Evaluating the Effect of Peer-Based Financial Education on Savings and Remittances for Foreign Domestic Workers in Singapore[*]

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Abstract

We evaluate a randomized field experiment among Filipino domestic workers in Singapore to study the effect of financial literacy on financial knowledge and behavior, savings and remittances. Preliminary evidence suggests that financial education has no effect on financial knowledge, outcomes and behavior. However, we find that assignment to a financial education class has a negative effect on saving outcomes among female migrants. Our results suggest that financial literacy classes may lead to a decline in savings if it has a detrimental effect on behavior and aspirations of the participants. We also find evidence that those assigned to treatment were able to exert greater control over remittance amounts. However, we cannot tell for sure if the decrease in savings is also a result of a substitution towards certain forms of remittances.

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1 Introduction

Financial decisions are complicated, particularly for those with little experience with formal financial products. Savings, borrowing, and remittance decisions can have serious consequences for individual and social well-being, but involve abstract trade-offs over time and an understanding of risks and probabilities. If the individual involved is a migrant worker, then there exists an additional information gap. Since the migrant worker and the remittance recipient are geographically separated, often for long time periods, the worker cannot observe the spending patterns of the recipient directly. Thus, migration creates changes in household structure that exacerbate intra-household information asymmetries and generates agency and moral hazard problems.

Asymmetric information may lead to greater inefficiencies if the migrant worker in question are females. Women are less confident about making financial decisions and therefore may not be willing or able to control how the money sent through remittances is spent by their families back home.

Financial literacy, the ability to process financial information and make informed decisions regarding the use and management of money, is one of the interventions through which this market failure can be minimized. Policy makers are increasingly focusing on financial education as a tool to empower individuals to manage their finances effectively for a lifetime of financial well-being.

The scope of this study is threefold. *First*, we aim to demonstrate the efficacy of financial education and counseling. We study the effect of financial literacy training given to Filipino Foreign Domestic Workers (FDWs) in Singapore on their financial decision making and behavior. In particular, this study addresses the following questions:

- *Financial Knowledge and Planning* – Does financial education increase the participants' financial knowledge and understanding of financial concepts? Does it make individuals plan for the future?

- *Financial Savings* – Does financial education increase the participants' savings

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(e.g. likelihood of saving, savings amounts, probability of opening a bank account)?

- *Remittance Behavior* – Does financial education change the way participants remit to their dependents (e.g. amount and frequency of remittance method)?

- *Heterogeneous effects* – Does the impact of financial education vary with initial levels of financial literacy, education or other demographic characteristics?

One problem in empirically evaluating the effect of financial literacy is that individuals who are more able, responsible, and self-motivated are more likely to enroll in financial literacy training as well as make sound financial choices. Thus, to deal with this endogenous self selection and in order to establish a causal effect, our study incorporates random assignment of Filipino FDWs to financial literacy classes.

Most studies involving migrant workers implicitly assume that financial knowledge and interests, motivation to save and control over remittances are gender-neutral. In reality though, men and women face different psycho-social barriers and family responsibilities that influence the amount and frequency of savings and remittances, as well as control over how the money is used. Thus, to maximize the development benefits of remittances from women migrants, we need gender-sensitive research on savings, borrowings and remittance patterns among female migrant workers. The *second* aim of this study is to evaluate whether financial education makes women more confident about their financial choices. To this end, we evaluate the following question:

- *Controls over Finances* – Does financial education allow the participant to have more control over how much is remitted and how the money is spent?

The *third* aim of this paper is to illustrate the importance of peer effects in financial education. Even though members of the class are supported by a mentor, the financial literacy class that we evaluate is member-organized and member-led. In addition to learning through peer support groups, volunteers are assigned each week to send out a weekly inspirational SMS to their fellow classmates. This allows us to study the effect of peer-based learning.

To our knowledge, there is no other study that has evaluated the impact of financial literacy on FDWs and the financial decisions unique to their circumstances.

Thus, our study could have substantial impact on public policy, by suggesting policies to further stimulate savings and remittance flows among this group.

Our results suggest that women with better mathematical ability, lower earnings and higher baseline savings are more likely to join a financial literacy class. This reemphasizes the importance of randomization in studies that evaluate the effect of financial education on outcomes. Moreover, we find a counter intuitive result i.e. financial education had a negative effect on saving outcomes. We explore several channels that may have driven this result. We find some evidence that those assigned to treatment were able to exert control over remittance amounts. However, we cannot tell for sure if the decrease in savings is a result of a substitution towards certain forms of remittances. This is a preliminary version and we are still in the process of studying other remittance outcomes. We also explore other possible channel for the decline in savings. The results suggest that financial education may lead to a decline in savings if it has a detrimental effect on behaviors and aspirations of the participants.

The rest of this paper is organized as follows. Section 2 provides a brief literature review. In section 3, we discuss the policy relevance and provide the background for the population under study. Section 4 describes in detail the intervention, sample selection and presents descriptive statistics. The empirical results are presented in section 5 and finally, section 6 concludes with an emphasis on the policy implications of our study.

2   Related Literature

Recent research suggests that financial illiteracy is an important contributory cause of low savings levels and poor financial management. Financially illiterate households tend not to plan for future or unexpected events, borrow at high interest rates, and acquire few assets (Lusardi and Mitchell 2007; Lusardi and Tufano 2009; Maarten, Lusardi and Alessie 2011). As a result, improving financial literacy is a key goal of policy makers.

