Fall and recovery. Disruption and catching up effects after tsunami on a sample of MFI borrowers

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Abstract

We evaluate the effects of the tsunami shock on several monetary and non-monetary wellbeing indicators of 305 randomly selected MFI borrowers in Southern Sri Lanka and find four main results. First, psychological wellbeing indicators vary more than material ones when scaled on their own pre-tsunami standard deviations. Second, people who had no economic damages did not report any significant psychological loss (contrary to the "solidarity effect" found by some authors after the hurricane Katrina in 2005). Third, although the process is not complete yet, most of the material and psychological wellbeing indicators of the damaged people are recovering to their own pre-tsunami levels and converging to those of non-damaged ones after MFI refinancing. Fourth, we find a positive impact of the amount of MFI refinancing scaled by the post-tsunami income on real income growth. On the contrary, governmental subsidies, donations and grants do not have any positive impact on the recovery.

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1. Introduction

Even though it was not the most damaged country, Sri Lanka was severely affected by the tsunami of the 26th of December 2004. The disaster was triggered by an earthquake measuring 9.0 on the Richter scale whose epicenter was located in the Indian Ocean near Banda Aceh in Sumatra. The giant wave struck a coastal area stretching over 1,000 kilometers, or two thirds of the country's coastline (from Jaffna in the North to the west coast, North of Colombo). Human losses were huge (over 35,000 dead and 443,000 displaced people).[1] Economic losses were also immense since the wave damaged 24,000 boats (about 70% of the fishing fleet), 11,000 businesses[2] and 88,500 houses, of which more than 50,000 were completely destroyed.

However, also the most unfortunate events may conceal some side opportunities which we can exploit to extend our knowledge of the effects of calamities and of the best strategies needed to tackle them from an economic point of view. In a way, the tsunami disaster is a natural experiment which may help us to accurately evaluate the impact of the shock itself and of specific types of recovery tools on material and non material wellbeing. In this framework the specific focus of our paper is on the impact of microfinance[3] as a recovery tool after a natural disaster such as the tsunami. To do so we compare cross-sectionally and intertemporally the levels of economic and social wellbeing of damaged and non-damaged borrowers before and after the first microfinance loan ever obtained, before and after the tsunami shock, and before and after the first microfinance loan obtained after the disaster.

The tsunami event in fact creates two "randomly selected" groups: a treatment group (borrowers directly hit by the tsunami shock) and a control group (borrowers from the same MFI not affected by it). Our study can therefore be assimilated to a (quasi) natural experiment in which the exogenous shock is such that the two above mentioned groups

[1] Athurokala and Resoudarmo (2006) remind us that these figures do not cover the deaths in the coastal area controlled by the Liberation Tigers of the Tamil Elam (LTTE), from Nagakovil in the North down to Alampili in the district of Ampara. Noyalhr (2005) has estimated the unrecorded death toll in this area to be between 32 and 35 thousands. Around 600 foreign tourists were among the dead.

[2] See ADB (2008) on http://www.adb.org/media/Articles/2005/6619_tsunami_impact_Sri_Lanka/ .

[3] The origin of modern microfinance traces back to the creation of Grameen Bank in 1983 after a pioneering activity of Muhammad Yunus which started in 1976 to experiment the effects of lending small sums to poor borrowers without asking collateral. The development of microfinance has been astounding. The Grameen Bank has now six million borrowers and the *Microcredit Summit Campaign* at end 2006 documents the existence of 3,133 microfinance programs around the world reaching approximately 113 million borrowers and, among them, 82 millions in straight poverty conditions. The most outstanding element of the performance of MFIs is their extremely low share of nonperforming loans. According to the most systematic source of aggregate data on MFIs, - the Micro Banking Bullettin (http://www.mixmbb.org/en) which created a panel of 200 MFIs from different world continents – the average MFIs loan loss rate was 1 percent in 2005. The literature provides various interpretations for this surprising performance. The most reputed among them are the role of group lending with joint liability (Ghatak, 2000; Stiglitz, 1990 and Armendariz de Aghion, 1999), which is however neither adopted by all MFIs nor by the same Grameen after its 2000 reform, and the capacity of MFI loan officers of accumulating soft information in the Berger and Udell sense (2002) which is crucial to assess creditworthiness of small businesses.

are not significantly different in terms of borrower's quality or seniority characteristics as it may typically occur in other microfinance impact analyses.

We exploit this unique opportunity by focusing on the effects of the tsunami shocks and on those of MFI refinancing. More specifically we: (i) analyze the behavior of the economic and psychological wellbeing indicators over time; (ii) evaluate the psychological reaction of neighbouring non-damaged people after the shock; (iii) test the existence of convergence and/or full recovery in material an psychological variables after the MFI refinancing; (iv) evaluate on the whole the importance of microcredit as recovery tool after natural disasters like a tsunami.

The paper is divided into five sections including introduction and conclusions. In section 2 we explain how our survey has been developed. In section 3 we describe the dataset and provide summary statistics. Section 4 presents and comments econometric evidence from our study. Section 5 concludes.

2. Agro Micro Finance and the survey

Agromart Foundation is a Sri Lankan NGO founded in 1989 to carry out grassroots work with a large number of communities in Sri Lanka. The Head Office is located in Colombo with nine other provincial offices in Uva, the Southern, North Western and Eastern provinces. The core of its mission is strengthening the competencies of its members through participatory trainings. In order to achieve this goal Agromart Foundation creates self-help groups in rural areas through the provision of technical assistance and education with the goal of making them independent in the saving and lending activities.

In 1994 the Foundation broadened its activity by working as a microcredit institution for its clients, but in 2000 it decided to fund Agro Micro Finance (AMF) and to delegate this task to it. Even if the respective fields of action remain separated, the links between the two organizations are strong. Agro Micro Finance lends only to members of community based organizations (CBOs) which received for at least six months self-employment, entrepreneur development and literacy trainings from the Agromart Foundation. 72 % of AMF borrowers are women. In March 2005 the MFI's loan portfolio was of 295.000 €.

After the tsunami Agro Micro Finance and Agromart Foundation certified direct and indirect losses on 620 clients in the district of Galle, Matara and Hambantota. The estimated corresponding financial needs to cover such losses amounted to 72,600 €, that is, almost 24.4 % of the MFI loan portfolio at the tsunami date (295,000 euros). This evidence documents the importance of foreign intervention to avoid the MFI financial distress and the consequent restriction to credit access for the MFI borrowers. The liquidity provided by foreign institutions allowed AMF to avoid credit restrictions to non-damaged clients in order to finance damaged clients. Support to AMF refinancing needs came from USAID, UNDP, and an Italian MFI (Etimos).

For a first evaluation of the impact of refinancing we decided to select randomly from the bank records a sample of 305 borrowers: 200 of them with at least one type of damage (which we define as treatment group) and 105 with no damages (which we define as control group). We decided to make the size of the treatment group larger since we specifically focus on subsamples of the treatment group which differ by damage typologies in addressing some of the above mentioned research questions. A questionnaire which is attached in the Appendix was administered to both groups in April 2007. The interviews were conducted face to face by one of the authors of the paper (Stefano Castriota) with the help of two more Italian researchers and three translators with economic degree (the questionnaire was translated in Sinhalese). Some borrowers were interviewed at their homes, some during the monthly society meetings and the remaining during some extra meeting arranged by AMF for this purpose.

3. Organisation of the dataset and summary statistics

Since the event which originates our research was not programmed we could not organise a panel survey with different observations in time, before and after tsunami. Hence, we follow a backcast panel data approach (see Wydyck, 2006): in April 2007 respondents were asked to declare the current and remember the past wellbeing levels by making reference to four different periods. We select periods easy to remember due to the occurrence of memorable events. The four time windows we consider are (P1) the six month interval before the first microfinance loan ever obtained, (P2) the period going from the first microfinance loan to the tsunami date (26th of December 2004), (P3) the period between the tsunami date and the first microfinance loan after tsunami and (P4) the period from the first microfinance loan after tsunami to the survey date (April 2007).

A methodological issue in this analysis is the heterogeneity in time windows of the four different periods since only two time points (the tsunami date, 26th of December 2004, and the month in which the survey was administered, April 2007) are common to every interviewed borrower. Consequently, only the first time interval (six months before the first MFI financing) is fixed in length, even though not coincident for all respondents. In order to overcome this potential problem in the rest of the analysis such heterogeneity will obviously be controlled for.[4] In fact, to solve the problem of irregularly spaced windows we add the length of the windows in months as controls in our regressions. Furthermore, this potential problem is limited by the fact that differences in the length of

[4] The estimation of the significance of a common event in a sample of non-synchronous events is the typical focus of event studies in finance (for a standard treatment see Campbell, Lo and McKinlay, 1997). In those studies non-synchronicity concerns the event date and abnormal returns are calculated on the basis of a normal return model estimated in the period preceding the event window. In our study non-synchronicity concerns the rightward boundary of the event window (period 4) when measuring tsunami effects and the leftward boundary of the event window (period 2) when measuring refinancing effects. Hence we have both non-synchronicity and irregularly spaced event windows (which we will control for). As it will be shown in the next sections abnormality in our empirical work is measured with respect to both normal changes preceding the event window and the comparison of changes in the event period for the treatment and control sample.

the second and third intervals are not strong among respondents. The average length of the second interval is one year and a half and no longer than two years and a half for 75 percent of sample respondents. The length of the third interval is 6 month for the first quarter of the sample, 10 months for half of it and 15 months up to 75 percent of the sample.

Even if the motivation of the first AMF loan after tsunami is different for the treatment and the control sample, we do not observe significant differences between the two groups in the duration of the third time window. Treatment and control group differ instead in the amount of the post-tsunami loan. The median value for the treatment group (75,000 Rps.) is 25 percent higher than that of the control group (60,000 Rps.), the difference being stronger in the low end than in the upper end of the amount distribution (no one of the damaged customers obtains less than 5,000 against 1,500 Rps. of the first one percent in the control group). Finally, the difference in the length of the AMF relationship with the two groups is not significant (treatment group length is just 4 months longer in mean and 3 months longer in median).

With the survey data collected on the field we obtain information on the respondents' socio-demographic characteristics, on their lending status (seniority of the relationship with AMF, existence/non existence of multiple borrowing relationships, etc.), on hours worked[5] and on a series of wellbeing indicators. As it is easy to imagine we need to control for the quality of the information retrieved in two respects: the quality of their memories (events which are more distant in time, such as the first AMF financing, are more difficult to remember) and the absence of interview biases. From this point of view it is important to underline that the dates and amounts of all loans released by AMF have been obtained from official documents of the MFI. In the rest of the paper we will emphasize how some of our findings seem to show that such biases are negligible.

Tables 1a and 1b describe the socio-demographic and economic variables used in our study while Table 2a reports summary statistics for selected socio-demographic characteristics of the MFI sample borrowers. We can see in this table that a bit less than half of the sample has house and economic activity within one kilometer from the coast. Most of clients work at home or very close to it, to save money and time (only a minority of families has a motorbike, almost nobody has a car). 85% of the sample is composed by women, the figure being higher than the average 72% of the AMF's full sample clients: this could be party due to the fact that men were more busy with their work (the average declared number of hours worked is 64 for men and 47 for women) and less available to come to the meetings to be interviewed.

