

Gender Differences in Risk Tolerance, Trust and Trustworthiness: Are They Related?

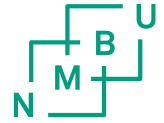
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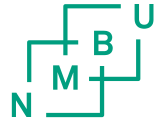


Development context: Ethiopia

- Youth underemployment and growing landlessness: Densely populated areas with rapid population growth
- Rural transformation
- Policy initiative & experiment: Provide new livelihood opportunities for youth
- Establishment of formal youth business groups
 - Establish primary cooperatives under cooperative law
 - Allocated a land or mineral resource/task responsibility
 - Self-organize, own bylaw, business plan, board, auditing
- **Females are under-represented** as they constitute 32% of the members.
- The **broader policy question is whether gender can be ignored or whether a gender dimension of the policy is needed**

Our youth research: Youth business groups

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The importance of Ostrom's Design Principles: Youth group performance in northern Ethiopia

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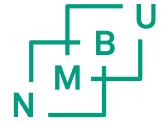
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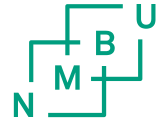


- **Compliance with Ostrom's Design Principles in youth business groups is correlated with higher within-group trust & other performance indicators**

This study: contributions to the literature



- We add to the **limited literature on risk taking and trust among young entrepreneurs working in joint businesses** in a developing country setting
- We add to the **few studies on the relationship between risk tolerance, trust and trustworthiness with the first study to explicitly assess gender differences in these relationships**
- To our knowledge, this is also the first study to study the impact of group-average risk tolerance on trust and trustworthiness
- We have a **relatively large sample** which gives more power to the **assessment of gender differences** than most studies in the past



Gender differences in risk preferences

Journal of Economic Behavior & Organization 83 (2012) 50–58

Journal of Economic Literature 2009, 47:2, 448–474
<http://www.aeaweb.org/articles.php?doi=10.1257/jel.47.2.448>



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Journal of Economic Behavior & Organization

journal homepage: www.elsevier.com/locate/jebo



Gender Differences in Preferences

RACHEL CROSON AND URI GNEEZY*

Strong Evidence for Gender Differences in Risk Taking

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- The authors base their conclusions on experiments with the standard investment game (Gneezy & Potters 1997)
- Similar conclusions are drawn by: Eckel and Grossman 2008, Byrnes et al. 1999
- Finucane et al. (2000) find a gender difference among whites, but not among any other ethnic group, and term it “the white male effect”



Opposing view:



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Feminist Economics



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ARE WOMEN REALLY MORE RISK-AVERSE THAN MEN? A RE-ANALYSIS OF THE LITERATURE USING EXPANDED METHODS

Julie A. Nelson

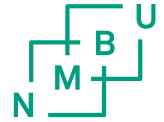
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Not-So-Strong Evidence for Gender Differences in Risk Taking

Julie A. Nelson

- Many studies do not show any significant gender difference
 - Low Cohen's d for gender difference in most studies
 - Filippin and Crosetto (2016) draw similar conclusions based on a review of a large number of studies utilizing the Holt & Laury (2002) method for eliciting risk preferences
-

Importance of trust in business



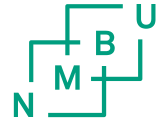
- **Trust** and **trustworthiness**
 - Important (endogenous) institutional characteristics
 - Associated with GDP per capita and GDP growth
 - Easier to analyze as an outcome than as an explanatory variable (e.g. Fehr 2009)
 - **Definition** of trust
 - Coleman (1990), Fehr (2009)
 - As a behavior e.g. as captured by the allocation behavior of the first player in the standard trust game (Berg et al. 1995).
 - Includes **beliefs** (expectations) and **preferences**
-

Trust and risk preferences

- Trusting people is a risky decision!
 - Agreed upon across disciplines
- Empirical evidences on whether risk preferences influence trust are mixed:
 - **Many studies find no significant correlation, e.g.:**
 - Ashraf et al. 2003; 2006;
 - Eckel and Wilson 2004;
 - Houser et al. 2010
- A few studies have found significant positive correlation between trust and risk tolerance (Schechter 2007; Sapienza et al. 2013).

