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The impact of a gender and business training on income hiding: An experimental study in Vietnam

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ABSTRACT

We use a randomized controlled trial and behavioral game to study the extent and determinants of income hiding in rural Vietnam. We focus on a training program that aims to promote gender equality and entrepreneurship among women in poverty who are engaged in running a small business. In one treatment arm, we allow husbands to participate in the training as well. While the impact of the training on income hiding is not significant at usual significance levels if only women are allowed to follow the training, we provide some evidence that the training invites women to hide income. Our study also suggests that allowing husbands to be present at the training intensifies this effect. We discuss several mechanisms that may explain these findings, including an increase in expected income and a decrease in information asymmetry between the spouses.

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1. Introduction

Economic thinking about household decision-making has evolved over time. Initially, so-called unitary household models were used in which a single planner was assumed to maximize household utility – representing the interests of all household members (e.g. [Becker, 1981](#)). This perspective gave way to intra-household allocation models based on cooperative or non-cooperative behavior of household members. Cooperative models assume income pooling by partners, and subsequent allocations based on Nash bargaining (e.g. [Manser and Brown, 1980](#)) or another form of collective decision making (e.g. [Chiappori, 1988](#); [Chiappori 1992](#)). Such models yield outcomes that are Pareto efficient. However, cooperation may break down, and inefficient non-cooperative bargaining may occur if marriage dissolution is prohibitively costly. Household members do not pool their income, but allocate their resources according to their own preferences and in accordance with socially-enforced and specialized gender roles (e.g. [Lundberg and Pollak, 1993](#)). Contributions to the provision of household public goods are voluntary, typically resulting in under-provision of such goods. Non-cooperation within the household is not only relevant for how income is spent. Evidence suggests households may also fail to generate income efficiently (e.g., [Udry, 1996](#); [Iversen et al., 2011](#); [Kebede et al., 2013](#)), and fail to provide insurance to its members efficiently ([Robinson, 2012](#)).

Cooperation in households may break down because of commitment problems or transaction costs, especially when the gains from cooperation for individual members are small (say, because of low bargaining power). Individuals might resort to non-cooperative strategies to advance their interests. More typically, perhaps, hybrid strategies are followed in which

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household members cooperate in specific domains and pursue their private interests in others. In a context of full information, individuals may resort to external commitment devices to force their preferences upon their partners. For example, [Anderson and Baland \(2002\)](#) demonstrate that women may commit to a specific (privately desirable) savings strategy by joining a ROSCA.¹ In a context of imperfect information about spousal income, a hybrid strategy may involve hiding part of one's income from the spouse ([Chen, 2006](#); [Castilla and Walker, 2013](#)). Income hiding is an important topic for development economists because of potential efficiency implications. Such concerns emerge when public goods are underprovided, or when household members have different preferences for the bundle of goods and services that should be consumed. But income hiding also matters (for economists) because survey-based measures of household income may be systematically biased in the context of income hiding ([Ashraf, 2009](#)). If so, the estimates of regression models in which income enters as a regressor are biased.

Our paper contributes to the recent literature on income hiding. The main objective of the study is to test whether income hiding by women is affected by participating in a gender and business training intended to promote female empowerment – both economically as well as socially. To achieve this we use a randomized controlled trial to generate exogenous variation in exposure to the training and a behavioral game to measure income hiding. We are unaware of other studies examining the causal impact of gender and business training on income hiding. An auxiliary objective is to examine whether inviting husbands to participate in the training affects outcomes. The literature on the impact of business trainings (and micro finance, in general) is starting to mature and one key feature seems to be that gender is important, as it is seemingly harder to move female entrepreneurs than male ones ([De Mel et al., 2008](#); [Berge et al., 2015](#)). This paper takes a next step to consider one aspect of the gender dimension of training interventions.

Our paper seeks to bridge two literatures – the one on intra-household resource allocation and income hiding discussed above, and the nascent literature on the impact of (gender and) business training interventions. The literature contains several studies probing the impact of such so-called “Finance+” training programs (for a critical review see [McKenzie and Woodruff, 2014](#)). Some studies document training programs have the potential to alter knowledge and behavior of microfinance clients (e.g., [Bulte et al., 2016a](#); [Giné and Mansuri, 2014](#); [Sayinzoga et al., 2016](#); but also see [Karlan and Valdivia, 2011](#)), although evidence suggests the response to such interventions may be gender-specific ([Berge et al., 2015](#)).² Complementing this literature's focus on business knowledge, practices and outcomes, our study focuses on the short-term impact of a gender and business training on intra-household decision making and incentives for hiding income.

Some recent papers also focus on information asymmetries between spouses (e.g. [Hoel 2015](#)) and income hiding from one's spouse.³ The closest to our work are [Ashraf \(2009\)](#) and [Fiala \(2017\)](#). [Ashraf \(2009\)](#) uses a field experiment to show that men in the Philippines, when observed by their spouses, commit to consumption by choosing a gift certificate for themselves (rather than deposit money in a household account). But they prefer to put windfall money in their private account when their choices are unobservable to their partners. [Fiala \(2017\)](#) examines the interaction between income hiding and outcomes of business training. Women who hide income from their spouses have positive (but insignificant) impacts of the treatments while women who do not hide income show large significantly negative effects of the intervention. While that paper considers the mediating impact of intra-household issues and income hiding on the impact of a training intervention, we consider a complementary issue, namely the causal effect of participating in a business and gender training on income hiding.

We study income hiding using a new dataset collected in rural Vietnam – a region with a strong patriarchal culture where men control most household resources ([Krantz and Vung, 2009](#)). We invited a random sub-sample of female clients of the microfinance institution Tao Yeu May (TYM) in Vietnam to participate in a gender and business training. In addition, and responding to recent suggestions in the literature, we invite a random sub-sample of women to bring their husbands along to participate in the training (e.g., [Rahman et al., 2011](#); [World Bank, 2011](#)). The training intends to promote gender equality and female empowerment via the gender and business components. Shortly after the training sessions had been completed, we invited a random sub-sample of the married participants, and their spouses, to participate in an income hiding game to examine whether the training induced more or less income hiding.

While our data does not enable us to precisely test the channels by which the training affects income hiding, we are able to rigorously determine the reduced form effects of the training on income hiding. Our main findings are as follows. Unlike the outcomes in Senegal discussed by [Boltz et al., \(2017\)](#), most Vietnamese women prefer not to hide income from their spouse, and the majority even chooses transparent behavior at a monetary cost to themselves. However, some income hiding does occur in rural Vietnam. Participating in the training appears to have two effects: it discourages honest behavior

¹ Interestingly, [Anderson and Baland \(2002\)](#) find an “inverted-U” shaped relation between autonomy and the decision (or ability) to join a ROSCA: women with either little or great autonomy from their husbands do not join ROSCAs, while women with average autonomy do.

² In addition, some literature focuses on the impact of life skills training for females. For example, [Bandiera et al. \(2012\)](#) found that a combined life skills and vocational training diminished engagement of adolescent girls and young women in sexual risky behaviour and increased participation in income generating activities. [Adoho et al. \(2014\)](#) found that the EPAG training increased employment, empowerment, and earnings of adolescent girls.

³ There are clear parallels with the literature on income hiding within (extended) family networks, where forced solidarity between family members may exist and which may be resented by family members who are typically on the giving side of the relation. Such family members may be tempted to hide part of their income from others in order to avoid requests for assistance and support. For example, [Beekman et al. \(2015\)](#) find that the incidence of willingness to pay for secrecy increases with family density. In addition, [Boltz et al. \(2017\)](#) find that on average subjects are willing to accept a decline in income of 14% to keep their earnings hidden from their peers. See also [Di Falco and Bulte \(2011\)](#), [Baland et al. \(2011\)](#), [Jakiela and Ozier, \(2016\)](#), and [Squires \(2017\)](#).

by women and it encourages income hiding. Moreover, husbands' participation in the training seems to accentuate income hiding. The latter interpretation should be treated with some care: while the coefficient of the treatment arm with invited husbands is (much) larger than the coefficient of the women-only treatment arm, the difference between the estimated effects is not statistically significant.

This paper is organized as follows. In [Section 2](#), we discuss several mechanisms via which the training may affect income hiding. [Section 3](#) introduces the context and presents the training intervention. [Section 4](#) summarizes the data and outlines the identification strategy. In [Section 5](#), we present the main results. The section also provides some tentative explanations for the main results. [Section 6](#) concludes.

