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## **Key behavioural characteristics of small-business owners**

A lab-in-the-field experiment in Myanmar

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**Abstract:** This study investigates the role of owners' personal preferences and behaviour in determining the success of micro, small and medium-sized enterprises using a lab-in-the-field experiment with small-business owners in Myanmar. The study is a complement to a 2017 quantitative survey conducted within the project 'Towards inclusive development in Myanmar'. The lab-in-the-field experiment comprised five behavioural games: dictator, bargaining, trust, public goods, and risk-preference elicitation. It was conducted in 12 townships in 11 states and regions of Myanmar in September and October 2018. The sample comprised 397 enterprise owners, managers, and employees. This study has a twofold contribution. First, we present for the first time the behavioural profile of small-business owners in Myanmar. Second, we link the results of different behavioural games to the main participant and enterprise characteristics. Finally, we reflect on the implications for enterprise performance and for policy as it relates to micro, small and medium-sized enterprises.

**Key words:** entrepreneurship, risk-taking, trust, bargaining, altruism, behaviour

**JEL classification** C91, D91, L25, L26

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## 1 Introduction

Business success in micro, small, and medium-sized enterprises (MSMEs) is in general considered to be contingent on the role of external factors—that is, various aspects of the business environment—and also on the internal aspects of MSMEs, in terms of both the organizational variables and the characteristics of small-business owners. The external factors typically linked with business success include the role of government in creating an environment that is conducive to MSME success. A major impediment to success among MSMEs is the lack of various forms of support, such as access to finance and training, or a functional legal and regulatory framework (Aidis et al. 2012; Carter and Wilton 2006; Hansen et al. 2009). However, business success can also to a large extent be attributed to business owners as the key decision makers, and in particular to their managerial and planning skills, as well as their overall entrepreneurial capabilities (Augier and Teece 2009; Baum et al. 2001; Gaskill et al. 1993; Teece et al. 1997). Other characteristics are also relevant. For instance, risk preferences, trustworthiness, and pro-sociality have been found to affect market performance (Ingenhoff and Sommer 2010; Leibbrandt 2012; Willebrands et al. 2012).

We have incorporated a lab-in-the-field experiment into the Myanmar Enterprise Monitoring System (MEMS) project, as experimental data can help us to shed light on the role of owners' personal preferences and behaviour in determining MSME success. The lab-in-the-field experiment within the MEMS project comprises five behavioural games: dictator, bargaining, trust, public goods, and risk-preference elicitation. The games were presented to participants in this exact order in a web-based application created in oTree (Chen et al. 2016).

This study presents the main findings from the experimental data. We present the main results of the different games and link them to the main participant and enterprise characteristics. Following this, we reflect on the implications for enterprise performance and MSME policy.

The behavioural profile of small-business owners in Myanmar shows on average a high concern for others, as measured by the level of donations in the dictator game. The level of donations of enterprise owners was higher than among other participants (manager, supervisor, clerk, etc.). None of the key respondent and enterprise characteristics correlate significantly with bargaining measures, while the bargaining measures considered do not correlate with business association membership; this could be related to low availability of such associations in general, or to the way that they operate.

The results from the trust game reveal that trust and trustworthiness do not depend on gender, position in the enterprise, or firm size, but we obtained a lower trust value for informal firms. This might signal either their choice to remain informal due to general distrust of others or a lack of trust arising from their status as informal firms. Trustworthiness seems to be affected by enterprise location: trustees from Yangon and central Myanmar return slightly higher amounts to the trustors.

The results from the public goods game reveal a highly pronounced egalitarian profile of contributions for both male and female participants, as well as for both enterprise owners and employees. The level of contributions does not seem to depend on the size or the location of the enterprise. We do not find significant differences in enterprise profitability for less and more pro-social owners, even though less pro-social enterprise owners get the highest profit levels and more pro-social ones achieve the lowest levels.

We measured the risk preferences of enterprise owners and managers using an iterative multiple price list, also known as a ‘staircase’ risk elicitation method. The results revealed a predominant profile of risk-averse individuals in our sample. We first investigated how risk preferences correlate with other behaviour. Here, we did not find significant correlation between the risk-preference measure and decisions in other games. Second, we investigated the relationship between risk preferences and enterprise performance. Our results show that enterprises owned by risk-averse individuals are as profitable as enterprises owned by risk-loving individuals.

The findings indicate that experimentally measured personal preferences may not explain common measures of enterprise performance in Myanmar, and may not factor strongly in business decisions when the business environment is not supportive for MSME development. This could be due to a couple of factors. First, experimental behaviour such as trust and co-operation might correspond well to these two kinds of behaviour in real life, but not to the more complex dimensions of business performance. Second, firm performance may depend on the context, or the overall business environment, and not just on personal preferences measured in field experiments such as ours.

## 2 Sample

Our target number of participants for the lab-in-the-field experiment was 500 enterprise owners or managers. For that purpose, a random sample of 660 enterprises in 12 townships was selected from the total sample of 2,496 enterprises from the MEMS quantitative survey in 2017. The townships included are: Wundwin, Monywa, Hlaingthaya, Chaungzon, Dawei, Pakokku, Bago, Taunggyi, Loikaw, Myitkyina, Patheingyi, and South Dagon. The townships were selected based on the number of surveyed enterprises in 2017. The goal was to maximize the number of participants in each location, which serves to reduce implementation costs.

The experiments were conducted in ten locations in September and two locations in October 2018. The final sample included 397 participants. The distribution of participants by location, gender, position in the enterprise, and firm size is shown in Table 1.

The highest number of participants in one single session was in Monywa Township, located in Sagaing Region. One-quarter of participants were female, reflecting a generally higher tendency of men to own or work in manufacturing enterprises (70 per cent male ownership, estimated in MSME Survey 2017). Both firm owners and managers participated in the experiment, but owners clearly dominate, as they comprise 80 per cent of the sample. There were also a few cases where employees participated instead of owners.

The variable ‘Bamar’ indicates that the enterprise is located in the central part of Myanmar, dominated by the Bamar ethnic majority. This variable captures the geographical location, not the respondent’s ethnicity. As can be seen from Table 1, about 60 per cent of participants were from the so-called mainland of Myanmar. The periphery comprises the following townships: Chaungzon in Mon State, Loikaw in Kayah State, Taunggyi in Shan State, Myitkyina in Kachin State, and Dawei in Tanintharyi Region. In terms of firm size, three-quarters of the sample were micro firms; the rest were nearly all small (19.6 per cent) or medium-sized enterprises (6.6 per cent). There was one large enterprise in the sample.

Table 1: Summary statistics

	Share	SD	Min.	Max.
Bago	0.07	0.26	0	1
Chaungzon	0.11	0.31	0	1
Dawei	0.11	0.31	0	1
Hlaingthaya	0.06	0.23	0	1
Loikaw	0.07	0.26	0	1
Monywa	0.12	0.32	0	1
Myitkyina	0.08	0.26	0	1
Pakokku	0.09	0.28	0	1
Patheingyi	0.09	0.29	0	1
South Dagon	0.06	0.24	0	1
Taunggyi	0.06	0.24	0	1
Wundwin	0.09	0.29	0	1
Female	0.25	0.43	0	1
Owner	0.80	0.40	0	1
Bamar	0.58	0.49	0	1
Micro firm	0.73	0.44	0	1
Observations	397			

Source: Myanmar MSME 2018 experiments.

### 3 Implementation

The games were implemented using oTree, which is an open-source platform for laboratory, online, and field experiments (Chen et al. 2016). The platform enables the presentation of experimental tasks as a web application which can be accessed from any device that has a web browser: a desktop computer, a tablet, or a smartphone. The experiments in Myanmar were implemented on tablets.

The experimental setup in oTree consists of a web application written within oTree, a server computer, and subjects' devices with a web browser. As shown in Figure 1, oTree creates an experimental session on the server, as well as links for all the participants and the experimenter. The links enable participants to access individualized web pages displaying the experiment and recording their answers, while the experimenter gets real-time information about the progress and entries of all participants in the Progress Monitor. The application was coded using Python.

The fields were labelled in English during the development and test phase. They were subsequently translated into the Myanmar language. The translation did not affect the design of the pages in any major way, as can be seen in Figure 2.

Before the experiment, we developed the instructions and the protocol for experimenters. Both the instructions and the protocol were translated into the Myanmar language. The versions in English are available in Appendices B and C.

The instructions were read to participants after all of them had arrived. After the instructions were read, subjects could ask clarifying questions. Participants were randomly assigned roles in each game and were randomly paired with one or two other players, depending on the game. The assignment into different roles and pairs was anonymous.