However, existing research yields mixed results as to whether financial literacy improves either performance on knowledge-based tests of financial literacy or actual financial wellbeing (Lusardi and Mitchell 2007). Evaluations in developing countries have demonstrated modest, but by no means overwhelming, success. Cole, Sampson and Zia (2010), who present the only randomized evaluation of financial literacy

program designed to promote savings behavior, find that a financial literacy program in Indonesia caused some financially illiterate households to open a savings account. Karlan and Valdivia (2010) find that business education for female entrepreneurs improved business knowledge and revenues.

Non-experimental evidence has been mixed and mostly targeted towards young adults. The seminal work by Bernheim, Garrett, and Maki (2001) on the impact of financial education in high school showed that adults who took a personal financial management course in high school tended to save a higher proportion of their incomes than others who did not. Their identification relied on variation in course requirements across different states. However, states that imposed the mandates were inherently different from those that did not casting doubt on their estimates. Cole and Shastry (2010) use variation in U.S. state reforms on high school graduation requirements to examine the impact of financial education on asset accumulation. They find that state mandates that require high school students to take financial literacy courses do not affect the propensity to save. Mandell and Klein (2009) used a matched sample design based on a school system's records to identify high school students who had and had not taken a course in personal financial management. They find that those who took the course did not evaluate themselves to be more savings-oriented and did not appear to have better financial behavior than those who had not taken the course.

Our study contributes to this literature by rigorously evaluating a financial literacy intervention for female migrant domestic workers in Singapore. To our knowledge, there is no other study that has evaluated the impact of financial literacy on female migrant workers and the financial decisions unique to their circumstances.

Second, this study will shed light on whether financial literacy helps minimize the inefficiencies in migrant remittance patterns caused by asymmetric information. Overseas migrants may not share the same objectives as family members remaining back home, in particular regarding the use of remittances. For example, migrants may prefer that remittances be saved or invested, while remittance recipients may prefer consumption over investment.[1] When overseas migrants cannot perfectly monitor how recipients use remittances, remittance amounts may be lower than under perfect information. De Laat (2007) shows that male Kenyan migrants spend consid-

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[1] Ashraf (2009) shows that husbands and wives change whether they choose to consume or save their money when they are being observed by their spouse.

erable resources monitoring their rural wives, consistent with the existence of moral hazard in wives' implementation of husbands' remittance instructions. Chen (2006) finds evidence in China that non-cooperative behavior by wives when husbands have migrated is greater for behaviors that are more difficult to monitor. Since our focus group comprises of women migrant workers, asymmetric information may lead to greater inefficiencies as they don't always have the power to say no or decide how remittances should be spent.

3   Foreign Domestic Workers (FDWs) in Singapore

Our study focuses on the effect of financial education on financial well being of Singapore based Filipino FDWs. Philippines is the second largest migrant-sending country and the third largest remittance receiving country in the world. The concentration of Filipino women as international migrants is striking; 87% of international migrants in the services sector from the Philippines in 2010 were women. Among these, 70% were domestic workers.[2] Recent research in the economics of migration has documented several beneficial impacts of remittance flows on household well-being and investments. For instance, households in the Philippines experiencing exogenous increases in remittances become more likely to leave poverty status, to send their children to school, and to invest in new entrepreneurial enterprises (Yang and Martinez 2005, Yang 2006, Yang 2008).

Singapore is an important case-study because it hosts a large migrant worker population, approximately one-fourth of its total population of 5 million (Singapore Department of Statistics, 2011), and is also a major receiving country for female migrant labour. As of December 2010, there were 201,000 FDWs and the majority of them came from Philippines (Ministry of Manpower, Singapore). It has been estimated, that one in five households employ a live-in maid in Singapore.[3]

Though reliance on live-in help has historically been an integral part of Singapore since British colonization, it was only in 1978 when the first Foreign Maid Scheme was established. According to this scheme, domestic workers from other Asian countries were allowed to come and work in the country.

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[2]Bell M & Muhidin S (2009) "Cross National Comparisons of Internal Migration", UNDP human development research paper 2009/30.

[3]http://www.mom.gov.sg/newsroom/Pages/SpeechesDetail.aspx?listid=235

Following this scheme, there has been an increased influx of domestic helpers in Singapore. The majority of FDWs come from Indonesia, Philippines and Sri Lanka. FDWs must be between 23 and 50 years old when first entering Singapore and may work up to the age of 60. The government of Singapore also requires that the women have atleast 8 years' minimum formal education. Domestic workers are not covered by the Employment Act. Thus, there are no minimum wage regulations or minimum number of days off. However, the Philippine Overseas Employment Administration's stipulates a minimum salary of S$ 350 (approximately US$ 278) for maids with none or little experience. In general, Filipino domestic helpers get paid higher than FDWs from other regions as they speak English and are often more experienced. Moreover, salaries tend to increase with levels of experience.

The norm in Singapore is to grant the domestic helper atleast one Sunday off each month. However, some employers grant alternate Sundays off while others also give a day off on public holidays. This policy has important implications for our study because all women in our sample were only available to take classes on their free Sundays. We discuss this in detail in Section 4.3 below.

