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## Does microfinance have an impact on borrower's consumption patterns and women's empowerment?

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## Die Hochschule im Dialog:

# Does Microfinance have an impact on borrower's consumption patterns and women's empowerment?

Charlotte H. Feldhoff  
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# Does Microfinance have an impact on borrower's consumption patterns and women's empowerment? (A study conducted in Mexico)\*

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## **Abstract**

This paper conducts a thorough data analysis using cross-sectional data from a study carried out in Mexico including over 16,500 observations. In the study, clusters were selected in areas Compartamos Banco, a Microfinance institution (MFI), has not lent in before. The clusters were randomly assigned to either the treatment or the control group. The analysis suggests that Microfinance has a significant positive effect on school and food expenditure but no apparent effect on entrepreneurship. Using regression analysis, a significant positive effect on women's empowerment and its positive effect on total consumption is found.

## **Zusammenfassung**

Diese Forschungsarbeit analysiert Querschnittsdaten aus einer in Mexiko durchgeführten Studie mit über 16.500 Beobachtungen. In dieser Studie wurden Cluster in Gebieten ausgewählt, in denen Compartamos Banco, eine Mikrofinanzinstitution (MFI), zuvor noch keine Kredite vergeben hatte. Die Cluster wurden zufällig entweder der Behandlungs- oder der Kontrollgruppe zugeordnet. Die Analyse deutet darauf hin, dass Mikrofinanz sich signifikant positiv auf die Schul- und Nahrungsmittelausgaben auswirkt, aber offensichtlich Unternehmertum nicht fördert. Unter Verwendung eines Regressionsansatzes wird aber ein signifikant positiver Effekt auf die Frauenförderung und ihre positive Wirkung auf den Gesamtkonsum festgestellt.

**Keywords:** Microfinance; consumption patterns; women's empowerment; Mexico

**JEL classifications:** D14, G21, I15, I25, I26, I31, J16, O12

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## **Section 1 – Introduction**

Microfinance is believed to promote human development, women's empowerment and economic growth by encouraging entrepreneurship. However, recent studies have cast doubts on whether Microfinance really has had considerable effects on poverty, welfare and entrepreneurship. For the aforementioned reasons, research is of great importance to determine the real effects of Microfinance. The paper looks at other positive impacts that Microfinance might have on the borrower beside its effect on income and entrepreneurship. The aim of this paper is to show how Microfinance could lead to an improvement in welfare through its effects on consumption patterns and women's empowerment. Mexico was chosen as the main country of study as almost half of Mexican adults do not make use of any financial services, indicating a potential demand for Microfinance (Reedy, Bruhn and Tan, 2013; The World Bank, Figure 1). Furthermore, gender inequality in Mexico is prevalent with a Gender Inequality Index score of 0.345, ranking Mexico 73rd out of 159 countries (United Nations Development Programme; Social Institutions and Gender Index; Islas, 2015). Hence, there is sufficient potential for Microfinance to promote women's empowerment.

## **Section 2: Literature review**

The majority of Microfinance institutions (MFIs) aim to reduce poverty by making financial services available to the poor and giving them the opportunity to become entrepreneurs (Buera, Kaboski and Shin, 2012). Assuming Microcredit allows borrowers to start or expand their own business, profits will increase, lifting the borrower out of poverty. This theory has led to the majority of research focusing on the impact of Microfinance on income and business profits. However, in reality there seems to be little evidence of an increase in income and profits in the short or medium run (Attanasio *et al.*, 2015; Augsburg *et al.*, 2015; Tarozzi, Desai and Johnson, 2015; Crepon *et al.*, 2014). On the basis of these results some conclude that Microfinance does not improve borrowers' welfare as it does not raise their income. This paper argues that Microfinance might have other positive effects on borrowers, which are not captured by income.

## Sub-section 2.1.: Theory: Sacrificing non-durable consumption to save up for lumpy investments

The theory about sacrificing non-durable consumption to save up for lumpy investments is adopted as the main reasoning by many research papers, for instance by Banerjee, Karlan and Zinman (2015) and Duflo *et al.* (2013), to explain changes in consumption patterns caused by Microfinance. The theory is built around the idea that borrowers sacrifice non-durable consumption in the short run to be able to afford a durable in the long run. It is assumed that investments are lumpy implying that the acquisition of a durable requires a lump sum of money to be spent (Turvey, 2000). Most low-income households have very little savings, if any at all, so do not have the funds to acquire those assets. Microfinance alone may not be sufficient to relax those credit constraints. This is not an unrealistic assumption as most initial microcredits are of small magnitude mostly ranging between 350 and 800 pesos (17.7 to 40 pounds<sup>1</sup>) in Mexico (Angelucci, Karlan and Zinman, 2015). Therefore, borrowers need to supplement the credit with their own funds to afford the durables. To do so they have to either use their savings or decrease their spending on non-durable goods in the short run to use the extra funds to acquire the durable instead (Augsburg *et al.*, 2015). This reasoning can partly explain why there is no change in the level of consumption being observed but rather a change in the composition of consumption.

This model assumes that non-durable goods are consumed in the period they are bought and durable goods are assumed to lead to utility being received by the owner for at least two periods after the good is bought (Duflo *et al.*, 2013). Thus, buying a non-durable leads to the instantaneous utility  $u_t$  being received by the consumer. Buying a durable good provides the consumer with utility  $au_t$  in every single period over the useful economic life of the asset.

For the general case, assuming that the durable lasts for  $n$  periods, total utility increases if the sum of utility i.e.  $\sum_{t=1}^n au_t$  received over the economic life of the durable good is larger than the one-off instantaneous utility  $u_t$  from the non-durable good (Duflo *et al.*, 2013, p. 14; Banerjee and Mullainathan, 2010). Hence, the

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<sup>1</sup> 1 MXN = 0.05 GBP in 2012 (Figure 3)

coefficient  $a$  needs to be larger than  $\frac{1}{n}$  to make the consumer better off from buying the durable instead of the non-durable.

$$\sum_{t=1}^n au_t > u_t \quad \text{if } a > \frac{1}{n}$$

This theory assumes that the consumer maximizes lifetime utility by optimizing durable and non-durable consumption in each period. Furthermore, it is assumed that the consumer values present utility equally to future utility. As consumers are myopic and as most economies experience inflation, present-bias exists which should be accounted for by discounting future utility. To simplify matters, this present-bias is ignored, meaning that the theory is not completely applicable in the real world (Karlan *et al.*, 2010).

In this model the durable represents either an investment in the owner's business or an investment in the household's home. The payoff received by the household, depends crucially on which type of durable the investment was made in.

Firstly, if the lumpy investment is made in the owner's business, the return of this investment is reflected by an increase in profits (Augsburg *et al.*, 2015). A possible reason for why increases in profits are not observed in the short run is because borrowers cannot invest in the durable as soon as the microcredit is received. Households first need to cut down on their short run non-durable consumption to be able to supplement the credit with their own funds. Consequently, many Microfinance studies do not consider a long enough horizon to be able to capture increases in profits and even more so for increases in consumption. This is because the profits might first be reinvested instead of being extracted for higher household consumption (Karlan and Goldberg, 2007).

Alternatively, if the borrower invests in a home-durable, profits are not going to be affected so consumption remains constant. While some economists argue that the consumer has not experienced an increase in utility because the level of total consumption has remained constant, Duflo *et al.* (2013) and Banerjee *et al.* (2014) argue that the consumer may still be better off if the total utility received by the durable is larger than the instantaneous utility of the non-durable (Banerjee, Karlan, Zinman, 2015; Demirgüç-Kunt, Beck, Honohan, 2008).

In this paper a third type of durable is considered, reflecting investments in human capital in the form of expenditure on education or health. These investments lead to long term economic benefits but might not lead to any instantaneous utility. For school expenditure, depending on the child's age, it might take several years until the child is grown up and can capitalize on his higher education. Better education increases human capital of the individual and is likely to result in higher wages earned (Psacharopoulo, 1993). Besides having a positive private rate of return, investments in education also have a positive public rate of return. The public rate of return is positive because better education contributes to human development and increases human capital which can be seen as factors of production and hence leads to economic growth. (Ranis, 2004; Bennell, 1996; Mincer 1981).

Medical expenditure might increase utility quicker as the members of the household will experience a rise in their productivity in the short run and potentially even an increase in their life expectancy in the long run. Therefore, an improvement in health of the individual, in theory, should lead to a rise in the wage rate as it is tied to the productivity of the individual i.e. to the marginal product of labour (Borjas, 2010; Mankiw, 2009; Hamermesh, 1993; Holzer 1988). Furthermore, total wages earned should be higher even if wages per hour remain constant, as an increase in the consumer's life expectancy means that he can work for longer.

To conclude, investment in education and health benefits individuals in terms of higher wages by increasing productivity and the public in terms of higher economic growth.

