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## Competitiveness of entrepreneurs and salaried workers

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**Competitiveness of Entrepreneurs and  
Salaried Workers**

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# Competitiveness of entrepreneurs and salaried workers\*

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## Abstract

We measure the willingness to compete of entrepreneurs and salaried workers in an experiment. We let participants choose between a piece-rate and a tournament scheme either in private or in public. We find that in the private condition entrepreneurs are less competitive than salaried workers, but that in the public condition this ordering is reversed. Data from a follow-up survey suggest that social image concerns of entrepreneurs and perceived norms can explain why entrepreneurs are more competitive when decisions are publicly observable. Our survey also reveals that more competitive entrepreneurs earn higher profits in their businesses.

Keywords: Competitiveness, Entrepreneurs, Salaried Workers, Profits, Field Behavior, Experiment

JEL-Codes: C91, C93, D01, L26

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## **1. Introduction**

Entrepreneurial Orientation (EO) – a widely used framework to study how firm and personal characteristics motivate entrepreneurial decisions (Lumpkin and Dress, 1996; Shane et al., 2003) – has emphasized the importance of competitive aggressiveness as one of the motivating factors for entrepreneurs. Indeed, it is almost impossible to think of entrepreneurial activities without competition (Kirzner, 2015) because entrepreneurial processes almost always involve a competitive market environment. However, empirical evidence on whether entrepreneurs are actually more competitive than salaried workers is rather scant. Moreover, competitiveness may be a context dependent trait, aligning with perceived norms of appropriate behavior in an entrepreneurial setting: such norms, combined with social image and reputational concerns that arise when competitiveness is observed by other market participants, suggest that entrepreneurs' competitive choices may be different when being observed in the public than when making decisions privately. Finally, there is no evidence whether more competitive entrepreneurs are more successful with their business.

In this study, we aim to contribute to the literature by providing evidence on entrepreneurs' competitiveness, the influence of observability on competitive choices, and the link to profits of entrepreneurs. To this end, we use an established experimental paradigm (by Gneezy et al., 2009) to measure competitiveness of entrepreneurs and salaried workers under incentivized and controlled conditions. Importantly, in addition to eliciting competitiveness of both groups of subjects, we let them take their decisions in two different settings: a private setting, where their choice between a piece-rate and a tournament-based payment scheme remains private information, and a public setting where this decision is made known to all participants in a session. Through this exogenous manipulation we can identify a causal effect of introducing observability on the competitive choices of entrepreneurs and salaried workers. We complement the analysis of experimental choices with rich survey data that allows to better understand the choices of entrepreneurs and salaried workers. Finally, we collect data on the entrepreneurs' business profits and link their experimental choices on competitiveness to their economic success on the market.

While personality traits have been studied extensively in the Entrepreneurial Orientation literature (Baum and Locke, 2004; Rauch and Frese, 2007; Zhao and Seibert, 2006; Zhao and Lumpkin, 2009), empirical work on many other traits and preferences has lagged behind because of measurement difficulties in the field. Tools in experimental economics provide methods to

quantify a host of behavioral traits and outcomes. Taking advantage of a commonly used experimental method to measure one's willingness to compete, our study contributes to the growing literature on entrepreneurship in behavioral and experimental economics by examining the relationship between entrepreneurship and competitiveness at an individual level. Our method uses a lab-in-the-field experiment conducted with a sample of entrepreneurs and salaried workers in Vietnam.

Our main results can be summarized as follows: in the private condition, entrepreneurs are less likely to choose the competitive payment scheme compared to salaried workers. Hence, our data reject the notion that entrepreneurs are generally more competitive than salaried workers. Yet, when choices are made public, this pattern from the private condition is reversed. When choices are publicly observable by others, entrepreneurs increase and salaried workers decrease their willingness to compete, resulting in a significantly different response to treatment and to a 12% higher rate of competitive choices of entrepreneurs compared to salaried workers.

Using data from a follow-up survey conducted six months after the experiment, we offer a potential explanation for why competitiveness depends on whether or not choices are observable by others. We argue that choices in our experiment can be explained by means of participants' desire to maintain a good social image and reputation (as an entrepreneur) and by perceptions regarding the extent to which competitive behavior is considered appropriate and important for professional success for each of the two samples. Finally, looking at the set of entrepreneurs only, our survey also reveals that more competitive entrepreneurs report higher profits for their business than less competitive ones.

Our paper relates to previous work that studies economic decision making and preferences of entrepreneurs. When comparing entrepreneurs' risk preferences to those of employed individuals, many papers do not find significant differences (e.g., Macko and Tyszka, 2009; Burmeister-Lamp et al., 2012). Koudstaal et al. (2016), however, show that entrepreneurs exhibit a lower risk aversion than managers and employed workers, but that this can be explained by differences in loss aversion. Holm et al. (2013, 2017) show that entrepreneurs in China are more willing to take strategic risks compared to employed people while there are no differences with respect to non-strategic risks. Batsaikhan (2017) shows that successful entrepreneurs are more trusting in a strategic context than less successful entrepreneurs. Cooper and Saral (2013) examine entrepreneurs' and students' willingness to form a team for collaboration, and find that

entrepreneurs are less likely to join teams than non-entrepreneur subjects. Batsaikhan and Putterman (2019) show that entrepreneurs are better at sustaining high levels of cooperation in a repeated social dilemma experiment than a sample of student subjects in Mongolia. Similarly, Holm et al. (2020) find that Chinese CEOs make more efficient and pro-social choices in cooperation and coordination games than a control group, so that CEOs earn higher payoffs. The paper most closely related to our main research question is by Berge et al. (2015). They present a lab experiment with small-scale entrepreneurs in Tanzania and show that the willingness of entrepreneurs to compete in a quiz task correlates with aspects of their field behavior, such as investment and employment decisions. Berge et al. (2015) also report suggestive evidence of a positive correlation between competitive behavior and profits, which fits in well with the patterns we observe in our data.<sup>1</sup> Although their experiment is run in a similar setting as ours, it has a different research focus (on the relation between competitiveness and field behavior) and does not compare competitive behavior of entrepreneurs to non-entrepreneurial professional groups. Moreover, they do not investigate the influence of observability on competitive choices of entrepreneurs. We consider the findings from Berge et al. (2015) as complementary, in particular since they provide strong support for the capacity of experimentally elicited competitive choices to predict behavior in an entrepreneurial context of a developing country.

On a broader perspective, our paper is also related to the large literature on how to measure competitiveness (Gneezy et al., 2003) and on gender differences in the willingness to compete (Niederle and Vesterlund, 2007). Using real effort tasks in experimental studies, this literature has documented that women are usually less willing to compete than men (e.g., Gneezy et al., 2009; Andersen et al., 2013; Datta Gupta et al., 2013; Flory et al., 2015; Saccardo et al., 2018). Experimental behavior in experiments on competitiveness has also been shown to correlate with important aspects of real-world behavior such as educational choices (college dropout rates or choice of educational track) and income (Buser et al., 2014, 2021; Almas et al., 2016; Reuben et al., 2020), but except for Berge et al. (2015) this literature has not yet studied the competitive attitudes of entrepreneurs.

