Do You Really Know the Income of Your House?

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Abstract: Good quality data is fundamental for applied economic research; particularly data relating to income, which is used to calculate the levels of poverty. Using a survey that asks the same questions to the wife and the husband within a household, I found that the income reported by the two spouses is different. While it is reasonable that the wife and the husband differ in some margin in the income reported, the principal concern is when one spouse reports income which classifies the household as being poor, and the other spouse reports income which classifies the household as not poor ("misclassification of poverty"). To understand this problem of misclassification, I develop a non-unitary household model that predicts when one spouse has problems of self-control, then the other spouse has incentives not to reveal his or her true salary or other sources of income. The consequence is that the spouses have different information about the income of the household. I test the theoretical model, and I found that the self-control of the wife can predict the difference in the income reported, and her self-control can be used to partially explain the misclassification of poverty problem.

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1 Introduction

The following question was asked of both the husband and the wife living in the same household and participating in the social program *Progresa*: What is the monthly income of this household, taking into account all the salaries of your family and other sources of income, e.g., rent, transfers, remittances, pensions, among others? Only in 16% of the households the income reported by the husband and the wife coincide. On average, husbands reported higher income than their wives: 2,542 pesos vs. 2,450 pesos (see Table 1). This difference with respect to the income reported by wives and their husbands varies widely across households from zero to 7,500 pesos (see Figure 1).

Furthermore, I find that reporting different incomes affects the classification of the household as being poor or not poor. As a consequence, who answers the survey matters. For example, 11% of the households were classified as poor using the information reported by the wife, and not poor using the information reported by the husband (see Table 2). Conversely, for 9% of the cases, the households were classified as poor by the husband; and not poor using the information of the wife (see Table 2). I call this situation "misclassification of poverty".

There is an increasing interest in the relationship between measures of poverty and problems in survey data. Kilic and Sohnesen (2015) found that using a short versus a longer questionnaire can affect the answers, and as a consequence, the prediction of poverty rates. Glewwe and Dang (2008) found that using laptop computers in the field to improve the collection of data has no significant effect on measurement of poverty. As a consequence, Glewwe and Dang (2008) recommended increasing the sample size to improve the precision of the estimate of interest.

This paper incorporates self-control as a variable to understand the difference in the income reported by the wife and the husband. Recent psychological evidence has found that individuals use their perceptions of

other's self-control as a signal to trust (Righetti *et al.*, 2011). I propose that this evidence can be extended to understand the difference between the household income reported by the wife and by the husband. In particular, I develop a non-unitary household model that predicts that when one spouse has problems of self-control, then the other spouse has incentives not to reveal his or her true salary or other sources of income. As a result, the wife and the husband end with different information about the income of the household.

While it is reasonable that the wife and the husband differ in some margin in the income reported, the principal concern is when one spouse reports income which classifies the household as being poor, and the other spouse reports income which classifies the household as not poor ("misclassification of poverty"). So, I analyze how the self-control of the wife and the husband can explain the "misclassification of poverty" problem.

The data contains information that measures lack of self-control for the wife and for the husband. However, I have problems of endogeneity. The measure of self-control is a proxy using a psychological test, as a consequence, there is a potential problem of measurement error. Furthermore, the psychological literature recognizes other variables that can explain problems of coordination and trust inside the household that are not available in the data. This situation opens the possibility of bias due to omitted variables. Regarding reverse causality, there is evidence that adult personality is stable after the age of 26. Although there is a potential problem of reverse causality, this is minimal because most of the participants in the survey are above the age of 26. To assess the problem of omitted variables, I use a bounding methodology developed by Altonji *et al.* (2005), and refined by Oster (2014). Finally, to correct for the problem of measurement error, I use a structural latent model with unobserved heterogeneity (Carneiro, *et al.*, 2003).

I find that wive's impulsiveness (lack of self-control) is an important predictor regarding the misclassification of poverty problem. By using this non-cognitive variable, the problem of misclassification can be reduced in 15%.

The rest of the paper is organized as follows. Section 2 introduces some consequences for the husband reporting a different income than his wife. Section 3 presents the basic environment of the model. In Section 4, I introduce the data and empirical strategy. In Section 5, I present the results, and I conclude with Section 6.

2 Some Consequences and Potential Explanations for the Husband Reporting Different Income than the Wife

I estimate the consequences for the husband reporting different income than his wife on the classification of "poverty" of the household[1]. In 80% of the cases, it does not matter whether the wife or the husband answer the survey, the classifications of being poor or not poor coincide. However, in 11% of the cases, the households were classified as poor by the wife, but not as poor by the husband. Conversely, for 9% of the cases, these households were classified as poor by the husband; and not as poor using information from the wife (see Table 2). So, in 20% of the cases, using the information of the income reported by the wife and the husband, there is no clarity about the poverty classification.

The question is to understand why the wife and the husband reported different incomes. Some potential hypothesis are: (1) differences in the capacity of the wife and the husband to recall income information (Fisher, Reimer and Car, 2010). This could be the case when the income of the head of the household fluctuates daily depending of the type of job, or households that have different sources of income; (2) incentives to underreport income in order to get help from the government. Meyer and Mittag (2015) found evidence of underreporting government transfers by survey respondents comparing the Current Population Survey (CPS) with administrative data; and (3) problems of asymmetric information inside the household. Castilla

[1] Mexico uses a multidimensional measure of poverty based on income and social rights. A person with an income below the well-being income threshold established by the National Council of Evaluation and with one or more social deprivations is considered multidimensional poor. A person is considered below the well-being income level if the per capita household income is less than 704.69 pesos per month in rural areas and 1,002.56 pesos in urban areas. These levels correspond to those calculated by the National Council of Evaluation (CONEVAL) for December 2010, which is the period when the survey was collected. In this paper, I just focus on the monetary part. So, the definition used of "poverty" in this paper refers to a person below the well-being income level used by CONEVAL.

(2015) conducted a trust game among married couples who were given a considerable amount of money in order to understand asymmetric problems. As a result, she found that wives received more money and gave less money in return to their husbands. In particular, she found that when the husbands spends a significant amount of their salary on tobacco, the wives gave to them less money.

While the hypothesis (1) is related to a cognitive process of the individuals, the hypothesis (2) and (3) are related to the behavior of the individuals. In particular, the hypothesis (2) is related to a potential problem of cheating. Gottfredson and Hirshi (1990) affirmed that in order to get away from rule-breaking conducts, as cheating, individuals are required to have self-control. Conducting laboratory experiments, Muraven *et. al* (2006) found that lack of self-control predicted cheating. Bucciol and Piovesan (2011) found that a way to reduce the probability of being dishonest is reminding people to behave honestly.

The hypothesis (3) is related with the problem of trust within the spouses. Buyukcan-Tetik, *et. al* (2015) observed that being seen as having higher levels of self-control is identified with being more trustworthy among adults. Peetz and Kammrath (2011) found that individuals with higher self-control are better able to keep promises to their sentimental partners. Finally, Righetti *et. al* (2011), developed four experiments to analyze the relationship between self-control and trust, and they found that individuals use one's self-control as an indicator to be trustworthy.

The self-control is a potential variable that can explain the problems of trust inside the household and cheating. As a consequence, it is a potential variable that can explain the differences in the income reported by the wife and the husband and for understanding the "misclassification of poverty" problem. In particular, if one of the spouses has problems of self-control, but the other spouse does not, it should be expected that the spouse without problems of self-control hide some of his/her income from the other spouse. As a consequence, the spouses have different information about the income of the household. I formalize this idea presenting a non-unitary household model in the next section incorporating the possibility that the spouses have problems of self-control.

3 The Model

3.1 Intertemporal Consumption

I introduce a simple model of two periods. There are two individuals: man (m) and woman (w). Both of them have preferences for consumption of food (c), and a household level public good (Q), in both periods. Each individual has a discount utility factor given by δ^i. Also, each individual has a "bias for the present" represented by β^i. It is assumed that δ^i, $\beta^i \in$ (0,1], and these parameters are perfectly observed by each individual and his or her spouse. While the individuals recognize they will have potential problems of self-control ($\beta^i < 1$), I will assume that they do not do ex-ante any commitment to avoid future problems of self-control. The only technology available for each individual is to hide part of his/her income when a problem of self-control is observed in his/her spouse. I explain this situation with more detail later. Their preferences are given by a concave and strictly increasing utility function in each argument:

$$u^i\left(c_{it}, Q_t\right) \qquad i = m, w \qquad t = 1, 2 \tag{1}$$

Each period, both spouses are provided with 1 unit of labor that can be used for producing the public good (z_{it}) or work in the market (1- z_{it}). The public good (Q) is produced using a concave and strictly increasing production function (f) in each argument that only uses labor:

$$Q_t = f\left(z_{it}, z_{jt}\right) \qquad i, j = m, w \qquad t = 1, 2 \tag{2}$$

If an individual decides to work in the market, he or she will receive a salary w_{it}. Each individual uses this income to buy food, c_{it}; saving, s_{i1}; and time for producing the public good, z_{it}, at price, w_{it}. Finally, there are benefits and costs for being in the household. Besides the benefits of the public good, another benefit is given by the money that one individual can extract from the other member, this "tax" is

represented by the function $\tau^i(\theta_{it}w_{it}) \in [0,1]$. Notice that this "tax" is a function of his/her salary (w), and the proportion of the salary reported (θ). Also, θ is between zero and one. So, as much income the spouse reports ($\theta_{it}w_{it}$), then bigger is the income that can be extracted from the other spouse. But also, the other spouse can "tax" his/her income reported. As a consequence, the spouse faces a trade-off, on the one hand the spouse wants to report a higher income in order to have more power to "tax" the income of the other spouse; but, on the other hand, reporting more income opens the possibility of being more "taxed" by the other spouse. So, the budget set for each individual is given by:

$$c_{i1} + s_{i1} = [1 - z_{i1}]w_{i1} - \tau^j(\theta_{j1}w_{j1})[1 - z_{i1}]\theta_{i1}w_{i1} + \tau^i(\theta_{i1}w_{i1})[1 - z_{j1}]\theta_{j1}w_{j1}$$ for i=m,w; t=1; and

$$c_{i2} = [1 - z_{i2}]w_{i2} - \tau^j(\theta_{j2}w_{j2})[1 - z_{i2}]\theta_{i2}w_{i2} + \tau^i(\theta_{i2}w_{i2})[1 - z_{j2}]\theta_{j2}w_{j2} + (1+r)s_{i1}$$ for i=m,w; t=2; or

$$c_{i1} + \frac{c_{i2}}{(1+r)} = [1 - z_{i1}]w_{i1} - \tau^j(\theta_{j1}w_{j1})[1 - z_{i1}]\theta_{i1}w_{i1} + \tau^i(\theta_{i1}w_{i1})[1 - z_{j1}]\theta_{j1}w_{j1}$$
$$\frac{1}{(1+r)}\{[1 - z_{i2}]w_{i2} - \tau^j(\theta_{j2}w_{j2})[1 - z_{i2}]\theta_{i2}w_{i2} + \tau^i(\theta_{i2}w_{i2})[1 - z_{j2}]\theta_{j2}w_{j2}\} \quad (3)$$

Notice that the individuals can separate. In which case, each individual maximizes his/her private consumption subject to his/her budget set. In this situation the individual does not need to share the income with the other member of the household; but, the cost of separating is not having access to the income of the other individual and the overall public good.