### **Sub-section 2.2.: Does Microfinance affect the composition of consumption?**

The effect of Microfinance on total consumption varies but is mostly found to be positive, however of small size (Attanasio *et al.*, 2015; Augsburg *et al.* 2015; Tarozzi, Desai and Johnson, 2015; Banerjee *et al.* 2014; Duflo *et al.*, 2013). There are some studies that find a significant and large positive effect on total consumption (Kaboski and Townsend, 2010; Buera, Kaboski and Shin, 2012) but a few others, for example Augsburg *et al.* (2015), observe a significant fall in total consumption.



The literature conveys that Microfinance has a modest positive effect on total consumption. There are numerous possible factors that could be the source of these results, for example the loan could be too small to start a business or the borrower could lack entrepreneurial skills. This essay does not attempt to resolve this issue and instead focuses on conveying the idea that Microfinance might be welfare-improving without increasing consumption in the median run. If Microfinance has a positive effect on the composition of consumption, in turn leading to an increase in life-time utility, welfare will increase as a result.

Augsburg *et al.* (2015), Banerjee *et al.* (2014), Duflo *et al.* (2013) and Banerjee and Mullainathan (2010), all find that Microfinance has a negative impact on consumption of temptation goods. The saved funds from this cut in expenditure and the loan are then found to be spent on durable goods (Augsburg *et al.*, 2015; Crépon *et al.*, 2014; Duflo *et al.*, 2013; Shirazi, 2012). Assuming durables give consumers a higher utility than the instantaneous utility of temptation goods, Microfinance increases consumer's welfare.

Furthermore, Microfinance is often found to have a positive effect, especially if the loan was given to a woman, on food expenditure and on food diversity (Thuita, Mwadime, and Wang'ombe 2013; Imai and Azam, 2012; Hamad and Fernald, 2010; Lott, 2009; Burnham, 2005; Doocy, Teferra and Norell, 2005; Khandker, 2005; Duflo, 2000; Zeller and Sharma, 1998; McNelly and Dunford, 1998; Thomas 1990). This leads to an improvement in the nutrition of the household increasing human capital in the long run. Hence, if Microfinance increases food consumption borrowers are made better off.

The effect of Microfinance on spending on education and medical expenses seems unclear in the literature. Overall there seems to be a slight positive effect of Microfinance on expenditure on education and no effect on expenditure on health (Shirazi, 2012; Wydick, 1999). However, most papers find an increase in school enrollment as well as a decrease in child labour (Jack *et al.*, 2016; Crépon *et al.* 2014; Duflo *et al.*, 2013). Children who went to school for a higher number of years have higher human capital leading to an increase in their earning power in the future (Mincer, 1958; Becker, 1994; Schultz 1961). Therefore, if Microfinance leads

to better educated children, by increasing expenditure on school expenses for example, it enables households to be better off in the long run.

From these results the conclusion can be drawn that Microfinance does impact the composition of consumption. The positive effect of Microfinance on food consumption seems to be found by most researchers which would increase household's life-time utility by impacting utility in the short and long run.

### **Sub-section 2.3.: Does Microfinance impact women's empowerment?**

In the history of Microcredit, the vast majority of MFIs, like the Grameen bank, have mostly lent to women, enabling them to contribute to the household's income. It is believed that by making women contributors to the household's income, Microfinance increases women's bargaining power allowing them to take a bigger part in the household's decision-making process (Osmani, 2007).

Duflo *et al.* (2013), Hunt and Kasynathan (2001) and Kabeer (1998) find no impact of Microfinance on empowerment yet others, for instance Bali-Swain (2006), Cheston and Kuhn (2002) and Shrestha (1998), find that it does have a positive effect. There is even counter evidence for this theory as Rahman (1999) and Goetz and Sen Gupta (1996) find disempowerment. These results could be explained by the varying percentage of women in control of the loan determining the effect of Microfinance on women's empowerment.

A key problem with women's empowerment is its measurement. Many studies do not consider all aspects of women's empowerment and hence only measure it partially. Section 4 considers many different indicators for women's empowerment and tries to shed more light on the effect of Microfinance on specific elements of women's empowerment.

### **Sub-section 2.4.: Are women's empowerment and consumption patterns linked?**

Many MFIs lend to women as they believe that women spend a larger proportion of their income on improving the household's welfare in comparison to men. In the past, many studies have found that women allocate more of their resources towards

the family's health in comparison to men (Duflo, 2000; Thomas, 1990 and Tripp 1981). Both Khandker and Shahidur (1998) and Pitt and Khandker (1998) find a significant rise in total expenditure when the loan is given to a woman, which becomes insignificant when the loan is given to a man. This demonstrates that the gender of the borrower impacts consumption patterns.

In section 6, this essay looks at the effect of women's empowerment on consumption patterns by using decision-making power as an independent variable when running a regression.

### **Section 3 – Empirical Design**

#### **Sub-section 3.1.: The dataset: A study in Mexico**

This essay uses data from a study conducted by Angelucci, Karlan and Zinman (2015) in Mexico. They selected clusters in areas where Compartamos Banco had not lent before and then randomly assigned each cluster to either the treatment or the control group. Compartamos then only advertised and gave access to their Microcredit to females between 18 and 60 years old in the treatment clusters.

The majority of the data was collected in the endline survey which was conducted from November 2011 to March 2012. A baseline survey was conducted from April 2010 to June 2010 and included 2912 observations, which as a result of attrition led to a small panel dataset. For the aforementioned reason, only the available cross-sectional data from the endline survey is considered comprising 16,560 observations.

There are two requirements that need to be met in order to see the effects of Microfinance. The time span between when the credit was made available to the borrower and the time of execution of the survey should be of considerable length, giving the borrower time to spend the credit and adjust his lifestyle accordingly. This requirement was met because the endline study was carried out 17 to 35 months after Compartamos started lending to the households in the treatment clusters.

Second, there should be a significant and preferably large difference in the amount borrowed from Compartamos between the treatment and the control group. As shown in table 1, the mean amount borrowed from Compartamos in the treatment

group is significantly higher by 244%<sup>2</sup> compared to the control group. This difference in percentage is equal to a nominal amount of 404 pesos (equivalent to around 20 pounds at that time<sup>3</sup>). The overall amount borrowed from an MFI also differs significantly at the 1% level and is equal to a nominal amount of 478 pesos. Besides there being a difference in amount borrowed from Compartamos there is also a significant difference in the number of borrowers between the treatment and the control group, as shown in the appendix 4. However, the overall take up rate is rather low with only 13% of surveyed individuals being Compartamos clients in the treatment group, compared to 4% in the control group.<sup>4</sup>

To conclude there is a large enough difference in both the amount borrowed from Compartamos and the number of Compartamos clients, however the effects of Microfinance might be small due to a low take up rate. This is not an uncommon finding with many researchers finding similar take up rates, mostly varying between 12% and 50%, indicating that the demand for credit is much lower than initially thought (Banerjee, Karlan and Zinman, 2015; Crépon *et al.*, 2014; Duflo *et al.*, 2013).

### Sub-section 3.2.: The general model

$$Y_i = \beta_0 + \beta_1 Microfinance_i + \tau \sum Control_i^1 + \pi \sum Control_i^2 + \varepsilon_i$$

where  $i$  denotes an individual observation and  $\beta_0$  the intercept term.

Outcome  $Y_i$  includes different variables of interest where  $Y_i$  captures the outcome for every value in the set, taken one at a time. For consumption patterns this is the amount spent on food, temptation goods, non-durables, family events, medical expenses and school expenses. For women's empowerment this is the outcome for any business, number of businesses, participates in any economic activity, depression index, satisfaction index, good health status, satisfied with economic

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<sup>2</sup>  $\frac{\text{Treatment Coefficient}}{\text{mean of the control group}} \times 100 = \frac{683.4}{279.718} \times 100 = \text{percentage change}$

<sup>3</sup> 1 MXN = 0.05 GBP in 2012 (Figure 3)

<sup>4</sup> See Table 1: Amount of credit

situation, number of issues she has a say on, average control locus and the women's empowerment index.

Microfinance is a dummy variable and is equal to 1 when the respondent is in the treatment group and 0 when the respondent is in the control group.

Sigma Control<sup>1</sup><sub>i</sub> describes the personal characteristics of the respondent which includes age, the level of education of the respondent and whether the respondent has owned a business before. The level of education is indicated by three dummy variables: Primary, middle and high school of which two are included in the regressions to avoid multi-collinearity (Dougherty, 2011, chapter 5).

Sigma Control<sup>2</sup><sub>i</sub> is the second set of control variables to control for regional characteristics, including the dummy denoting if the respondent lived in an urban area and the cluster in which the respondent lived.