2. Theoretical framework

Gender and business trainings may affect intra-household income hiding via multiple channels. Important elements that determine the scope and incentives for income hiding are (i) the availability of unobserved income that may be hidden; (ii) the extent of “taxation” within the household, or the lack of autonomy of spouses to spend their own income; and (iii) the divergence in preferences between spouses on how income should be spent. Income hiding will typically not occur in the absence of unobserved income, forced contributions to other household members (a common pot), and the absence of diverging preferences.

[Malapit \(2012\)](#) developed a hybrid model of household decision making that illustrates these points. She assumes that spouses first decide how to split their income between joint (i.e. household) and private expenditures, and then bargain over how to spend the joint sum. In the limited autonomy version of the model, the preferences of one of the partners prevail. She writes: “social and gender norms could assign the right to choose the share of income to be contributed by the couple to either the husband only or the wife only. For example, many cultures assign men as the traditional head of the household, which could suggest that wives are compelled to comply with what their husbands deem as the appropriate contribution” ([Malapit, 2012](#), p.590). In patriarchal societies, we assume men have the authority to set the (common) contribution share for both themselves and their wives – each partner pays the same share of his (her) income to the common pot to finance joint expenditures. If so, women have an incentive to hide income when they consider the compulsory contribution, set by their husband, too high. This will depend on the extent to which money from the common pot is spent on household goods that she does not value highly.

A rational and selfish husband will set a contribution share that is increasing in the income level of his wife (allowing him to leverage his own contribution to the common pot to a greater extent), and decreasing in his own income level. Moreover, the contribution share is increasing in his bargaining power over how to spend the common pot. Contribution shares exceeding the wife's optimal (voluntary) contribution to the common pot may induce her to hide of part of her unobserved income – depending on utility losses associated with “cheating” and the expected penalty upon discovery of cheating. This model suggests three main channels by which a business and gender training may affect income hiding.

- If the business-component of the training increases female income it will invite a raise in the compulsory contribution share chosen by the husband which, *ceteris paribus*, makes hiding by women more attractive;
- If the gender-component of the training increases female bargaining power over how to spend the common pot, the wife's tolerance for high contribution shares increases as she expects to benefit more from how the pot is allocated, and income hiding will go down; and
- The training may affect information asymmetries within the household ([Bernardt et al., 2017](#)).⁴ Specifically, in our empirical study we invite husbands to participate in the training interventions, enabling them to gain an improved understanding of the incomes of their wives. As information asymmetries disappear and the unobserved income of women decreases, the incentive for women to hide a larger share of her remaining unobserved income goes up.

Of course the impact of participating in trainings in real life will be more complex than this. For example, attending the training sessions with one's spouse may influence aspects other than information about income. Partners may learn how to make investments together, work together, making them more cooperative. Participating in women empowerment sessions may make husbands perceive their wives in a different way – especially if they participated in the training sessions emphasizing gender equality. This simple observation strengthens the main insight, namely that participating in a gender and business training may affect income hiding via multiple, potentially conflicting channels. While an increase in female income or husband information about female income should increase hiding of unobserved income by the wife, an increase in female bargaining power or cooperation between the spouses will have the opposite effect. The net effect of the training on income hiding is therefore ambiguous, and ultimately an empirical matter to which we turn below.

⁴ Contributing to the literature documenting that women tend to benefit less from microfinance interventions than husbands ([De Mel et al., 2008](#); [Berge et al., 2015](#)), [Bernardt et al. \(2017\)](#) recognize that male and female micro-entrepreneurs often belong to the same household. They find that low average returns of female-run enterprises may be explained in part by re-channeling the wife's income to the husband's enterprise. Obviously there are efficiency and equity dimensions to this issue.

Table 1
Descriptive statistics by treatment group.

	Control	T1	T2	Training (T1 + T2)
Female hiding	1.69(1.84)	2.27**(2.42)	2.10(2.25)	2.19*(2.34)
Husband hiding	1.80(1.98)	2.12(2.44)	2.12(2.20)	2.12(2.32)
Income wife	2988.1(1823.6)	3015.7(2094.5)	3023.1(1726.2)	3019.3(1919.9)
Income husband	4040.2(3286.2)	3515.7(3149.3)	3461.5(1828.1)	3488.0(2581.2)
Observations	114	115	110	225

Notes: T1 indicates the group of women that attended the training together with their husband, T2 indicates the group of women that attended the training on their own. Standard deviations are reported in parentheses. * $p < 0.10$, ** $p < 0.05$ (referring to a comparison to the control group).

3. The intervention

The study combines two experimental designs: a randomized controlled trial (RCT) of a gender and business training intervention and a behavioral income hiding game. The RCT is explained in this section, and the behavioral game below. Our study takes place in Northern Vietnam, a patriarchal society (Krantz and Vung, 2009). We cooperate with a microfinance organization called Tao Yeu May (TYM). TYM aims to improve the quality of life and the social position of its female clients by offering financial and non-financial services. It has done so since 1992. TYM offers three main financial products: loans, savings opportunities, and mutual assistance funds. It also offers several training programs. In this study we focus on one particular non-financial service, namely the provision of a gender and business training. Given our focus on intra-household behavior, only females from couples were eligible to participate in this study (“stratified sampling” from larger population – see below).

TYM offered nine monthly training sessions during local center meetings in the period February to end October 2012. The training was designed by the International Labor Organization (ILO), based on the Gender and Entrepreneurship Together (GET) Ahead for Women in Enterprise Training Package and Resource Kit. McKenzie and Petro (2017) indicate that this training increased profits of female-owned business in Kenya. The first three modules focused entirely on topics related to gender: (i) ‘Gender and gender equality;’ (ii) ‘The business woman and her self-confidence;’ and (iii) ‘The business woman and her environment’. The other modules dealt with business related themes: (iv) ‘The business project: business ideas;’ (v) ‘Marketing and how to sell with success;’ (vi) ‘Calculations and how to calculate interest;’ (vii) ‘Managing cash;’ (viii) ‘How to record accounts receivable and accounts payable?’; and finally (ix) ‘How to calculate cost of production and cost of goods sold’. Each training session lasted approximately 45–60 min., and participation in the training was costless and voluntary. In addition to participating in the training sessions, treated members were able to consult trainers individually during weekly meetings in which debts were repaid.

In total there have been four waves of data collection. First, before the intervention we collected baseline in October and November of 2011. Within one month after completing the training (November and December 2012) we organized lab-in-the-field experiments among a subsample of respondents (see below). We subsequently collected midline data in March and April 2013, and end-line data 6 months later. Baseline, midline and end-line data were used to assess the business outcomes of the intervention (Bulte et al., 2016b). Baseline and lab-in-the-field data were used to consider the impact on bargaining power (Bulte et al., 2016a). Similarly, this paper uses experimental data from the second wave, augmented with baseline controls for increased accuracy.

The purpose of the training, according to TYM’s so-called theory of change, was twofold. The first objective relates to the gender part of the training, which is supposed to improve women’s empowerment in the household. Indeed, Bulte et al., (2016a) demonstrated that the training positively affected female empowerment, as measured by a simple allocation game played by the spouses separately and jointly during the midline. The second objective is to improve income of female participants via an increase in business knowledge and the adoption of improved business practices. Bulte et al., (2016b) established that the training substantially improved economic performance. Since the experimental data used in this paper was collected earlier than the midline and end-line data in Bulte et al., (2016b), this income effect had not materialized yet (details available on request, but also see bottom rows of Table 1). However, we cannot rule out that behavior of both spouses changes in anticipation of future income increases.

In our RCT, TYM members were randomly assigned to one of two treatment arms (see below), or allocated to the control group. The RCT was conducted in 187 existing local centers through which TYM operates, each consisting of approximately 30 clients. We selected two areas, Vinh Phuc and Ha Noi, and enrolled all local centers in the experiment. Randomization took place at the local center level. A cluster sampling approach was employed to attenuate concerns about spill-over effects. In total, more than 4,000 women participated in the RCT (see Bulte et al., 2016b for a detailed discussion of the intervention and an analysis of the training’s impact on business outcomes).

The control group (C) consists of the clients from 86 centers who were not invited to (and also did not attend) any of the training sessions. Subjects in this group benefitted from the regular package of TYM microfinance services. The first treatment group (T1) consisted of the (female) clients of 70 centers who were invited to the training together with their

husbands.⁵ During the sessions, participants were encouraged to bring up their own experiences. The second treatment group (T2) consists of the (female) clients of 31 other centers, who were invited to participate in the training without their partner. The treatment arms are potentially “different” for multiple reasons: (i) including husbands in the discussions might raise the quality of the sessions and translate into a differential income effect; (ii) husbands participating in the trainings may learn something about the profitability of their wives’ businesses (attenuating pre-existing information asymmetries); and (iii) the impact of the gender equality sessions might depend on whether husbands were present and engaged with the content.