Hypotheses

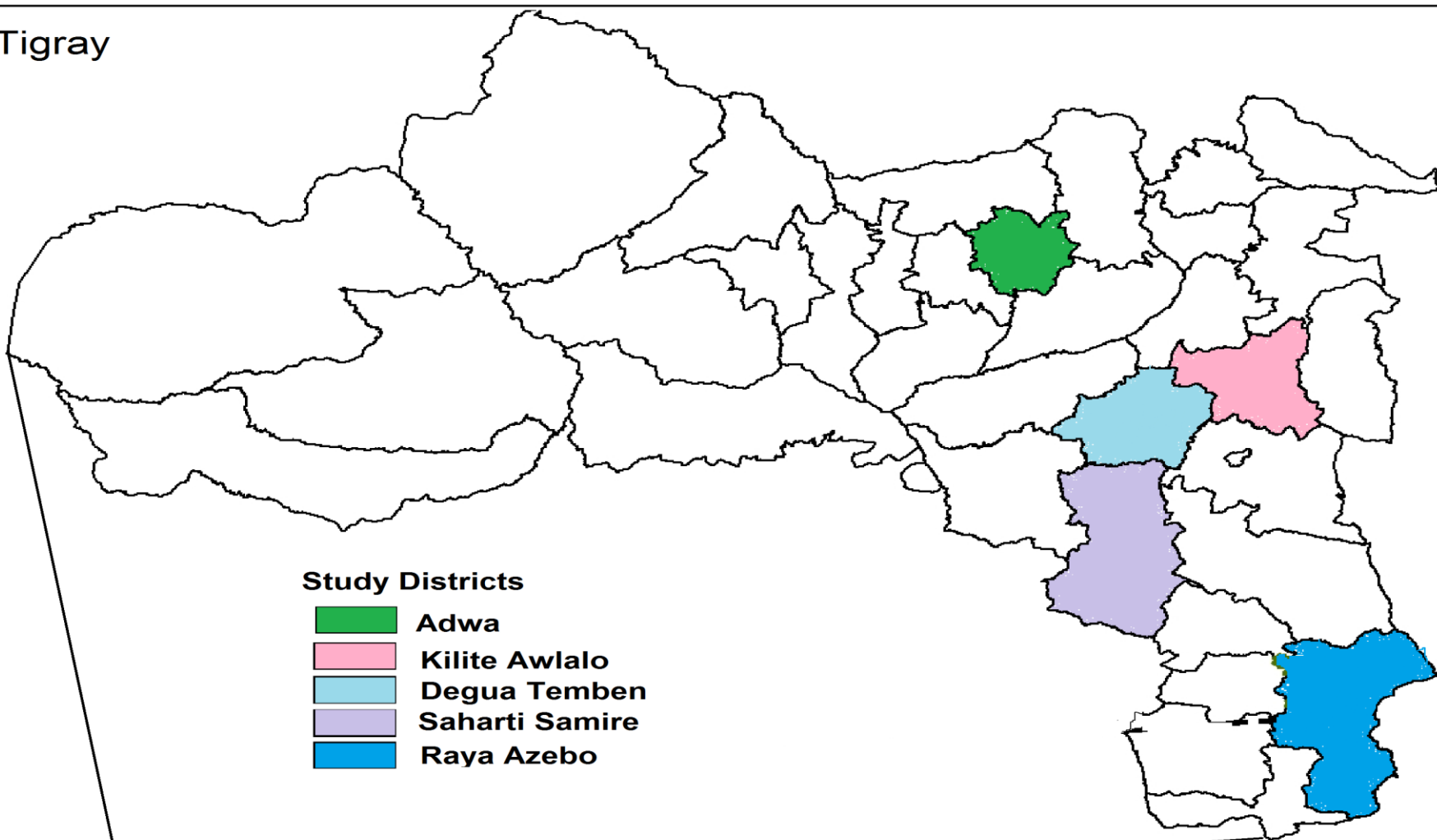
- Derived from a set of theories and earlier studies:
- H1: **Male group members are more risk tolerant** than female group members
- H2: **Male group members are more trusting** than female group members (send a larger share as trustors than female group members).
- H3. **Risk tolerance (share sent in risk game) is positively correlated with trust** (share sent in the trust game)
- H4: **Higher risk tolerance of male group members explains why male group members invest more in the trust game than female members.**
- H5: **Average risk tolerance in groups positively affects individual trusting behavior.**
- H6: **Female group members' trusting and trustworthiness decisions are more sensitive to group characteristics** than male members' trusting and trustworthiness decisions are.
- H7: **Female group members are more trustworthy** (return larger amounts as trustees in the trust game) than men.