## **Section 4 – Estimated results for consumption patterns**

### **Sub-section 4.1.: Total Consumption and the consumption of non-durable goods**

The study considers three different variables i.e. the amount spent on temptation goods, on non-durables items (excluding food) and on family events, which all capture expenditure on different types of non-durables goods. Unlike Duflo *et al.* (2013), this study finds no effect on consumption of non-durable items, temptations goods and festival events, before and after adding in control variables.<sup>5</sup>

There seems to be evidence for prior business owners and highly educated individuals to spend an increased amount on non-durables. This is likely due to the positive effect that education and business knowledge have on wages and business profits. As shown in table 11 and 12, highly educated individuals with prior business experience are likely to earn more than the average citizen allowing them to consume a larger quantity of those unnecessary goods.<sup>6</sup>

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<sup>5</sup> See Table 2: Amount spent on temptation goods, Table 3: Amount spent on non-durables other than food, Table 4: Amount spent on family events

<sup>6</sup> See Table 11: The effect of high school education on income, Table 12: The effect of prior business experience on income

A possible reason, why there is no effect of Microfinance on non-durables, is that Microfinance does not decrease overall spending but decreases relative spending on non-durables. Recipients of Microcredit have more funds available than those who have not received any credit, but seem to spend the same amount or even slightly less on non-durables compared to those who did not receive Microfinance. Hence, the observed results suggest that Microfinance clients change the way they spend their credit but do not change the way they spend their other income. Therefore, the theory in section 2 applies to the funds from Microfinance but not to overall income.

#### **Sub-section 4.2.: Expenditure on food**

The reason food consumption is taken into consideration is because nutrition in childhood has an effect on long term physical and cognitive development, impacting productivity in the long run (Dasgupta 2004; Schultz, 1999; Strauss and Thomas, 1998, Thomas 1994, Leibenstein, 1957). Therefore, a shift towards an increase in expenditure on food would increase welfare in the short run by increasing instantaneous utility from food consumption and in the long run by raising future earnings.

In this study Microfinance is observed to have a significant positive effect on the amount spent on food (table 7). However, this might not just be a sign of an increase in the quantity but also in the quality of food consumed. The latter is more likely to be the case as in 2010 only 11% of the population of Mexico lived in extreme poverty (Report of Poverty in Mexico, 2010).

To see whether these results are robust, propensity score matching (PSM), using the nearest neighbour method, was carried out matching on both regional and personal characteristics. The average treatment effect on the treated (ATET) for food expenditure was positive and significant at the 10% level. This indicates that a particular individual if treated spends more on food compared to when that same individual would not receive treatment.

### **Sub-section 4.3.: Consumption of durable goods – education and health**

Having mostly found evidence for a decrease in spending on non-durables and assuming that credit is not deposited, there needs to be an increase in spending on other items. In sub-section 4.1 the theory hypothesized that this augmentation in spending is on durable goods.

Here the focus lies on expenditure on durables in the form of expenditure on health and education. As depicted in table 5, positive and mostly significant estimates for the treatment coefficient on expenditure on education have been obtained when controlling for personal and regional characteristics. The effect of Microfinance on school expenditure represents an increase in amount spent on education of up to 3.4 pounds when receiving one pound of credit.<sup>7</sup>

Important to consider is whether a rise in expenditure on education affects the amount of schooling children receive. As conveyed by appendix 3 there is a rise in the fraction of children going to school which is significant at the 5% level. The rise in school attendance is matched by a decrease in the fraction of children working (Appendix 5). Hence, it can be argued that Microfinance increases expenditure on education, which in turn increases the fraction of children receiving education.

When conducting PSM, ATET for school expenditure was found to be positive but insignificant. Yet, the increase in fraction of children going to school was still found to be significant at the 5% level. Therefore, Microfinance affects school expenditure not as strongly as suggested by the regression results, but affects the more important downstream result of increased schooling.

The effect of mother's education on school expenditure is positive and significant at the 1% level as shown in table 5 column 9. Mothers who went to high school spent 16 pounds more on school expenditure than mothers who received primary education or less. Hence, there is a positive relationship between parent's education and children's education (Emisch and Pronzata, 2010; Behrman *et al.* 1999; Becker, 1994). If Microfinance increases children's education, then the next generation will be more highly educated and in turn spend more on their children's education.

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<sup>7</sup> See Table 6: Amount spent on medical expenses

Consequently, Microfinance can have a long lasting effect through improving the population's education level, not just for the next generation but for subsequent generations thereafter.

The second possible durable in which borrowers can invest in is health. An improvement in health is desirable for individuals and the public as it leads to higher productivity and hence higher human capital which contribute to higher wages and higher economic growth (Bloom and Canning, 2008). This study observes a positive point estimate for Microfinance on medical expenditure (Table 6). When conducting a difference in difference analysis the mean amount spent on medical expenses for the treatment group is 34 %<sup>8</sup>higher than it is for the control group (Appendix 6). A possible explanation to why the effect is found to be insignificant could be that in 2012 universal health care, known as Seguro Popular, was fully implemented in Mexico. Seguro Popular has made health care free for anyone, which has decreased the need to pay for private health care. This has been reflected by a decrease in out-of-pocket expenditure on health as conveyed in Figure 2.

Just as it was found for expenditure on education, highly educated individuals with prior business experience spend more on health than uneducated individuals with no prior business experience (Currie and Moretti, 2003). Educated individuals, who have owned a business previously, have an income above the average and are more aware of the impacts of health on human capital and on productivity and future earnings.

There seems to be sufficient evidence to conclude that Microfinance does impact the composition of consumption. The regression results obtained give evidence for the theory discussed in 3.1 as almost all point estimates for non-durables were negative and all point estimates for durables were positive and sometimes significant. Unlike Duflo *et al.* (2013), the results do not suggest that Microfinance brings about a shift away from temptation goods to supplement long term investments. The results are consistent with Duflo *et al.* (2013) with respect to longer term investments. An explanation into why the effects are smaller than hypothesised, could be that take up rates of Microfinance were too low.

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<sup>8</sup>  $\frac{\text{mean of the treatment group} - \text{mean of the control group}}{\text{mean of the control group}} \times 100 = \frac{14.4}{36.6} \times 100 = \text{percentage change}$



## **Section 5: The effect of Microfinance on women's empowerment**

### **Sub-section 5.1.: Results – The effect of Microfinance on different indicators of women's empowerment**

Besides having an effect on consumption patterns Microfinance is believed to have an effect on social outcomes as well. Here the social outcome chosen is women's empowerment. Women's empowerment has many definitions but in general refers to the ability of women to make their own decisions concerning their resources and allowing them to benefit from those resources (World bank, chapter 2). The term also encompasses the improvement of their economic status and well-being. This essay considers 12 indicators for women empowerment which can be grouped into three areas of women's empowerment. The first group aims to capture the economic status. The second category tries to capture the mental and physical wellbeing and the third group represents the decision-making power.

The essay uses two different methods to analyse women's empowerment. First, as shown in tables 8 and 9, the paper looks at all indicators separately to see if the treatment has an effect on them. To then have an idea of the overall effect on each specific area of women's empowerment, three indexes are constructed.

The following three paragraphs focus on how Microfinance affects women's mental and physical health. Here a depression index and a satisfaction index are used to measure mental health. Physical health is captured by a dummy for health status, her satisfaction with her economic situation, amount spent on food and on medical expenses.

As shown in tables 8 and 9 (columns 4 and 5), the treatment leads to a statistically significant improvement in the depression index for female borrowers. The improvement is statistically significant at the 1% level which is found to be consistent with the results of PSM. This result is supported by a positive point estimate for Microfinance on satisfaction index. From these results it can be concluded that in this study Microfinance has improved the mental health of the recipient.

These results should still be handled with care as the depression index asks the respondents about her thoughts and feelings in the last week. The 20 questions

asked to determine the depression index only ask about the mental health of the last week. By chance, this week might have been a bad week or the day on which the respondent fills in the questionnaire has been a particular bad day. However, this study used a large sample size and as having a bad or good day is determined randomly it can be assumed that these effects, by asking respondents randomly, cancel each other out. This is based on the assumption that the distribution of good and bad days is normal which can be concluded by making use of the central limit theorem. As the survey was carried out over an 18-month period, public news on a specific day affecting individuals' feelings in a similar way could not have biased the results.

Besides mental health, physical health is also an important indicator for women's empowerment. Here current and future physical health is indicated by the amount spent on food and medical expenses and by her satisfaction with her economic condition. Furthermore, a dummy indicating current health status is included. As found in sub-section 4.2, Microfinance has a positive significant effect on food consumption and a large positive but insignificant effect on medical expenditure. Both better nutrition and increased medical expenditure should lead to improved physical health in the future. The only puzzling result found, is a negative and insignificant point estimate for the effect of Microfinance on the level of satisfaction with economic condition. As no deterioration in income has been found, a possible explanation could be that female clients become more aware of how much possible improvement there is to their present economic condition. Therefore, even if they are slightly better off than before they might feel less happy about their condition than before.

