Don't Expect Too Much - High Income Expectations and Over-Indebtedness

(Previous title: Don't Expect Too Much: The Effect of Biased Expectations on (Over)-Indebtedness)*

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Abstract

Household indebtedness is rising worldwide. This study investigates one possible driver of this increase that is rooted in the theory of permanent income: high income expectations. We collect data from an emerging country, Thailand, as (over-) indebtedness in markets with incomplete financial infrastructure and social security can be devastating. Furthermore, our sample of rural households is exposed to a high degree of uncertainty, which makes expectation formation prone to behavioral biases. We implement a new measure for high income expectations and show that it is strongly and robustly related to both objective and subjectively felt over-indebtedness. Controlling for various household characteristics, unexpected shocks, and other possible confounding factors reduces the concern about reverse causality. In an additional lab-in-the-field experiment, we explicitly find that overconfidence, a specific form of biased expectation, is related to overborrowing.

Keywords: Household debt; Lab-in-the-field experiment; Emerging markets

JEL: D14; D84; D91

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1 Introduction

For households, taking out debt is a valuable tool to smooth consumption and often a necessary precursor of private investments. However, as consumer indebtedness is significantly increasing worldwide, there is widespread concern that it may turn detrimental. Specifically, when households face increasing difficulties to repay their debts, household well-being and consumption are threatened. Moreover, household over-indebtedness poses a serious threat to the stability of the financial system as a whole; for example, as experienced during the U.S. financial crisis in 2007-08.

Emerging market economies are especially at risk of low growth and even financial crises when the level of household debt is high, as not only are their institutions and financial regulations weaker, but income inequality is also higher (IMF, 2017). Therefore, understanding the factors and reacting to the consequences of over-indebtedness are crucial for improving living conditions while also ensuring a stable development of emerging economies. Building on the "permanent income hypothesis", where income expectations determine current consumption and borrowing, this paper studies one potential driver of over-indebtedness: too high income expectations. Although being positive about the future might have a net positive effect on lifetime utility (see Brunnermeier and Parker, 2005), being too positive might lead to serious financial distress and over-indebtedness.

In general, households' borrowing behavior around the world is still puzzling in various aspects and often hard to reconcile with standard neoclassical and behavioral models. Zinman (2015) argues that one reason for many unresolved puzzles is that household debt is vastly under-researched within household finance. In the last decade, a vibrant literature on measuring over-indebtedness has emerged (e.g. D'Alessio and Iezzi, 2013; Keese, 2012; Schicks, 2013). In contrast, its determinants are still mostly unidentified. Our paper contributes to closing this gap by focusing on high income expectations as one likely cause. To the best of our knowledge, we are the first to study the relationship between real income expectations and over-indebtedness.

We investigate the relationship between positive expectations and over-indebtedness using extensive survey data on the financial situation and financial behavior of one of the most vulnerable populations in Thailand: rural households in the north-east. A crucial part of our survey was to collect objective and subjective data on potential symptoms of over-indebtedness. This allows us to construct different objective and subjective over-indebtedness indicators.[1] Additionally, we quantify households' predictions of their future income. Instead of relying on qualitative Likert scale measures, we elicit individual distributions of expected household income and set these in relation to actual income. Hence,

[1] It is still a highly debated topic how to measure over-indebtedness and there is no clear-cut answer on the right method of elicitation, which is why we construct a variety of over-indebtedness measures.

a major contribution to the literature is that we relate the over-indebtedness indicators to a sophisticated measure of subjective income expectations. In our regression analysis, we control for relevant household characteristics and unexpected shocks faced by households, thereby reducing reverse causality concerns. In order to further strengthen the contribution of our paper, we delve deeper into the causal effect of positively biased expectations on overborrowing by carrying out a lab-in-the-field experiment with the exact same respondents. In the experiment, we concentrate on one particular expectation bias: overconfidence. We exogenously bias income expectations via two treatments that vary the level of self-confidence of the respondents and, thereby, their expected earnings. Subsequently, we investigate if participants spend more on goods they can buy in the experiment and, as a consequence, potentially overborrow.

Thailand is, on the one hand, an exemplary emerging market, but, on the other, outstanding when it comes to household finances: Financial inclusion is comparatively high, with four out of five persons participating in the formal financial system. Simultaneously, household debt has increased to over 78.03% of the country's GDP. This makes it the emerging market with the highest household debt to GDP ratio in the world (IMF (2017), see Figure A.1). Given these numbers, it is hardly surprising that both local policy makers and international institutions agree that over-indebtedness is a growing problem in Thailand (Tambunlertchai, 2015). Additionally, there are circumstances that make our sample especially vulnerable to over-indebtedness and to struggle with financial hardship. This part of the population faces higher uncertainty regarding their future incomes in two ways: through the generally high level of macroeconomic volatility in emerging markets and through individual, mostly weather-related shocks, common to poor, small-scale agricultural households (see Loayza et al., 2007; Klasen and Waibel, 2015).

Our survey results show that there is a strong and robust relationship between high expectations and over-indebtedness. Those who have positive expectations are more likely to be over-indebted than those with neutral or negative expectations, which we interpret as a sign that these expectations are truly too high for some households. The results vary slightly with respect to different debt indicators. The relationship between high expectations and the objective over-indebtedness indicator is more pronounced in comparison to the subjective indicator, but both indices are significant. Our results indicate that the subjective indicator is not only driven by actual debt levels but also by personal characteristics and perceptions, such that it measures a different dimension of over-indebtedness. In an additional exercise, we can show that the subjective over-indebtedness indicator is highly correlated to a qualitatively assessed income forecast (error) measure. Eventually, we find that being more certain about the future income realization, which can be another form of forecast error, is also positively related to our objective over-indebtedness

indicator. Rural households are exposed to a highly uncertain environment; hence, being too certain about ones future income may be harmful. Our results are robust to various sample specifications and become more precise if we exclude parts of the sample that may have had difficulties understanding the questions on eliciting future income expectations.

In the supplemental experiment, we find that overconfidence is related to more spending and overborrowing. However, our treatments themselves have no impact on overborrowing, which is why we cannot claim a causal relationship of overconfidence on overborrowing. These results are not driven by presumably confounding factors that the treatments could have affected and are relatively robust. Rather, we find evidence for "sticky" overconfident beliefs, which also points to a high level of perceived certainty in our sample. Furthermore, participants who overspend in the lab are also those who experience over-indebtedness in real life. This shows that our experiment is not "too artificial" to capture real life behavior.

Our study touches on three strands of literature: First, the literature on eliciting and using subjective expectations data; second, research on potential behavioral biases in financial decision-making and debt illiteracy; and, third, the literature on households' (over-)indebtedness in emerging economies. There are at least two reasons why the relationship between income expectations and over-indebtedness should be explicitly studied in an emerging market setting and why findings from "WEIRD"[2] populations might not translate to rural populations. First, financial literacy is substantially lower. This implies lower debt literacy, which might hamper expectation formation on financial matters. For example, Lusardi and Tufano (2015) find that debt illiteracy is related to higher debt burdens and the inability to evaluate the own debt position. Burke and Manz (2014) experimentally show that economic illiteracy increases financial forecast errors. Second, the higher uncertainty that respondents are facing distinguishes this research from work done in "WEIRD" societies. A more volatile economic environment requires more individual belief formation, which makes biased expectation formation more likely (see for example Johnson and Fowler, 2011) and at the same time more dangerous. In any case, the empirical evidence from WEIRD countries on the relationship between income expectations and over-indebtedness is sparse as well. To the best of our knowledge, there is no study that explicitly concentrates on real-life income expectations.

Our work is most closely related to Hyytinen and Putkuri (2018) and Grohmann et al. (2019). The former find a correlation between Finnish households' overborrowing and extreme positive forecast errors about the financial situation of the household. They do not analyze the effect of income expectations on overborrowing but the effect of financial expectations in general, which gives more rise to issues of reverse causality. Furthermore,

[2] Western, educated, industrialized, rich and democratic (Heinrich et al., 2010)

the forecast errors are constructed using Likert scales and hence, cannot be quantified. They show that households exhibiting high positive forecast errors are more likely to overborrow than households exhibiting smaller errors. Grohmann et al. (2019) conduct a lab experiment among students in Germany that is similar to ours and link the experiment data with data from the German Socio-Economic Panel. They find a causal link between overconfidence and debt taking in the lab and a correlation between a simple measure for overconfidence and the level of household debt in the panel sample. Our study differs from these two studies in that it contributes to the literature by (i) explicitly eliciting and quantifying real income expectations and precisely measuring over-indebtedness; and (ii) analyzing the research question in a setting where expectation formation is generally difficult and over-indebtedness bears severe consequences.

The paper proceeds as follows: Section 2 presents the survey data, discusses the setting, and explains how our variables of interest are constructed. In Section 3, the estimation strategy is outlined and survey results are presented. Section 4 describes the experiment and its results. Section 5 concludes.

2 Data

This section introduces the data collected during the survey and explains how the main variables of interest are derived. We develop a measure that approximates future income expectations, which we call the quantitative income forecast. Further, we construct various over-indebtedness indicators to capture the different dimensions of household debt.

2.1 The Thailand Vietnam Socio Economic Panel

The survey was conducted in Thailand in November 2017 and is an add-on project of the Thailand Vietnam Socio Economic Panel (TVSEP).[3] The TVSEP has conducted panel surveys in rural Thailand and Vietnam on a regular basis since 2007, with recurrent surveys in 2008, 2010, 2011, 2013, 2016, 2017, and 2019, so far. The TVSEP survey captures the living conditions of households in rural areas that are largely engaged in agriculture. It focuses on factors affecting households' vulnerability to poverty. Among others, the survey includes socio-economic characteristics of every household member, sections on household consumption and savings, crop farming, livestock rearing, and, in particular, questions on exposure to shocks and anticipated risks. Furthermore, each wave captures topics of current research interest. About 4000 rural households in 440 villages across six provinces in Thailand and Vietnam are interviewed for the survey. The sample

[3] See https://www.tvsep.de/overview-tvsep.html

is set to represent the rural population in these two countries while urban households are deliberately excluded. To obtain a representative sample, a three-stage cluster sampling is used. The procedure is described in Hardeweg et al. (2013).

Our study is conducted in only one of the TVSEP provinces in Thailand, Ubon Ratchathani, which borders Cambodia and Laos (Figures 1 and 2). The sample consists of about 750 households in 97 villages. For the majority of our analysis, we concentrate on our own survey, adding data from the 2016 and 2017 general TVSEP survey as necessary.

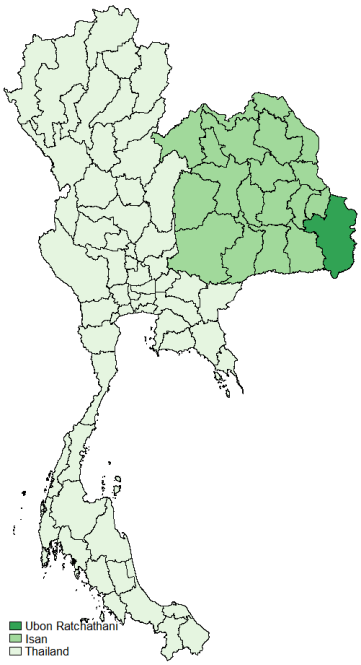

Figure 1: Study Site, Ubon Ratchathani

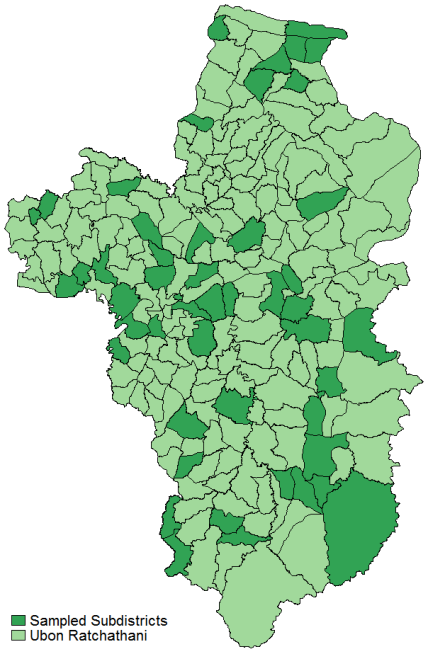

Figure 2: Sampled Subdistricts

With our study, we want to gain new insights into the determinants of debt induced financial distress within a vulnerable population. Therefore, our survey includes extensive question batteries on objective and subjective over-indebtedness (see Sub-Section 2.4), savings, financial literacy, borrowing behavior in general, and income expectations (see Sub-Section 2.3). In addition, we collect data on health, subjective well-being, personality traits, and risk preferences. We use established items to assess these data. For example, personality traits are measured using the short version of the Big Five Inventory "BFI-S" (John and Srivastava, 1999; Gerlitz and Schupp, 2005). We develop a broad financial literacy score, which not only encompasses numeracy but also questions on financial behavior and attitude. The score is similar in style to that developed by the OECD (OECD, 2018). Furthermore, we construct a score for risk preference out of two questions: The first one asks whether the person is generally fully prepared to take risks and the second question specifically asks for risk-taking behavior in financial decision-making (i.e. investing and borrowing). Self-control is assessed using the well-established scale of Tangney et

al. (2004). Given the low numeracy within the sample, we add a phrase to each numerical value on questions involving scales.[4]

We use a restricted sample for the analysis in Section 3 and exclude outliers by the following means: We exclude (i) the 1 percent highest monthly household incomes in 2016 and 2017, (ii) households who have a debt service to income ratio greater than four, and (iii) those whose income is negative in general. For the latter case, we trim them as we do not know whether a negative income itself means that the households are in financial distress. Regression results without trimming are very similar to those with trimming. In any case, trimming (marginally) downward biases our results.

In our trimmed sample, the average respondent is 57 years old, female, the spouse of the household head, and has 5.7 years of education. Our financial literacy score indicates a relatively low level of financial literacy. On average, respondents answered four out of seven knowledge questions correctly, reached five out of nine possible points concerning financial behavior, and three out of seven possible points with regard to financial attitude. This is in line with findings from the OECD/INFE study for Thailand from 2016 (OECD, 2016). While 57.27% of our respondents are the sole financial decision makers in their households, 28.05% share this task with someone else. Hence, when sometimes using respondent- and not household-specific characteristics or perceptions in the analysis, we are still confident that these individual traits determine the household's state of indebtedness because the majority of respondents is in charge of making financial decisions.[5]

2.2 The Thai Rural Credit Market

In Thailand, over 80% of the population has a bank account and over 60% uses it for digital payments. The gaps in financial inclusion between women and men as well as between the rural and urban population have declined and are now relatively small (Demirguc-Kunt et al., 2018). Financial inclusion in our sample is similar: 78.34% of our sample households have an account with a formal banking institution.

Simultaneously, the rural credit market has evolved extensively, providing manifold loan options for consumers. This is mainly due to heavily subsidized government programs. The market is dominated by government-financed institutions (Chichaibelu and Waibel, 2017). The most important ones are the Bank for Agriculture and Agricultural Cooperatives (BAAC) and the Village and Urban Community Fund (VF) program,[6] with the former reaching approximately 95% of all farm households (Terada and Vandenberg,

[4] Our main questionnaire can be downloaded here.

[5] Still, as a robustness check, we re-run the analysis without respondents who are not at all in charge of financial decision-making within the household.

[6] The aim of the VF is to improve financial access in rural areas in Thailand. It is one of the largest microfinance programs in the world (Menkhoff and Rungruxsirivorn, 2011).

2014). This massive expansion can also be observed in our sample, where the majority (73.4%) of households has a loan that is either still owed or has been paid back within the last 12 months. Figure 3 provides a graphic overview of the loan situation. Conditional on having a loan, households have on average 2.4 loans. Households borrow from formal and informal sources alike. In fact, loan sources are diverse, with the two most important credit sources being the BAAC and the VF. This lending pattern is similar across all districts we consider. Households also borrow from other sources, for example, from agricultural cooperatives, business partners, money lenders, relatives, and friends. Loans are taken out for various reasons. Most loans are primarily used for agricultural related goods like fertilizer or pesticides (23.96%), for consumption goods (22.39%), and for agricultural investments, e.g. farm land or agricultural machines (16.58%). Loans are also used for paying back another loan (9.87%), buying durable household goods (6.72%), and for education (3.15%).

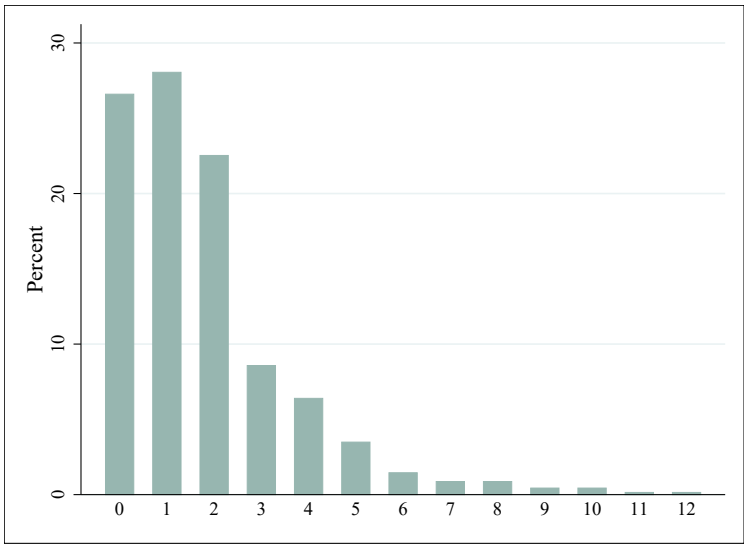

Figure 3: Number of Loans

2.3 Income Expectations

Households can form positive or negative income expectations. We are interested in studying households that exhibit high (positive) income expectations. In order to obtain a positive income expectation measure, we must elicit income expectations in the first place. Expectations play a central role in the economic theory of household decision-making, for example, with respect to determining saving, borrowing, and consumption (Friedman, 1957), or with respect to occupation choices (Becker, 1964). Manifold research has tried to predict this choice behavior based on expectations. Yet, expectations are challenging to elicit empirically.

2.3.1 Eliciting Income Expectations

Expectations from Former Income Realizations The traditional way of elicitation - referred to as revealed preference analysis - assumes that individuals have *rational expectations* (Dominitz and Manski, 1997; Manski, 2004) and infers expectations from data on past income realizations. For this approach, strong assumptions on the expectation formations process are needed, with both the researcher and the respondent needing to have the same information set (Guiso et al., 2002). Given these strong assumptions and our conjecture that mistakes in expectation formation are likely to occur in our setting, we decide for two alternative elicitation methods, which are explained in what follows.

Qualitative Expectations Questions The first way is to elicit expectations via qualitative questions, e.g. using Likert scales for questions on future expected events. We use this method in the appendix to replicate the results of Hyytinen and Putkuri (2018), who use Likert scales to elicit financial expectations. However, this approach suffers from two main drawbacks: First, answers might not be comparable across respondents and, second, response options may be too coarse and leave room for responses different from what is proposed.

Subjective Probabilistic Income Expectations Dominitz and Manski (1997) suggest to elicit *probabilistic expectations*. This approach is particularly useful for calculating individual cumulative distribution functions and moments of the relevant variable (Attanasio, 2009). By allowing researchers to retrieve different moments of the expected income distribution, it becomes possible to algebraically study the internal consistency of elicited expectations (e.g. apply the laws of probability) and to use these probabilistic expectations as actual probabilities describing how respondents assess future outcomes. We use this approach in our main analysis to retrieve positive expectations.

