

Can Informal Traditional Institutions Mediate Risk Preferences among Smallholder Farmers?*

- Evidence from Rural Ethiopia -

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비정형의 전통적 기구가 소작농의 위험 성향에 영향을 미치는가?

- 에티오피아 농촌 마을을 중심으로 -

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Abstract

This paper assesses the role of informal institutions in determining risk preference among smallholders in Tigray, Ethiopia. We use data from a household survey conducted by the Institute of Poverty Alleviation and International Development (IPAID). We find that households which participate in Debo, an informal labor-sharing institution, or have a friend from whom they can receive help are less likely to be risk-averse. However, participation in Iddir, a traditional form of insurance, is not significantly associated with risk preference. Hence, the existence of social institutions that provide assistance and social connections through reciprocity may be affording security against risk beyond that brought by more monetary forms of insurance. Given the importance of risk attitude in mediating the adoption of improved agricultural production, a policy suggestion is to provide selected aid to households which are less risk-averse agricultural investors. Also, Debo as a labor-sharing institution may serve as a nexus for managing aid and knowledge sharing.

Key words: Ethiopia, social capital, risk preference, millennium village

국문초록

본 논문은 에티오피아 티그레이의 농촌 마을의 사회적 기구가 소작농의 농업 투자 등 위험에 대한 성향에 미치는 영향을 연구하였다. 연세대학교 빈곤문제연구소는 2014년과 2015년에 에티오피아 북동부에 위치한 티그레이 지역의 두 마을에서 관련 설문자료를 수집하였다. 주요 결론으로서, 지역에서 노동력을 분담하는 기구인 Debo (한국의 품앗이)에 참가하거나 조언 및 도움을 구할 수 있는 조력자가 있을 경우 위험에 적극적인 태도를 보여주었다. 반면, 결혼 및 장례식에 대비하여 보험 역할을 하는 Iddir나 사적금에 해당하는 Equub (한국의 계)에 참여하는 가구의 경우 상대적으로 위험에 적극적인 태도를 보여주지는 않았다. 하나의 정책 제안으로서 빈곤국의 농촌 개발 및 지원시 위험에 적극적인 가구를 선택하여 집중적으로 지원하거나, Debo와 같은 마을내 노동협력 기구를 중심으로 원조·교육 계획을 수립할 필요가 있다.

주제어: 에티오피아, 사회적 자산, 위험에 대한 태도, 밀레니엄 마을

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1. Introduction

Attitudes toward risk play an important role in the decision making of poor farmers in developing countries, and therefore affect agricultural productivity and incomes. From a neo-classical view, asset market failures and risk preferences are sufficient to explain why worthwhile transactions and investments may fail to occur, and why poverty may persist as a result. In reality, constraints on the actions available to the poor go beyond what a rational model would predict, to include behavioral economic aspects (Duflo, 2006; Mullainathan & Thaler, 2000). Moreover, agriculture is inherently risky due to the vagaries of climate and other factors, and it is not surprising that poor farmers are typically risk-averse (Henrich & McElreath, 2002). For instance, poor farmers in Ethiopia, India, Uganda, and Brazil have all been found to be highly risk averse based on experimental approaches (Binswanger, 1980; Dillon & Scandizzo, 1978; Harrison, Humphrey, & Verschoor, 2010; Yesuf & Bluffstone, 2009).

Due to the importance of risk preference in poverty persistence, there is growing interest in sources of risk mitigation for poor smallholder households that could facilitate an increased willingness to invest in potentially higher agricultural returns (Yesuf & Bluffstone, 2009; Nyikal & Kosura, 2005). Various forms of formal finance and participation in functioning labor markets have a clear role to play, but the access of poor households is generally insufficient. As such, traditional social institutions may play an important role in risk mitigation.

In this paper we examine the role of informal village institutions in mediating risk preferences in rural Ethiopia, where risk is a major consideration and poverty is widespread and severe. Rural communities in Ethiopia are often isolated geographically and isolated from new ideas and influences. Rural populations generally lack regular access to mass media. Households are on average 10 km away from a dry weather road and 18 km from public transport services. Social capital and informal institutions play a key role in protecting rural households from risk in such an unpredictable environment (Butcher, 2007).