Most of clients were married and aged around 40 or 50, with complete primary or incomplete secondary education. 23% of the people (the sum of the men and the widowed women) claim to be the head of the household. Over the four time windows,

[5] Note that it would not be worthwhile to consider worked hours among wellbeing indicators if not under the specific focus of our study. We can in fact reasonably assume that pre-tsunami worked hours as the optimal choice of borrowers in the equilibrium without shock and therefore evaluate the post-tsunami drop as the deviation from optimum imposed by the shock.

most of people (94%) were self-employed while only 2% were unemployed. Most of people were involved in trade (46%) and manufacturing (39%), with a significant share (21%) working in the agricultural sector.[6] The average family size was 4.6 people, with 2.3 children currently living at home.

An interesting finding is that almost all the women interviewed declare that their participation to family decisions and relationship with partner/spouse improved a lot after the first microfinance loan. This can be due to an economic effect, since a sounder financial situation can improve the family environment, but also to the important role played by the business activity and the societies. The rationale should be that being able and free to start a business improves the participation to family decisions and the life satisfaction, the sense of independence and the self-esteem also net of the income effect, which, in turn, has a positive impact on the quality of the relationship with the partner. Furthermore, the monthly society meetings provide a unique environment were to discuss economic or personal problems. Clients usually claim to feel more protected since they joined the societies.

Table 2b reports summary statistics for the economic variables. The real and equivalent[7] income show a high variability, while the equivalent income in PPP is 5.26 $ per day, well above the symbolic 1 or 2 $ threshold. Given the low absolute income for Western standards and the damages caused by the tsunami, the declared level of satisfaction with the standard of living achieved over the four time windows is surprisingly high, probably also thanks to cultural elements and adaptation effects. Over the four analyzed periods, 13% of clients had problems to provide daily meals to their family and this figure rises to 26% in the third period after the tsunami shock. Most of families either are unable to save money or save very little. However, a lot of money is often invested to start or improve a business activity, thus the actual savings given by investments plus net savings should be higher. The number of hours worked is very high and displays very high variability and maximum value. It must be underlined, however, that the intensity of the customers' work seemed to be much lower to the interviewer that that in advanced economies.

Average happiness, life satisfaction and self-esteem levels are high, especially if one thinks that the average is computed across the entire sample (treatment and control groups) and over the four time windows (including the period immediately after tsunami). Many clients reported damages to raw materials (32%), tools (27%), buildings (25%) and house (19%). Only 4% had family members injured or dead in the catastrophe. Half the people in the sample declared that their business was indirectly damaged by the tsunami because of the worsened macroeconomic situation. One third of the sample was forced to use the savings immediately after the tsunami to buy food or repair the damages. After the disaster the government, international organizations and NGOs tried

[6] Some people had more than one economic activity, thus the total sum exceeds 1.

[7] Under the current OECD rule, earnings are divided by a scale factor A, where $A = 1 + 0.5\ (N_{adults} - 1) + 0.3\ N_{children}$. However, in our sample a large part of consumption is food consumption. It is therefore advisable to reduce the extent of economies of scale by increasing weights in the equivalence scale. We therefore decide to follow the standard suggestion in development studies of giving unit weights to each member (for a discussion of the methodological problems in creating equivalence scales see Deaton and Paxson, 1998).

to help the populations by providing food, row materials, medicines, money etc. In our random sample, only looking at the third window, 6% of people could rely on remittances from relatives abroad, 32% on governmental subsidies (especially a four-month check of 5,000 Rps. per month to buy food), 27% on donations from international organizations, foreign governments and NGOs and 3% on other forms of charity.

4. Empirical analysis

4.1 Descriptive analysis of the fall and recovery

We start our analysis by looking at average changes of selected variables period by period over the four windows (see Table 3). Our wellbeing indicators include objective and subjective variables. Among the first ones we consider monthly real household income, daily equivalent income in PPP and the number of hours worked, a variable which helps us to evaluate the effects of tsunami and refinancing on productivity levels. An indirect measure of poverty is created by answers to the question in which we ask respondents to tell whether they had problems in providing daily meals to their families. With this respect an important consistency check in our data is the strict correspondence between equivalent household income and declared existence of problems in providing daily meals to their family. The average equivalent income in PPP for those declaring such problems is 2.74 $ against a value of 5.58 $ for those not declaring them (the difference in means is highly significant). Among non monetary wellbeing indicators we include self-declared life satisfaction, happiness[8] and self esteem.[9]

[8] The recent economic literature has provided several arguments in support of the validity of empirical studies on self-declared happiness data. The main arguments are that: (i) such studies have a longstanding tradition in psychology and sociology and have therefore passed a process of "cultural Darwinian selection" in these disciplines (Alesina, Di Tella and MacCulloch, 2004); (ii) significant and positive links have been found between self-declared happiness and healthy physical reactions such as smiling attitudes (Pavot, 1991 and Eckman et al., 1990) and heart rate and blood pressure responses to stress (Shedler, Mayman and Manis, 1993); (iii) neurosciences have identified a nexus between positive feelings and physical measures of brain activity (higher alpha power in the left parefrontal cortex) while, at the same time, measures of hedonic wellbeing, such as self-declared life satisfaction, have been shown to be related with the same activity (Clark et al., 2006); (iv) individuals choose to discontinue activities associated with low levels of well-being (Frijters, 2000 and Shiv and Huber, 2000); (v) happiness scores of respondents' friends and family members are significantly correlated with the respondents' own ones (see Sandvik et al., 1993, Diener and Lucas, 1999).

[9] The economic literature on the determinants of self-esteem is extremely scant. According to Tafarodi and Swann (2001) self-esteem is "the intrinsic perception of one's self in relation with other people" and is strictly related to *self-confidence*, which represents the perceived ability of accomplishing one's own goals in life, since "…those who are liked enjoy a clear advantage in achieving their goals". In analogy to what occurs in the happiness literature, while psychologists tend to believe that self-esteem is mainly determined by the ego structuring during childhood, economists emphasize that it can be significantly affected by life events (Checchi and Pravettoni, 2003). To our knowledge, the only two papers documenting this last point are those of Checchi and Pravettoni (2003) and Plotnick, Klawitter and Edwards (2005). For this reason the analysis of the effect of the tsunami shock on self esteem is an important original contribution to this literature.

The first approach we use here is simply a test on the significance of the change in the indicator from a period to the next one (t-statistics are reported in brackets). In Table 3a we observe, for the overall sample, a (slight) amelioration in several economic and psychological wellbeing indicators in the second period (P2), a fall after the tsunami (P3) and a recovery in the last time window (P4). This pattern is obviously stronger if we look at the subsample of damaged individuals (Table 3c), while the second effect almost disappears in that of non-damaged ones (Table 3b): in fact, in the third period the wellbeing indicators of the latter only stop growing but do not display any reduction[10]. This suggests that people who, on average, got no direct economic damage did not report any significant psychological loss at least when we calculate it as an average of the third (post-tsunami, pre-refinancing) period.

Kimball et al. (2006) found that, among different samples of people not directly hit by the hurricane Katrina, the dip in happiness of those living in the South-Central region of the United States lasted two or three weeks while that for the rest of Americans only one or two weeks. The authors conclude that this is due to altruism toward those hurt by the disaster. In our case, on the contrary, people who were not directly damaged by the tsunami did not declare any fall in happiness with the self-declared happiness level following the same pattern of that of real income. Both real income and psychological indicators improve in the second period, stop growing in the third and move together upwards in the last period (see Table 3b).

This is probably due to the longer time window considered in our study: in fact, the average number of months of the third period is 10.5. Thus, the solidarity effect found in South-Central region during the first three weeks from the hurricane Katrina has possibly disappeared in our data because interviewed people were asked to remember their emotional status in a longer time period. However, all the people we interviewed were living just a few kilometres from the coast, thus it would have been reasonable to expect non-damaged people to get more involved in the sufferences of their neighbours. It seems that after natural catastrophes like hurricanes and tsunami the emphatic reaction of neighbours, if present, has a short duration.

The strong impact of the tsunami shock on the full sample is evident from the descriptive findings presented in Table 3a. The real average income fell by 5,556 Rps. (a 25 percent reduction with respect to sample average), the daily equivalent income in PPP by 1.67$ (a 27 percent reduction), the psychological indicators and the standard of living registered a significant reduction and the probability to have problems in providing daily meals rose by 18% (from 8% in P2 to a worrying 26% in P3). Worked hours fell by 9 hours. Self-esteem and life satisfaction also fell considerably (respectively -0.86 and -1.32 on a 1-10 scale). Since these are full sample averages, they conceal a much higher effect in the treatment (Table 3c) and a much weaker or inexistent one in the control sample (Table 3b). Those declaring no damages register very small changes with respect to their pre-

[10] We perform a robustness check with non parametric analysis of the difference in the change of the considered wellbeing indicators between treatment and control sample which confirms that such difference is significant. Results are omitted for reasons of space and available upon request.

tsunami situation and even a slight amelioration in the average declared self-esteem. While it is obvious that the fall in wellbeing indicators after the tsunami is due to the direct and indirect effects of the natural catastrophe, the advancements in the second and fourth period can be attributed to the improvements in the general macroeconomic situation but also to the lending activity of AMF and (with regard to the second period) to the training courses that all borrowers need to follow from six months before the first loan.

The fourth column of Table 3a contains a test on the statistical significance of the changes from the second to the fourth period for the full sample. This can be considered as a test to verify whether the wellbeing indicators in the fourth period (P4) recovered to pre-tsunami levels (P2). We can see that, on the overall sample, the psychological variables have more than recovered since the changes are positive and statistically significant. The real income in P4 is not statistically different from that in P2 and the standard of living in terms of consumption goods has improved. Non-damaged people have significantly improved their economic and psychological situation while the number of hours worked has remained unchanged.

Statistics for the full sample and for the non-damaged are interesting, but the most important ones refer to the recovery of damaged people. Damaged individuals have increased the number of hours worked (probably an extra-effort was required in order to repair the damages) but have not fully recovered the pre-tsunami purchasing power yet, even if the self-declared standard of living is not significantly different. Interestingly, although the real income has not fully recovered to pre-tsunami levels, and in spite of the negative memory connected to the catastrophic event, the levels of self-esteem and life-satisfaction are remarkably higher in P4 than in P2. It seems there is a sort of positive "survivorship effect" for the damaged people: the fact that they managed to recover, even if not fully yet, and survive could have proven them that they are stronger and more valuable than they were previously thinking and that they can face bad luck and manage their destiny.

In order to compare the magnitude of changes in monetary and nonmonetary well being indicators we scale the post tsunami shocks (change from P2 to P3) on the standard deviation of changes in the same variable from the first to the second period (see Table 4). We can observe that there is a big difference in the magnitude effects between damaged and non-damaged people and that the change in an objective indicator such as household income is much smaller than that in subjective and non-monetary ones. This finding shows that the effect of the shock on subjective indicators is much higher than that on quantitative ones also because subjective indicators exhibit much less variability. This may happen because small shocks on quantitative indicators have severe effects on subjective indicators but also because part of the shock on subjective indicators is not determined by the loss of income. The tsunami may have generated loss of confidence, belief that the destiny is against the respondent, with bad luck associated to a sense of

guilt. All these factors may contribute to explain the excess variability of subjective with respect to objective indicators.[11] We will investigate further this issue in the next section.