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<sup>1</sup> Leibbrandt (2012) examines a different behavioral trait, namely cooperativeness in a public goods game, and reports that higher levels of cooperativeness are associated with superior market performance in a sample of professional sellers (Brazilian fishermen).

Finally, our treatment variation between a public and a private condition (when making the decision whether or not to compete) is related to a large literature on the effects of observability in experimental social sciences. Observability has been shown to affect behavior across a wide range of circumstances, which include, among others, donations and pro-social behavior in general (Lacetera and Macis, 2010; Lambarraa and Riener, 2015; Dufwenberg and Muren, 2016), cooperative behavior (Andreoni and Petrie, 2004; Yoeli et al., 2013), or the willingness to engage in third-party punishment (Banerjee et al., 2015). Regarding competitive behavior, we are aware of one study that relates observability to competition entry choices in a laboratory study. Buser et al. (2017) show that making the competition entry choices public (by asking participants in the lab to stand up and announce their choice between a piece-rate and a tournament-based payment scheme for their performance in a real-effort task) has only a small and insignificant effect on the willingness to compete among male and female participants. Our paper is different because we study competitive choices of entrepreneurs and compare them to non-entrepreneurs, and moreover we relate entrepreneurs' competitive behavior to their businesses' profits and also to complementary survey evidence about the importance of social image and reputation concerns (e.g., Benabou and Tirole, 2006). In our setting, participants may be changing their behavior when choices become public in order to signal that they are of a particular type (competitive or not) that is valued more in their profession. If being competitive is a signifying characteristic among entrepreneurs, but not among salaried workers, deciding in public to embrace (respectively, to avoid) competition allows the entrepreneur (respectively, the salaried worker) to signal consistency with a desired image.

The paper proceeds as follows. In section 2 we present the experimental design and implementation. Section 3 shows our results and section 4 concludes.

## **2. Experimental Design and Procedure**

### **2.1. Game, Subject Pool, and Treatments**

We used the experimental task developed by Gneezy et al. (2009). Subjects were asked to throw a tennis ball into a bucket placed three meters away from them in a room. Performance was measured by how many (out of ten) balls a subject threw successfully into the bucket. To measure the willingness to compete, subjects had to choose between a piece-rate or a tournament payment

scheme. Under the piece-rate scheme, subjects were paid 20,000 Vietnamese Dong (approximately 0.85 USD) for each successful throw. Under the tournament scheme, subjects were randomly paired with one other person in a separate room. They were paid 60,000 Vietnamese Dong for each successful toss if they outperformed their opponent, and zero otherwise. In case of a tie, both subjects were paid the piece rate of 20,000 Vietnamese Dong per successful toss.<sup>2</sup>

Our subject pool consisted of salaried workers and entrepreneurs who ran a business in the My Huong commune of Vietnam.<sup>3</sup> Our definition of a salaried worker was a full-time employee in a firm in the commune. Entrepreneurs were individuals who had a business registered in the commune and spent most of their time working on that business. Some entrepreneurs did have part-time jobs, and we included them in the sub-sample of entrepreneurs if they indicated that they spent more time on their business than on their part-time job. We asked the commune leaders to identify subject types by their job nature (entrepreneurs versus salaried workers) and to invite them to our experimental sessions. We ran separate sessions for entrepreneurs and salaried workers.

For each sub-sample we conducted two treatments in a between-subjects design.

- In treatment *Private* we let each subject choose between both payment schemes, and this choice remained private information and was not communicated to any other participant.
- In treatment *Public*, subjects first made their choice between payment schemes, but then had to move to two opposite ends of the room, contingent on their choice. In this way, all other participants in the same experimental session were able to observe a subject's choice. This procedure was made common knowledge before subjects made their decision.

Our motivation for this particular treatment variation was the following: in *Private*, our aim was to have subjects reveal their preferences with respect to competition. In *Public*, however, subjects' decisions were likely to be affected by the local norms or their peers' expectations regarding competitive attitudes – which, in turn, may vary by professional activity (or gender). Our treatment variation allows us to investigate how salaried workers and entrepreneurs respond to norms and expectations, which we elicited in a follow-up survey (see section 2.3).

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<sup>2</sup> The full set of instructions used in the experiment is reported in Online Appendix B.I.

<sup>3</sup> The word 'commune' refers to the fourth level of official administrative unit in Vietnam (after district, city, and provincial city). My Huong is an agricultural commune in the Luong Tai district, Bac Ninh province. The population of the commune is 7,356 individuals living in about 2410 households. The economic activity of this commune is based predominantly on agriculture.



## 2.2. Experimental Procedure

In April 2019, subjects were identified by commune leaders and invited to a local school, where the experiment took place. Issues of selection and attrition did not arise. In particular, more than 95% of invited subjects showed up for the experiment, and 100% of those who showed up ended up participating in the experiment after the rules had been explained. For each of the two treatments we ran two sessions for entrepreneurs and two sessions for salaried workers, resulting in a total of eight sessions. A session included between 22 and 30 subjects. Out of a total of 196 subjects in our experiment, 102 were salaried workers and 94 were business owners.

In each session, the experimenter first explained the rules of the game in one large classroom and clarified questions from subjects. Then, each subject chose his or her preferred payment scheme on a decision sheet that included an identification number assigned to each subject in the experiment. In treatment *Public* only, subjects were asked to move to a specific side of the classroom, contingent on their choices. Once all subjects had decided about the payment scheme, they were randomly assigned to four waiting rooms in order to minimize their waiting time before the ball tossing game began. The experimenter informed subjects that their opponents would be in a different waiting room if they chose to compete and would not know whom they were competing against. Each waiting room was assigned to a different ball tossing room where subjects completed the ball-tossing task and staff members recorded the number of successful attempts. The design of the rooms is sketched in Online Appendix A (Figure A1).

After tossing the balls, subjects moved to a different room where they were asked to complete a risk elicitation task, allowing us to measure their risk aversion. We used the investment game by Gneezy and Potters (1997). Subjects had to decide how many of 100 experimental currency units (at an exchange rate of 1 unit = 1500 Dong) to keep, and how many to invest in a risky lottery that returned three times the invested amount with a 50% chance, and 0 otherwise. Afterwards, all subjects were invited to another large classroom where they filled out an exit survey that contained questions on demographics and on employment and the subject's business (the survey can be found in Online Appendix B.II). Subjects were paid privately and in cash after completing the exit survey.

### **2.3. Follow-Up Survey**

Six months after the experiment (in October 2019), we conducted a follow-up survey over the phone. Conducting the follow-up survey at this later point in time ensured that responses to it were not distorted by a subject's choices, outcomes, or treatment allocation in the main experiment. Indeed, responses to all questions in the follow-up survey did not differ significantly across treatments. We commissioned the survey from the Mekong Development Research Institute (MDRI), a Hanoi-based institute providing consulting and research services and specializing in conducting surveys for national and international organizations. The MDRI was able to reach 166 out of the 196 participants (85%) in the original experiment. The follow-up survey asked the subjects again what their job type was, along with nine additional questions about their attitudes towards competition, presented in randomized order (see Table 3 below for the exact questions). In particular, (i) we asked participants whether they liked to compete in general, as well as when they were observed in doing so; (ii) we included three questions on the role of social status and relative performance by eliciting the importance respondents attached to the opinion of others, to maintaining a good social image and reputation, and to being the best at what one does (following Cohn et al., 2014); (iii) we asked four questions on whether being competitive was appropriate for conducting business and for salaried jobs, and whether it was a key for success in business and salaried jobs.