Following Butcher (2007), this study defines informal institutions in Ethiopia as a bundle of rules by which people relate to each other and have dealings (or not). They are “social practices that are repeated and are sanctioned and maintained by social norms.” In this analysis, four informal institutions are considered: Iddir, informal insurance against the cost of funerals and weddings; Equub, informal pseudo-banking based on a social network; and Debo¹⁾, an agricultural labor sharing group. A fourth type of reciprocal social connection as a human capital is also considered, the existence of a friend from whom the household can receive help (for details, see Appendix A).

2. Previous Studies

Smallholder farmers typically prefer a satisfactory level of security over an attempt to maximize incomes. This may also involve favoring established over new technologies, and growing larger shares of family food requirements rather than increased commercialization strategies (Nyikal & Kosura 2005). For instance, Tanaka, Camerer, and Nguyen (2010) find evidence that people living in poor villages in Vietnam are generally more risk averse than those in wealthier villages, and are more likely to shy away from high risk but high return investments, helping to explain the persistence of poverty. Rosenzweig and Binswanger (1993) studied the relationship between asset composition and weather in India. During periods of risky weather such as the monsoon season, farmers decrease their holdings of productive assets, reducing the profitability of their portfolios.

When the borrower and lender are related, the inherent social capital can mitigate the limitation of credit accessibility for the poor (Bastelaer, 2002). Increased credibility between the borrower and the lender and peer pressure for repaying facilitate access to credit, implying that social capital influences a poor individual's risk preference in an overall sense.

The influence of various types of social capital on technical adoption in Ethiopia is controversial. Deressa, Hassan, Ringler, Alemu, & Yesuf (2009) address the human network of a

1) Note that the structure of Equub and Debo is similar to that of Gae and Poomaci in Korea.

household, which is represented by whether there is a farmer-to-farmer extension service. This was found to be positively associated with technical adoption in the Nile basin of Ethiopia. On the other hand, kinship networks, that is, the number of relative in the village, negatively influence the adoption of risk mitigating strategies for climate change in Ethiopia (Falco, 2013). The kinship networks discourage the incentive to adopt risk mitigation strategies and encourage the willingness to free-ride.

Wossen, Berger, & Falco (2015) investigate the relationship between informal social institutions and the adoption of improved farm land management practice in Ethiopia. Membership in local labor sharing arrangements, or Debo, provides a positive relationship with the adoption of improved farm land management. Membership in local informal saving and credit organizations, or Ekub, also provides positive influences on adoption because it reduces the limitation of accessibility to a financial institution. However, Iddir provides a negative influence on adoption because it is tied up with a specific daily activity, a funeral or a wedding ceremony. Hence, it has been recognized as a pre-paid expense rather than an investment.

3. Methodology

3.1. Sample

This study uses new data collected by the Institute for Poverty

Alleviation and International Development (IPAID) based at Yonsei University in South Korea. IPAID conducted two surveys of four villages (Hiwot, Koraro, Selam, Simret) in the Hawzen district of Tigray Region in northern Ethiopia. Two of the villages (Koraro and Selam) were included in the Millennium Village Project (MVP)².

The first survey, conducted in 2014, collected information via an enumerator administered questionnaire on 325 randomly selected households. The sample represented 6.34 percent of the total number of households. Survey modules focused on agricultural productivity, expenses, household assets, sanitation, and community attitudes and satisfaction levels. In 2015, two villages only, Selam and Simret, were surveyed due to cost restraints. This survey was designed to collect additional information on risk preferences, informal institution participation, sanitation, and gender issues. All survey questions utilized in this study are provided through the IPAID homepage³. The sample was collected from 129 households. Of these 92 were matched to the data collected in 2014 and 37 were new additions. The new additions were assigned a different identification code. Further details on the surveyed households are shown in Table 1.