As we elicit expectations within a rural sample in an emerging economy, we rephrase percent change questions in a way similar to "how sure are you" and use visual aids to make the concept of probability more comprehensible.[7] Thereby, we address the concerns of Attanasio (2009) and Delavande et al. (2011), who state that the concept of probability might be hard to convey in contexts where people have low levels of education.[8]

To check whether respondents adhere to the basic laws of probability, we first ask

[7] Studies dealing with these kind of expectation elicitation include, among others, Attanasio and Augsburg (2016), who study income processes in India, McKenzie et al. (2013), who investigate income expectations of Tongans, and Attanasio and Kaufmann (2014), who elicit income expectations among high school students in Mexico.

[8] The average respondent in our sample only attended school for six years.

them how sure they are that it will rain tomorrow and how sure they are that it will rain within the next two weeks. They can indicate their answer by putting between zero and ten marbles that we gave them beforehand into a cup, with zero marbles meaning they are absolutely sure it will not rain and ten marbles meaning they are absolutely sure it will rain. There are 182 out of 748 respondents (24.33 %) who do not obey the laws of probability: they set a zero chance that it will rain within the next two weeks but a positive probability that it will rain tomorrow. This is a substantial share of respondents, most likely caused by the low educational level in our sample. In the subsequent analysis, we run our regression both with and without these individuals.

After this "warm-up" exercise, we ask respondents how sure they are that their monthly household income in the next twelve months will be in a predefined range. We use income quartiles from the 2013 TVSEP wave to predetermine the four bins to which respondents allocate their ten marbles. The four bins range between 0 - 3,300 Thai Baht (THB), 3,300 - 8,100 THB, 8,100 - 16,590 THB, and 16,590 - 921,000 THB.[9] Respondents distribute their ten marbles based on how likely they think it is that their future monthly income will lie in each specific bin.[10] Hence, we are able to calculate the individual cumulative distribution function (CDF) for the expected monthly income as we interpret the number of marbles distributed between the cups as points on their individual CDFs.

We then fit a subjective income distribution following Attanasio and Augsburg (2016) and assume a piecewise (i.e. per cup) uniform probability distribution. This enables us to calculate a specific expected mean and median income, as well as the standard deviation, for each household.

Table 1: Probabilities Assigned to Sections of the Income Distribution

	Observations	Minimum	Maximum	Median	Mean	S.D.
0-3300 THB	737	0	100	20	32.18	35.1
3301-8100 THB	737	0	100	30	30.71	29.27
8101-16590	737	0	100	20	24.03	28.38
16591-300000	737	0	100	0	13.08	24.08

Respondents allocate the number of marbles to the cups as a function of their underlying subjective probability to earn income in the specific income range. The average distribution of marbles per cup, i.e. the average implied probabilities to earn income in

[9] The range of the last bin is very broad. Compared to the maximum monthly income respondents state, we find that only two respondents expect an income as high as 921,000 THB. All other maximum income guesses range between 0 - 300,000 THB. In order to avoid artificially high expected median incomes, we restrict the range of the last bin in our calculation of expected median income to a maximum of 300,000 THB.

[10] The enumerator places four cups in front of them, each labelled with a different income range and makes sure that all marbles are allocated at the end of the exercise.

the respective income quartile is shown in Table 1. Additionally, Figure 4 presents the probability density function of expected income in our sample. The average respondent's expected income distribution is skewed to the right; that is, on average, respondents believe it is more probable that their average monthly future income is in the lower cups.

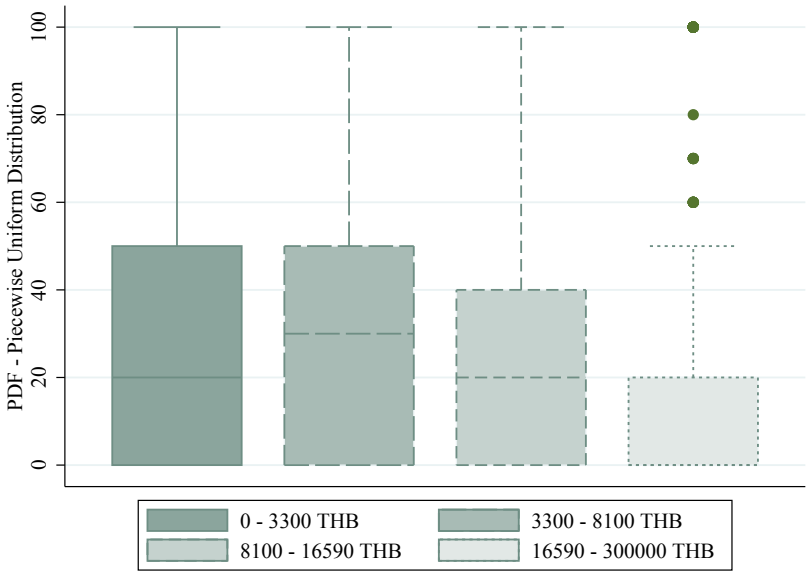

Figure 4: Probability Density Function of Expected Income

We also ensure that the elicited expected income is not completely at odds with the actual income process. As measure for the income process, we use the realized income in 2016 and a measure averaging the self-reported income in a very bad and a very good month. Correlations between these and our expected income measure are always statistically significant and range between 0.27 and 0.33, which is encouragingly high given that the correlation between actual income in 2016 and 2017 is 0.48. Furthermore, as Attanasio (2009) proposes, we check how the subjective expected median income covaries with household characteristics, particularly with the composition, education, and realized income (results available upon request). Beyond the already stated relationship with income, household total education is significantly, positively related to the expected median income. A little ambiguous is the correlation to household composition: While a larger number of elders in the household is associated with lower expected income (albeit not significantly), more workers in the household also seem to decrease it.[11]

[11] Reflecting on this last result, we assume that households with more working members are, in general, poorer and have less stable incomes. There is a tendency in Thailand to abolish multi-generational households for small family homes, which is, however, only possible if income is high enough and stable.

2.3.2 Defining Positive Income Expectations

We develop a new kind of positive income expectation measure that is based on the expected future monthly income and the current income. To derive a *quantitative income forecast (Quant. IF)*, we first calculate the percentage change between actual monthly income generated in t and future expected monthly income in $t+1$, which is elicited by the procedure explained in this Section. Specifically, t refers to the year 2017, for which we have actual income data. Consequently, $t+1$ considers income expectations for 2018.

$$Quantitative\ Income\ Forecast\ (Quant.\ IF) = \frac{E_t(Inc_{i,t+1}) - Inc_{i,t}}{Inc_{i,t}} \times 100 \tag{1}$$

In a second step, we divide the quantitative income forecast into quintiles such that our outcome measure allows for five categories ranging from a very negative, negative, mildly negative income forecast, via a neutral income forecast to a positive quantitative income forecast. Thus, the negative (positive) forecasts capture households that expect relatively less (more) future monthly income as compared to their actual earned income in the current year. Each quintile enters the regression via a dummy variable where households with a mildly negative quantitative income forecast (i.e. respondents that range in the third quintile) serve as the omitted group.

In general, respondents are rather pessimistic with regard to their future income. The distribution of changes in expected future income ranges from -98.6% to 19528.6% whereas the maximum is a clear outlier, which also drives the average increase of expected future income of about 35%. If we exclude this household the average shrinks to 6.9%.[12] The median household expects a 51% decrease of future income relative to actual income. Thus, the distribution is skewed to the right. In total, 75% of the sample expect their future income to be lower than the one in the year of the survey. This explains why three of the quintiles clearly range in the negative scope of the distribution and are thus coined "negative income forecast." Only the highest quintile is composed of households that have a clearly positive outlook.[13] The negative outlook on future income may be explained by two developments: First, respondents may fear further political turmoil following the 2014 military coup. Second, the negative outlook may be due to the persistent, regional, economic inequality. People from north eastern Thailand still earn substantially less than people from other regions and, thus, might feel disadvantaged throughout (Lao et al., 2019). According to the World Bank, inequality in Thailand has increased between 2015 and 2017, despite overall economic growth in the country (World Bank, 2019).

[12] The corresponding respondent has a very low income in 2017, but - in the cup game - used all ten balls for the highest income range. We suspect the respondent had not fully grasped the elicitation game.
[13] Variables that covary with each respective forecast group can be found in Online Appendix I.

While we cannot formally test accuracy of expectations with our subjective expected income data,[14] we assume that a high and positive relative difference between expected income in 2018 and realized income in 2017 is partly due to respondents being too optimistic regarding what they will earn in the future. This assumption is based on studies finding that expectations about various future outcomes may tend toward being positively biased (see for example Zinman, 2015). Furthermore, considering the median household's negative expectation on future monthly income, we are confident that we capture very optimistic households with regard to income development in the highest quintile of the distribution.

We also account for perceived income uncertainty in our analysis. In addition to asking respondents how they think that their income will develop over the next 12 months, we ask how certain they are that this income development will truly become reality. Being potentially too certain about future realizations of stochastic processes can be a form of biased expectation called "overprecision" (Moore and Healy, 2008).

Figure 5 provides a graphic overview of the results on our measure for perceived income certainty: 55.56% of respondents are at least somewhat certain about their income development and 28.44% are very certain. The survey took place during the harvest season, so that respondents might have an idea about the harvest outcome and, therefore, perceive their expected future income as rather certain or they truly suffer from overprecision.

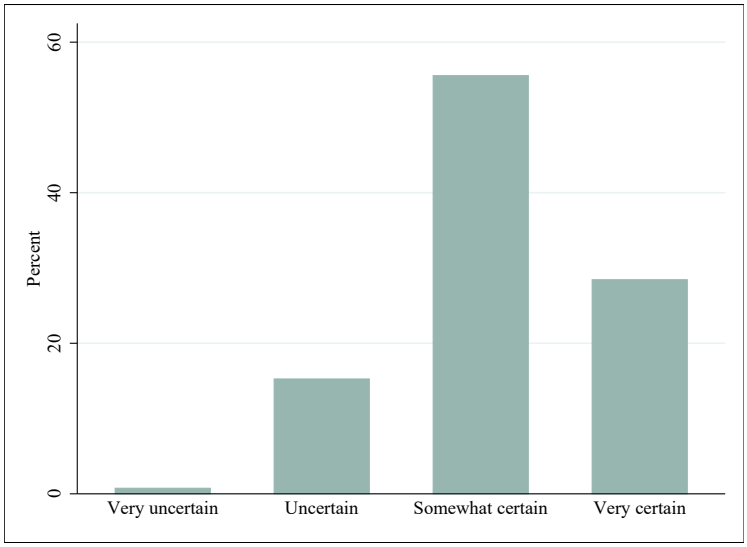

Figure 5: Income Certainty

Last, we derive a measure of expectation accuracy following Souleles (2004) and Hyytinen and Putkuri (2018). It is based on a coarser assessment of a household's future income.

[14] For example, because we lack data about realized income in 2018, the year after we asked for expected income, and we do not know (yet) about shocks households endured during that time.

We can actually determine its accuracy, which is why we call this measure the *qualitative forecast error*. The derivation and estimation results are found in Appendix B.

2.4 Over-indebtedness Indicators

There is no consensus regarding a single set of indicators measuring indebtedness precisely, even less so for over-indebtedness.[15] In general, all measures share economic, social, temporal, and psychological dimensions such as that the amount of debt exceeds income over a medium- to long-term time horizon and the household is not able to fulfill its debt commitments without increasing its income or lowering its standard of living, which might lead to stress and worry (D'Alessio and Iezzi, 2013). Furthermore, so-called objective debt measures relate to the household's debt service capacity, subjective measures rather emphasize the psychological consequences of being indebted (Keese, 2012).

Based on the existing literature, we decide to construct two measures of over-indebtedness. The first index captures different dimensions of being "objectively" over-indebted (based on best practices from the literature) while the second index rather refers to "subjectively" felt factors related to financial distress.

Objective Over-Indebtedness Index The objective over-indebtedness measure is an aggregated and standardized index that combines four indicators. We include the following components in the index: an indicator variable if the debt service to income ratio (DSR) is greater than 0.4, an indicator variable if the overall remaining debt service to income ratio exceeds 0.4, an indicator for if the household holds more than two loans at the same time, and one indicator for if the household paid late or defaulted on a loan in the last 12 months. Each component is well established in the literature (see, for example D'Alessio and Iezzi, 2013). Among these variables, the DSR is widely recognized as standard measure to capture indebtedness. The threshold we set for the DSR to indicate over-indebtedness is based on considerations from the literature where a range between 0.3 and 0.5 is used (Chichaibelu and Waibel, 2017; D'Alessio and Iezzi, 2013). In constructing the objective over-indebtedness index we follow Kling et al. (2007). We explain how the index and its components are derived in Online Appendix II. When deriving our debt measures, we include all types of loans that households report. Those can be formal or informal loans, as well as loans taken from friends and family members. During the interview, respondents were highly encouraged to report all loans regardless of the source. Hence, we are confident that we capture a household's true debt level.

Subjective Over-Indebtedness Index While objective debt indicators provide numerically accurate debt measures, they are sometimes criticized for failing to account

[15] Among others, D'Alessio and Iezzi (2013) provide a summary on different indebtedness indicators, their usage, and possible drawbacks.

either for the reasons why households overborrow or for the household's undisclosed ability to pay back debt. Therefore, we also include subjective, "respondent driven" over-indebtedness measures in our analysis. As before, we derive a standardized index aggregating different indicators of subjective over-indebtedness. The indicators include an assessment identifying if the household feels it has too much debt, if it has difficulties paying debt off, and the so-called "sacrifice index."[16] The index and its components are explained in detail in Online Appendix II. Schicks (2013) prefers to use subjective over objective debt measures in her work analyzing over-indebtedness from a customer-protection point of view in microfinance. D'Alessio and Iezzi (2013) also rely heavily on a subjective measure to study over-indebtedness in Italy. In line with Keese (2012) and Lusardi and Tufano (2015), we argue that subjective measures describe a situation of financial distress for the respective households but are, naturally, highly subjective to the respondent such that these measures should not be used without considering objective indicators as well. For all indices derived, higher scores point at a higher value of accumulated debt.

Table 2 depicts the summary statistics of the objective and subjective over-indebtedness indices. The objective index ranges from -1 to 3 with higher values indicating a more severe level of over-indebtedness. While the average DSR lies at 0.23, about 18% of the households have a DSR that is higher than 0.4. More strikingly, about 23% of our sample households have more than two loans. The range of the subjective index is between -2 and 3, again oriented in a way that higher numbers point to higher indebtedness. On average, households state that they have the "right amount of debt" (Mean = -0.02 for the debt position variable) and that they have no difficulties paying off debt. However, the average household admits to have made at least some sacrifices regarding household needs due to lack of money as the average value is -0.08 and a household with no sacrifices would be found at the lowest end of the sacrifice index distribution.

Furthermore, Table A.1 presents correlations between all our debt indicators. Naturally, the objective and subjective indices are significantly correlated with their respective sub-indicators. However, our objective and subjective measures also correlate significantly with each other. This is encouraging, since it rebuts criticism with respect to objective over-indebtedness measures neglecting important dimensions of financial distress.

[16] We closely follow Schicks (2013) in constructing the sacrifice index.

Table 2: Summary Statistics - Over-Indebtedness Variables

	Mean	S.D.	Min	Max	Observ.
Objective Index	0.00	0.99	-1	3	688
DSR > 0.4 (=1)	0.18	0.39	0	1	688
Holds > 2 Loans (=1)	0.23	0.42	0	1	688
RDSR > 0.4 (=1)	0.40	0.49	0	1	688
Paid Late/Default (=1)	0.15	0.36	0	1	685
Subjective Index	-0.02	0.98	-1	4	688
Debt Position	-0.02	0.86	-1	1	688
Diff. Paying Debt (=1)	0.06	0.25	0	1	686
Sacrifice Index	-0.08	1.19	-2	4	688

Note: The debt index variables are standardized. The components of the indices are given in non-standardized real terms.

3 Survey Results

In the following, we relate the quantitative income forecast to the over-indebtedness indices by running OLS regressions, estimating correlations between the respective variables.

3.1 Estimation Strategy

The regressions we run take the following form:

$$Over\text{-}Indebtedness\ Index_i = \beta_0 + \beta_1 Quant.\ IF_i + X_i^{'}\beta_2 + \epsilon_i \tag{2}$$

The dependent variable $Over\text{-}Indebtedness\ Index_i$ represents the debt measures we apply to mirror financial distress of the household. It contains either the objective over-indebtedness index,[17] or the subjective over-indebtedness index.[18] The main variables of interests are captured in $Quant.IF_i$. It comprises the income forecast groups (quantitative income forecast) we derived in Section 2.3, where the mildly negative forecast group serves as reference group. We cluster our standard errors at the district level.[19]

The vector X_i controls for household and respondent characteristics that are likely to influence household over-indebtedness: dummies for farming, self-employment, and

[17] Standardized average of a dummy equaling one if the debt service to income ratio is greater than 0.4, a dummy equaling one if the remaining debt to income ratio is greater than 0.4, a dummy regarding whether the household paid late or defaulted on a loan, and a dummy equaling one if the household has more than two loans.

[18] Standardized average of the sacrifice index, answers to questions on debt position and whether the household has difficulties paying off debt.

[19] Cameron and Miller (2015) advise to cluster at least at the primary sampling unit, which is the district level in our case. Since this gives us a small number of clusters, as a robustness check, we use wild cluster bootstrap. This does not change our main findings.

wage employment, monthly household income in 2016 and 2017, the number of children between the age of 0-6, 7-10, and 11-16 years, the number of elders and working members, total household education (sum of all educational levels in the hh), age and age squared of the respondent, and respondent's financial literacy score. The vector also captures the monetary loss from past shocks. We use detailed information from 2016 and 2017 about monetary losses directly related to a shock. We differentiate between losses from farming related shocks, environmental shocks, economic shocks, crime shocks, and other shocks.

3.2 Main Results

To begin with, we relate the quantitative income forecast groups to each over-indebtedness index (OI-Index). In a second step, we add the aforementioned control variables to our regression as the indices depend on other respondent and household specific characteristics as well. Tables 3 and 4 provide results for the objective and subjective OI-Indices. The tables show results for the four income forecast groups as well as for the shock loss control variables. Tables presenting results for all covariates included in the regression analysis are presented in Online Appendix I. The first column in each table represents the standardized and averaged index whereas the subsequent columns depict results for the single non-standardized components of the indices.

Objective Over-Indebtedness We find a strong, statistically significant, relationship between positive income forecasts and the objective OI-Index. Households with high future income expectations compared to their actual income are more likely to be over-indebted. The over-indebtedness index increases by 0.29 - 0.31 points for positive income expectations (columns (1) and (2), Table 3). This relationship is mainly driven by the remaining debt ratio and the dummy on if the household paid late or defaulted on a loan. The debt service to income ratio is only marginally significantly related to positive expectations and having more than two loans shows no relation at all. The RDSR increases by 18.7 - 20.7 percentage points (columns (5) and (6)) and the probability that a household paid late or defaulted on a loan increases by 10.9 - 12.4 percentage points for households whose expected future median income is greater than the current income (columns (7) and (8)). Furthermore, the coefficient of the dummy indicating a DSR greater than 0.4 increases by 8.4 - 9.8 percentage points (columns (3) and (4)) for those households.

With regard to the other income forecast groups, we do not find consistent results. While the probability of a household defaulting or paying late slightly increases for households with a negative forecast, overall, results for the non-positive income forecast groups are insignificant, if not showing a negative sign. A significant and robust link to over-indebtedness can only be found for households with positive future income expectations.