There was a small fraction of subjects (26 subjects) who indicated a different job type in the follow-up compared to the initial survey, and we asked them to specify a reason for this discrepancy. Some subjects indicated that they had moved to a different job, while others failed to provide an adequate explanation. Given the importance of correctly and unambiguously identifying the type of occupation at the time when the experiment was run, in the data analysis of the following section we are using only those subjects who gave consistent answers on their job type in both surveys, leading to a sample of 140 subjects (64 salaried workers and 76 business owners). We note, however, that all our results are robust to including the full sample. In Online Appendix A we show versions of Figure 1 (in Figure A2) and Table 2 (in Table A2) using the full sample of 196 participants, confirming that all key findings on the relationship between willingness to compete, professional group, and treatment assignment hold irrespective of the choice of sample.

### 3. Results

#### 3.1. Descriptive Statistics

Table 1 presents summary statistics, disaggregated by professional group (salaried workers and entrepreneurs) and treatment (*Private* and *Public*). We have data on the participants' gender, age, marital status and level of formal educational attainment and vocational training; on their performance in the ball-tossing task (number of successful tosses); on their investment decision in the risk elicitation task; on the self-reported number of contacts in their mobile phones (as a proxy for the size of their social network); as well as on monthly business profits of entrepreneurs.<sup>4</sup> To test randomization, we show in the penultimate column of Table 1 statistical tests that compare observable characteristics of the subjects across treatments. The results confirm that randomization into treatments has been successful along every dimension for which we have available data.

In the last column of Table 1 we also show the results of comparing entrepreneurs and salaried workers. In this respect, there is no exogenous randomization, so self-selection into different professions makes some differences between the two samples likely. We find no significant differences between entrepreneurs and salaried workers in gender composition, performance in the ball-tossing task, risk attitudes and vocational training, but we do find that the sample of entrepreneurs consists, on average, of older individuals, who have received less formal education and are more likely to be married. We control for all of these factors in the regression analysis presented in the following section.

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<sup>4</sup> The term 'entrepreneur' is used and defined in different ways in the literature. A couple of remarks regarding our sample of entrepreneurs are therefore due. The large majority among them (69 out of 89 respondents) report in the exit survey having used their own savings to start the business. This points towards a very different profile than that of 'survival entrepreneurs' who are pushed into self-employment and are often encountered in South-East Asia. At the same time, it remains true that our sample consists of small-scale entrepreneurs for the most part: 65 out of 85 entrepreneurs who responded to the relevant question in the exit survey do not employ people beyond their spouses, meaning that the majority are household-run businesses.

Table 1: Summary Statistics

Variable	Private		Public		p-values <sup>g</sup>	
	Salaried	Entrepreneur	Salaried	Entrepreneur	Treat-ment	Professio-nal group
<i>Female (= 1)</i>	0.64 (0.49)	0.57 (0.50)	0.67 (0.48)	0.56 (0.50)	0.93	0.28
<i>Married (= 1)</i>	0.82 (1.16)	0.94 (1.12)	0.75 (1.40)	0.93 (1.10)	0.47	0.01
<i>Performance</i> <sup>a</sup>	2.96 (1.62)	2.49 (1.56)	2.44 (1.36)	2.56 (1.61)	0.55	0.50
<i>Investment in Risk</i> <sup>b</sup>	48.00 (38.54)	47.00 (36.59)	50.14 (31.22)	58.83 (40.0)	0.24	0.52
<i>Age (in years)</i>	38.43 (12.34)	47.97 (11.15)	37.50 (11.42)	47.92 (11.97)	0.72	0.00
<i>Formal Education</i> <sup>c</sup>	2.18 (0.39)	1.94 (0.24)	2.58 (0.44)	2.02 (0.27)	0.37	0.06
<i>Vocational Training</i> <sup>d</sup>	0.59 (0.97)	0.50 (0.95)	0.42 (0.94)	0.42 (0.87)	0.28	0.92
<i># of Contacts</i> <sup>e</sup>	2.50 (1.43)	3.09 (1.67)	3.06 (1.80)	3.00 (1.65)	0.47	0.42
<i>Business Profit</i> <sup>f</sup>	n/a	3,746 (2,164)	n/a	4,726 (3,277)	0.18	
<i>N</i>	28	35	36	41		

Notes: Mean values reported, with standard deviations in parentheses.

<sup>a</sup> *Performance* refers to the number of successful tosses in the ball-tossing task.

<sup>b</sup> *Investment in Risk* is the number of invested tokens in the Gneezy and Potters (1997) risk elicitation task and ranges from 0 to 100, with higher values corresponding to higher risk tolerance.

<sup>c</sup> *Formal Education* categories include 0 (no education); 1 (primary school); 2 (lower secondary school); 3 (upper secondary school); 4 (continuing education); 5 (college); 6 (university).

<sup>d</sup> *Vocational education* categories include 0 (No training); 1 (Primary/elementary vocational school); 2 (Vocational secondary diploma); 3 (Professional school or vocational college diploma).

<sup>e</sup> *# of Contacts* is the self-reported number of contacts on the subject's cellphone, coded as shown in Online Appendix B.II.

<sup>f</sup> *Business Profit* (in million Vietnamese Dong) is the self-reported monthly business profit of entrepreneurs, adjusted by their reported share of the business ownership.