3.2. Measurement

In order to measure household risk preferences, this paper follows Fausti & Gillespie (2006) and Pirttila & Uusitalo (2010) in utilizing self-reported values from a survey. This approach is thought to yield less reliable results compared to a controlled

(Table 1) Census of Surveyed Areas

Region	Total Population	Household (A)	1 st Survey (2014)		2 nd Survey (2015)
			Sample Household (B)	Ratio (B/A, %)	Sample Household
Simret	7,999	1,668	85	5.1	67
Hiwot	7,121	1,417	81	5.72	–
Selam	3,449	781	81	10.37	62
Koraro	5,682	1,261	78	6.19	–
Total	24,251	5,127	325	6.34	129

Sources: Population and Housing Census of 2007 in Ethiopia

2) For the detailed information of the first survey's methodology, refer 이주삼, 백인립, 이태정, 김판석, & 박현수 (2013).

3) To download the full questionnaire, contact Dr. Kim Young-Je, Email: ipaid@yonsei.ac.kr

experiment (e.g. Yesuf & Bluffstone, 2009). For instance, Binswanger (1980) measured the risk preference of farmers in rural India through both conducting an experiment and a survey, finding that self-reported values netted through surveys were somewhat less reliable. Thus, the method used in this study to measure risk preferences is open to criticism as it is based on survey questions, which could possibly be unrelated to the actual conditions. Various factors, including self-serving biases, inattention, and strategic motives could cause respondents to distort their reported risk preferences (for details, see Camerer & Hogarth, 1999). However, experiments place an increased time burden on participants, and are significantly more costly and difficult to implement with a large, representative sample than a survey. Furthermore, the existing literature provides a conclusion about the reliability of survey measures. Dohmen et al. (2011), for instance, argue that responses to the general risk question are in fact a reliable predictor of actual risky behavior, even controlling for a large number of observables. More generally, their findings show that the simple, qualitative survey measure can generate a meaningful measure of risk preferences, which maps into actual choices in lotteries with real monetary consequences.

(Table 2) Self-Reported Risk Preferences

(Unit : percent)

	Risk Aversion		Risk Loving		Bad Harvest	
Strongly Disagree	0	(0,0)	0	(0,0)	11	(8,8)
Disagree	28	(22,4)	4	(3,2)	48	(38,4)
Slightly Disagree	7	(5,6)	4	(3,2)	14	(11,2)
Slightly Agree	23	(18,4)	23	(18,4)	17	(13,6)
Agree	52	(41,6)	72	(57,6)	30	(24,0)
Strongly Agree	15	(12,0)	22	(17,6)	5	(4,0)
Total	125	(100)	125	(100)	125	(100)

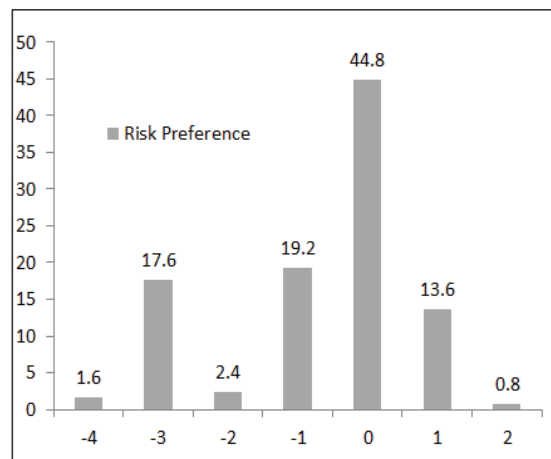
The 2015 survey contained three questions to elicit self-reported risk preferences from respondents. Two of the questions asked about risk preference in opposite directions: risk aversion and risk loving. Risk aversion is derived using responses scored on a six-point scale to the statement “I tend to avoid risk when possible in my farming decisions relative to other village members”. A response of 1 corresponds to strongly disagree and 6 to strongly agree. Similarly, the risk loving measure is derived

from the responses to the question “I tend to take on substantial levels of risk in my farming decisions”. There is also the same six-point scale with the following options: Strongly Disagree – Disagree – Slightly Disagree – Agree – Strongly Agree. Respondents were also asked a question to elicit a risk preference response to a direct question about a specific farming decision: “I usually do not change the variety of crop that I cultivate because it might result in a poor harvest”.