Table 3: Objective Over-Indebtedness

	Obj. Index		DSR > 0.4		RDSR > 0.4		Paid Late/Default		> 2 Loans	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Very Negative	–0.125	–0.017	–0.097*	–0.022	–0.073	0.011	0.017	–0.015	0.001	0.010
	(0.151)	(0.143)	(0.047)	(0.050)	(0.081)	(0.079)	(0.033)	(0.036)	(0.059)	(0.060)
Negative	0.050	0.058	–0.067	–0.054	0.075	0.100*	0.081**	0.066**	–0.029	–0.037
	(0.134)	(0.132)	(0.045)	(0.048)	(0.058)	(0.057)	(0.032)	(0.029)	(0.057)	(0.058)
Neutral	0.153	0.135	0.025	0.002	0.079	0.067	0.074	0.095*	–0.002	–0.010
	(0.153)	(0.168)	(0.050)	(0.060)	(0.058)	(0.064)	(0.045)	(0.051)	(0.061)	(0.063)
Positive	0.289**	0.333**	0.098**	0.087*	0.187**	0.210***	0.109***	0.133***	–0.054	–0.037
	(0.134)	(0.136)	(0.042)	(0.047)	(0.072)	(0.069)	(0.038)	(0.041)	(0.055)	(0.060)
Farming Shocks		–0.000		–0.000		0.000		–0.000		0.000
		(0.002)		(0.000)		(0.001)		(0.001)		(0.001)
Environ. Shocks		0.005***		–0.000		0.002***		0.002**		0.002***
		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)
Economic Shocks		0.003***		0.000		0.002***		0.001*		0.000
		(0.001)		(0.000)		(0.001)		(0.001)		(0.001)
Crime Shocks		–0.016*		–0.004*		–0.013***		–0.002		–0.001
		(0.009)		(0.002)		(0.003)		(0.004)		(0.004)
Other Shocks		–0.000		–0.000		–0.000		0.000**		–0.000
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
Constant	–0.073	–1.425**	0.189***	0.119	0.343***	–0.617**	0.099***	–0.016	0.245***	–0.291
	(0.144)	(0.576)	(0.048)	(0.296)	(0.072)	(0.286)	(0.019)	(0.243)	(0.063)	(0.280)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	688	676	688	676	688	676	685	673	688	676
Adj. R-squared	0.014	0.099	0.025	0.046	0.025	0.125	0.007	0.044	-0.003	0.053

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

We account for monetary losses from various shock events, because a shock might influence both the level of over-indebtedness and income expectations at the same time (i.e. an expectation to return to pre-shock-level income). The results show that higher losses are associated with higher debt levels. However, while we find statistically significant effects, these effects are economically rather small. For example, if an environmental shock loss increases by 1000 Thai Baht (ca. 26€ in 2017), the objective OI-Index increases by 0.05 points. Even when accounting for monetary losses induced by shocks, the relationship between positive income forecasts and over-indebtedness remains significant, confirming a robust relationship between the two. Concerning additional covariates,

household income and the perceived social status are significantly negatively related to household over-indebtedness. Age is positively and age squared negatively significant, suggesting a hump-shaped pattern in line with life-cycle-income-smoothing. Furthermore, over-indebtedness remains largely unaffected by household composition and education.

Subjective Over-Indebtedness Our analysis of subjective over-indebtedness reveals that the relationship to the positive income forecast group is less pronounced than for the objective over-indebtedness index but still significant for the index and all its components.

Table 4: Subjective Over-Indebtedness

	Subj. Index		Debt Position		Diff. Pay off Debt		Sacrifice Index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Very Negative	0.182	0.215*	0.040	0.036	0.065**	0.058	0.118	0.245**
	(0.112)	(0.122)	(0.114)	(0.110)	(0.029)	(0.039)	(0.106)	(0.103)
Negative	0.157	0.150	0.096	0.046	0.037	0.033	0.108	0.178
	(0.135)	(0.110)	(0.111)	(0.109)	(0.025)	(0.026)	(0.174)	(0.154)
Neutral	–0.007	0.048	–0.021	0.008	0.022	0.031	–0.098	–0.035
	(0.104)	(0.092)	(0.096)	(0.094)	(0.021)	(0.019)	(0.128)	(0.095)
Positive	0.144	0.258**	0.113	0.181**	0.024	0.041*	0.113	0.245*
	(0.086)	(0.101)	(0.071)	(0.084)	(0.021)	(0.023)	(0.120)	(0.122)
Farming Shocks		–0.001		0.002		–0.000*		–0.002
		(0.001)		(0.001)		(0.000)		(0.002)
Environmental Shocks		0.007***		0.003***		0.002**		0.003
		(0.001)		(0.001)		(0.001)		(0.002)
Economic Shocks		0.001		0.003**		–0.000		–0.000
		(0.001)		(0.001)		(0.000)		(0.002)
Crime Shocks		0.000		–0.006		0.003		–0.005
		(0.014)		(0.007)		(0.003)		(0.014)
Other Shocks		0.002***		0.000		0.001***		0.002***
		(0.001)		(0.000)		(0.000)		(0.000)
Constant	–0.115	–0.482	–0.064	–1.480***	0.035**	0.140	–0.131	0.344
	(0.082)	(0.593)	(0.081)	(0.514)	(0.016)	(0.155)	(0.111)	(0.591)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	688	676	688	676	686	674	688	676
Adj. R-squared	0.001	0.133	-0.002	0.094	0.002	0.073	-0.001	0.119

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

As shown in Appendix B, the qualitative forecast error is more strongly related to the subjective OI-Index. This hints at two possible explanations: One, the subjective OI-Index is rather a concept of perceived financial distress and, thus, more related to the "more subjective" qualitative forecast error. Two, financial distress is not only determined by the household's true debt situation but more so by its perception. When analyzing the control variables, we find that risk seeking and the perceived social status of the household are highly significantly related to the subjective OI-Index, much more so than other control variables. Delving deeper into respondent characteristics, we run regressions including the Big Five measures,[20] (results are presented in Online Appendix I). For respondents who score high on openness and neuroticism, the subjective OI-Index and its components are larger than for those who score low. Eventually, shocks are similarly related to subjective over-indebtedness as they are to objective over-indebtedness: Households experiencing an environmental shock have a significantly higher perceived debt level.

Income Certainty In an additional exercise, we investigate whether being potentially too certain about the future income development is related to over-indebtedness.

[20] The Big Five comprise the following personality traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism. More details on their construction are found in Online Appendix II.

Table 5: Certainty Measure - Objective Over-Indebtedness

	Obj. Index	DSR > 0.4	RDSR > 0.4	Paid Late	> 2 Loans
	(1)	(2)	(3)	(4)	(5)
Very Negative	–0.017	–0.023	0.012	–0.017	0.013
	(0.144)	(0.050)	(0.079)	(0.036)	(0.061)
Negative	0.047	–0.062	0.104*	0.057*	–0.034
	(0.129)	(0.044)	(0.054)	(0.030)	(0.057)
Neutral	0.122	–0.002	0.062	0.092*	–0.013
	(0.167)	(0.060)	(0.064)	(0.051)	(0.063)
Positive	0.323**	0.084	0.201***	0.131***	–0.037
	(0.140)	(0.051)	(0.070)	(0.043)	(0.061)
Certainty	0.129**	0.052**	0.046*	–0.008	0.061**
	(0.061)	(0.022)	(0.026)	(0.024)	(0.022)
Constant	–1.564**	0.074	–0.705**	0.064	–0.413
	(0.552)	(0.299)	(0.284)	(0.268)	(0.276)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	664	664	664	661	664
Adj. R-squared	0.101	0.054	0.125	0.042	0.060

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

As shown in Tables 5 and 6, there is no relation between certainty about future income and subjective over-indebtedness, although we find that higher income certainty is related to objective over-indebtedness. If a respondent is very certain about the development of future household income, this is linked to an augmented over-indebtedness index. This result is mainly driven by the debt to service ratio and by having more than two loans (columns (2) and (5), Table 5). Thus, certainty is likely to constitute a part of the positive forecast we derived.

Table 6: Certainty Measure - Subjective Over-Indebtedness

	Subj. Index	Debt Position	Diff. Pay off Debt	Sacrifice Index
	(1)	(2)	(3)	(4)
Very Negative	0.220	0.049	0.057	0.247**
	(0.133)	(0.117)	(0.041)	(0.108)
Negative	0.144	0.045	0.032	0.168
	(0.109)	(0.108)	(0.026)	(0.150)
Neutral	0.043	0.010	0.030	–0.048
	(0.092)	(0.095)	(0.019)	(0.097)
Positive	0.238**	0.177*	0.035	0.227*
	(0.110)	(0.098)	(0.023)	(0.125)
Certainty	0.069	0.092	0.006	0.031
	(0.086)	(0.066)	(0.020)	(0.104)
Constant	–0.673	–1.802***	0.143	0.273
	(0.651)	(0.578)	(0.165)	(0.699)
Controls	Yes	Yes	Yes	Yes
Observations	664	664	662	664
Adj. R-squared	0.133	0.098	0.072	0.115

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Overall, we conclude, (i) that there is indeed a significant positive and robust relationship between positive quantitative income forecasts and objective as well as subjective over-indebtedness; (ii) We are also reassured that, although correlated to each other, subjective and objective over-indebtedness indicators measure different dimensions of indebtedness. The "hard" objective OI-Index is much stronger related to positive income forecasts than the subjective OI-Index; (iii) Certainty about the household's income development is also related to over-indebtedness, primarily to objective over-indebtedness.

3.3 Robustness

Excluding Possibly Confounding Observations. Before eliciting the subjective expected income of respondents, we ask two questions testing the understanding of the concept of probability. We re-run the analysis including only those respondents who do not violate the laws of probability and examine whether our main results hold. Results are presented in Tables A.2 and A.3 in the Appendix. The coefficients for this sub-sample

stay highly significant and almost all coefficients increase in size emphasizing the link between a positive income forecast and objective over-indebtedness. In order to verify that respondents have an actual understanding of their household's finances, we again re-run the regressions, including only those individuals who are in charge of the household's financial decisions either alone or together with someone else (see Appendix Tables A.4 and A.5). Overall, the results stay virtually unchanged with regard to the significance of our coefficients of interest. Point estimates change slightly.

Interacting the Income Forecast with Personality Traits. We do not claim to show a causal effect because - among other reasons - we acknowledge that the relation between over-indebtedness and positive income expectations may also work in the reverse. For example, if people are indebted, they might have a great bias regarding future expected income as they plan to work harder in the future to pay down their debt. We expect such people to exhibit a high level of conscientiousness, the personality marker describing achievement oriented (McClelland et al., 1953), hard-working, effective, and dutiful characters (Barrick and Mount, 1991). Hence, we interact our income forecast measure with this character trait, expecting to find significant effects for conscientious people. Results for the aggregated indices as dependent variables are presented in Appendix Table A.6. The interaction is not significant for the positive income forecast and any of the OI-Indices. This counteracts the assumption that the achieving respondents with distorted expectations drive the relationship between our positive income forecast and debt status.

Exchanging the Forecast Groups with One Single Indicator. We apply a coarser indicator measuring positive future income expectations to counteract the possible criticism that our results hinge on the choice of the reference category with respect to our income forecast groups. In lieu of the five quantitative income forecast groups, we define an indicator variable to turn one if the relative difference between expected future and actual income is greater than zero. Results for the objective and subjective over-indebtedness indices as well as for the certainty measure are presented in Appendix Tables A.7, A.8, A.9, and A.10. Probably due to the broader category that we use as the main explanatory variable, point estimates gain in significance, but are numerically a little smaller when compared to the positive income forecast group. This actually supports our finding that it is exactly those respondents with high expectations about their future income who are also relatively more indebted. Generally, this robustness check confirms that our results remain significant and similar in size with respect to the objective and subjective over-indebtedness indicators when using a broader income expectation indicator. Hence, it is

not the choice of the reference group that drives our results.[21]

4 The Experiment

The preceding section shows that high expectations and over-indebtedness are strongly related to each other in our rural Thai population, even when controlling for important socio-economic characteristics and shocks. However, methodologically, the implemented regression analysis only represents correlations. Furthermore, we are specifically interested whether overconfidence, a systematic behavioral bias that might be responsible for having too high expectations in the first place, can actually cause overspending and overborrowing. In what follows, we analyze if overconfidence is one potential *cause* why households in our sample spend more than they can actually afford.

Theoretically, upward biased expectations can arise for two reasons; either an individual is overly optimistic or overly confident. We follow Heger and Papageorge (2018) in defining overoptimism as the tendency to overestimate the probability of preferred outcomes and overconfidence as the tendency to overestimate one's own performance. We acknowledge that in our rural, agricultural setting, overoptimism might occur as frequently if not more than overconfidence. Since agricultural activities and the exposure to weather shocks are rather homogeneous in our sample and less driven by personal abilities, a more positive view on the future might originate from an optimistic view on the world in general. Still, there is scope for overconfidence as the adoption of new agricultural technologies and crops, the working pace (that can influence agricultural output) and the bargaining power in selling crops is strongly dependent on beliefs about individual performance and might lead to positive income expectations as well. For our experiment, we concentrate on overconfidence because numerous studies show that overconfidence is related to important life and financial decisions, while overoptimism is less so.[22]

4.1 Experimental Design

As final part of the survey, we play a market game in which respondents can buy different kinds of goods for a discounted price with money they earn in the experiment. They can buy packs of coffee, chips, dried mango, or detergent for 10 THB (ca. 0.25€) each instead of the 20 THB list price.[23] Each participant receives an endowment of 40 THB. Additional

[21] Additionally, we also used different reference groups in the first place and our regression results remain similar. Results are available upon request.

[22] For example, Camerer and Lovallo (1999), who experimentally test the effect of overconfidence on entrepreneurial decision-making (this relationship is a well-researched field of study), conclude that excess entry in a market game is strongly related to overconfidence and not to overoptimism.

[23] At least for the bag of chips, it is common knowledge that they usually cost 20 THB as, for a long time, they had the price printed on their front. To further convince participants that the products are

money can be earned by answering questions in a trivia game. Earnings depend on how many questions the participant answers correctly in comparison to the other participants. We rank them from 1-10, where rank ten corresponds to answering the most questions correctly and rank one to answering the least number of questions correctly.[24] People ranked 1-4 do not earn anything on top of their endowment, those ranked 5-6 earn 10 THB, those ranked 7-8 20 THB, and those ranked 9-10 earn 40 THB additionally. Thus, participants can earn up to 80 THB and can buy at most eight goods.

We make expectations a crucial factor in the game by requiring participants to decide how much and what to buy before they take the pay-off relevant quiz, i.e. before they know their final payoff. We divide participants in two treatment groups; one group faces a "hard" quiz and the other one an "easy" trivia quiz. To convey the difficulty of each quiz and to exogenously vary expectations about relative performance, participants do a test quiz with seven questions upfront where difficulty again depends on treatment. Based on the test quiz, participants infer how good they will be in the pay-off relevant main quiz and form expectations about the performance of the others and, thereby, their relative rank. They are ranked within each treatment group and they are told that everybody they are ranked against took the exact the same quiz. With this design, we can exploit the so-called hard-easy gap analogous to Dargnies et al. (2019) and very similar to Grohmann et al. (2019). Much research finds that people tend to overplace themselves in easy tasks and to underplace themselves in hard tasks (for example Merkle and Weber, 2011; Hartwig and Dunlosky, 2014; Benoit et al., 2015). Over-(under-)placing is a form of over-(under-)confidence in which individuals over-(under-)estimate their relative performance in comparison to others. Thus, by assigning participants to two different treatments, we exogenously vary their expectations through varying self-confidence (see Figure 6).[25] We subsequently measure confidence as the difference between expected rank and actual rank:

$$confidence = rank_{exp} - rank_{act} \tag{3}$$

truly discounted, we attached "20 THB" price tags to each product.

[24] In the field, participants from the first villages were ranked against participants from our pilot villages and our interviewers who also took the quizzes. For later villages, we replaced our interviewer data with data from the previous villages and told participants that they are ranked against ten persons who live in a village similar to theirs. For the final analysis, we use all the observations to create a ranking. In each treatment, we have two accumulation points in the number of correctly answered questions that are next to each other and around the mean. We set these two points as rank five and six. Each one point deviation in correctly answered question then constitutes a one point deviation in rank (e.g. if rank five means nine questions answered correctly, rank four means eight questions answered correctly). Since there are more questions than possible ranks, we have some bunching of correctly answered questions around rank one and rank ten, the boundaries of the ranking.

[25] The exogenous variation is one reason why we do not include this measure for self-confidence in our survey regressions as a measure for expectation bias. Another reason is that self-confidence is domain dependent.

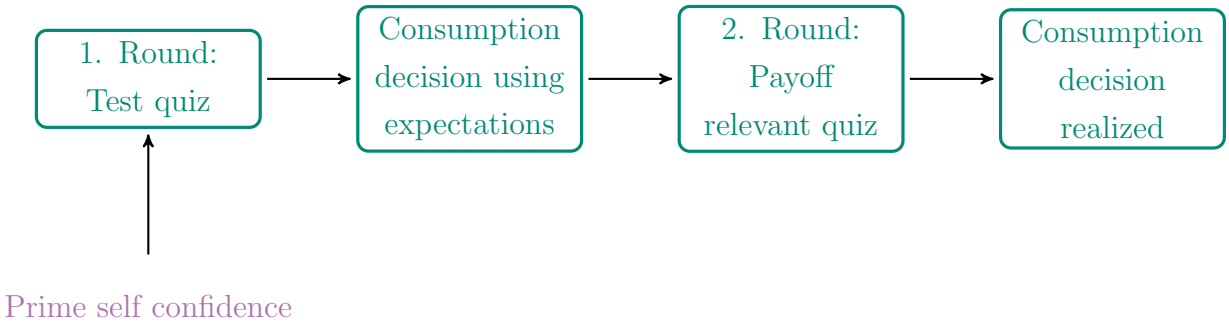

Figure 6: Experimental Flow

Except for the difference in difficulty, the procedure is the same for every participant: If participants agree to play the game, the interviewer prepares the set-up and starts reading the instructions. The instructions include comprehension questions to test whether participants understand how their rank is determined and how much they can earn. If participants do not answer these questions correctly, the interviewer does not continue with the instructions.[26] After they have finished the instructions, the participants start answering the test quiz, which has seven trivia questions. They have five minutes to answer all the questions. For each question, four possible answers are given. When the time is up or participants have finished answering, they receive a decision sheet. On the decision sheet, they first have to write down the rank and the earnings they expect to reach in the following main quiz. Then, they must indicate their buying decision based on their expected earnings. Afterwards, participants continue with the main quiz where they have to answer 15 questions in ten minutes. Following the quiz, there are three debriefing questions including a question on the expected rank after the second quiz has actually taken place (such that we can check for belief updating). Finally, the interviewer calculates the rank and earnings, then hands over the products and money, if applicable.

In most cases, participants could read, write, and answer the quizzes on their own. Sometimes, people, in particular the elderly, needed assistance in reading and writing, which was provided by the interviewer. The supplemental material for the experiment is found in Online Appendix III in English (for the experiment everything was translated to Thai).

Rational Decisions

If participants want to buy more than they can afford, including their endowment, their consumption has to be restricted. They receive at most as many goods as they can buy with their earnings and nothing beyond that amount. Participants are aware of this fact.