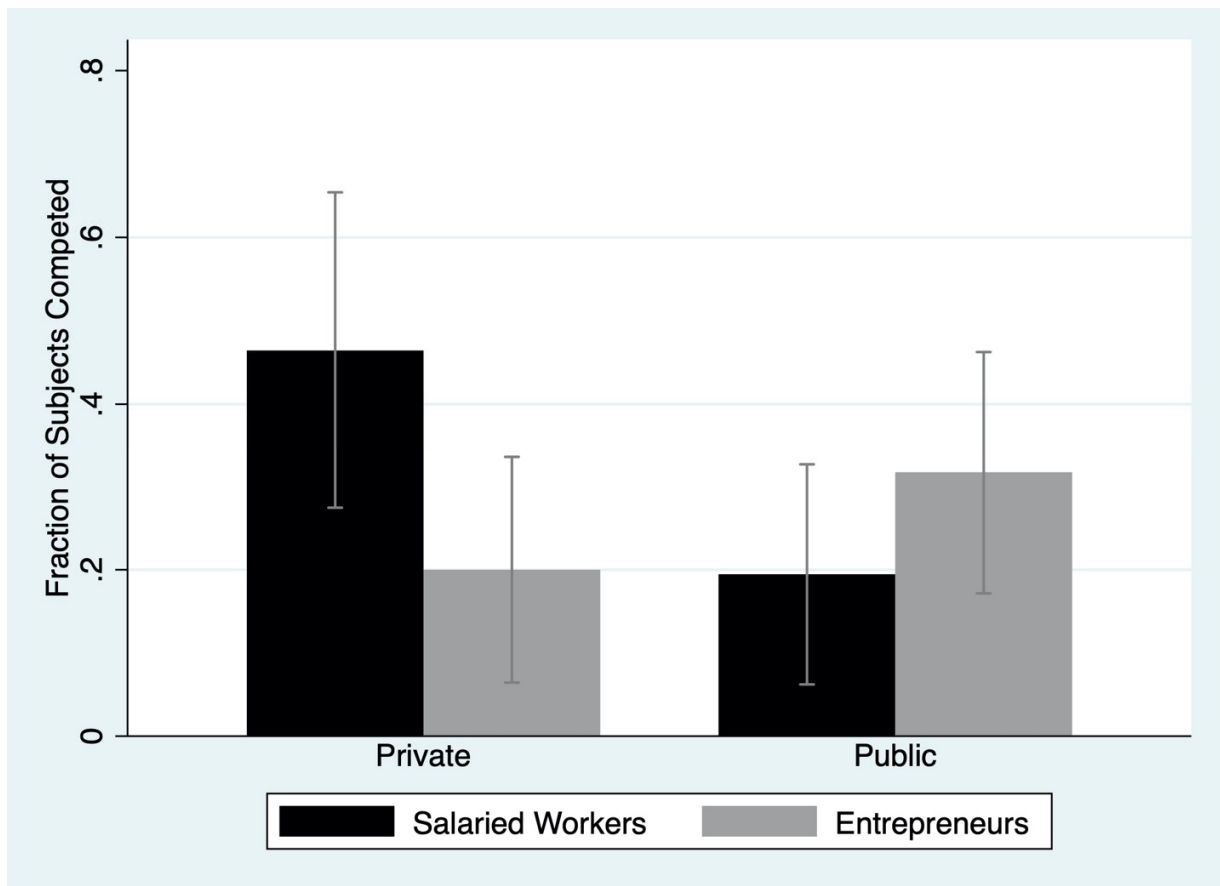
<sup>g</sup> p-values refer to comparisons between treatment (*Public* vs. *Private*) and between professional group (entrepreneurs vs. salaried workers). p-values are based on Mann-Whitney U tests (for *Performance*, *Investment in Risk*, *Age*, *Formal Education*, *Vocational Training* and *# of Contacts*) and  $\chi^2$  tests (for *Female* and *Married*).

### 3.2. Competition Entry Choices

The first question we are interested in is whether a difference in competitive attitudes exists between entrepreneurs and salaried workers. Figure 1 displays the percentage of subjects who choose to compete in the ball-tossing game, by professional group and treatment. In *Private*, entrepreneurs are much *less* competitive in their choices of payment scheme than salaried workers (20% vs. 46%;  $p=0.03$ ,  $\chi^2$  test). Yet, Figure 1 also shows strong treatment effects. Competition entry rates among salaried workers drop by more than half when the competition decision is made public (46% vs. 19%;  $p=0.02$ ,  $\chi^2$  test). Entrepreneurs follow the opposite pattern, increasing their willingness to compete in treatment *Public* compared to *Private*. While this increase is insignificant when using non-parametric tests (20% vs. 32%;  $p=0.25$ ,  $\chi^2$  test), our regression analysis will reveal that the two professional groups react significantly differently to the treatment variation.

Before moving to the regression analysis, we briefly address the issue of gender differences as a side note. In line with most existing studies, we find that, in the aggregate, women are significantly less likely to choose the competitive payment scheme than men. Overall, the gender gap is very large, with men being almost five times as likely as women to choose competition (55% vs. 12%;  $p<0.01$ ,  $\chi^2$  test), even though performance in this task does not differ significantly by gender (2.74 for men and 2.49 for women;  $p=0.43$ , Mann-Whitney U test). The gender gap is significant among both professional groups ( $p<0.01$  for each,  $\chi^2$  tests), although it is slightly larger among salaried workers (68% vs. 12%) than among entrepreneurs (46% vs. 12%).

Figure 1: Competition entry choices by professional group and treatment



Note: All bars include 95% confidence intervals

Table 2 reports results from Ordinary Least Squares regressions, with a subject's competition choice as dependent variable.<sup>5</sup> In column (1), the right-hand side variables are dummy variables for treatment *Public* and for the professional group of entrepreneurs, as well as an interaction term between the two. In column (2) we add, first, a female dummy and our measure of risk attitudes as explanatory variables, motivated by the fact that the literature has identified both as key determinants of competitive behavior. Additionally, we add those exit survey variables that were included in the surveys of both professional groups, namely a participant's age, marital status, level of formal and vocational education (with higher values corresponding to a higher

<sup>5</sup> We prefer to present Ordinary Least Squares instead of Probit estimations due to the problems associated with estimating and testing for the significance of interaction terms in Probit models (Ai and Norton, 2003), and in light of the importance of the interaction term between treatment and professional group for our research question. However, for completeness we also report Probit regressions in Table A1 in Online Appendix A, confirming that all results remain qualitatively unchanged.

educational attainment), and the number of contacts on their cell-phone as a proxy for the size of their social network.

In line with the impression from Figure 1 and the non-parametric analysis presented above, the coefficient for *Entrepreneur* is negative and significant in all specifications, reflecting the fact that this professional group competes less than salaried workers in the *Private* condition. In the *Public* condition, however, the difference between the two groups changes sign, with entrepreneurs competing more than salaried workers. This is due to the highly significant and positive interaction term between *Public* and *Entrepreneur*, which captures the difference in treatment responses of the two professional groups. As a consequence, the joint coefficient *Entrepreneur + Public x Entrepreneur* is significantly positive. This suggests a full reversal in the pattern of competitive behavior, with entrepreneurs being less competitive than salaried workers in *Private*, but more competitive in *Public*.

Looking at further control variables in column (2) of Table 2, we note that the female dummy is very sizeable, negative and highly significant, which matches the dominant finding in the literature.<sup>6</sup> The risk coefficient (*Investment in risk*) is insignificant and does not drive willingness to compete in our sample. Age has a weakly significant effect, with the willingness to compete slightly declining among older individuals. We can summarize our main findings on entrepreneurs vs. salaried workers as follows:

*Result 1:* Entrepreneurs are less competitive than salaried workers when tournament entry choices remain private, but more competitive than salaried workers when they are made public. The treatment responses of the two groups go in opposite directions and differ significantly from each other.

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<sup>6</sup> We have also estimated versions of the Table 2 specifications where we add the interaction term between *Public* and *Female*. These interaction terms are always insignificant. Furthermore, including this interaction term does not lead to any notable changes in any of the Table 2 results.