As the training took place during regular center meetings, most women invited to the training actually attended. However, husbands do not normally attend the center meetings, and so we incentivized husband attendance (for group T1) by providing financial compensation. As we wanted most husbands to attend the gender module on “Gender and gender equality” we paid husbands 100,000 VND (around 5 USD) for their participation in the first training module. For cost reasons, we gradually reduced the financial compensation for the next modules, and did not pay any compensation for the last three modules. While these financial incentives may imply an income effect that could affect the behaviors we study, we believe the size of these transfers is rather modest compared to actual business earnings of the subjects in the study.⁶ While we cannot rule out that giving money to men for their attendance may psychologically affect the way he plays in the games (and perhaps affect the play of his wife as well) we are not overly concerned about this given the delay of 6–8 months between the subsidized training sessions and the time when the income hiding game was played.

4. Data, identification and design of the behavioral game

The current paper is based on data collected almost immediately after completing the training intervention for a subsample of women participating in the larger experiment. About 80% of the women in our full sample are formally married. To play the hiding game, we randomly sampled women from the subsample of TYM members who were in a stable relationship. This resulted in a subsample where 97% of the women were married and 3% (10 women) were not formally married but otherwise engaged. Specifically, we invited 115 women from the first treatment arm (T1), 110 women from the second treatment arm (T2), and 114 women from the control group, to participate in a lab-in-the field experiment and to complete a short supplementary survey. We invited the husbands of all 339 women to participate in the behavioral game as well. Perhaps induced by the promise of an opportunity to earn a modest sum of money, there was full-compliance among the 339 men and women thus selected. Everybody who was invited actually participated in the game. The 339 women came from 50 centers.

Did the women and men participating in the game also comply with their initial assignment in the RCT? The data show a mixed pattern. While the great majority of women from the treatment arms actually participated in most training modules (92% participated in seven or more modules and 56% in all modules),⁷ there was non-compliance among the husbands. The number of sessions attended by husbands from T1 in our subsample selected for the behavioral game varied greatly. However, still about 90% of these men attended at least one of the gender sessions, typically the one for which they received the highest incentive, and 50% participated in all three gender sessions. However, attendance of the business sessions by men was lower, and less than 10% participated in the final three business sessions. Moreover, 10% of the invited men in the T1 group (and 2% of the invited women in the T1 group) did not participate in any training session. This implies our results should be interpreted as intention-to-treat (ITT) effects of the trainings.

We report the results of a balance test, based on baseline survey data collected before the intervention took place, in Appendix Tables A1a–A1c.⁸ We can only conduct balancing tests for females, as we do not have baseline data for husbands.⁹ The Tables show there is balance for all variables at baseline, except education. The number of years of schooling varies slightly across arms, which presumably reflects chance. We therefore conclude there is little reason to suspect that randomization did not work.

⁵ We oversampled T1 because we expected significant non-compliance among invited husbands, and wanted to ensure sufficient participation of husbands in the trainings (to increase power).

⁶ The average increase in profits due to the training equals about USD 70 per year (Bulte et al., 2016b).

⁷ For our sub-sample selected from T1 98 percent of the women attended at the least one gender session, and for our sub-sample selected from T2, all women attended at least one of the gender sessions. For both groups around 75% of the women participated in all gender sessions. High compliance rates are presumably due to the fact that trainings took place after monthly center meetings (reducing transaction costs). From the control group, nobody attended any training session, and the same holds for husbands of women in the T2 sub-sample.

⁸ In Table A1c we present balance tests for inverse hyperbolic sine transformations of some imprecisely measured variables to test to what extent balance is only due to large standard errors.

⁹ However, directly after we played the games we collected some information about husbands. Using this information, we were able to conduct some balancing tests for husbands as well, regarding their age and education level. The balancing tests show that there is no difference in age and education level for husbands of the different treatment arms (and control). These analyses suggest that there is also balance for the husbands who participated in the games.

4.1. Measuring income hiding

We measure income hiding using a simple incentive compatible lab-in-the-field game. In addition to the income hiding game, we conducted a time preference game (see Bulte et al., 2016a), and a variant of a dictator game.¹⁰ In this paper we only use data from the income hiding game. The games were organized in 16 locations, during morning and afternoon sessions in November and December 2012.¹¹ On average, playing the three games took 3.5 h (excluding piloting). In all locations, 23 enumerators were available to explain the games and to provide instructions. This implies that each participant could receive one-on-one explanation and instruction as the games were never played with more than 23 women or men at the same time. We organized separate sessions for men and women.¹² All participants received, in addition to the money they won, free cakes, fruits, coffee, tea and soft drinks. We played the games in a fixed order, with the income hiding game last. Although we cannot completely rule out the existence of order effects, we expect these to be small because actual pay-outs did not occur (in private) until after all games had been completed. Moreover, it is not evident that order effects will affect the propensity to hide income differentially across experimental arms. More details about the organization of the games are provided in Appendix B.

Regarding the income hiding game, each group of women played the game for 8 rounds (making 8 choices). In each round, the women were offered two sums of money, and had to choose which one they preferred; option A or option B. Option A always involved a gift of 80,000 Vietnamese Dong (VND), or approximately USD 4.¹³ If the subject preferred this option, and if this round was selected for payment (see below), then the experimenters promised not to inform the respondent's spouse about this choice. The gift promised in Option B increased from VND 75,000 (in round 1) to VND 115,000 (in round 8). Details are provided in Appendix A. For 7 out of 8 choices, the gift in option B exceeded the gift in option A. If the respondent chose option B, and if that round was selected for actual payment, then the experimenters would announce the choice and payoff to the respondent's partner. In other words, for rounds 2–8, the subject had to choose between receiving a modest (and fixed) amount in private, or a larger (and increasing) amount in public. It is relatively inexpensive to opt for the private transfer in early rounds (hiding income), but as the offer in option B becomes more attractive, subjects are tempted to switch from a small amount in private to the larger amount and a fully informed spouse. We interpret the round in which subjects switch from A to B as a proxy of the propensity to hide income.¹⁴

After concluding the 8 choices, respondents were asked to draw one out of nine tickets. Eight tickets corresponded to the eight different rounds of the game. If one of these tickets was picked, then the respondent received amount A or B of the associated round (depending on the choice in the experiment). Drawing the ninth ticket, instead, implied “bad luck” and the respondent would not receive any money. This “bad luck” ticket was included to provide respondents with a credible opportunity to hide income from their partner – i.e. to ensure that income earned in the experiment was potentially unobservable. If a participant chose option A (i.e. chose to hide) for a number of rounds, and if one of these rounds was subsequently selected for payment, then she could simply tell her partner that she drew the bad luck ticket (so that, unfortunately, there was no income to share). If, instead, a participant chose option B and that choice was subsequently selected for actual payment, the participant's spouse would be informed about that outcome at the end of the experimental session, after recipients had received their income (see Appendix B).

To further facilitate income hiding we included one round in the experiment where the gift for option A exceeded the gift for option B (that is: round 1). In case the respondent failed to hide the VND 80,000 after the game, she could simply argue to “rationally” maximize household income by choosing option A in the first round (and that this round was selected for payment). We also include round 1 (or the option of costly revelation of income) to allow subjects to choose option B in case they consider the cost associated with income hiding from their spouse too high. This allows us to obtain a measure of extreme honesty which may be affected by the training.

4.2. Summarizing the data

Aggregate descriptive statistics of the experiment are provided in Table 1, which distinguishes between the three subsamples (T1, T2 and control). While the main analysis will focus on female income hiding, we also report hiding behavior of husbands.

¹⁰ We have not yet analysed the results of the dictator game.

¹¹ The games took place on 23, 24, 25 and 30 November 2012 and on 01, 02, 08, 19, and 23 December 2012.

¹² The time preference game as well as the dictator game were also played with couples on the same date.

¹³ This is a salient incentive for our respondents, as all women in our sample earn less than VND 40,000 per day, which is a prerequisite for membership in TYM.

¹⁴ A minority of 18% of our respondents switched from option B back to option A – evidence of inconsistent choices, and possibly reflecting that these respondents did not fully understand the game. This includes “multiple switchers” as well as women who choose B in the first round and switch to A later. According to Giné et al. (2012) such inconsistent choices are not uncommon in these type of games, but they also argue that these choices are still more consistent than choices made at random. The main dataset we use includes all subjects, and is based on the first switch in case of multiple switches. We will demonstrate that all results are robust to excluding the 18% of respondents who fail to choose consistently across the rounds. Finally, the propensity for people to switch from public to private information as the public amount increased is not correlated with the experimental arm (T1, T2 or C): a simple OLS model explaining variation in such switching behavior for our sample of respondents reveals that neither the T1 nor the T2 dummy enter significantly (in models with and without additional baseline controls) – details available from the authors on request.