Our Lab-in-the-field experiments

- Uses a sample of **119 youth business groups** from a census of 740 such groups in five districts in Tigray region of Ethiopia (Holden and Tilahun 2018).
- The census was carried out in early 2016 and collected a range of baseline information on each youth group.
- Trust and risk tolerance games with **1142 individual group members** in **July/August 2016**, included a survey of group members

Tigray

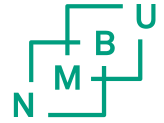


Study Districts

-  Adwa
-  Kilite Awlalo
-  Degua Temben
-  Saharti Samire
-  Raya Azebo

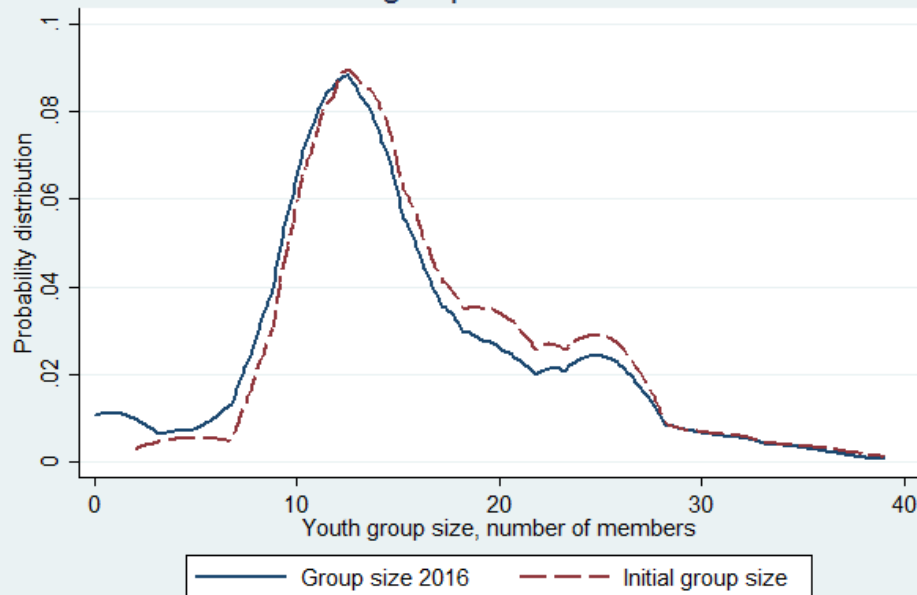


Group characteristics

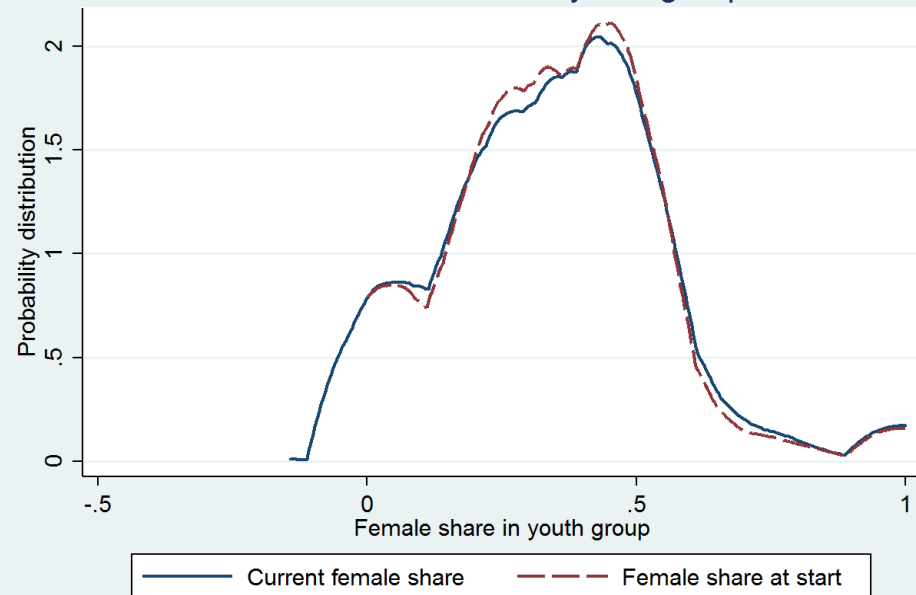


- Mostly self-selection into groups
- Land demarcation and allocation by local administrations
- Group required to protect the land area
- Alternative **business models (main production activity) defined by administrations** (based on feasibility/resource base)

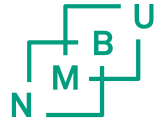
Youth group size distribution



Gender distribution in youth groups

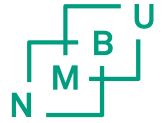


Experimental and analytical approach



- Lab-in-the-field experiments: Combine
 - Gneezy and Potters (1997) simple investment game to elicit risk tolerance
 - Berg et al. (1995) standard trust game to measure within-group trust and trustworthiness of members of the youth business groups.
- → statistical significance and size of these gender differences
- → whether differences in individual and group average risk tolerance can explain differences in individual trust and trustworthiness and whether gender matters.

Youth group member experiments: In schools



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1	H																	He
2	Li	Be											B	C	N	O	F	Ne
3	Na	Mg	Al	Si	P	S	Cl	Ar									Kr	
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Cobalt	Nickel	Cu	Zn	Ga	Ge	As	Se	Br	Krypton
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xenon
6	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
7	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	

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ሆስፐታል ማሳሪያ



መ = መሥሪያ
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ሸ = ሸራሽ

ሰ = ሰላም
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4 youths per classroom, 3 classrooms with simultaneous games for each group



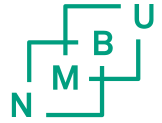