Table 2 presents the response to the three risk preference questions. For respondents that agreed with both the risk averse and the risk taking statement, we measure the self-reported risk preference from the difference between the risk averse value and the risk loving value. Hence, the higher the risk preference index, the more risk-averse the household.

Figure 1 presents a histogram of risk preferences. Clearly, there are two peaks. One is centered at zero and the other at minus three. Although zero in the measure literally represents two identical agreements with both the risk averse and loving statement, and there is some lumping together of different risk preferences in a common index number, this is a minor problem.

(Figure 1) Histogram of risk preferences



3.3. Descriptive Statistics

Participation in informal institutions was widespread among the sampled households. Forty three (43) percent of respondents participate in an Iddir. Participants in an Iddir typically deposited 88 birr (USD 4.20) monthly. The main reason given for

(Table 3) Summary Statistics

Variable	Mean	Standard Deviation	Respondents	Description
<i>Income</i>	6,447	5,523	307	Unit: birr
<i>Family Number</i>	5,51	2,55	362	Number of family members
<i>HH Age</i>	52,12	13,80	328	Age of Household Heads (years)
<i>HH education</i>	1,00	2,31	331	Household Head years of schooling 0 = no school, above 1 = school education year
<i>HH Gender</i>	0,66	0,47	328	Male = 0, Female = 1
<i>Children per Parent</i>	2,62	1,63	334	The number of children per parent
<i>Land Size</i>	0,63	0,37	335	Land size per household (ha)
<i>Livestock</i>	4,26	3,99	325	Converted to Tropical Livestock Unit
<i>MVP</i>	187	175	362	Dummy variable: 1 if Millennium village, 0 otherwise

Note: HH Age = household age, HH Education = household education, HH Gender = household gender, MVP = millennium village project.

participation was to prepare for a funeral or a wedding ceremony (43%) or to help others with such ceremonies (32%). This suggests that most of people in this region tend to utilize an Iddir as an implicit form of insurance, which is consistent with Aredo (1993) and Dercon, Weerdt, Bold, & Pankhurst (2006). In addition, 48 percent of households participate in a Debo. Typically, three family members contributed labor to a Debo, with the average family size being 5.51. Labor is allocated to Debo participants rotationally, and participation is therefore less related to insurance than the case of an Iddir. A question asking whether the household had a friend from whom it could receive help when required (referred to as general helper below) was also included in the questionnaire.

Respondents were prompted with examples including advice, small sums of money and the lending of agricultural machinery. To secure the credibility of the answers, the respondent was requested to specify this friend by name. Of the 129 households, 59 (45.73%) responded that they have such a friend in the village. The average period for knowing such a friend was 27 years. The period of acquaintance was asked in order to check how attached the household is to the village through this general helper.

The definition and summary statistics for the other variables

used in the analysis are presented in Table 3. Data on characteristic variables were collected in the 2014 survey (2012 EST.). These are comprised of the family characteristic variables, and asset variables. The family related variables include the number of family members, education, age, gender of each household head, and the number of children per parent. The typical household head was 52 years old and an uneducated farmer. The average land size cultivated per household is 0.63 ha, which is smaller than the national figure, 0.89 ha.⁴⁾ Also, the number of livestock owned by the household is converted to tropical livestock units (TLU) following Hassen, Ebro, Kurtu, & Treydte (2010). For example, the TLU estimators of ox and cow are 1.26 and 1.29 respectively. The income on average is 6,447 birr. Considering the GDP per capita of 2012 in Ethiopia, this income level is a little low.⁵⁾ However, the figure needs to be treated with caution due to under-reporting.⁶⁾

Table 4 presents the correlation matrix of dependent and independent variables, which measures the strength and the direction of a linear relationship between variables. Income has a significant relationship with risk preference although the causality cannot be revealed. Children per parent provides the negative relationship with risk preference. Although it is

4) Authors' calculation based on Table 4.2 in the 2015 central statistical agency report in Ethiopia (Central Statistical Agency [CSA], 2015).

5) The average plot size and overall crop production of this region is around 70 percent of those in the national statistics. Hence, it would be reasonable to think that their household income would be 60 or 70 percent level of their GDP per capita.