It is also important from a descriptive point of view to examine not just average values but also the dynamics of the entire distribution of selected well being indicators across the four time intervals. Figure 1 clearly documents the downward shift of the cumulative distribution of real household income, life satisfaction and self esteem in the third period for the whole sample and the subsample of the most damaged people. In the third time interval all points of the cumulative distribution function are lower or equal to those of the second time interval so that the a first order stochastic dominance between the two becomes evident just from this picture.

By focusing on the subsaple of people with at last three damages it is even more evident the fall in wellbeing indicators after the tsunami and the stronger negative effect for the left part of the distribution. We can easily observe that there is full recovery for the psychological indicators but not for the real income. The comparison of cumulative distributions in the four periods shows that the shock and the catching up effect do not act only on the mean of the subample distribution of the selected wellbeing indicators but almost on any point of the distribution, with special reference to its low tail. In fact, it is clear that the poorest are both the most damaged and those registering the most significant recovery.

Table 5 tests period by period the difference in the mean of each variable between damaged and non-damaged respondents. This is done to verify whether the two groups were significantly different before and after the tsunami and whether there has been a perfect catch up in the fourth period. We can easily see that all the indicators were not significantly different among the two groups at 5% level before the tsunami (P1 and P2). In the third period all the means become strongly different, while in the fourth period there is a partial convergence of damaged people to the levels of non-damaged ones. In fact, average happiness, number of hours worked and probability in providing daily meals of the two subsamples are not different at 5% level, while for the remaining variables the difference is still strong. However, it must be underlined that the gap has enormously reduced: the size and the statistical significance of the difference in the variables are much lower in P4 than in P3: in other words, there has been a partial, but still incomplete, catch up.

4.2 Econometric analysis

Another way to evaluate the different patterns of economic and psychological indicators and their reaction to changes in real income, tsunami damages and MFI (re)financing is by performing regression analyses. The literature of financial recovery from big disasters

[11] Consider however that part of the excess variability of subjective indicators with respect to income related ones may still be explained by material factors. In fact, if we consider that the information on damage includes damage to the house and if this variable has significant effects on subjective indicators, net of the impact of the change in income, we clearly have a negative wealth effect which explains part of the excess variability.

documents that the unbanked are those who suffer the most from the consequences of such calamities (see Cheney and Shrine (2006) on the effects of Katrina hurricane in New Orleans). A first positive effect of MFIs in these circumstances should therefore lie in their capacity of providing credit to the "unbankables" (potential borrowers lacking or with insufficient collateral resources). The possibility of estimating such effects is unfortunately beyond reach with our data since we cannot measure the differences between MFI borrowers and unbanked. However, we can evaluate the performance of MFI damaged borrowers intertemporally and compare it with that of our control sample of non-damaged borrowers.

In this perspective we estimate specifications in which the dependent variables are represented by the changes in wellbeing indicators (*ΔWellbeing*) such as real income, standard of living in terms of consumption goods, happiness and self-esteem. The regressors are dummy variables for province and sector of activity, socio-demographic variables like age, gender, education and number of children and dummy variables for governmental subsidies, remittances, donations and other forms of assistance. In order to capture the tsunami effect we use either a dummy variable measuring whether the person had at least one type of damage (*Damage*), a variable measuring the number of damage types registered (*SumDam*) or a set of dummy variables, one for each of the six types of damage.

When considering the changes from P1 to P2 and from P3 to P4 we add to the list of regressors the ratio between real amount lent and average real income in the period considered (*RelativeLoan*) to measure the contribution of MFI (re)financing to wellbeing improvements. All the regressions include the length of the time window as a control. The model is estimated with an OLS regression if the dependent variable is, or can be approximated, to a continuous one (such as equivalent household monthly income and weekly worked hours) and with an ordered logit approach if it is discrete (such as life satisfaction, self esteem, satisfaction with the standard of living etc.). Regressions are run by use of robust standard errors.

We analyze the determinants of the changes of the above mentioned indicators from P1 to P2 (MFI financing effect), from P2 to P3 (tsunami effect) and from P3 to P4 (MFI refinancing effect). Every effect is estimated under several specifications. We start with a regression run on the full sample, then perform a robustness check by restricting the sample to borrowers for which the time window is not longer than 24 months in order to reduce heterogeneity in windows lenght. This eliminates around 7 % of observations from the sample. When testing the tsunami and the re-financing effects the two just described specifications include *SumDam*, a third one repeats the calculations of the first one by replacing *SumDam* with dummy variables for the six types of damages and a fourth performs a further robustness check in which we control for the selection effects of location on the coast and agricultural activity[12]. In fact, we re-estimate the model with a

[12] We do this to avoid confusion between the tsunami shock and some possible concurring changes associated to agricultural activity or to some-ex ante different characteristics of people living on the coast with respect to those living in the inland. If, for instance, in the same tsunami period agriculture has had a relatively higher performance than other activities for reasons independent from tsunami (i.e. extremely

treatment regression approach in which main equation and selection equation are jointly estimated. In the selection equation participation to the treatment group is regressed on the two above mentioned variables which we have found to be significantly different between the treatment and the control sample:

$$Damage_i = \beta_0 + \beta_1 Agric_i + \beta_2 Coasthouse_i + \nu_i$$

with *Agric* being a dummy for agriculture and *Coasthouse* a dummy for the house close to the coast.[13] Summarizing, the changes from P1 to P2 have two regressions for each indicator while that from P2 to P3 and from P3 to P4 have four regressions.

Table 6 shows regression results for changes from period 1 to period 2. The growth rate of real income is negatively affected by the income level of the previous period (exactly as in conditional convergence growth equations) and positively by the ratio between the real amount loaned by AMF and real monthly income. Thus, net of monthly instalments required to repay the loan, the real monthly income grows at a higher speed when the financial support of the MFI is stronger. MFI lending is expected to have positive direct and indirect effects on clients' wellbeing. Higher loans should directly boost income growth which, in turn, should indirectly affect the other wellbeing indicators. The direct effect of *RelativeLoan* on psychological variables, net of the indirect income effect, could be null or even negative, in case people perceive the higher loan amount to be a weight for the family budget. This is exactly what we observe.

The other selected wellbeing indicators like standard of living, happiness and self-esteem are again negatively affected by the initial income level, positively by the income growth while the other variables are usually not significant. The length of the window interval is seldom significant. In terms of economic effects the highest impacts are those of the change in income on happiness and self declared standard of living. By considering the baseline estimate (Table 6, first column) an income change corresponding to one standard deviation of its distribution determines a variation of self declared standard of living of 1.5 its standard deviation (0.92 of the standard deviation of self-declared happiness).

The consequences of the tsunami are shown in Table 7. The change in real income is again strongly influenced by the income level of the previous period (net of the tsunami effect) while the effect of the damages produced by the tsunami is strongly negative. Surprisingly, governmental subsidies have a negative effect: this is probably due to the fact that they are addressed to the most damaged people. Thus, the dummy variable *Subsidies* is possibly capturing part of the intensity of the damages produced by the

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good yields, etc.) this event would crate an upward bias on the observed negative effect of tsunami on wellbeing indicators. Consider however that such effect should not be considered totally avulse from the damage if the relatively better performance of agricultural workers is, on the contrary, be related to the consequences of tsunami.

[13] In the two equations system (v) and (ε) are the error terms of the selection and main equations and are bivariate normal random variables with zero mean and covariance matrix $\begin{bmatrix} \sigma & \rho \\ \rho & 1 \end{bmatrix}$. The likelihood function for the joint estimation is provided by Maddala (1983) and Greene (2003).

tsunami. The changes in other variables are strongly affected by the change in real income and by the damages produced by the tsunami. In terms of coefficient magnitudes (first column of each table) a negative shock corresponding to one standard deviation on income growth generates a reduction of 1.01 standard deviation of self-declared standard or living, while one standard deviation change in the number of damages suffered contributes to an additional effect of 0.24 standard deviation of the dependent variable. When the dependent variable is self-declared happiness the same two numbers are 0.76 and 0.40.

Finally, Table 8 shows the determinants of the recovery. People with lower income in period 3, higher damages (column 3 and 4) and higher loans provided by the MFI registered the highest real income growth. Furthermore, past income level, real income change and damages from the tsunami are important determinants of the changes in other wellbeing indicators. The economic effect is relevant here as well. One standard deviation shock in income growth generates a change in self declared standard of living (happiness) of 0.72 (0.51) its standard deviation (based on the regressions in the first column). Subsidies, grants and remittances do not display any significant effect on the change in real income: this is important especially if we consider that in the third period 27 % of respondents received grants, 6 % remittances and 32 % subsidies. These numbers become 50, 24 and 49 % if we consider the treatment sample only. Consider that the significant effect of the ratio of the loan amount to the real income after the tsunami shock is a result arising from the combination of official bank data with survey responses and therefore is much less subject to potential interview biases.

Summarizing, changes in real income heavily depend on the initial income, on the number and intensity of damages from the tsunami and on the ratio between the amount of loans obtained from AMF and monthly income. Changes in other wellbeing indicators are strongly influenced by the initial income, the change in real income and the damages from the tsunami while the direct effect of loans obtained, net of the indirect positive effect from income, is negligible. These results show that people who were damaged the most by the tsunami reported the fastest recovery and seem to confirm the usefulness of microcredit as recovery tool after natural catastrophes like tsunami. Interestingly, governmental subsidies, donations and grants do not show any positive impact on the recovery of the sample clients. This seems to suggest that these instruments have no capacity to offset, even partially, the losses from tsunami and that development programs are more effective than charity.

5. Conclusions

Our paper examines the dynamics of a set of objective and subjective wellbeing indicators before and after the tsunami date for a sample of 305 randomly chosen clients of a Sri Lankan MFI. In order to reconstruct time series we need to devise an approach of backcast panel data by asking clients to remember the past wellbeing levels making reference to four different periods. The four periods were easy to remember due to the

occurrence of memorable events like the tsunami and the first loans obtained from the MFI, while all the data on MFI loan amounts and dates came from official banking records. Descriptive statistics document an improvement of wellbeing indicators after the first microfinance loan before the tsunami, a strong deterioration after the natural catastrophe and a process of recovery and convergence after the microfinance loan obtained after the tsunami.

Among the rich descriptive and econometric evidence collected we emphasize four main results. First, psychological wellbeing displays bigger fluctuations than material wellbeing. Second, while some authors found that people not hit by the hurricane Katrina declared a bigger dip in happiness when living in states close to the catastrophe, we do not find evidence of any "solidarity effect" after the tsunami when looking at average psychological indicators in the post tsunami-pre-refinancing interval, which is probably due to the length of the time window we analyze. Third, after the first microfinance loan after the tsunami we observe an imperfect process of recovery of the indicators of damaged people to their pre-tsunami levels and of convergence to the levels of non-damaged people. The speed of the recovery is impressive even if, given the short time since the natural catastrophe occurred, convergence and recovery are not complete yet. Fourth, we find a positive direct contribution of microcredit on the growth rate of real income and an indirect effect (through income) to the other material and psychological wellbeing indicators. The same positive effects are not found for governmental subsidies, donations and grants.