Assuming that both individuals decide to be together, then each individual (i=m,w) maximizes his/her utility function (1) subject to (2) and (3). Notice that besides the level of consumption, the individuals need to choose the optimal level of income to report (θ). If the individual reports a lower income, the cost is that he/she will have less power to "tax" the other spouse; but on the other hand, as much income the individual reports, his/her income is more subject to be "taxed" by the other spouse. Solving this problem,

and assuming an interior solution, the equilibrium conditions are presented in Appendix B.

3.2 Trust and Self-control

In this section, I analyze the relationship between the "bias for the present" of individual i (β^i) and the report of income of individual j (θ_j). Without loss of generality, let me start using the husband's Euler Equation for labor (see Appendix B) :

$$u^w_{Q1}\left(c_{w1}, Q_1\right) \frac{f_{z_{w1}}(z_{m1}, z_{w1})}{w_{w1}[1-\tau(\theta_{m1} w_{m1})]\theta_{w1}} = (1+r)\,\beta^w \delta^w u^w_{Q2}\left(c_{w2}, Q_2\right) \frac{f_{z_{w2}}(z_{m2}, z_{w2})}{w_{w2}[1-\tau(\theta_{m2} w_{m2})]}\theta_{w2}$$

Applying the Implicit Function Theorem ($\frac{d\theta_{m1}}{d\beta^w} = -\frac{\frac{dg}{d\beta^w}}{\frac{dg}{d\theta_{m1}}}$) to the following expression:

$$g = u^w_{Q1}\left(c_{w1}, Q_1\right) \frac{f_{z_{w1}}(z_{m1}, z_{w1})}{w_{w1}[1-\tau(\theta_{m1} w_{m1})]\theta_{w1}} - (1+r)\,\beta^w \delta^w u^w_{Q2}\left(c_{w2}, Q_2\right) \frac{f_{z_{w2}}(z_{m2}, z_{w2})}{w_{w2}[1-\tau(\theta_{m2} w_{m2})]}\theta_{w2}$$

It follows that $\frac{dg}{d\beta^w}$ and $\frac{dg}{d\theta_{m1}}$ are given by:

$$\frac{dg}{d\beta^m} = -\,(1+r)\,\delta^w u^w_{Q2}\left(c_{w2}, Q_2\right) \frac{f_{z_{w2}}(z_{m2}, z_{w2})}{w_{w2}[1-\tau(\theta_{m2} w_{m2})]}\theta_{w2} < 0$$

and

$$\frac{dg}{d\theta_{m1}} = u^w_{Q1}\left(c_{w1}, Q_1\right) \frac{f_{z_{w1}}(z_{m1}, z_{w1})}{w_{w1}[1-\tau(\theta_{m1} w_{m1})]^2\theta_{w1}} \frac{d\tau(\theta_{m1} w_{m1})}{d\theta_{m1}} > 0$$

So, it is clear that:

$$\frac{d\theta_{m1}}{d\beta^w} > 0 \text{ and } \frac{d\theta_{w1}}{d\beta^m} > 0$$

From these results, I can stablish the following proposition:

Proposition 1. *Consider the case with i=m,w agents, and t=2 periods. The utility functions are given by* $u^m(c_{mt}, Q_t)$ *and* $u^w(c_{wt}, Q_t)$ *, where c is a private consumption and Q is a public good. Each agent has an individual budget constraint determined by (3), where* $\tau^i(\theta_{it} w_{it})$ *is the "tax" of the individual i over the salary of individual j, each individual has a discount utility factor given by* δ^i *and each individual has a "bias for the present" represented by* β^i*. Then, assuming an interior solution, there is a positive relationship between the income reported by the individual i and a decrease in the "bias for the present" for individual j, i.e.* $\frac{d\theta_{i1}}{d\beta^j} > 0$.

The model predicts that having higher levels of self-control is identified with being more trustworthy, e.g. with a higher level of income reported by the other spouse. As a consequence, the self-control can be used as a variable that can give us information about the difference in the income reported by the wife and the husband. Using this model, we can predict that if one of the spouses has self-control and the other spouse does not, then the spouse who has problems of self-control will report a lower household income. The former result is a consequence that the spouse with self-control hides part of the income. Unfortunately, when both spouses present problems of self-control, it is difficult to predict the bias of the income reported. In the survey most of the husbands are working, but not the wives; so, it is possible that the husbands hide income based on the observation of the self-control of their wives. If this is the case, the difference of the income reported will be explained by the self-control of the wives. However, the wives receive the money from *Progresa*, and it is a considerable part of the income of the household. As a consequence, the wives can also hide some of the income based on their husbands' self-control. Thus, it is necessarily to explore empirically the relationship between the difference in the income reported and the self-control of the wife and the husband.

3.3 Pareto Optimality

The only technology that the wife and the husband have to handle with the problem of self-control is hiding the income. A natural question is to understand what is the effect of this strategy in terms of welfare. There is no guarantee that this equilibrium generates the Samuelson condition for Pareto optimality; however, under some circumstances it is possible. Following Meir and Rainer (2015), let me define $MRS^i_{Qct} = \frac{u^i_{Qt}(.)}{u^i_{ct}(.)}$, for i=m,w, and t=1,2. Using the first order conditions:

$$\frac{u^i_{Qt}(.)}{u^i_{ct}[1-\tau(\theta_{jt}w_{jt})\theta_{it}]} = \frac{MRS^i_{Qct}}{[1-\tau(\theta_{jt}w_{jt})\theta_{it}]} = \frac{w_{it}}{f_{z_{i1}(.)}}$$

and following the condition for Pareto Optimality:

$$MRS^i_{Qct} + MRS^j_{Qct} = \frac{w_{it}}{f_{z_{i1}(.)}} = \frac{w_{jt}}{f_{z_{j1}(.)}}$$

It follows that the conditions in order to satisfy Pareto Optimality are given by[2]:

$$\tau^i(\theta_{it}w_{it})\theta_{jt} = \frac{MRS^i_{Qct}}{MRS^i_{Qct}+MRS^j_{Qct}}, \text{ and}$$

$$\tau^j(\theta_{jt}w_{jt})\theta_{it} = \frac{MRS^j_{Qct}}{MRS^i_{Qct}+MRS^j_{Qct}}$$

It is well known that a non-cooperative household equilibrium does not satisfy the Pareto Optimality condition; however, selecting the correct "tax" on the income and hiding part of the income when faced with problems of self-control can generates an equilibrium that satisfies Pareto Optimality. So, I establish the following proposition:

Proposition 2. *Consider the case with i=m,w agents, and t=2 periods. The utility functions are*

[2] Meir and Rainer (2015) arrived to a similar result, using a static model with exogenous taxes on labour. The principal difference with the results presented here is that the "taxes" are determined endogenously trough the income reported.

given by $u^m(c_{mt}, Q_t)$ *and* $u^w(c_{wt}, Q_t)$ *, where c is a private consumption and Q is a public good. Each agent has an individual budget constraint determined by (3), where* $\tau^i(\theta_{it}w_{it})$ *is the "tax" of the individual i over the salary of individual j, and* θ_{it} *is the proportion of the salary reported by individual i. Then, assuming an interior solution, the Pareto Optimality is obtained if* $\tau^i(\theta_{it}w_{it})\theta_{jt} = \frac{MRS^i_{Qct}}{MRS^i_{Qct}+MRS^j_{Qct}}$ *and* $\tau^j(\theta_{jt}w_{jt})\theta_{it} = \frac{MRS^j_{Qct}}{MRS^i_{Qct}+MRS^j_{Qct}}$ *for i=m,w and t=1,2.*

4 Data

I use a database that has information on socioeconomic and non-cognitive variables for married men and women in 958 households in Mexico. This database was developed to analyze the behaviour of poor families participating in the *Progresa* program, and the data was collected in 2010. In the first step, 60 localities were randomly selected, and then 15 families were randomly selected from each locality.[3]

The dependent variable is the "misclassification of poverty", which is a dummy variable. It takes the value of one when one spouse reports income which classifies the household as being poor, and the other spouse reports income which classifies the household as not poor. It takes the value of zero when the classification of the household is not affected by who answer the survey.

Regarding other important socioeconomic variables, 84.5% of men were employed or self-employed, while 80.4% of women were primarily homemakers (see Table 3). For the men who were working, the average income was 2,002 pesos per month (around US$125), and the average age was 49. Most of the men in this database did not finish the primary school; and, the mean years of schooling was approximately 4 (see Table 4). For women who were working, the average income was 665.32 pesos per month (around US$42), and the average age was 44. The mean years of schooling was 4 (see Table 4).

The data contains information for the following two variables that measure lack of self-control for the

[3]The original sample was 900 families, but it was finaly collected information for 958 household.

wife and the husband: impulsive resolution of problems and impulsiveness. Impulsive resolutions of problems refers to the process of problem solving in the social environment, and impulsiveness measures the ability to achieve goals.

For D'Zurilla and Maydeu-Olivares (1996), social problem solving deals with situations that might affect a person, including impersonal problems, e.g., stolen property; intrapersonal problems, e.g., health problems; interpersonal problems, e.g. marital conflicts; and, social problems, e.g., discrimination. Kaslow and Robinson (1996) found that satisfied couples reported using less impulsive ways of solving problems. Satisfied couples are willing to ask each other for help, to consult each other when making decisions, and to engage in joint decision-making.

Self-control is the ability to manage or regulate emotions, and avoid negative behaviors. Self-control is essential to achieve goals and to avoid impulses. Self-control dilemmas occur when long-term goals and values clash with short-term temptations. A number of rigorous studies have examined the relationship between self-control and positive outcomes. One of the most famous is the "Marshmallow test". Within this experiment the children were each given a marshmallow and told that they can eat it at anytime they desired; however, if they waited 15 minutes, they would receive another marshmallow. Mischel, *et al.* (1989) found that children who were able to wait longer became more academically competent, verbally fluent, attentive, and able to deal with frustration.

The database has two measurements of impulsiveness for the wife and the husband: impulsive resolution of problems and impulsiveness. The impulsive resolution of problems test is based on the Social Problem Solving Inventory of D'Zurilla, *et al.* (1999), it was adapted by Palomar (2012) in Mexico, and it has 3 items. The impulsiveness test is based on the Self-Regulation Questionnaire (SQR) of Brown, *et al.* (1999), it was adapted by Palomar (2012) in Mexico, and it has 5 items.