4   Background, Sample and Intervention

Existing evidence demonstrates a strong correlation between financial literacy and better savings, investment and remittance behavior, but there is little evidence firmly establishing the causal link. One explanation is that it is difficult to draw causal inference since people who choose to seek financial education may be different from those who do not. One could easily argue that individuals who are more able, responsible, and self-motivated enough to enroll in financial literacy training are also more likely to make sound financial choices. There is an obvious selection bias if those with high levels of financial literacy are different than those with low levels of financial literacy. OLS estimates of the effect of financial literacy on savings patterns would be biased as we might end up attributing differences in savings levels to unobserved differences rather than financial literacy. For instance, Meier and Sprenger (2008) show that individual time preference may explain which individuals choose to become financially literate. At the same time, discount rates are an important determinant of individual saving patterns as a person with a high discount rate would place lower value on future rewards. If we do not control for this unobserved heterogeneity in time

preferences across individuals, we will get biased estimates.

In order to establish a causal effect, our study incorporates random assignment of Filipino domestic workers to financial literacy training. This ensures that those who receive training are statistically indistinguishable from those who do not, and that any ex-post observable difference between the groups (in terms of saving, borrowing, etc.) can be attributed solely to the training program.

4.1   The Program

The intervention evaluated in this study was implemented in conjunction with *Aidha*, a non-profit organization based in Singapore that is dedicated to providing financial education to female migrant workers. With initial support from United Nations Development Fund for Women, *Aidha* was formally established in year 2006 as an independent organization. *Aidha* offers courses in management and entrepreneurship training, financial education, computer skills and marketing and communication classes. The majority of the students are women, particularly domestic workers, who have migrated to support their families. Most of these women come from families that are living below \$2/day. The ultimate aim of the organization is to empower students to end poverty through the means of businesses and incomes that are sustainable. Since 2006, approximately 1200 students have enrolled in *Aidha*.

4.2   Financial Compass Clubs

At the time of study, one of *Aidha*'s core programs revolved around peer-based savings clubs, called Financial Compass Clubs (Compass Clubs for short). Compass Clubs are organized as peer support groups. Each club consists of 10 to 12 members, who meet for three hours, once a month for 9 months along with a life-planning coach to discuss savings goals and priorities. The mentors, who undergo rigorous training, are provided with a standardized curriculum that has been developed by *Aidha*. The curriculum is structured so as to inculcate four main learnings of the program: a) Importance of savings and identifying reasons to save, b) Learning to say "no" to unnecessary expenses, both by the individual and her family members, c) How to control remittances and d) Visualizing and accomplishing financial goals and business plans.

The nine sessions are organized with three key-words in mind; knowledge, goals

and rewards. With the help of the mentor, the participants acquire basic *knowledge* about budgeting, planning, opening bank accounts, investing in productive assets, interest rates etc. To ensure that students take classroom learning to the real world, the Compass Clubs leverage on peer support groups, sustained intervention and non-monetary rewards. In each session, the women announce their *goals*, challenges and successes to one another. With the goals in place, they begin saving and motivating each other to put their learning into practice. Four volunteers are assigned each week to send out a weekly inspirational SMS to their fellow Compass Club members. Finally, when goals are achieved and saving targets met, participants are *rewarded* to reinforce behavioral change. The rewards are generally in the form of certificates and badges.

Aidha does not pool money for the participants, instead the women save in their own bank accounts. At every meeting, members have to show to the mentor their monthly bank statement including savings deposits and total bank balance. For women who do not have a bank account, they ask their employer to save on their behalf. In this case, they need to present to the mentor a letter from the employer on savings amount in place of the bank statement. There is a minimum monthly saving S$5 required for each member. In addition to savings, from the first session, compass club members start tracking their expenses on a daily basis. The expense tracking notebooks are checked by the mentors each month.

4.3   Sample, Baseline and Endline

Most domestic workers in Singapore get atleast one Sunday off, though a majority get alternate Sundays off. On their day off, most women spend the day in church or with friends in malls or parks. In addition, some domestic workers chose to attend classes that are offered by various non profit organizations, schools or local community centers and churches. These classes range from cooking, baking, nursing and dressmaking to formal classes on financial education, entrepreneurship, computer skills and English language training. All courses are tailored to suit migrant workers with two Sundays off per month. Generally, there are two sets of Sundays and time slots which they can choose from, ie 1st & 3rd Sunday or 2nd and 4th Sunday.

Our sample of women was drawn from those attending computer or cooking classes in two different locations. Following a pilot in 2010, we conducted a baseline survey in

January/February 2011. Women were selected for the baseline survey conditional on being a Filipino domestic worker, attending a computer or cooking class and having atleast one Sunday off. A total of 365 Filipino domestic workers were surveyed in the baseline.

We went to the location of the classes and gave a brief presentation that explained the financial literacy classes. All attendees were told that they stand a chance to receive an invite for the compass club. In addition, we asked them to fill out lottery tickets and randomly selected winners were given a S$10 phone top-up voucher.

After randomization of the baseline group, 205 women were assigned to the treatment group and were invited to attend classes beginning in March 2011. However, the enrollment rate was much lower, only 44 women (21.4 percent of treatment group) enrolled in classes. Four different compass clubs began in March 2011.

The initial registration fee for the class, which amounted to S$55, was paid by the student. However, we ensured them a full refund if they attend all 9 sessions. In particular, to ensure attendance, we followed a staggered payment scheme; $10 was refunded after three sessions, another $20 was refunded after the sixth session and finally the remaining $25 were given back at the end of the last session.

Aidha has many different classes that are offered simultaneously. In order to discourage women from taking any other class during the time that they were attending the compass club sessions, we decided to hold the classes in a separate location. This also ensured that the peer effects that we intend to identify is restricted to classroom peer effects within a class as opposed to network effects across different types of classes. Finally, we hired a survey firm to conduct the endline surveys by phone in November 2011. The respondents were given $40 grocery vouchers as an incentive to complete the survey. We interviewed 280 women, i.e. 77% of the baseline sample, in the follow up surveys. The remaining women either did not complete the survey or they no longer worked in Singapore or we could not contact them due to a change in telephone numbers.