Table 1a: Description of the socio-demographic variables

CoastHouse	DV equal to 1 if the house is on the coast
CoastBusiness	DV equal to 1 if the business activity is on the coast
Galle	DV equal to 1 if the province is Galle
Matara	DV equal to 1 if the province is Matara
Hambantota	DV equal to 1 if the province is Hambantota
Female	DV equal to 1 if the gender is female
Age	Age of the respondent in years
Single	DV equal to 1 if the marital status is single
Married	DV equal to 1 if the marital status is married
Widow	DV equal to 1 if the marital status is widow
Divorced	DV equal to 1 if the marital status is divorced
Separate	DV equal to 1 if the marital status is separated
Cohabitant	DV equal to 1 if the marital status is cohabitant
HeadHous.	DV equal to 1 if head of the household
Incompled	DV equal to 1 if the education level is incomplete primary
Primary	DV equal to 1 if the education level is complete primary
SecPlus	DV equal to 1 if the education level is higher than primary
FullTime	DV equal to 1 if the employment status is employed full time
Ptime	DV equal to 1 if the employment status is employed part time
SelfEmpl.	DV equal to 1 if the employment status is self-employed
Unempl.	DV equal to 1 if the employment status is unemployed
Student	DV equal to 1 if the employment status is student
Retired	DV equal to 1 if the employment status retired
Agriculture	DV equal to 1 if the sector of activity is agriculture
Fishery	DV equal to 1 if the sector of activity is fishery
Manufacturing	DV equal to 1 if the sector of activity is manufacturing
Trade	DV equal to 1 if the sector of activity is trade
OtherJob	DV equal to 1 if the sector of activity is something else
HouseMembers	Number of people living in the house
NumChildren	Number of children currently living in the house
Empowerment	Self-declared level of women empowerment from 0 (min) to 4 (Max)
Relation	Self-declared change in relation with partner/spouse From -2 (worsened much) to 2 (improved much)

Table 1b: Description of the economic variables

RealIncome	Real income in April 2007 Sri Lankan Rps.
RealYeq	Real equivalent income in April 2007 Sri Lankan Rps.
PPPYeq	Real equivalent income in April 2007 PPP USD
StandLiv.	Standard of living in terms of consumption goods
ProbMeal	DV equal to 1 if the respondent had problems in providing daily meals
PrivMed.	DV equal to 1 if the respondent could afford private medical consultations
Savings	Amount of savings from 0 (not at all) to 4 (very much)
Van	DV equal to 1 if the respondent owns a van
Tract	DV equal to 1 if the respondent owns a tractor
Motorbike	DV equal to 1 if the respondent owns a motorbike
Bicycle	DV equal to 1 if the respondent owns a bicycle
HoursWorked	Number of hours worked per week
Happiness	Self-declared level of happiness from 0 (not at all) to 4 (very happy)
LifeSatisf.	Self-declared level of life satisfaction from 1 (min) to 10 (Max)
SelfEsteem	Self-declared level of self-esteem from 1 (min) to 10 (Max)
Trust	DV equal to 1 if most people can be trusted
Health	Self-declared level of health from 1 (min) to 10 (Max)
DamFamily	DV equal to 1 if the respondent reported damages to the family
DamHouse	DV equal to 1 if the respondent reported damages to the house
DamBuild.	DV equal to 1 if the respondent reported damages to the office buildings
DamTools	DV equal to 1 if the respondent reported damages to the working tools
DamRawMat.	DV equal to 1 if the respondent reported damages to the raw materials
DamMkt.	DV equal to 1 if the respondent reported damages to the market of its own activity
SumDam.	Number of types of damage from 0 to 6
TsunForced	DV equal to 1 if the tsunami forced the respondent to use personal savings after the tsunami
Remittances	DV equal to 1 if the respondent received remittances from foreign countries
Subsidies	DV equal to 1 if the respondent received governmental subsidies
DonGrant	DV equal to 1 if the respondent received donations and grants
OthCharity	DV equal to 1 if the respondent received other forms of charity
RelativeLoan	Ratio between the real amount loaned and the average monthly income

Table 2a: Socio-demographic characteristics of the MFI sample clients

	Obs.	Mean	Std. Dev.	Min	Max
CoastHouse	1,220	0.44	0.50	0	1
CoastBusiness	1,220	0.46	0.50	0	1
Galle	1,220	0.31	0.46	0	1
Matara	1,220	0.52	0.50	0	1
Hambantota	1,220	0.17	0.37	0	1
Female	1,220	0.85	0.35	0	1
Age	1,160	48.48	10.15	23	73
Single	1,220	0.08	0.27	0	1
Married	1,220	0.82	0.39	0	1
Widowed	1,220	0.09	0.28	0	1
Divorced	1,220	0.00	0.06	0	1
Separated	1,220	0.01	0.08	0	1
Cohabitant	1,220	0.00	0.00	0	0
HeadHous.	1,220	0.23	0.42	0	1
Incompled	1,220	0.35	0.48	0	1
Primary	1,220	0.48	0.50	0	1
SecPlus	1,220	0.16	0.37	0	1
Fulltime	1,219	0.02	0.13	0	1
PartTime	1,219	0.02	0.14	0	1
SelfEmpl.	1,219	0.94	0.23	0	1
Unempl.	1,219	0.02	0.15	0	1
Student	1,219	0.00	0.06	0	1
Retired	1,219	0.00	0.03	0	1
Agriculture	1,219	0.21	0.41	0	1
Fishery	1,219	0.02	0.15	0	1
Manufacturing	1,219	0.39	0.49	0	1
Trade	1,219	0.46	0.50	0	1
OtherJob	1,218	0.09	0.28	0	1
HousMembers	1,216	4.61	1.57	1	12
NumChildren	1,216	2.38	1.48	0	7
Empowerment	246	3.25	0.94	0	4
Relation	219	1.43	0.72	-1	2

Table 2b: Economic and financial characteristics of the MFI sample clients

Variable	Obs.	Mean	Std. Dev.	Min	Max
RealIncome	1,122	19,277	13,540	1080	120,000
RealYeq	1,118	8,351	6,067	327	47,817
PPPYeq	1,108	5.26	4.45	0.21	39.02
StandLiv.	1,219	2.27	0.96	0	4
ProbMeal	1,219	0.13	0.34	0	1
PrivMed.	1,219	0.66	0.47	0	1
Savings	1,200	0.86	1.01	0	4
Van	1,219	0.05	0.21	0	1
Tract	1,219	0.03	0.17	0	1
Motorbike	1,219	0.21	0.40	0	1
Bicycle	1,214	0.51	0.50	0	1
HoursWorked	1,220	49.94	27.30	0	100
Happiness	1,214	2.52	0.95	0	4
LifeSatisfaction	1,206	6.90	2.10	1	10
SelfEsteem	1,206	7.72	2.11	1	10
Trust	1,199	0.49	0.50	0	1
Health	1,196	8.59	1.57	1	10
DamFamily	305	0.04	0.19	0	1
DamHouse	305	0.19	0.39	0	1
DamBuilding	305	0.25	0.43	0	1
DamTools	305	0.27	0.45	0	1
DamRawMat.	305	0.32	0.47	0	1
DamMkt.	305	0.49	0.50	0	1
SumDam.	305	1.56	1.67	0	6
TsunForced	300	0.32	0.47	0	1
Remittances	305	0.06	0.23	0	1
Subsidies	304	0.32	0.47	0	1
DonGrant	305	0.27	0.44	0	1
OthCharity	305	0.03	0.18	0	1

Table 3a: Changes in mean of selected indicators, full sample

Variable	P2-P1	P3-P2	P4-P3	P4-P2
Δ Real Income	4273.118	-5556.833	4441.441	-1066.862
	(7.18)	(-7.04)	(7.22)	(-1.51)
Δ Eq. Income PPP	1.3792	-1.675444	1.409149	-0.2225023
	(7.49)	(-7.07)	(6.62)	(-0.93)
Δ Standard of Living	0.3585526	-0.5377049	0.7180328	0.1803279
	(8.50)	(-8.03)	(12.15)	(3.37)
Δ Self-Esteem	0.6727575	-0.8654485	1.425249	0.557947
	(9.89)	(-6.39)	(12.45)	(5.72)
Δ Life Satisfaction	0.7269103	-1.32392	1.689369	0.3625828
	(11.64)	(-8.94)	(13.24)	(3.37)
Δ Happiness	0.2748344	-0.8519737	0.9506579	0.0986842
	(8.45)	(-12.05)	(14.64)	(2.06)
Δ Hours Worked	7.006557	-9.203279	11.10164	1.898361
	(6.50)	(-7.13)	(8.65)	(2.36)
Δ Prob. Meal	-0.0263158	0.1836066	-0.1704918	0.0131148
	(-1.89)	(7.49)	(-7.26)	(0.78)

Note: t-statistics in parenthesis.

Table 3b: Changes in mean of selected indicators, non damaged respondents only

Variable	P2-P1	P3-P2	P4-P3	P4-P2
Δ Real Income	3972.47	-1255.463	2908.87	1795.856
	(5.33)	(-1.55)	(3.00)	(1.70)
Δ Eq. Income PPP	1.257967	-0.4536367	0.8078155	0.4296515
	(5.46)	(-1.80)	(3.43)	(1.38)
Δ Standard of Living	0.2285714	-0.0095238	0.3238095	0.3142857
	(3.24)	(-0.12)	(4.65)	(4.09)
Δ Self-Esteem	0.5714286	0.0809524	0.5428571	0.6238095
	(5.43)	(0.56)	(5.56)	(3.90)
Δ Life Satisfaction	0.6857143	-0.0857143	0.6952381	0.6095238
	(7.86)	(-0.53)	(5.05)	(3.69)
Δ Happiness	0.2285714	-0.0952381	0.2857143	0.1904762
	(4.64)	(-1.25)	(3.75)	(2.45)
Δ Hours Worked	8.342857	-1.933333	0.7904762	-1.142857
	(4.85)	(-1.48)	(0.58)	(-0.70)
Δ Prob. Meal	-0.0380952	0.0380952	-0.047619	-0.0095238
	(-1.65)	(1.42)	(-1.68)	(-0.38)

Note: t-statistics in parenthesis.

Table 3c: Changes of mean of selected indicators, damaged respondents only

Variable	P2-P1	P3-P2	P4-P3	P4-P2
Δ Real Income	4431.439	-8037.377	5333.118	-2529.337
	(5.40)	(-7.24)	(6.79)	(-2.79)
Δ Eq. Income PPP	1.442423	-2.381209	1.759619	-0.5557458
	(5.69)	(-7.16)	(5.77)	(-1.72)
Δ Standard of Living	0.4271357	-0.815	0.925	0.11
	(8.21)	(-9.32)	(11.77)	(1.56)
Δ Self-Esteem	0.7270408	-1.372449	1.897959	0.5228426
	(8.27)	(-7.50)	(12.02)	(4.25)
Δ Life Satisfaction	0.7489796	-1.987245	2.221939	0.2309645
	(8.93)	(-10.23)	(13.07)	(1.67)
Δ Happiness	0.2994924	-1.251256	1.301508	0.0502513
	(7.07)	(-14.21)	(16.21)	(0.83)
Δ Hours Worked	6.305	-13.02	16.515	3.495
	(4.59)	(-7.28)	(9.71)	(4.06)
Δ Prob. Meal	-0.0201005	0.26	-0.235	0.025
	(-1.16)	(7.78)	(-7.42)	(1.15)

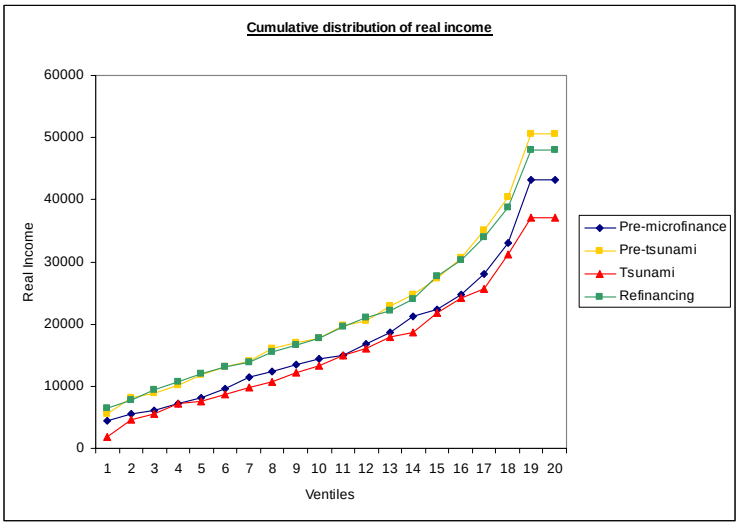
Note: t-statistics in parenthesis.