[26] Still, there are participants who had serious difficulties in understanding the game such that we exclude them from the main analysis

We implicitly assume that expectations influence buying decisions. If this does not hold, the aforementioned design feature seriously distorts our results as follows. If it was the case that "rational" participants strictly prefer goods over money because, for example, they are cheaper than list price and can be stockpiled, expectations would become meaningless for the consumption decision. Indicating to buy eight goods is weakly dominating any other number of goods for this kind of participants, since they clearly prefer goods over money independent of the budget.[27]

Eventually about 4% of our participants decided to buy eight goods even though they expect to earn less. An additional 3% wanted to buy more than they expected to earn but less than eight goods. In our main analysis, these observations are excluded because i) we already know that expectations do not impact consumption in this setting for them and ii) they could artificially inflate our results. We present additional analyses on this sub-sample in the Appendix Section "The Rationals" (C.4) and discuss whether they truly acted in a rational way or rather had difficulties understanding the game.

For the other 93%, we still assume that respondents generally prefer a bundle of products and cash. The exact composition depends on individual preferences but also expected earnings. Thus, being overconfident (or underconfident) creates a distortion in utility. Following these reflections, we derive the following hypotheses:

Hypothesis 1: *On average, individuals in the easy treatment will buy more than individuals in the hard treatment.*
Hypothesis 2: *A great level of overconfidence will lead to excessive spending.*

Hypothesis 1 is implied by the finding on the hard-easy gap. Hypothesis 2 follows from the fact that we define respondents to be overconfident if their expected rank is higher than their actual rank, which implies that they earn less than expected. Since we cannot allow respondents to pay from personal money if experimental money is insufficient, restricting consumption in some cases is necessary. Therefore, people cannot accumulate debt. Still, we try to mimic real life financial decision making with this design, especially the fact that sometimes (and optimally) consumption decisions must be made before income is realized. In that sense, participants still have to take a loan, although only for a short time and without serious consequences, if they want to consume. Further, if they have biased beliefs, they might end up with a consumption bundle that is sub-optimal, thus overborrowing. The process can also be seen as a form of household budgeting; however, we prefer the term overborrowing as participants have to plan with money they do not

[27] If the participant expects less than 80 THB, there is a potential loss in indicating to buy less than eight goods because the prediction might be underconfident. However, given our setting, there is no loss if she indicates buying eight goods but actual earnings are less than 80 THB.

have in the moment of planning. In real life those who overborrow accumulate more debt than optimal, perhaps more than they are able to repay.

4.2 Experimental Results

Overall, 604 respondents participated in the game. Since participation is self-selected, participants and non-participants are compared in Table C.1 in the Appendix. As can be seen, participants and non-participants differ significantly in some variables.[28] In all these variables, the difference is in the expected direction: female, older, less occupied, less educated, financial illiterate and less numerate, and more financial risk averse respondents are less likely to participate in the game. Several of these variables are significantly correlated with each other. Running a simple regression on the likelihood to participate, we find that some of these variables are insignificant and that the time of day is one of the strongest predictors of game participation (see C.2). Since the time of day at which we visited households for the interviews is mostly exogenous,[29] self-selection into the game is less pronounced than initially expected.

Out of the 604, seven observations are excluded because either treatments for them are mixed up, personal information is missing, or a third person helped them answer the questions. We exclude 44 observations that are also excluded from the survey regression analysis because they are outliers in income or the debt service to income ratio (see Section 2.1).[30] Additionally, 84 observations are excluded because it can be inferred from the data that comprehension was insufficient[31] or because they want to buy more than they expect to earn in total (see previous Sub-Section on these special cases). Those 84 cases differ only in their number of children between 7-10 years.

In Table 7 characteristics of the remaining 471 participants are compared across treatments. The significantly unequal number of participants per treatment is due to fact that we slightly over-sampled the easy treatment. Results from previous studies suggest that the effect of easy tasks on self-confidence is generally stronger than the effect of hard tasks (see for example Dargnies et al., 2019). The characteristics depicted here might be important for the general level of self-confidence and the willingness to buy products. Given the sample size and the number of variables analyzed, randomizing participants into

[28] A complete list of all variables and their explanation is provided in Online Appendix II.

[29] We interviewed households according to a schedule we designed together with our interview team manager, which tried to minimize travel distances for each interview team. Hence, this schedule was exogenous to individual household characteristics, except for the village that the household resides in. However, a few houses were empty the first time we visited them and we had to reschedule another date with the household itself.

[30] The results are robust to this exclusion.

[31] For example, one participant writes that he expects to earn 30 Baht from the game, which is, however, not an possible option. Another one wants to buy 35 products although the maximum affordable number is eight.

the treatments worked well; the two groups only significantly differ with regard to their health status, their monthly household income, and their (objective) over-indebtedness index. Controlling for these variables leaves our results virtually unchanged and a f-test on joint orthogonality finds that controls do not jointly determine the treatment group.

Table 7: Descriptive Statistics across Treatments

	Full Sample	Hard Treatment	Easy Treatment	Difference
Sex	1.64	1.60	1.67	−0.07
Age	56.16	55.23	56.93	−1.70
Relation to HH Head	1.70	1.69	1.71	−0.02
Marital Status	2.13	2.09	2.16	−0.07
Main Occupation	4.79	4.29	5.20	−0.90
Years of Schooling	5.92	6.08	5.79	0.28
Children (0-6 years)	0.33	0.37	0.29	0.08
Children (7-10 years)	0.26	0.26	0.26	0.01
Numeracy	2.14	2.09	2.19	−0.10
Health Status	1.38	1.32	1.43	−0.11**
BMI	23.58	23.25	23.86	−0.61
Fin. Decision Maker	1.57	1.55	1.59	−0.03
Self Control	20.94	21.19	20.75	0.44
Risk Taking	4.02	3.96	4.07	−0.12
Fin. Risk Taking	4.06	3.99	4.12	−0.13
FL-Score	5.66	5.55	5.75	−0.20
Monthly Inc. 2017	18653.06	20802.79	16893.44	3909.35**
Obj. OI-Index	0.01	−0.09	0.09	−0.18**
Subj. OI-Index	−0.04	−0.03	−0.06	0.03
Morning	0.53	0.51	0.54	−0.03
Midday	0.27	0.26	0.28	−0.02
Read Alone	1.44	1.44	1.44	−0.00
Difficulties in Game	1.14	1.15	1.13	0.01
Observations	471	212	259	471

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels.

Shift in Beliefs

On average, participants answered 9.07 out of 15 trivia questions correctly in the easy treatment and 5.09 out of 15 in the hard treatment. Thus, it can be assumed that, for our sample, the easy treatment is truly "easier" than the hard treatment. The average expected rank in the hard treatment is 6.89 whereas the average expected rank in the easy treatment is 7.22. In Figure 7 the cumulative distribution functions of the expected ranks for both treatments are plotted. It seems that there is only a small shift in beliefs, since

the distributions are still almost overlapping.[32] Indeed, if we compare the distributions of the "second" expectations that are elicited after respondents actually took the main quiz, we find a much larger shift (see Appendix Figure C.1). Thus, either our test quizzes are not as hard or easy as the main quizzes and, therefore, the shift in first beliefs is smaller or participants have such strong beliefs that they only gradually update their beliefs. Still, the distributions of first beliefs are significantly different from each other (Kolmogorov-Smirnov one-sided p=0.056; Wilcoxon rank-sum two-sided p=0.041). The t-test for mean expectations is significant at the 5% level (one-sided) as well (Figure 10).

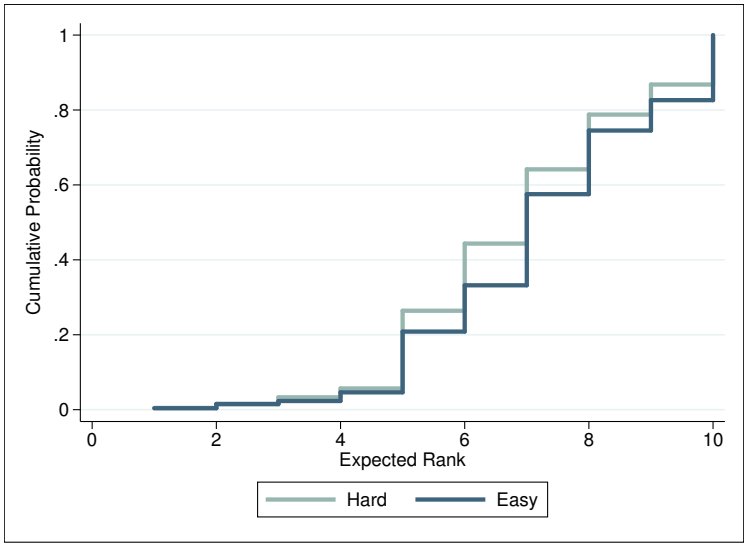

Figure 7: Cumulative Density Distribution of Expected Rank by Treatment

The difference in self-confidence is larger than the difference in expected rank (see Figure 8). This might be driven by our ranking procedure or by the fact that the easy quiz is not a perfect shift of the hard quiz with respect to the number of questions answered correctly. In any case, this suggests that our manipulation via the treatments to shift the level of beliefs and thereby self-confidence worked.

[32] We focus on the expected rank in our analysis but everything holds analogously for expected earnings.

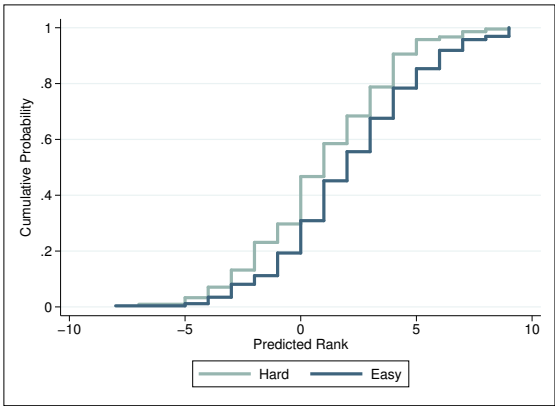

Figure 8: CDFs of Self-Confidence

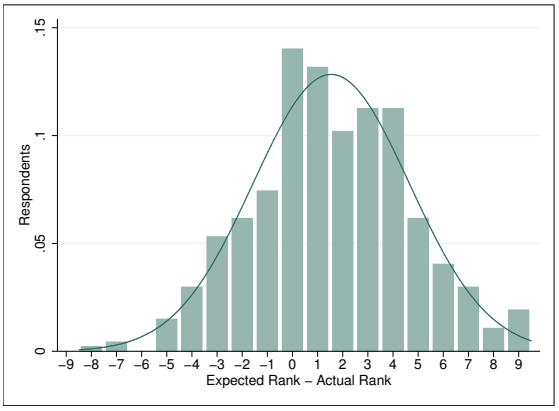

Figure 9: Histogram for Self-Confidence

As seen in Figure 9, across both treatments, the mean and median respondents are slightly overconfident (even in the hard treatment). The whole distribution is a little bit skewed to the left but still resembles a normal distribution. Over 14% of the sample have perfectly accurate beliefs and have a self-confidence of "0." Small deviations from 0 could be considered accurate as well because they could present a form of Bayesian updating.[33] Still, a substantial fraction of participants seems to be tremendously overconfident.

Buying Decision

We find a significant positive correlation between expected rank (earnings) and the number of goods participants want to buy. However, there is no significant relation between the treatment itself and mean desired consumption as presented in Figure 11.

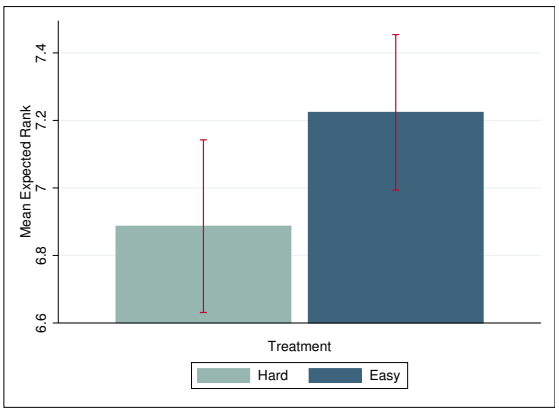

Figure 10: Mean Expected Rank by Treatment

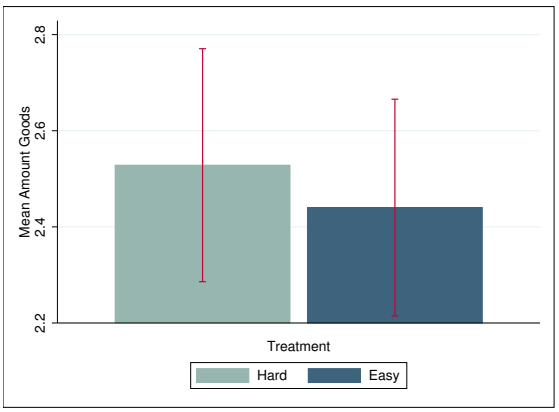

Figure 11: Mean Consumption by Treatment

If we run regressions where we can control for the variables that are unbalanced across treatments, the picture stays the same: the treatment is positively related to the expected

[33] On this discussion, see Merkle and Weber (2011).

rank, the expected rank is positively related to the desired amount of goods, but the treatment is not related to the amount of goods (see Table 8).

Table 8: Consumption Decision

	Exp. Rank	No. Goods		
	(1)	(2)	(3)	(4)
Treatment	0.377**	–0.133		–0.189
	(0.175)	(0.173)		(0.171)
Exp. Rank			0.144***	0.149***
			(0.046)	(0.046)
Controls	Yes	Yes	Yes	Yes
Observations	470	470	470	470

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Robust standard errors in parentheses. Treatment: 0=Hard Quiz, 1=Easy Quiz; A higher expected rank corresponds to a higher expected performance. Controls: Health Status, Monthly HH income and Objective OI-Index.

A similar pattern emerges if we look explicitly at spending behavior (see Table 9). We distinguish *overborrowing*, meaning buying more than actual earnings including endowment can pay for, from *overspending*, meaning buying more than actual game earnings can pay for, but the spending can still be paid with the endowment. The expected rank as well as confidence have a significant effect on both variables, but treatment does not.[34]

Table 9: Overborrowing and Overspending

	Overconfidence	Overborrowing		Overspending
	(1)	(2)	(3)	(4)
Treatment	1.217***	0.010	–0.007	–0.034
	(0.284)	(0.019)	(0.019)	(0.045)
Overconfidence			0.014***	0.044***
			(0.004)	(0.007)
Controls	Yes	Yes	Yes	Yes
Observations	470	470	470	470

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Robust standard errors in parentheses. Treatment: 0=Hard Quiz, 1=Easy Quiz; Controls: Health Status, Monthly HH income and Objective OI-Index.

Summarized, our treatments shifted expectations in hypothesized directions; expectations are positively related to spending behavior, but the treatment has no impact on the

[34] The level of significance is higher not lower when we exclude possibly "rational" participants who want to buy more than they expect to earn in total.

latter. Therefore, we cannot claim that there is a causal link between expectations and overborrowing in our experiment.

4.3 Confounding Factors

The previous findings are robust to various restrictions. For example, they are not driven by participants who are very old or have mild comprehension difficulties (we already excluded those with large difficulties in the main analysis). It is also not the case that the treatments only affect expected ranks but not expected earnings.[35] This suggests that there are confounding factors or "noise" interfering with our treatments. We run further analyses to rule out that the treatments affected factors other than expectations:

Frustration and Gratification. One of the most likely confounds could be that participants in the hard treatment feel frustrated because of the difficult questions and want to treat themselves with "shopping." In contrast, some others might be proud of mastering such a hard quiz and also want to reward themselves. Both motives should lead to the result that, specifically, participants with extreme expectations behave differently across treatments. Participants who are frustrated should rank themselves rather low whereas participants that are proud should rank themselves rather high. Subsequently, the buying behavior of participants with the same expected rank across treatments should be significantly different for the lowest and highest ranks. However, the only (marginally) significant difference we can detect is for the five participants who expected to reach rank two: here, participants in the hard treatment want to buy more than participants in the easy treatment. Excluding these observations does not change our results. For all other ranks, participants in both treatments exhibit the same spending pattern. This finding does not favor frustration and gratification as being possible confounding factors.

Temptation. Another possibility is that participants in the hard treatment are more susceptible to temptation goods. They have to exercise more cognitive effort, which decreases their self-control, so-called "ego depletion" (see, for example, Hagger et al., 2010). Running separate regressions on each product, we find a significantly different treatment effect only for dried mango. Still, self-control (measured with the scale from Tangney et al., 2004) and BMI do not have significant effects on buying mango, which opposes the ego depletion interpretation. We also do not find evidence that frustrated (more depleted) participants are more likely to buy mango. Furthermore, detergent is the most popular product and the share of detergent in all goods desired is not different across

[35] This could happen if there is a piecewise treatment effect (shifting expectations only within the same earnings category) because earnings are only piecewise increasing in ranks and not equidistant.

treatments, whereas mango is the least popular. Detergent is the one product we would expect to be least related to self-control issues. Summarized, we do not find convincing evidence that persons in the hard treatment are more likely to give in to temptation.

Based on these tests, we argue that we can rule out the most probable factors interfering with our treatment. We believe that the reason we do not find a treatment effect on spending and borrowing is that the shift in beliefs was not strong enough to eventually be reflected in spending. We find additional evidence for this proposition when employing IV estimation, where we instrument expected rank with treatment. Several tests indicate that treatment is a weak instrument for expected rank.

4.4 Behavior in the Lab and in Real Life

A supplementary result we find worth mentioning is that being over-indebted in "real life" is actually related to spending behavior in our experiment (see Table 10). Those respondents who have problems controlling their spending in real life are also those who spend less carefully in the game. Eventually, we see this as evidence that our experiment, although highly artificial, still captures aspects of real life behavior.

Table 10: Overborrowing in the Game and in Real Life

	No. Goods		Overborrowing		Overspending	
	(1)	(2)	(3)	(4)	(5)	(6)
Obj. OI-Index	–0.000		–0.001		0.050**	
	(0.077)		(0.008)		(0.021)	
Subj. OI-Index		0.105		–0.005		0.043*
		(0.078)		(0.008)		(0.022)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	471	471	471	471	471	471

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Robust standard errors in parentheses. Controlled for confidence as defined in Equation 3.

We can only speculate why the well-established hard-easy gap is so small in our setting. Consulting our interviewers, we have no reason to believe that participants did not perceive the test quizzes as hard or easy when they should. Several other studies find larger shifts in beliefs, although participants had less exposure to manipulation.[36] The rural Thai population may have more persistent beliefs than WEIRD populations. This

[36] For example, Grohmann et al. (2019) only use four questions they frame as "example questions" and find larger treatment effects on expectations.

makes changing these beliefs more difficult. Given the tremendous level of overconfidence we find in the lab, this circumstance might not be beneficial for our participants. It relates to our regression result that being too certain about future income is related to over-indebtedness. "Sticky," biased expectations, bear implications for policy making and must be taken into account when measures to reduce over-indebtedness are designed.

5 Conclusion

Over-indebtedness can pose a serious threat to households' welfare and the financial stability of a country, especially in emerging markets. However, the determinants underlying over-indebtedness globally are, so far, not well understood. Theoretically, as modelled in various permanent income hypotheses, higher income expectations should lead to a higher level of borrowing.