To analyze the effects of psychological variables on the misclassification problem, I use factor analysis

as a data reduction tool to construct the following latent variables for the wives and the husbands: impulsive resolution of problems and impulsiveness. Factor analysis is used as a psychometric tool to create latent factors that are correlated with a subset of variables of observed data (Glewwe, Ross and Wydick, 2013). Table 5 lists the scales (Column 1) and the questions (Column 2) used to build each scale. Each question has a categorical answers of the type "always", "frequently", "rarely" and "never". I aggregate those answers into scales using principal component analysis where only one latent factor was retained. Column 1 presents the eigenvalue of each latent factor and Column 3 shows the loading associated with each variable.

5 Estimation Strategy

5.1 Establishing Causality

The model to estimate is given by:

$$Y = \beta_1 PV + W_1 + e.$$

where:

Y: Outcome of interest (misclassification of poverty).

PV: Psychological variable of interest (impulsive resolution of problems and impulsiveness of the wife and the husband).

W_1: Observed control variables multiplied with their coefficients $\sum_{j=1}^{J_o} w_j^o \gamma_j^0$.

e: Error term.

The interest is to understand how the psychological variables explain the misclassification problem. However, there are some estimation problems. The first problem is omitted variables bias. Some variables that have explanatory power are not available in the data set, i.e., other variables that can explain problems of coordination inside the household. If these omited variables are correlated with the explanatory variables, then there will be a bias in the estimated coefficients. The second problem is bias due to measurement error in the data, especially with the non-cognitive skills tests. It is well known that when the regressors are measure with error the parameters estimated are bias toward zero. Finally, while it is recognized a potential problem of reverse causality, there is limited evidence that adult personality changes. Caspi and Herbener (1990) argue that this stability is a consequence of individuals selecting environments that are compatible with their choices of partners and occupations, and therefore, maintain considerable personality stability over a lifetime.

To assess the problem of omitted variable, I use a bounding methodology developed by Altonji *et al.* (2005), and refined by Oster (2014). To correct for the problem of measurement error, I use a structural latent model with unobserved heterogeneity (Carneiro, et al., 2003). I explain both methodologies below.

Following Oster (2014), the full model has the form:

$$Y = \beta_1 PV + W_1 + W_2 + \epsilon.$$

where W_2 contains all residual variation that can not be explained by PV and W_1, and $W_2 = \sum_{j=1}^{J_u} w_j^u \gamma_j^u$ is not observed. If PV is correlated with W_2, then β_1 is not identified. Oster (2014) suggests the following:

(1) Regress Y on PV, and report the parameters β_1^0 and R-squared R^0.

(2) Regress Y on PV and W1, and report the parameters $\tilde{\beta}_1$ and R-squared $\tilde{R}$.

(3) Use the information from (1) and (2), and define R_{max} as the overall R-squared of the com-

plete model, i.e. controlling for observables (PV, W_1) and unobservables (W_2). Also, assuming that $\frac{cov(PV,W_2)}{Var(W_2)} = \delta\frac{cov(PV,W_1)}{Var(W_1)}$; Oster (2014) shows that $\beta_1^* = \tilde{\beta}_1 - \delta\frac{(\beta_1^0-\tilde{\beta}_1)(R_{max}-\tilde{R})}{(\tilde{R}-R^0)}$ is a consistent estimator for β_1. So, we can build the following set $[\tilde{\beta}_1,\beta_1^*]$. If this set excludes zero, the results from the controlled regressions can be considered robust to omitted variable bias. But, to estimate β_1^* one needs assumptions for δ and R_{max}. Oster (2014) argues that $\delta \in [0,1]$ is a useful bound because observed control variables are deliberately chosen as determinants of the outcome. Concerning R_{max}, she argues that a useful bound is given by $R_{max} = min\{2.2\tilde{R}, 1\}$[4].

Finally, as a robustness check, Oster (2014) proposes to calculate the value of δ that makes β_1 equals to zero, and she proposes that a value of δ bigger than 1 implies that a result is robust to omitted variables.

To correct for the measurement error problem, I use a structural latent model with unobserved heterogeneity (Heckman, et. al 2006). The "mismatch" (Y) is a function of the latent variable that measures lack of self-control (PV) and the observable variables (X_Y), the reduced equation is given by:

$$Y = \alpha^Y PV + X_Y B^Y + \epsilon^Y$$

While the latent variable (PV) is unobservable, there are measures available in the data (items) that can be treated as realizations of the latent variable:

$$Q = \alpha^Q PV + X_Q B^Q + \epsilon^Q.$$

where Q is an Lx1 vector of items related to the latent variable of interest. The identification assumption takes ϵ^Y and ϵ^Q independent conditional on PV and X.

[4] In a new version Oster (2015) proposes an $R_{max} = min\{1.3\tilde{R}, 1\}$, the cutoff value of 1.3 is derived by a sample of 65 papers that used randomized controlled trials. She determined that using that cutoff allowed 90% of the randomized results to survive

Following Carneiro et al. (2003), the likelihood function is given by:

$$L = \Pi_{i=1}^{N} \int f_{e^Y}(X_Y, Y, \varrho_{PV}) f_{e^{Q_1}}(X_{Q_1}, Q_1, \varrho_{PV}) \ldots f_{e^{Q_q}}(X_{Q_q}, Q_q, \varrho_{PV}) dF_{PV}(\varrho_{PV})$$

Maximizing this likelihood function, it is possible to recover the parameters $\alpha^Y, \alpha^Q, B^Y, B^Q$ for Q=1,... q.

6 Results

6.1 Determinants of the misclassification of poverty

I start in Table 6 column 1 by presenting an OLS regression of the impulsive resolution of problems of the wife on the misclassification of poverty. I control for the age, age squared, and education of both the wife and the husband. Also, I control for the number of children less than 12 years old, the number of adults above 65 years old, and whether the locality is rural or urban. I found that wife's impulsive resolution of problems affects positively the probability of "misclassification".

In Table 6 column 2, I use the same control variables as in column 1, but I added a dummy variable for the type of job of the husband. It takes the value of one if the husband works in the agricultural sector, and zero otherwise. I observe that the parameter of the dummy variable of type of job of the husband is statistically significant. This result makes sense due to the difficulty of recall the information of some kind jobs. Controlling for this variable, the parameter of wife's impulsive resolution of problems continue being statistically significant.

In Table 6 column 3, I include a dummy variable that takes the value of one if the wife works and zero otherwise. I do not find that this variable is statistically significant, and I do not find any considerable change in the parameter of impulsive resolution of problems of the wife. In column 4, I include a variable related to the number of sources of income of the household. It is possible that the wife and the husband

living in households who received different sources of income (salaries, remittances, income for other social programs, pensions, etc.), may have some issues of recalling information about the income of the household. The inclusion of this variable does not affect the magnitude of the effect of the impulsive resolution of problems of the wife on misclassification.

Our theoretical model predicts that if one of the spouses has problems of self-control, but not the other; then, it can give us some idea about the potential direction of the difference in the income reported. But, if both spouses present problems of self-control, it makes difficult to predict the direction of the difference in the income reported. So, who has the problem of self-control matters. In Table 6 Column 5, I incorporate the impulsive resolution of problems of the husband. I do not find that this variable is statistically significant. In table 6 column 6, I include a variable that control for the impulsiveness of the couple, it is the result of multiplying the variables of the impulsive resolution of problems of the wife and the husband. I found that this variable is statistically significant and have a negative effect on the "misclassification" problem. In other words, as more similar are the couples (including the case when both are impulsive), less is the difference in the income reported. However, also including this variable in the regression, the impulsive resolution of problems of the wife continue being statistically significant.

Finally, in Table 6 column 7, I include all the variables analyzed from column (1) to column (6). I found that the impulsive resolutions of problems of the wife is statistically significant, and I observe an increase from 3.1% in column (1) to 3.6% in column (7). While this coefficient is statistically significant, it is necessary to remember that this result can be bias toward zero as a consequence of the problem of measurement error, or potentially not statistically significant as a consequence of the problem of omitted variables. Both concerns will be addressed later. Regarding the other variables, I found that the dummy of the type of job of the husband, the years of school of the husband, the number of children less than 12 years old and living in a rural area were statistically significant. I found that more years of school of the husband impacts positively the probability of misclassification. This can be a consequence of the relationship between years of school and income. Husbands with more years of school, earn more income,

and they have more margin to hide some income. Also, I found that the number of children less than 12 years old is negatively related to the probability of misclassification. A potential explanation for this result is the fact that when the couple has more children, then it is possible that they are receiving more money from the *Progresa* program. So, it is better for the couple to coordinate in order to not lose this money. Other potential alternative is that the income that the families receive from the *Progresa* program is stable; so, as much bigger is this income in relation to the total income of the household, then it minimizes the problem of recall. Finally, I found that living in a rural area increases the probability of misclassification.

In Table 7 column 1, I present an OLS regression of the impulsive resolution of problems of the husband on the "misclassification of poverty". In column (1), I control for the age, age squared, and education of both the wife and the husband. Also, I control for the number of children less than 12 years old, the number of adults above 65 years old, and whether the locality is rural or not. I found that the husband's impulsive resolution of problems is not statistically significant. Then from columns (2) to (6), I control for the same variables as in columns (2) to (6) in Table 6. From these regressions, I do not find the parameter of the impulsive resolution of problems of the husband being statistically significant. Finally, in column (7), I include all the variables analyzed from column (1) to column (6), and this regression confirms our previous results, i.e. that the parameter of the impulsive resolution of problems of the husband is not statistically significant.

The data has another measure of lack of self-control based on the Self-Regulation Questionnaire (SQR) of Brown, et al. (1999). The results of impulsiveness of the wife using this scale are presented in Table 8. From column (1) to (7), I use the same controls as those presented in Table 6. I found that in all the regressions the impulsiveness of the wife is statistically significant, and the magnitude of the coefficient range from 1.6% to 1.8%. Also, these regressions confirm the significance of the following variables: type of job of the husband, years of school of the husband, number of children less than 12 years old, and living in a rural area. The results of impulsiveness of the man using the SQR scale on "misclassification of poverty" are presented in Table 9. From columns (1) to (7), I use the same controls as those used in Table 7. The results

confirm that the impulsiveness of the man is not statistically significant.

To sum up, using OLS regressions I found that impulsive resolution of problems and impulsiveness of the wife are statistically significant; however, it is not the case for the husband. This result can be a consequence that most of the husbands are the principal contributors to the income of the household, and as a consequence, it is the husband that observes the impulsiveness of the wife and decides to hide part of his income. However, these results can present some bias. In particular, in the case of the impulsiveness of the husbands, this measure is affected by measurement error and can be bias toward zero. Also, in the case of the impulsiveness of the wives, it could be the case that this variable is affected by omitted variables, and as a consequence, the estimations using OLS suffer from bias. In order to correct for the problem of omitted variables, I use a bounding methodology. And, for the problem of measurement error, I use a Structural Latent Model. The results are presented below.