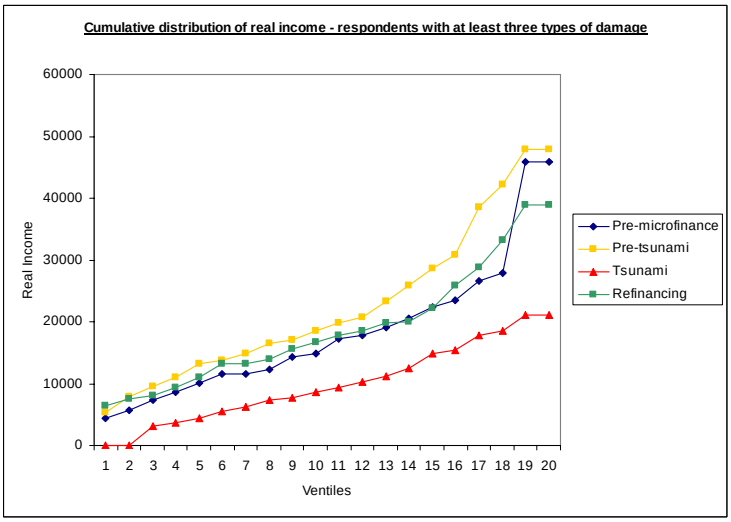
Table 4: Variability of economic and psychological indicators from P2 to P3

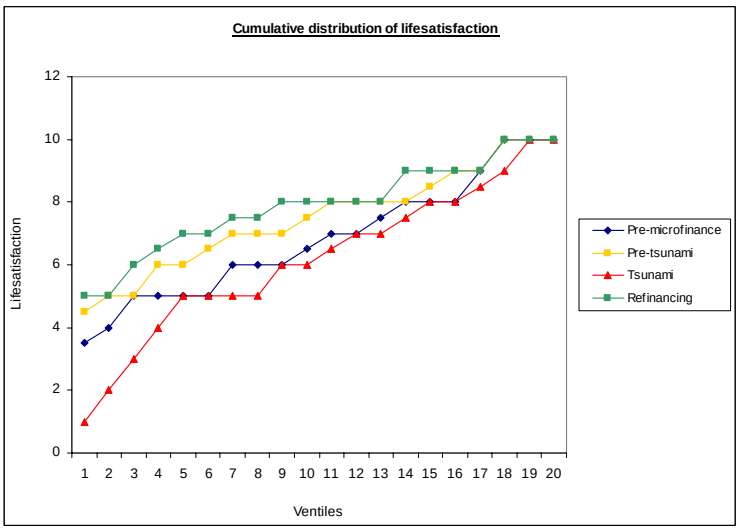
	All sample	No damages	At least 1damage	At least 3damages
Real household income	-0.160	-0.020	-0.099	-0.575
Equivalent income PPP	-0.144	0.001	-0.076	-0.559
Hours worked	-0.489	-0.109	-0.190	-1.061
Standard of living	-0.731	-0.013	-0.280	-1.612
Probmeal	0.757	0.160	0.347	1.346
Self-esteem	-0.733	0.075	-0.044	-2.187
Life satisfaction	-1.222	-0.095	-0.310	-3.052
Happiness	-1.507	-0.188	-0.655	-3.349

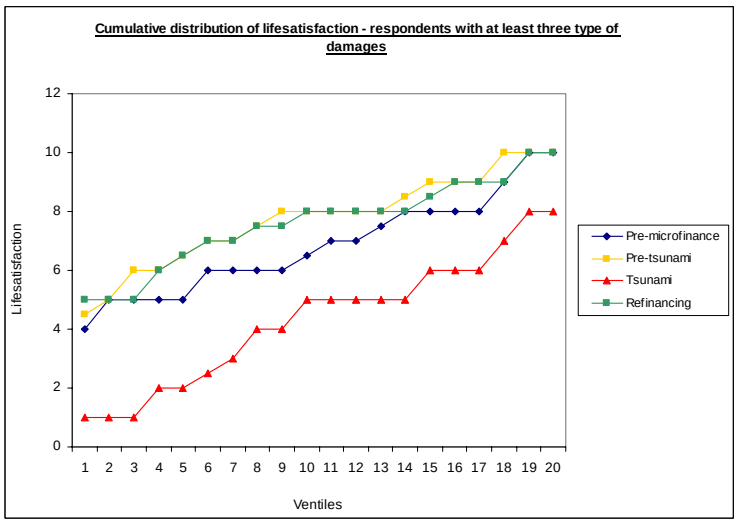
Note: the coefficients are the ratio between the change in the variable between P2 and P3 and the standard error of the change of the same variable from P1 to P2.

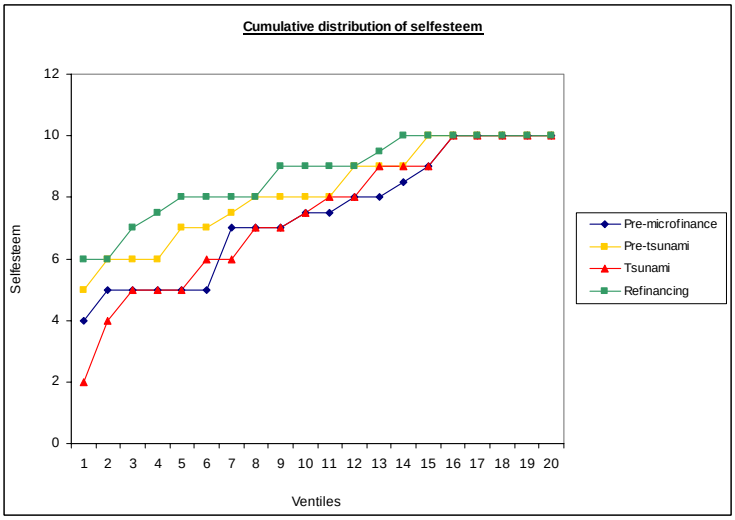
Figure 1: Cumulative distribution of selected variables











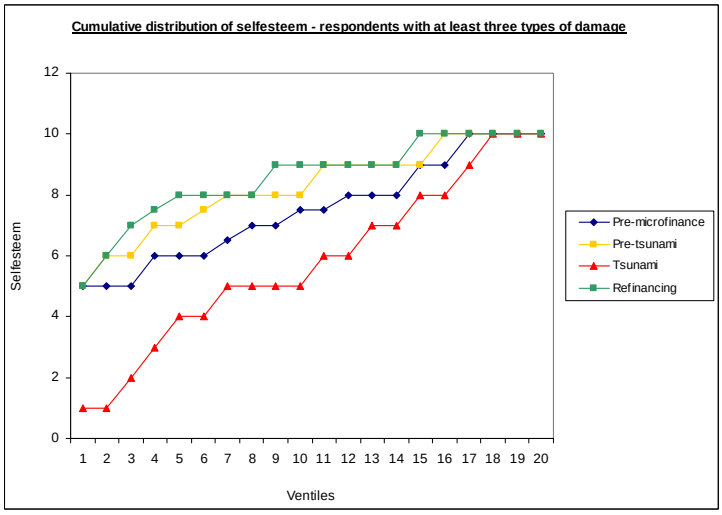


Table 5: Difference in mean of selected indicators between non-damaged and damaged respondents

Variable	**P1**	**P2**	P3	**P4**
Real Income	-1037.945	-566.9911	-7139.124	-4905.54
	(-0.65)	(-0.30)	(-5.03)	(-2.93)
Eq. Income PPP	-0.5749012	-0.4018226	-2.192877	-1.326885
	(-1.08)	(-0.65)	(-5.05)	(-2.29)
Standard of Living	-0.193922	0.007381	-0.7980952	-0.1969048
	(-1.77)	(0.07)	(-6.66)	(-1.92)
Self-Esteem	-0.4479592	-0.2865845	-1.745748	-0.3875514
	(-1.77)	(-1.35)	(-6.00)	(-1.97)
Life Satisfaction	-0.189966	-0.123036	-2.028231	-0.5015954
	(-0.79)	(-0.58)	(-7.39)	(-2.45)
Happiness	-0.1044235	-0.0311558	-1.187174	-0.1713807
	(-1.08)	(-0.39)	(-9.75)	(-1.82)
Hours Worked	0.9738095	-1.064048	-12.15071	3.57381
	(0.29)	(-0.36)	(-3.50)	(1.15)
Prob. Meal	0.0007657	0.0183333	0.2402381	0.0528571
	(0.02)	(0.56)	(4.68)	(1.52)

Note: t-statistics in parenthesis.

Table 6a: Effect of the first microfinance loan on ΔRealIncome and ΔStandLiv

Δ Real Income

Variable	OLS		OLS length<24	
	Coef.	t	Coef.	t
Galle	-0.1072055	-0.89	0.0623252	0.48
Matara	0.0800953	0.98	0.2235483	1.91
Agric.	-0.2085638	-1.27	-0.3856779	-1.08
Fishery	-0.501262	-1.76	-0.5632631	-2.49
Manuf.	-0.1723409	-1.13	-0.1193024	-0.41
Age	-0.0068603	-1.58	-0.0110975	-1.66
Female	0.1384287	1.33	-0.190104	-1.27
Primary	-0.0117582	-0.07	-0.142999	-0.55
SecPlus	-0.1354264	-0.72	-0.3855122	-0.96
NumChild	0.0261557	1.13	0.0286606	1.1
RealInco_lag	-0.0000187	-3.32	-0.0000214	-2.29
ΔRealInco	-	-	-	-
Remittances	-0.060751	-0.25	0.6483085	1.05
Subsidies	0.2607591	0.7	0.1330431	0.24
DonGrants	0.276971	0.47	0.1919256	0.38
OtherLoans	0.1129496	0.52	0.3311392	0.84
RelativeLoan	0.0218311	2.07	0.0242353	1.12
Length	0.0017931	0.62	-0.00696	-0.81
Constant	0.8312824	2.18	1.364551	1.98
N	269		148	
R2	0.1099		0.8298611	
Log Likelihood				

Δ Stand. Liv.