Table 2: OLS Regressions on Competitive Choice

	(1)	(2)
<i>Public</i>	-0.270** (0.077)	-0.294*** (0.046)
<i>Entrepreneurs</i>	-0.264* (0.091)	-0.229** (0.050)
<i>Public x Entrepreneurs</i>	0.387** (0.112)	0.391** (0.069)
<i>Female</i>		-0.495*** (0.022)
<i>Investment in Risk</i>		-0.001 (0.001)
<i>Married</i>		0.032 (0.132)
<i>Formal Education</i>		0.045 (0.021)
<i>Vocational Training</i>		-0.071 (0.035)
<i>Age</i>		-0.007* (0.003)
<i># of Contacts</i>		0.011 (0.015)
Constant	0.464*** (0.076)	0.981** (0.221)
N	140	130
R-squared	0.052	0.325
<i>p (Public + Public x Entrepreneurs)</i>	0.157	0.060
<i>p (Entrepreneurs + Public x Entrepreneurs)</i>	0.083	0.021

Notes. Dependent variable equals 1 if a subject chose competition for the ball-tossing task, and 0 otherwise. *Investment in Risk* ranges from 0 to 100, with higher values corresponding to higher risk tolerance. *Formal Education* ranges from 0 (No Education) to 7 (University Degree) and *Vocational Training* ranges from 0 (No Training) to 4 (Professional school or vocational college diploma). *# of Contacts* ranges from 1 (0-20 contacts) to 6 (501 or more contacts). Exact coding for *Formal Education*, *Vocational Training* and *# of Contacts* shown in Online Appendix B.II. The number of observations is slightly smaller in (2) due to some responses missing in the exit survey. Robust standard errors clustered at waiting room level in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



### **3.3. Insights From the Follow-Up Survey: Understanding the Treatment Effects and Linking Entrepreneurial Choices to Profits**

To better understand why business owners increase and salaried workers decrease their willingness to compete when their choices are observable by peers, we can use the data from the follow-up survey described in section 2.3. Table 3 reports mean responses to each of the nine questions included in the survey, disaggregated by professional group. The data reveal that, overall, respondents consider competitive behavior more appropriate when running a business (mean rating of 4.13) than in salaried jobs (mean rating of 3.27). The difference in the appropriateness ratings is large and significant both in the sample of entrepreneurs (mean rating of 4.30 in business vs. 3.11 in salaried jobs;  $p < 0.01$ , Wilcoxon signed-ranks test) and in that of salaried workers (mean rating of 3.92 in business vs. 3.47 in salaried jobs;  $p < 0.01$ , Wilcoxon signed-ranks test). In addition, we note that entrepreneurs agreed more than salaried workers to the statement that being competitive is appropriate in doing business (4.30 vs. 3.92;  $p < 0.01$ , Mann-Whitney U test), while they agreed less than salaried workers that being competitive is appropriate for salaried jobs (3.11 vs. 3.47,  $p = 0.05$ ). Hence, competition is generally considered ‘the right thing to do’ for entrepreneurs, in any case more so than for salaried workers. Building up on this observation, we document a stronger concern among entrepreneurs than among salaried workers about their social image and reputation (4.32 vs. 4.00;  $p = 0.06$ , Mann-Whitney U test), about what other people think of them in general (3.74 vs. 3.19;  $p < 0.01$ ), and about being the best at what they do (3.49 vs. 2.97;  $p < 0.01$ ).

The kind of behavior we document in our experiment is nicely summarized in the responses to survey questions Q6 (‘I like to compete’) and Q5 (‘I like to compete when others can see what I am doing’). The two professional groups offer similar responses to Q6, mirroring the fact that tournament entry rates in our experiment do not differ by group in the pooled sample (pooling across treatments, competition entry rates are 27% for entrepreneurs and 31% for salaried workers;  $p = 0.52$ ,  $\chi^2$  test). However, business owners indicate in Q5 a significantly stronger preference for competition than salaried workers when decisions are observed (3.74 vs. 3.42;  $p < 0.01$ ; Mann-Whitney test).

Table 3: Mean Responses in the Follow-up Survey

	Entrepreneurs	Salaried workers <sup>#</sup>	Overall mean
Q1: Being competitive is appropriate in the context of doing business.	4.30	3.92 ***	4.13
Q2: Being competitive is appropriate when one has a salaried job.	3.11	3.47 *	3.27
Q3: Being competitive is a key to success in the context of doing business.	4.21	3.94 *	4.09
Q4: Being competitive is a key to success when one has a salaried job	3.36	3.39	3.37
Q5: I like to compete when others can see what I am doing.	3.74	3.42 **	3.59
Q6: In general, I like to compete.	3.80	3.58	3.70
Q7: What other people think about me is very important to me.	3.74	3.19 ***	3.49
Q8: It is important to maintain a good social image and reputation.	4.32	4.00 *	4.17
Q9: It is important for me to be the best at what I do	3.49	2.97 ***	3.25

Notes. All responses are coded as follows: 1 = Strongly disagree or disapprove; 2 = Disagree or disapprove; 3 = Indifferent/Neutral or undecided; 4 = Agree, approve; 5 = Strongly agree or approve.

<sup>#</sup> Stars in this column show results of Mann-Whitney U tests comparing responses between entrepreneurs and salaried workers. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

So, the analysis of the follow-up survey can help explain the patterns and treatment responses we observe in Figure 1: when the competition decision is made public, salaried workers as well as entrepreneurs change their behavior in the direction of what is considered appropriate for each professional group, reducing or increasing their willingness to compete, respectively. The emerging pattern is that choices move towards the commonly held view that entrepreneurs behave in a more competitive fashion compared to non-entrepreneurs, and this movement is also driven by salaried workers who express a distaste for competition when they are under observation.

In addition to the above discussion on the role of individual attitudes towards competition and perceptions about what is appropriate for each group, we find that survey respondents also attach an instrumental value to competitive behavior in business. Overall, being competitive is considered as being a key to success in business (mean rating of 4.09), much more so than in salaried jobs (mean rating of 3.37). This difference in perceptions exists both among entrepreneurs (4.21 vs. 3.36;  $p < 0.01$ , Wilcoxon signed-ranks test) and among salaried workers (3.94 vs. 3.39;  $p < 0.01$ ). The responses to these survey items reinforce our explanation of the observed treatment differences as being driven by participants' perceptions regarding the role of competitiveness in each sector and the behavior expected from each professional group. Such norms and expectations arguably take up a central position when competition decisions are made public, shaping the behavior of entrepreneurs and salaried workers in our sample.

Finally, for our sample of entrepreneurs we also asked for their business profits in the exit survey. 71 out of 76 entrepreneurs answered this question, so we can link profits to experimental choices for these participants. We find that those entrepreneurs choosing the competitive payment scheme in the experiment have an average monthly profit of 4.73 million Vietnamese Dong, while those choosing the piece rate scheme fare considerably worse, with 4.35 million Vietnamese Dong on average. The difference is significant ( $p = 0.02$ , Mann-Whitney U-test), confirming that experimental choices are related to economic outcomes in the field. We summarize this evidence as follows:

*Result 2:* When decisions are public, choices of both entrepreneurs and salaried workers are aligned with their peers' expectations about what is considered as the appropriate behavior for each professional group. For entrepreneurs, we find a significantly positive relationship between their willingness to compete and their businesses' monthly profits.