The effects of the psychological variables of impulsiveness of the wife and the husband on misclassification of poverty using the bounding methodology (Oster, 2014) are presented in Table 10. Column (1) shows the estimated treatment effects for the baseline model (together with standard errors (in parentheses) and the R-squared $\dot{R}$ (in brackets)). Column (2) presents the point estimates for the model including control variables. Control variables are: age, age squared, and level of education for the wife and the husband, living in a rural area, the number of children less than 12 years old, and the number of adults above 65 years. Also, a dummy variable for the job of the husband, a dummy variable regarding if the wife works or not, the number of sources of income of the household, the impulsiveness of the other spouse, and a variable that measure the impulsiveness of the couple (it is the result to multiply the impulsiveness of the wife and the husband). Column (3) reports the identification set $\left[\tilde{\beta}, \beta^*\right]$. Column (4) shows whether the identified set excludes zero, and finally column (5) reports the hypothetical value of δ that suggests an effect of $\beta = 0$.

In column (1) the effects of the psychological variables that measures lack of self-control over the misclassification are presented. The following psychological variables are analyzed for the wife and the husband:

impulsive resolution of problems and impulsiveness. From the variables analyzed, only impulsive resolution of problems and impulsiveness of the wife are statistically significant in the baseline and the control model. The estimate baseline effect of impulsive resolution of problems of the wife is .031, with an R-squared value ($\dot{R}$) of .009. The corresponding estimate in the control model $\tilde{\beta}$ is .036, with an R-squared model ($\tilde{R}$) of .081. The estimate baseline effect of impulsiveness of the wife is .020, with an R-squared value ($\dot{R}$) of .006. The corresponding estimate in the control model $\tilde{\beta}$ is .016, with an R-squared model ($\tilde{R}$) of .072. Then, to analyze the potential effect of omitted variables, column (3) presents the identified sets (this assumes $\tilde{\delta}$=1). This gives an identified set for wife's impulsive resolution of problems of [.036, .044] and for impulsiveness of [.011, .016], which do not include zero. To further test robustness, I calculate the hypothetical $\dot{\delta}$ that makes the effect of β=0. The absolute value of $\dot{\delta}$ is 4.4 for the wife's impulsive resolution of problems and 3.0 for the wife's impulsiveness. According to Oster (2014), a value bigger than one can be considered robust against omitted variables. In the case of the husband, impulsive resolutions of problems is not robust to the problem of omitted variable, because it presents a value of $\dot{\delta}$ equal to 0.48 below the value of one recommended by Oster (2014). In the case of the impulsiveness of the husband (a measure using the SQR scale), it has a value of $\dot{\delta}$ equal to 1.2, barely passing the threshold of one suggested by Oster (2014); however, the effect of this variable is close to zero, i.e. the bounding is [-.005,-.003].

Finally, I will present the results using a structural latent model[5]. To obtain the system to identify the latent variable related to resolution of problems in an impulsive way, I use the following scores: (1) You make quick judgments and later regret them; (2) when you have a problem, you are guided by "hunches" without thinking on the consequences; and (3) when you have a problem, you make decisions impulsively. To obtain the system for the latent variable of impulsiveness, I use the following scores: (1) You are very impulsive; (2) You lose your control quickly; (3) You do things even though you know they are wrong; (4) You say inappropriate things, and then you regret them; and (5) when you get angry, you are violent. For the outcome of interest ("misclassification of poverty"), I use as controls age, age squared, and level of education for the wife and the husband, living in a rural area, the number of children less than 12 years old, and the

[5]The estimations were calculated using the heterofactor command developed by Sarzosa and Urzúa (2016)

number of adults above 65 years. Also, I include a dummy variable for the job of the husband, a dummy variable regarding if the wife works or not, and the number of sources of income of the household. In the case of the equations of the realizations of the latent variable ($Q = \alpha^Q PV + X_Q B^Q + \epsilon^Q$), I use as a controls ($X_Q$): age, age squared, and years of education for the spouse which latent variable is calculated. Also, the dummy for rural area is included[6]. The estimations are presented in Table 11. The results presented confirm that the impulsive resolutions of problems of the wife affects the probability of "misclassification of poverty" (see column 1). The coefficient associated with this latent variable is 11.5%. However; I do not find that impulsive resolutions of problems of the husband, impulsiveness of the wife and impulsiveness of the husband are statistically significant.

To sum up, using three different strategies (OLS, bounding methodology and structural latent variables), I found that the wife's impulsive resolution of problems affects the probability of misclassification of poverty. Also, I find that the variables regarding the husband's years of school, the number of children less than 12 years old, the type of job of the husband, and living in a rural area are statistically significant in all the strategies used.

6.2 Robustness checks

From the previous section, it was found that wife's impulsive resolution of problems affects the probability of misclassification of poverty. However; it could be the case that the difference in the income reported by the wife and the husband is very small, but also it generates a different classification of poverty of the household. To analyze this situation, I regress the wife's impulsive resolution of problems on misclassification only for the households when the difference in the income reported is bigger than 5%[7]. The results are presented in

[6] In the case of the latent variable of impulsiveness of the wife using the SQR scale, to secure the necessary smoothness in the system, I included as a control a question related to grow up in a family with conflictive resolution of problems: When you were child, in your family discussed a lot and never resolved their problems.

[7] I control for the variables used as a controls in column (7) Table 6: age, age squared, and level of education for the wife and the husband, living in a rural area, the number of children less than 12 years old, and the number of adults above 65 years. Also, I add a dummy variable for the job of the husband, a dummy variable regarding if the wife works, the number of sources of income of the household, the impulsiveness of the other spouse, and a variable that measure the impulsiveness of the couple (it is the result to multiply the impulsiveness of the wife and the husband).

Table 12 column 1. The parameter of wife's impulsive resolution of problems is statistically significant and I do not observe any considerable change in the magnitude of the parameter. Then I do the same regression, but only for households where the difference in the income reported are bigger than 10%, 15%, 20%, 25%, and 30%. The results are presented in columns (2) to (6), respectively. I do not find any considerable change in the parameter of the wife's impulsive resolution of problems, and it is statistically significant over all the specifications.

Another potential problem is the presence of outliers on the difference in the income reported. It is possible that wives with impulsive resolution of problems live in some of these outliers, and as a consequence, it can affect the results presented. In order to handle with this potential problem, I only consider households where the difference in the income reported is at most 100%. Then, I reproduce the regressions presented in Table 12, i.e. households where the difference in the income reported are 5%, 10%, 15%, 20%, 25%, and 30%. The respective results are presented in columns (1) to (6) in Table 13. In all the cases, the parameter of wife's impulsive resolution of problems is statistically significant. Also, it is observed an increase in the magnitude of this parameter ranging from 4.6% to 5.7%.

Another question is to understand if the effect of the wife's impulsive resolution of problems on the misclassification is when the wife reports more income than the husband or when the husband reports more income than the wife or both. Remember that the "misclassification of poverty" takes the value of one when one spouse reports income which classifies the household as being poor, and the other spouse reports income which classifies the household as not poor. And, it takes the value of zero when the classification of the household as being poor or not is not affected by who answer the survey. To answer this question, in Table 14 column 1, I regress the wife's impulsive resolution of problems on misclassification, considering only the cases when the income reported by the wife is bigger or equal than the income reported by the husband. I use as a controls: age, age squared, and level of education for the wife and the husband, living in a rural area, the number of children less than 12 years old, and the number of adults above 65 years old. I do not find that the parameter of wife's impulsive resolution of problems being statistically significant. In column (2), I use the

same controls as in column (1), but adding a dummy variable for the job of the husband, a dummy variable regarding if the wife works or not, the number of sources of income of the household, the impulsiveness of the other spouse, and a variable that measure the impulsiveness of the couple. Also, in this regression, I do not find that the parameter of wife's impulsive resolution of problems being statistically significant. Then, in column (3), I regress wife's impulsive resolution of problems on misclassification, considering only the cases when the income reported by the wife is less or equal than the income reported by the husband. I control for the same variable than in column (1). In this case, I found that the parameter of wife's impulsive resolution of problems is statistically significant. In column (4), I do a similar regression, but using the same controls than in column (2). Again, I found that the parameter of wife's impulsive resolution of problems is statistically significant.

The previous results confirm the hypothesis that it is the husband who hides part of the income once he observes the self-control of his wife. This result is in part explained by the fact that the husband controls a considerable part of the income of the household. We should expect that if the wife controls more of the income, then the wife will observe the self-control of her husband and then decides how much income to hide. The experiment conducted by Castilla (2015), reflects in part this idea. She conducted a trust game among married couples who were given a considerable amount of money individually. She found that when the husband spends a significant extent of his salary on tobacco, the wife gave less money to him. In this case, the consumption of tobacco could be a variable related to the self-control of the husband, which was observed by the wife. In order to explore this hypothesis, I will use the income from *Progresa*. This income is mainly given to the wives, and it can be expected that the wives control this income. The dependent variable is the absolute value of the percentage difference between the income from *Progresa* reported by the husband and the wife, calculated as [(Income from *Progresa* reported by the husband- Income from *Progresa* reported by the wife)/ Income from *Progresa* reported by the wife]*100. The variables of interests are the impulsive resolutions of problems of the wife and the husband. The results are presented in Table 15. The controls are: age, age squared, and level of education for the wife and the husband, living in a rural area, the number of children less than 12 years old, and the number of adults above 65 years. In column (1), I

find that the coefficient of impulsive resolution of problems of the wife is 5.7 and it is statistically significant at the 0.10 level. In column (2), I find that the coefficient of impulsive resolutions problems of the husband is 7.9 and it is statistically significant at the 0.01 level. In column (3), I include all the variables analyzed in column (1) and (2), an also I include a variable that measures the impulsiveness of the couple (it is the result to multiply the impulsiveness of the wife and the husband). In this regression, only the husband's impulsive resolution of problems is statistically significant. In Table 16, I reproduce the same calculations as in Table 15, but measuring impulsiveness using the SQR test for the wife and the husband. I find that only the impulsiveness of the husband can explain the difference in the income from *Progresa*.

The previous results using OLS are potentially biased as a consequence of the problem of measurement error and omitted variable. To handle with these problems, I use a bounding methodology and a structural latent variable model. The results using the bounding methodology are presented in Table 17. I found that the impulsiveness of the wife and the husband, using the two different measures of impulsiveness, are robust to the problem of omitted variables. The results of the structural latent model are presented in Table 18. The latent variable of impulsiveness resolution of problems of the man has an associated coefficient of 29.0, and it is statistically significant at the .01 level. In the case of the latent variable of impulsiveness resolution of problems of the wife, it has a coefficient of 7.6 and it is statistically significant at the level of .10. In the case of impulsiveness using the SQR, I do not find the coefficients of impulsiveness of the wife or the husband as being statistically significant. To sum up, using the OLS, the bounding methodology and the structural latent variable, it is the impulsive resolutions of problems of the husband that can better explain the difference in the income reported from *Progresa*.