To conclude, both mental and physical health seemed to be positively affected by Microfinance. The full extent of investments in medical expenses might not yet be seen but should be shown as an improvement in both mental but more likely physical health in the future.

Possibly the most important indicator for women's empowerment is often seen to be her participation in the decision-making process in the household. In this essay her stand in the household is taken into account by three variables. The first variable

represents her participation in any financial decision, the second variable considers the number of issues she has a say in (on a scale from 0-4) and the third variable considers her average locus of control. The results obtained for the first two variables convey a positive effect of Microfinance on women's empowerment. For both the treatment effect is found to be positive and significant at the 1% level. PSM finds similar results indicating that Microfinance has a positive effect on both variables which is significant at the 5% level. In the short run such positive effects seem to be limited with the magnitude of both coefficients to be rather small with the mean number of issue she has a say in increasing from 2.7 to 2.8 and her participation in financial decisions increasing from 0.976 to 0.981. Lastly, Microfinance is found to have no impact on the average locus of control. Overall Microfinance has slightly increased her influence in the decision-making process.

The last group of variables indicating women's empowerment convey the economic status of the individual. There are three variables which fall into this category which are the number of businesses owned, a dummy indicating whether the individual owns a business and a dummy for whether she has participated in an economic activity or not. The point estimate obtained for both the dummy for owning a business and the number of businesses is very close to zero. On the basis of these results it can be concluded that in this study Microfinance has no observed effect on entrepreneurship. There seems to be a clear impact of borrower's education on both the likelihood of owning a business at all and the number of businesses. This seems to suggest that education equips them with skills to lead a business. Hence, Microfinance could indirectly increase entrepreneurship in the future by improving the education of the next generation.

The last indicator of her economic status is a dummy for whether she has participated in an economic activity or not. A significant negative effect of Microfinance is observed. As shown in the difference in difference analysis (Appendix 2) this effect is of small magnitude as the mean of the treatment group is only 3.5%<sup>9</sup> lower than that of the control group. Therefore, there seems to be a small negative effect of Microfinance on participation in an economic activity (see variable

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<sup>9</sup>  $\frac{\text{mean of the treatment group} - \text{mean of the control group}}{\text{mean of the control group}} \times 100 = \frac{0.0164}{0.4744} \times 100 = \text{percentage change}$

list for definition). A possible explanation is that her husband has taken over the loan, which has allowed him to increase the household's business profits. This gives the mother the opportunity to stay at home and look after their children instead of going to work or starting a business.

The previous paragraphs have only considered the direct effects of Microfinance on women's empowerment. There could be indirect effects through which Microfinance impacts women's empowerment. As seen in the appendix 3, children's schooling years increase in the treatment group which should lead to a better educated generation. When looking at table 8 and 9 it can be observed that individuals who went to high school, have more decision-making power, better health and a better economic status. Assuming that these indicators convey women's empowerment, Microfinance might indirectly increase women's empowerment by improving education.

To conclude, there seems to be a considerable improvement in both mental and physical health of female borrowers. There is also a positive impact on female decision-making process. The effect on the economic situation is less clear but there seems to be a very slight deterioration in the economic status of women, as fewer are involved in any economic activity. Overall, higher education seems to improve women's health, increase her decision-making power and improve her economic status. Therefore, Microfinance will empower women indirectly by improving overall education. It can be concluded, when weighting the impact on each indicator equally, that Microfinance does not deteriorate women's empowerment and quite possibly improves it. To have a clearer idea of the overall effect of Microfinance on women's empowerment the next section looks at a proxy for each group of indicators for women's empowerment.

### **Sub-section 5.2.: Results - Women's empowerment index**

Women's empowerment is captured by a number of different indicators making it hard to evaluate the overall effect of Microfinance. For the aforementioned reason, a proxy was used as used by Duflo *et al.* (2013). The proxy is an equally weighted average of the z-scores for all 12 indicators discussed in sub-section 4.1. As all

indicators are measured in different units each variable is standardized using z-scores.

$$Y_i = \frac{x_{1i} + x_{2i} + x_{3i} + x_{4i} + x_{5i} + x_{6i} + x_{7i} + x_{8i} + x_{9i} + x_{10i} + x_{11i} + x_{12i}}{12}$$

Here  $Y_i$  is the women's empowerment index for individual  $i$ . Where  $x_1$  stands for any business,  $x_2$  for number of businesses,  $x_3$  for participated in any economic activity,  $x_4$  for the depression index,  $x_5$  for the satisfaction index,  $x_6$  for good health status,  $x_7$  for satisfaction with economic condition,  $x_8$  for participation in any financial decision,  $x_9$  number of issues she has a say on,  $x_{10}$  for average control locus,  $x_{11}$  for amount spent on food and  $x_{12}$  for amount spent on medical expenses.

In table 8 and 9 in column 13, the treatment effect is found to be positive and significant at the 1% and 5% level. Further, the effect of both mother's education and prior business experience is positive which is consistent with their effects on the individual indicators. This indicates the soundness of the proxy.

To see how the three elements of women's empowerment are impacted three more proxies are constructed. The equally weighted average of z-scores for the economic status including  $x_1$ ,  $x_2$  and  $x_3$  is found to be significantly smaller in the treatment group than in the control group (Appendix 7). Hence Microfinance negatively impacts the overall economic status.

Both the proxy measuring decision-making power including  $x_8$ ,  $x_9$  and  $x_{10}$  and the proxy for health including  $x_4$ ,  $x_5$ ,  $x_6$ ,  $x_7$ ,  $x_{11}$  and  $x_{12}$  are found to be significantly higher for the treatment group than for the control group (Appendix 8).

To summarize, the null hypothesis is rejected as Microfinance is observed to have a positive effect on women's empowerment. However, this is only the case if all indicators are weighted equally. If the economic status is considered to be more important than decision-making power and health, then the effect of Microfinance on women's empowerment might be negative. Therefore, Microfinance is observed to promote women's empowerment when all three elements of women's empowerment are weighted equally.

## **Section 6 – The mechanism between women’s empowerment and consumption patterns**

So far the essay has focused on the effects Microfinance has on borrower’s consumption patterns and on women’s empowerment. The question this section answers is whether those two are related. In this study all MFI clients were female so it could be argued that the results found are all due to the women’s decision-making. However, studies conducted in the past have found that husbands take the loan of their wife and then spend it without consulting them (Basu, 2006; Rajasekhar, 2000; Rahman, 1999; Goetz and Gupta, 1996). Hence, the changes in consumption observed could be caused by the husband’s expenditure. To overcome this problem, this study uses the proxy for decision-making power created in subsection 5.2.

Assuming that the proxy correctly reflects decision-making power it can be concluded that women spend more on food, education and on non-durables when they are allowed to participate in the decision-making process (Thomas, 1990). It also seems as though women increase total consumption. These results support the practice of MFIs to lend mainly to women as they seem to increase spending on education and food which in turn will reduce poverty in the future.<sup>10</sup>

## **Section 7 – Conclusion**

This paper has attempted to convey that Microfinance can be welfare-improving by affecting consumption patterns and women’s empowerment. It sheds new light on these questions by finding a significant increase in food and school expenditure, which will improve the nutrition of the members of the household and will increase children’s human capital.

The paper found modest and insignificant reductions in spending on non-durable items which are unlikely to cause a transformative impact on the household. Yet this is evidence for the fact that Microcredit is not spent on non-durables but rather on durables.

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<sup>10</sup> See Table 10: Link between her decision making power and consumption patterns of the household

The effect of Microfinance on women's empowerment is found to be positive. However, Microfinance is found to reduce her economic status.

Finally, this paper investigated whether there was a link between consumption patterns and women's decision-making power. Women, when allowed to participate in the decision-making process, increased total consumption, expenditure on school expenses, food and non-durables.

Overall the regression analysis seems to convey that Microfinance improves women's well-being in the short run and raise future human capital and thus wages of the next generation. The full extent of these investments might only be seen in 5 to 10 years' time and a follow up study would need to be conducted to confirm these predictions. Unfortunately, just like Duflo *et al.* (2013) this paper finds evidence that Microfinance is by no means a way to reduce poverty substantially in the short run.

These results might not be of external validity as Compartamos used group lending as a means of lending which may affect the way women spend their money due to factors like peer pressure. There could be selection biases affecting the results which cannot be controlled as there was no extensive baseline study conducted. It is likely that groups self-selected their members on their socio-economic characteristics leading to the observed effects. This paper controls for the personal and regional characteristics for which data was available using different methods of PSM (Appendix 1). The different methods for PSM were consistent with each other and were mostly consistent with the results of the regression, increasing the robustness of the results. Consequently, the effects observed were indeed caused by Microfinance even after adjusting for personal and regional characteristics.