Figure 1: Experimenter's dashboard in oTree

The screenshot shows the oTree experimenter's dashboard for a session titled "Games Experiment CSO: session s2359hv1 (demo)". The top navigation bar includes "oTree", "Demo", "Sessions", "Rooms", "Data", and "Server Check". Below the navigation bar, there are several tabs: "Description", "Links", "Monitor", "Data", "Payments", and "New". A light blue box contains a message: "Links will play automatically with browser bots. To disable, go to settings.py and set 'use\_browser\_bots': False in the session config." Below this, there is a paragraph explaining that the links are temporary and can be used to launch a real study by creating a room or session. It then provides a "Session-wide link" and a list of "Single-use links" (P1, P2, P3, P4) with their respective URLs.

oTree Demo Sessions Rooms Data Server Check

## Games Experiment CSO: session s2359hv1 (demo)

Description Links Monitor Data Payments New

Links will play automatically with browser bots. To disable, go to settings.py and set 'use\_browser\_bots': False in the session config.

Below are temporary links for testing and demonstration. To launch a real study, either create persistent links by setting up a room, or create a session through the sessions page.

You can either open the session-wide link, or the single-use links.

### Session-wide link

Open the below link in up to 6 browser tabs.

<http://localhost:8000/join/97xdvdow4c/>

### Single-use links

Open each link in its own browser tab.

P1	<a href="http://localhost:8000/InitializeParticipant/ve0amlwm">http://localhost:8000/InitializeParticipant/ve0amlwm</a>
P2	<a href="http://localhost:8000/InitializeParticipant/2y226a0e">http://localhost:8000/InitializeParticipant/2y226a0e</a>
P3	<a href="http://localhost:8000/InitializeParticipant/04yhexn0">http://localhost:8000/InitializeParticipant/04yhexn0</a>
P4	<a href="http://localhost:8000/InitializeParticipant/hx4wje1u">http://localhost:8000/InitializeParticipant/hx4wje1u</a>

Source: Myanmar MSME 2018 experiments.

The experiment was designed such that the participants played with points which were converted to Myanmar kyats (MMK) at the rate of MMK50 for one point. Participants were paid a participation fee of MMK5,000 and whatever they earned in one of the five games. The payout game was chosen at random at the end of the experiment.

The experiment was piloted in Taungoo on 4 July 2018 with 18 enterprises. There were no major changes to the experiment design following this pilot. One notable change was to simplify the instructions in the Myanmar-language version.

As using tablets may not be common among enterprise owners and managers in Myanmar, care was taken to provide instructions for use and assist participants who felt uncomfortable. Overall, three tasks related to tablet usage were required from participants: to input a number, to choose a relevant option (e.g. option 1 or option 2), and to press the 'Next' button. The first page of the application was designed to help the participants familiarize themselves with using the tablet. The format of this page is shown in Figure 3.

Figure 2: Page design in English and the Myanmar language

## Game 1

**Instructions**

You will be paired randomly and anonymously with another participant. In this study, one of you will be Participant A and the other Participant B. Prior to making a decision, you will learn your role, which will be randomly assigned.

There is 100 to split. Participant A will decide how much she or he will retain. Then the rest will go to Participant B.

Next

## ကစားနည်း (၁)

**လမ်းညွှန်ချက်များ**

သင်နှင့်တွဲဖက်ကစားရမည့်သူမှာ သင်မသိသော အခြားသူဖြစ်ပါသည်။ သင်သည် ကစားသမား (က) ဖြစ်ပြီး အခြားတစ်ယောက် သည် ကစားသမား (ခ) ဖြစ်ပါလိမ့်မည်။ သင့်အနေဖြင့် ဆုံးဖြတ်ချက် မချမီ သင်လုပ်ဆောင်ရမည့် အခန်းကဏ္ဍကို ဖော်ပြထားပါသည်။

စုစုပေါင်း 100 ရှိပါသည်။ ကစားသမား (က) သည် သူ့အတွက် ဘယ်လောက်ချန်ထားမည်ကို ဆုံးဖြတ်ပြီး ကျန်ရှိသည့် ပမာဏသည် ကစားသမား (ခ) ထံ ရောက်ရှိပါမည်။

Source: Myanmar MSME 2018 experiments.

Due to the multi-game design of the experiment, the minimum number of participants in one session needed to be six. This meant that the experiment was implemented in groups that contained multiples of six participants. Depending on the circumstances in each experiment location, the sessions were conducted with groups of 6 to 24 participants. The most common group sizes were 24 and 18 participants, but there were also two groups of six players in two different locations. There is a small concern that the anonymity condition may have been relaxed in smaller groups, which may have affected participants' decision-making. However, we do not find that the results were affected by the group size. Table A1 in Appendix A shows that there are no major differences in the results of different games for participants in small and other groups, where small groups are defined as those with six players. The only exception is the public goods game, which is analysed with adjustment for potential small-group bias.

Another point of concern is that it was not possible to divide the participants into groups of the desired size in some locations. Due to cultural considerations, we could not have just paid the participation fee to some participants and asked them to leave: it was required that they participate in the experiment as well. To form groups of the desired size in such cases, local CSO staff participated in the experiment. The results in Table A2 in Appendix A show that this had implications for the public goods game results, which were therefore analysed without the sessions that included CSO staff. This adjustment also accounts for the small-group bias illustrated in Table A1.

Figure 3: Test page

## Familiarize yourself

This page shows two simple tasks important for using the tablet:

- 1) entering numbers
- 2) choosing the relevant option

When asked to enter a number, you just need to type inside the box.

When asked to choose between different options, you just need to touch the circle to the left of your chosen option.

For example:

Introduce any number between 1 and 10:

Select Option 1:

Option 1

Option 2

After completing, you will need to press the blue button "Next" to continue to the next page.

Source: Myanmar MSME 2018 experiments.

## 4 Key findings

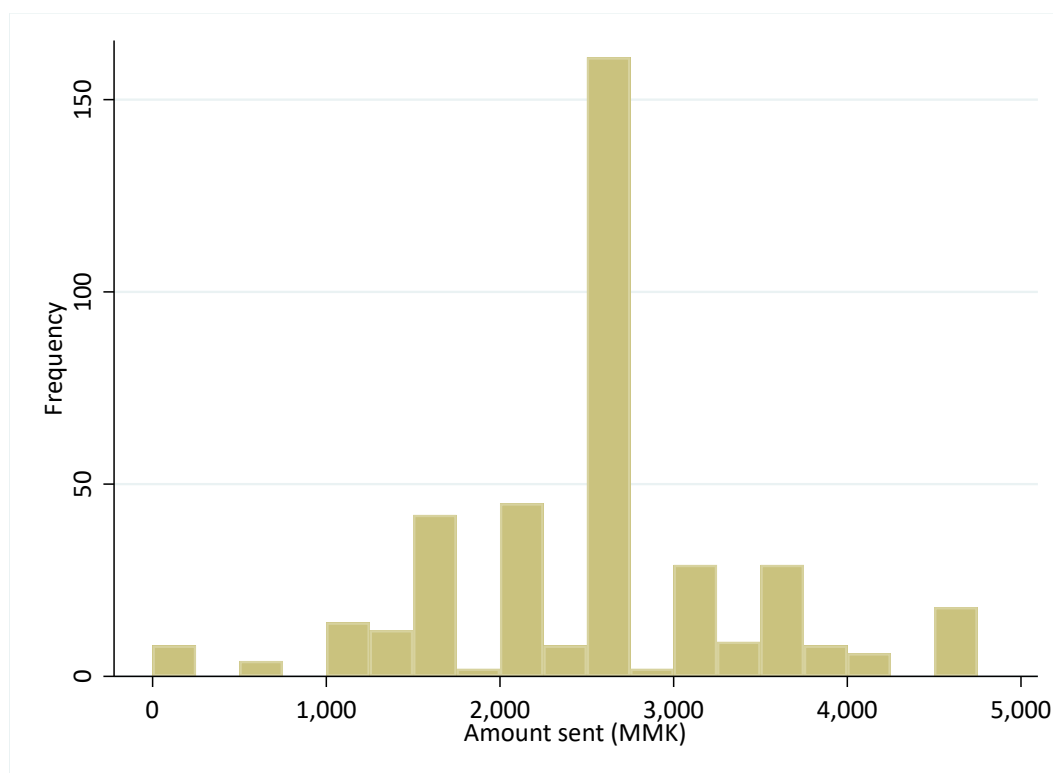
### 4.1 Dictator game

The dictator game is widely used in experimental economics to reveal information about self-interested behaviour—or its opposite: altruism, reciprocity, fairness, or inequality aversion. In this game, players assigned to the role of a dictator have to decide how much, if anything, of an endowment to give to another player they are randomly and anonymously paired with. The allocated endowment in this game was 100 points, corresponding to MMK5,000.