Simultaneous games within groups

- Players cannot know directly what decisions other players make in their own group
- Since **they know each other well**, they may form **expectations about the trustworthiness of other members based on experience** with stated and actual behavior of other group members

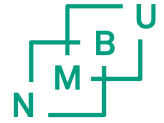
Sequence of field activity

- 1. First part of trust game: Endowment: 30ETB
–with strategy method (stated trustworthiness)
- 2. Risk game: Endowment: 30ETB, $p=0.5$
- 3. Survey interview
- 4. Second part of trust game (actual trustworthiness revealed)

Experimental protocol: Trust game



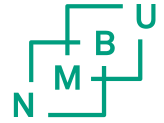
- The **first part of the trust game was played before the risk game** (avoid framing influence), with the **strategy method** to get a complete picture of stated responses as trustees.
 - The respondents were given **30 ETB** in two 10 ETB notes and two 5 ETB notes.
 - They would then decide how much to give to an **anonymous person in their own youth group**.
 - The amount given was **tripled** by the enumerator.
 - The supervisors collected the envelopes and organized the random redistribution.
 - 30 Ethiopian Birr (ETB) was equivalent to 1.28 US\$ at the time of the survey (close to a daily wage rate).



Experimental protocol: Risk game

- After first part of trust game (+ strategy part)
- The respondent was **again allocated 30 ETB** like in the trust game
- Offered to invest some or all of this money in a risky game where the **amount invested was tripled by the enumerator** and put in an envelope.
- The respondent would then **draw one of two paper notes where one implied win and the other loss.**

Survey and Second part of Trust game



- After the risk game the enumerator carried out the **survey interview**. The survey interview took about **45 minutes**.
- After this, the **second part of the trust game** was played. Each respondent was given a random envelope from one of the other group members, decided how much to return and how much to retain of this money.
- After this had been orchestrated by the supervisors, the respondents got back their initial envelope with the returned amount of money.
- They then signed for all the money they had received and left the room and school **without talking with anybody from the groups eventually waiting to participate**.