Table 2
Female switch points for treatments and controls.

Round	Control	T1	T2
1	84	67	70
2	20	25	20
3	2	9	7
4	1	1	3
5	1	1	0
6	0	0	0
7	0	0	1
8	0	0	0
9	6	12	9
Total	114	115	110

Table 3
Frequency table for specific behavior (women).

	Control		T1		T2	
Extreme honesty (never hiding)	1	0	1	0	1	0
Always hiding	84	30	67	48	70	40
Highest income	6	108	12	103	9	101
	20	94	25	90	20	90

Note: This table can be derived from Table 2 as *Extreme honesty* equals switching in Round 1, *Always hiding* equals switching in Round 9 and *Highest income* equals switching in Round 2.

The variables *female hiding* and *husband hiding* indicate the round in which a participant switches from option A to option B (i.e. from hiding income to informing one's spouse). The later switching occurs, the greater the revealed willingness to pay to keep income secret. A value of 1 indicates extremely honest behavior – the participant did not hide in any round and was willing to give up VND 5000 for transparency. In contrast, a value of 9 indicates that a participant preferred to hide his or her choice in all rounds. On average, switching of females occurs after 2.2 rounds in the treatment groups (significantly more than in control group; the two treatment groups do not differ significantly from each other). The distribution of the participants is non-normal and is censored toward the left and the right. This also holds for husband switching, but for husbands we find much less evidence of differences in hiding behavior across experimental arms.

Table 2 presents the switching points for our female respondents split across experimental groups (see Table A3 for a similar breakdown for our male respondents). Some 8% of our female subjects “always hides,” and is willing to give up 40,000 VND for secrecy. Approximately 20% of the participants switch from hiding to revealing in round 2, and the rest between rounds 2 and 8. We observe that most women switch in an early round. As the efficiency loss of secrecy increases, more participants choose not to hide. Fewer women switch in each additional round, except for the last round. Also observe that there appear to be differences across experimental arms – it appears as if a greater share of the women from the control group opt for the public option even in round 1, and that women from the treatment arms are more likely to switch at later rounds (or not switch at all). This is especially true for women from T1, or the group where husbands were also invited to participate in the training. These findings are a prelude to our regression results below. Similar patterns, albeit slightly weaker, appear in the switching data for husbands (Table A3).

To further examine the impact of the training on income hiding we create three new variables: we construct binary variables for (1) never hiding (extreme honesty: participants opting for option B in round 1); (2) always hiding (always opt for option A); and (3) efficiency (always maximize income; option A for the first choice, and option B for the remaining seven choices). Table 3 presents a frequency table, displaying frequencies per treatment arm for these three binary variables. Women from the treatment arms, especially from T1, appear less likely to be extremely honest. In terms of efficiency there does not seem to be systematic differences between the experimental groups, but the data do weakly suggest that treated women (especially from T1) are more likely to “always hide” their income – even if this behavioral strategy is adopted by a minority across all experimental groups. Behavioral strategies for husbands are summarized in Table A4, and are rather similar.

Our first result follows directly from the raw data: About 65% of the female participants (see Table 3: $(84 + 67 + 70)/339$) did not hide income in the first round, and the same is true for 68% of the husbands (Table A4). These subjects are willing to pay a cost of VND 5000 to reveal their choice to their spouses, and behave extremely honestly. This result suggests intra-household openness or transparency is quite important for most participants in our sample, even more important than a (small) monetary gain.¹⁵ This finding suggests the costs of income hiding (in terms of guilt, expected punishment, or otherwise) is large in the setting of rural Vietnam, or that productivity of income in the generation of public goods is very

¹⁵ We do not believe that this finding reflects that our respondents did not understand the game. They received extensive (one-on-one) instruction, and participated in a test round. Moreover, the female respondents are fairly well educated (on average nearly 8 years of schooling), and we do not find a

Table 4
Impact of training on specific behavior.

	Extreme honesty (never hiding)	Extreme honesty (never hiding) (sub sample)	Always hiding	Always highest income
T1	−0.157 (0.07)**	−0.173 (0.07)**	0.053 (0.05)	0.041 (0.06)
T2	−0.105 (0.08)	−0.086 (0.08)	0.033 (0.04)	0.007 (0.07)
Constant	0.234 (0.04)***	0.279 (0.04)***	−0.235 (0.03)***	−0.254 (0.04)***
Wald test T1 = T2 (p- value)	0.50	0.22	0.55	0.61
Observations	339	281	339	339
Pseudo R ²	0.01	0.02	0.01	0.002

Note: Estimates refer to Probit estimates (marginal effects). Cluster-robust standard errors (clustering at the center level) between parentheses.
** $p < 0.05$, *** $p < 0.01$. Subsample refers to sample without multiple switchers.

high. The high percentage of respondents displaying extremely honest behavior is possibly due to Confucianism which had a strong influence on Vietnamese culture.¹⁶ This finding stands in contrast to results for Senegal obtained by Boltz et al., (2017), where the majority of respondents indicated to be willing to pay a price for income hiding from kin members.

4.3. Empirical strategy

Since respondents were randomly assigned to experimental arms, the reduced form effect of the training on hiding is easily identified. In the absence of an income effect due to the training, a simple comparison of the women-only treatment arm T2 and the control group C reveals the effect of the training on income hiding. This effect may be due to woman empowerment or an increase in (expected) income. The former should decrease income hiding (as women have a greater say in how the common pot will be spent) and the latter is expected to increase income hiding (leverage effect). We can identify which effect dominates. Similarly, a comparison across the two treatment arms reveals the net effect of two opposing underlying effects. As mentioned, participating husbands may update their beliefs about gender equality but also gain an updated signal about the profitability of their wife's business. We again cannot distinguish between these effects, and will report the net effect.

To examine how the business and gender training affects hiding behavior, we regress hiding variables on treatment dummies T1 and T2 and baseline controls. We use the three binary hiding variables introduced above, but also the round in which a woman switched from secrecy to transparency – from option A to option B. If the coefficient with the treatment dummies enters positive and significantly, then the treatment induces women to switch later – revealing an increased preference for income hiding. We estimate ordered logistic regressions and Tobit regressions, since our hiding variables are censored and skewed towards extreme values. Ordered logistic regression models treat the dependent variable as an ordinal one, and Tobit regressions allow estimating dependent variables that are left or right censored. We always cluster standard errors at the center level, reflecting that randomization took place at the center level.

5. Empirical results

We present the results of our regression analysis in Tables 4 and 5. Table 4 explains variation in behavioral strategies for women, and suggests the training affects the prevalence of extremely honest behavior (i.e., the revelation of information to one's partner at a cost of VND 5000). We find that, as a result of participating in the training, women are less likely to be fully transparent. The effect of the training seems large: the marginal effects of the Probit regression suggest participation in the training decreases the probability of being extremely honest by 11 and 16 percent. Displaying extremely honest behavior appears especially less likely for women whose husbands also attended the meetings because the coefficient associated with T1 is nearly 50% larger than the coefficient associated with T2. Moreover, the former coefficient is significantly different from zero ($p < 0.05$) and the latter is not. Nevertheless, T1 and T2 are not significantly different from each other, so we lack the power to provide evidence that inviting husbands matters. We speculate the absence of an (even) stronger difference

significant correlation between the years of schooling of individual respondents and their propensity for extremely honest behaviour. Indeed, the reverse is true: more educated women are slightly more likely to disclose their earnings (even at a cost) (regression results can be obtained on request).

¹⁶ Confucian ethical teachings strongly promote values like honesty and trustworthiness ("Xin"). Evidence for high trust norms in Vietnam is signalled by the fact that interpersonal trust in Vietnam is very high. According to the world value survey about 51% of people in Vietnam agreed in 2009 with the statement "most people can be trusted" (downloaded from <https://ourworldindata.org/trust>). In 2009 (the latest year for which information for Vietnam is available) only four countries (Sweden, Norway, New Zealand and Finland) out of a total of 57 countries scored higher in terms of interpersonal trust. Vietnam's score is similar to that of China (49%), but much higher than that of countries with a comparable GDP per capita (compare with scores of 20%, 8% and 8% for India, Moldavia and Ghana, respectively). We believe this is an important insight given the lack of knowledge about the incidence of income hiding in different contexts.

Table 5
Training interventions and female income hiding.