The participants in our experiment on average decided to keep 51.2 (out of 100) points for themselves and to donate 48.8. Converted to Myanmar kyats, this amounts to MMK2,558 kept and MMK2,442 donated. Figure 1 shows the distribution of the amounts given in the dictator game. We can observe that the most frequently given amount is half of the endowment. Table 2 corroborates this observation by showing that 41 per cent of the players donated 50 out of 100 points. About one-third of players donated more than one-half of the endowment to another player: 24 per cent donated 51–74 points and 9 per cent donated 75–99 points. Two players transferred their entire endowment to the other player. The summary statistics for the dictator game indicate an overall distribution skewed to the right, which, combined with the frequent even split, indicates a strong sense of other-regarding preferences among MSMEs in Myanmar.



Figure 4: Dictator game results



Source: Myanmar MSME 2018 experiments.

In this regard, our participants differ from the subjects in numerous other dictator games played around the world. Kahneman et al. (1986) found that three-quarters of students who participated in their experiment with a hypothetical choice set-up chose an uneven split in their own favour. Using real stakes, usually more than 60 per cent of subjects send a positive amount of money, with a mean transfer of roughly 20 per cent of the endowment (Forsythe et al. 1994; Roth 1995). This indicates a much lower degree of selfish behaviour among our participants compared with participants in other studies.

Table 2: Dictator game donation results (shares)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Points kept	0	1–24	25–49	50	51–74	75–99	100
Share	0.00	0.06	0.19	0.41	0.24	0.09	0.00
Observations	0	24	77	161	97	36	2

Source: Myanmar MSME 2018 experiments.

Table 3 shows the relationship between the dictator game results and key participant characteristics. We do not see significant differences in the average level of donations between male and female participants (Column 1) or between male and female enterprise owners (Column 2). The level of donations in the dictator game also does not seem to be different between enterprises located in Yangon or central Myanmar and enterprises in other locations, or between informal and formal firms. We find, however, that enterprise owners donated more than other

players (e.g. manager, supervisor, clerk) and that those from micro firms donated more than those from larger firms, as shown in Columns 3 and 4, respectively. No differences in the level of transfers are related to firm size when comparing only owners of micro and larger firms, as shown in Column 5.

Table 3: Dictator game results and key participant characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	-2.30 (2.16)	-1.60 (2.61)						
Owner			5.62** (2.19)					
Micro				4.44** (1.97)	1.56 (2.52)			
Bamar						-1.85 (1.80)		
Yangon							-3.71 (2.43)	
Informal								-0.99 (2.53)
Observations	397	318	397	397	318	397	397	397

Notes: Dependent variable is the amount of points sent in the dictator game. Sample of enterprise owners in Columns 2 and 5. Robust standard errors in parentheses. Significance levels: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Source: Myanmar MSME 2018 experiments and Myanmar MSME 2017 data (Berkel et al. 2018).

## 4.2 Bargaining game

The bargaining game applied in this experiment is Nash’s demand game (Nash 1953), which seeks to provide information about the co-operative behaviour of participants. We included the bargaining game in the experiment to obtain an insight into the relationship between personal preferences for co-operation and business association membership.

The bargaining game is implemented with two anonymously paired players, each of them demanding a share of the endowment. Both players make simultaneous decisions, so if the sum of demands does not surpass the available amount, each player gets the share they demanded. Otherwise, neither gets anything. The allocated endowment in this game was 100 points, corresponding to MMK5,000. Any pair of amounts that sum to 100 is a Nash equilibrium in this game.

Table 4 shows the results of the bargaining game. The first row shows the average amount claimed by each player. Participants on average tended to claim less than one-half of the endowment. The overall level of co-operation for each pair of players is assessed by the number of cases exceeding the Nash equilibrium outcome of 100. This occurred in 16 per cent of pairs. Even though an individual may be co-operative, they may end up in an overall non-co-operative game. The opposite may also be true—a non-co-operative individual may end up in a co-operative game—so we also show the proportion of individuals who claimed more than half of the endowment. The proportion of individually non-co-operative participants is 14.6, which is slightly lower than the proportion of non-co-operative pairs.

Table 4: Bargaining game results

	Average	SD	Min.	Max.	Obs.
Average request (points)	42.90	15.52	0	90	397
Non-co-operative pair outcome (%)	15.87	36.58	0	100	397
Individual non-co-operative outcome (%)	14.61	35.36	0	100	397
Hard bargain (%)	42.32	49.47	0	100	397

Source: Myanmar MSME 2018 experiments.

None of the key respondent and enterprise characteristics correlate significantly with measures of non-co-operative outcome and hard bargaining, as shown in Tables 5 and 6, respectively. The bargaining measures considered do not correlate with the variable that indicates business association membership, which could be related to the low availability of such associations in general, or the way that they are operated. The MEMS survey report indicates that business association members obtain very few, if any, membership benefits (Berkel et al. 2018).

Table 5: Non-co-operative outcome in the bargaining game and key respondent characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
						Non-co-operative	
Female	0.01 (0.04)						
Owner		-0.02 (0.05)					
Micro			0.02 (0.04)				
Bamar				0.02 (0.04)			
Yangon					0.08 (0.06)		
Business association						-0.01 (0.06)	
Informal							0.01 (0.05)
Observations	397	397	397	397	397	397	397

Notes: Dependent variable is individually non-co-operative outcome, defined as claiming more than half of the endowment. Robust standard errors in parentheses. Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Myanmar MSME 2018 experiments and Myanmar MSME 2017 data (Berkel et al. 2018).

Table 6: Bargaining game results and key respondent characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
						Hard bargain	
Female	0.04 (0.06)						
Owner		-0.01 (0.06)					
Micro			0.05 (0.06)				
Bamar				-0.00 (0.05)			
Yangon					0.00 (0.08)		
Business association						-0.02 (0.08)	
Informal							0.04 (0.07)
Observations	397	397	397	397	397	397	397

Notes: Robust standard errors in parentheses. Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

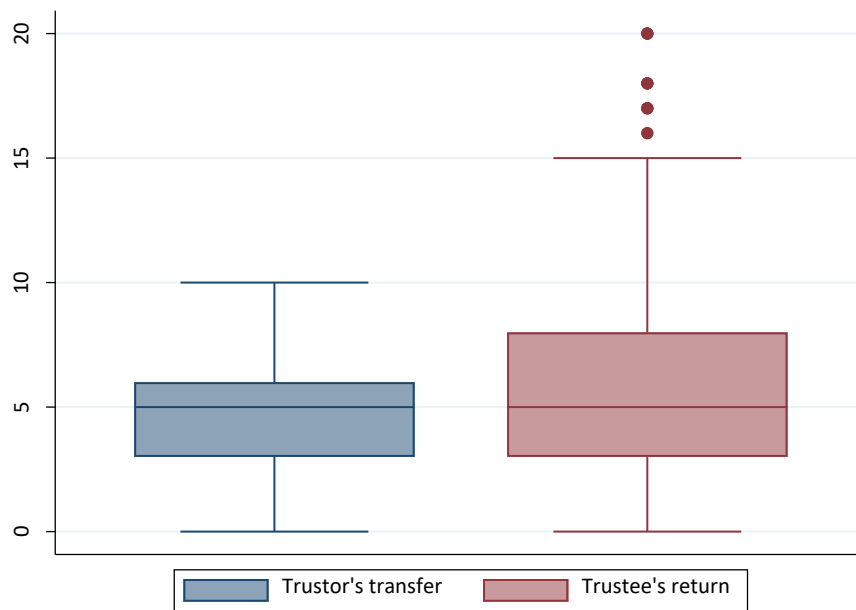
Source: Myanmar MSME 2018 experiments and Myanmar MSME 2017 data (Berkel et al. 2018).

### 4.3 Trust game

Trust and trustworthiness smooth transactions when complete contracts are absent (Sutter and Kocher 2007). Many interactions related to family, market, or business life would not be feasible without mutual trust and trustworthiness (Knack and Keefer 1997; Zak and Knack 2001). Berg et al. (1995) were the first to design a game for studying trust and reciprocity in an investment setting. Since then, their game has had numerous applications (Levitt and List 2007). In the trust game, a first mover (also called a trustor) is randomly and anonymously paired with a second mover (also called a trustee). The first mover decides how much of the endowment to transfer to the second mover. This transfer is increased by the experimenter and in the final step, the second mover decides how much of the received transfer to return to the first mover. First-mover transfers are interpreted as a measure of trust, and second-mover transfers as a measure of trustworthiness. To allow for learning effects to set in, this game is usually repeated several times.

As described in the instructions in Appendix C, our game had an endowment of 10 points and a multiplication factor of 3, and it was played in five rounds. The results of the fifth round of the trust game are shown in Figure 5. The average amount transferred by the first mover was 4.9 (out of 10) points, while the returned amount averaged at 5.9. The relative return, which measures trustworthiness, was 0.39—slightly lower than the average of 0.46 found in experiments in other countries in Asia (Johnson and Mislin 2011). Both the amount sent and the amount returned had the same median value (5), as shown in Figure 5.