Data and measurement

- Measure risk tolerance, trust and trustworthiness as shares sent/returned in the games
- Assess gender differences statistically and with use of **Cohen's d**:

$$d = \frac{\overline{x_m} - \overline{x_f}}{sd_i}$$

- Advantages:
 - being easily compared across studies
 - expressing the size of the cross-sex mean difference relative to the degree of within-sex variation

Estimation strategy

- Trust models: joint and separate models by gender

$$t_{gi} = f(s_{gi}, r_{gi}, \bar{r}_g, \int(w_g); g_g, i_{gi}) =$$

$$\left(\begin{array}{l} \alpha_0 + \alpha_1 s_{gi} + \alpha_2 r_{gi} + \alpha_3 s_{gi} * r_{gi} + \alpha_4 \bar{r}_{g-i} + \alpha_5 \bar{w}_{g-i} \\ + \alpha_6 sd(\bar{w}_g) + \alpha_7 x_{gc} + \alpha_8 i_{gi} + c_g + \varepsilon_{gi} \end{array} \right)$$

average risk tolerance in group \bar{r}_{g-i}

average trustworthiness in group \bar{w}_{g-i}

sex of individual s_{gi}

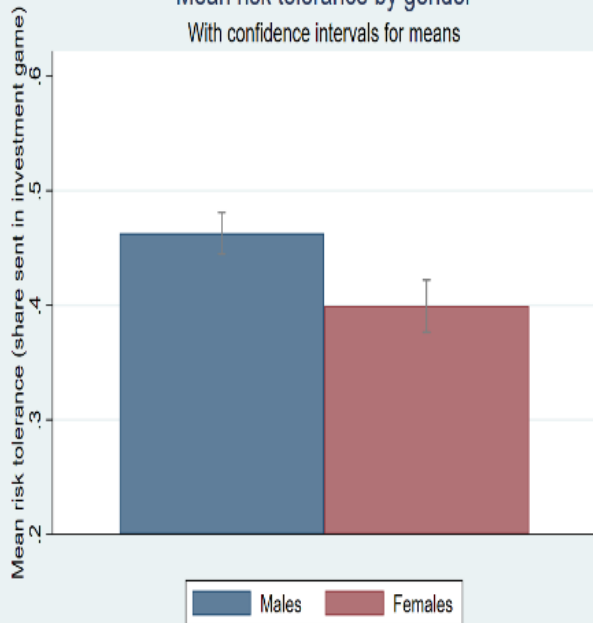
individual risk tolerance r_{gi}

Trustworthiness models: joint and separate by gender

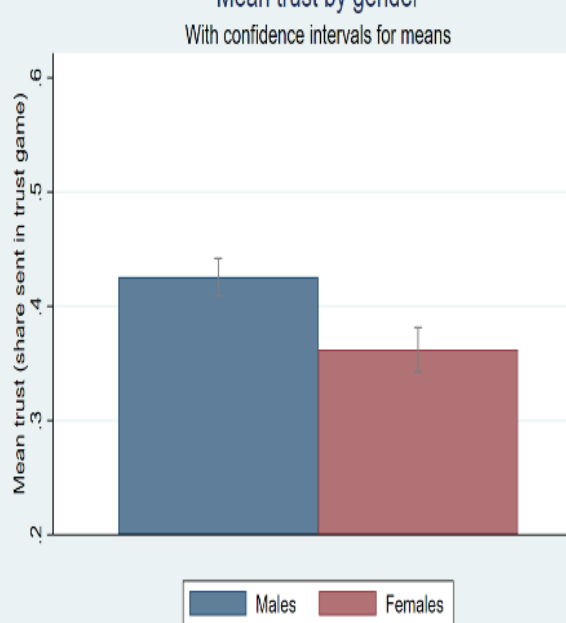
$$w_{gi}^A = \beta_0 + \beta_1 s_{gi} + \beta_2 r_{gi} + \beta_3 t_{gj} + \beta_4 t_{gi} + \beta_5 c_{gi}^D + \beta_6 \bar{r}_{g-i} + \beta_7 g_g + \beta_8 i_{gi} + v_g$$