## 4. Conclusion

In this paper, we have presented a lab-in-the-field experiment with a sample of entrepreneurs and salaried workers in Vietnam. We have elicited their willingness to compete in a real effort task (Gneezy et al., 2009), varying the observability of individual choices in a between-subjects design. While we have found that more competitive entrepreneurs have, on average, higher profits in their businesses (thus confirming earlier evidence from Berge et al., 2015), the relationship between competitiveness and being an entrepreneur or not is not straightforward. Contrary to the conjecture that entrepreneurs might be more competitive *per se*, we have found a more nuanced pattern of behavior. In fact, when choices between a piece-rate and a tournament payment scheme remain private, the sample of salaried workers opts for the competitive payment scheme more frequently than the sample of entrepreneurs. However, this pattern reverses completely when participants know that their choices will be observed by other peers. The reactions of the two professional groups to introducing observability of their choices are in opposite directions and significantly different from each other.

As an explanation for this reversal of behavior contingent on the observability of choices, evidence from a follow-up survey conducted six months after the main experiment suggests that the stereotypical image of entrepreneurs as a highly competitive group may be the result of a desire to maintain a good social image and reputation, behaving in accordance with certain norms and peers' expectations. Likewise, salaried workers reduce their willingness to compete when choices become public because it is perceived as less appropriate to compete as a salaried worker than as an entrepreneur. The difference in behavior between the *Private* and the *Public* condition implies a methodological caveat when comparing entrepreneurs and non-entrepreneurs *without* controlling for whether their choices are observable or not. Previous studies that do not distinguish between observable and unobservable conditions may have missed important interaction effects of professional activity and making choices in private or public. Future work on the behavior of entrepreneurs may therefore want to control for such potential interaction effects and thus pay attention to how perceived norms influence entrepreneurs' behavior when their actions are publicly observable.

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## Online Appendix A – Additional figures and tables

*Figure A1: Room settings for the experiment*

### Room 1: Instruction of Ball Tossing Game

Subjects are invited to each section where the enumerators explained the game rules and payment scheme ( tournament versus piece-rate ) in this large room. Subjects had the opportunity to ask questions before they make their choice of payment. We assigned an identification number for each subject to keep the anonymity. However, in Public treatment, subjects were asked to stand each side of the room depending on their choice of payment scheme after making their choice

### Room 2 Ball tossing and Waiting Rooms

Waiting Room A	Ball Tossing Room A	Subjects waited for their turn to toss the ball in a waiting room. We minimized the wait time by dividing each session into four waiting rooms. Because subjects in each waiting room can see each other, we have clustered our standard errors at this room level. The ball tossing rooms are private and only one subject at a time with an enumerator.
Waiting Room B	Ball Tossing Room B	
Waiting Room C	Ball Tossing Room C	
Waiting Room D	Ball Tossing Room D	

### Room 3: Other Tasks and Exit Survey

Once the subjects completed the ball tossing task, they were invited to another room to do the other tasks here and answer the exit survey

### Room 4: Payment and Cashier

Subjects joined the other subjects in a large room and received their payment.



Figure A2: Competition entry choices by professional group and treatment – using the full sample of 196 participants

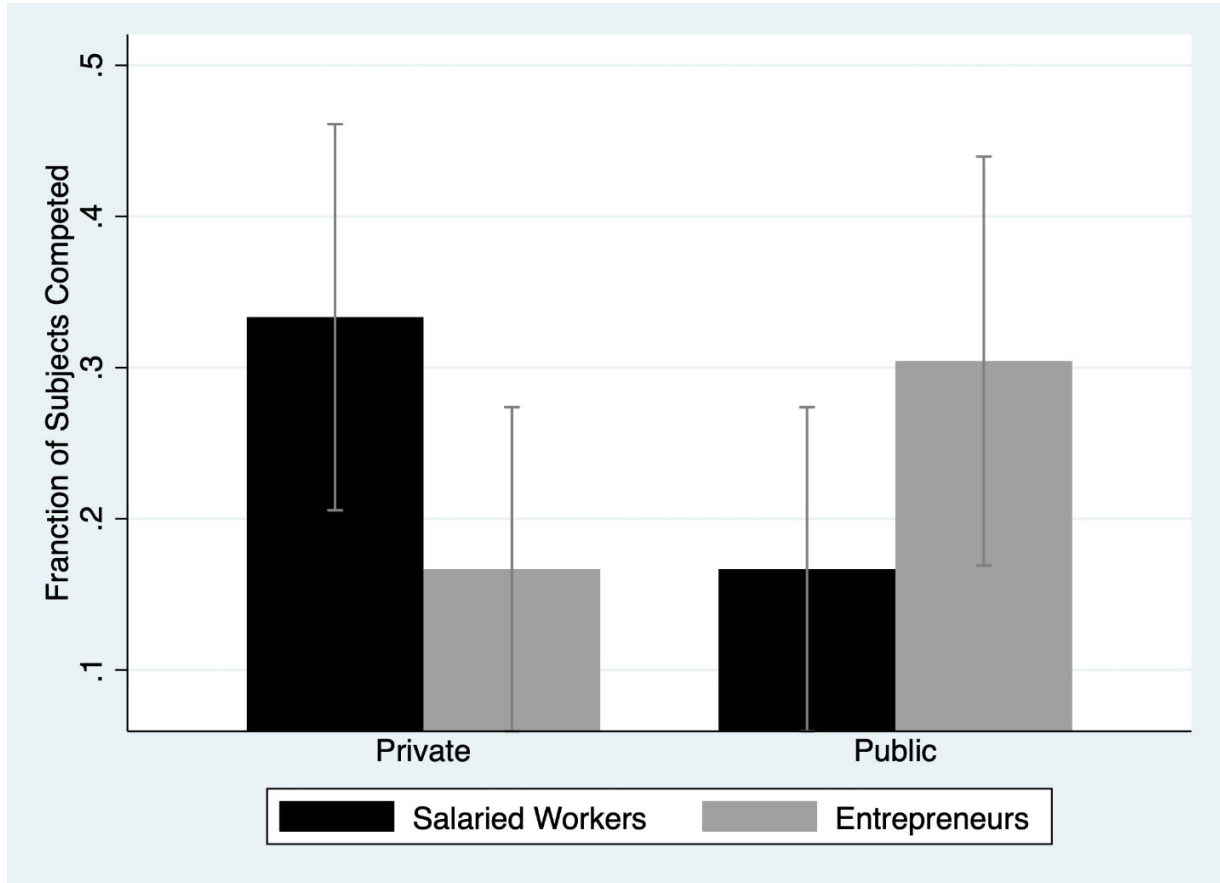


Table A1: Probit Regressions on Competitive Choice

	(1)	(3)
<i>Public</i>	-0.772*** (0.195)	-1.142*** (0.162)
<i>Business Owners</i>	-0.752*** (0.250)	-1.054*** (0.310)
<i>Public x Business Owners</i>	1.138*** (0.328)	1.608*** (0.364)
<i>Female</i>		-1.904*** (0.273)
<i>Investment in Risk</i>		-0.004 (0.004)
<i>Married</i>		0.412 (0.562)
<i>Formal Education</i>		0.211*** (0.081)
<i>Vocational Training</i>		-0.278 (0.190)
<i>Age</i>		-0.031** (0.012)
<i># of Contacts</i>		0.044 (0.069)
Constant	-0.090 (0.189)	1.776* (0.996)
N	140	130