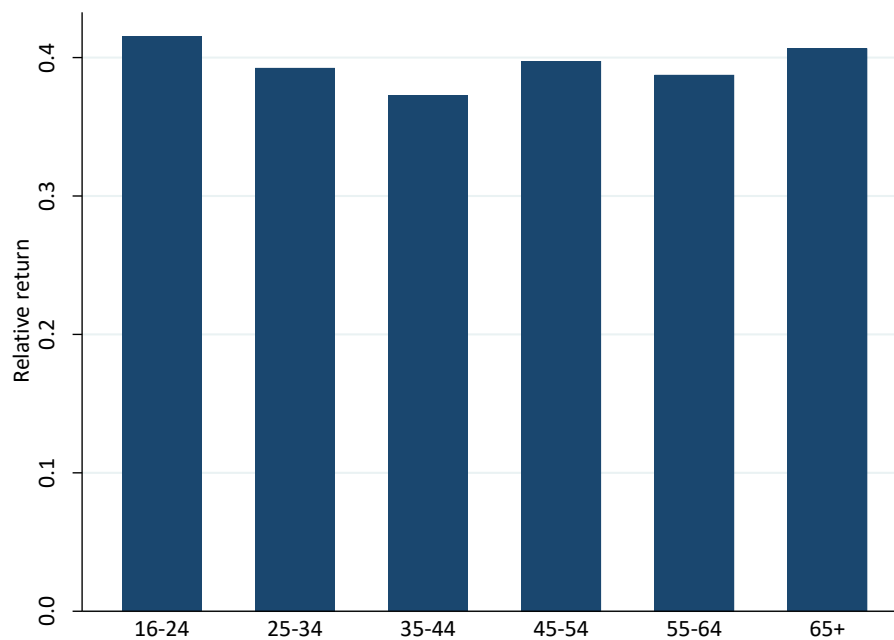
Figure 5: Average points transferred in the trust game



Source: Myanmar MSME 2018 experiments.

As shown in Figure 6, the average relative return does not seem to vary substantially with participants' age. There is, however, a dip for the group aged 35–44. This is in contrast to Sutter and Kocher (2007), who found that the degree of trustworthiness increases with age.

Figure 6: Average relative returns in the trust game for different age groups



Source: Myanmar MSME 2018 experiments.

Table 7 shows that trust and trustworthiness do not depend on gender, position in the enterprise, or firm size. Similarly to us, Eckel and Wilson (2004) did not find gender differences in trustworthiness. But there is no consensus in the literature, as some studies—for instance,

Bellemare and Kröger (2007)—find that men are more trustworthy than women. We obtain lower trust value for informal firms; this might signal either their choice to remain informal due to general distrust of others, or a lack of trust arising from their status as informal firms. Trustworthiness seems to be affected by enterprise location: trustees from Yangon and central Myanmar return slightly higher amounts to the trustors.

Table 7: Trust game results and key respondent characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
						Trust	Trustworthiness (proportion returned)						
Female	-0.23 (0.25)						-0.02 (0.02)						
Owner		-0.02 (0.28)						-0.03 (0.02)					
Micro			-0.06 (0.26)						-0.01 (0.02)				
Bamar				0.32 (0.21)						0.03* (0.02)			
Yangon					0.25 (0.33)						0.06*** (0.02)		
Informal						-0.80*** (0.30)						-0.03 (0.02)	
Observations	397	397	397	397	397	397	395	395	395	395	395	395	

Notes: Robust standard errors in parentheses. Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Myanmar MSME 2018 experiments and Myanmar MSME 2017 data (Berkel et al. 2018).

We administered a questionnaire-based self-assessment of selected personality traits in the MEMS 2017 survey (Berkel et al. 2018), in which trust was measured in a series of five questions that required respondents to indicate on a scale of 1 to 7 their level of agreement with each statement. The level of agreement with the statements provides information about the level of trust respondents place in other people, including their household members, friends, business contacts, and first-time acquaintances. Table 8 shows a comparison of the level of trust reported by enterprise owners, and by managers and other employees who were interviewed. We do not see large differences between owners and others on average, except in the case of trusting one’s own household members and first-time acquaintances. The results from the experiment reported in Table 5 do not show differences between owners and participants with some other role in the enterprise, which is comparable with the survey result that enterprise owners report a similar level of trust in business contacts as others do. Apart from agreeing that trust is relevant for firm performance, the literature does not offer a lot of evidence on the trust and trustworthiness of enterprise owners—apart from Fehr and List (2004), who found that CEOs exhibited much more trusting and trustworthy behaviour than students.

Table 8: Differences in self-reported trust levels for enterprise owners and other respondents

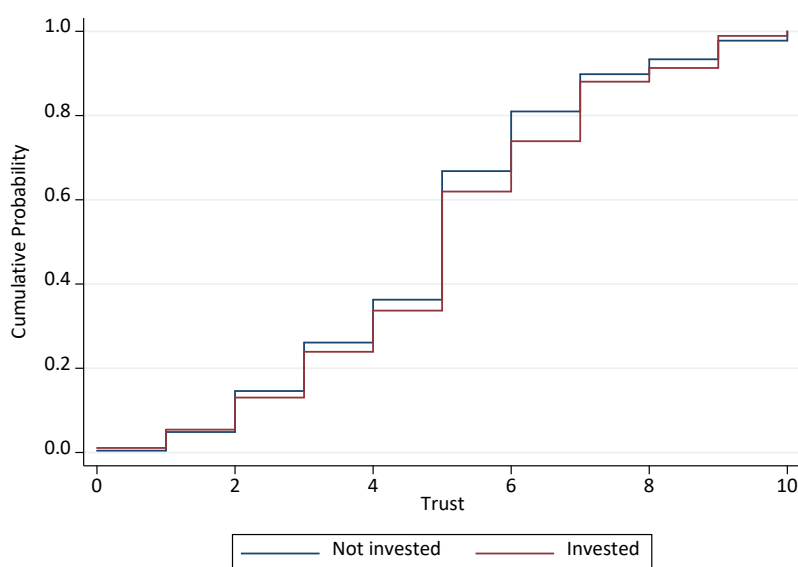
	Number	Other	Owner	Difference	t-value
I feel that most people can be trusted (1–7)	2,496	4.29	4.36	-0.07	-0.94
I feel that members of my household can be trusted (1–7)	2,496	5.83	5.92	-0.09	-1.44*
I feel that my friends can be trusted (1–7)	2,496	4.87	4.82	0.05	0.79
I feel that people I do business with can be trusted (1–7)	2,496	4.74	4.79	-0.05	-0.77
I feel that people I meet for the first time can be trusted (1–7)	2,496	3.00	3.21	-0.20	-2.42***

Note: Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Myanmar MSME 2017 data (Berkel et al. 2018).

We also investigate how the revealed preference for trust in the trust game correlates with tendency to make business investments. Figure 7 compares the results in the trust game for those who reported having made business investments in the past two years and those who had not made recent investments. The results indicate a similar tendency to trust others among those who had and those who had not made recent investments.