6.3 Do the Non-cognitive Skills Provide Information to Improve the Consistency of the Data?

Another question is how the use of impulsive resolution of problems of the wife affects the classification of poverty. To analyze this situation, I take the questions used to build the index of impulsive resolutions of

problems of the wives, i.e. You make quick judgments and later regret them; when you have a problem, you are guided by “hunches" without thinking on the consequences; and when you have a problem, you make decisions impulsively. Then, I removed from the sample those households where the wives answered “always”[8] for the three questions used to build the index. Using this strategy, the problem of misclasification is reduced to 17.18%, from the original misclasification of 20.19% (see Table 19). In other words, by using the wive’s impulsive resolution of problems the misclasification of poverty is reduced in 15%[9].

[8]The potential answers for each question are never, rarely, frequently, and always
[9]This results comes from the following calculation [(20.19%-17.18%)/17.18%]

7 Conclusion

This paper develops a non-unitary household model that predicts that when one spouse has problems of self-control, then the other spouse has incentives to not reveal his or her true salary or other kinds of income. This generates an asymmetric information problem, and as a consequence, it matters who answers the survey.

Using a database that asks the same survey questions to the wife and to the husband, I found that: 1. The income reported is different; and 2. This difference affects the classification of whether the households are poor ("misclassification of poverty"). Given the theoretical results, neither increasing the sample size nor using short questionnaires will solve the problem of bias in the estimation due to asymmetric information inside the household. However, I found that the self-control of the wife can predict the difference in the income reported, and her self-control can be used to partially explain the misclassification of poverty problem.

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Appendix A

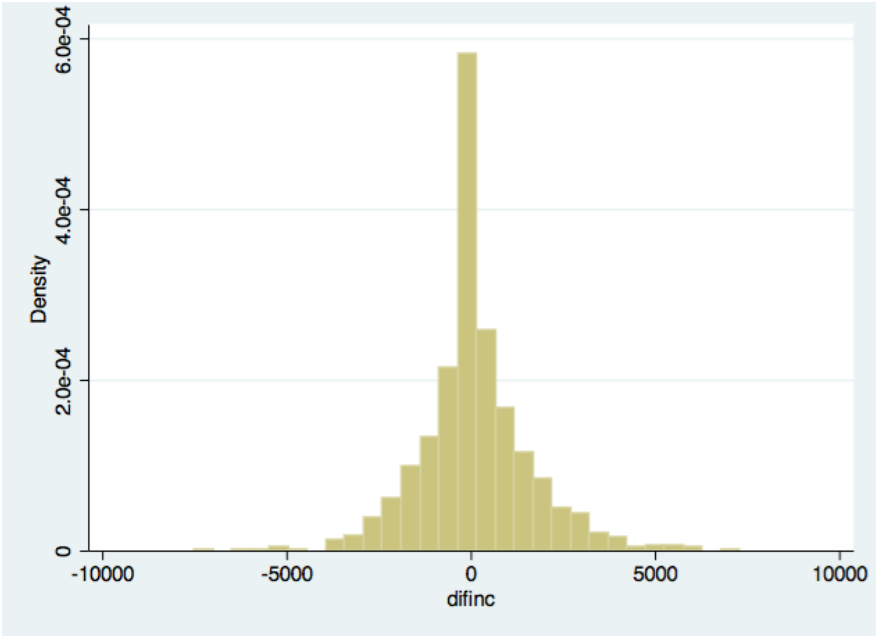

Figure 1: Difference with respect to the income reported by wives and their husbands

Appendix B. The Model

Intertemporal Consumption

Without loss of generality, I will get the First Order Conditions for the woman. The lagrangian is given by:

$$L = u^w\left(c_{w1}, f\left(z_{w1}, z_{m1}\right)\right) + \beta^w \delta^w u^w\left(c_{w2}, f\left(z_{w2}, z_{m2}\right)\right)$$

$$+\lambda^w\{[1-z_{i1}]w_{i1} - \tau^j\left(\theta_{j1}w_{j1}\right)[1-z_{i1}]\,\theta_{i1}w_{i1} + \tau^i\left(\theta_{i1}w_{i1}\right)[1-z_{j1}]\,\theta_{j1}w_{j1}$$

$$. \quad \tfrac{1}{(1+r)}\{[1-z_{i2}]w_{i2} - \tau^j\left(\theta_{j2}w_{j2}\right)[1-z_{i2}]\,\theta_{i2}w_{i2} + \tau^i\left(\theta_{i2}w_{i2}\right)[1-z_{j2}]\,\theta_{j2}w_{j2}\}$$

$$. \quad -c_{w1} - \tfrac{c_{w2}}{(1+r)}\}$$

Each individual (i=m,w) maximizes his/her utility function (4) subject to (5) and (6). Solving this problem and assuming an interior solution, the first order conditions are:

$$[c_{w1}]: \; u^w_{c1}(.) - \lambda^w = 0$$

$$[c_{w2}]: \; \beta^w\delta^w u^w_{c2}(.) - \tfrac{\lambda^w}{1+r} = 0$$

$$[z_{w1}]: \; u^w_{Q1}(.)f_{z_{w1}}(.) - \lambda^w\{w_{w1}[1-\tau(\theta_{m1}w_{m1})]\theta_{w1}\} = 0$$

$$[z_{w2}]: \; \beta^w\delta^w u^w_{Q2}(.)f_{z_{w2}}(.) - \tfrac{\lambda^w}{1+r}\{w_{w2}[1-\tau(\theta_{m2}w_{m2})]\theta_{w2}\} = 0$$

$$[\theta_{w1}]: \; -\tau(\theta_{m1}w_{m1})[1-z_{w1}]w_{w1} + \tfrac{d\tau(\theta_{w1}w_{w1})}{d\theta_{w1}}w_{w1}[1-z_{m1}]\theta_{m1}w_{m1} = 0$$

$$[\theta_{w2}]: \; -\tau(\theta_{m2}w_{m2})[1-z_{w2}]w_{w2} + \tfrac{d\tau(\theta_{w2}w_{w2})}{d\theta_{w2}}w_{w2}[1-z_{m2}]\theta_{m2}w_{m2} = 0$$

The equilibrium conditions are given by:

a) Euler's equation:

$$u^w_{c1}\left(c_{w1}, Q_1\right) = (1+r)\,\beta^w\delta^w u^w_{c2}\left(c_{w2}, Q_2\right)$$

$$u_{c1}^{m}\left(c_{m1},Q_1\right)=\left(1+r\right)\beta^{m}\delta^{m}u_{c2}^{m}\left(c_{m2},Q_2\right)$$

$$u_{Q1}^{w}\left(c_{w1},Q_1\right)\frac{f_{z_{w1}}(z_{m1},z_{w1})}{w_{w1}[1-\tau(\theta_{m1}w_{m1})]\theta_{w1}}=\left(1+r\right)\beta^{w}\delta^{w}u_{Q2}^{w}\left(c_{w2},Q_2\right)\frac{f_{z_{w2}}(z_{m2},z_{w2})}{w_{w2}[1-\tau(\theta_{m2}w_{m2})]}\theta_{w2}$$

$$u_{Q1}^{m}\left(c_{m1},Q_1\right)\frac{f_{z_{m1}}(z_{w1},z_{m1})}{w_{m1}[1-\tau(\theta_{w1}w_{w1})]\theta_{m1}}=\left(1+r\right)\beta^{m}\delta^{m}u_{Q2}^{m}\left(c_{m2},Q_2\right)\frac{f_{z_{m2}}(z_{w2},z_{m2})}{w_{m2}[1-\tau(\theta_{w2}w_{w2})]}\theta_{m2}$$

b) Inter-individual constraints:

$$\frac{u_{c2}^{w}(c_{w2},Q_2)}{u_{c2}^{m}(c_{m2},Q_2)}=\frac{\lambda^{w}}{\lambda^{m}}\frac{\beta^{m}\delta^{m}}{\beta^{w}\delta^{w}}$$

$$\frac{u_{Q2}^{w}(c_{w2},Q_2)f_{z_{w2}}(z_{w2},z_{m2})}{u_{Q2}^{m}(c_{m2},Q_2)f_{z_{m2}}(z_{w2},z_{m2})}=\frac{\lambda^{w}}{\lambda^{m}}\frac{\beta^{m}\delta^{m}}{\beta^{w}\delta^{w}}\frac{[1-\tau^{m}(\theta_{m2}w_{m2})\theta_{w2}]w_{w2}}{[1-\tau^{w}(\theta_{w2}w_{w2})\theta_{m2}]w_{m2}}$$

c) Optimal level of report of income:

$$\theta_{m1}=\frac{\tau(\theta_{m1}w_{m1})[1-z_{w1}]}{\frac{d\tau(\theta_{w1}w_{w1})}{d\theta_{w1}}[1-z_{m1}]w_{m1}}$$

$$\theta_{w1}=\frac{\tau(\theta_{w1}w_{w1})[1-z_{m1}]}{\frac{d\tau(\theta_{m1}w_{m1})}{d\theta_{m1}}[1-z_{w1}]w_{w1}}$$

$$\theta_{m2}=\frac{\tau(\theta_{m2}w_{m2})[1-z_{w2}]}{\frac{d\tau(\theta_{w2}w_{w2})}{d\theta_{w2}w_{w2}}[1-z_{m2}]w_{m2}}$$

$$\theta_{w2}=\frac{\tau(\theta_{w2}w_{w2})[1-z_{m2}]}{\frac{d\tau(\theta_{m2}w_{m2})}{d\theta_{m2}}[1-z_{w2}]w_{w2}}$$

d) and the budget constraints:

$$c_{i1}+\frac{c_{i2}}{(1+r)}=[1-z_{i1}]w_{i1}-\tau^{j}\left(\theta_{j1}w_{j1}\right)\left[1-z_{i1}\right]\theta_{i1}w_{i1}+\tau^{i}\left(\theta_{i1}w_{i1}\right)\left[1-z_{j1}\right]\theta_{j1}w_{j1}$$

$$\frac{1}{(1+r)}\left\{[1-z_{i2}]w_{i2}-\tau^{j}\left(\theta_{j2}w_{j2}\right)\left[1-z_{i2}\right]\theta_{i2}w_{i2}+\tau^{i}\left(\theta_{i2}w_{i2}\right)\left[1-z_{j2}\right]\theta_{j2}w_{j2}\right\}\quad i=m,w$$

This generates a system of twelve equations with twelve unknowns.