In both baseline and follow up survey, information was collected on individual and household characteristics, employment attributes, asset ownership, decision-making, expenditure, borrowing, savings and remittances. In addition, following Lusardi and Mitchell (2010), the questionnaire included several simple math-based and problem-solving questions including a question that would indicate risk aversion.

Baseline summary statistics are reported in Table 1. The sample is restricted

to the 280 women who completed the follow up survey. Columns 1-3 provides the means and standard deviations (in parenthesis) for some of the baseline variables for the entire sample, the control group and the treatment group, respectively. Column 4 shows the difference between the treatment and control groups. As is evident from column 4, none of the differences in means are statistically different for the two groups. Thus, it seems that randomization achieved its goal of balance in terms of pre-treatment variables.

The average FDW in our sample is about 37 years with 12 years of education and only a third of the women are presently married. The mean number of years that they have spent in Singapore is 9.3 years. Since FDW salaries increase with experience, this explains the relatively higher mean monthly salary of S$464 among this group. Their monthly expenses, excluding remittances, is about 37% of their average monthly salary.

Another interesting variable is the lower math skills among this group. We measure numeric skills through a series of 4 mathematics questions on addition, division and interest rates. On an average, the respondent only answered 50% of math questions correctly. If math skills are a good proxy for financial literacy, then this shows low levels of financial literacy among domestic workers. We also asked respondents a question on probabilities that proxied for their risk aversion. We asked them, "Suppose we had a jar with three green balls and one red ball. You are playing a game and you have two choices. You can receive $100 for certain. Or you can pick a ball from this jar with your eyes shut, and if you choose a green ball you will receive $200. Do you want $100 for certain, or do you want to have a chance of getting $200?" The table below suggests that 54.3% of women chose the option of $100 with certainty.

In terms of baseline financial status, 61% women reported that they owned at least one form of assets. These assets could include a house, land, farm, livestock, vehicles, machines or other forms of physical assets. Interestingly, more than 90% of women reported having savings. The amount of savings held in Singapore was equivalent of S$ 658 (approximately US$ 520) while they held PhP 25008 (US$ 500) as savings in the Philippines. When asked about their control over remittance, 36 percent women felt that they had no control over how remittances were spent by their families back home. At the same time, 50 percent of the women reported that within the last 12 months they had disagreements with their family members regarding their expenditure patterns.

To check whether randomization was balanced, Table 2 presents regressions for the 17 baseline variables reported in Table 1 on the treatment indicator variable. Panel B also reports regressions with stratification fixed effects. With minor exceptions, the baseline variables appear to be well balanced. Women in treatment group have lower education. However, this effect disappears when we control for stratification fixed effects. Since we stratified the sample based on number of days off, it is no surprise that women in treatment group have more number of days off. The only variable that appears with a strong statistical significance is the variable that measures the extent of control that the female migrant worker has over remittance spending. In particular, women who have control over their remittances are 12.5 to 15.5 percentage points less likely to be in the treatment group.

5   Results

Let D_i be an indicator for whether an individual was invited to join a Compass Club i.e. assigned to Treatment. Y_{it} is the outcome of interest such as savings, remittances, financial knowledge and behavior. We estimate the following regression:

$$Y_{it} = \alpha_1 + \alpha_2 D_i + \alpha_3 X_{it-1} + \varepsilon_{it}$$

The constant term α_1 is the value of the dependent variable for individuals assigned to the control group and α_2 is the difference in outcomes for individuals assigned to the treatment and control groups. ε is a mean-zero error term. X_{it-1} is a vector of baseline (pre-treatment) characteristics. X_{it-1} includes a range of baseline pre-treatment characteristics that might be correlated with treatment in spite of randomization. In particular, we control for age, education, marital status, number of children, employer origin (Caucasian or not), whether they had any savings, years spent in Singapore, number of days off each month, monthly income, whether they had any assets and monthly expenses.

To estimate the impact of financial education, we focus attention to intent to treat (ITT) estimates; that is, simple comparisons of averages among the treatment and comparison groups, averaged over those who enrolled and did not enroll in class. This is an "intent-to-treat" analysis as we consider as treated all individuals assigned to the treatment group, regardless of whether they attended the course. In countries

such as Singapore where financial education is voluntary for migrant workers, the ITT estimate is of greater policy interest.

5.1 Take-up

Table 3 displays the results from a regression of whether the individual chose to enroll in the compass club on demographic characteristics and survey responses at baseline, conditional on being offered treatment. Column (1) includes a restricted set of control variables. Column (2) adds income variables, math and financial literacy variables and the control for risk aversion. Columns 3 and 4 include fixed effects for the stratification level. Standard errors are clustered at the level of stratification.

In the complete specification, with all control variables and stratification fixed effects, four variables are important predictors of take up, namely, the number of days off per month, monthly income, baseline savings and baseline math skills. Looking at column (4), the higher is the proportion of math questions that a respondent got correct, the greater is the likelihood that she will enroll in the financial education class and this effect is statistically significant at 5%. These findings are consistent with several previous studies that describe a close relationship between cognitive ability and financial behavior (see for example, Cole, Sampson, and Zia (2010), Cole and Shastry (2010), and Christelis et al. (2006)).