	(1)	(2)	(3)	(4)	(5)	(6)
T1	0.577 (0.333)**	0.72 (0.28)**	0.71 (0.30)**	2.44 (1.10)**	0.73 (0.39)**	0.85 (0.35)**
T2	0.407 (0.30)	0.51 (0.34)	0.62 (0.35)*	1.70 (1.15)	0.56 (0.36)	0.40 (0.38)
Age wife			−0.02 (0.04)		−0.04 (0.04)	−0.05 (0.04)
Age husband			0.05 (0.04)		0.07 (0.04)*	0.08 (0.04)**
Constant	1.67 (0.95)***			−3.12 (1.00)***		
Wald test T1 = T2 (<i>p</i> -value)	0.56	0.50	0.77	0.47	0.60	0.29
Observations	339	339	339	339	337	279
R ²	0.01	0.01	0.02	0.01	0.01	0.03

Notes: Column 1 refers to an OLS regression. Columns 2, 3 and 5 report results from an ordered logistic regression. Column 4 reports results of a Tobit regression. The regression presented in column 5 also includes all variables presented in the balance tests (see Tables A1a–A1c). Column (6) re-estimates model (5) for the sub-sample of women who never switch back from option B to option A. Standard errors clustered at the center level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

between T1 and T2 may be caused by large-scale non-compliance of husbands – the majority missed the bulk of the training sessions so the differential effects are necessarily small (see also Bulte et al., 2016b).

In column (2) we re-estimate the first model (extreme honesty) but now restrict the analysis to the subsample of women who never switch (back) from option B to option A – we omit women who develop a preference for secrecy as income hiding becomes more costly). These results are qualitatively the same as the ones in column (1). Finally, observe from columns (3–4) that we do not find any evidence that the training increases the probability of always hiding or a preference for maximizing income (efficiency). These coefficients are very small and far from significant. In Table A5 we summarize regression results for husbands. Results are slightly weaker, but the signs of the coefficients are the same as for women. Husbands from T1 are more likely to “always hide” ($p < 0.1$) and husbands from T2 are less likely to be “always honest” ($p < 0.1$) as well as more likely to be “efficient” ($p < 0.1$).

Next, we use the round in which women switch from option A to B – see Table 5. Column (1) presents results of a parsimonious specification of an ordered logistic model. In column (2) we add age of the husband and wife as explanatory variables, and in column (3) we add the full vector of controls summarized in Tables A1a–A1c. In column (4) we use the Tobit estimator. Column (5) re-estimates the same model as in column (4) but only uses the sub-sample of women who never switch (back) from option B to option A.

Results are interesting and rather consistent across specifications. Regression coefficients of both training variables are positive across all columns, suggesting the training postpones switching or promotes income hiding. As in Table 4, we again find that the coefficients for T1 are systematically larger than the coefficients associated with T2. Indeed, as before, the coefficients are only significantly different from zero if husbands are also invited to the training ($p < 0.05$). Yet, T1 and T2 do not significantly differ from each other. The Tobit regression suggests that if women follow the training, they switch some 2.5 rounds later.

The results for husbands, summarized in Table A6 are generally weaker, but all coefficients have the same sign – if anything the training delays switching to transparent choices. However, regression coefficients are only marginally significant ($p \leq 0.1$) for the models that include the full vector of controls – this is true for the full sample as well as the reduced sample that never switches (back) from secrecy to openness.

Taken together, what do these regression estimates reveal about the impact of business and gender trainings on income hiding? The interpretation is complicated by the fact that the coefficients associated with the husband treatment T1 are consistently different from zero, but not significantly different from the coefficients associated with T2 (even if the latter are of the “right sign” but typically not different from zero). According to the theory, increasing the bargaining power of women should attenuate incentives for income hiding as they have a greater say in how to spend the common pot, presumably resulting in outcomes more closely aligned with their own preferences. While Bulte et al., (2016a) have documented that participating in the training increased women’s bargaining power, the new results suggest that this effect does not reduce income hiding – as expected. It appears to be dominated by the opposing (expected) income effect. Husbands expect their trained wives to be more successful in the economic activities they pursue, and as a result will increase demands for the common pot. This appears especially the case if husbands can participate in the training as well, enabling them to obtain an even better signal of their wife’s earnings. Indeed, given the sample size at our disposal, we only have sufficient power

to identify an effect on income hiding if husbands are invited along with women – when the bargaining, (expected) income and information effect play out jointly.¹⁷

However, the empirical results are not very strong. Partly this may be because husbands do not seem to tax their women to an excessive extent, as perhaps in other contexts. For example, *Bernhardt et al., (2017)* document that low rates of return to capital by female entrepreneurs accessing microfinance may be due to diversion of capital towards business activities undertaken by the husband. If the same is true for our sample of Vietnamese respondents, it appears as if such diversion takes place at much more modest levels. *Bulte et al., (2016b)* found that profitability of female economic activities responded favorably to the intervention – an outcome that would be unlikely in a context of large-scale capital diversion.

It is interesting to observe that the patterns in the behavior of males, summarized in *Appendix A*, are consistent with Malapit's theory of income hiding. Specifically, if husbands believe their trained wives will be more economically successful (as indeed borne out by analysis based on follow-up data; see *Bulte et al., (2016b)*), or if they receive an updated signal about the profitability of their wives' business, they should raise the compulsory contribution share. This would not only invite hiding of unobserved income by women – it also makes the hiding of unobserved income by men more attractive. However, if husbands have the greatest say in how the common pot is spent, then their incentive to hide is attenuated as the distinction between the common pot and their discretionary income may be moot. This is reflected in the data: male income hiding appears to go up, but to a much smaller extent than hiding by women.

It is important to discuss the efficiency implications of our findings. Previous studies have shown that hiding may be inefficient – individuals preferring a small earning in private over a larger earning in public (e.g. *Jakiela and Ozier, 2016*). While we find the training delays the switching from “secrecy” to “transparency,” it is not evident that in the context of this experiment such hiding behavior is necessarily inefficient. This is evident from *Table 2*. While we do observe that the training causes a larger number of women to “always hide” income from their husband (a behavioral outcomes that is inefficient from the household perspective), we also observe a reduction in extremely honest behavior. Since extreme honesty is also costly in our experiment, the aggregate efficiency implications are unclear.

6. Discussion and conclusion

We use an experimental approach to probe the impact of a gender and business training on income hiding. We are also interested in the effect of husbands' participation on hiding, and discuss various channels by which husbands involvement may matter. Consistent with recent studies we find some evidence of non-cooperative decision-making within the household, and document a positive willingness to pay for income hiding by a minority of our respondents. However, the majority of the participants in our experiments preferred not to hide income from their spouse – even when full revelation of information was costly and therefore inefficient.

Our main results are that (i) participating in the training on average discourages honesty and encourages income hiding by women, but (ii) only robustly when husbands also participated in the training. In addition to an increase in (expected) female income invited by the trainings, these reduced form effects lump together various potentially opposing effects, including an increase in bargaining power of women within the household and a reduction in asymmetric information within the household. But other factors including enhanced cooperation or improved numeracy may also play a role. It is worthwhile to observe that while some of the additional income hiding invited in the game is inefficient from a household perspective, the reduction of extreme honesty promotes efficiency.

The reduction in asymmetric information about the wife's behavior is an intuitive explanation for the finding that participating in the training by men seems to intensify income hiding. If husbands learn about the profitability of their wife's enterprise, women have to contribute more to the common pot, distorting the balance between consuming private and household goods.¹⁸ Since an updated signal about the profitability of his wife's business may invite husbands to raise the compulsory contribution to the common pot (reflecting that the consumption of household goods for them becomes cheaper), women have an incentive to evade this tax in domains where their income is unobserved. However, several other channels may be important as well, and we emphasize that additional research is necessary to establish the merits of hybrid models of household decision-making.

Overall the findings represent a mixed message for NGOs seeking to advance the livelihoods of rural women via training interventions. While inviting husbands to trainings may attenuate concerns about intra-household frictions (*Allen et al., 2010*), it may simultaneously generate intra-household flows of information that invite income hiding. The overall welfare effects of a transition towards non-cooperative modes of decision-making in the household, even in the presence of potential direct beneficial effects of interventions, are potentially ambiguous. Understanding how the participation of husbands in training interventions for women affects both the efficiency and equity outcomes of these interventions is an important topic of future research.

¹⁷ As mentioned, additional mechanisms may matter as well, including increased mutual appreciation and understanding. However, we would expect such an effect to result in more cooperative outcomes with less income hiding. Hence if this effect exists, it is quantitatively less important than some of the other, opposing, effects.

¹⁸ This would occur when, in the absence of the training intervention, wives are able to reduce their contribution to the household common pot by downplaying their business earnings (i.e. evasion in the context of imperfect information). In response to the higher contribution rate, women should hide a larger fraction of their unexpected and unobserved windfall income (such as earned in the experiment).