Trust and self-control

In this section I analyze the relationship between the “bias for the present" of individual i and the report of income of individual j. In order to do that, I use the Implicit Function Theorem. Without loss of

generality, let me start using the husband's Euler Equation for labor:

$\frac{d\theta_{m1}}{d\beta^w} = -\frac{\frac{dg}{d\beta^w}}{\frac{dg}{d\theta_{m1}}}$, where

$$g = u^w_{Q1}\left(c_{w1}, Q_1\right) \frac{f_{z_{w1}}(z_{m1}, z_{w1})}{w_{w1}[1-\tau(\theta_{m1}w_{m1})]\theta_{w1}} - (1+r)\,\beta^w \delta^w u^w_{Q2}\left(c_{w2}, Q_2\right) \frac{f_{z_{w2}}(z_{m2}, z_{w2})}{w_{w2}[1-\tau(\theta_{m2}w_{m2})]}\theta_{w2}$$

Notice that:

$$\frac{dg}{d\beta^m} = -\,(1+r)\,\delta^w u^w_{Q2}\left(c_{w2}, Q_2\right) \frac{f_{z_{w2}}(z_{m2}, z_{w2})}{w_{w2}[1-\tau(\theta_{m2}w_{m2})]}\theta_{w2} < 0$$

and

$$\frac{dg}{d\theta_{m1}} = u^w_{Q1}\left(c_{w1}, Q_1\right) \frac{f_{z_{w1}}(z_{m1}, z_{w1})}{w_{w1}[1-\tau(\theta_{m1}w_{m1})]^2\theta_{w1}} \frac{d\tau(\theta_{m1}w_{m1})}{d\theta_{m1}} > 0$$

So, it is clear that:

$$\frac{d\theta_{m1}}{d\beta^w} > 0$$

$$\frac{d\theta_{w1}}{d\beta^m} > 0$$

Appendix C

Table 1: **Income Reported by the Wife and the Husband**

	Obs	**Mean**	**Std. Dev.**	**Min**	**Max**
Income reported by the husband	896	2,542.6	1,553.1	0	9,700
Income reported by the wife	907	2,450.4	1,528.2	0	10,000
Difference in income reported	851	114.8	1,519.4	-7,500	7,300

Table 2: **Households living on poverty**

	Non poor (wife)	**Poor (wife)**	**Total**
Non poor (husband)	71	92	163
	(8.48)	(10.99)	(19.47)
Poor (husband)	77	597	674
	(9.20)	(71.33)	(80.53)
Total	148	689	837
	(17.68)	(82.32)	(100.0)

Table 3: **Labor Market Participation**

	Labor Situation	**Freq**	**Percent**
Husbands	Employee	376	39.3
	Self-employed	433	45.2
	Unemployed	57	6.0
	Household Chores	20	2.0
	Retired/ Pensioner	20	2.0
	Other Situation	46	4.8
	Not answered	3	0.3
Wives	Employee	58	6.0
	Self-employed	98	10.2
	Unemployed	5	0.5
	Household Chores	770	80.4
	Retired/ Pensioner	2	0.2
	Student	1	0.1
	Other Situation	24	2.5

Table 4: **Basic Descriptive Statistics**

	Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Husbands	Income	878	2,002.31	1,470.94	0	8,000
	Age	958	48.68	13.04	19	107
	Hours	788	43.21	18.96	2	130
	Years of Schooling	958	3.85	3.73	0	17
Wives	Income	854	665.32	1,084.89	0	8,000
	Age	955	44.81	12.18	19	99
	Hours	953	4.56	13.34	0	88
	Years of schooling	958	4.07	3.59	0	17

Table 5: **Impulsiveness Scales**

Scale name	Scale survey question	Factor Loadings
Impulsive Resolution of Problems (husband) Eigenvalue: 1.636	[1] You make quick judgments and later regret them	0.5467
	[2] When you have a problem, you are guided by “hunches" without thinking on the consequences	0.5749
	[3] When you have a problem, you make decisions impulsively	0.6087
Impulsive Resolution of Problems (wife) Eigenvalue: 1.567	[1] You make quick judgments and later regret them	0.5541
	[2] When you have a problem, you are guided by “hunches" without thinking on the consequences	0.5625
	[3] When you have a problem, you make decisions impulsively	0.6137
Impulsiveness (husband) Eigenvalue: 2.5538	[1] You are very impulsive	0.4138
	[2] You lose your control quickly	0.4528
	[3] You do things even though you know they are wrong	0.4401
	[4] You say inappropriate things	0.4459
	[5] When you get angry, you are violent	0.4808
Impulsiveness (wife) Eigenvalue: 2.3202	[1] You are very impulsive	0.4405
	[2] You lose your control quickly	0.4435
	[3] You do things even though you know they are wrong	0.4279
	[4] You say inappropriate things	0.4525
	[5] When you get angry, you are violent	0.4706

Table 6: **Effect of impulsive resoultion of problems of the wife on the "misclassification" problem**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Impulsive Resolution of	0.031***	0.033***	0.031***	0.031***	0.033***	0.033***	0.036***
Problems (wife)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Husband type of job		-0.060*					-0.068**
		(0.032)					(0.032)
Wife works			-0.001				-0.016
			(0.038)				(0.040)
Sources of income				0.005			0.003
				(0.025)			(0.027)
Impulsive Resolution of					-0.002		-0.003
Problems (husband)					(0.011)		(0.012)
Couple Impulsiveness						-0.015*	-0.011
						(0.009)	(0.009)
Age (husband)	0.011	0.007	0.011	0.011	0.011	0.011	0.008
	(0.009)	(0.012)	(0.009)	(0.009)	(0.009)	(0.009)	(0.012)
Age squared (husband)	-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)
Years of school (husband)	0.011**	0.010**	0.011**	0.011**	0.011**	0.011***	0.011**
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Age (wife)	-0.010	-0.010	-0.010	-0.010	-0.010	-0.011	-0.011
	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Age squared (wife)	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)
Years of school (wife)	0.005	0.003	0.005	0.005	0.005	0.006	0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Number of children	-0.038***	-0.045***	-0.038***	-0.038***	-0.039***	-0.039***	-0.046***
less than 12 years old	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Number of adults	-0.031	-0.028	-0.031	-0.031	-0.036	-0.035	-0.034
above 65 years old	(0.026)	(0.028)	(0.026)	(0.026)	(0.027)	(0.027)	(0.029)
Rural	0.105***	0.137***	0.105***	0.105***	0.102***	0.101***	0.134***
	(0.028)	(0.031)	(0.028)	(0.028)	(0.028)	(0.028)	(0.031)
Constant	0.024	0.157	0.024	0.021	0.034	0.025	0.156
	(0.212)	(0.232)	(0.212)	(0.213)	(0.215)	(0.214)	(0.237)
R-squared	0.050	0.063	0.049	0.048	0.050	0.054	0.062
N. of cases	820	741	820	819	808	808	729

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1
Husband type of job: It takes the value of one if the husband works in the agriculture sector, and zero otherwise. Wife works: It takes the value of one if the wife works and zero otherwise. Sources of income: It adds the number of sources of income of the household. Couple impulsiveness: It is the result to multiply the impulsiveness of the wife and the husband.

Table 7: **Effect of impulsive resoultion of problems of the husband on the "misclassification" problem**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Impulsive Resolution of	0.001	-0.002	0.000	0.000	-0.002	0.001	-0.003
Problems (husband)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Husband type of job		-0.070**					-0.068**
		(0.032)					(0.032)
Wife works			0.005				-0.016
			(0.038)				(0.040)
Sources of income				0.010			0.003
				(0.025)			(0.027)
Impulsive Resolution of					0.033***		0.036***
Problems (wife)					(0.011)		(0.012)
Couple Impulsiveness						-0.015*	-0.011
						(0.009)	(0.009)
Age (husband)	0.011	0.006	0.011	0.011	0.011	0.011	0.008
	(0.009)	(0.012)	(0.009)	(0.009)	(0.009)	(0.009)	(0.012)
Age squared (husband)	-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)
Years of school (husband)	0.011**	0.010**	0.011**	0.011**	0.011**	0.011**	0.011**
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Age (wife)	-0.012	-0.011	-0.012	-0.012	-0.010	-0.012	-0.011
	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Age squared (wife)	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)
Years of school (wife)	0.003	0.001	0.003	0.003	0.005	0.003	0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Number of children	-0.040***	-0.047***	-0.040***	-0.039***	-0.039***	-0.040***	-0.046***
less than 12 years old	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Number of adults	-0.037	-0.038	-0.037	-0.037	-0.036	-0.036	-0.034
above 65 years old	(0.027)	(0.029)	(0.027)	(0.027)	(0.027)	(0.027)	(0.029)
Rural	0.099***	0.133***	0.099***	0.098***	0.102***	0.099***	0.134***
	(0.028)	(0.031)	(0.029)	(0.028)	(0.028)	(0.028)	(0.031)
Constant	0.068	0.213	0.068	0.060	0.034	0.067	0.156
	(0.214)	(0.234)	(0.214)	(0.215)	(0.215)	(0.215)	(0.237)
R-squared	0.041	0.053	0.039	0.039	0.050	0.043	0.062
N. of cases	813	735	813	812	808	808	729

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1
Husband type of job: It takes the value of one if the husband works in the agriculture sector, and zero otherwise. Wife works: It takes the value of one if the wife works and zero otherwise. Sources of income: It adds the number of sources of income of the household. Couple impulsiveness: It is the result to multiply the impulsiveness of the wife and the husband.

Table 8: **Effect of wife's impulsiveness on the "misclassification" problem**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Wife's impulsiveness	0.018**	0.017*	0.018**	0.018**	0.017*	0.017*	0.016*
	(0.009)	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)
Husband type of job		-0.063**					-0.071**
		(0.032)					(0.033)
Wife works			0.002				-0.011
			(0.038)				(0.041)
Sources of income				0.016			0.015
				(0.025)			(0.027)
Husband's impulsiveness					-0.002		-0.003
					(0.009)		(0.009)
Couple Impulsiveness						-0.008	-0.007
						(0.005)	(0.006)
Age (husband)	0.014	0.008	0.014	0.014	0.011	0.013	0.009
	(0.009)	(0.012)	(0.009)	(0.009)	(0.011)	(0.011)	(0.012)
Age squared (husband)	-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)
Years of school (husband)	0.010**	0.009**	0.010**	0.010**	0.010**	0.010**	0.009**
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Age (wife)	-0.011	-0.010	-0.012	-0.012	-0.012	-0.013	-0.014
	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Age squared (wife)	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)
Years of school (wife)	0.003	0.001	0.003	0.003	0.004	0.003	0.002
	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Number of children	-0.036***	-0.043***	-0.036***	-0.036***	-0.037***	-0.037***	-0.044***
less than 12 years old	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Number of adults	-0.033	-0.033	-0.033	-0.033	-0.039	-0.037	-0.039
above 65 years old	(0.026)	(0.028)	(0.026)	(0.026)	(0.027)	(0.027)	(0.029)
Rural	0.098***	0.130***	0.098***	0.097***	0.096***	0.095***	0.128***
	(0.028)	(0.031)	(0.028)	(0.028)	(0.028)	(0.028)	(0.032)
Constant	-0.011	0.142	-0.011	-0.023	0.062	0.067	0.185
	(0.215)	(0.234)	(0.215)	(0.216)	(0.228)	(0.227)	(0.242)
R-squared	0.046	0.056	0.044	0.045	0.043	0.046	0.052
N. of cases	804	726	804	803	785	785	710

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1
Husband type of job: It takes the value of one if the husband works in the agriculture sector, and zero otherwise. Wife works: It takes the value of one if the wife works and zero otherwise. Sources of income: It adds the number of sources of income of the household. Couple impulsiveness: It is the result to multiply the impulsiveness of the wife and the husband.