Variable	OLOGIT		OLOGIT length<24	
	Coef.	z	Coef.	Z
Galle	0.7504324	1.86	0.0805994	0.14
Matara	0.0606352	0.31	0.0060535	0.02
Agric.	0.1035401	0.33	-0.1945886	-0.44
Fishery	0.4473298	0.92	0.6868683	0.92
Manuf.	0.4969374	1.5	0.3402263	0.8
Age	-0.0154781	-1.08	0.0030326	0.14
Female	-0.1140489	-0.36	-0.0313057	-0.05
Primary	-0.0167121	-0.06	0.0268112	0.06
SecPlus	0.0641625	0.17	0.3088421	0.54
NumChild	0.2118823	2.5	0.3157983	2.96
RealInco_lag	-0.0000327	-2.67	-0.000036	-1.6
ΔRealInco	1.045112	2.19	1.911764	1.13
Remittances	0.9520778	0.73	-0.161218	-0.12
Subsidies	0.0856485	0.16	-0.0134497	-0.01
DonGrants	1.642404	2.01	1.481847	1.11
OtherLoans	-0.2879159	-0.78	-0.4091295	-0.76
RelativeLoan	0.0031749	0.09	-0.0549492	-0.79
Length	0.0104799	1.15	-0.0210357	-0.73
Constant	-	-	-	-
N	269		148	
R2				
Log Likelihood	-236,08126		-120.06909	

Notes: for the description of the variables used, see Tables 1a-1b. T-statistics are computed on the basis of robust standard errors. *RealInco_lag* is the real household income of the previous period. *OtherLoan* is a dummy variable equal to one if the respondent had other loans from banks, family members or friends apart from AMF. *Length* is the length of the time window.

Table 6b: Effect of the first microfinance loan on ΔHappy and ΔSelfEst

Δ Happy

Variable	OLOGIT		OLOGIT length<24	
	Coef.	z	Coef.	z
Galle	-0.0187788	-0.05	-0.1807423	-0.28
Matara	0.0757822	0.43	0.1597931	0.63
Agric.	0.4990528	1.4	0.2707805	0.54
Fishery	-1.0911	-2.81	-1.059808	-1.79
Manuf.	0.3711741	1.1	0.2820804	0.58
Age	0.0073835	0.47	0.0226689	1.21
Female	-0.0831992	-0.22	0.2414817	0.38
Primary	-0.3749985	-1.17	-0.3810173	-0.77
SecPlus	0.3126271	0.77	0.1667626	0.27
NumChild	0.0793607	0.68	-0.0442681	-0.29
RealInco_lag	-0.000046	-3.18	-0.0000638	-2.19
ΔRealInco	0.4701559	2.59	0.5443398	1.73
Remittances	1.456643	1.08	-2.347884	-2.47
Subsidies	-0.7106222	-1.01	-1.923881	-2.2
DonGrants	0.6856021	0.64	3.098102	2.43
OtherLoans	-0.2572698	-0.79	-0.384815	-0.75
RelativeLoan	-0.0138753	-0.54	-0.0787075	-0.73
Length	0.0199025	2.25	-0.0187441	-0.55
Constant	-	-	-	-
N	267		147	
R2				
Log Likelihood	-191,30199		-96,508127	

Δ Self-Esteem

Variable	OLOGIT		OLOGIT length<24	
	Coef.	z	Coef.	Z
Galle	0.6074573	1.57	0.9359683	1.74
Matara	0.2101759	1.24	0.3886316	1.6
Agric.	0.2908038	0.91	0.4512741	0.91
Fishery	0.3575969	0.58	0.5253086	0.92
Manuf.	0.5082091	1.9	0.2554627	0.67
Age	-0.013856	-1.04	-0.0075803	-0.41
Female	0.0098248	0.03	-0.1321475	-0.18
Primary	0.3614427	1.4	0.3159988	0.9
SecPlus	0.9846957	2.48	1.262566	2.63
NumChild	0.1231046	1.44	0.075797	0.68
RealInco_lag	-0.0000198	-1.81	5.31E-06	0.39
ΔRealInco	0.1890292	0.85	0.11716	0.46
Remittances	-1.171549	-0.91	-4.004359	-3.48
Subsidies	0.457018	0.9	0.1287574	0.23
DonGrants	-0.2147486	-0.3	0.2272076	0.17
OtherLoans	-0.1097278	-0.37	-0.0632859	-0.13
RelativeLoan	-0.0229585	-0.85	0.1047916	2.56
Length	0.0078543	1.06	-0.0337247	-1.22
Constant	-	-	-	-
N	266		147	
R2				
Log Likelihood	-405,98664		-218,67735	

Notes: for the description of the variables used, see Tables 1a-1b. T-statistics are computed on the basis of robust standard errors. *RealInco_lag* is the real household income of the previous period. *OtherLoan* is a dummy variable equal to one if the respondent had other loans from banks, family members or friends apart from AMF. *Length* is the length of the time window.

Table 7a: Effect of tsunami on Δ Real Income

Variable	OLS		OLS length<24		OLS		TREATMENT REGRESSION MODEL	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Galle	-0.1083263	-1.35	-0.10624	-1.24	-0.1011438	-1.26	-0.1193641	-1.53
Matara	-0.0546899	-1.44	-0.0544742	-1.33	-0.0580774	-1.52	-0.049056	-1.41
Agric.	0.1144032	1.56	0.11807	1.57	0.1086796	1.48	0.017533	0.22
Fishery	0.6131391	1.7	0.6056124	1.67	0.6193805	1.74	0.5832108	3.69
Manuf.	0.0840262	1.53	0.0866824	1.56	0.0742008	1.35	0.0949158	1.79
Age	-0.0026314	-0.96	-0.002541	-0.9	-0.0022058	-0.78	-0.0031573	-1.19
Female	0.0219435	0.27	0.0200315	0.25	0.0129208	0.15	0.0547129	0.76
Primary	0.0026665	0.04	-0.0001308	0	-0.0087126	-0.15	-0.0034898	-0.06
SecPlus	-0.0157637	-0.21	-0.0236014	-0.31	-0.0316222	-0.42	-0.0310031	-0.41
NumChild	0.0230472	1.13	0.0229348	1.09	0.0239052	1.15	0.0199173	1.13
RealInco_lag	-0,00000827	-4.9	-0,00000823	-4.73	-0,00000802	-4.88	-0,00000771	-4.63
Damage	-	-	-	-	-	-	-0.504126	-3.45
Sumdam.	-0.0507761	-2.06	-0.0533099	-2.08	-	-	-	-
DamFam.	-	-	-	-	-0.0960925	-1.03	-	-
DamHou.	-	-	-	-	-0.0624163	-0.58	-	-
DamBuil.	-	-	-	-	-0.076015	-0.96	-	-
DamT.	-	-	-	-	0.0734198	0.58	-	-
DamRaw.	-	-	-	-	-0.0897484	-0.97	-	-
DamMkt.	-	-	-	-	-0.1014542	-1.73	-	-
Remittances	-0.0618524	-0.51	-0.0644086	-0.54	-0.0776426	-0.61	-0.0245741	-0.22
Subsidies	-0.2029383	-2.34	-0.1955724	-2.17	-0.2073318	-2.38	-0.2172484	-3.29
DonGrants	-0.0666285	-0.89	-0.0618695	-0.82	-0.0754206	-0.99	-0.0625187	-0.9
OtherLoans	0.0065782	0.1	0.0105461	0.16	-0.0057783	-0.09	0.0002443	0
Length	-0.0023883	-0.62	-0.0011768	-0.27	-0.002218	-0.57	-0.0028446	-0.68
Length_lag	-0.0014526	-1.19	-0.0014184	-1.14	-0.0014561	-1.14	-0.0012735	-0.93
Constant	0.2857094	1.57	0.2710335	1.46	0.2984728	1.55	0.5545652	3
							Dep. Var:	*damage*
Agric.	-	-	-	-	-	-	-0.5829317	-2.79
CoastHou.	-	-	-	-	-	-	1.198485	5.1
Constant	-	-	-	-	-	-	0.11061	0.93
N	254		248		254		254	
R2	0.2917		0.2903		0.2993			
Log Likelihood							-250.6634	

Notes: for the description of the variables used, see Tables 1a-1b. T-statistics are computed on the basis of robust standard errors. *RealInco_lag* is the real household income of the previous period. *OtherLoan* is a dummy variable equal to one if the respondent had other loans from banks, family members or friends apart from AMF. *Length* is the length of the time window. The last three coefficients of the fourth column refer to the selection equation.

Table 7b: Effect of tsunami on Δ Stand. Liv.

Variable	OLOGIT		OLOGIT length<24		OLOGIT		TREATMENT REGRESSION MODEL	
	Coef.	z	Coef.	z	Coef.	z	Coef.	z
Galle	-0.7272687	-1.72	-0.6169857	-1.42	-0.6058468	-1.38	-0.3522941	-1.93
Matara	-0.3971833	-2.32	-0.3277555	-1.89	-0.4161683	-2.32	-0.1623353	-2
Agric.	0.3672797	0.94	0.2850453	0.73	0.4397409	1.16	-0.0740086	-0.44
Fishery	-0.8774102	-0.54	-0.9457824	-0.58	-0.7700587	-0.53	-0.5982727	-1.65
Manuf.	-0.0187502	-0.07	0.011978	0.04	-0.0924856	-0.34	-0.0274655	-0.22
Age	0.0092513	0.59	0.0056434	0.36	0.0132518	0.78	0.0036014	0.58
Female	0.3568207	0.95	0.4218664	1.14	0.2688475	0.68	0.1634218	1.02
Primary	0.0495701	0.17	-0.0389859	-0.13	-0.0116236	-0.04	-0.0026763	-0.02
SecPlus	-0.0299106	-0.07	-0.0985301	-0.24	-0.0473494	-0.12	-0.0680236	-0.38
NumChild	-0.1062462	-1.14	-0.1295822	-1.39	-0.1381439	-1.47	-0.0609496	-1.52
RealInco_lag	-0,00000759	-1.02	-0,00000651	-0.87	-0,00000317	-0.44	-0,00000435	-1.09
ΔRealInco.	2.540218	3.84	2.503142	3.7	2.602218	3.75	1.009277	7.07
Damage	-	-	-	-	-	-	-0.9688617	-3.44
SumDam.	-0.2841351	-1.98	-0.308499	-2.07	-	-	-	-
DamFam.	-	-	-	-	0.3264413	0.76	-	-
DamHou.	-	-	-	-	-0.3212456	-0.59	-	-
DamBuil.	-	-	-	-	-1.216033	-2.96	-	-
DamT.	-	-	-	-	0.1912571	0.41	-	-
DamRaw.	-	-	-	-	0.428901	1.16	-	-
DamMkt.	-	-	-	-	-0.7451251	-2.49	-	-
Remittances	-0.2554763	-0.57	-0.2267839	-0.51	-0.435598	-0.86	-0.1360223	-0.52
Subsidies	0.307848	0.89	0.3690115	1.04	0.3457222	1.02	0.1148074	0.75
DonGrants	0.0693531	0.17	0.1305644	0.33	-0.1317063	-0.32	-0.0392901	-0.24
OtherLoans	-0.127121	-0.42	-0.0879781	-0.28	-0.170715	-0.54	-0.1060028	-0.84
Length	0.0425113	1.91	0.0327126	1.36	0.045887	1.97	0.0188058	1.91
Length_lag	0.0130675	1.81	0.0121474	1.69	0.0154289	1.93	0.0052924	1.67
Constant	-	-	-	-	-	-	0.3063902	0.71
							Dep. Var:	*damage*
Agric.	-	-	-	-	-	-	-0.5844622	-2.77
CoastHou.	-	-	-	-	-	-	1.39628	6.95
Constant	-	-	-	-	-	-	0.0527289	0.45
N	254		248		254		254	
R2								
Log Likelihood	-305.05033		-299.10331		-296.49413		-459.68277	

Notes: for the description of the variables used, see Tables 1a-1b. T-statistics are computed on the basis of robust standard errors. *RealInco_lag* is the real household income of the previous period. *OtherLoan* is a dummy variable equal to one if the respondent had other loans from banks, family members or friends apart from AMF. *Length* is the length of the time window. The last three coefficients of the fourth column refer to the selection equation.