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APPENDIX A

Tables A1a–A1c, Tables A2–A6.

Table A1a

Balance tests.

Variables	(1) Age	(2) Schooling	(3) Total savings	(4) Members hh	(5) Region	(6) Total loans	(7) Agr. Activity
T1	0.77 (1.43)	−0.66 (0.35)*	−1938.28 (2843.56)	0.05 (0.21)	0.02 (0.10)	−4464.63 (5509.26)	0.06 (0.05)
T2	−1.43 (1.41)	−0.59 (0.44)	−3477.60 (2491.19)	−0.08 (0.20)	0.04 (0.13)	−238.45 (5645.53)	−0.01 (0.07)
Constant	44.99 (1.02)***	7.62 (0.27)***	8106.94 (2330.91)***	4.96 (0.13)***	0.21 (0.07)***	26888.70 (4111.33)***	0.85 (0.04)***
Observations	339	339	339	338	339	339	338
R-squared	0.010	0.016	0.006	0.001	0.002	0.003	0.010
P value Wald test T1 = T2	0.12	0.86	0.57	0.41	0.83	0.43	0.25

Notes: The balancing tests are based on a OLS regression of the dependent variable (presented in top row) on T1, T2 and a constant. We use baseline values and cluster robust standard errors (clustering at center level). *** $p < 0.01$, * $p < 0.1$. Age: age in year; Schooling: amount of years followed school; Total savings: Total stock of savings containing savings at TYM, savings outside TYM at bank account; savings in storage and other savings; Members hh: amount of household members; Region: region dummy; Total loans: Total loans (loans from TYM and loans outside TYM); Agr activity: dummy for having agricultural activities. For detailed explanations of the variables, see Bulte et al. (2016b).

Table A1b

Balance tests (continuation).

Variables	(1) Non-farm business activity	(2) Knowledge	(3) General practices	(4) Innovation	(5) Sales total	(6) Profit total
T1	0.01 (0.07)	−0.36 (0.30)	0.24 (0.21)	−0.02 (0.20)	2210.48 (8436.74)	−1721.59 (1986.82)
T2	0.13 (0.09)	−0.17 (0.36)	−0.06 (0.28)	0.47 (0.34)	4768.07 (7326.55)	−703.04 (2243.97)
Constant	0.30 (0.05)***	9.20 (0.22)***	0.11 (0.16)	0.06 (0.14)	19310.08 (5092.18)***	5079.24 (1803.19)***
Observations	339	339	339	339	339	339
R-squared	0.015	0.009	0.009	0.015	0.001	0.002
P value Wald test T1 = T2	0.15	0.61	0.27	0.15	0.57	0.52

Notes: The balancing tests are based on a OLS regression of the dependent variable (presented in top row) on T1, T2 and a constant. We use baseline values and cluster robust standard errors (clustering at center level). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Non-farm business activities: dummy for having non-farm business; Knowledge: The amount of correct answers on 16 business questions; General practices: Index based on 7 business practices questions - 1st component of a principal component analysis (PCA); Innovation: Index based on 7 business practices questions - 2nd component of PCA; Sales tot: Total sales of farming and non-farm business activities of female; Profit total: Total profit of farming and non-farm business activities. For detailed explanations of variables, see Bulte et al. (2016b).

Table A1c

Balance tests (continuation).

Variables	(1) IHSTLoans	(2) IHSTSaving	(3) IHSTSales	(4) IHSTProfit
T1	0.268 (0.42)	0.083 (0.10)	0.870 (0.86)	0.988 (1.21)
T2	−0.112 (0.49)	−0.180 (0.24)	0.364 (0.82)	0.804 (2.27)
Constant	9.648 (0.34)***	8.698 (0.13)	6.862 (0.54)***	2.620 (0.91)***
Observations	339	339	339	339
R-squared	0.003	0.007	0.007	0.004
P value Wald test T1 = T2	0.37	0.24	0.50	0.87

Notes: The balancing tests are based on a OLS regression of the dependent variable (presented in top row) on T1, T2 and a constant. We use baseline values and cluster robust standard errors (clustering at center level). *** $p < 0.01$. IHSTLoans, IHSTSaving, IHSTSales and IHSTProfit are the inverse hyperbolic sine transformations of Total loans, Total savings, Sales total and Profit total. The inverse hyperbolic sine transformation is defined as $\log(y_i + (y_i^2 + 1)^{0.5})$. Except for very small values of y_i , this is approximately the same as $\log(2y_i)$, so it can be interpreted the same way as a standard logarithmic dependent variable.

Table A2
Experimental game: Measuring the propensity to hide income.

Choices	Information	A We will not inform your wife about your choice	B We will inform your wife about your choice	Please write your preference A or B
1	Would you prefer	80.000	75.000	
2	Would you prefer	80.000	85.000	
3	Would you prefer	80.000	90.000	
4	Would you prefer	80.000	95.000	
5	Would you prefer	80.000	100.000	
6	Would you prefer	80.000	105.000	
7	Would you prefer	80.000	110.000	
8	Would you prefer	80.000	115.000	

Table A3
Husband switch points for treatments and controls.

Round	Control	T1	T2
1	86	78	69
2	14	20	20
3	2	3	6
4	1	1	3
5	4	1	2
6	0	0	2
7	1	0	0
8	0	0	0
9	6	12	8
Total	114	115	110

Table A4
Frequency table for specific behavior (husbands).

	Control		T1		T2	
Extreme honesty (never hiding)	86	28	78	37	69	41
Always hiding	6	108	12	103	8	102
Highest income	14	100	20	95	20	90

Note: This table can be derived from Table A3 as *Extreme honesty* equals switching in Round 1, *Always hiding* equals switching in Round 9 and *Highest income* equals switching in Round 2.

Table A5
Impact of training on specific behavior husbands.

	Extreme honesty (never hiding)	Extreme honesty (never hiding) (sub sample)	Always hiding	Always highest income
T1	-0.080 (0.06)	-0.09 (0.06)	0.051 (0.03)*	0.054 (0.04)
T2	-0.128 (0.07)*	-0.133 (0.08)	0.023 (0.05)	0.061 (0.04)*
Constant	0.243 (0.04)***	0.292 (0.05)***	-0.227 (0.03)***	-0.279 (0.02)***
Wald test T1 = T2 (p- value)	0.44	0.54	0.53	0.83
Observations	339	287	339	339
Pseudo R ²	0.01	0.01	0.01	0.01

Note: Estimates refer to Probit estimates (marginal effects). Cluster-robust standard errors between parentheses. * $p < 0.10$, *** $p < 0.01$. Subsample refers to sample without multiple switchers.

Table A6
Training interventions and husband income hiding.

	(1)	(2)	(3)	(4)	(5)
T1	0.37 (0.29)	0.36 (0.29)	1.63 (1.13)	0.32 (0.28)	0.44 (0.34)
T2	0.57 (0.36)	0.58 (0.36)	2.00 (1.51)	0.56 (0.34)*	0.66 (0.40)*
Age wife		-0.02 (0.03)		-0.02 (0.04)	-0.07 (0.04)*
Age husband		0.03 (0.03)		0.03 (0.04)	0.08 (0.03)**
Constant			-3.86 (1.30)***		
Wald test T1 = T2 (p- value)	0.62	0.47	0.80	0.44	0.29
Observations	339	339	339	337	285
R ²	0.01	0.01	0.004	0.04	0.04

Notes: Columns 1, 2 and 4 report results from an ordered logistic regression. Column 3 reports results of a Tobit regression. The regression presented in column 4 also includes all variables presented in the balance tests (see Tables A1a–A1c). Column (5) re-estimates model (4) for the sub-sample of women who never switch back from option B to option A. Standard errors clustered at the center level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix B. Experimental games handbook (Gender and business training project in Vietnam) November 2012

1. General Information

The international organization 3ie, The University of Groningen and TYM Fund collaborate on a project to evaluate the impact of gender and business training for female clients and their husbands at Vinh Phuc province. The project includes some experimental games to improve our understanding of the decision-making processes of female clients and their husbands.

2. Manual for experimenters

2.1. Preparation

- Each experimenter need the following:
 - (1) 3 survey questionnaires (one for male, one for female and one for couple).
 - (2) 16 beer bottle covers with number from 1 – 16 for drawing.
 - (3) one box to put all 16 beer bottle covers.
 - (4) Invoices for game 1, game 2 and game 3.
 - (5) Carbon paper.
 - (6) Results sheet of Game 2 and Game 3.
 - (7) Laptop.
- Inform the participants to be present on time.
- Each experimenter has a copy file of experiment 1 on the screen with the file name “Name of the experimenter _ date _ name of participant_ household code”. Each couple will have 3 sheets:
 - + “1vo”: for woman
 - + “1chong”: for man
 - +” 1vochong”: for couple

2.2. Game process

- Give the number cards to the couples, each couple will have the same number. This number is also indicated on the table they sit.
- Guide these couples to sit on the right places.
- Inform the participants about the experiments.
- Welcome and inform the general rules to participants (Branch manager – Mrs. Huong).