Table 9: **Effect of husband's impulsiveness on the "misclassification" problem**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Husband's impulsiveness	-0.001	-0.003	-0.001	-0.001	-0.002	-0.000	-0.003
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Husband type of job		-0.072**					-0.071**
		(0.032)					(0.033)
Wife works			0.008				-0.011
			(0.038)				(0.041)
Sources of income				0.011			0.015
				(0.025)			(0.027)
Wive's impulsiveness					0.017*		0.016*
					(0.009)		(0.010)
Couple Impulsiveness						-0.008	-0.007
						(0.006)	(0.006)
Age (husband)	0.009	0.006	0.009	0.009	0.011	0.011	0.009
	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Age squared (husband)	-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)
Years of school (husband)	0.010**	0.010**	0.010**	0.010**	0.010**	0.009**	0.009**
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Age (wife)	-0.012	-0.013	-0.012	-0.012	-0.012	-0.014	-0.014
	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Age squared (wife)	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)
Years of school (wife)	0.003	0.002	0.003	0.003	0.004	0.003	0.002
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Number of children	-0.040***	-0.047***	-0.040***	-0.040***	-0.037***	-0.040***	-0.044***
less than 12 years old	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Number of adults	-0.038	-0.038	-0.038	-0.037	-0.039	-0.038	-0.039
above 65 years old	(0.027)	(0.029)	(0.027)	(0.027)	(0.027)	(0.027)	(0.029)
Rural	0.099***	0.135***	0.100***	0.099***	0.096***	0.096***	0.128***
	(0.028)	(0.031)	(0.029)	(0.028)	(0.028)	(0.028)	(0.032)
Constant	0.136	0.261	0.136	0.125	0.062	0.121	0.185
	(0.223)	(0.236)	(0.223)	(0.225)	(0.228)	(0.226)	(0.242)
R-squared	0.040	0.053	0.039	0.039	0.043	0.042	0.052
N. of cases	805.000	730.000	805.000	804.000	785.000	785.000	710.000

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1
Husband type of job: It takes the value of one if the husband works in the agriculture sector, and zero otherwise. Wife works: It takes the value of one if the wife works and zero otherwise. Sources of income: It adds the number of sources of income of the household. Couple impulsiveness: It is the result to multiply the impulsiveness of the wife and the husband.

Table 10: **Determinants of the "misclassification" problem (bounding methodology)**

	(1)	(2)	(3)	(4)	(5)
	Baseline Effect	Controlled Effect	Identified Set	Exclude	$\dot{\delta}$ for
Indepvar	$\dot{\beta}$, (S.E.), [$\dot{R}$]	$\tilde{\beta}$, (S.E.), [$\tilde{R}$]	$[\tilde{\beta}, \beta^{*'}\left(min\{2.2\tilde{R}, 1\}, 1\right)]$	zero?	$\beta = 0$
Impulsive Resolution of Problems (wife)	.031 ***	.036***	[.036,.044]	Yes	-4.407
	(.011) [0.009]	(.012) [0.081]			
Impulsiveness (wife)	.020**	.016*	[.011,.016]	Yes	3.038
	(.009) [.006]	(.010) [.072]			
Impulsive Resolution of Problems (husband)	.002	- .003	[-.010,-.003]	Yes	-0.482
	(.011) [0.001]	(.012) [0.081]			
Impulsiveness (husband)	-.001	-.003	[-.005,-.003]	Yes	-1.226
	(.009) [0.001]	(.009) [0.072]			

Standard errors in parentheses. *** p <0.01, ** p <0.05, *p <0.1.
Controls: Age, age squared, and level of education for the wife and the husband, living in a rural area, the number of children less than 12 years old, and the number of adults above 65 years. Also, I add a dummy variable for the job of the husband, a dummy variable regarding if the wife works, the number of sources of income of the household, the impulsiveness of the other spouse, and a variable that measure the impulsiveness of the couple (it is the result to multiply the impulsiveness of the wife and the husband).

Table 11: **Effect of impulsiveness on the "misclassification" problem using Structural Estimation**

	(1)	(2)	(3)	(4)
Impulsive Resolution of Problems (wife)	0.115**			
	(0.048)			
Impulsive Resolution of Problems (husband)		-0.0004		
		(0.014)		
Impulsiveness (wife)			0.018	
			(0.016)	
Impulsiveness (husband)				-0.020
				(0.016)
Age (husband)	0.005	0.005	0.007	0.006
	(0.011)	(0.011)	(0.011)	(0.011)
Age squared (husband)	-0.001	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Years of school (husband)	0.010 **	0.010**	0.009**	0.009**
	(0.004)	(0.004)	(0.004)	(0.004)
Age (wife)	.001	-0.010	-0.011	-0.013
	(0.001)	(0.012)	(0.012)	(0.012)
Age squared (wife)	0.000	0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Years of school (wife)	0.002	0.0009	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)
Number of children	-.045***	-0.046 ***	-0.044 ***	-0.047 ***
less than 12 years old	(0.011)	(0.011)	(0.011)	(0.011)
Number of adults	-.027	-0.038	-0.033	-0.035
above 65 years old	(0.028)	(0.028)	(0.028)	(0.028)
Rural	0.134 ***	0.131 ***	0.127 ***	0.133 ***
	(0.030)	(0.030)	(0.031)	(0.030)
Husband type of job	-.064**	-0.071**	-0.060 *	-0.072 **
	(0.031)	(0.032)	(0.032)	(0.031)
Wife works	-.019	-0.011	-0.008	-0.004
	(0.039)	(0.039)	(0.040)	(0.039)
Sources of income	-0.004	0.002	0.008	0.005
	(0.026)	(0.026)	(0.040)	(0.026)
Constant	0.198	0.208	0.153	0.264
	(0.231)	(0.232)	(0.233)	(0.235)
N. of cases	740	734	723	729

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1

Husband type of job: It takes the value of one if the husband works in the agriculture sector, and zero otherwise. Wife works: It takes the value of one if the wife works and zero otherwise. Sources of income: It adds the number of sources of income of the household. Couple impulsiveness: It is the result to multiply the impulsiveness of the wife and the husband.

Table 12: **Robustness Check Using Different Cohorts in the Income Gap**

	(1)	(2)	(3)	(4)	(5)	(6)
Impulsive Resolution of	0.036**	0.039**	0.035**	0.034**	0.036**	0.037*
Problems (wife)	(0.014)	(0.015)	(0.016)	(0.017)	(0.018)	(0.019)
Impulsive Resolution of	-0.008	-0.010	-0.014	-0.021	-0.011	-0.011
Problems (husband)	(0.014)	(0.015)	(0.016)	(0.017)	(0.018)	(0.018)
Couple Impulsiveness	-0.012	-0.016	-0.018	-0.015	-0.019	-0.019
	(0.011)	(0.011)	(0.012)	(0.012)	(0.013)	(0.014)
Age (husband)	0.012	0.010	0.013	0.016	0.018	0.014
	(0.014)	(0.014)	(0.015)	(0.015)	(0.016)	(0.016)
Age squared (husband)	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Years of school (husband)	0.015***	0.015**	0.015**	0.016**	0.022***	0.026***
	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)
Age (wife)	-0.015	-0.015	-0.020	-0.024	-0.021	-0.022
	(0.014)	(0.015)	(0.015)	(0.016)	(0.016)	(0.017)
Age squared (wife)	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Years of school (wife)	0.003	0.004	0.003	0.002	-0.001	-0.003
	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)
Number of children	-0.052***	-0.051***	-0.052***	-0.058***	-0.058***	-0.052***
less than 12 years old	(0.015)	(0.016)	(0.016)	(0.017)	(0.018)	(0.019)
Number of adults	-0.049	-0.053	-0.061*	-0.055	-0.057	-0.052
above 65 years old	(0.033)	(0.035)	(0.036)	(0.038)	(0.039)	(0.041)
Rural	0.130***	0.134***	0.154***	0.167***	0.168***	0.193***
	(0.038)	(0.040)	(0.042)	(0.044)	(0.047)	(0.050)
Husband type of job	-0.066*	-0.070*	-0.086*	-0.101**	-0.109**	-0.112**
	(0.039)	(0.041)	(0.044)	(0.046)	(0.048)	(0.051)
Wife works	-0.024	-0.026	-0.002	-0.028	-0.039	-0.053
	(0.049)	(0.050)	(0.054)	(0.056)	(0.059)	(0.062)
Sources of income	0.010	0.014	0.034	0.028	0.035	0.039
	(0.032)	(0.033)	(0.035)	(0.036)	(0.037)	(0.039)
Constant	0.164	0.214	0.241	0.295	0.171	0.244
	(0.283)	(0.291)	(0.307)	(0.320)	(0.342)	(0.371)
R-squared	0.060	0.061	0.061	0.069	0.077	0.083
N. of cases	571	535	482	447	413	366

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1
Column (1) to (6) present the regressions considering only the households where the difference in the income reported are bigger than 5%, 10%, 15%, 20%, 25%, and 30%, respectively.
Husband type of job: It takes the value of one if the husband works in the agriculture sector, and zero otherwise. Wife works: It takes the value of one if the wife works and zero otherwise. Sources of income: It adds the number of sources of income of the household. Couple impulsiveness: It is the result to multiply the impulsiveness of the wife and the husband.

Table 13: **Robustness Check Using Different Cohorts in the Income Gap and Controling for Outliers**

	(1)	(2)	(3)	(4)	(5)	(6)
Impulsive Resolution of	0.046***	0.050***	0.046***	0.047**	0.051**	0.057***
Problems (wife)	(0.015)	(0.016)	(0.017)	(0.018)	(0.020)	(0.022)
Impulsive Resolution of	-0.010	-0.014	-0.018	-0.026	-0.016	-0.016
Problems (husband)	(0.015)	(0.016)	(0.017)	(0.018)	(0.019)	(0.020)
Couple Impulsiveness	-0.010	-0.016	-0.018	-0.015	-0.019	-0.019
	(0.011)	(0.012)	(0.013)	(0.014)	(0.015)	(0.015)
Age (husband)	0.010	0.008	0.011	0.015	0.015	0.008
	(0.015)	(0.015)	(0.016)	(0.016)	(0.017)	(0.018)
Age squared (husband)	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Years of school (husband)	0.012**	0.012*	0.011*	0.012	0.019**	0.023***
	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)
Age (wife)	-0.021	-0.022	-0.026	-0.032*	-0.029*	-0.030*
	(0.015)	(0.015)	(0.016)	(0.017)	(0.017)	(0.018)
Age squared (wife)	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Years of school (wife)	0.006*	0.007	0.006	0.006	0.002	-0.000
	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)
Number of children	-0.064***	-0.063***	-0.064***	-0.072***	-0.075***	-0.070**
less than 12 years old	(0.016)	(0.017)	(0.018)	(0.019)	(0.020)	(0.022)
Number of adults	-0.043	-0.046	-0.056	-0.048	-0.049	-0.041
above 65 years old	(0.036)	(0.037)	(0.040)	(0.042)	(0.044)	(0.046)
Rural	0.112***	0.114***	0.134**	0.148**	0.144***	0.180***
	(0.039)	(0.041)	(0.045)	(0.047)	(0.050)	(0.054)
Husband type of job	-0.051	-0.053	-0.069	-0.084	-0.090*	-0.091
	(0.041)	(0.043)	(0.047)	(0.050)	(0.053)	(0.056)
Wife works	-0.060	-0.065	-0.042	-0.077	-0.089	-0.113*
	(0.051)	(0.053)	(0.058)	(0.060)	(0.064)	(0.068)
Sources of income	0.003	0.007	0.034	0.026	0.034	0.034
	(0.035)	(0.036)	(0.039)	(0.041)	(0.043)	(0.046)
Constant	0.360	0.421	0.448	0.525	0.440	0.584
	(0.298)	(0.308)	(0.326)	(0.342)	(0.372)	(0.406)
R-squared	0.073	0.076	0.072	0.087	0.096	0.112
N. of cases	497	461	408	373	339	292

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1
Column (1) to (6) present the regressions considering only the households where the difference in the income reported are bigger than 5%, 10%, 15%, 20%, 25%, and 30%, respectively and the difference in the income reported is at most 100%.
Husband type of job: It takes the value of one if the husband works in the agriculture sector, and zero otherwise. Wife works: It takes the value of one if the wife works and zero otherwise. Sources of income: It adds the number of sources of income of the household. Couple impulsiveness: It is the result to multiply the impulsiveness of the wife and the husband.