In this study, we analyze the relationship between high income expectations and over-indebtedness using data from an extensive household survey and a lab-in-the-field experiment. Low levels of financial knowledge and high income uncertainty demand for explicit research in emerging countries because relying on results for Western populations is insufficient. Our sample belongs to a panel survey of relatively poor and rural households in Thailand. Indeed, we can confirm a low level of financial literacy in several dimensions and find substantial uncertainty in income expectations for our sample. While over-indebtedness is increasingly recognized as a growing problem in Thailand, our study sheds light on one potential driver.

In our regression analysis, we find a strong and robust positive relationship between high expectations concerning future income and over-indebtedness controlling for various household characteristics and shocks. We think this is a sign that these expectations are actually too high for some households. This finding holds for various measures of over-indebtedness. They are stronger for objective measures, if we use a quantitative elicitation method for positive income expectations based on probabilistic expectations and stronger for subjective over-indebtedness, if we use a qualitative, more subjective forecast error. In any case, they are always significant. The results reflect that subjective over-indebtedness indicators are likely to be influenced more heavily by personal perceptions on the household's financial situation as well as by respondents' personality traits and that objective and subjective measures capture different dimensions of over-indebtedness. Eventually, higher certainty about the future household income development is also related to more household over-indebtedness, which might be the case because being too certain is not optimal given the highly uncertain environment. The results are robust to a diverse set of different sample specifications and we do not find evidence of reverse causality issues.

We attempt to establish a causal relationship between overconfidence as a form of biased expectation and overborrowing in our experiment by exogenously biasing self-confidence via the so-called hard-easy gap. Thereby, we change expectations about the future payout in the game. Our results show that, in the experiment, overconfidence is related to more spending and overborrowing, but we cannot claim causality. The most probable reason why our treatments do not affect spending behavior are too "sticky" beliefs. This also suggests that rural households are indeed too certain about their income expectations. Interestingly, we find that overspending in the experiment is related to overspending in real life, which confirms that the artificial experiment still captures real life behavior.

As we will never know the true income generating process, we cannot know whether the expectations of our respondents are systematically biased or positive for other reasons. A systematic overestimation of future income would have much more devastating effects than a random, one-shot, inaccurate guess. Nevertheless, we find reassuring evidence that even one-time high expectations are positively related to household over-indebtedness, thus pushing households into severe poverty. One of the potential channels through which high expectations are related to over-indebtedness is being too certain about own expectations in the highly uncertain environment that rural households in emerging markets are living in. Given the supplemental evidence for sticky beliefs from our experiment, to change beliefs or their certainty seems to be challenging. More appropriate policy measures might reduce vulnerability and uncertainty with the expansion of assistance and insurance schemes, especially for households engaged in agriculture.

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Appendix

A Survey Appendix

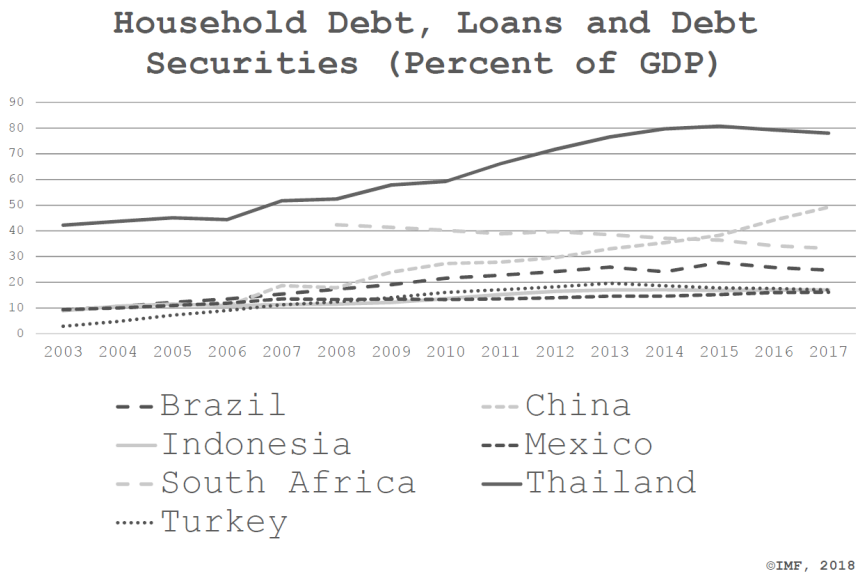


Figure A.1: Household Debt to GDP Ratio, Selected Emerging Markets

Table A.1: Correlation Matrix - Over-Indebtedness Variables

	Obj. OI-Index	DSR > 0.4 (=1)	RDSR > 0.4 (=1)	Holds > 2 Loans (=1)	Paid Late/ Default (=1)	Subj. OI-Index	Debt Position	Diff. to Pay Debt (=1)	Sacrifice Index
Obj. OI-Index	1								
DSR > 0.4 (=1)	0.733***	1							
RDSR > 0.4 (=1)	0.771***	0.481***	1						
Holds > 2 Loans (=1)	0.725***	0.426***	0.430***	1					
Paid Late/Default (=1)	0.529***	0.111***	0.212***	0.141***	1				
Subj. OI-Index	0.458***	0.193***	0.347***	0.310***	0.417***	1			
Debt Position	0.485***	0.250***	0.439***	0.348***	0.302***	0.763***	1		
Diff. to Pay Debt (=1)	0.298***	0.0922**	0.164***	0.169***	0.398***	0.749***	0.371***	1	
Sacrifice Index	0.240***	0.0881**	0.169***	0.174***	0.233***	0.728***	0.330***	0.305***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The objective and subjective overindebtedness indices are standardized with mean zero and standard deviation of one.

Table A.2: Subsample Probability Question: Objective OI-Indicators

	Obj. Index	DSR > 0.4	RDSR > 0.4	Paid Late	> 2 Loans
	(1)	(2)	(3)	(4)	(5)
Very Negative	–0.088	–0.067	–0.024	–0.003	–0.008
	(0.166)	(0.052)	(0.093)	(0.043)	(0.061)
Negative	0.061	–0.071	0.075	0.079**	–0.009
	(0.178)	(0.064)	(0.075)	(0.038)	(0.066)
Neutral	0.109	0.010	0.033	0.090	–0.014
	(0.196)	(0.076)	(0.066)	(0.060)	(0.068)
Positive	0.373**	0.105**	0.218***	0.141***	–0.025
	(0.137)	(0.047)	(0.063)	(0.043)	(0.058)
Constant	–1.978**	–0.103	–0.914***	–0.008	–0.448
	(0.845)	(0.315)	(0.316)	(0.303)	(0.383)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	525	525	525	522	525
Adj. R-squared	0.092	0.054	0.124	0.044	0.039

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table A.3: Subsample Probability Question: Subjective OI-Indicators

	Subj. Index	Debt Position	Diff. Pay off Debt	Sacrifice Index
	(1)	(2)	(3)	(4)
Very Negative	0.210	–0.003	0.059	0.282**
	(0.131)	(0.115)	(0.047)	(0.106)
Negative	0.124	0.044	0.012	0.207
	(0.118)	(0.135)	(0.027)	(0.154)
Neutral	0.019	0.026	0.017	–0.073
	(0.115)	(0.127)	(0.024)	(0.094)
Positive	0.343***	0.213**	0.057**	0.351***
	(0.092)	(0.083)	(0.025)	(0.120)
Constant	–0.872	–1.816**	0.059	0.154
	(0.829)	(0.726)	(0.181)	(0.688)
Controls	Yes	Yes	Yes	Yes
Observations	525	525	523	525
Adj. R-squared	0.109	0.076	0.055	0.119

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table A.4: Subsample Financial Decision Makers: Objective OI-Indicators

	Obj. Index	DSR > 0.4	RDSR > 0.4	Paid Late	> 2 Loans
	(1)	(2)	(3)	(4)	(5)
Very Negative	–0.098	–0.024	–0.032	–0.027	–0.031
	(0.154)	(0.055)	(0.085)	(0.040)	(0.067)
Negative	–0.016	–0.064	0.076	0.045	–0.069
	(0.141)	(0.051)	(0.064)	(0.035)	(0.072)
Neutral	0.094	0.002	0.041	0.083	–0.023
	(0.197)	(0.070)	(0.067)	(0.060)	(0.078)
Positive	0.352**	0.093	0.212***	0.132***	–0.023
	(0.153)	(0.055)	(0.073)	(0.042)	(0.064)
Constant	–1.394*	0.082	–0.634**	0.076	–0.299
	(0.676)	(0.340)	(0.292)	(0.236)	(0.308)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	575	575	575	572	575
Adj. R-squared	0.094	0.040	0.141	0.046	0.046

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table A.5: Subsample Financial Decision Makers: Subjective OI-Indicators

	Subj. Index	Debt Position	Diff. Pay off Debt	Sacrifice Index
	(1)	(2)	(3)	(4)
Very Negative	0.141	–0.041	0.047	0.204*
	(0.122)	(0.134)	(0.040)	(0.116)
Negative	0.108	–0.042	0.021	0.245
	(0.120)	(0.116)	(0.027)	(0.208)
Neutral	–0.030	–0.053	0.013	–0.074
	(0.115)	(0.114)	(0.018)	(0.135)
Positive	0.252**	0.148**	0.040	0.278*
	(0.100)	(0.069)	(0.026)	(0.156)
Constant	–0.181	–1.442**	0.194	0.848
	(0.710)	(0.563)	(0.179)	(0.787)
Controls	Yes	Yes	Yes	Yes
Observations	575	575	573	575
Adj. R-squared	0.140	0.108	0.065	0.132

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table A.6: Interaction of Over-Indebtedness Indices with Conscientiousness

	Obj. Index	**Subj. Debt Index**
	(1)	(2)
Very Negative	–0.409	1.102
	(0.747)	(0.867)
Negative	–0.767	0.834
	(0.498)	(0.668)
Neutral	–0.184	0.169
	(0.801)	(0.596)
Positive	–0.071	0.909
	(0.773)	(0.592)
Conscientiousness	–0.105	0.077
	(0.069)	(0.085)
Very neg. x Conscient.	0.068	–0.155
	(0.127)	(0.140)
Negative x Conscient.	0.144*	–0.119
	(0.076)	(0.107)
Neutral x Conscient.	0.056	–0.021
	(0.127)	(0.103)
Positive x Conscient.	0.071	–0.113
	(0.122)	(0.106)
Constant	–0.859	–0.942
	(0.777)	(0.769)
Controls	Yes	Yes
Observations	676	676
Adj. R-squared	0.095	0.130

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table A.7: Objective Over-Indebtedness, Quantitative Inc. Forecast Dummy

	Obj. Index		DSR > 0.4		RDSR > 0.4		Paid Late/Default		> 2 Loans	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Quant. Inc. Forecast Dummy	0.269**	0.245**	0.131***	0.095**	0.163***	0.137**	0.058*	0.077**	–0.033	–0.022
	(0.097)	(0.101)	(0.036)	(0.038)	(0.049)	(0.049)	(0.031)	(0.034)	(0.035)	(0.040)
Farming Shocks		–0.000		–0.000		–0.000		–0.000		0.000
		(0.002)		(0.000)		(0.001)		(0.001)		(0.001)
Environ. Shocks		0.005***		–0.000		0.002***		0.002*		0.002***
		(0.001)		(0.001)		(0.000)		(0.001)		(0.001)
Economic Shocks		0.003***		0.000		0.002***		0.001*		0.000
		(0.001)		(0.000)		(0.001)		(0.001)		(0.001)
Crime Shocks		–0.014		–0.003		–0.012***		–0.001		–0.001
		(0.009)		(0.002)		(0.003)		(0.004)		(0.004)
Other Shocks		–0.000		–0.000		–0.000		0.000*		–0.000
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
Constant	–0.061	–1.274**	0.150***	0.133	0.358***	–0.518*	0.141***	0.074	0.237***	–0.314
	(0.091)	(0.546)	(0.031)	(0.285)	(0.042)	(0.294)	(0.015)	(0.226)	(0.044)	(0.265)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	686	676	686	676	686	676	683	673	686	676
Adj. R-squared	0.012	0.099	0.020	0.048	0.019	0.121	0.003	0.037	-0.000	0.055

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table A.8: Subjective Over-Indebtedness, Quantitative Inc. Forecast Dummy

	Subj. Index		Debt Position		Diff. Pay off Debt		Sacrifice Index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quant. Inc. Forecast Dummy	0.063	0.172*	0.105	0.165*	–0.005	0.019	0.054	0.146
	(0.097)	(0.093)	(0.094)	(0.086)	(0.020)	(0.024)	(0.079)	(0.087)
Farming Shocks		–0.001		0.001		–0.000**		–0.003
		(0.001)		(0.001)		(0.000)		(0.002)
Environmental Shocks		0.007***		0.003***		0.002***		0.004*
		(0.001)		(0.001)		(0.001)		(0.002)
Economic Shocks		0.000		0.003**		–0.001		–0.000
		(0.001)		(0.001)		(0.000)		(0.002)
Crime Shocks		0.000		–0.006		0.003		–0.006
		(0.014)		(0.008)		(0.003)		(0.015)
Other Shocks		0.002***		0.000		0.001***		0.002***
		(0.001)		(0.000)		(0.000)		(0.000)
Constant	–0.037	–0.430	–0.044	–1.447***	0.066***	0.152	–0.100*	0.377
	(0.040)	(0.566)	(0.045)	(0.504)	(0.011)	(0.147)	(0.050)	(0.584)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	686	676	686	676	684	674	686	676
Adj. R-squared	-0.001	0.133	0.001	0.099	-0.001	0.073	-0.001	0.117

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table A.9: Certainty Measure - Objective Over-Indebtedness - Quantitative Inc. Forecast Dummy

	Obj. Index	DSR > 0.4	RDSR > 0.4	Paid Late	> 2 Loans
	(1)	(2)	(3)	(4)	(5)
Quant. Inc. Forecast Dummy	0.242**	0.096**	0.130**	0.079**	–0.023
	(0.103)	(0.040)	(0.050)	(0.035)	(0.041)
Certainty	0.127*	0.053**	0.043	–0.008	0.062**
	(0.061)	(0.023)	(0.027)	(0.024)	(0.022)
Constant	–1.406**	0.080	–0.587*	0.160	–0.443
	(0.526)	(0.286)	(0.299)	(0.247)	(0.262)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	664	664	664	661	664
Adj. R-squared	0.102	0.056	0.121	0.035	0.063

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table A.10: Certainty Measure - Subjective Over-Indebtedness - Quantitative Inc. Forecast Dummy

	Subj. Index	Debt Position	Diff. Pay off Debt	Sacrifice Index
	(1)	(2)	(3)	(4)
Quant. Inc. Forecast Dummy	0.156	0.160*	0.014	0.133
	(0.094)	(0.091)	(0.022)	(0.091)
Certainty	0.064	0.090	0.005	0.023
	(0.089)	(0.066)	(0.021)	(0.107)
Constant	–0.609	–1.761***	0.154	0.331
	(0.630)	(0.571)	(0.153)	(0.726)
Controls	Yes	Yes	Yes	Yes
Observations	664	664	662	664
Adj. R-squared	0.133	0.103	0.072	0.112

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

B The Qualitative Forecast Error

Deriving the Qualitative Forecast Error

We develop a measure of expectation accuracy closely following Souleles (2004) and Hyytinen and Putkuri (2018), which enables us to replicate the latter authors' results. We make use of the available panel data and combine categorical answers to the question, "How do you think your average monthly income will develop in the next twelve months?" $(E_{t-1}(Inc_{i,t}))$ asked in 2016 (one year prior to our survey) with responses to the question "Do you think your household is better off than last year" asked in 2017 $(A(Inc_{i,t}))$.[1] We call the difference between these two questions qualitative forecast error:

$$Qualitative\ Forecast\ Error = A(Inc_{i,t}) - E_{t-1}(Inc_{i,t}) \tag{1}$$

A positive qualitative forecast error occurs if the expected household situation is better than the realized one and a negative if the opposite is true. We form five categories ranging from a very negative to a very positive qualitative forecast error, which enter the regression analysis as dummy variables. The category with households making no forecast error serves as omitted group.

As the qualitative forecast error is derived at the household level, the respondent may not be the same for all three data points. Therefore, we re-run the analysis for a sub-sample with only identical respondents, which does not change the results. We assume that the household's qualitative assessment regarding its own development stays similar for a time period of two years and, thus, is able to explain indebtedness in 2017. There are two reasons encouraging this view: We are able to control for a rich set of socio-economic variables that capture household formation and, as incomes are rather stationary, expectations may also change slowly.

Results for the Qualitative Forecast Error

The regressions we run for the qualitative forecast error take the same form as the ones for the quantitative income forecast (standard errors are clustered at the district level):

$$Over - Indebtedness\ Index_i = \beta_0 + \beta_1 Qual.FE_i + X_i^{'}\beta_2 + \epsilon_i \tag{2}$$

Results for the objective and subjective over-indebtedness indices are presented in Tables B.1 and B.2. With regards to the relationship between the objective OI-Index and the qualitative forecast error, we find that over-indebtedness increases by 0.42 points if respondents exhibit a very positive forecast error. The results are driven by two components: the remaining debt to service ratio (columns (5) and (6), Table B.1) and the probability of whether people paid late or defaulted on a loan (columns (7) and (8)). The results are similar to those of the quantitative income forecast. We again find that very positive forecasts are related to a higher probability of being objectively over-indebted. Point estimates are slightly higher for results from the qualitative forecast error. Regarding the impact of losses from shocks as well as additional control variables, results are similar to those of the quantitative income forecast. Overall, results from the qualitative forecast error confirm the findings from the quantitative income forecast: positive future income expectations are related to increasing objective over-indebtedness.

[1] Answer options range on a scale from 1-5. For the question asked in 2016, one means "increase a lot" and five "decrease a lot." The question asked in 2017 ranges from one being "much better off" to five "much worse off."

Table B.1: Qualitative Forecast Error - Main Results Objective OI-Indicators

	Obj. Index		DSR > 0.4		RDSR > 0.4		Paid Late/Default		> 2 Loans	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Very negative	0.130	0.179	–0.089	–0.073	0.118	0.148	0.106	0.109	0.024	0.034
	(0.222)	(0.236)	(0.061)	(0.067)	(0.129)	(0.142)	(0.106)	(0.101)	(0.067)	(0.065)
Negative	–0.158**	–0.055	–0.046	–0.030	–0.033	0.006	–0.026	–0.003	–0.076	–0.033
	(0.063)	(0.069)	(0.032)	(0.035)	(0.040)	(0.044)	(0.028)	(0.029)	(0.047)	(0.048)
Positive	0.165**	0.069	0.007	–0.009	0.087*	0.044	0.035	0.014	0.069	0.034
	(0.064)	(0.070)	(0.031)	(0.034)	(0.045)	(0.040)	(0.036)	(0.035)	(0.041)	(0.039)
Very Positive	0.443**	0.410**	0.070	0.052	0.194***	0.182***	0.151*	0.149**	0.100	0.093
	(0.170)	(0.144)	(0.073)	(0.068)	(0.058)	(0.050)	(0.073)	(0.067)	(0.063)	(0.057)
Farming Shocks		0.000		0.000		–0.000		0.000		0.000
		(0.001)		(0.000)		(0.000)		(0.000)		(0.000)
Environmental Shocks		0.003**		–0.000		0.002***		0.001		0.001**
		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)
Economic Shocks		0.003***		0.001**		0.001***		0.001**		0.000
		(0.001)		(0.000)		(0.000)		(0.000)		(0.000)
Crime Shocks		–0.012***		–0.003***		–0.006**		–0.002		–0.003
		(0.004)		(0.001)		(0.002)		(0.002)		(0.002)
Other Shocks		–0.000		–0.000**		–0.000		0.000		–0.000
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
Constant	–0.059	–1.264**	0.184***	0.190	0.359***	–0.508*	0.132***	0.059	0.214***	–0.355
	(0.082)	(0.584)	(0.032)	(0.320)	(0.032)	(0.290)	(0.020)	(0.229)	(0.038)	(0.275)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	688	676	688	676	688	676	685	673	688	676
Adj. R-squared	0.022	0.120	0.002	0.044	0.014	0.124	0.013	0.050	0.011	0.063

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, positive*, and *very positive* represent the forecast groups. Households with no forecast error serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

We also find a strongly significant relationship between positive qualitative forecast errors and subjective over-indebtedness. This relationship is much stronger than for the quantitative income forecast. Again, we only find a robust relationship for households in the group with the largest positive forecasts. The subjective OI-Index increases by 0.42 points for respondents who exhibit very positive forecast errors (columns (1) and (2), Table B.2). Mainly, this is due to the positive relationship between the forecast error and the "debt position" component of the index and the sacrifice index component. Households with a very positive error tend to state more frequently that they "have too much debt right now" (columns (3) and (4)) and that they make an increasing number of everyday sacrifices to repay their loans (column (7) and (8)). We conclude that the nature of the qualitative forecast error being more "subjectively" elicited than the calculated quantitative income forecast *per se*, might be reflected in more pronounced results regarding subjectively "felt" debt. This is also in line with our analysis from the quantitative

income forecast that subjective over-indebtedness may rather be a concept of perceived financial distress affected by not only the household's true debt situation but also by respondent characteristics.

