0.026***	-0.042**
	(0.006)	(0.014)	(0.005)	(0.005)	(0.006)	(0.010)	(0.017)
Female Dummy	-0.011	-0.024	-0.000	-0.014**	-0.003	-0.016*	-0.021
	(0.008)	(0.014)	(0.005)	(0.006)	(0.007)	(0.009)	(0.017)
Education	0.004*	0.004	-0.001	-0.000	-0.002	0.001	-0.005
	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.003)	(0.005)
Number of children (<6)	0.000	-0.001	0.002	0.003	-0.002	-0.005	-0.006
	(0.003)	(0.005)	(0.003)	(0.002)	(0.003)	(0.005)	(0.007)
Number of children in school (6-11)	-0.003	-0.007*	0.003	0.004	0.001	-0.002	0.008
	(0.002)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)
Credit Availability	-0.010**	0.008	0.003	-0.008	-0.005	0.007	-0.005
	(0.005)	(0.008)	(0.007)	(0.005)	(0.006)	(0.008)	(0.022)
2 years before * Islamic Dummy	-0.004	0.017	0.002	-0.006	0.023	0.013	0.072
	(0.021)	(0.029)	(0.020)	(0.005)	(0.017)	(0.022)	(0.053)
1 year before * Islamic Dummy	-0.001	0.016	-0.014	-0.007	-0.015	-0.019	-0.039
	(0.022)	(0.038)	(0.012)	(0.009)	(0.017)	(0.034)	(0.056)
Year of take-up * Islamic Dummy	0.020	0.057	-0.029*	0.029	0.023	-0.043**	0.007
	(0.032)	(0.040)	(0.016)	(0.022)	(0.021)	(0.017)	(0.058)
1 year after * Islamic Dummy	0.017	0.022	-0.009	0.035	-0.010	0.095	0.020
	(0.027)	(0.043)	(0.011)	(0.028)	(0.034)	(0.058)	(0.067)
2 years after * Islamic Dummy	0.025	-0.015	-0.030	-0.048**	0.066*	0.054	0.127*
	(0.027)	(0.049)	(0.022)	(0.021)	(0.038)	(0.044)	(0.069)
Constant	-0.034*	-0.054	-0.013	0.008	0.041*	-0.003	0.002
	(0.018)	(0.037)	(0.015)	(0.012)	(0.021)	(0.029)	(0.045)
Observations	2,398	2,398	2,365	2,354	2,344	2,354	2,327
R-squared	0.016	0.013	0.010	0.015	0.010	0.016	0.013
Number of Region-Year	88	88	88	88	88	88	88

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figures 2A-B: Change in Probability of Investments