6) The correlation coefficient among self-reported wealth, estimated wealth, and estimated income shows a significant and positive relationship between self-reported wealth and income, but does not show any relationship between self-reported wealth and wealth (for details see Table 5).

(Table 4) The correlation matrix of main dependent and independent variables

	Risk Preference	Income	Land Size	Livestock	Family Size	HH Age	HH Education	Children per Parent
Risk Preference	1,00							
Income	-0,255 (0,029)**	1,00						
Land size	0,010 (0,912)	-0,006 (0,920)	1,00					
Livestock	0,095 (0,377)	0,173 (0,004)***	-0,095 (0,100)	1,00				
Family Size	-0,105 (0,246)	0,218 (0,000)***	0,008 (0,878)	0,247 (0,000)***	1,00			
HH Age	0,116 (0,260)	-0,101 (0,094)	0,073 (0,204)	0,014 (0,810)	-0,081 (0,143)	1,00		
HH Education	-0,078 (0,444)	0,119 (0,047)	-0,056 (0,328)	0,069 (0,224)	0,006 (0,917)	-0,320 (0,000)***	1,00	
Children per Parent	-0,155 (0,123)	0,178 (0,003)***	-0,038 (0,504)	0,105 (0,062)*	0,631 (0,000)***	-0,067 (0,228)	-0,092 (0,096)*	1,00

Note: ***p<0,01, **p<0,05, *p<0,1. The number in parenthesis is p-value.

HH Age = household age, HH Education = household education, HH Gender = household gender, MVP = millennium village project.

insignificant under 10% significant level, it needs to get an attention in that the risk preference is compounded and only the linear relationship is measured. With regards to the correlation between independent variables, several variables provides some degree of multi-collinearity, such as livestock and family-size, family-size and children per parent, and household head age and household head education. However, since each variable provides different information about household characteristics, these variables are employed in the model. For example, although the older household head is, the longer period of education he is likely to have, the older household head does not necessary take more education.

3.4. Analysis

The main objective of this study is to estimate the association between informal institutions at the community level and risk preference. In order to specify the regression model we examine the average difference of risk preferences across the membership in informal institutions. As shown in Table 5, the participation variables, HELPER (i.e., having a friend that can be called on to provide general help) and DEBO (i.e., participating a Debo), provide a positive difference and it is statistically significant. On

the other hand, membership in an Iddir and Equub does not provide any significant difference.

(Table 5) The difference of risk preference across participation variables

Variables	Non-Parti. (A)	Parti. (B)	Diff. (A)-(B)	t-value
<i>Helper</i>	-0,1(73)	-1,5(52)	1,40	6,59***
<i>Iddir</i>	-0,63(72)	-0,75(53)	0,13	0,53
<i>Equub</i>	-0,7(118)	-0,67(3)	-0,04	-0,05
<i>Debo</i>	-0,17(69)	-1,33(55)	1,15	5,14***

Note: The number of observations in parenthesis. ***p<0,01, **p<0,05, *p<0,1.

Dufwenberg & Patel (2015) argue that if reciprocal players only hold reciprocal preferences for the members in a circle, these people are more likely to participate in a coalition in which the costs of public good activities are shared and free-riding is minimized. Thus, in this case, those with friends bring the requisite social trust to enable successful cooperation within a Debo. Moreover, the reciprocity and shared work involved in a Debo no doubt contributes to the forging of friendships that expand reciprocity to other contexts (Kebede & Butterfield, 2009). On the other hand, the participation in Iddir and Equub are inherently less social activities, at least in terms of time spent in

close proximity to fellow villagers engaging in reciprocity. These institutions are much more financial, with Iddir functioning as an insurance against future costs and Equub an informal savings institution. Hence, it is not surprising that participation in Iddir and Equub are associated, and that both associate with financial contributions to public good provision. In the analysis, we group HELPER and DEBO together by combining these two as a social proximity variable (SPV). A financially associated variable (FAV) includes participation in Iddir and Equub.

Discerning the direction of causality is problematic. Conceptually, whether it is the case that individuals with certain risk preferences prefer certain institutions or that institutions shape member risk preferences are both valid. However, in this study the distinction is not important. Whether an institution is chosen in order to support activities influenced by a particular risk preference or that institutions shape preferences in such a way as to support certain activities, the end result is the same: risk loving or risk averse activities are supported.