Table 14: **Robustness Check: Direction of the Income Gap**

	(1)	(2)	(3)	(4)
Impulsive Resolution of	0.023	0.023	0.040**	0.050***
Problems (wife)	(0.014)	(0.016)	(0.014)	(0.015)
Impulsive Resolution of		0.000		0.002
Problems (husband)		(0.015)		(0.015)
Couple Impulsiveness		-0.005		-0.012
		(0.012)		(0.011)
Age (husband)	0.008	0.002	0.012	0.007
	(0.011)	(0.015)	(0.011)	(0.015)
Age squared (husband)	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Years of school (husband)	0.010	0.010	0.008	0.008
	(0.005)	(0.006)	(0.005)	(0.006)
Age (wife)	-0.004	-0.000	-0.011	-0.013
	(0.013)	(0.015)	(0.013)	(0.016)
Age squared (wife)	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Years of school (wife)	0.005	0.002	0.007	0.009
	(0.006)	(0.006)	(0.006)	(0.006)
Number of children	-0.021	-0.029*	-0.046**	-0.056***
less than 12 years old	(0.013)	(0.014)	(0.014)	(0.015)
Number of adults	-0.028	-0.031	-0.032	-0.032
above 65 years old	(0.036)	(0.041)	(0.032)	(0.035)
Rural	0.099**	0.127**	0.108**	0.127**
	(0.034)	(0.040)	(0.035)	(0.039)
Husband type of job		-0.033		-0.089*
		(0.041)		(0.041)
Wife works		0.048		-0.083
		(0.049)		(0.052)
Sources of income		-0.031		0.031
		(0.033)		(0.034)
Constant	-0.093	0.016	0.064	0.247
	(0.256)	(0.293)	(0.271)	(0.310)
R-squared	0.030	0.030	0.057	0.082
N. of cases	465.000	412.000	487.000	436.000

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1

In Columns 1 and 2, I regress the wife's impulsive resolution of problems on "misclassification", considering only the cases when the income reported by the wife is bigger or equal than the income reported by the husband. In Columns 3 and 4, I regress the wife's impulsive resolution of problems on "misclassification", considering only the cases when the income reported by the wife is less or equal than the income reported by the husband

Husband type of job: It takes the value of one if the husband works in the agriculture sector, and zero otherwise. Wife works: It takes the value of one if the wife works and zero otherwise. Sources of income: It adds the number of sources of income of the household. Couple impulsiveness: It is the result to multiply the impulsiveness of the wife and the husband.

Table 15: **Impulsive Resolution of Problems on the difference of income from *Prospera* reported**

	(1)	(2)	(3)
Impulsive Resolution of	5.713*		5.032
Problems (wife)	(3.092)		(3.142)
Impulsive Resolution of		7.900***	6.895**
Problems (husband)		(2.948)	(2.956)
Couple Impulsiveness			3.182
			(2.270)
Age (husband)	-2.571	-2.780	-2.732
	(2.442)	(2.456)	(2.448)
Age squared (husband)	0.006	0.009	0.007
	(0.022)	(0.022)	(0.022)
Years of school (husband)	-0.943	-0.430	-0.535
	(1.210)	(1.250)	(1.249)
Age (wife)	5.870**	6.155**	6.412**
	(2.684)	(2.699)	(2.695)
Age squared (wife)	-0.045*	-0.048*	-0.050*
	(0.026)	(0.027)	(0.026)
Years of school (wife)	0.720	0.559	0.834
	(1.258)	(1.250)	(1.264)
Number of children	1.970	1.540	1.698
less than 12 years old	(3.149)	(3.185)	(3.177)
Number of adults	14.275**	13.849*	14.903**
above 65 years old	(7.162)	(7.339)	(7.329)
Rural	4.201	1.553	3.070
	(7.568)	(7.652)	(7.654)
Constant	-15.874	-17.017	-26.025
	(58.773)	(59.040)	(58.981)
R-squared	0.012	0.019	0.022
N. of cases	660	656	652

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1

Table 16: **Impulsiveness on the difference of income from *Prospera* reported**

	(1)	(2)	(3)
Impulsiveness (wife)	0.890		0.746
	(2.514)		(2.541)
Impulsiveness (husband)		4.247*	4.240*
		(2.356)	(2.453)
Couple Impulsiveness 3.182			-0.119
(2.270)			(1.457)
Age (husband)	-2.736	-2.868	-3.039
	(2.520)	(2.945)	(3.044)
Age squared (husband)	0.008	0.011	0.013
	(0.023)	(0.028)	(0.029)
Years of school (husband)	-1.022	-0.476	-0.470
	(1.239)	(1.233)	(1.258)
Age (wife)	5.613**	5.509*	5.498*
	(2.754)	(2.828)	(2.912)
Age squared (wife)	-0.043	-0.042	-0.042
	(0.027)	(0.028)	(0.029)
Years of school (wife)	0.277	0.522	0.504
	(1.278)	(1.247)	(1.279)
Number of children	1.620	1.147	0.958
less than 12 years old	(3.249)	(3.160)	(3.254)
Number of adults	13.783*	9.665	9.724
above 65 years old	(7.288)	(7.451)	(7.570)
Rural	2.308	1.109	0.259
	(7.768)	(7.624)	(7.828)
Constant	-1.440	-1.739	4.210
	(61.036)	(62.202)	(64.670)
R-squared	0.007	0.008	0.004
N. of cases	645	646	628

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1

Table 17: **Determinants of the difference of income from *Prospera* reported (bounding methodology)**

	(1)	(2)	(3)	(4)	(5)
	Baseline Effect	Controlled Effect	Identified Set	Exclude	$\dot{\delta}$ for
Indepvar	$\dot{\beta}$, (S.E.), [$\dot{R}$]	$\tilde{\beta}$, (S.E.), [$\tilde{R}$]	$[\tilde{\beta}, \beta^{*'}\left(min\{2.2\tilde{R}, 1\}, 1\right)]$	zero?	$\beta = 0$
Impulsive Resolution of Problems (wife)	4.123 (2.962) [0.003]	5.032 (3.142) [0.040]	[5.032,6.209]	Yes	-3.978
Impulsiveness (wife)	0.365 (2.454) [.001]	0.746 (2.540) [.023]	[.0746,1.204]	Yes	-1.628
Impulsive Resolution of Problems (husband)	7.527*** (2.819) [0.011]	6.895** (2.955) [0.040]	[5.856,6.895]	Yes	6.079
Impulsiveness (husband)	4.536* (2.316) [0.006]	4.240* (2.452) [0.023]	[3.762,4.240]	Yes	8.391

Standard errors in parentheses. *** p <0.01, ** p <0.05, *p <0.1.
Controls: Age, age squared, and level of education for the wife and the husband, living in a rural area, the number of children less than 12 years old, and the number of adults above 65 years., the impulsiveness of the other spouse, and a variable that measure the impulsiveness of the couple (it is the result to multiply the impulsiveness of the wife and the husband).

Table 18: **Structural Latent Estimation: Effects of impulsiveness on the Difference of the Income Reported from *Progresa***

	(1)	(2)	(3)	(4)
Impulsive Resolution of Problems (wife)	7.609*			
	(4.093)			
Impulsive Resolution of Problems (husband)		29.017***		
		(10.288)		
Impulsiveness (wife)			1.073	
			(3.631)	
Impulsiveness (husband)				-0.020
				(0.016)
Age (husband)	-2.587	-2.834	-2.792	-2.901
	(2.422)	(2.435)	(2.490)	(2.926)
Age squared (husband)	0.005	0.008	0.008	0.011
	(0.022)	(0.022)	(0.022)	(0.027)
Years of school (husband)	-1.023	-0.515	-1.044	-0.0683
	(1.199)	(1.234)	(1.226)	(1.220)
Age (wife)	5.753**	6.132**	5.617**	5.395*
	(2.659)	(2.672)	(2.730)	(2.809)
Age squared (wife)	-0.043 *	-0.047*	-0.042	-0.040
	(0.026)	(0.026)	(0.026)	(0.027)
Years of school (wife)	0.645	0.425	0.251	0.562
	(1.242)	(1.237)	(1.266)	(1.238)
Number of children less than 12 years old	2.032	1.828	1.528	1.257
	(3.123)	(3.150)	(3.208)	(3.142)
Number of adults above 65 years old	14.454**	13.232*	13.745*	10.101
	(7.106)	(7.278)	(7.224)	(7.401)
Rural	4.045	2.164	2.383	1.255
	(7.508)	(7.579)	(7.703)	(7.600)
Constant	-11.652	-13.915	0.126	2.758
	(58.202)	(58.512)	(60.191)	(61.754)
N. of cases	660	734	723	729

Standard errors in parenthesis. *** p <0.01, ** p <0.05, *p <0.1

Table 19: **Households living on poverty**

	Original	**Removing Impulsiveness**
Non poor (both)	8.48	9.73
Poor (both)	71.33	73.09
Poor (men); Non poor (woman)	9.20	8.40
Non poor (men); Poor (woman)	10.99	8.78
Total mismatch	20.19	17.18
N. of cases	837	524

Appendix D

Impulsive Resolution Questions

[1] You make quick judgments and later regret them.

[2] When you have a problem, you are guided by “hunches" without thinking on the consequences.

[3] When you have a problem, you make decisions impulsively.

Impulsiveness Questions

[1] You are very impulsive.

[2] You lose your control quickly.

[3] You do things even though you know they are wrong.

[4] You say inappropriate things.

[5] When you get angry, you are violent.