Table B.2: Qualitative Forecast Error - Main Results Subjective OI-Indicators

	Subj. Index		Debt Position		Diff. Pay off Debt		Sacrifice Index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Very negative	0.218	0.140	0.064	0.055	0.052	0.027	0.243	0.167
	(0.258)	(0.245)	(0.230)	(0.261)	(0.068)	(0.060)	(0.214)	(0.198)
Negative	–0.025	0.030	–0.091	–0.011	0.030	0.028	–0.096	–0.046
	(0.127)	(0.103)	(0.072)	(0.061)	(0.035)	(0.031)	(0.153)	(0.134)
Positive	0.208**	0.105	0.139*	0.065	0.021	0.011	0.265*	0.134
	(0.077)	(0.083)	(0.072)	(0.069)	(0.016)	(0.019)	(0.150)	(0.133)
Very Positive	0.476**	0.455**	0.351*	0.361**	0.091	0.086	0.352*	0.308*
	(0.208)	(0.186)	(0.177)	(0.155)	(0.053)	(0.053)	(0.187)	(0.160)
Farming Shocks		0.000		0.000		0.000		–0.001
		(0.001)		(0.001)		(0.000)		(0.001)
Environ. Shocks		0.002		0.001		0.001		0.001
		(0.002)		(0.001)		(0.001)		(0.002)
Economic Shocks		0.000		0.002**		–0.000*		0.001
		(0.001)		(0.001)		(0.000)		(0.001)
Crime Shocks		–0.003		–0.000		–0.000		–0.007
		(0.007)		(0.007)		(0.002)		(0.006)
Other Shocks		0.001***		0.000		0.000***		0.001**
		(0.000)		(0.000)		(0.000)		(0.000)
Constant	–0.122**	–0.499	–0.074	–1.459**	0.043***	0.122	–0.176**	0.357
	(0.057)	(0.664)	(0.050)	(0.530)	(0.014)	(0.175)	(0.072)	(0.626)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	688	676	688	676	686	674	688	676
Adj. R-squared	0.019	0.136	0.015	0.102	0.006	0.073	0.012	0.115

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, positive*, and *very positive* represent the forecast groups. Households with no forecast error serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Furthermore, we again add an income certainty measure to the regression. Results are presented in Tables B.3 and B.4. There is no relationship between future income certainty on objective and subjective over-indebtedness. For the subjective OI-Indicators, results are in line with those from the quantitative income forecast. However, they differ for objective over-indebtedness. While we find that higher income certainty is related to higher objective over-indebtedness with respect to the quantitative income forecast, we do not find that relationship with the qualitative error. This may be due to the more subjective nature of the qualitative forecast error.

Table B.3: Objective Over-Indebtedness - Income Certainty

	Obj. Index	DSR > 0.4	RDSR > 0.4	Paid Late	> 2 Loans
	(1)	(2)	(3)	(4)	(5)
Very negative	0.180	–0.075	0.151	0.110	0.034
	(0.242)	(0.067)	(0.145)	(0.102)	(0.066)
Negative	–0.056	–0.030	0.007	–0.004	–0.034
	(0.068)	(0.035)	(0.044)	(0.029)	(0.048)
Positive	0.070	–0.010	0.045	0.015	0.034
	(0.069)	(0.034)	(0.040)	(0.035)	(0.039)
Very Positive	0.465**	0.093	0.187***	0.153*	0.104*
	(0.164)	(0.078)	(0.059)	(0.074)	(0.058)
Certainty	0.046	0.030	0.008	0.004	0.011
	(0.049)	(0.020)	(0.017)	(0.019)	(0.024)
Constant	–1.481**	–0.001	–0.640**	0.066	–0.297
	(0.551)	(0.295)	(0.280)	(0.262)	(0.261)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	663	663	663	660	663
Adj. R-squared	0.118	0.050	0.122	0.046	0.058

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. Households with no forecast error serve as the reference group. The variables *very negative, negative, positive*, and *very positive* represent the forecast groups. Households with no forecast error serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table B.4: Subjective Over-Indebtedness - Income Certainty

	Subj. Index	Debt Position	Diff. Pay off Debt	Sacrifice Index
	(1)	(2)	(3)	(4)
Very negative	0.150	0.063	0.026	0.186
	(0.242)	(0.258)	(0.060)	(0.192)
Negative	0.028	–0.012	0.028	–0.048
	(0.104)	(0.061)	(0.031)	(0.136)
Positive	0.109	0.068	0.011	0.141
	(0.085)	(0.071)	(0.019)	(0.135)
Very Positive	0.578**	0.429**	0.116*	0.400**
	(0.211)	(0.191)	(0.064)	(0.169)
Certainty	–0.035	–0.033	0.010	–0.103
	(0.058)	(0.048)	(0.012)	(0.072)
Constant	–0.356	–1.374**	0.128	0.605
	(0.667)	(0.563)	(0.181)	(0.629)
Controls	Yes	Yes	Yes	Yes
Observations	663	663	661	663
Adj. R-squared	0.143	0.104	0.076	0.121

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. Households with no forecast error serve as the reference group. The variables *very negative, negative, positive*, and *very positive* represent the forecast groups. Households with no forecast error serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Overall, results from the qualitative forecast error confirm the main findings from the quantitative income forecast: very positive forecasts are related to a higher level of over-indebtedness. There is no such relationship for negative forecasts and over-indebtedness. The results also support the analysis from the quantitative income forecast that subjective and objective over-indebtedness indicators measure different dimensions of indebtedness. Finally, our results from the qualitative forecast error are in line with those of Hyytinen and Putkuri (2018). They report that households with a very positive forecast error are more likely to be over-indebted and that such a pattern cannot be found for households with negative forecast errors. Our results show the same relationship.

C Experiment Appendix

Table C.1: Descriptive Statistics by Participation in Game

	Full Sample	Participating	Non-Participating	Difference
Sex	1.66	1.63	1.76	0.12***
Age	57.01	56.35	59.78	3.43***
Relation to HH Head	1.67	1.66	1.71	0.05
Marital Status	2.15	2.14	2.22	0.09
Main Occupation	4.97	4.66	6.29	1.64*
Years of Schooling	5.74	5.83	5.33	−0.51*
Children (0-6 years)	0.32	0.32	0.33	0.01
Children (7-10 years)	0.24	0.23	0.25	0.02
Numeracy	2.05	2.13	1.69	−0.45***
Health Status	1.40	1.38	1.46	0.08
BMI	23.64	23.70	23.41	−0.28
Fin. Decision Maker	1.57	1.56	1.60	0.03
Self Control	21.26	21.02	22.26	1.24
Risk Taking	3.95	3.99	3.78	−0.21
Fin. Risk Taking	3.94	4.04	3.57	−0.47**
FL-Score	5.50	5.63	4.95	−0.68***
Monthly Inc. 2017	19197.02	19313.71	18704.57	−609.14
Obj. OI-Index	0.00	0.00	−0.00	−0.00
Subj. OI-Index	−0.00	−0.01	0.03	0.04
Morning	0.53	0.53	0.53	0.00
Midday	0.24	0.26	0.17	−0.09***
Observations	748	604	144	748

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels.

Table C.2: Linear Probability Model Participation in Game

	Participation
Sex	–0.077**
	(0.036)
Age	–0.003**
	(0.002)
Fin. Risk Taking	0.023**
	(0.010)
FL-Score	0.020**
	(0.010)
Morning	0.083**
	(0.040)
Midday	0.144***
	(0.043)
Observations	717

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Only significant variables reported, remaining variables are the same as in Table C.1.

Table C.3: Descriptive Statistics for Excluded Sample

	Full Sample	In	Out	Difference
Sex	1.65	1.64	1.67	−0.03
Age	56.40	56.16	57.75	−1.59
Relation to HH Head	1.68	1.70	1.56	0.14
Marital Status	2.14	2.13	2.24	−0.11
Main Occupation	4.68	4.79	4.08	0.71
Years of Schooling	5.87	5.92	5.60	0.32
Children (0-6 years)	0.31	0.33	0.25	0.08
Children (7-10 years)	0.24	0.26	0.13	0.13***
Numeracy	2.13	2.14	2.04	0.11
Health Status	1.38	1.38	1.38	0.00
BMI	23.69	23.58	24.27	−0.68
Fin. Decision Maker	1.56	1.57	1.52	0.05
Self Control	21.05	20.94	21.62	−0.67
Risk Taking	3.98	4.02	3.74	0.28
Fin. Risk Taking	4.03	4.06	3.90	0.15
FL-Score	5.62	5.66	5.40	0.26
Monthly Inc. 2017	18523.65	18653.06	17798.04	855.02
Obj. OI-Index	0.01	0.01	−0.02	0.03
Subj. OI-Index	−0.03	−0.04	0.05	−0.09
Read Alone	1.45	1.44	1.49	−0.04
Difficulties	1.15	1.14	1.21	−0.08
Observations	555	471	84	555

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels.

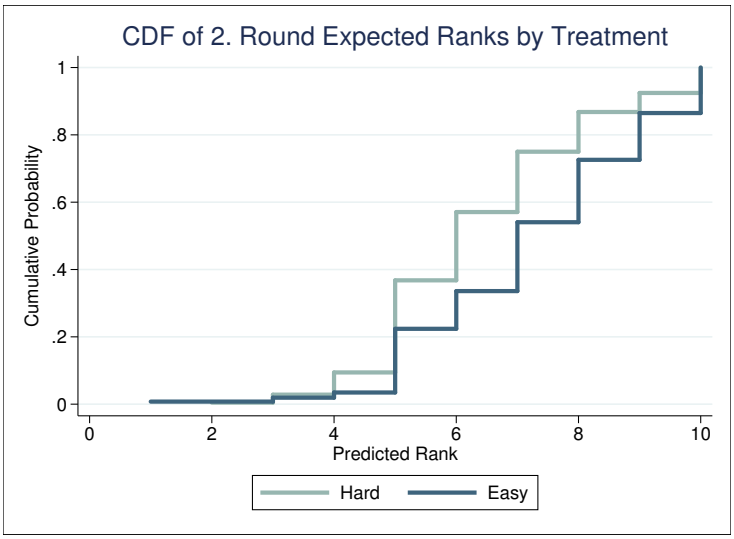


Figure C.1: CDF for the Expected Rank by Treatment, After the Main Quiz

The Rationals

As mentioned above, so far we have excluded experiment participants who want to buy more than they expect to earn. We refer to these persons as "rationals." In this section, we discuss whether these participants are actually rational or had difficulties in understanding the experiment and how including these observations change our results. Comparing our main sample against all rationals does not yield results that differ substantially from those presented in Table C.3. However, if we divide the rationals into those participants who want to buy more than expected earnings could pay for but less than eight goods and those who want to buy exactly eight goods (which would be the "truely" rational decision), we find interesting differences. The former group has significantly lower education, numeracy, and financial literacy than the main sample (see Table C.4). We see this as evidence that they may have had difficulties understanding the game (from here on, we refer to these individuals as non-rationals). It does not seem to be the case, however, that these are persons who generally have problems controlling their own spending behavior (also outside the lab) because their debt to service ratio is significantly smaller compared to the main sample.

Table C.4: Descriptive Statistics for Non-Rationals (only significant effects reported)

	Full Sample	Others	Non-Rationals	Difference
Years of Schooling	5.84	5.91	5.00	0.91***
Children (7-10 years)	0.24	0.26	0.12	0.14**
Numeracy	2.10	2.13	1.76	0.36*
FL-Score	5.60	5.64	5.10	0.54*
Observations	532	490	42	532

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels.

The remaining rationals, however, not only have significantly higher numeracy and financial literacy, but also have a better understanding of the game as perceived by the interviewers (see Table C.5) (for non-rationals the difference is in the opposite direction, but not significant). Thus, these participants might have taken advantage of the set-up and reasoned that it is optimal for them to buy as many goods as possible because of the large discount.

Table C.5: Descriptive Statistics for Rationals (only significant effects reported)

	Full Sample	Others	Rationals	Difference
Main Occupation	4.70	4.76	3.48	1.28*
Numeracy	2.16	2.13	2.78	−0.66*
FL-Score	5.66	5.64	6.22	−0.58*
Difficulties in Game	1.15	1.16	1.00	0.16***
Observations	513	490	23	513

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels.

Including these two groups into the analysis, the results change as anticipated: the effect of expected rank on goods turns insignificant and negligible (see Table C.6). All other effects are almost unchanged.

Table C.6: Consumption Decision including Rationals

	Exp. Rank	No. Goods		
	(1)	(2)	(3)	(4)
Treatment	0.373**	–0.234		–0.254
	(0.168)	(0.199)		(0.199)
Exp. Rank			0.048	0.054
			(0.052)	(0.052)
Controls	Yes	Yes	Yes	Yes
Observations	511	511	511	511

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Standard errors in parentheses. Treatment: 0=Hard Quiz, 1=Easy Quiz; A higher expected rank corresponds to a higher expected performance. Controls: Health Status, Monthly HH income and Objective OI-Index.

Online Appendix to accompany "Don't Expect Too Much - High Income Expectations and Over-Indebtedness"

Contents:

I Additional Regression Tables

Table 1: Full Regression Output for Main Regression - Objective Over-Indebtedness

	Obj. Index		DSR > 0.4		RDSR > 0.4		Paid Late/Default		> 2 Loans	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Very Negative	−0.125	−0.017	−0.097*	−0.022	−0.073	0.011	0.017	−0.015	0.001	0.010
	(0.151)	(0.143)	(0.047)	(0.050)	(0.081)	(0.079)	(0.033)	(0.036)	(0.059)	(0.060)
Negative	0.050	0.058	−0.067	−0.054	0.075	0.100*	0.081**	0.066**	−0.029	−0.037
	(0.134)	(0.132)	(0.045)	(0.048)	(0.058)	(0.057)	(0.032)	(0.029)	(0.057)	(0.058)
Neutral	0.153	0.135	0.025	0.002	0.079	0.067	0.074	0.095*	−0.002	−0.010
	(0.153)	(0.168)	(0.050)	(0.060)	(0.058)	(0.064)	(0.045)	(0.051)	(0.061)	(0.063)
Positive	0.289**	0.333**	0.098**	0.087*	0.187**	0.210***	0.109***	0.133***	−0.054	−0.037
	(0.134)	(0.136)	(0.042)	(0.047)	(0.072)	(0.069)	(0.038)	(0.041)	(0.055)	(0.060)
Monthly Inc. 2017		−0.000		−0.000*		−0.000***		0.000		0.000
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
Age		0.061***		0.007		0.031***		0.015*		0.019***
		(0.017)		(0.008)		(0.009)		(0.008)		(0.007)
Age Squared		−0.001***		−0.000		−0.000***		−0.000**		−0.000***
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
FL-Score		0.021		0.008		0.018***		−0.010		0.012
		(0.018)		(0.007)		(0.006)		(0.006)		(0.007)
Risk Preference		0.054***		0.013*		0.026***		0.012		0.013
		(0.018)		(0.007)		(0.008)		(0.008)		(0.008)
Self-Control		0.001		−0.002		−0.001		0.003		0.001
		(0.006)		(0.002)		(0.003)		(0.002)		(0.002)
Main Inc. Farming		−0.122		−0.066		−0.006		−0.090		0.032
		(0.155)		(0.059)		(0.091)		(0.057)		(0.044)
Main Inc. Employed		−0.194		−0.106*		−0.032		−0.022		−0.063
		(0.166)		(0.059)		(0.076)		(0.057)		(0.055)
Main Inc. Self-Emp.		−0.163		−0.087		−0.025		−0.025		−0.053
		(0.212)		(0.089)		(0.099)		(0.068)		(0.061)
Main Inc. Remitt.		−0.151		−0.068		−0.016		−0.070		−0.015
		(0.144)		(0.060)		(0.057)		(0.058)		(0.037)
Children (0-6 yrs)		−0.085*		−0.012		−0.057**		0.007		−0.045**
		(0.047)		(0.017)		(0.026)		(0.027)		(0.020)
Children (7-10 yrs)		0.092		0.012		0.079**		0.008		0.019
		(0.082)		(0.048)		(0.033)		(0.022)		(0.036)
Children (11-16 yrs)		0.030		−0.017		0.017		0.025		0.009
		(0.040)		(0.020)		(0.021)		(0.020)		(0.019)
No. of Elders		0.036		0.003		0.036*		0.034*		−0.032
		(0.040)		(0.024)		(0.018)		(0.020)		(0.023)
No. of Working Mem.		0.072*		0.022		0.008		0.002		0.051**
		(0.042)		(0.015)		(0.019)		(0.019)		(0.021)
Total HH Education		−0.001		−0.000		0.002		−0.000		−0.003
		(0.005)		(0.002)		(0.003)		(0.002)		(0.002)
Farming Shocks		−0.000		−0.000		0.000		−0.000		0.000
		(0.002)		(0.000)		(0.001)		(0.001)		(0.001)
Environ. Shocks		0.005***		−0.000		0.002***		0.002**		0.002***
		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)
Economic Shocks		0.003***		0.000		0.002***		0.001*		0.000
		(0.001)		(0.000)		(0.001)		(0.001)		(0.001)
Crime Shocks		−0.016*		−0.004*		−0.013***		−0.002		−0.001
		(0.009)		(0.002)		(0.003)		(0.004)		(0.004)
Other Shocks		−0.000		−0.000		−0.000		0.000**		−0.000
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
Social Status		−0.140*		−0.021		−0.028		−0.056***		−0.051
		(0.071)		(0.023)		(0.033)		(0.019)		(0.032)
Constant	−0.073	−1.425**	0.189***	0.119	0.343***	−0.617**	0.099***	−0.016	0.245***	−0.291
	(0.144)	(0.576)	(0.048)	(0.296)	(0.072)	(0.286)	(0.019)	(0.243)	(0.063)	(0.280)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	688	676	688	676	688	676	685	673	688	676
Adj. R-squared	0.014	0.099	0.025	0.046	0.025	0.125	0.007	0.044	-0.003	0.053

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses.