A follow-up survey should be conducted where the education level of the borrower should be resampled to see whether women invest in their own education. If Microfinance is found to improve the education level of adults, then Microfinance could indirectly impact household's income in the now as well as the future.

On the basis of these results Microfinance should include mandatory training in order to have a stronger and quicker impact on women's empowerment and income.

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## Tables

**Table 1: Amount of credit**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Amount from any MFI	Amount from Compart.	Amount from other MFI	Amount from other bank	Amount from other formal institution	Amount from informal entity	Amount from other source	Total amount
Treatment	574.2***	683.4***	-109.3	102.6	-223.2	9.149	401.9***	922.0**
	(91.40)	(49.17)	(76.73)	(296.2)	(220.7)	(67.82)	(154.2)	(427.8)
Constant	1,052***	279.7***	772.7***	2,906***	919.3***	308.2***	1,188***	6,493***
	(64.50)	(34.70)	(54.15)	(209.0)	(155.8)	(47.86)	(108.8)	(301.9)
Observations	16,154	16,155	16,156	16,147	16,157	16,165	16,159	16,139
R-squared	0.002	0.012	0.000	0.000	0.000	0.000	0.000	0.000
Mean of control group	1052.5	279.7	772.7	2905.7	919.3	308.2	1187.5	6492.5

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 2: Amount spent on temptation goods**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Am. spent on tempt. goods	Am. Spent on tempt. goods	Am. spent on tempt. goods	Am. spent on tempt. goods	Am. spent on tempt. goods	Am. spent on tempt. goods	Am. spent on tempt. goods
Treatment	-1.722 (1.971)	-1.266 (1.955)	-1.060 (1.987)	-0.616 (1.987)	-0.0105 (1.994)	-0.294 (1.991)	-0.0786 (1.992)
Age		-1.458*** (0.0881)	-1.547*** (0.0911)	-1.550*** (0.0910)	-1.559*** (0.0910)	-1.318*** (0.0983)	-1.435*** (0.0954)
Prior busin. owner			14.15*** (2.471)	12.54*** (2.488)	13.18*** (2.493)	11.83*** (2.497)	12.49*** (2.495)
Lives in urban area				-11.68*** (2.237)	-7.186*** (2.549)	-6.802*** (2.546)	-7.078*** (2.547)
Cluster					-0.0573*** (0.0156)	-0.0649*** (0.0156)	-0.0618*** (0.0156)
Primary school						-20.31*** (2.745)	
Middle school						-11.61*** (2.377)	3.703 (2.351)
High school							15.06*** (2.726)
Observations	16,435	16,435	15,906	15,906	15,906	15,894	15,894
R-squared	0.000	0.016	0.018	0.020	0.021	0.024	0.023
Mean of control group	97.8						

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 3: Amount spent on non-durables other than food**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Amount spent on non-durables	Amount spent on non-durables	Amount spent on non-durables	Amount spent on non-durables	Amount spent on non-durables	Amount spent on non-durables	Amount spent on non-durables
Treatment	-1.565 (9.546)	-1.992 (9.544)	-0.209 (9.781)	-0.267 (9.791)	-0.0783 (9.823)	-3.707 (9.713)	-0.726 (9.787)
Age		1.302*** (0.430)	0.793* (0.448)	0.793* (0.448)	0.790* (0.448)	3.777*** (0.479)	1.837*** (0.468)
Prior busin. owner			85.06*** (12.17)	85.27*** (12.26)	85.47*** (12.29)	67.40*** (12.19)	78.25*** (12.27)
Lives in urban are				1.516 (11.03)	2.939 (12.55)	7.831 (12.41)	4.189 (12.50)
Cluster					-0.0183 (0.0769)	-0.108 (0.0762)	-0.0540 (0.0768)
Primary school						-257.6*** (13.39)	
Middle school						-161.6*** (11.60)	12.47 (11.55)
High school							143.5*** (13.40)
Observations	16,556	16,556	16,022	16,022	16,022	16,010	16,010
R-squared	0.000	0.001	0.004	0.004	0.004	0.028	0.012
Mean of control group	502.4						

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 4: Amount spent on family events**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Amount spent on fam. events	Amount spent on fam. events	Amount spent on fam. events	Amount spent on fam. events	Amount spent on fam. events	Amount spent on fam. events	Amount spent on fam. events
Treatment	-0.251 (1.624)	-0.214 (1.624)	-0.160 (1.654)	-0.0147 (1.656)	0.122 (1.661)	-0.133 (1.659)	0.0450 (1.660)
Age		-0.107 (0.0732)	-0.166** (0.0758)	-0.167** (0.0758)	-0.169** (0.0759)	-0.00184 (0.0820)	-0.105 (0.0795)
Prior busin. owner			10.47*** (2.057)	9.949*** (2.073)	10.09*** (2.077)	8.920*** (2.081)	9.502*** (2.079)
Lives in urban area				-3.835** (1.865)	-2.800 (2.122)	-2.473 (2.119)	-2.700 (2.120)
cluster					-0.0133 (0.0130)	-0.0180 (0.0130)	-0.0153 (0.0130)
Primary school						-16.85*** (2.289)	
Middle school						-14.90*** (1.983)	-2.382 (1.958)
High school							12.05*** (2.273)
Observations	16,373	16,373	15,845	15,845	15,845	15,833	15,833
R-squared	0.000	0.000	0.002	0.002	0.002	0.007	0.005
Mean of control group	16.75						

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5: Amount spent on school expenses**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Amount spent on school exp.	Amount spent on school exp.	Amount spent on school exp.	Amount spent on school exp.	Amount spent on school exp.	Amount spent on school exp.	Amount spent on school exp.
Treatment	2.676 (1.638)	2.891* (1.669)	3.406** (1.675)	3.360** (1.675)	3.346** (1.674)	2.543 (1.651)	3.219* (1.671)
Prior busin. owner		13.75*** (2.040)	13.75*** (2.039)	13.22*** (2.075)	12.03*** (2.095)	8.740*** (2.071)	11.25*** (2.094)
Cluster			-0.0412*** (0.0115)	-0.0408*** (0.0115)	-0.0156 (0.0131)	-0.0320** (0.0130)	-0.0182 (0.0131)
Age				0.105 (0.0764)	0.108 (0.0763)	0.651*** (0.0814)	0.197** (0.0799)
Live in urban area					-8.567*** (2.133)	-7.534*** (2.104)	-8.366*** (2.129)
Primary school						-46.90*** (2.276)	
Middle school						-29.86*** (1.974)	-2.606 (1.972)
High school							15.58*** (2.288)
Observations	15,573	15,087	15,087	15,087	15,087	15,078	15,078
R-squared	0.000	0.003	0.004	0.004	0.005	0.034	0.010
Mean of control group	32.55						

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 6: Amount spent on medical expenses**

VARIABLES	(1) Amount spent on medical expenses	(2) Amount spent on medical expenses	(3) Amount spent on medical expenses	(4) Amount spent on medical expenses	(5) Amount spent on medical expenses	(6) Amount spent on medical expenses
Treatment	12.43 (12.35)	12.28 (12.36)	13.45 (12.75)	14.37 (12.76)	15.64 (12.81)	16.05 (12.81)
Age		0.430 (0.558)	0.0901 (0.585)	0.0852 (0.585)	0.441 (0.633)	0.241 (0.614)
Prior busin. owner			53.30*** (15.89)	49.99*** (16.01)	49.35*** (16.11)	50.49*** (16.08)
Lives in urban area				-24.12* (14.36)	-8.504 (16.37)	-9.011 (16.37)
Cluster					-0.201** (0.100)	-0.196* (0.100)
Primary school					-38.60** (17.66)	
Middle school					-33.09** (15.30)	-2.992 (15.11)
High school						31.02* (17.54)
Observations	15,919	15,919	15,419	15,419	15,407	15,407
R-squared	0.000	0.000	0.001	0.001	0.002	0.002
Mean of control group	37.03					

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 7: Amount spent on food**

VARIABLES	(1) Amount spent on food	(2) Amount spent on food	(3) Amount spent on food	(4) Amount spent on food	(5) Amount spent on food	(6) Amount spent on food	(7) Amount spent on food
Treatment	15.18 (9.524)	23.62** (9.534)	25.10*** (9.512)	25.88*** (9.647)	25.81*** (9.640)	21.61** (9.492)	25.06*** (9.597)
Cluster		-0.649*** (0.0655)	-0.666*** (0.0653)	-0.664*** (0.0663)	-0.491*** (0.0755)	-0.602*** (0.0745)	-0.537*** (0.0753)
Age			-3.923*** (0.427)	-4.078*** (0.440)	-4.060*** (0.440)	-0.580 (0.469)	-2.885*** (0.460)
Prior busin. owner				53.88*** (11.95)	45.69*** (12.06)	25.56** (11.91)	38.53*** (12.03)
Lives in urban area					-59.27*** (12.32)	-53.60*** (12.13)	-57.79*** (12.27)
Primary school						-291.0*** (13.09)	
Middle school						-161.8*** (11.34)	29.42*** (11.33)
High school							149.1*** (13.14)
Observations	16,497	16,497	16,497	15,966	15,966	15,954	15,954
R-squared	0.000	0.006	0.011	0.012	0.013	0.044	0.022
Mean of control group	874.26						