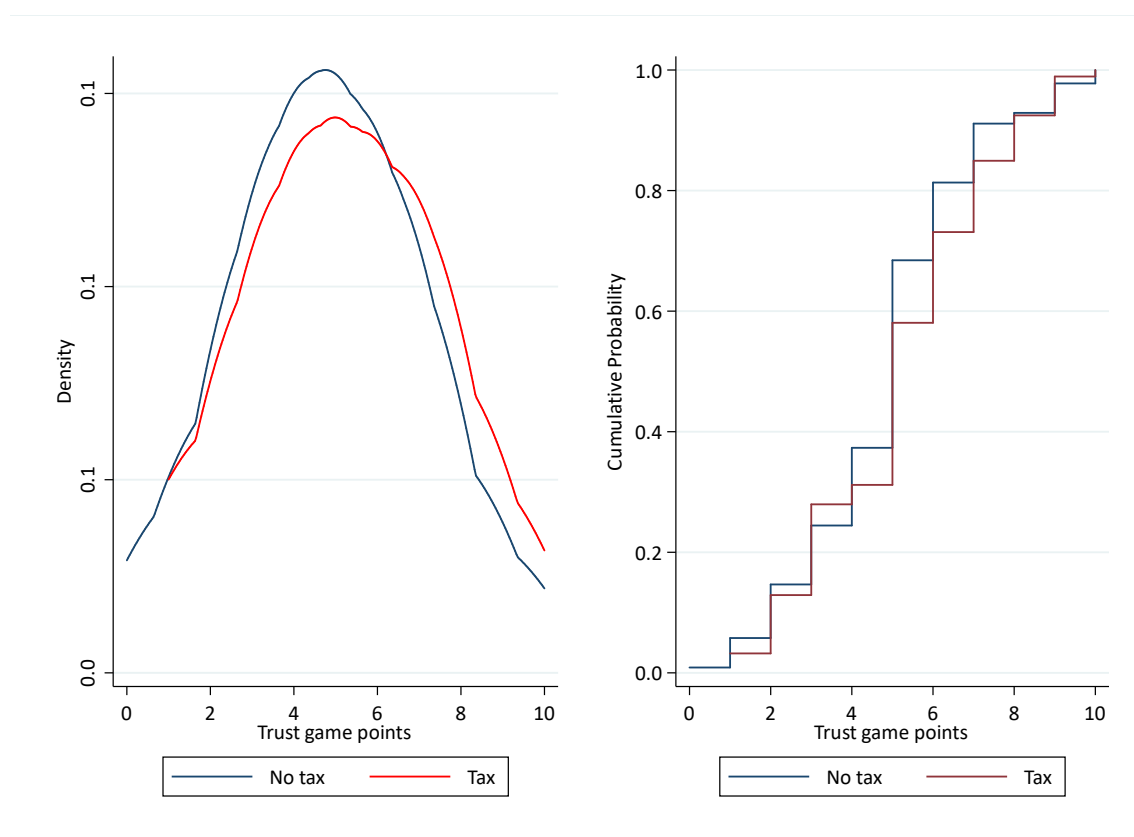
Figure 7: Investment and trust



Source: Myanmar MSME 2018 experiments.

Finally, we look into the revealed preference for trust in the trust game and participants' tendency to comply with corporate tax laws, measured by whether the enterprise paid any taxes in the previous fiscal year. We find no significant difference in the trust level between taxpayers and non-taxpayers. Visual representation of this is provided by Figure 8, which compares the results for trust levels and taxpaying behaviour. Even though the levels of trust among non-taxpayers seem to be more concentrated around the mean and taxpayers' trust skews towards higher levels, the differences are not statistically significant.

Figure 8: Tax and trust



Source: Myanmar MSME 2018 experiments.

#### 4.4 Public goods game

Many communities rely on local norms of conduct to provide public goods and regulate the use of common-pool resources. Such norms of conduct do not always play out perfectly in practice, as individuals make decisions in light of both personal and common gains. Egoistic individuals could take advantage of the contributions to public goods made by others (i.e. ‘free-ride’), but the community as a whole does better when everyone contributes. The public goods game can shed light on these tensions by providing a measure of altruism, fairness, or pro-sociality.

The game is played in several rounds. In each round, subjects are asked to contribute to a common pool. After the contributions have been made, the experimenter places some percentage of the total amount from the public account into the private account of each player. At the end of each round, all subjects observe the total amount in the common pool as well as the individual contributions of others. While the socially efficient outcome is for all players to put the whole endowment into the common pool, the privately optimal solution is free-riding: conditional on others contributing, it is more profitable not to contribute anything.

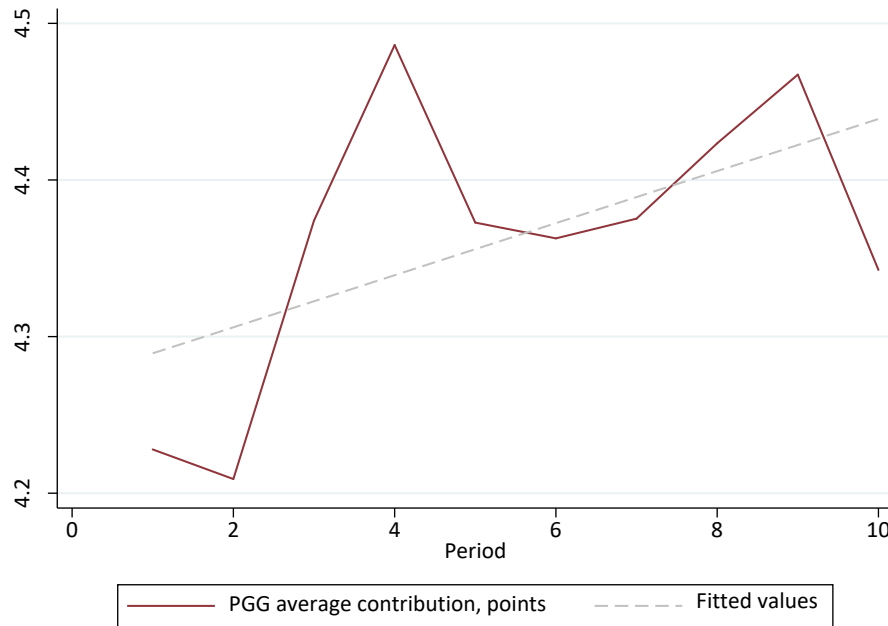
To implement the game, we randomly allocated participants into groups of three, without revealing to participants who else was in their group. Each participant had an endowment of 10 points to distribute between the personal and group accounts. Contributions to the group fund were augmented by 50 per cent and distributed equally among all players. The game was repeated ten times.



Empirical evidence on the public goods game shows that subjects begin by contributing about half of their endowment to the common pool, and that the contributions begin to drop in subsequent rounds and towards the last round (Levitt and List 2007).

Our data reveal a relatively stable level of contributions to the common pool over all game periods, as shown in Figure 9. Unlike in other experiments, which have identified a declining profile of contributions, the level of contributions had an increasing trajectory in our case, with peaks in the fourth and the ninth periods. The level of donations was not significantly higher in the final round, compared with the first round (t-value = 1.11, p = 0.13s).

Figure 9: Contribution to public goods



Source: Myanmar MSME 2018 experiments.

Table 9 shows an egalitarian profile of contributions for both male and female participants, as well as for both enterprise owners and employees. The level of contributions does not seem to depend on size or location of enterprise. Participants from Yangon show a tendency to be less pro-social than participants from other locations, but when considering enterprise owners only, those from Yangon do not have different pro-social preferences from owners in other parts of Myanmar.

Table 9: Public goods game results and key respondent characteristics

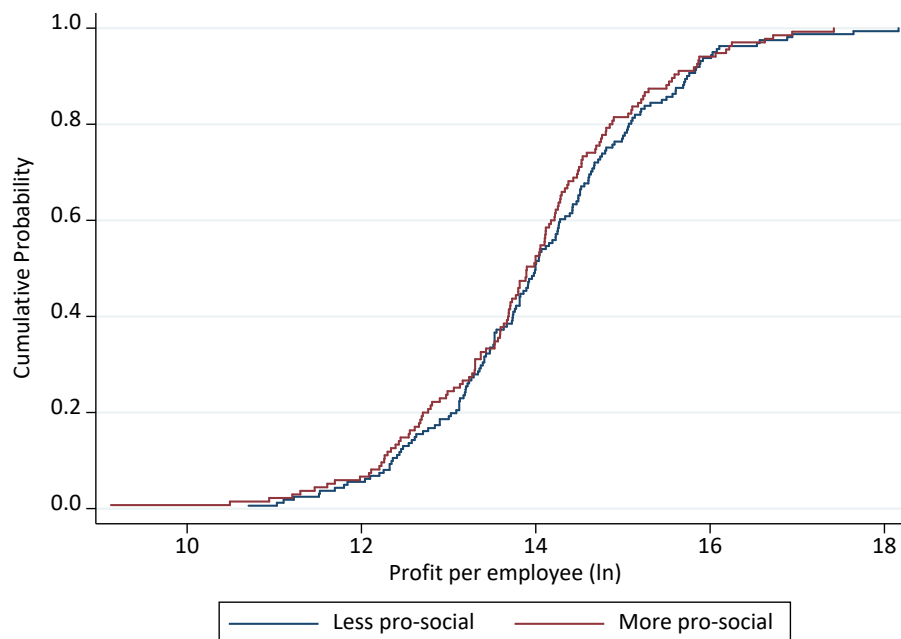
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Period 10 earnings						Pro-sociality						
Female	-2.38 (12.49)						0.04 (0.06)						
Owner		12.46 (14.05)						0.07 (0.07)					
Micro			-3.35 (13.01)						-0.02 (0.06)				
Bamar				4.69 (11.21)						0.04 (0.05)			
Yangon					-27.68 (22.46)						-0.24*** (0.09)	-0.20 (0.22)	
Informal						-17.91 (15.01)							-0.08 (0.07)
Observations	365	365	365	365	365	365	365	365	365	365	365	302	365

Notes: Sample of enterprise owners in Column 11. Robust standard errors in parentheses. Significance levels: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Source: Myanmar MSME 2018 experiments and Myanmar MSME 2017 data (Berkel et al. 2018).