Number of days off is a strong predictor of take up. An additional day off increases probability of attending compass club by 6 percent. Women who have some initial savings are 20% more likely to enroll in class. This also points to the self selection of more motivated individuals into financial literacy classes. Monthly earnings are also a determinant of take up though the coefficient is almost zero in magnitude. However, the sign on the coefficient is consistent with what we would expect, women with lower earnings are more likely to attend a financial literacy class. Finally, column (2) suggests that more risk averse individuals are less likely to attend the financial education class, however, this variable loses significance in the complete specification in column (4).

The self selection of women with better mathematical ability, lower earnings and higher baseline savings into the financial literacy class also reemphasizes the importance of randomization in studies that evaluate the effect of financial education on outcomes.

5.2 Effects on Financial Knowledge and Behavior

In addition to standard data on individual characteristics, our survey also measured financial knowledge, attitudes and preferences. Table 4 presents OLS estimates from estimating equation (1), where the outcome variables are different measures of financial knowledge and attitudes. Panel B includes fixed effects for the stratification level.

We start by looking at the mean of the outcome variables given in the last row of Table 4. 58% of the women surveyed had gathered together their financial information, reviewed it in detail, and put together a specific financial plan. A majority of the women (67%) also had plans to continue making financial plans in future. Only about 50% of respondents had knowledge about budgeting and a third of the sample regretted making a purchase in the recent past.

The reduced form results indicate that assignment to treatment has no statistically significant effect on financial knowledge and behavior for three out of the four variables. The only variable that is marginally significant at the 10% level is the likelihood of making a financial plan in future. Surprisingly, those who were assigned to treatment are 12 percentage points less likely to make a financial plan in the future in the specification without fixed effects and 15.7 % less likely in the model with stratification fixed effects.

5.3 Effects on Savings

Next, we study the effect of financial education classes on savings. Table 5 displays OLS estimates from a regression of savings outcomes from endline survey on whether the individual was assigned to treatment controlling for pre-treatment demographic characteristics. Columns (1), (2) and (4) report probability of having any savings, savings in Singapore and savings in Philippines respectively. Column (3) and (5) show results for regressions where the outcome variables is the amount of savings in Singapore (in SGD) and Philippines (in PhP) respectively. Column (6) reports estimates for a variable that measures whether the individual was happy with their current level of savings. And finally, the outcome variable reported in column (7) is a dummy variable for whether or not the individual had a bank account.

Looking at the regression coefficients, we find a counter intuitive result; the effect of treatment status on several saving outcomes is negative and significant. In the

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specification without fixed effects, assignment to treatment led to S$132 less savings in Singapore compared to the control group. Moreover, those assigned to treatment are 8.5% less likely to have any form of savings. The treatment group is also 17% less likely to be happy with their current saving amounts.

In Panel B, we find that assignment to financial education class led to a 9 percent decrease in the probability of saving. The effect is large and statistically significant at 10%. Finally, those assigned to treatment are much less likely to be happy with their current savings levels. The magnitudes on the coefficients in large, almost 20 % and statistically significant at 1% level. There is no statistically significant difference between the treatment and control group in the probability of holding a bank account.

The results indicate that the compass club class had a negative effect on saving outcomes. There could be at least four possible explanations for this counter intuitive result. First, individuals who take the financial education class are saving less because they increase the amount or frequency of remittances. Thus, there could be a substitution between savings and remittances and that could explain the decrease in savings. A second explanation is that we observe a change in patterns of investment or expenditures. Individuals may be saving less because they are substituting to other forms of expenditures or investments. Third, since the average income among FDWs is very low, it is possible that financial literacy makes them pessimistic. They may believe that given their income levels, they cannot achieve their saving goals and thus they "give-up". If this is the case, we should observe that women with lower baseline earnings have lower savings in the follow up compared to women with higher than median baseline income. Finally, one could argue that taking a financial education class makes individuals more likely to reveal true savings as opposed to inflated numbers that they would have given if they were not in the class. To explore these reasons further, we next look at several other outcome variables.

5.4   Expenses, Investments and Remittances

We now turn to understand if treatment made individuals change their remittance patterns. These results are shown in Table 6. Column (1) reports estimates for the frequency of remittances where the outcome variable takes on the value of 1 to 4 (1-Infrequent, 2- Monthly, 3- Twice a week, 4- Weekly). Column (2) is a dummy variable that takes on the value of 1 if the FDW decided each time the amount to

be remitted. On the other hand, it takes on the value of zero if her family decided how much she should send to them. Finally, in column (3), the outcome is a dummy variable that takes on the value of one if the FDW was in control of how this money was spent by her family back home.

There is little evidence that assignment to treatment had any effect on the frequency of remittances or on the amount of control that a FDW had on her families expenditure patterns. This is not surprising since migrant workers are separated by geographical distances, making it hard to control remittance spending. However, one integral aspect of the financial education class that we evaluated is to teach these women to control the amount remitted to families back home. In particular, a key learning from the compass club is that the migrant should be able to say no to frivolous demands for money. The results from column (2) suggests that there was indeed a significant effect on the individuals control over money sent home. The treated group is 25 to 28% more likely to control the amount of money that is eventually remitted. This is an important result as women are generally less confident about taking financial decisions. However, the result suggests that the financial education class was successful in building self confidence among the treated group, atleast for the purpose of controlling remittances.