Table 7c: Effect of tsunami on Δ Happiness

Variable	OLOGIT		OLOGIT length<24		OLOGIT		TREAT	
	Coef.	Z	Coef.	z	Coef.	Z	Coef.	z
Galle	-0.5865039	-1.38	-0.6288355	-1.47	-0.7653405	-1.71	-0.3005257	-1.72
Matara	-0.3047967	-1.66	-0.3030119	-1.66	-0.3856704	-2.01	-0.0934718	-1.2
Agric.	0.6661767	2.13	0.5970412	1.88	0.6006174	1.89	0.1348227	0.79
Fishery	-0.6039119	-0.56	-0.6665052	-0.61	-0.438966	-0.39	-0.2175835	-0.63
Manuf.	0.3471835	1.29	0.2741756	1.01	0.3603811	1.19	0.1543646	1.29
Age	0.0102843	0.69	0.0104487	0.7	0.0107125	0.72	0.0042519	0.73
Female	-0.2665967	-0.71	-0.1448823	-0.39	-0.2078078	-0.56	-0.0439339	-0.29
Primary	0.0149681	0.05	0.0442586	0.14	0.0341904	0.11	-0.047011	-0.39
SecPlus	-0.3153473	-0.93	-0.2263344	-0.66	-0.3169563	-0.94	-0.1546393	-0.92
NumChild	-0.0889019	-0.97	-0.1270483	-1.4	-0.0886536	-0.93	-0.0328601	-0.86
RealInco_lag	0,000000263	0.04	0,000000421	0.07	-0,00000265	-0.38	1.38E-06	0.36
ΔRealInco.	2.00782	3.75	2.04378	3.74	1.97232	3.61	0.8435373	6.15
Damage							-1.215284	-3.77
SumDam.	-0.4961947	-3.92	-0.4816318	-3.78				
DamFam.					-0.3092501	-0.34		
DamHou.					-0.5301814	-1.2		
DamBuil.					0.1500949	0.39		
DamT.					-0.8267398	-1.37		
DamRaw.					-0.4833963	-1.32		
DamMkt.					-0.876674	-2.76		
Remittances	-0.0912142	-0.13	-0.0597703	-0.09	-0.1245215	-0.18	0.059445	0.24
Subsidies	-0.5999573	-1.65	-0.6763862	-1.85	-0.6220615	-1.69	-0.3685384	-2.5
DonGrants	-0.402122	-1.06	-0.3348112	-0.89	-0.3502006	-0.93	-0.3004579	-1.92
Multiaff.	0.3756564	1.24	0.4275131	1.35	0.4150627	1.23	0.1035472	0.86
Lenght	0.0185994	0.75	0.0130905	0.52	0.0196291	0.78	0.0052843	0.56
Length_lag	0.0094745	1.42	0.0077192	1.15	0.0099332	1.4	0.0066609	2.16
Constant							0.1890117	0.45
Agric.							-0.5914706	-2.83
CoastHou.							1.336412	6.28
Constant							0.0663705	0.55
N	253		247		253		253	
R2								
Log Likel.	-302.90067		-290.83178		-300.77844		-447.30065	

Notes: for the description of the variables used, see Tables 1a-1b. T-statistics are computed on the basis of robust standard errors. *RealInco_lag* is the real household income of the previous period. *OtherLoan* is a dummy variable equal to one if the respondent had other loans from banks, family members or friends apart from AMF. *Length* is the length of the time window. The last three coefficients of the fourth column refer to the selection equation.

Table 7d: Effect of tsunami on Δ Self-Esteem

Variable	OLOGIT		OLOGIT length<24		OLOGIT		TREATMENT REGRESSION MODEL	
	Coef.	z	Coef.	z	Coef.	z	Coef.	z
Galle	-0.6192918	-1.68	-0.5546413	-1.45	-0.5636889	-1.43	-0.5063066	-1.3
Matara	-0.2008371	-1.17	-0.191378	-1.07	-0.198843	-1.1	-0.0955872	-0.55
Agric.	-0.0223484	-0.08	-0.0266445	-0.1	0.0497876	0.18	-0.4816018	-1.2
Fishery	-1.038784	-1.17	-1.055307	-1.2	-1.433002	-1.56	-1.018133	-1.32
Manuf.	-0.2575865	-0.95	-0.2724824	-0.99	-0.0886599	-0.31	-0.2920878	-1.06
Age	0.0046743	0.37	0.0051647	0.4	0.0071561	0.54	0.0029799	0.23
Female	-0.134966	-0.41	-0.1367853	-0.42	-0.3741568	-1.05	-0.0558189	-0.16
Primary	0.261027	0.96	0.2839297	1.01	0.2659047	0.99	0.1425357	0.52
SecPlus	-0.0046028	-0.01	-0.0538001	-0.17	0.102836	0.31	0.0787716	0.21
NumChild	-0.0141349	-0.19	-0.020712	-0.27	-0.0267274	-0.32	-0.0061222	-0.07
RealInco_lag	-0.0000115	-1.84	-0.0000115	-1.82	-0.00001	-1.68	-0,00000993	-1.17
ΔRealInco.	1.702318	3.2	1.651558	3.1	1.742448	3.19	1.398295	4.56
Damage	-	-	-	-	-	-	-2.235848	-2.96
SumDam.	-0.4519028	-3.62	-0.4670416	-3.61	-	-	-	-
DamFam.	-	-	-	-	-0.3084769	-0.23	-	-
DamHou.	-	-	-	-	0.9150754	1.64	-	-
DamBuil.	-	-	-	-	-1.053848	-3.2	-	-
DamT.	-	-	-	-	-0.6650478	-1.18	-	-
DamRaw.	-	-	-	-	-0.9535701	-2.17	-	-
DamMkt.	-	-	-	-	-0.2575943	-0.84	-	-
Remittances	-0.4164247	-0.76	-0.4417927	-0.81	-0.1433849	-0.26	-0.2625227	-0.44
Subsidies	0.184409	0.65	0.213558	0.74	0.2059421	0.71	-0.2294705	-0.69
DonGrants	-0.2714456	-0.77	-0.2672265	-0.74	-0.3502461	-1.02	-0.7708332	-2.25
OtherLoans	0.0040813	0.02	-0.0100895	-0.04	0.0979264	0.32	-0.0139229	-0.05
Length	0.0103843	0.53	0.013843	0.59	0.0044537	0.2	0.0004242	0.02
Length_lag	0.0044799	0.52	0.0040781	0.46	0.0054088	0.6	0.0049908	0.73
Constant	-	-	-	-	-	-	1.685735	1.71
							Dep. Var:	*damage*
Agric.	-	-	-	-	-	-	-0.6064021	-2.9
CoastHou.	-	-	-	-	-	-	1.307269	6.18
Constant	-	-	-	-	-	-	0.0950874	0.74
N	250		244		250		250	
R2								
Log Likelihood	-518.40476		-507.32098		-510.99509		-643.64104	

Notes: for the description of the variables used, see Tables 1a-1b. T-statistics are computed on the basis of robust standard errors. *RealInco_lag* is the real household income of the previous period. *OtherLoan* is a dummy variable equal to one if the respondent had other loans from banks, family members or friends apart from AMF. *Length* is the length of the time window. The last three coefficients of the fourth column refer to the selection equation.

Table 8a: Effect of refinancing on Δ Real Income

Variable	OLS		OLS length<24		OLS		TREATMENT REGRESSION MODEL	
	Coef.	T	Coef.	t	Coef.	t	Coef.	t
Galle	-0.4386531	-1.61	-0.5154834	-3.12	-0.5274596	-1.93	-0.3897838	-1.51
Matara	-0.0078018	-0.06	-0.1713416	-2.3	-0.014718	-0.12	-0.0028202	-0.02
Agric.	-0.4312598	-1.9	-0.28506	-2.12	-0.475442	-2.1	-0.2757469	-1.21
Fishery	-0.3193011	-0.6	-0.1729012	-0.53	-0.1101497	-0.21	-0.3301095	-0.65
Manuf.	-0.1573703	-0.82	-0.069576	-0.6	-0.1443692	-0.74	-0.1844152	-1
Age	-0.0048518	-0.52	-0.0051579	-0.91	-0.0084244	-0.91	-0.0036169	-0.41
Female	0.0106709	0.04	-0.0552591	-0.37	0.1623583	0.63	0.0062958	0.03
Primary	-0.0003294	0	0.2136088	1.8	0.0471019	0.24	0.0145752	0.08
SecPlus	-0.1188845	-0.44	0.1429405	0.86	-0.0671873	-0.25	-0.0977342	-0.37
NumChild	0.0359106	0.59	0.0381678	1.04	0.0413824	0.69	0.0281316	0.48
RealInco_lag	-0.0000204	-2.4	-0.0000167	-3.31	-0.0000234	-2.72	-0.0000189	-2.32
Damage	-	-	-	-	-	-	0.5161743	1.84
SumDam.	0.0027461	0.04	0.033669	0.88	-	-	-	-
DamFam.	-	-	-	-	-0.1200791	-0.22	-	-
DamHou.	-	-	-	-	-0.4140929	-1.43	-	-
DamBuil.	-	-	-	-	0.7660326	2.86	-	-
DamT.	-	-	-	-	-0.2716882	-0.9	-	-
DamRaw.	-	-	-	-	-0.1699755	-0.51	-	-
DamMkt.	-	-	-	-	0.1645013	0.82	-	-
Remittances	0.3541721	0.56	0.264485	0.73	0.509198	0.81	0.343458	0.56
Subsidies	0.0401729	0.11	-0.0470013	-0.22	-0.3973557	-1.05	0.0189111	0.05
DonGrants	-0.6039296	-0.73	-0.5589841	-1.19	-0.6908473	-0.83	-0.6729328	-0.85
OtherLoans	0.0801552	0.41	-0.0636205	-0.54	0.1289906	0.67	0.0779366	0.42
RelativeLoan	0.0375697	4.17	0.030965	5.78	0.0350659	3.92	0.0362283	4.22
Length	0.0196783	1.25	0.0016292	0.16	0.0191043	1.23	0.018535	1.23
Constant	0.6882423	1.01	0.9852119	2.34	0.7708005	1.12	0.2828383	0.42
							Dep. Var:	*damage*
Agric.	-	-	-	-	-	-	-0.6630702	-3.2
CoastHou.	-	-	-	-	-	-	1.482891	6.86
Constant	-	-	-	-	-	-	0.0595934	0.51
N	249		222		249		249	
R2	0.2012		0.3703		0.2427			
Log Likelihood							-545.8315	

Notes: for the description of the variables used, see Tables 1a-1b. T-statistics are computed on the basis of robust standard errors. *RealInco_lag* is the real household income of the previous period. *OtherLoan* is a dummy variable equal to one if the respondent had other loans from banks, family members or friends apart from AMF. *Length* is the length of the time window. The last three coefficients of the fourth column refer to the selection equation.