Leibbrandt (2012) administered a public goods experiment among shrimp farmers in Brazil to investigate the relationship between social preferences and market performance. He constructed a measure of pro-sociality by which those who contributed less than four units were categorized as less pro-social and those who contributed four or more units as more pro-social. The results revealed the importance of social preferences for market performance, as less pro-social sellers were more likely to get a lower price. In light of Leibbrandt's (2012) analysis, we compare profits per employee of less and more pro-social enterprise owners. The results shown in Figure 10 indicate that there are no significant differences in enterprise profitability between less and more pro-social owners, even though less pro-social enterprise owners get the highest profit levels and more pro-social ones achieve the lowest levels.

Figure 10: Pro-sociality and profit



Source: Myanmar MSME 2018 experiments and Myanmar MSME 2017 data (Berkel et al. 2018).

#### 4.5 Risk-preference elicitation game

Risk preferences are found to influence a person's decision to start a business, how they run it, and, finally, whether it succeeds (Cramer et al. 2002). To investigate risk attitudes of business owners in Myanmar, we administered a survey that measured risk attitudes on an 11-point scale, which establishes if the interviewee is generally a person who tries to avoid taking risks (0) or is fully willing to take risks (10).<sup>1</sup> The survey asked about both the interviewees' willingness to take risks in general and their willingness to take risks in certain contexts, such as when it comes to financial matters, occupation, health, leisure and sports, and driving (Berkel et al. 2018).

To complement the survey-based self-reported risk measure, we included an iterative multiple price list, also known as a 'staircase' risk-elicitation method (similar to Andersen et al. 2006; Falk

<sup>1</sup> The questions were taken from the German Socio-Economic Panel (SOEP), which has undergone numerous validations (SOEP 2007).

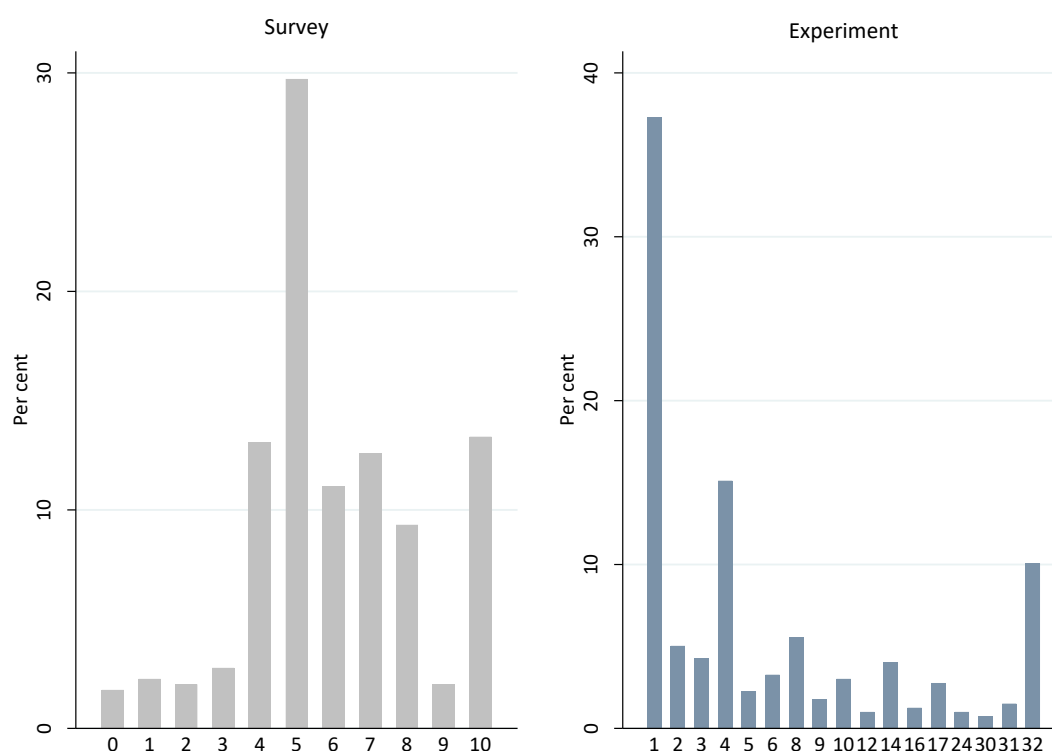
et al. 2018), in our lab-in-the-field experiment. The multiple price list format enables measurement of how subjects trade off risky and safe payments.

The implementation follows the procedure specified in Holzmeister (2017). Participants are asked to choose between a safe payment and a lottery. The choice is made five times, and one of the choices only is randomly picked for payout. The lottery is the same each time, while the safe payment varies. If a participant chooses the lottery, a random draw determines whether the high or low outcome will be paid; otherwise, a participant gets the safe-payment amount. The lottery is determined by a high and a low payoff, which are set to 300 and 50 points, respectively, as well as the probability of the high payoff, which is set to 50 per cent. The varying safe payments are identified in an iterative manner based on the certain payoff in the first round (set to 160 points), the initial increase/decrease in the second choice (set to 80 points), and the number of choices (set to five). Following Falk et al. (2018), the row in which a participant switches from lottery to the safe payment is used as a measure of the participant's risk preferences. As there could be several switching points, the average of rows in the price list in which subjects switch from preferring the lottery to preferring the safe option is taken as the risk-aversion measure. Figure A1 in Appendix A shows how the calculations on willingness to take risks proceeded.

First, we correlate the self-reported risk-preference measure from the survey with the incentivized risk-preference measure from the experiment. It has been shown previously that the subjective risk-preference measure is a significant predictor of incentivized experimental risk-taking measures (Vieider et al. 2015) and risk-taking behaviour in the field when evaluated for a representative sample (Dohmen et al. 2011). We do not find, however, that the two measures are significantly correlated. With the average value of six, the survey-based measure indicates a risk-neutral to slightly risk-loving majority, while the experiment-based measure indicates a higher degree of risk aversion. The distribution of risk-preference scores is shown in Figure 11.

Second, we compare both measures of risk preference across different participant and enterprise categories. The outcome of this exercise is shown in Table 10. As expected from the weak correlation, the two risk measures do not correlate in the same way across key participant and enterprise characteristics. For instance, the survey-based measure implies higher risk aversion for women, but the experiment-based measure implies higher willingness to take risks—but it is not precisely determined. Similarly, the survey-based measure implies higher risk aversion for those from central Myanmar, but the experiment-based measure implies the exact opposite.

Figure 11: Survey- and experiment-based measures of willingness to take risks



Source: Myanmar MSME 2018 experiments and Myanmar MSME 2017 data (Bertel et al. 2018).

Table 10: Willingness to take risks and key respondent characteristics

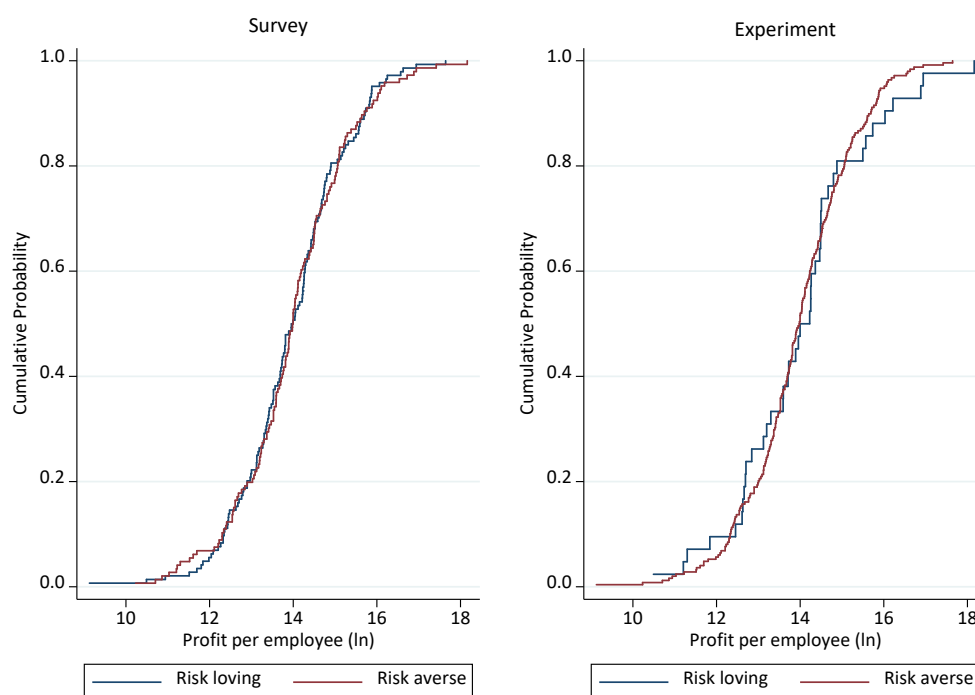
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Prepared to take risks (0–10 scale, survey)					Willingness to take risks (1–32 scale, experiment)						
Female	-0.52*						0.15					
	(0.27)						(1.18)					
Owner		0.21						-1.61				
		(0.29)						(1.32)				
Micro			-0.34						-1.27			
			(0.25)						(1.18)			
Bamar				-0.59**						3.43***		
				(0.26)						(1.06)		
Yangon					-1.29***						1.18	
					(0.33)						(1.80)	
Informal						-0.29						-1.52
						(0.33)						(1.41)
Observations	397	397	397	318	397	397	397	397	397	318	397	397

Notes: Columns 4 and 9 include only enterprise owners. Robust standard errors in parentheses. Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Myanmar MSME 2018 experiments and Myanmar MSME 2017 data (Bertel et al. 2018).