Notes. Dependent variable equals 1 if a subject chose competition for the ball-tossing task, and 0 otherwise. *Investment in Risk* ranges from 0 to 100, with higher values corresponding to higher risk tolerance. *Formal Education* ranges from 0 (No Education) to 7 (University Degree) and *Vocational Training* ranges from 0 (No Training) to 4 (Professional school or vocational college diploma). *# of Contacts* ranges from 1 (0-20 contacts) to 6 (501 or more contacts). Exact coding for *Formal Education*, *Vocational Training* and *# of Contacts* shown in Online Appendix B.II. Robust standard errors clustered at waiting room level in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table A2: OLS Regressions on Competitive Choice – using the full sample of 196 participants

Table 2: OLS Regressions on Competitive Choice

	(1)	(2)
<i>Public</i>	-0.167*** (0.024)	-0.167*** (0.025)
<i>Entrepreneurs</i>	-0.167** (0.034)	-0.080 (0.046)
<i>Public x Entrepreneurs</i>	0.304*** (0.035)	0.295*** (0.027)
<i>Female</i>		-0.418*** (0.034)
<i>Investment in Risk</i>		-0.001 (0.001)
<i>Married</i>		-0.034 (0.049)
<i>Formal Education</i>		0.009 (0.016)
<i>Vocational Training</i>		-0.041 (0.028)
<i>Age</i>		-0.007 (0.004)
<i># of Contacts</i>		0.018 (0.028)
Constant	0.333*** (0.034)	0.867** (0.204)
N		
R-squared	196 0.032	180 0.256
<i>p (Public + Public x Entrepreneurs)</i>	0.00435	0.0165
<i>p (Entrepreneurs + Public x Entrepreneurs)</i>	0.0653	0.00207

Notes. Dependent variable equals 1 if a subject chose competition for the ball-tossing task, and 0 otherwise. *Entrepreneurs* is equal to 1 if the subject reported to have own business and 0 if the subject reported to have a salaried job without any business ownership. *Investment in Risk* ranges from 0 to 100, with higher values corresponding to higher risk tolerance. *Formal Education* ranges from 0 (No Education) to 7 (University Degree) and *Vocational Training* ranges from 0 (No Training) to 4 (Professional school or vocational college diploma). *# of Contacts* ranges from 1 (0-20 contacts) to 6 (501 or more contacts). Exact coding for *Formal Education*, *Vocational Training* and *# of Contacts* shown in Online Appendix B.II. Robust standard errors clustered at waiting room level in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Online Appendix B

### I. Experimental Instructions

#### Competition task:

This is the first part of the experiment and will take about 15 minutes. The instructions are simple, and if you follow them carefully, you can earn a considerable amount of money. All the money you earn is yours to keep, and will be paid to you, in cash, immediately after the experiment ends. In addition to any earnings you might have in this task, you will be paid 100,000 Dong to participate.

The task that we ask you to perform today is throwing this ball into this bucket behind the line shown in the room. You will have 10 tries.

We now ask you to choose one of two options according to which you will be paid in the experiment.

#### Option 1:

If you choose this option you will get 20,000 Dong for each time you get the ball in the bucket in your 10 tries. So if you succeed 1 time, then you will get 20,000. If you succeed 2 times, then you will get 40,000. If you succeed three times you will get 60,000 and so on.

#### Option 2:

If you choose this option you will receive a reward only if you succeed more times than the person who is playing in the next room. If you succeed more than this person you will be paid 3 times of 20,000 dong for every time you succeed. So if you succeed 1 time, then you will get  $3 \times 20,000 = 60,000$  dong. If you succeed 2 times, then you will get  $3 \times 40,000 = 120,000$  dong. If you succeed 3 times you will get  $3 \times 60,000 = 180,000$  dong and so on. But you will only receive a reward if you are better than the person in the next room. If you both succeed the same number of times you will both get 20,000 dong for each success.

We now ask you to choose how you want to be paid: according to option 1 or option 2 and circle the option in your answer sheet.

[Baseline: Your choice of these options will not be shared anyone but the instructor in the next room]

[Treatment: Once you choose your option, we will announce your choice and will be sorted into two different rooms]

Now please circle your option and give the answer sheet to your instructor.

*[Record both their ID number and their choice and invite the subject to the next room one by one. In the next room, allow the participant to toss the balls and record the result on the back of their ID card. You can record the result of each toss with a checkmark and X (check mark for success and X for failure). At the end of the 10 tosses, write the total number of successes on the back of the card: for example, √√X√XX√√√√ 7 X 20 Y*

*You do not need to write the total payment on the card. Tell them that they must go to the next room for the second part of the experiment. Once they have finished all three parts they should take their card to the “cashier” who will calculate the total earnings and pay in cash.*

*IF            THEY            ASK            YOU            WHAT            TO            DO:*

*Tell them that you cannot give them advice about what to choose and offer to read the script to them again.]*

*[Invite the subject to the Room 3 and read the following instructions]*

In this room, you will be asked to complete three simple tasks and earn some cash in each of them. We will record your earnings in each task and fill in your ID card and you will be paid at the cashier.

### **Risk elicitation task:**

Now this is a different experiment than the one you just did. In this experiment, your earnings will not depend on anyone else in a different room. It will depend on your choice and tossing a die. You are endowed with 100 points and asked to choose the portion of this amount (between 0 and 100 points, inclusive) that you wish to invest in a risky option. Those points not invested are yours to keep.

The risky investment:

There is a 50% chance that the investment in the risky asset will be successful. If it is successful, you receive 3 times the amount you chose to invest; if the investment is unsuccessful, you lose the amount invested.

How do we determine if the investment is successful?

The roll of a 6-sided die determines the value of the risky asset. You will be asked to choose 3 “success” numbers. You will roll the die, and if one of your 3 numbers shows up, your investment will be successful and you will receive 3 times of the points you invested. If any of your 3 numbers does not show up in your one toss, you will lose the points you invested.

We now ask you to indicate the number of points that you wish to invest, your 3 success numbers, and whom you wish to roll the die.

- I wish to invest \_\_\_\_\_ points
- My 3 success numbers are: \_\_\_\_\_

You will be paid 1,500 dong for each point you have for this part of the experiment.