Table 8b: Effect of refinancing on Δ Stand. Liv.

Variable	OLS		OLS length<24		OLS		TREATMENT REGRESSION MODEL	
	Coef.	z	Coef.	z	Coef.	z	Coef.	z
Galle	0.4774544	1.2	0.6120911	1.41	0.324914	0.78	0.1851986	1.09
Matara	0.073949	0.42	0.199207	1.03	0.0204386	0.11	0.0035363	0.05
Agric.	-0.3977426	-1.15	-0.2300284	-0.65	-0.5744679	-1.62	-0.0263832	-0.16
Fishery	0.5709731	0.78	0.9760787	1.26	0.9178266	1.22	0.2273397	0.69
Manuf.	0.0365444	0.13	0.1524409	0.51	-0.033977	-0.12	0.0445352	0.36
Age	-0.0071914	-0.54	0.0007715	0.05	-0.0098379	-0.73	-0.0035709	-0.61
Female	-0.7930516	-2.25	-0.797812	-2.18	-0.6593679	-1.79	-0.2474198	-1.55
Primary	0.5736952	1.99	0.5221661	1.68	0.7300657	2.44	0.2802506	2.3
SecPlus	0.6654759	1.71	0.749102	1.79	0.7283192	1.84	0.3005417	1.77
NumChild	0.0945762	1.07	0.0418349	0.44	0.1080236	1.22	0.0137558	0.36
RealInco_lag	-0.0000292	-2.16	-0.0000272	-1.91	-0.000035	-2.49	-0.0000106	-1.99
ΔRealInco.	0.5232224	4.12	0.8632287	4.66	0.5049996	3.66	0.2205582	5.36
Damage	-	-	-	-	-	-	0.4269501	1.28
SumDam.	0.2682896	2.98	0.2913392	2.98	-	-	-	-
DamFam.	-	-	-	-	-1.287119	-1.61	-	-
DamHou.	-	-	-	-	-0.2440201	-0.54	-	-
DamBuil.	-	-	-	-	1.549684	3.78	-	-
DamT.	-	-	-	-	-0.556004	-1.23	-	-
DamRaw.	-	-	-	-	0.5018812	1.01	-	-
DamMkt.	-	-	-	-	0.353114	1.17	-	-
Remittances	-0.4084597	-0.48	-0.4063467	-0.47	-0.1052489	-0.12	-0.225759	-0.57
Subsidies	1.294177	2.6	1.135692	2.18	0.5503299	1.02	0.527685	2.35
DonGrants	-2.583771	-2.07	-2.386559	-1.93	-2.286282	-1.84	-1.016778	-1.98
OtherLoans	-0.4006098	-1.4	-0.2079564	-0.68	-0.3287514	-1.12	-0.0964041	-0.8
RelativeLoan	-0.0152204	-1.12	-0.021521	-1.47	-0.0210966	-1.54	-0.0047104	-0.82
Length	0.0364607	1.57	0.0461784	1.71	0.042906	1.81	0.0197934	2.02
Constant	-	-	-	-	-	-	0.1957531	0.41
							Dep. Var:	*damage*
Agric.	-	-	-	-	-	-	-0.6619702	-3.2
CoastHou.	-	-	-	-	-	-	1.445726	6.74
Constant	-	-	-	-	-	-	0.0587594	0.49
N	249		222		249		249	
R2								
Log Likelihood	-277.36287		-243.62787		-269.18658		-437.80671	

Notes: for the description of the variables used, see Tables 1a-1b. T-statistics are computed on the basis of robust standard errors. *RealInco_lag* is the real household income of the previous period. *OtherLoan* is a dummy variable equal to one if the respondent had other loans from banks, family members or friends apart from AMF. *Length* is the length of the time window. The last three coefficients of the fourth column refer to the selection equation.

Table 8c: Effect of refinancing on Δ Happy

Variable	OLOGIT		OLOGIT length<24		OLOGIT		TREATMENT REGRESSION MODEL	
	Coef.	Z	Coef.	z	Coef.	z	Coef.	z
Galle	0.9677323	2.38	1.114144	2.46	1.142429	2.68	0.3770524	2.22
Matara	0.2543023	1.4	0.3076824	1.52	0.3068942	1.61	0.0581789	0.77
Agric.	-0.166653	-0.49	-0.1717765	-0.47	-0.1118237	-0.32	0.0168833	0.1
Fishery	0.3785065	0.51	0.6155988	0.79	0.1975791	0.26	0.1571245	0.48
Manuf.	-0.2383941	-0.84	-0.1346816	-0.44	-0.2374812	-0.81	-0.0952989	-0.78
Age	-0.0102426	-0.75	-0.0080216	-0.54	-0.0090957	-0.65	-0.0124289	-2.16
Female	0.4272031	1.08	0.4190341	1.03	0.3913724	0.98	0.2472625	1.56
Primary	0.1377615	0.48	0.0848373	0.27	0.1254193	0.43	0.0882617	0.72
SecPlus	0.6467594	1.7	0.4688859	1.13	0.638086	1.65	0.306408	1.81
NumChild	0.0856734	1	0.0799835	0.88	0.0941148	1.09	0.0376905	1
RealInco_lag	-0.0000272	-2.03	-0.0000297	-2.04	-0.0000233	-1.7	-0.0000155	-2.92
ΔRealInco.	0.4096987	3.59	0.6755559	3.87	0.4176049	3.69	0.1602278	3.83
Damage	-	-	-	-	-	-	1.167421	3.74
SumDam.	0.6191906	6.37	0.581556	5.59	-	-	-	-
DamFam.	-	-	-	-	0.6494149	0.85	-	-
DamHou.	-	-	-	-	0.7260577	1.72	-	-
DamBuil.	-	-	-	-	0.1776064	0.46	-	-
DamT.	-	-	-	-	0.24258	0.54	-	-
DamRaw.	-	-	-	-	1.134221	2.27	-	-
DamMkt.	-	-	-	-	0.8860704	2.93	-	-
Remittances	-0.7355215	-0.63	-0.7158938	-0.6	-0.9349025	-0.79	-0.0428187	-0.11
Subsidies	-0.1648778	-0.34	-0.3351076	-0.65	-0.0538271	-0.1	-0.2900259	-1.3
DonGrants	-2.447837	-1.44	-2.221526	-1.29	-2.375283	-1.35	-1.001709	-1.95
OtherLoans	0.281889	1	0.3220716	1.07	0.2358689	0.82	0.1049061	0.87
RelativeLoan	-0.0347421	-2.63	-0.0391723	-2.72	-0.034611	-2.59	-0.0129029	-2.23
Length	-0.0047408	-0.21	-0.0077571	-0.29	-0.0030947	-0.13	-0.0022568	-0.23
Constant	-	-	-	-	-	-	0.4797057	1.01
							Dep. Var:	*damage*
Agric.	-	-	-	-	-	-	-0.6444475	-3.11
CoastHou.	-	-	-	-	-	-	1.419806	6.56
Constant	-	-	-	-	-	-	0.0506485	0.42
N	248		221		248		248	
R2								
Log Likelihood	-263.82062		-236.05792		-262.40323		-435.61495	

Notes: for the description of the variables used, see Tables 1a-1b. T-statistics are computed on the basis of robust standard errors. *RealInco_lag* is the real household income of the previous period. *OtherLoan* is a dummy variable equal to one if the respondent had other loans from banks, family members or friends apart from AMF. *Length* is the length of the time window. The last three coefficients of the fourth column refer to the selection equation.

Table 8d: Effect of refinancing on Δ Self-Esteem

Variable	OLOGIT		OLOGIT length<24		OLOGIT		TREATMENT REGRESSION MODEL	
	Coef.	Z	Coef.	z	Coef.	z	Coef.	z
Galle	0.9193141	2.36	1.049611	2.4	1.007785	2.47	0.6496031	2.06
Matara	0.2194057	1.23	0.2033428	1.04	0.2295002	1.23	0.0758409	0.54
Agric.	0.3493703	1.09	0.3585033	1.05	0.2061461	0.63	0.4874472	1.63
Fishery	0.0480468	0.06	0.1293912	0.16	0.3006802	0.4	0.2249824	0.37
Manuf.	0.5927488	2.2	0.486459	1.68	0.4108804	1.46	0.4780381	2.11
Age	-0.0142931	-1.13	-0.0131721	-0.96	-0.0159331	-1.23	-0.0117623	-1.1
Female	0.2206065	0.59	0.1840085	0.48	0.3415604	0.86	0.2435025	0.82
Primary	0.1419432	0.51	0.0978302	0.33	0.0440192	0.15	0.1553797	0.68
SecPlus	0.3378527	0.91	0.1088488	0.27	0.1890154	0.5	0.3232144	1.03
NumChild	-0.0275862	-0.32	-0.058202	-0.63	-0.0226032	-0.27	-0.0537619	-0.77
RealInco_lag	-0.000014	-1.09	-0.0000116	-0.83	-0.0000188	-1.39	-0.0000147	-1.5
ΔRealInco.	0.1250497	1.57	0.3151945	1.68	0.1124794	1.39	0.0840467	1.07
Damage	-	-	-	-	-	-	2.291594	5.64
SumDam.	0.6580118	6.8	0.6779746	6.45	-	-	-	-
DamFam.	-	-	-	-	1.058176	1.15	-	-
DamHou.	-	-	-	-	-0.8676814	-2	-	-
DamBuil.	-	-	-	-	1.151915	2.99	-	-
DamT.	-	-	-	-	0.9391897	2.01	-	-
DamRaw.	-	-	-	-	1.574685	3.14	-	-
DamMkt.	-	-	-	-	0.2262835	0.79	-	-
Remittances	0.6262017	0.82	0.5490867	0.7	0.53188	0.69	0.2263567	0.31
Subsidies	0.5406075	1.24	0.5329534	1.16	0.3267223	0.66	0.1449345	0.35
DonGrants	-2.524185	-1.91	-2.469263	-1.78	-2.722506	-2.01	-1.736783	-1.8
OtherLoans	-0.2480935	-0.91	-0.3688554	-1.26	-0.4195695	-1.5	-0.1109033	-0.49
RelativeLoan	-0.0067449	-0.56	-0.0117406	-0.87	-0.011323	-0.92	-0.0002297	-0.02
Length	-0.0109655	-0.5	-0.0231939	-0.9	-0.0130475	-0.57	0.008419	0.46
Constant	-	-	-	-	-	-	-0.3274484	-0.4
							Dep. Var:	*damage*
Agric.	-	-	-	-	-	-	-0.6345475	-3.05
CoastHou.	-	-	-	-	-	-	1.458806	7.18
Constant	-	-	-	-	-	-	0.0390192	0.32
N	245		218		245		245	
R2								
Log Likelihood	-418.96923		-366.97226		-409.36835		-581.42439	

Notes: for the description of the variables used, see Tables 1a-1b. T-statistics are computed on the basis of robust standard errors. *RealInco_lag* is the real household income of the previous period. *OtherLoan* is a dummy variable equal to one if the respondent had other loans from banks, family members or friends apart from AMF. *Length* is the length of the time window. The last three coefficients of the fourth column refer to the selection equation.

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