Third, we compare how the two risk measures correlate with enterprise performance, measured as profit per employee. As displayed in Figure 12, both measures show that enterprises owned by risk-averse individuals are as profitable as enterprises owned by risk-loving individuals.

Figure 12: Survey- and experiment-based measures of willingness to take risks



Source: Myanmar MSME 2018 experiments and Myanmar MSME 2017 data (Bertel et al. 2018).

Finally, we investigate how risk preferences correlate with other behaviour. The results shown in Table 11 indicate that there is no significant correlation between the risk-preference measure and decisions in other games.

Table 11: Risk preferences and other behaviour

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dictator game points sent	Trust	Trustworthiness	Public goods game earnings	Pro- sociality	Bargaining hard	Non-co- operative
Willingness to take risk	0.042 (0.104)	-0.008 (0.011)	-0.001 (0.001)	0.277 (0.547)	0.001 (0.002)	0.000 (0.002)	0.000 (0.002)
Observations	397	397	395	397	397	397	397

Notes: Trustworthiness is calculated as proportion returned. The smaller number of observations in Column 3 is due to the need to exclude those sending 0 in the trust game.

Source: Myanmar MSME 2018 experiments.

## 5 Conclusion

This paper has presented the main findings from the lab-in-the-field experiment implemented within the Myanmar Enterprise Monitoring System project. The experiment comprised five behavioural games: dictator, bargaining, trust, public goods, and risk-preference elicitation. These were implemented with the aim of assessing unique enterprise owner characteristics, which may play a role in developing a better understanding of enterprise performance and MSME-oriented policy implications.

The results from the dictator game indicate a highly pronounced preference for altruism among the participants. This preference seems to be equally distributed among men and women and across the country. Enterprise owners show a higher degree of generosity than managers or other employees, which could be related to the role of the status they have in the society. This finding indicates that equality-preserving policies would be appealing to most in the MSME sector.

The results of the bargaining game indicate that most of the participants show a high tendency to co-operate with others. The preference is stable across gender, enterprise size, respondent's role in the enterprise, and enterprise location. This finding indicates that initiatives that count on co-operation would meet with success. However, we did not find a significant relationship between personal preference for co-operation and business association membership, which could be due to the relative scarcity of business associations and the way that they operate.

The results of the trust game show a general trusting predisposition among participants, although the trustworthiness level is slightly lower than in other Asian countries. While there are no significant differences in the levels of trust shown among participants of different gender, enterprise size, and location, participants from Yangon and central Myanmar appear more trustworthy. Also, participants from informal firms show lower levels of trust. The level of trust, however, does not seem to be related to investment behaviour, which could indicate a strong influence of the investment climate for enterprise decisions. It is also not related to taxpaying behaviour, which could point to two things. First, it may be that trust in government institutions is different from general trust or trust in business partners or colleagues, which in all likelihood is what was captured in the experiments. Perhaps a more direct measure of trust in the public sector would yield different results with respect to tax compliance. Second, it is unclear whether trust should play a role in meeting one's tax commitments when doing so is not a voluntary decision but is supposed to be a legal requirement equally applicable to all Myanmar businesses.

The results of the public goods game indicate a high degree of pro-sociality among the participants. This preference appears remarkably stable across gender, enterprise size, position in the enterprise, and enterprise location. Even though, in theory, pro-sociality could have implications for business success, we have not discovered a significant relationship between preference for pro-sociality and enterprise profit.

The risk profile of the participants indicates a sample of risk-averse individuals. The risk-preference measure, however, does not correlate with enterprise performance, nor does it seem to be a strong explaining factor of other behaviour.

The findings indicate that the experimentally measured personal preferences may not explain common measures of enterprise performance, or may not factor strongly in business decisions when the business environment is not supportive for MSME development. This could be due to a couple of factors. First, experimental behaviour such as trust and co-operation might correspond well to these two kinds of behaviour in real life, but not to the more complex dimensions of business performance. Second, firm performance may depend on the context, or the overall business environment, and not just on personal preferences measured in field experiments such as ours. Overall, our findings emphasize the importance of the business environment over personal preferences for business performance in Myanmar, indicating a need for policies that are supportive of MSME sector development, including, for example, improving the investment climate and functioning of co-operative initiatives such as business associations.

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## Appendix A: Sample sensitivity tests

Table A1: A t-test comparison of results in different games by session size

	Other	Small session	Difference	t-value
Dictator game (amount sent)	48.85	48.82	0.02	0.01
Bargaining game (tough)	0.42	0.47	-0.05	-0.40
Public goods game earnings	218.62	183.82	34.79	1.33*
Trust	4.95	4.94	0.01	0.02
Trustworthiness	0.39	0.37	0.02	0.59
Risk preference	7.98	7.06	0.92	0.37
Observations	380	17	397	

Notes: 'Small session' is a session with one group of six participants. Other sessions usually included more than one group. There were four sessions with one group in four different locations.

Source: Myanmar MSME 2018 experiments.

Table A2: A t-test comparison of results in different games in groups with CSO staff as participants

	Other	CSO session	Difference	t-value
Dictator game (amount sent)	2,439.73	2,471.88	-32.15	-0.19
Bargaining game (tough)	0.42	0.44	-0.02	-0.17
Public goods game earnings	215.07	240.63	-25.56	-1.32*
Trust	4.93	5.13	-0.19	-0.48
Trustworthiness	0.39	0.42	-0.03	-1.09
Risk preference	7.97	7.63	0.34	0.18
Observations	365	32	397	

Notes: 'CSO session' is a session in which CSO staff participated, to enable the minimum group size to be reached.

Source: Myanmar MSME 2018 experiments.

## Appendix B: Protocol

1. Register all participants
  - a. Write their name on the attendance list
    - i. Attendance list contains the following fields
      1. Participant number
      2. Enterprise number
      3. Enterprise name
      4. Participant name
      5. Position in the enterprise
      6. Phone number
      7. Payoff
      8. Signature
2. Enter participant links in the browser
3. Record participant number (P1, P2, etc.) and participant code in an Excel sheet
4. Give a note with a participant number and a tablet to each participant
  - a. They need to return the tablet and the note after finishing all games
5. Take the participants to their assigned seat
6. Introduce the project
7. Introduce the activities they will partake in
  - a. Read the welcome note
  - b. Give instructions before each game
  - c. Best is that players pay one by one game at the same time
    - i. Wait for the slow ones to finish a game before proceeding to the next game
8. After all players have finished, call one by one to receive the payment
  - a. Payment is given after finishing all games
  - b. Participants sign that they have received the payoff (mobile credit)

Thank the participants for helping with the project and give the Certificate of Recognition

## Appendix C: Instructions

### Welcome

You are now taking part in an economic experiment. Depending on your decisions and the decisions of other participants, you will be able to earn some credit for mobile phone. How you can earn is described in these instructions. Please read them carefully. You will have to answer control questions, to check that you understand the instructions. You can only continue the experiment when you have answered these questions correctly.

During the experiment you are not allowed to communicate with other participants. If you have a question, raise your hand. One of us will come to answer your question. Sometimes you may have to wait a short while before the experiment continues. Please be patient.

During the experiment your earnings will be calculated in points. Points will be converted to Kyats at the following rate:

**1 points = 50 Kyats**

At the end of the experiment your total earnings will be paid out to you in the form of credit for mobile phone.

In the experiment, all participants are randomly divided into **groups of 2 or 3**. This means that you are in a group with one or two other participants. **You will be part of the same group throughout the entire experiment.** Nobody knows which other participants are in their group, and nobody will be informed who was in which group after the experiment.

Phases 1 and 2 include 1 round, phases 3 and 5 are divided into 5 rounds and phase 4 is divided into 10 rounds.

*Phase 1: Dictator game (played once)*

- a. You will randomly and anonymously be paired up with another player and allocated a role: either participant A or participant B.

- If you are participant A:

You will be asked to indicate the number of points you want to give to player B. Only integers between 0 and 100 are allowed for this purpose. You will automatically keep the remaining points. Your earnings in the game are calculated as follows:

**Total earnings = 100 – (points you allocated to participant B)**

- If you are participant B:

You will receive the number of points that participant A decided to give you.