Table 2: Full Regression Output for Main Regression - Subjective Over-Indebtedness

	Subj. Index		Debt Position		Diff. Pay off Debt		Sacrifice Index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Very Negative	0.182	0.215*	0.040	0.036	0.065**	0.058	0.118	0.245**
	(0.112)	(0.122)	(0.114)	(0.110)	(0.029)	(0.039)	(0.106)	(0.103)
Negative	0.157	0.150	0.096	0.046	0.037	0.033	0.108	0.178
	(0.135)	(0.110)	(0.111)	(0.109)	(0.025)	(0.026)	(0.174)	(0.154)
Neutral	−0.007	0.048	−0.021	0.008	0.022	0.031	−0.098	−0.035
	(0.104)	(0.092)	(0.096)	(0.094)	(0.021)	(0.019)	(0.128)	(0.095)
Positive	0.144	0.258**	0.113	0.181**	0.024	0.041*	0.113	0.245*
	(0.086)	(0.101)	(0.071)	(0.084)	(0.021)	(0.023)	(0.120)	(0.122)
Monthly Inc. 2017		−0.000		−0.000		−0.000		−0.000
		(0.000)		(0.000)		(0.000)		(0.000)
Age		0.061***		0.063***		0.007*		0.042**
		(0.014)		(0.015)		(0.004)		(0.018)
Age Squared		−0.001***		−0.001***		−0.000**		−0.000**
		(0.000)		(0.000)		(0.000)		(0.000)
FL-Score		−0.026**		0.007		−0.007**		−0.047**
		(0.012)		(0.010)		(0.003)		(0.018)
Risk Preference		0.044**		0.057***		0.003		0.023
		(0.017)		(0.018)		(0.005)		(0.019)
Self-Control		0.009**		0.005		0.001		0.015***
		(0.004)		(0.004)		(0.001)		(0.005)
Main Inc. Farming		−0.192**		−0.159		0.007		−0.323**
		(0.078)		(0.100)		(0.032)		(0.140)
Main Inc. Employed		0.042		0.017		0.047		−0.138
		(0.121)		(0.114)		(0.037)		(0.176)
Main Inc. Self-Emp.		−0.019		−0.019		0.031		−0.178
		(0.139)		(0.108)		(0.046)		(0.164)
Main Inc. Remitt.		−0.159		−0.251**		0.020		−0.176
		(0.102)		(0.090)		(0.036)		(0.165)
Children (0-6 yrs)		−0.091		−0.101**		−0.012		−0.046
		(0.062)		(0.048)		(0.016)		(0.063)
Children (7-10 yrs)		−0.084		0.039		−0.026		−0.162
		(0.075)		(0.071)		(0.019)		(0.094)
Children (11-16 yrs)		0.007		−0.002		−0.022		0.123*
		(0.063)		(0.037)		(0.022)		(0.066)
No. of Elders		0.026		0.043		0.012		−0.045
		(0.036)		(0.042)		(0.011)		(0.056)
No. of Working Mem.		0.121***		0.123***		−0.005		0.182***
		(0.042)		(0.033)		(0.014)		(0.045)
Total HH Education		−0.009**		−0.008**		0.001		−0.019***
		(0.004)		(0.003)		(0.001)		(0.005)
Farming Shocks		−0.001		0.002		−0.000*		−0.002
		(0.001)		(0.001)		(0.000)		(0.002)
Environmental Shocks		0.007***		0.003***		0.002**		0.003
		(0.001)		(0.001)		(0.001)		(0.002)
Economic Shocks		0.001		0.003**		−0.000		−0.000
		(0.001)		(0.001)		(0.000)		(0.002)
Crime Shocks		0.000		−0.006		0.003		−0.005
		(0.014)		(0.007)		(0.003)		(0.014)
Other Shocks		0.002***		0.000		0.001***		0.002***
		(0.001)		(0.000)		(0.000)		(0.000)
Social Status		−0.353***		−0.184***		−0.069***		−0.371***
		(0.079)		(0.045)		(0.023)		(0.092)
Constant	−0.115	−0.482	−0.064	−1.480***	0.035**	0.140	−0.131	0.344
	(0.082)	(0.593)	(0.081)	(0.514)	(0.016)	(0.155)	(0.111)	(0.591)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	688	676	688	676	686	674	688	676
Adj. R-squared	0.001	0.133	-0.002	0.094	0.002	0.073	-0.001	0.119

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses.

Table 3: Additional Regression on Big5 Measures - Objective Over-Indebtedness

	Obj. Index		DSR > 0.4		RDSR > 0.4		Paid Late/Default		> 2 Loans	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Very Negative	−0.125	−0.032	−0.097*	−0.026	−0.073	0.006	0.017	−0.021	0.001	0.008
	(0.151)	(0.137)	(0.047)	(0.050)	(0.081)	(0.076)	(0.033)	(0.036)	(0.059)	(0.059)
Negative	0.050	0.056	−0.067	−0.052	0.075	0.097*	0.081**	0.062**	−0.029	−0.035
	(0.134)	(0.133)	(0.045)	(0.050)	(0.058)	(0.056)	(0.032)	(0.029)	(0.057)	(0.061)
Neutral	0.153	0.111	0.025	−0.001	0.079	0.059	0.074	0.087*	−0.002	−0.019
	(0.153)	(0.160)	(0.050)	(0.058)	(0.058)	(0.060)	(0.045)	(0.050)	(0.061)	(0.063)
Positive	0.289**	0.311**	0.098**	0.084*	0.187**	0.206***	0.109***	0.128***	−0.054	−0.050
	(0.134)	(0.135)	(0.042)	(0.046)	(0.072)	(0.072)	(0.038)	(0.040)	(0.055)	(0.060)
Openness		0.100***		0.028***		0.040**		0.027**		0.022
		(0.030)		(0.008)		(0.016)		(0.012)		(0.016)
Conscientiousn.		−0.083**		−0.016		−0.036**		−0.025		−0.020
		(0.031)		(0.014)		(0.014)		(0.016)		(0.013)
Extraversion		−0.003		0.013		−0.013		−0.018		0.014
		(0.038)		(0.013)		(0.021)		(0.015)		(0.015)
Agreeableness		0.039		0.007		−0.008		0.009		0.034*
		(0.049)		(0.019)		(0.019)		(0.019)		(0.019)
Neuroticism		0.033		0.001		0.008		0.002		0.029*
		(0.034)		(0.010)		(0.018)		(0.017)		(0.015)
Constant	−0.073	−1.493*	0.189***	0.053	0.343***	−0.464	0.099***	0.073	0.245***	−0.539*
	(0.144)	(0.783)	(0.048)	(0.367)	(0.072)	(0.360)	(0.019)	(0.264)	(0.063)	(0.305)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	688	676	688	676	688	676	685	673	688	676
Adj. R-squared	0.014	0.108	0.025	0.047	0.025	0.129	0.007	0.046	-0.003	0.061

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table 4: Additional Regression on Big5 Measures - Subjective Over-Indebtedness

	Subj. Index		Debt Position		Diff. Pay off Debt		Sacrifice Index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Very Negative	0.182	0.213*	0.040	0.035	0.065**	0.056	0.118	0.252**
	(0.112)	(0.115)	(0.114)	(0.103)	(0.029)	(0.039)	(0.106)	(0.102)
Negative	0.157	0.136	0.096	0.032	0.037	0.034	0.108	0.155
	(0.135)	(0.113)	(0.111)	(0.109)	(0.025)	(0.026)	(0.174)	(0.157)
Neutral	−0.007	0.030	−0.021	−0.003	0.022	0.030	−0.098	−0.061
	(0.104)	(0.089)	(0.096)	(0.090)	(0.021)	(0.020)	(0.128)	(0.100)
Positive	0.144	0.239**	0.113	0.170**	0.024	0.041*	0.113	0.206*
	(0.086)	(0.091)	(0.071)	(0.077)	(0.021)	(0.023)	(0.120)	(0.113)
Openness		0.094**		0.058*		0.012		0.113**
		(0.036)		(0.033)		(0.009)		(0.049)
Conscientiousness		−0.007		0.005		−0.017		0.054
		(0.054)		(0.042)		(0.014)		(0.056)
Extraversion		−0.042		−0.055		0.007		−0.072
		(0.042)		(0.037)		(0.012)		(0.042)
Agreeableness		−0.021		−0.026		−0.001		−0.019
		(0.042)		(0.037)		(0.011)		(0.050)
Neuroticism		0.058*		0.031		−0.002		0.123**
		(0.031)		(0.029)		(0.009)		(0.044)
Constant	−0.115	−0.577	−0.064	−1.401**	0.035**	0.183	−0.131	−0.209
	(0.082)	(0.706)	(0.081)	(0.646)	(0.016)	(0.154)	(0.111)	(0.812)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	688	676	688	676	686	674	688	676
Adj. R-squared	0.001	0.143	-0.002	0.098	0.002	0.072	-0.001	0.141

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses. The variables *very negative, negative, neutral*, and *positive* represent the income forecast groups. Households with a mildly negative income forecast serve as the reference group. Additional controls: age, age squared, children (0-6), children (7-10), children (11-16), financial literacy score, loss from crime shocks, loss from economic shocks, loss from environmental shocks, loss from other shocks, main income farming, main income employed, main income self-employed, main income remittances, monthly household income 2017, no. of elders in hh, no. of working members in hh, risk preference, self-control, social status, total hh education.

Table 5: Additional Regression on Predictors for Income Forecast Groups

	Very Negative		Negative		Mildly Negative		Neutral		Positive	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Monthly Inc. 2017	0.000***	0.000***	0.000	0.000	−0.000**	−0.000**	−0.000***	−0.000***	−0.000***	−0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age	0.016**	0.018***	0.003	0.000	0.004	0.006	−0.008	−0.006	−0.015*	−0.019**
	(0.006)	(0.006)	(0.008)	(0.008)	(0.007)	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)
Age Squared	−0.000**	−0.000**	−0.000	−0.000	−0.000	−0.000	0.000	0.000	0.000*	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FL-Score	−0.022***	−0.020***	−0.001	−0.001	0.002	0.003	0.019***	0.017***	0.002	0.001
	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.006)	(0.007)
Risk Preference	0.006	0.007	−0.015*	−0.015	0.018**	0.015*	−0.008	−0.007	−0.001	−0.000
	(0.006)	(0.007)	(0.008)	(0.009)	(0.008)	(0.008)	(0.007)	(0.007)	(0.008)	(0.008)
Self-Control	−0.002	−0.002	0.002	0.002	−0.001	−0.000	0.002	0.002	−0.001	−0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Main Inc. Farming	0.131***	0.136***	0.032	0.035	0.008	0.011	0.058	0.053	−0.230***	−0.236***
	(0.034)	(0.037)	(0.041)	(0.044)	(0.053)	(0.055)	(0.060)	(0.062)	(0.069)	(0.070)
Main Inc. Employed	0.184***	0.197***	0.086*	0.089*	0.046	0.034	−0.021	−0.021	−0.295***	−0.298***
	(0.028)	(0.033)	(0.049)	(0.049)	(0.059)	(0.064)	(0.054)	(0.057)	(0.078)	(0.080)
Main Inc. Self-Emp.	0.144***	0.155***	0.116	0.107	−0.146**	−0.145**	0.070	0.073	−0.184*	−0.190**
	(0.046)	(0.047)	(0.071)	(0.071)	(0.062)	(0.061)	(0.068)	(0.071)	(0.091)	(0.087)
Main Inc. Remitt.	0.075*	0.089**	0.001	0.007	0.103	0.094	0.062	0.060	−0.241***	−0.251***
	(0.036)	(0.040)	(0.043)	(0.040)	(0.067)	(0.071)	(0.066)	(0.067)	(0.083)	(0.083)
Children (0-6 yrs)	−0.006	−0.002	0.045	0.044	−0.011	−0.020	−0.022	−0.019	−0.006	−0.003
	(0.021)	(0.020)	(0.028)	(0.030)	(0.023)	(0.023)	(0.028)	(0.029)	(0.030)	(0.028)
Children (7-10 yrs)	−0.038	−0.038	0.004	−0.009	0.094**	0.095**	−0.039*	−0.035	−0.021	−0.014
	(0.031)	(0.032)	(0.031)	(0.029)	(0.035)	(0.034)	(0.021)	(0.022)	(0.025)	(0.025)
Children (11-16 yrs)	0.028	0.027	0.023	0.018	−0.028	−0.028	−0.000	0.004	−0.023	−0.021
	(0.032)	(0.032)	(0.032)	(0.032)	(0.024)	(0.023)	(0.025)	(0.025)	(0.021)	(0.019)
No. of Elders	0.047**	0.045**	0.026	0.024	0.008	0.008	−0.023	−0.017	−0.058**	−0.060**
	(0.018)	(0.019)	(0.019)	(0.020)	(0.019)	(0.018)	(0.017)	(0.019)	(0.022)	(0.023)
No. of Working Mem.	0.021	0.019	0.037*	0.035*	−0.003	0.000	−0.004	−0.004	−0.050**	−0.050**
	(0.016)	(0.016)	(0.018)	(0.019)	(0.019)	(0.018)	(0.016)	(0.017)	(0.018)	(0.018)
Total HH Education	−0.003*	−0.003*	−0.000	−0.000	−0.003	−0.003	0.001	0.001	0.005**	0.005**
	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Social Status	−0.021	−0.028	−0.015	−0.015	−0.031	−0.034	0.010	0.006	0.057**	0.070**
	(0.018)	(0.018)	(0.027)	(0.028)	(0.023)	(0.025)	(0.021)	(0.021)	(0.023)	(0.025)
Farming Shocks		0.000		−0.000		0.001		−0.000		−0.001**
		(0.001)		(0.001)		(0.001)		(0.001)		(0.000)
Environmental Shocks		0.002		0.001		−0.001		−0.000		−0.002**
		(0.001)		(0.001)		(0.000)		(0.000)		(0.001)
Economic Shocks		−0.000		−0.000		−0.001		0.000		0.001
		(0.000)		(0.001)		(0.001)		(0.001)		(0.001)
Crime Shocks		−0.006**		−0.001		−0.003**		0.000		0.009**
		(0.002)		(0.004)		(0.001)		(0.001)		(0.004)
Other Shocks		0.000*		−0.000		0.000		−0.000		−0.000*
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
Certainty		−0.001		−0.012		0.020		0.033		−0.040*
		(0.022)		(0.024)		(0.034)		(0.022)		(0.019)
Constant	−0.286	−0.363*	0.035	0.151	0.209	0.089	0.207	0.075	0.835***	1.047***
	(0.219)	(0.209)	(0.259)	(0.267)	(0.264)	(0.280)	(0.220)	(0.247)	(0.261)	(0.269)
Observations	676	664	676	664	676	664	676	664	676	664
Adj. R-squared	0.221	0.224	0.025	0.017	0.041	0.037	0.063	0.055	0.072	0.087

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses.

II Description of Variables

Debt Indices	
Objective Over-Indebtedness Index	It contains the equally weighted average of z-scores of four debt indicators. The procedure of aggregating these specific outcomes is adapted from Kling et al. (2007). It "improves statistical power" and helps "to detect effects that go in the same direction" among indicators (Kling et al., 2007, p.89). The objective over-indebtedness index captures households with a debt service to income ratio greater than 40%, a remaining debt service to income ratio greater than 40%, households, who defaulted on a loan or paid late in the last 12 months and households with more than two loans. The literature has defined (kind of arbitrary) thresholds for the DSR indicator beyond which a household is over-indebted. A household is deemed over-indebted, for example, if its DSR exceeds - depending on the study - 0.3 to 0.5 (Chichaibelu and Waibel, 2017). Hence, we set the over-indebtedness threshold at a DSR of 0.4 following what we deem is best practice among researchers (Georgarakos et al., 2010).
Subjective Over-indebtedness Index	It contains the equally weighted average of z-scores of three debt indicators: the standardized sacrifice index and two assessments on whether the household has too much debt and whether it has difficulties paying them off.
Debt Measures	
Debt Service to Income Ratio	It is the ratio of all annual interest and principal payments on loans divided by all annual income generating activities of the household.
Debt Position	The question if the household has too much debt right now is asked twice in almost identical fashion. For this reason, we combine both questions by deriving two dummy variables, standardize them and calculate their mean. The exact formulation of both questions is the following: "I have too much debt right now" (Disagree fully, disagree strongly, disagree a little, neither agree nor disagree, agree a little, agree strongly, agree fully) and "Which of the following best describes your current debt position?" (I have too little debt; I have about the right amount of debt; I have too much debt right now.). The first dummy equals 1 if the respondent at least agrees a little and the second equals 1 if they feel they have too much debt right now.
Difficulties to Pay Off Debt	Dummy variable derived from the categorical question with answer options 1-"I have no difficulties paying off my debt", 2-"I have some difficulties [...]", and 3-"I have a lot of difficulties [...]", where 1 and 2 are coded to 0 in the dummy and 3 is coded to 1.
Remaining Debt to Income Ratio	The ratio relates a household's actual, yearly debt burden to the average income of 2016 and 2017.

Sacrifice Index	This index is adapted by Schicks (2013), which asks for several sacrifices households may make because they lack money. Like them, we combine these indicators into one "sacrifice index" applying polichoric principal component analysis such that a continuous index is created giving more weight to more serious sacrifices people have to make and transforming the categorical responses into a continuous measure (Kolenikov and Angeles, 2009; Smits and Günther, 2017). In total, we ask respondents about ten possible sacrifices both for a shorter term (i.e. twelve months) and for a longer term (five years). Unlike Schicks (2013), we do not pose questions about the acceptability of sacrifices made but ask only for the frequency of distress events that occurred in the household. We added two questions introduced by Smits and Günther (2017) and two new questions that are more context-specific to the rural setting in North-East Thailand. Depending on the question asked, respondents could answer on a scale from 1-3 (e.g. had to work much more, more, not more) or from 1-5 (e.g. had to buy less food: never, sometimes, regularly, often, almost always, always).
Income Forecasts	
Quantitative Income Forecast	Relative change between expected median income from the probabilistic expectations elicitation and the actual income in 2017.
Qualitative Forecast Error	Difference between expected income in 2016 and actual welfare of the household as evaluated in 2017.
Expectation Measures	
Actual welfare of the household	Answer to "Do you think your household is better off than last year?", from 1-"much worse off" to 5-"much better off".
Certainty	Answer to "How certain are you that this income development will truly become reality?". The scale ranges from 1-"Very uncertain" to 4 "Very certain".
Expected income	Answer to "How do you think your average monthly income will develop in the next twelve months?", from 1-"Decrease a lot" to 5-"Increase a lot".
Probabilistic expectations	Probabilities assessing how individuals assess future outcomes.