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 8: indicators for women's empowerment (middle and high school)**

VARIABLES	(1) Any business	(2) No. of businesses	(3) Participated in an economic activity	(4) Depression index (higher=better)	(5) Satisfaction index	(6) Good health status
Treatment	-0.000416 (0.00590)	0.000143 (0.00686)	-0.0162** (0.00757)	0.0480*** (0.0157)	0.0214 (0.0157)	0.00464 (0.00619)
Cluster	-0.000160*** (4.62e-05)	-0.000184*** (5.38e-05)	8.23e-05 (5.94e-05)	0.00139*** (0.000123)	-0.000565*** (0.000123)	1.41e-05 (4.85e-05)
Age	0.00113*** (0.000282)	0.00105*** (0.000328)	-0.00112*** (0.000362)	-3.02e-05 (0.000750)	-0.00972*** (0.000753)	-0.0112*** (0.000296)
Prior business owner	0.482*** (0.00739)	0.539*** (0.00859)	0.356*** (0.00949)	-0.0174 (0.0196)	0.0289 (0.0197)	-0.00882 (0.00775)
Lives in urban area	0.0620*** (0.00753)	0.0711*** (0.00876)	0.0716*** (0.00967)	-0.104*** (0.0200)	-0.0501** (0.0201)	-0.0233*** (0.00790)
Middle school	0.0232*** (0.00696)	0.0301*** (0.00809)	0.0315*** (0.00893)	0.0245 (0.0185)	-0.0564*** (0.0186)	0.0459*** (0.00730)
High school	0.0404*** (0.00807)	0.0487*** (0.00938)	0.0521*** (0.0104)	0.171*** (0.0215)	0.129*** (0.0215)	0.0867*** (0.00847)
Observations	16,014	16,014	16,014	15,802	16,007	16,010
R-squared	0.222	0.208	0.086	0.014	0.020	0.111
Mean of control group	0.2431	0.2637	0.4778	-2.22e-09	-2.90e-09	0.7794

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 8 continued**

VARIABLES	(7) Satisfied with economic situation	(8) Participates in any financial decision	(9) No. of issues she has a say on	(10) Average control locus	(11) Amount spent on food	(12) Amount spent on medical expenses	(13) Women's empowerment index
Treatment	-0.00462 (0.00785)	0.00717*** (0.00270)	0.0713*** (0.0246)	-0.00106 (0.0157)	25.06*** (9.597)	16.05 (12.81)	0.0216*** (0.0073)
Cluster	-0.000172*** (6.16e-05)	-6.80e-06 (2.13e-05)	0.000484** (0.000194)	-0.000300** (0.000123)	-0.537*** (0.0753)	-0.196* (0.100)	-0.0001** (0.0001)
Age	-0.00471*** (0.000376)	-0.000271** (0.000136)	0.00421*** (0.00124)	-0.00376*** (0.000753)	-2.885*** (0.460)	0.241 (0.614)	-0.0036*** (0.0004)
Prior busin. owner	-8.88e-05 (0.00984)	0.00558 (0.00340)	0.221*** (0.0309)	0.157*** (0.0197)	38.53*** (12.03)	50.49*** (16.08)	0.2962*** (0.0092)
Lives in urban area	-0.0504*** (0.0100)	0.00426 (0.00344)	0.0971*** (0.0313)	0.0700*** (0.0201)	-57.79*** (12.27)	-9.011 (16.37)	0.0209** (0.0093)
Middle school	-0.0343*** (0.00926)	0.0112*** (0.00319)	0.197*** (0.0290)	0.0158 (0.0186)	29.42*** (11.33)	-2.992 (15.11)	0.0501*** (0.0086)
High school	0.0266** (0.0107)	0.0144*** (0.00371)	0.362*** (0.0338)	0.186*** (0.0215)	149.1*** (13.14)	31.02* (17.54)	0.1565*** (0.0101)
Observations	15,982	11,765	11,766	16,003	15,954	15,407	11,151
R-squared	0.017	0.003	0.019	0.012	0.022	0.002	0.1134
Mean of control group	0.4576	0.975	2.7428	-3.85e-09	874.3	37.03	0.0009

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



**Table 9: indicators for women's empowerment (primary and middle school)**

VARIABLES	(1) Any business	(2) No. of businesses	(3) Participated in an economic activity	(4) Depression index (higher=better)	(5) Satisfaction index	(6) Good health status
Treatment	-0.000752 (0.00590)	-0.000300 (0.00686)	-0.0180** (0.00754)	0.0432*** (0.0156)	0.0177 (0.0157)	0.00306 (0.00616)
Cluster	-0.000162*** (4.63e-05)	-0.000188*** (5.38e-05)	4.50e-05 (5.91e-05)	0.00130*** (0.000122)	-0.000638*** (0.000123)	-1.24e-05 (4.83e-05)
Age	0.00125*** (0.000291)	0.00123*** (0.000338)	0.000163 (0.000372)	0.00307*** (0.000768)	-0.00717*** (0.000773)	-0.0102*** (0.000304)
Prior busin. owner	0.481*** (0.00740)	0.538*** (0.00860)	0.349*** (0.00946)	-0.0347* (0.0195)	0.0147 (0.0197)	-0.0143* (0.00772)
Lives in an urban area	0.0624*** (0.00753)	0.0717*** (0.00876)	0.0737*** (0.00963)	-0.0988*** (0.0199)	-0.0457** (0.0200)	-0.0213*** (0.00786)
Primary school	-0.0390*** (0.00813)	-0.0496*** (0.00945)	-0.139*** (0.0104)	-0.368*** (0.0215)	-0.294*** (0.0216)	-0.140*** (0.00849)
Middle school	-0.0110 (0.00704)	-0.0123 (0.00819)	-0.0515*** (0.00900)	-0.210*** (0.0186)	-0.240*** (0.0187)	-0.0523*** (0.00735)
Observations	16,014	16,014	16,014	15,802	16,007	16,010
R-squared	0.222	0.208	0.095	0.028	0.029	0.120
Mean of control group	0.2431	0.2637	0.4478	-2.22e-09	-2.90e-09	0.7794

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 9 continued**

VARIABLES	(7) Satisfied with economic condition	(8) Participates in any financial decisions	(9) No. of issues she has a say on	(10) Average control locus	(11) Amount spent on food	(12) Amount spent on medical expenses	(13) Women's empowerment index
Treatment	-0.00602 (0.00783)	0.00701*** (0.00270)	0.0651*** (0.0244)	-0.00634 (0.0156)	21.61** (9.492)	15.64 (12.81)	0.01835** (0.007)
Cluster	-0.000204*** (6.14e-05)	-8.09e-06 (2.13e-05)	0.000395** (0.000192)	-0.000408*** (0.000122)	-0.602*** (0.0745)	-0.201** (0.100)	-0.00017*** (0.0005)
Age	-0.00364*** (0.000386)	-0.000211 (0.000139)	0.00762*** (0.00125)	-2.44e-05 (0.000768)	-0.580 (0.469)	0.441 (0.633)	-0.0017*** (0.00037)
Prior busin. Owner	-0.00603 (0.00982)	0.00512 (0.00340)	0.198*** (0.0307)	0.136*** (0.0195)	25.56** (11.91)	49.35*** (16.11)	0.28325*** (0.0091)
Lives in urban area	-0.0488*** (0.0100)	0.00430 (0.00344)	0.100*** (0.0311)	0.0764*** (0.0199)	-53.60*** (12.13)	-8.504 (16.37)	0.0223** (0.0091)
Primary school	-0.103*** (0.0108)	-0.0162*** (0.00370)	-0.563*** (0.0335)	-0.430*** (0.0215)	-291.0*** (13.09)	-38.60** (17.66)	-0.2715*** (0.0098)
Middle school	-0.0907*** (0.00935)	-0.00227 (0.00324)	-0.211*** (0.0293)	-0.252*** (0.0186)	-161.8*** (11.34)	-33.09** (15.30)	-0.0139*** (0.0086)
Observations	15,982	11,765	11,766	16,003	15,954	15,407	11,151
R-squared	0.022	0.004	0.032	0.032	0.044	0.002	0.1526
Mean of control group	0.4576	0.975	2.7428	-3.85e-09	874.3	37.03	0.0009

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 10: Link between her decision making power and consumption patterns of the household**