Risk tolerance, trust and trustworthiness by gender

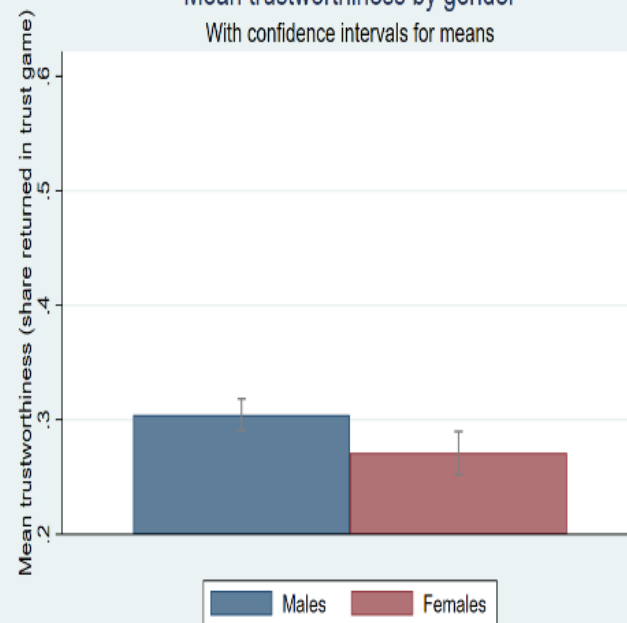
Mean risk tolerance by gender
With confidence intervals for means



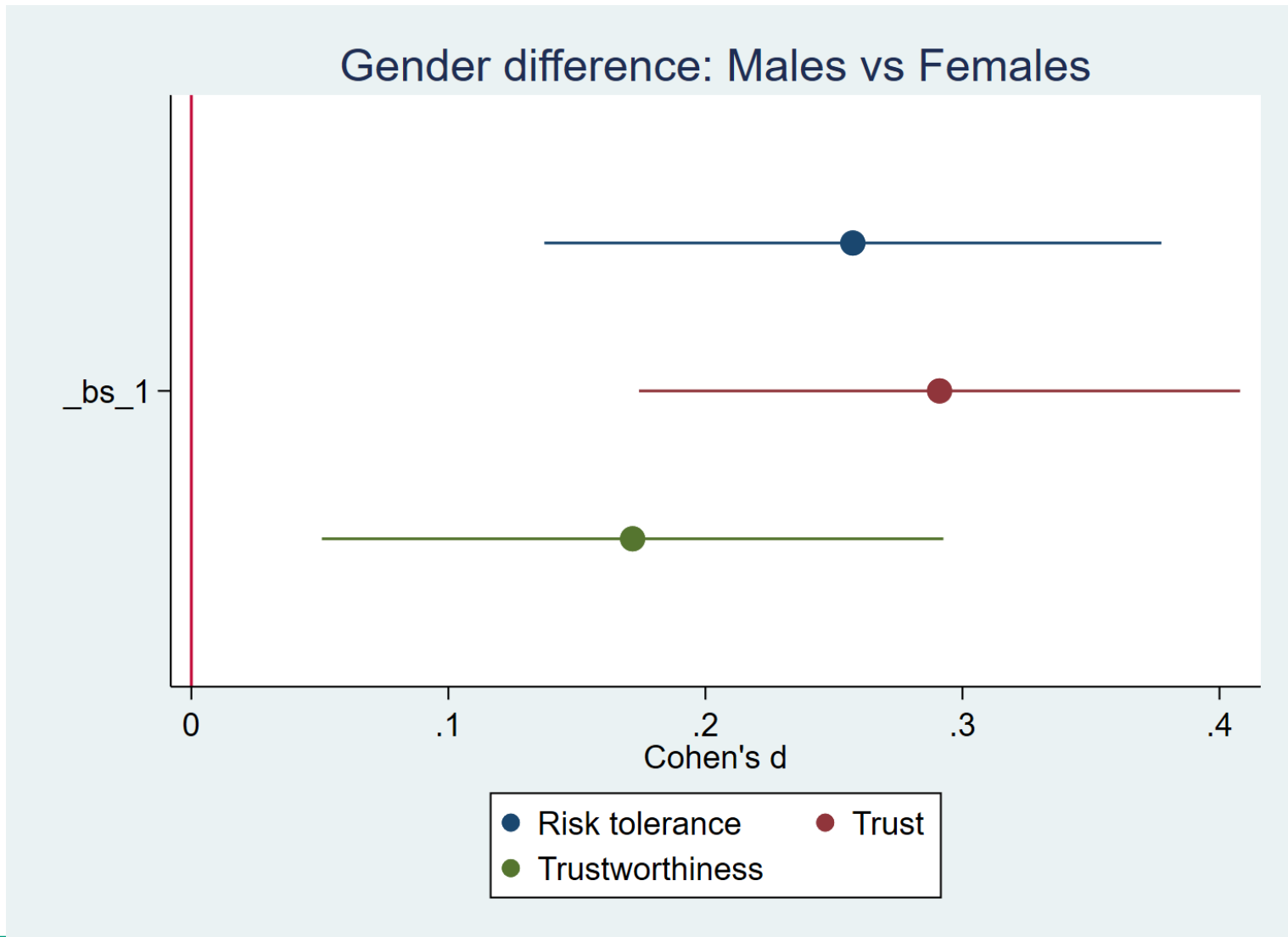
Mean trust by gender
With confidence intervals for means