**Total earnings = points given by participant A**

*Phase 2: Bargaining game (played once)*

- a. You will randomly and anonymously be paired up with another player and allocated a role: either participant A or participant B. There is **100 points** for you to divide. Both of you have to simultaneously and independently demand a portion of the **100 points** for yourselves. If the sum of your demands is smaller or equal to **100**, both of you get what you demanded. If the sum of your demands is larger than **100**, both of you get nothing.

- If you are participant A:

You will be asked to indicate the number of points you want to keep for yourself. Only integers between 0 and 100 are allowed for this purpose. You will receive the desired number of points only if the total sum of your and player B's contribution is less or equal than 100.

- If you are participant B:

You will be asked to indicate the number of points you want to keep for yourself. Only integers between 0 and 100 are allowed for this purpose. You will receive the desired number of points only if the total sum of your and player A's contribution is less or equal than 100.

*Phase 3: Trust game (played 5 times)*

- a. You will randomly and anonymously be paired up with another player and allocated a role: either participant A or participant B.

- If you are participant A:

You will be asked to indicate the number of points you want to give to player B. Only integers between 0 and 10 are allowed for this purpose. You will automatically keep the remaining points.

Your earnings are equal to the number of points you decide to keep, that is, for each point you keep, you get 1 point as earnings.

Player B then receives the tripled amount of what you sent him/her as the rules of the game specify that the amount sent to the player B is tripled. That is, for each point you sent he/she receives 3 points.

Then player B decides how much to send back to you.

Your earnings can be calculated with the following formula:

$$10 - (\text{points you sent player B}) + (\text{points player B sends back})$$

- If you are participant B:

Player A will send you a chosen amount between 0 and 10 points. You will receive that amount multiplied by 3.

Then you decide how much to keep and how much to send back to player A.

Your earnings can be calculated with the following formula:

$$3 \times (\text{points player A sent}) - (\text{points you sent back to player A})$$

### *Example*

Suppose you allocate 5 points to player B. Player B receives 15 points and decides to give back 6.

Your total earnings are:  $10 - 5 + 6 = 11$  points.

Player B's earnings are:  $(5 \times 3) - 6 = 15 + 6 = 9$  points

### *Phase 4: Public goods game (played 10 times)*

- a. You and the two others in your group simultaneously decide how to use the endowment.
- b. You will be asked to indicate the number of points you want to contribute to public goods. Only integers between 0 and 10 are allowed for this purpose. You will automatically keep the remaining points. Your earnings depend on the number of points you kept and the total number of points in the group account.
- c. Your earnings from points you kept are equal to the number of points you allocate to it. That is, **for each point you keep you get 1 point as earnings**. For example, if you keep 3 points then you receive 3 points for it. The points you keep do not affect the earnings of the others in your group.
- d. Your earnings from the group amount equal the **sum** of points allocated to the group by all 3 members multiplied by 0.5. **For each point contributed to the group by all participants, each participant obtains 0.5 points as earnings**. For example, if the sum of points contributed is 30, then your earnings from the group account and the earnings of each of the others in your group from the group account are equal to 15 points.

Your earnings can be calculated with the following formula:

**$10 - (\text{points you contributed to the group}) + 0.5 \times (\text{sum of points allocated by all group members to the group account})$**

Note that you get 1 point as earnings for each point you allocate to your private account. If you instead allocate 1 extra point to the group account, your earnings from the group account increase by  $0.5 \times 1 = 0.5$  points and your earnings from your private account decrease by 1 point. However, by allocating 1 extra point to the group account, the earnings of the other 2 group members also increase by 0.5 points. Therefore, the total group earnings increase by  $0.5 \times 3 = 1.5$  points. Note that you also obtain earnings from points allocated to the group account by others. You obtain  $0.5 \times 1 = 0.5$  points for each point allocated to the group account by another member.

*Example*

Suppose you allocate 6 points to the group account, the second member of your group allocates 10 points to the group account, and the last individual allocates 0 points. In this case, the sum of points in the group account is  $6 + 10 + 0 = 16$  points. Each group member gets earnings of  $0.5 \times 16 = 8$  points from the group account.

Your total earnings are:  $10 - 6 + (0.5 \times 16) = 4 + 8 = 12$  points.

The second members' earnings are:  $10 - 10 + (0.5 \times 16) = 0 + 8 = 8$  points.

The third members' earnings are:  $10 - 0 + (0.5 \times 16) = 10 + 8 = 18$  points.

*Phase 5: Risk preference (played 5 times)*

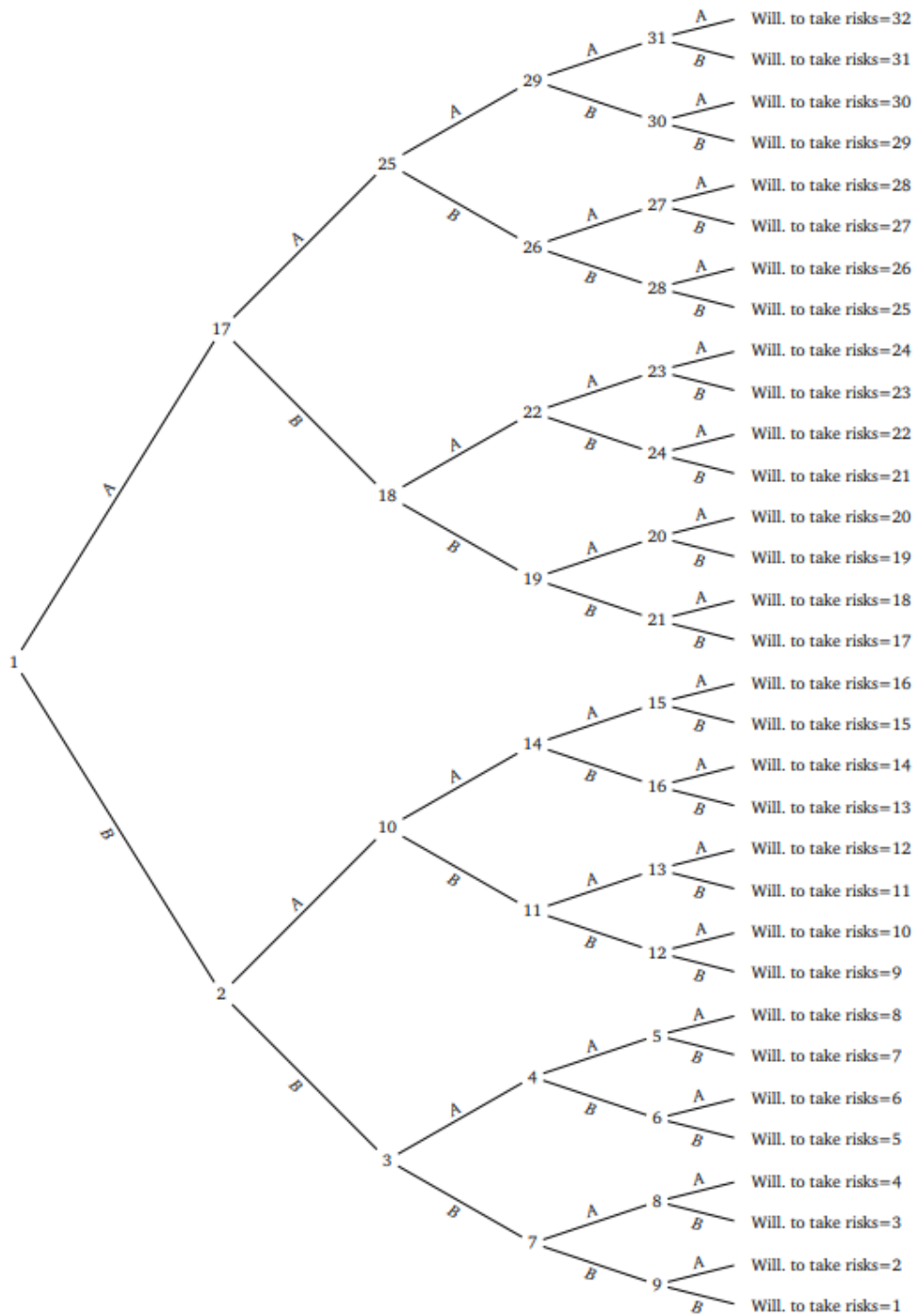
In the following, you can choose between a sure payment and a lottery. The lottery gives you a 50 percent chance of receiving 300 points and a 50 percent chance of receiving nothing. We will present to you five different situations. While the lottery is the same in all situations, the sure payment will differ in every choice.

After completing all five choices, one of the choices will be randomly picked to determine your payoff. If you chose the lottery, a random draw will determine whether the high or low outcome will constitute your payoff; otherwise, the sure payment will constitute your payoff.

Do you have any questions? (Please raise your hand.)

## Appendix D: Willingness to take risks calculation

Figure D1: Willingness to take risks calculation



Source: based on Falk et al. (2018).