VARIABLES	(1a)	(2a)	(3a)	(1b)	(2b)	(3b)
	Am. Spent on tempt. goods	Am. Spent on non-durables	Am. Spent on food	Am. Spent on tempt. goods	Am. Spent on non-durables	Am. Spent on food
Decision-making power	4.5008** (1.8034)	49.4668 *** (9.6641)	81.9777 *** (9.0474)	1.465575 (1.870658)	19.5935* (10.0854)	49.6532*** (9.2339)
Treatment				-0.5382 (2.2839)	-9.7462 (12.3201)	16.8171 (11.281)
Age				-0.8937*** (0.1174)	6.1532*** (0.6332)	0.8406 (0.58)
Cluster				-0.071*** (0.018)	-0.1410 (0.0971)	-0.7144*** (0.0889)
Prior business owner				13.9607*** (2.8826)	73.7656*** (15.5639)	19.1897 (14.248)
Urban				-6.8575** (2.9108)	16.9436 (15.6994)	-41.1576*** (14.3769)
Primary school				-18.9912*** (3.1899)	-260.7257*** (17.2156)	-290.1892*** (15.7607)
Middle school				-6.4788** (2.7504)	-151.8871*** (14.8407)	-155.8024 *** (13.59)
Observations	12,092	12,162	12,133	11,677	11,744	11,718
R-squared	0.0005	0.001	0.003	0.0167	0.028	0.0455
Mean of control group	97.8	502.4	874.3	97.8	502.4	874.3

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 10 continued**

VARIABLES	(4a)	(5a)	(3a)	(4b)	(5b)	(3b)
	Amount spent on school expenses	Amount spent on medical expenses	Amount spent on family events	Amount spent on school expenses	Amount spent on medical expenses	Amount spent on family events
Decision-making power	9.57*** (1.502)	-13.33 (13.31)	2.61* (1.49)	4.41*** (1.54)	-22.21 (14.14)	0.201 (1.565)
Treatment				5.12*** (1.89) 1.11*** (0.096)	22.67 (17.299)	0.104 (2.284)
Age					0.583 (0.891)	-0.0304*** (0.098)
Cluster				-0.035** (0.015)	-0.242* (0.136)	-0.019 (0.015)
Prior business owner				8.27*** (2.38)	62.82*** (21.91)	8.399*** (2.42)
Urban				-7.88*** (2.397)	-7.22 (22.05)	-0.581 (2.44)
Primary school				-45.12*** (2.64)	-52.75** (24.18)	-19.85*** (2.67)
Middle school				-25.93*** (2.27)	-42.86** (20.86)	-18.41 *** (2.305)
Observations	11,504	11,726	12,041	11,127	11,333	11,626
R-squared	0.0035	0.0001	0.0003	0.0401	0.002	0.0097
Mean of control group	32.55	37.03	16.75	32.55	37.03	16.75

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 11: The effect of high school education on income**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Household's business income last month	Household's income for salaried and non-salaried jobs (last month)	Household's income per adult in the last month ('000)	Household's business income last month	Household's income for salaried and non-salaried jobs (last month)	Household's income per adult in the last month ('000)
High school	313.9*** (57.74)	952.4*** (96.25)	0.436*** (0.106)	289.3*** (58.95)	749.9*** (97.49)	0.402*** (0.107)
Age				-3.652 (2.289)	-45.87*** (3.791)	-0.00263 (0.00409)
Prior busin. owner				1,192*** (62.53)	-417.1*** (102.2)	0.331*** (0.0885)
Cluster				-0.918** (0.386)	1.235* (0.638)	-0.00108 (0.00498)
Lives in urban area				146.2** (62.97)	-596.6*** (104.1)	
Observations	15,567	16,145	1,821	15,085	15,635	1,789
R-squared	0.002	0.006	0.009	0.026	0.019	0.017
Mean of control group	839.8	4540.7	1.596	839.8	4540.7	1.596

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 12: The effect of prior business experience on income**

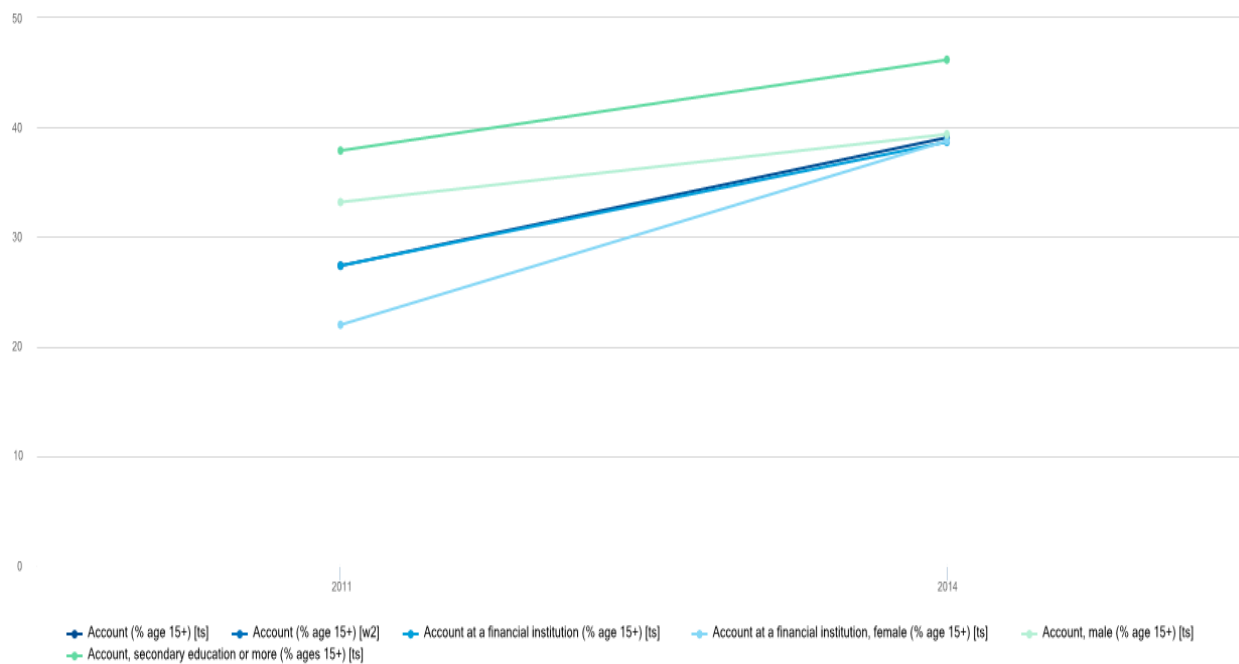
VARIABLES	(1a)	(2a)	(1b)	(2)
	Household's business income last month	Household's income per adult in the last month ('000)	Household's business income last month	Household's income per adult in the last month ('000)
Prior business owner	1158.253*** (60.86)	0.334*** (0.087)	1,166*** (62.52)	0.287*** (0.0874)
Cluster			-1.059*** (0.386)	-0.00361 (0.00491)
Age			0.812 (2.432)	0.00664 (0.00435)
Primary school			-581.3*** (67.88)	-0.944*** (0.116)
Middle school			-414.7*** (58.94)	-0.582*** (0.105)
Lives in urban area			156.9** (62.87)	
Observations	15,095	1,790	15,085	1,789
R-squared	0.0234	0.0081	0.030	0.046
Mean of control group	839.8	1.596	839.8	1.596

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

## Figures

Figure 1: The percentage of age +15 having an account



Country : Mexico  
Source: Global Financial Inclusion  
Created on: 03/13/2018

Available at: <http://databank.worldbank.org/data/reports.aspx?source=1228>

Figure 2: Out of pocket health expenditure

### Out-of-pocket health expenditure (% of total expenditure on health)

World Health Organization Global Health Expenditure database ( see [apps.who.int/nha/database](https://apps.who.int/nha/database) for the most recent updates ).