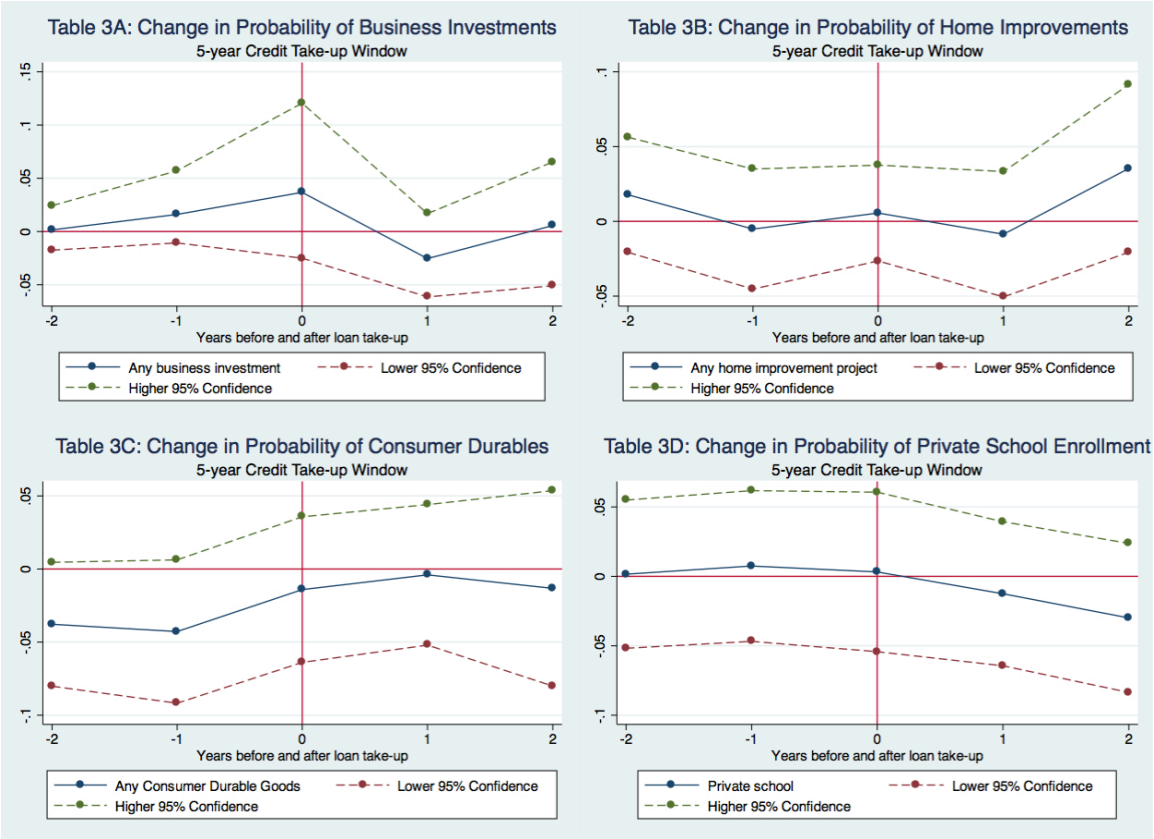

Table 6: OLS Household-Level Fixed-Effects on Business Investments

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	New Machinery	Store Expansion	Increased in Inventory	Purchase of Livestock	Hiring of New Employee	Any Business Investment
1 year before	0.028**	-0.011**	-0.009	-0.001	0.016	0.019
	(0.012)	(0.006)	(0.011)	(0.003)	(0.011)	(0.019)
2 years before	0.010	0.010	-0.017*	0.004	0.003	-0.000
	(0.007)	(0.009)	(0.009)	(0.004)	(0.008)	(0.015)
Year of take-up	0.043***	0.014	-0.012	0.011	-0.002	0.043*
	(0.014)	(0.012)	(0.015)	(0.007)	(0.005)	(0.023)
1 year after	0.012	0.007	-0.049***	0.000	0.005	-0.027
	(0.014)	(0.013)	(0.015)	(0.005)	(0.008)	(0.024)
2 years after	0.015	-0.009	-0.021	0.000	0.009	-0.004
	(0.014)	(0.011)	(0.024)	(0.007)	(0.010)	(0.030)
Age of participant	0.010***	0.008***	-0.004	0.003*	0.002	0.017
	(0.003)	(0.003)	(0.012)	(0.002)	(0.002)	(0.013)
Age squared	-0.000**	-0.000**	-0.000	-0.000**	-0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of children (<6)	0.002	0.001	-0.003	0.002	-0.000	0.001
	(0.004)	(0.004)	(0.004)	(0.002)	(0.002)	(0.007)
Number of children in school (6-11)	-0.003	-0.007**	-0.001	-0.001	0.002	-0.009
	(0.003)	(0.003)	(0.005)	(0.002)	(0.002)	(0.007)
Credit Availability	-0.006	-0.002	0.006	0.009	0.002	0.011
	(0.011)	(0.006)	(0.009)	(0.007)	(0.006)	(0.017)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.171***	-0.142***	0.143	-0.027	-0.041	-0.216
	(0.055)	(0.050)	(0.332)	(0.032)	(0.038)	(0.338)
Observations	2,398	2,398	2,398	2,398	2,398	2,398
R-squared	0.131	0.107	0.119	0.099	0.119	0.167

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: OLS Region-Year Fixed-Effects on Selected Investments