*[Once the subject fills in the answer sheet, ask the subject to roll a die and determine the earning. Calculate the total number of points that the subject has earned and write it down in the answer sheet.]*

## II. Exit Surveys

**A: Survey for Salaried Workers:** *[coding for variables used in regression analysis shown after responses to questions 1-3, 8, 9, 16]*

1. In what solar month and year were you born? (use lunar month and year if you do not remember your DoB in solar calendar)

MONTH |\_\_|\_\_|    YEAR |\_\_|\_\_|\_\_|\_\_|    *[coded as continuous age variable]*

2. Your gender: *[coded as dummy variable equal to 1 for female respondents, and 0 otherwise]*

- a. MALE
- b. FEMALE
- c. Other

3. What is your current marital status? *[coded as dummy variable equal to 1 for married respondents, and 0 otherwise]*

- a. Single
- b. Married
- c. Divorced/Separated
- d. Widowed

4. When did you start working at the current workplace?

*(The starting time is the time of your first salary payment. If you have more than one job, please answer regarding your main job, which is defined as the job where you spend the most time)*

I started working at the current workplace since: Month \_\_\_ YEAR \_\_\_

5. How long have you been employed by someone else on all paid jobs *(including the current paid job)*?

|\_\_|\_\_|\_\_|\_\_| YEARS |\_\_|\_\_|\_\_| MONTHS

6. What sector is your employer (the company/organization that you are working at) in?

- a. Agriculture, forestry and fisheries
- b. Mining industry
- c. Processing and manufacturing industry
- d. Production, distribution of electricity and water, construction
- e. Trading
- f. Transportation, warehousing and communication
- g. Finance and credit
- h. Other services (consulting, research, beauty care ...)
- i. State management, security and defense
- j. Education, health, culture, sports
- k. Other industries (please specify): \_\_\_\_\_

7. What is your current occupation? \_\_\_\_\_

*(This question asks about your occupation, which must be different from farming and be a paid job. If you have more than one job, answer regarding the main job, which is defined as the job that you spend the most time)*

8. What is the highest educational level that you obtained (with degree awarded)?

- a. None [0]
- b. Primary School (Tieu Hoc) [1]
- c. Lower Secondary (Trung Hoc Co So) [2]
- d. Upper Secondary School (Pho Thông Trung Hoc ) [3]
- e. Upper Secondary School in Continuing Education Centers (Bàng Tốt Nghiệp Phó Thông Trung Hoc Trung Tam giao duc thuong xuyen) [4]
- f. College (Cao Dang) [5]
- g. University (Bang Tot Nghiep Dai Hoc) [6]
- h. Master's (Thac si) [no entries]
- i. PhD (Tiên Sy) [no entries]
- j. Other (please specify): \_\_\_\_\_ [missing value]



9. What is the highest vocational training level that you obtained (with degree awarded)?
- a. None [0]
  - b. Primary /elementary vocational school (Trung Tam Day Nghe/ So Cap Nghe) [1]
  - c. Vocational secondary diploma (Trung Cap Nghe) [2]
  - d. Professional school or vocational college diploma (Trung Cap Chuyen Nghiep/ Cao Dang Nghe) [3]
  - e. Other (please specify: \_\_\_\_\_) [*missing value*]

10. What is your monthly salary (from the job mentioned in Question 7)?

\_\_\_\_\_ (thousand VND)

11. Is working at your current workplace (as answered in Question 4) your only job?

- a. Yes (>> skip Question 13, continue with Question 14)
- b. No (>> continue with Question 13)

12. If your current job is not your only job, how much do you earn from all of your other jobs?

*(In thousand VND)*

\_\_\_\_\_ (thousand VND/month)

13. How many persons are working with you in the unit at work?

Total   |\_|\_| persons

*(If the answer to Question 15 is different from 0 (zero), continue with Question 16)*

14. Do you feel stress from co-workers' achievements at work?

- a. Yes
- b. No

15. What type of business is your employer (the company/organization that you are working at)?

- a. Public or Para-public sector
- b. Private domestic enterprise
- c. Foreign / joint venture enterprise
- d. Household business
- e. Cooperative
- f. Individual business
- g. Farmer

16. How many contacts do you have in your mobile phone?

- a. 0-20 [1]
- b. 21-50 [2]

- c. 51-100 [3]
- d. 101-200 [4]
- e. 201-500 [5]
- f. 501 and more [6]
- g. No mobile phone [*missing value*]
- h. I don't know, but many [*missing value*]
- i. I don't know, but few [*missing value*]

**B: Survey for Business Owners:**

1. [*Same as Question 1 from survey for salaried workers*]
2. [*Same as Question 2 from survey for salaried workers*]
3. [*Same as Question 3 from survey for salaried workers*]
4. Is there a co-owner of the business?  
 (*If you own more than one business, please give your answer regarding the main business that you spend the most time operating and managing*)
  - a. Yes (>> *continue with Question 5*)
  - b. No (>> *skip Question 5, continue with Question 7*)
5. If Yes, what is the share of this person in terms of ownership of assets?  
 \_\_\_\_\_(%)
6. What is your relationship with the co-owner?
  - a. Spouse
  - b. Children (*including biological children, adopted children, stepchildren of spouse, children-in-law*)
  - c. Parents (*including birth parents, parents-in-law, adoptive parents, step parents*)
  - d. Siblings

- e. Other close relatives (*half-brothers/sisters, brothers/sisters in law, aunt/uncle, cousins, grandfather/grandmother, grandchild, nephew, niece*)
- f. Friends
- g. Others

7. When was this current business established?

*(Start of actual operation)*

YEAR \_\_\_\_ Month \_\_\_\_

8. Who created this business?

- a. Myself (>> *skip Question 9, continue with Question 10*)
- b. My father/mother/ siblings (>> *continue with Question 9*)
- c. Other relatives (>> *continue with Question 9*)
- d. Friends (>> *continue with Question 9*)
- e. Other (>> *continue with Question 9*)

9. If you yourself did not establish this business, how did you get this business?

- a. Inherited
- b. Bought
- c. Exchange with other business
- d. Other (please clarify \_\_\_\_\_).

10. How long have you been a business owner (the current company plus all current and previous businesses)?

\_\_\_\_\_ *(please clarify in number of days, months, years)*

11. What sector is your business in?

*(In case of multiple sectors, please select the sector that generates the greatest revenue)*

- a. Agriculture, forestry and fisheries
- b. Mining industry
- c. Processing and manufacturing industry

- d. Production, distribution of electricity and water, construction
- e. Trading
- f. Transportation, warehousing and communication
- g. Finance and credit
- h. Other services (consulting, research, beauty care ...)
- i. State management, security and defense
- j. Education, health, culture, sports
- k. Other industries (please specify): \_\_\_\_\_

12. *[Same as Question 8 from survey for salaried workers]*

13. *[Same as Question 9 from survey for salaried workers]*

14. How much profit do you (and your partner & unpaid family workers) earn from your business activity? *(in thousand VND)*

a. Amount |\_\_|\_\_|\_\_|\_\_|\_\_|

b. Period |\_\_|

*(Period code: 1. Day; 2. Week 3. Fortnight 4. Month 5. Quarter; 6. Year)*

*(>> skip Question 16, continue with Question 17)*

*Don't know (>> continue with Question 17)*

15. Is working at your business your only job?

a. Yes *(>> skip Questions 18, 19, continue with Question 20)*

b. No *(>> continue with Question 18)*

16. How much do you (and your partner & unpaid family workers) earn from all of your other jobs? *(In thousand VND)*

a. Amount |\_\_|\_\_|\_\_|\_\_|\_\_| *(>> skip Question 19, continue with Question 20)*

b. Period |\_\_|

*(Period code: 1. Day; 2. Week; 3. Fortnight; 4. Month; 5. Quarter; 6. Year)*

*Don't know (>> continue with Question 19)*

17. How many hours per day did you usually work in your business within the last month of activity? And how many days per month?

a. Number of working hours per day   

b. Number of working days in the last month of activity

18. *[Same as Question 16 from survey for salaried workers]*