In table 7 we study the effect of the treatment on outcomes related to expenditure and investment. Column (1) reports results for monthly expenditures in Singapore dollars and column (2) shows the estimated coefficient for the probability of owning any assets. We find that all reported estimates are statistically insignificant event though the coefficient on monthly expenses is positive.

In sum, we do not find any evidence of increase in personal expenses or investments. The results do suggest that the treated group has more control over remittances, however, our data does not allow us to determine if there was an increase in the amount remitted. We do not have a very clean measure of remittance amounts. However, this is a preliminary work and we are in the process of studying other remittance outcomes.

5.5   Below Median Income Earners

In order to understand the counter-intuitive results for saving patterns, we need to study how individuals at different levels of baseline earnings react to treatment. More

specifically, it is possible that the financial education class led to behavioral changes among the treated group. It may be easier to save when one does not have a good sense of how much money they need to save every month to meet their final motive. For instance, the migrant worker may wish to open an internet cafe in 10 years time but may not know the exact amount she would need for such an investment. Thus, she would save a fraction of her income every month hoping that in 10 years time she has enough to meet her objective. On the other hand, when she joins a financial education class she may realize that given her low income, her objective is not achievable in the time frame or the money that she has been savings will not be enough for starting the internet cafe. She may "give-up" or lose hope and start dis-saving. If this is indeed the case, we would expect savings to be lower for the lowest income earners within the treated group.

To explore this possibility, we divide the sample based on the median baseline earnings which was S$450 in our sample. Table 8 below shows the results from a regression of savings outcomes on assignment to treatment for those individuals with baseline income less than or equal to this amount. For space considerations, we limit the outcome variables to those for which we find interesting and statistically significant results.[4]

In Panel B, where we show results for the complete specification with stratification fixed effects, we find that treatment had a large negative effect on savings outcomes among low income earners. Those assigned to treatment with less than median baseline earnings are 23.5% less likely to have any form of savings. This effect is extremely precisely estimated. Looking at column (3), it is obvious that this could be explained by an almost equal magnitude effect on the probability of having a bank account. Those below median income are 24% less likely to have a bank account. Moreover, the coefficient on savings amount in Philippines is PhP 13125.7 which translates to approximately US$ 311 lower savings compared to the control group.

6   Discussion

We examines whether peer based financial literacy training is effective in encouraging female migrant workers to raise their savings and remittance amounts and have more

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[4]Comparable regression estimates for the above median income group returned all insignificant coefficients. Tables are available upon request.

control over how that money is spent. We show that individuals with better mathematical ability, lower earnings and higher baseline savings are more likely to join a financial literacy class. This reemphasizes the importance of randomization in studies that evaluate the effect of financial education on outcomes. To deal with this endogenous self selection and in order to establish a causal effect, our study incorporates random assignment of Filipino FDWs to financial literacy classes.

We find that assignment to a financial education class has a negative effect on saving outcomes among female migrants. We explore several channels that may have driven this result. We find some evidence that those assigned to treatment were able to exert control over remittance amounts. However, we cannot tell for sure if the decrease in savings is a result of a substitution towards certain forms of remittances. This is a preliminary result and we are still in the process of studying other remittance outcomes. We also explore other possible channel for the decline in savings. The results suggest that financial education may lead to a decline in savings if it has a detrimental effect on behaviors and aspirations of the participants.

The results from this study should be of interest to scholars of international migration and the economics of the family, as well as for economic theorists, in helping determine whether control issues and asymmetric information are indeed important determinants of resource transfers among family members. Since our study involves female migrant workers, issues of control and information asymmetries are exacerbated. Women are less confident about making financial decisions and therefore may not be willing or able to control how the money sent through remittances is spent by their families back home.

As a next step, we will look at the heterogeneous impact of the intervention and see if outcomes vary by cognitive ability as proxied by math skills, by education levels and by degree of aversion to risk. We will also study remittance patterns and determine if financial education led to a change in how money was spent by the remittance recipients. If the remittances are ultimately channeled towards a self sustaining goal, then financial literacy has the ability to improve the overall wellbeing of migrants.

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7 Appendix: Tables

Table 1: Summary statistics from baseline interview

	All (1)	Control (2)	Treatment (3)	Difference (4)
Age	36.66	36.33	36.89	-0.555
	(7.748)	(7.190)	(8.129)	(0.996)
Education	11.69	11.85	11.58	0.269
	(2.070)	(2.041)	(2.090)	(0.263)
Married	0.346	0.407	0.303	0.105
	(0.477)	(0.494)	(0.461)	(0.060)
Numer of Children	0.969	1.046	0.914	0.132
	(1.252)	(1.293)	(1.223)	(0.158)
Years in Singapore	9.262	10.02	8.752	1.270
	(6.131)	(6.832)	(5.579)	(0.824)
Caucasian Employer	0.379	0.353	0.398	-0.045
	(0.486)	(0.480)	(0.491)	(0.059)
Number of Days Off Each Month	3.136	2.952	3.263	-0.311
	(1.392)	(1.382)	(1.389)	(0.176)
Earnings (in SGD)	463.9	462.5	464.8	-2.281
	(165.6)	(99.17)	(200.3)	(21.291)
Monthly Expenses (in SGD)	166.9	185.3	153.7	31.522
	(172.5)	(218.8)	(129.3)	(25.552)
Financial Literacy	0.514	0.506	0.521	-0.015
	(0.336)	(0.325)	(0.344)	(0.042)
Risk Aversion	0.543	0.619	0.489	0.130
	(0.500)	(0.490)	(0.503)	(0.082)
Own Assets	0.610	0.656	0.579	0.077
	(0.489)	(0.477)	(0.495)	(0.064)
Any Savings	0.911	0.880	0.933	-0.053
	(0.286)	(0.327)	(0.251)	(0.036)
Amount of Savings in Singapore (in SGD)	657.9	774.0	552.7	221.231
	(2765.4)	(3936.3)	(803.1)	(503.018)
Amount of Savings in Philippines (in PhP)	25008.5	19833.4	29105.6	-9272.187
	(41942.2)	(30673.9)	(48895.8)	(7419.798)
Control over Remittances	0.641	0.714	0.590	0.124
	(0.481)	(0.455)	(0.494)	(0.075)
Disagreements	0.503	0.585	0.440	0.145
	(0.501)	(0.496)	(0.499)	(0.073)
N	280	119	161	280