VARIABLES	(1) New Machinery	(6) Any Business Investment	(3) Major Floor Upgrade	(3) New Car	(5) Air Conditioning Units	(6) Other Consumer Durable Goods	(7) Any Consumer Durable Good
2 years before	0.012	-0.004	0.004	-0.006	-0.028***	-0.012	-0.063**
	(0.010)	(0.015)	(0.010)	(0.008)	(0.008)	(0.010)	(0.024)
1 year before	0.028*	0.011	0.008	-0.007	-0.011	-0.001	-0.029
	(0.014)	(0.024)	(0.011)	(0.010)	(0.014)	(0.023)	(0.032)
Year of take-up	0.032*	0.018	0.009	-0.008	-0.028*	-0.013	-0.015
	(0.016)	(0.025)	(0.010)	(0.008)	(0.014)	(0.017)	(0.036)
1 year after	0.003	-0.032	-0.002	-0.002	-0.019	-0.019	-0.010
	(0.013)	(0.032)	(0.010)	(0.014)	(0.016)	(0.030)	(0.024)
2 years after	0.007	0.012	0.018	0.020	-0.032	-0.029	-0.057
	(0.017)	(0.036)	(0.021)	(0.020)	(0.026)	(0.034)	(0.041)
Age of participant	0.003***	0.007***	0.001	0.001	-0.000	0.003	0.009***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
Age squared	-0.000***	-0.000***	-0.000**	-0.000	0.000	-0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Islamic Dummy	-0.008	-0.035**	-0.000	-0.001	-0.010	-0.026***	-0.042**
	(0.006)	(0.014)	(0.005)	(0.005)	(0.006)	(0.010)	(0.017)
Female Dummy	-0.011	-0.024	-0.000	-0.014**	-0.003	-0.016*	-0.021
	(0.008)	(0.014)	(0.005)	(0.006)	(0.007)	(0.009)	(0.017)
Education	0.004*	0.004	-0.001	-0.000	-0.002	0.001	-0.005
	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.003)	(0.005)
Number of children (<6)	0.000	-0.001	0.002	0.003	-0.002	-0.005	-0.006
	(0.003)	(0.005)	(0.003)	(0.002)	(0.003)	(0.005)	(0.007)
Number of children in school (6-11)	-0.003	-0.007*	0.003	0.004	0.001	-0.002	0.008
	(0.002)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)
Credit Availability	-0.010**	0.008	0.003	-0.008	-0.005	0.007	-0.005
	(0.005)	(0.008)	(0.007)	(0.005)	(0.006)	(0.008)	(0.022)
2 years before * Islamic Dummy	-0.004	0.017	0.002	-0.006	0.023	0.013	0.072
	(0.021)	(0.029)	(0.020)	(0.005)	(0.017)	(0.022)	(0.053)
1 year before * Islamic Dummy	-0.001	0.016	-0.014	-0.007	-0.015	-0.019	-0.039
	(0.022)	(0.038)	(0.012)	(0.009)	(0.017)	(0.034)	(0.056)
Year of take-up * Islamic Dummy	0.020	0.057	-0.029*	0.029	0.023	-0.043**	0.007
	(0.032)	(0.040)	(0.016)	(0.022)	(0.021)	(0.017)	(0.058)
1 year after * Islamic Dummy	0.017	0.022	-0.009	0.035	-0.010	0.095	0.020
	(0.027)	(0.043)	(0.011)	(0.028)	(0.034)	(0.058)	(0.067)
2 years after * Islamic Dummy	0.025	-0.015	-0.030	-0.048**	0.066*	0.054	0.127*
	(0.027)	(0.049)	(0.022)	(0.021)	(0.038)	(0.044)	(0.069)
Constant	-0.034*	-0.054	-0.013	0.008	0.041*	-0.003	0.002
	(0.018)	(0.037)	(0.015)	(0.012)	(0.021)	(0.029)	(0.045)
Observations	2,398	2,398	2,365	2,354	2,344	2,354	2,327
R-squared	0.016	0.013	0.010	0.015	0.010	0.016	0.013
Number of Region-Year	88	88	88	88	88	88	88

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix:

II. Religion Index

The survey conducted also includes questions regarding the level of religiosity of the participants. Such questions include asking if the participants read the Qur'an, and if so, how often. Other questions were incorporated in the survey, such as "Do you prefer to send your children to religious school", "Do you support microfinance institutions to charge interest rates", and "Do you often seek advice with a sheikh". An index based on 6 religion questions was created using summary index. However, the index variable is found to be non-significant, and does not change the results of the regression. Thus, the researcher has decided to keep the variable out of the model.