Experiment 1

- For men: all males need to move to another room and wait for their turn. TYM's staff will be in this room to ensure that these men do not talk to each other.
- For women:

- An experimenter will explain experiment 1 to all women (Nhung/Yen).
 - An experimenter will fill in all information about the participant in Sheet 1a
 - Experimenter will ask if the participants have any questions and answer the questions (if any)
 - Participants play experiment 1. Before and during the game, the experimenter shows the calendar to the participants to let them know when they will receive money.
 - After finishing game 1, the participants will draw tickets. Before drawing tickets, ensure that participants see the number of the tickets.
 - Write down date and amount of money the respondent won on a receipt (make two copies) and let the participants sign.
- Same procedure for men and couples.

Experiment 2

- For women:
- An experimenter will instruct how to play experiment 2 for women (Nhung/Yen).
 - Let participants play the experiment.
After finishing game 2, the experimenter will pay the participants and ask them to sign the invoices and the result sheets of Game 2. The participants also sign the list which will be sent to the charity fund with their names and the amount of money they donate.
 - Same procedure for men and couples.

Experiment 3

- For women:
- An experimenter will instruct how to play experiment 3 for women (Nhung/Yen).
 - Experimenter will explain participants the details about experiment 3.
 - When the participants understand how to play the game, the experiment will be conducted.
 - After finishing game 3, the experimenter will write down names of participants and the money they will receive. If the participant selects option A, the money will be given to her immediately (without informing the husband). If the participant selects option B (inform husbands), give the money to the women after the couple has been interviewed. Inform the husband about the money gift. The participants will sign the receipts and the accountants will keep these receipts for archive.
 - Interview the participants (use the questionnaire).
- Same procedure for men. After interviewing men, invite women come to the room and interview couples (use questionnaire for couples).

2.3. After the game

- Send the receipt (second copy) to participants (women, men and couples), remind participants to bring along the ID when coming to receive money.
- Researchers/experimenters will copy all the files of experiment 1 and collect all files of experiments 2 and 3.

3. Instruction for participants at the experiment places

Experimenter will read the information below for participants

3.1. General introduction (For both men and women)

- We would like to thank all of you to participate in the experiments with us today. The purpose of this research is to improve our understanding of the decision-making processes within your household. Any information given by you in this research will be kept confidential.
- If you agree to participate, we will invite you to join several experiments and you will be paid for each experiment. Rules and money rewards received will be different between experiments and between people. Hence, answer all questions in line with your preferences since there is a probability that you will receive the money
- Today we will spend about four hours for experiments if any of you do not have enough time to attend, please notify us immediately.
- It is obligatory that both partners participate in the game. This implies that the husband (wife) is not allowed to participate if the wife (husband) does not participate.
- Your participation is voluntary. If you decide to participate, you will have chances to receive more money from the experiments. During the experiments we will explain details about how much and when you will be allowed to collect the money. After the experiments, you will sign the receipts following the instructions of the experimenters. These documents are used for accounting purposes and are not related to your answers.
- Do you have any more questions? (The experimenters should wait long enough for participants to think and ask about their questions).
- Please let us know whether you are willing to participate in the experiments?

Wait to see if anyone decides to leave after this introduction.

If no one decides to leave, experimenters will explain the next contents.

3.2. Experiments instructions

- Before proceeding, I would like to give an overview of what we will do today, as well as a number of rules which everyone has to follow.
- You will participate in 3 experiments, which all have **money rewards**. Any money you get today is your own money and you can take it home.
- If you have any questions you have to raise your hand and we will answer you individually. We kindly request you not to discuss with other participants during the experiments unless we allow it. We also kindly request you to **be quiet** during the experiments. This is very important.
- Each experiment will have its own instructions. You have to follow the instructions in each experiment.
- Now we start the **first experiment**. The women start with experiment 1. We would like all males to move to another room,. Please enjoy tea and cookies and wait for your turn.

3.3. Experiment 1

Instruction for women

In this experiment, you will receive 80,000 VND. You need to allocate 80,000 VND into two accounts, an “earlier” account which does not pay any interest, a so-called consumption account, and a “later” account, which does pay additional interest, a so-called savings account, respectively. We will ask you to do this several times. There are two main differences between the two accounts: (1) you are allowed to withdraw money from the “consumption account” earlier than from the savings account. So allocating money to the consumption account may be beneficial since it earlier helps to solve current liquidity problems than money allocated to the savings account; (2) the money you are allowed to withdraw from the consumption account is EXACTLY equal to the amount of money that you allocate to the consumption account. However, if you allocate some money to the SAVINGS account you are allowed to withdraw a higher amount than allocated to the consumption account: you are allowed to withdraw the money allocated to the savings account PLUS THE INTEREST you will receive on the savings!

The dates are different in each decision. Moreover, the additional interest income (and hence the interest rate) you will receive on allocating money to the savings account, differs per allocation decision. Your task is to decide how much money you ALLOCATE TO THE early date (the consumption account) and how much money you ALLOCATE TO THE later date (i.e. the savings account). Please note that if you allocate money to the later date, the amount you will eventually receive will be higher since allocations to a later date will “earn” some interest. Please note also that you will receive money allocated to the savings account at a later moment in time than money allocated to the “consumption” account. Hence: an advantage of allocating money to the early date is that you are allowed to withdraw some money very soon. On the other hand, allocating some money to the later date (the savings account) has the advantage that you receive more money due to the additional interest payments. The game replicates the choice between your actual consumption and saving decision.

I give you some examples which may help you to understand this experiment:

Draw on the board. I have two accounts: the “consumption account” and the “savings account”. If you allocate an amount of X to the consumption account, you are allowed to withdraw an amount of X on 19/11/2012. If you allocate an amount X to the saving account you can withdraw an amount X PLUS INTEREST on 19/12/2012. (PLEASE ADJUST THE DATES!!!!) Now assume that I give you 80,000 VND. You are asked to allocate this amount of money between the “consumption” account and the “saving” account. Assume that the interest rate in this period (30 days) is 9%. Moreover assume that you allocate 60,000 VND to the consumption account 19/11/2012 and 20,000 VND to the saving account. Then, you can withdraw 60,000 VND on 19/11/2012 from your consumption account and $20,000 \cdot (1 + 9\%) = + 21,800$ VND (which includes THE AMOUNT YOU ALLOCATED TO THE SAVINGS ACCOUNT, 20,000 VND, and 1,800 VND ADDITIONAL interest) on 19/12/2012. In order to help you understanding better the experiment, I would like to invite some of you to practice before we start the experiment.

(Invite a participant randomly)

Pilot 1:

Now I give 80,000 VND. You have two accounts, the consumption account, FROM WHICH YOU CAN withdraw on 19/11/2012 and the saving account, FROM WHICH YOU CAN WITHDRAW on 19/12/2012. If the interest rate in this period (30 days) is 15%, please let me know how much money you want to allocate to the consumption account and how much you want to put in the saving account. Please recall that the sum of the money allocated to the consumption and savings account should equal 80,000 VND; but that the amount of money you can eventually withdraw may be higher than 80,000 VND due to the interest payments. I will calculate how much money you will receive on 19/11/2012 and 19/12/2012.

(The experimenter writes the money the participant will receive in two accounts on board)

Pilot 2:

Now I give 80,000 VND. You have two accounts, the consumption account from which you can withdraw on 19/12/2012 and the saving account from which can withdraw on 19/1/2012. Note that even though it is not allowed to withdraw money from the consumption account before 19/0.12/2012 we call this a consumption account since it does not pay any interest. If the interest rate in this period (31 days) is 10%, please let me know how much money you want to allocate to the

consumption account and how much you want to put in saving account. I will calculate how much money you will receive on 19/12/2012 and 19/1/2012.

(The experimenter writes the money the participant will receive in two accounts on board).

If you understand how to play, I will explain next steps.

In the experiment, you will make 16 decisions with respect to allocating 80,000 VND into a non-interest paying consumption account and an interest paying savings account. The experimenter will help you to fill in the results on the computer screen if you do not use computer proficiently. You will also be informed about the “implied” daily interest rate paid on allocations to the savings account for each allocation decision. After you fill in your decision, the computer will automatically calculate the amount of money you will receive in each decision. You can edit/change your choices many times. When you are satisfied with your decisions, you can inform the experimenter that you have completed the experiment. The experimenter will save your decisions.