Mean trustworthiness by gender
With confidence intervals for means



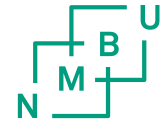
Cohen's d for gender differences



Key results: Trust models

Joint models	Model 1	Model 2	Model 3	Model 4
	Group	Group	Group	Group
	RE	FE	RE	FE
Male member dummy	0.0420***	0.0446***	-0.0455	-0.0351
Risk tolerance	0.248****	0.227****	0.0902**	0.0829*
Male*Risk tolerance			0.210****	0.192***
Separate models by gender	Females	Females	Males	Males
	Group RE	Group	Group RE	Group
		FE		FE
Individual risk tolerance	0.0824*	0.113**	0.295****	0.266****

Trustworthiness models: By gender



Dependent variable:	Amount returned		Share returned	
	Females	Males	Females	Males
Amount sent by trustor	0.687****	0.845****	-0.00134	-0.00236**
Amount sent as trustor	-0.013	0.0146	-0.00264	0.000801
Individual risk tolerance	2.383	4.547****	0.0601	0.140****
Luck in risk game, dummy	0.981	1.155*	0.00916	0.0297*
Group characteristics				
Group size in game	-0.180	0.179	-0.00715*	0.00631
Average risk tolerance	12.15***	2.86	0.335***	0.0514
Relative group trust vs. Community trust	-3.600***	0.982	-0.0433	0.00681
Relative group trust vs. Family trust	2.119****	-0.0868	0.0510***	-0.0144
Self-selection, dummy	-0.331	-0.605	-0.0293	-0.0196
Self-selection, IMR	-11.21**	1.705	-0.271**	0.0392
Initial group size	0.220****	-0.0107	0.00497***	-0.00046
Severe conflict, dummy	-2.485***	-0.241	-0.0678****	-0.0108
Less severe conflict, dummy	-0.201	0.652	-0.0415	0.0094

Conclusions

- In our study of youth business group members in Ethiopia we find **significant but relatively small gender differences** as **males were more risk tolerant, trusting and trustworthy**.
 - **When we analyzed the relationship between these characteristics, larger gender differences became visible.**
 - Higher trust among males is driven by or positively correlated with higher individual risk tolerance and so is trustworthiness.
 - Females are found to be more sensitive to group characteristics
- More research is needed to investigate the economic importance of these gender differences