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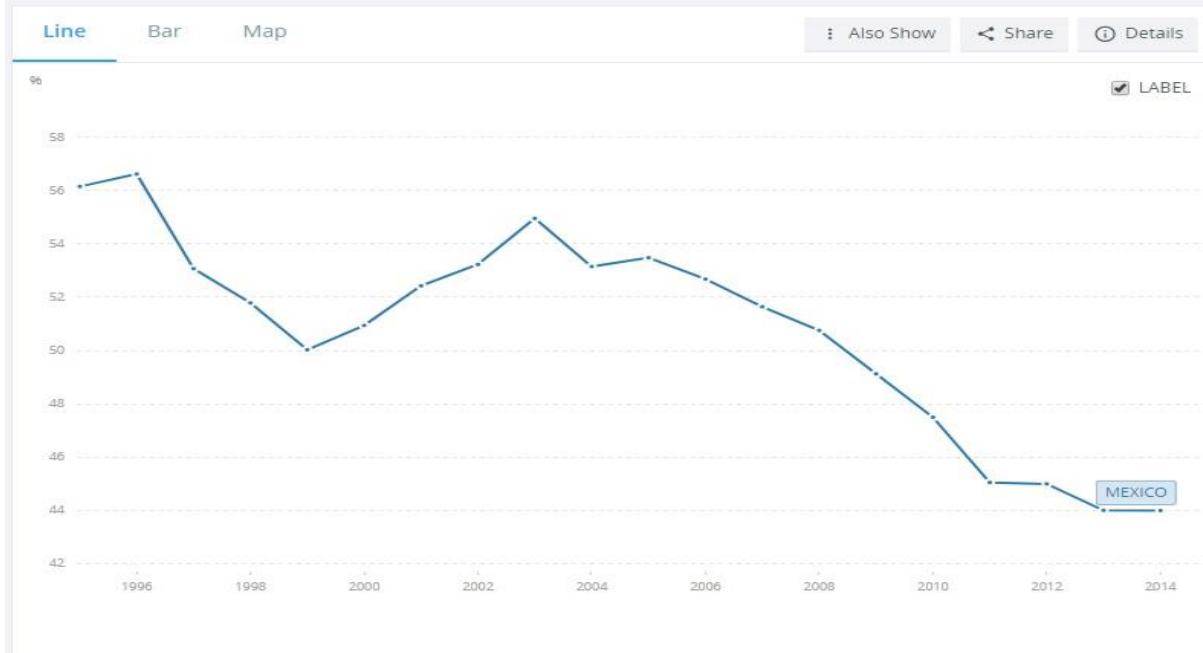


Figure 3: MXN to GBP

### MXN to GBP Chart

22 Mar 2008 00:00 UTC - 19 Mar 2018 13:49 UTC **MXN/GBP** close:0.03782 low:0.03607 high:0.05510



Available at:

<http://www.xe.com/currencycharts/?from=MXN&to=GBP&view=10Y>

## Appendix

### Appendix 1: Propensity score matching results

Treatment	Coefficient	Std. Err.	z	P>z	[95% Conf. Interval]	
Age	0.002	0.001	2.51	0.012	0.001	0.004
Middle school	0.028	0.023	1.20	0.230	-0.018	0.074
High school	0.046	0.027	1.70	0.088	-0.007	0.099
urban	0.121	0.022	5.43	0.000	0.078	0.165
Prior business owner	-0.052	0.025	-2.11	0.035	-0.101	-0.004
constant	-0.189	0.046	-4.17	0.000	-0.279	-0.100

	Observations control	Observations Treatment	ATET (Nearest neighbor)	Std. Err.	t-statistic	ATET (using logit model)
Participated in and economic activity	8001	7987	-0.015	0.008	-1.831	-0.015*
Any business	8001	7987	-0.002	0.007	-0.303	-0.002
Number of businesses	8001	7987	-0.001	0.008	-0.162	-0.001
Amount spent on temptation goods	8001	7903	0.058	0.016	3.529	-0.746
Depression index (higher=better)	8001	7910	0.054	0.016	3.333	0.059***
Satisfaction	8001	7985	0.015	0.016	0.927	0.015
Good health status	8001	7984	0.005	0.007	0.674	0.005
Satisfied with economic situation	8001	7970	-0.006	0.008	-0.780	-0.006
Participated in any financial decisions	8001	5869	0.008	0.002	3.111	0.006**
# of household issues she has got a say on	8001	5868	0.064	0.022	2.872	0.064***
Fraction of children in school	8001	6017	0.02	0.005	4.222	0.011**
Fraction of children working	8001	6017	-0.006	0.004	-1.444	-0.008*
Amount spent on nondurable items other than food	8001	7985	1.335	10.425	0.128	1.624
Amount spent on food	8001	7966	18.641	9.962	1.871	18.725*
Amount spent on school expenses	8001	7542	3.029	1.679	1.804	1.736
Amount spent on medical expenses	8001	7687	11.168	12.594	0.887	11.605
Amount spent on family events	8001	7890	-0.241	1.733	-0.139	-0.168
Average locus of control	8001	7980	-0.003	0.016	-0.203	-0.003

## Appendix 1: Propensity score matching results (continued)

	ATT (Kernel method)	ATT (Radius: 0.005)	ATT (Stratification method)	Standard error	t-statistic
Participated in and economic activity	-0.018	-0.018	-0.016	0.008	-1.968
Any business	-0.005	0.011	-0.002	0.007	-0.284
Number of businesses	-0.005	0.015	-0.001	0.008	-0.153
Amount spent on temptation goods	-1.074	-12.274	-0.732	1.989	-0.368
Depression index (higher=better)	0.066	0.069	0.065	0.016	4.133
Satisfaction	0.012	0.015	0.013	0.016	0.827
Good health status	0.002	0.007	0.003	0.007	0.496
Satisfied with economic situation	-0.008	-0.007	-0.006	0.008	-0.822
Participated in any financial decisions	0.007	0.008	0.007	0.002	2.976
# of household issues she has got a say on	0.078	0.068	0.078	0.021	3.672
Fraction of children in school	0.009	0.007	0.009	0.004	2.157
Fraction of children working	-0.009	-0.008	-0.009	0.004	-2.214
Amount spent on nondurable items other than food	0.168	12.305	-0.608	10.193	-0.060
Amount spent on food	16.937	130.038	19.165	9.616	1.993
Amount spent on school expenses	3.165	3.044	3.115	1.592	1.957
Amount spent on medical expenses	13.252	12.594	13.935	12.461	1.118
Amount spent on family events	-0.355	-0.254	-0.047	1.638	-0.029
Average locus of control	-0.002	-0.001	-0.000	0.016	-0.025

Used the common support option for all methods

### Difference in difference analysis:

#### Appendix 2: Participated in an economic activity

Group	Observations	Mean	Std. Err.	Std. Dev.	95% Conf. Interval	
0 (Control group)	7,154	0.4744	0.0059	0.4994	0.4629	0.486
1 (Treatment group)	7,579	0.458	0.0057	0.4983	0.4468	0.4692
Combined	14,733	0.466	0.0041	0.4989	0.458	0.474
Difference		0.0164**	0.0082		0.0003	0.0326

#### Appendix 3: Fraction of children in school

Group	Observations	Mean	Std. Err.	Std. Dev.	95% Conf. Interval	
0 (Control group)	5,391	0.8754	0.0038	0.2788	0.868	0.8829
1 (Treatment group)	5,542	0.8855	0.0036	0.2687	0.8785	0.8926
Combined	10,933	0.8806	0.0026	0.2738	0.8754	0.8857
Difference		-0.0101**	0.0052		-0.0204	0.0002

Appendix 4: Any loan from Compartamos survey data

Group	Observations	Mean	Std. Err.	Std. Dev.	95% Conf. Interval	
0 (Control group)	6,857	0.0422	0.0024	0.2009	0.0374	0.0469
1 (Treatment group)	7,251	0.1334	0.004	0.34	0.1255	0.1412
Combined	14,108	0.0890	0.0024	0.2848	0.0843	0.0937
Difference		-0.0912***	0.0047		-0.1005	-0.0819

Appendix 5: Fraction of children working

Group	Observations	Mean	Std. Err.	Std. Dev.	95% Conf. Interval	
0 (Control group)	5,391	0.0864	0.0035	0.2557	0.0795	0.0932
1 (Treatment group)	5,542	0.0763	0.0033	0.245	0.0699	0.0828
Combined	10,933	0.0813	0.0024	0.2506	0.0766	0.086
Difference		0.0100**	0.0048		0.0006	0.0194

Appendix 6: Amount spent on medical expenses

Group	Observations	Mean	Std. Err.	Std. Dev.	95% Conf. Interval	
0 (Control group)	6,885	36.5705	3.4243	284.1351	29.8578	43.2832
1 (Treatment group)	7,295	50.9486	13.0558	1115.102	25.3555	76.5416
Combined	14,180	43.9674	6.9194	823.9591	30.4045	57.5303
Difference		-14.3781	13.8445		-41.5152	12.759

Appendix 7: Proxy for the economic status

Group	Observations	Mean	Std. Err.	Std. Dev.	95% Conf. Interval	
0 (Control group)	8,298	0.0118	0.0099	0.3974	-0.0094	0.0111
1 (Treatment group)	8,262	-0.0119	0.0098	0.4192	0.0042	0.0259
Combined	16,560	0.0000	0.007	0.4084	1.0865	0.0154
Difference		0.0237 **	0.0139		-1.8305	0.0007

Appendix 8: Proxy for the decision-making power

Group	Observations	Mean	Std. Err.	Std. Dev.	95% Conf. Interval	
0 (Control group)	6,100	-0.0152	0.0082	0.8974	-0.0075	0.0311
1 (Treatment group)	6,063	0.0192	0.0078	0.892	-0.0311	0.0073
Combined	12,163	0.002	0.0057	0.8948	-0.0136	0.0136
Difference		-0.0344***	0.0113		-0.0035	0.051





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