After you complete 16 decisions, you will draw tickets to select one of the 16 decisions as the decision-that-counts. The decision-that-counts will determine your actual earnings. It should be noticed that, although you make 16 decisions, only one allocation decision will be paid to you. The allocation decision that will be paid to you, is determined by this lottery. You will not know which decision is selected in advance. Since each decision has the same probability to be selected for the final payment, it is extremely important that you complete each allocation decision seriously and in line with your own preferences.

Important: You will receive all money rewarded in this experiment at the center meetings or at TYM's office. We will write a certificate for you which indicates the amount of money you will receive as well as the date you are allowed to collect the money. Hence, if you allocate money partly to the consumption account and partly to the savings account, you will receive two certificates, indicating an amount of money you may collect at an early date, and another certificate indicating an amount of money you may collect at a later date. On each certificate, we will add 20,000 VND of your thank-you payment for your attendance. Therefore you will always have 20,000 VND for each time you go to collect rewards. In case you cannot come on the date of receipt. Please contact TYM's office for more information.

Please bring along your ID and the certificate when you come to get money at TYM office.

Do you have any more questions? (The experimenters should wait enough time for participants think and ask questions). If you do not have any questions, we will start with the first experiment.

Instruction (for men)

Same instruction for women, replace Ms by Mr. (it is different than “you” when translated into Vietnamese).

Instruction (for couples)

In this experiment, both of you will make 16 decisions about how to allocate 80,000 VND to a consumption account and a saving account. The experiment is the same as you have just completed individually. However, in this experiment, both of you will discuss together and decide how to allocate 80,000 VND.

In line with the procedure above, after both of you complete 16 decisions, you will draw tickets to select one of 16 decisions as the decisions-that-counts. PLEASE DECIDE ON WHO WILL DRAW THE TICKET: WILL IT BE THE MAN OR THE WOMEN, OR THE EXPERIMENTER (CAN NOT BE BOTH!!!!) The decision-that-counts will determine your actual earnings. Though you make 16 decisions, but only one decision will be selected to pay for you. You will not know which decision is selected in advance. Each decision has the same probability to be selected for the final payment, so you should be careful in all 16 decisions.

You will receive a certificate as you have received in previous plays. The ways to get money are as same as previous plays.

Do you have any more questions? (The experimenters should wait enough time for participants think and ask questions). If you do not have any questions, we will start the experiment 1.

3.5. Experiment 2

Instruction (for women)

In this experiment, you will receive 80,000 VND. You can keep the 80,000 VND for yourself, or you can donate it to a charity _____ (depending on the game location, the experimenter will add the name of the Buddhist temple fund). If you donate some money to a charity, we will double the donation using our own funds. For example, if you decide to keep 60,000 VND for yourself, and donate 20,000 VND to the charity fund, we will also donate 20,000 for charity. The charity will then obtain 40,000 VND. We will not tell your husband about the money you received, as well as your choice. We will bring the list with your signature and the amount of money you donate to the charity fund.

Below is the list of choices. Please read the choices carefully and mark one choice.

Note: only mark **one choice**.

(The experimenter gives the choice list for participants. Both participants and experimenters need to sign the list of choices.)

After finishing game 2, the experimenter will pay the participants and ask them to sign on the invoices and the result sheets of Game 2. The participants also sign on the list which will be sent to charity fund with their names and the amount of money they donate.

EXPERIMENT 2			
Full name:			
Date of birth			
Name of husband:			
Date of birth			
Household code:			
Group:		Branch:	
Also ASK MOBILE, AND REGISTER ADDRESS			
Name of experimenter:			
Date:			
TIME COMPLETED WEATHER:			
SUNNY/RAINY/TEMPERATURE			
Choice	Yourself	Charity	Your preferred choice
1	80.000	–	
2	75.000	5.000	
3	70.000	10.000	
4	60.000	20.000	
5	55.000	25.000	
6	50.000	30.000	
7	45.000	35.000	
8	40.000	40.000	
9	30.000	50.000	
10	25.000	55.000	
11	20.000	60.000	
12	15.000	65.000	
13	5.000	75.000	
14	–	80.000	
Mark (x) on the preferred choice.			
Note: mark 01 choice only			
Signature of participant		Signature of experimenter	

Instruction (for men)

Same instruction for women, replace Ms by Mr. (it is different than “you” when translated into Vietnamese).

Instruction (for couples)

In this experiment, you will receive 80,000 VND. You can keep the 80,000 VND for yourself, or you can donate it to a charity _____ (depending on the game location, the experimenter will add the name of the Buddhist temple fund). Based on the money you donate, we will donate to the same charity with the same amount of money you donate. For example, if you decide to keep 60,000 VND for yourself, and donate 20,000 VND for the charity fund, we will also donate 20,000 for the charity. Thus, the charity will receive 40,000 VND. This experiment is the same as you have just COMPLETED. However, in this experiment, both of you will discuss with each other and decide together on how much you will keep for your family and how much you will donate. We will bring the list with your signature and the amount of money you donate to charity fund.

The money which you indicate that you want to keep yourself, will be paid to the wife or the man. Please inform the instructor to whom the money needs to be paid (REGISTER THIS). It may also go 50% to the man/ and 50% the wife.

Below is the list of choices. Please read the choices carefully and mark on one choice.

Note: only mark on one choice.

(The experimenter gives the choice list for participants. Both participants and experimenters need to sign on the list of choices.)

After finishing game 2, the experimenter will pay the participants and ask them to sign on the invoices and the result sheets of Game 2. The participants also sign on the list which will be sent to charity fund with their names and the amount of money they donate. See above

4.6. Experiment 3

Instruction (for women)

You will have a chance receiving 80,000 VND. We will not tell your husband that you received some money. However, you may even receive a larger amount of money, conditional on that we will inform your husband about the amount of money that you have obtained.

Please look at the experiment 3 sheet. You have 8 choices. In each choice you have two options

Option A: You will receive 80.000 VND and we will *NOT* inform your husband that you received money.

Option B: You receive another amount of money and we will *INFORM* your husband about the amount of money that you obtained.

When you finish these eight choices, you will be asked to draw tickets containing the numbers one till nine. Depending on the number on the ticket selected, the amount of money you receive will be decided. Numbers 1–8 correspond to the decisions 1–8 you have just made. If you pick up ticket number nine, you are unlucky and you do not get any money in this experiment.

For example if you pick ticket number three, it corresponds to the decision number three. If you have chosen A, I will give you 80,000VND and not tell your husband about this money. If you have chosen B, I will give you 90,000VND, but I will also inform your husband that you have received this amount of money.

To help you to understand game 3, we let you do a pilot.

(Experimenter gives the pilot sheet to participants, then have them draw tickets, and explain the money they receive.)

Do you have any more questions? (The experimenters should wait long enough for participants to think and ask their questions). If you do not have any questions, we will start the experiment.

(If the participants understand how to play, the experiment can be started).

(After the play, the experimenter writes the amount of money the participants receive in the certificates and give the money to them. if they select option A (not to inform their husband)). If they select option B (inform their husbands), wait until when interview couple and give the money to women and inform their husbands. The participants will sign on the receipts and the accountants will keep these receipts for archive.)

Interview the participants (use the questionnaire).

Experiment 3

Full name:
D.O.B
Family code:
Group: Branch:
Name of experiments
Date:
Time completion of game Weather: rainy/sunny/temperature??

Choices	Information	A We will not inform your husband about your choice	B We will inform your husband about your choice	Please write your preference A or B
1	Would you prefer	80.000	75.000	
2	Would you prefer	80.000	85.000	
3	Would you prefer	80.000	90.000	
4	Would you prefer	80.000	100.000	
5	Would you prefer	80.000	110.000	
6	Would you prefer	80.000	120.000	
7	Would you prefer	80.000	140.000	
8	Would you prefer	80.000	150.000	
Signature of participants	Signature of experimenters			

Choices	Information	A We will not inform your husband about your choice	B We will inform your husband about your choice	Please write your preference A or B
1	Would you prefer	80.000	75.000	
2	Would you prefer	80.000	85.000	
3	Would you prefer	80.000	95.000	
4	Would you prefer	80.000	100.000	
5	Would you prefer	80.000	105.000	
6	Would you prefer	80.000	110.000	
7	Would you prefer	80.000	115.000	
8	Would you prefer	80.000	120.000	

Instruction (for men)

Same instruction for women, replace Ms by Mr (it is different than “you” when translated into Vietnamese).

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