Note: This table shows baseline characteristics for the 280 individuals who responded to the follow up survey. Each cell of columns 1-3 provides the mean and standard deviation for the listed variable for the entire sample, the control group and the treatment group, respectively. Column 4 shows the difference between the treatment and control groups with the standard errors in parenthesis. * 10% ** 5% *** 1%

Table 2: Balance of Baseline Variables With Respect to Treatment

	Age	Education	Married	Children	Yrs in S'pore	Caucasian Employer	Days off	Earnings	Expenses	Financial Literacy	Risk	Assets	Savings	Savings in S'pore	Savings in Philippines	Control	Disagreements
Panel A																	
Assigned to																	
Treatment	0.021	-0.334*	-0.053	-0.078	-0.726	-0.013	0.237*	-242.046	69.531	-0.026	-0.093	-0.084	0.038	-158.937	7809.332	-0.155***	-0.080
	(0.725)	(0.170)	(0.049)	(0.155)	(0.472)	(0.073)	(0.137)	(159.650)	(77.707)	(0.031)	(0.059)	(0.064)	(0.031)	(385.086)	(5722.297)	(0.045)	(0.074)
R-Squared	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.03	0.01
Panel B																	
Assigned to																	
Treatment	0.368	-0.227	-0.029	-0.020	-0.603	-0.027	0.327*	-221.367	80.051	0.010	-0.109	-0.051	-0.020	-76.549	6880.361	-0.125**	-0.053
	(0.770)	(0.205)	(0.053)	(0.166)	(0.492)	(0.084)	(0.162)	(160.931)	(99.007)	(0.030)	(0.067)	(0.068)	(0.032)	(314.465)	(6860.755)	(0.059)	(0.079)
Observations	354	360	365	365	323	223	358	348	271	365	206	334	359	182	188	242	285
R-Squared	0.11	0.10	0.10	0.14	0.11	0.11	0.12	0.15	0.23	0.18	0.21	0.13	0.40	0.30	0.11	0.18	0.20
Mean of dependent variable	35.99	11.79	0.35	0.89	8.91	0.39	3.09	572.68	192.22	0.50	0.59	0.62	0.89	529.48	24149.47	0.65	0.52

Note: This table displays the results from a regression of the baseline variables from table 2 on the treatment indicator. Panel B includes fixed effects for the stratification level. Robust standard errors are clustered at the stratification level. Robust standard errors are clustered at the stratification level. * 10% ** 5% *** 1%

Table 3: Predictors of takeup among the treatment group

Dependent Variable:	Enrolled			
	(1)	(2)	(3)	(4)
Age	-0.003	0.001	-0.005**	-0.002
	(0.002)	(0.002)	(0.002)	(0.003)
Marital Status	-0.058	-0.050	-0.043	-0.041
	(0.048)	(0.047)	(0.047)	(0.058)
Number of Children	-0.006	-0.007	0.008	0.003
	(0.031)	(0.027)	(0.036)	(0.032)
Years in Singapore	-0.002	-0.003	-0.003	-0.004
	(0.005)	(0.004)	(0.005)	(0.004)
Education	0.017	0.015	0.015	0.015
	(0.013)	(0.010)	(0.015)	(0.013)
Number of days off per month	0.042***	0.052***	0.046*	0.058***
	(0.014)	(0.009)	(0.022)	(0.015)
Any Savings		0.235***		0.202**
		(0.070)		(0.095)
Earnings		-0.000***		-0.000***
		(0.000)		(0.000)
Any Assets		-0.045		-0.005
		(0.042)		(0.041)
Financial Literacy		0.161*		0.194**
		(0.085)		(0.079)
Risk Aversion		-0.170*		-0.131
		(0.085)		(0.118)
Expenses		0.000		0.000
		(0.000)		(0.000)
Constant	-0.024	-0.225	-0.089	-0.394
	(0.173)	(0.169)	(0.300)	(0.288)
Observations	194	182	194	182
R-Squared	0.06	0.20	0.19	0.31

Note: This table displays the results from a regression of whether the individual chose to enroll on demographic characteristics and survey responses at baseline, conditional on being offered treatment. Columns 3 and 4 include fixed effects for the stratification level. Columns 2 and 4 also include an indicator for observations with missing observations for years in Singapore, monthly earnings, monthly expenses and missing risk aversion (values of the original variable are set to zero). Robust standard errors are clustered at the stratification level. * 10% ** 5% *** 1%