Experiment Measures	
Treatment	1=Hard Quiz, 2=Easy Quiz.
Expected Rank	Rank that participant expects to reach after taking the test quiz from 1-"Least questions answered correctly" to 10-"Most questions answered correctly".
Number of Goods	Amount of goods participant wants to buy.
Overconfidence	Difference between expected and actual rank of participant.
Overborrowing	Dummy variable, that takes the value 1 if participant wants to buy more than earnings including endowment can pay for.
Overspending	Dummy variable, that takes the value 1 if participant wants to buy more than earnings excluding endowment can pay for.
Controls	
Age	Age of respondent in years.
Age Squared	Squared term of age.
Financial Literacy Score	Our index is based on seven questions eliciting financial knowledge, on nine assessments concerning financial behavior, and on three questions regarding financial attitude. The overall index is composed of the sum of the sub indices and ranges between 0 and 22 with higher numbers indicating a higher level of financial literacy.
Financial Risk Taking	Answer to "Attitudes towards risk change in different situations. When thinking about investing and borrowing are you a person who is fully prepared to take risk or do you try and avoid taking risk?", from 1-"Fully unwilling to take risks" to 7-"Fully willing to take risks". Part of our risk preference measure.
Main Income Dummies	We include four income dummies that tell us whether the main income comes from farming, off-farm employment, self employment or remittances.
Monthly Inc. 2017	Monthly household income in 2017
Number of children	This variable is split in three age categories for the analysis. Number of children aged 0-6 years; Number of children aged 7-10 years; Number of children aged 11-16 years.

Number of Elders	Number of elder household members, defined as people older than 60 years.
Shock loss indicators	We include information on monetary losses from various shock events for 2016 and 2017. We hereby separate by five shock categories: Farming Shocks, Environmental Shocks, Economic Shocks, Crime Shocks, Other Shocks.
Number of Working Members	Number of working household members.
Risk Preference	Equally weighted average of risk taking and financial risk taking.
Risk Taking	Answer to "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risk?", from 1-"Fully unwilling to take risks" to 7-"Fully willing to take risks". Part of our risk preference measure.
Self-Control	We use the questions introduced by **?** and add up the Likert-Scale answers to one score. The scale ranges from 1-"Disagree fully" to 7-"Agree fully". The final score ranges from 0 to 49 where lower numbers indicate a higher level of self-control.
Total HH Education	Sum of years all working household members went to school.
Big Five - Personality Traits	
Agreeableness	A person, who scores high on Agreeableness (Item scale ranges from 1 to 7 for all items) has a forgiving nature, is considerate and kind and not rude to others.
Conscientiousness	A person, who scores high on Conscientiousnes does a thorough job, works efficiently and is not lazy.
Extraversion	A person, who scores high on Extraversion is communicative, talkative, outgoing and not reserved.
Neuroticism	A person, who scores high on Neuroticism worries a lot, gets nervous easily and is not relaxed.
Openness	A person, who scores high on Openness values artistic experiences, is original and has an active imagination.

Additional Controls Experiment	
BMI	Respondent's Body Mass Index as of 2017.
Difficulties in Game	Answer to "Did the respondent have difficulties answering questions?" with 1-"Not at all", 2-"Yes, a little bit", 3-"Yes, very much". Filled in by the enumerator.
Financial Decision Maker	Answer to question "Who is responsible for making day-to-day decisions about money in your household?" where means 1-"Myself", 2-"Myself and someone else" and 3-"Someone else".
Health Status	Health status of the respondent in 2017: 1-"Good", 2-"Can manage", 3-"Sick"
Marital Status	Respondent's marital status: 1-"Unmarried", 2-"Married", 3-"Widow", 4-"Divorced/separated".
Morning	Dummy variable that takes the value 1 if the interview took place in the morning, i.e. before 11am.
Midday	Dummy variable that takes the value 1 if the interview took place around noon, i.e. between 12am and 2pm.
Numeracy	The numeracy index is based on six questions about simple arithmetic problems. It ranges between zero and six. Zero, if the respondent does not give any correct answer and six if the respondent gives only correct answers.
Read Alone	Dummy variable that takes the value 1 if the participant could read the experimental instructions without help. Filled in by the enumerator.
Relation to HH Head	Respondent's relation to the household head: 1-"Head", 2-"Wife/Husband", 3-"Son/Daughter", 4-"Son/Daughter in law", 5-"Father/Mother", 8-"Grandchild", 9-"Nephew/Niece", 11-"Other relatives".
Sex	Sex of respondent: 1-"Male", 2-"Female".
Years of Schooling	Years respondent went to school.

III Experimental Material

Material 1: Instructions Experiment

Experiment Script

Read out:
We want to play a market game with you. In this game you can earn money and buy goods. The kind of goods you can buy are placed right next to you. Each piece has a value of 20 THB, but we offer them to you for a discounted price of 10 THB. You don't have to buy one kind of product, but can buy different kinds (for example 2 chocolate bars and 1 bag of chips). If you don't like to buy anything you can keep the money you earn.

To earn money, you have to play a quiz which consists of 15 questions. 10 persons from another village, which is similar to your village, took the same quiz before. The amount of money you earn is dependent on how many questions you answered right in comparison to these villagers. In this picture, the person who has given the most correct answers is ranked 10, the person who has given the second most correct answers is ranked 9, the person who has given the third most correct answers is ranked 8, and so on. In the picture you can also see how much money you will earn dependent on your ranking. For example, if you are ranked 7 you will earn 20 THB. Please take your time to understand how you can earn money in this game.

[Show picture of ranks, payoffs and people]

I want you to ask some test question to check whether the procedure of the ranking is clear to you. If not, I will explain it again.

Test Question 1: What does it mean to be ranked 6? [Open answer; enumerator please continue if you think the respondent gave a correct answer]

Test Question 2: How much money do you earn if you are ranked 6? [Answer: 10 THB]

Test Question 3: How many goods you can buy for 10 THB? [Answer: 1]

The money you earn, will be put on your game account which already has 40 THB in it. As you can see from the picture, you can earn up to additional 40 THB. The quiz for which you will receive money will be played in the second round.

In the first round, you will get 7 test questions, which are very similar to the questions you will get in the second round. But again, you can ONLY earn money in the second round.

After you answered this first set of questions, you have to decide how many goods you want to buy. The 40 THB that are already in your account are given you as a credit that you can use to buy the goods. With the money you earn in the second round in the quiz you will pay back your credit. If you spend more money than you earned we will keep the money from your account and give you the goods you have bought. If you earned more than you bought, you pay back your credit and can keep the rest of the money and goods.

If you don't have any further questions we start with the first round. [FAQ]

[Hand respondent the first quiz (green paper). If respondent cannot read, assist in all tasks]

Please read through the questions on the green sheet of paper and try to answer as many questions as you can. You have 5 minutes to answer the questions. I will tell you when the 5 minutes are over. After you have finished the quiz, please have a look on the white piece of paper and answer these questions and make your buying decision. When you have finished the first round, I will collect the white piece of paper. You can keep the green paper with the test quiz. It is only for you, so that you know what kind of questions to expect in the quiz of the second round.

[Set your alarm clock to 5 minutes and tell the respondent to start]

The 5 minutes are over. Please, stop answering the test quiz and make your decisions on the white sheet of paper. Give me a sign when you have made your decisions, then I will collect the white paper.

[During the time the respondent takes the second quiz, evaluate the white sheet of paper and enter the numbers on the tablet]

Now, in the second round, you play the quiz that decides how much money you earn. You have 10 minutes to answer the questions. Afterwards, I will collect the quiz, calculate your earnings and hand you the goods and money.

[Hand the second quiz, set your alarm clock to 10 minutes and tell respondent to start]

The time is up. Please, hand me the second quiz. Before we conclude, I have some final questions for you.

Question 1: After taking the quiz, when 1 is the villager who gave the least correct answers and 10 is the villager who gave the most correct answers, where do you see yourself in this picture?

Question 2 [Only ask if expected earning of respondent was smaller than 40 THB]: Would you have buy more goods, if you thought your earnings would be higher?

Question 3 [Only ask if expected earning of respondent was more than 0 THB]: Would you have buy less goods, if you thought your earnings would be lower?

Thank you very much for your participation, we hope you enjoyed the game. I will now calculate your earnings and inform my STL which will bring you your payment and goods.

[Calculate rank, earnings and cash/goods payoff. Wait for STL to hand the money/goods]

{In the very unlikely case, that more goods were wanted than earnings are generated:}

I calculated your earnings and you cannot afford all the goods you want to buy. You want to buy […] goods but can only afford […] goods. Please, choose which goods you want to keep.

[Please note which goods were finally kept]

Material 2: Guideline for Interviewers to Answer Questions from Participants

Frequently Asked Questions

Respondent: "What if I don't want to buy anything?"
You: "You don't have to buy anything, you can also keep the money."

Respondent: "Can I spend all my money on buying products?"
You: "Yes you can, but if you do not earn enough money to pay all the products you wanted to buy, you will only get the part of the products you can afford."

Respondent: "Can I change my buying decision after I took the second quiz?"
You: "No, your decision is fixed. Only in the case where you wanted to buy more products than you have money available, you can decide on which products to keep"

Respondent: "What happens if I spend more money on products than I earn?"
You: "Then we will take the money from the 40 THB that are already on your virtual bank account for the game. If even this is not enough, you only get as many products as you have money. We will NOT take any out of your pocket and we will NOT take money from the 50 THB you get for the questionnaire. We only count the money you get in the game."

Respondent: "Does being on rank 7 means that I need to get 7 questions correct?"
You: "No! It means that three persons have answered more questions correctly than you and six persons have answered less questions correctly than you. The rank is always dependent on how many questions you have correct in comparison to the other 10 villagers. In this case you are as good as the villager who was ranked 7."

Respondent: "Does it make a difference which questions I answer correctly?"
You: "No, all questions count the same."

Respondent: "Do the products really cost 20 THB per piece?"
You: "Yes, if you buy them as presented here, they cost 20 THB."

[Respondent: "What if I don't know the answer to a question at all?"
You: "Just take a guess. You don't receive some sort of minus points for wrong answers."]

Respondent: "What if I cannot finish the quiz in time?"
You: "That is no problem. Please, try to answer as many questions as you can in the given time frame. There will be no minus points for unanswered questions."

Respondent: "Who are the other 10 persons who have answered the quiz before?"
You: "They are just some randomly selected persons from another village, that is similar to your village."

Material 3: Quiz-Hard Treatment

Test Quiz

1. What is the biggest city in Canada by population?

- ☐ Ottawa
- ☐ Vancouver
- ☐ Montreal
- ☐ Toronto

2. What is the most common blood type in the world?

- ☐ O positive
- ☐ AB positive
- ☐ B positive
- ☐ A positive

3. Which animal cannot fly?

- ☐ Chicken
- ☐ Duck
- ☐ Penguin
- ☐ Squirrel

4. Which fruit contains the most amount of Vitamin C per 100g?

- ☐ Pineapple
- ☐ Mango
- ☐ Banana
- ☐ Passion Fruit

5. How many days does Mercury need to orbit the sun?

- ☐ 144
- ☐ 94
- ☐ 88
- ☐ 126

6. Which animal is not part of the Zodiac?

- ☐ Leo
- ☐ Pisces
- ☐ Dragon
- ☐ Scorpio

7. Which are the Japanese cities that were hit by atomic bombs of the U.S. army during WWII?

- ☐ Hokkaido and Kyushu
- ☐ Shikoku and Hashima
- ☐ Okinawa and Okinoshima
- ☐ Hiroshima and Nagasaki

Quiz

1. What is the national animal of China?

- [ ] Tiger
- [ ] Eagle
- [ ] Lion
- [ ] Panda

2. If Thai currency is THB, what is the currency of Germany?

- [ ] Euro
- [ ] US. Dollar
- [ ] Pound
- [ ] Deutsche Mark

3. How many provinces does Japan have currently?

- [ ] 47 provinces
- [ ] 48 provinces
- [ ] 49 provinces
- [ ] 50 provinces

4. Which is the heaviest insect in the world?

- [ ] Grasshopper
- [ ] Spider
- [ ] Beetle
- [ ] Centipede

5. Which of these countries does NOT border Germany?

- [ ] Austria
- [ ] France
- [ ] Sweden
- [ ] Poland

6. Which is the most drank beverage in the world?

- [ ] Coca Cola
- [ ] Beer
- [ ] Tea
- [ ] Coffee

7. Which country is the origin of pizza?

- [ ] Italy
- [ ] France
- [ ] Spain
- [ ] Portugal

8. Which of these four is the biggest organ of the human body?

- [ ] Lungs
- [ ] Heart
- [ ] Liver
- [ ] Brain

9. Who is the president of Indonesia?

- [ ] Susilo Bambang Yudhoyono
- [ ] Joko Widodo
- [ ] Abdurrahman Wahid
- [ ] Megawati Sukarnoputri

10. What color is traditionally not associated with Christmas Day?

- [ ] Red
- [ ] Gold
- [ ] Green
- [ ] Pink

11. Of which colors is the flag of Germany composed of?

- [ ] Black, Blue and Gold
- [ ] Black, Red and White
- [ ] Black, Red and Gold
- [ ] Black, Red and Blue

12. Which fruit is blue?

- [ ] Blueberry
- [ ] Pear
- [ ] Apple
- [ ] Kiwi

13. What color will you get if you mix blue, red and yellow?

- [ ] Grey
- [ ] Dark green
- [ ] Black
- [ ] Brown

14. How many seasons are there in Germany? And which ones?

- [ ] 4 seasons including spring, summer, autumn and winter.
- [ ] 3 seasons including rainy, winter and spring
- [ ] 2 seasons including rainy and winter
- [ ] 2 seasons including summer and winter

15. Who is the God of Islam?

- [ ] Nabi Muhammad
- [ ] Yahweh
- [ ] Allah
- [ ] Moses

QID: [ ]

Material 4: Quiz-Easy Treatment

Test Quiz

1. What is the biggest city in Thailand?

- ☐ Ubon Ratchathani
- ☐ Chiang Mai
- ☐ Bangkok
- ☐ Surat Thani

2. What color will you get if you mix blue and yellow?

- ☐ Grey
- ☐ Green
- ☐ White
- ☐ Pink

3. Which animal cannot jump?

- ☐ Asian Buffalo
- ☐ Dog
- ☐ Elephant
- ☐ Tiger

4. Which fruit is prohibited in public transport around South-East Asia?

- ☐ Banana
- ☐ Papaya
- ☐ Durian
- ☐ Apple

5. Which of these countries does NOT border Thailand?

- ☐ Vietnam
- ☐ Laos
- ☐ Cambodia
- ☐ Myanmar

6. Which animal is not part of the Chinese Zodiac?

- ☐ Monkey
- ☐ Horse
- ☐ Cat
- ☐ Dragon

7. What is the most common eye color in the world?

- ☐ Blue
- ☐ Brown
- ☐ Green
- ☐ Hazel

Quiz

1. What is the national animal of Thailand?

- [ ] Elephant
- [ ] Eagle
- [ ] Lion
- [ ] Naga (Thai Dragon)

2. If Thai currency is THB, what is the currency of USA?

- [ ] Euro
- [ ] US Dollar
- [ ] Pound
- [ ] Franc

3. How many provinces does Thailand have currently?

- [ ] 76 provinces
- [ ] 77 provinces
- [ ] 78 provinces
- [ ] 79 provinces

4. Which is the biggest animal in the world?

- [ ] Blue Shark
- [ ] Killer Whale
- [ ] Blue Whale
- [ ] Elephant

5. How many months have 31 days?

- [ ] 6
- [ ] 5
- [ ] 4
- [ ] 7

6. How many seasons are there in Thailand? And which ones?

- [ ] 3 seasons including summer, rainy and winter
- [ ] 2 seasons including summer and rainy
- [ ] 2 seasons including rainy and winter
- [ ] 4 seasons including summer, rainy, autumn and winter

7. Which of these do you need to make traditional Som Tam Thai?

- [ ] Coconut Milk
- [ ] Tomatoes
- [ ] Oyster Sauce
- [ ] Chili Paste

8. Which is the biggest sense organ of the human body?

- [ ] Skin
- [ ] Eyes
- [ ] Mouth
- [ ] Ears

9. Who is currently the president of the United States of America?

- [ ] Donald Trump
- [ ] Barack Obama
- [ ] Angela Merkel
- [ ] Bill Clinton

10. What is the color of the day on Wednesday?

- [ ] Red
- [ ] Pink
- [ ] Green
- [ ] Light blue

11. Of which colors is the flag of Thailand composed of?

- [ ] Green, White and Red
- [ ] Green, White and Blue
- [ ] Blue, White and Red
- [ ] Blue, Red and Yellow

12. Which fruit does not have thorns?

- [ ] Durian
- [ ] Jackfruit
- [ ] Rambutan
- [ ] Salak

13. Which reign of Thailand abolished slavery?

- [ ] 4th Reign
- [ ] 5th Reign
- [ ] 6th Reign
- [ ] 7th Reign

14. Which country has the highest total rice consumption?

- [ ] Thailan
- [ ] Germany
- [ ] Cambodia
- [ ] China

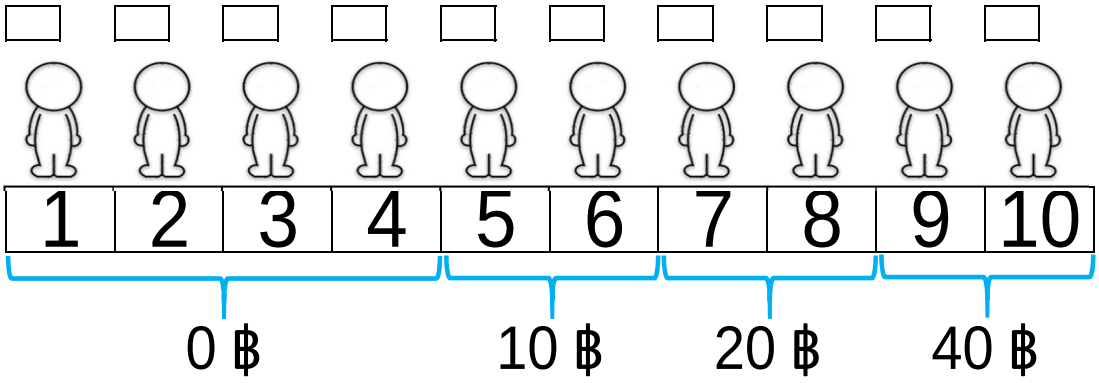
15. Who is the son of god of Christianity?

- [ ] Nabi Muhammad
- [ ] Jesus
- [ ] Guanyin
- [ ] Vishu

QID: [ ]

Before you take the second quiz where you can earn money, we have some questions for you and you have to decide which goods and how many you want to buy.

Question 1: As mentioned before, 10 persons from another village took the same quiz as you will have to take now. After taking the test quiz and knowing the second quiz will be similar: When the villager on the left side of this picture is the one who gave the least correct answers and the villager on the right side of this picture is the one who gave the most correct answers, where do you see yourself in this picture? Please cross the respective box.



Question 2: We told you that the money you will earn in the second quiz depends on how you actually are ranked in this picture above. For example if you are ranked 7, which means that 3 villagers gave more correct answers than you and 6 villagers gave less correct answers than you, you will get 20 THB. What do you think, how much money will you earn?

☐ ฿

Question 3: Now, you have to decide how many and which kind of goods you want. You have to think about how much you will possibly earn including your credit and how much you can spend on the goods. You don't have to buy anything at all. But if you want to, remember each piece has a discounted price of 10 THB and you can buy as many different kinds as you want.

Example: You think you are ranked 7, so you earn 40 THB, and you want to buy one pack of coffee and one bag of chips. That will cost you 20 THB. After you have answered the second quiz, we will calculate your earnings.

If you have earned 40 THB for example, we will give you the goods you wanted to buy and additionally 20 THB.
All in all, you have two goods then and 60 THB.

If you have earned 10 THB for example, we will give you the goods you wanted to buy and we will deduct 10 THB from the 40 THB credit we gave you. All in all, you have two goods then and 30 THB.

Please indicate here how many of each good you want. If you do not want to buy some kind of good put 0 there:

Coffee		Mango	
Chips		Detergent	

QID:

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