Table 4: Reduced Form Effect on Financial Knowledge and Behavior

	Made Financial Plan Past 6 Months	Will Make Financial Plan Next 12 Months	Knowledgable about Budget	Regret Purchase in Past Month
	(1)	(2)	(3)	(4)
Panel A				
Assigned to treatment	-0.003	-0.119*	-0.069	0.092
	(0.053)	(0.065)	(0.059)	(0.071)
R-Squared	0.07	0.11	0.03	0.11
Panel B				
Assigned to treatment	-0.015	-0.154*	-0.067	0.096
	(0.059)	(0.080)	(0.066)	(0.079)
Observations	224	225	224	223
R-Squared	0.15	0.19	0.14	0.23
Mean of dependent variable	0.58	0.67	0.51	0.30

Note: This table displays the results from a regression of various financial knowledge and behavior outcomes from endline survey on whether the individual was assigned to treatment. Panel B includes fixed effects for the stratification level. Robust standard errors are clustered at the stratification level. * 10% ** 5% *** 1% . The regressions control for baseline characteristics, namely, age, education, marital status, number of children, employer origin, whether they had any savings, years in Singapore, number of days off each month, monthly income, whether they had any assets and monthly expenses.

Table 5: Reduced Form Effect on Savings Outcomes

	Any Savings	Any Savings in Singapore	Savings Amount in Singapore	Any Savings in Philippines	Savings Amount in Philippines	Happy with Savings	Bank Account
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A							
Assigned to treatment	-0.068	-0.085*	-132.149*	-0.130	18228.989	-0.168***	-0.053
	(0.043)	(0.045)	(67.386)	(0.095)	(55777.806)	(0.054)	(0.067)
R-Squared	0.11	0.13	0.12	0.11	0.19	0.10	0.11
Panel B							
Assigned to treatment	-0.089*	-0.071	-65.566	-0.141	11181.367	-0.196***	-0.082
	(0.049)	(0.051)	(66.895)	(0.101)	(78526.869)	(0.067)	(0.081)
Observations	224	204	204	204	204	217	224
R-Squared	0.20	0.23	0.28	0.20	0.21	0.21	0.24
Mean of dependent variable	0.67	0.49	326.74	0.52	94227.94	0.58	0.80

Note: This table displays the results from a regression of various savings outcomes from endline survey on whether the individual was assigned to treatment. Panel B includes fixed effects for the stratification level. Robust standard errors are clustered at the stratification level. * 10% ** 5% *** 1% . The regressions control for baseline characteristics, namely, age, education, marital status, number of children, employer origin, whether they had any savings, years in Singapore, number of days off each month, monthly income, whether they had any assets and monthly expenses.

Table 6: Reduced Form Effects on Remittances

	Remittance Frequency (2)	Control over Remittance Amount (3)	Control Over how Remittances are spent (4)
Panel A			
Assigned to treatment	-0.013	0.254**	-0.028
	(0.135)	(0.108)	(0.083)
R-Squared	0.15	0.11	0.12
Panel B			
Assigned to treatment	-0.019	0.278**	-0.076
	(0.157)	(0.130)	(0.092)
Observations	193	192	192
R-Squared	0.26	0.25	0.24
Mean of dependent variable	1.95	0.40	0.51

Note: This table displays the results from a regression of remittance outcomes on whether the individual was assigned to treatment. Panel B includes fixed effects for the stratification level. Robust standard errors are clustered at the stratification level. * 10% ** 5% *** 1% . The regressions control for baseline characteristics, namely, age, education, marital status, number of children, employer origin, whether they had any savings, years in Singapore, number of days off each month, monthly income, whether they had any assets and monthly expenses.

Table 7: Reduced Form Effects on Expenditure and Investments

	Monthly Expenses	Any Assets
	(1)	(2)
Panel A		
Assigned to treatment	10.825	0.013
	(25.424)	(0.080)
R-Squared	0.15	0.12
Panel B		
Assigned to treatment	23.570	-0.013
	(29.199)	(0.087)
Observations	219	225
R-Squared	0.24	0.23
Mean of dependent variable	369.25	0.68

Note: This table displays the results from a regression of expenses and assets from endline survey on whether the individual was assigned to treatment. Panel B includes fixed effects for the stratification level. Robust standard errors are clustered at the stratification level. * 10% ** 5% *** 1% . The regressions control for baseline characteristics, namely, age, education, marital status, number of children, employer origin, whether they had any savings, years in Singapore, number of days off each month, monthly income, whether they had any assets and monthly expenses.

Table 8: Reduced Form Effects on Savings Outcomes for Individuals with Earnings Below the Median

	Any Savings	Savings Amount in Philippines	Happy with Savings	Bank Account
	(1)	(2)	(3)	(4)
Panel A				
Assigned to treatment	-0.136*	-3299.302	-0.129*	-0.113
	(0.073)	(10280.303)	(0.073)	(0.088)
R-Squared	0.20	0.11	0.17	0.17
Panel B				
Assigned to treatment	-0.235***	-13125.698*	-0.074	-0.239**
	(0.071)	(6927.075)	(0.076)	(0.113)
Observations	123	113	120	124
R-Squared	0.32	0.49	0.30	0.35
Mean of dependent variable	0.71	17185.84	0.56	0.76

Note: This table displays the results from a regression of various savings outcomes from endline survey on whether the individual was assigned to treatment. The sample is restricted to individuals who have earnings that are below median. Panel B includes fixed effects for the stratification level. Robust standard errors are clustered at the stratification level. * 10% ** 5% *** 1% . The regressions control for baseline characteristics, namely, age, education, marital status, number of children, employer origin, whether they had any savings, years in Singapore, number of days off each month, monthly income, whether they had any assets and monthly expenses.