Three models are estimated by regression. The risk preference regresses on three participation variables (Debo, Iddir, and Equub) mainly after controlling household characteristic and wealth variables. For household characteristics, we employ family size, household head age, household head gender, household head education, and the number of children per parent. For a wealth variable, land size and the amount of livestock are employed. To investigate the difference between the millennium and non-millennium villages, the dummy variable MVP is also employed. Because the number of households participating in Equub is too low (5 out of 105), model 2 alternatively regresses on the social proximity variable (SPV) and financially associated variable (FAV) for a robustness check. Model 1 as a baseline model is as follows:

$$RA_h = DEBO_h + IDDIR_h + EQUUB_h + X\beta + \epsilon_h$$

where h represents the household index, RA_h represents the risk aversion, X represents the household characteristics variables and ϵ_h is unobserved error.

Model 2 replaces participation variables with the re-grouped

variables. Note that SPV includes the participation in Debo along with having a helper.

$$RA_h = SPV_h + FAV_h + X\beta + \epsilon_h$$

In an experimental study using Ethiopian data, Yesuf & Bluffstone (2009) found that household head age and the number of children per parent is positively associated with risk aversion whereas family size is not significantly associated. Also, land size as a wealth variable is negatively associated with risk aversion, because wealth accumulation can substitute for constraints in financial markets to some extent (Yesuf & Bluffstone, 2009). Or at least, wealth is weakly associated with risk adversity (Binswanger, 1980).

Model 3 simply regresses risk preference on having a participation in Debo, MVP, and its interaction term, which is to multiply the participation in Debo and MVP. This model investigates how living in a millennium village influences risk preference through participating in Debo. The models are as follows:

$$RA_h = DEBO_h + MVP_h + Inter_h + \epsilon_h$$

where $Inter_h$ is to multiply Debo and MVP.

4. Results

4.1. Risk preference and participation in Millennium Villages

Table 6 provides the degree of the overall participation across the millennium and non-millennium villages. The risk preference does not show a significant difference between the two categories of villages. Households in a non-millennium village, Simret, have significantly more general helpers. The period of maintaining such a relationship does not show a clear difference across the villages. Additionally, the households living in the millennium village, Selam, participate significantly in Iddir.

(Table 6) The overall participation across the millennium village

Variables	Unit	Non-MV (Simret)		MV (Selam)		t-value
		mean	Obs.	mean	Obs.	
<i>Risk Preference</i>	-5~5 ^a	-0.52	66	-0.86	59	1.44
<i>Helper</i>	Yes=1	0.50	70	0.322	59	2.06 **
<i>Period of Relationship</i>	Years	26.90	39	27.79	19	-0.23
<i>Iddir</i>	Yes=1	0.186	70	0.712	59	-7.04 ***
<i>Deposit of Iddir</i>	birr	62.75	12	95.06	42	0.68
<i>Equub</i>	Yes=1	0.044	68	0.035	57	0.25
<i>Debo</i>	Yes=1	0.420	69	0.441	59	-0.23

Note: ^a The higher number, the more risk averse. ***p<0.01, **p<0.05, *p<0.1. Obs. represents the observation number.

4.2. The Role of the Implicit Social Assets on the Risk preference

The linear regression model estimates the coefficients of the participant variables in terms of implicit social asset variables. Tables 7 and 8 presents the result of models 1 and 2. In both models, participating in Debo in the model 1 and SPV in the model 2 are significantly associated with less risk-averseness. In an overall sense, this means when the house hold is closely associated with a social network in the village through a helper or participating in Debo, its risk preference turns to less risk averseness.

(Table 7) The result of Model 1

Variables	Model 1	
<i>DEBO</i>	-1.23	(0.32)***
<i>IDDIR</i>	1.08	(1.01)
<i>EQUUB</i>	0.13	(0.41)
<i>Land Size</i>	-0.11	(0.14)
<i>Livestock</i>	0.04	(0.05)
<i>Family Size</i>	0.08	(0.10)
<i>HH Age</i>	-0.02	(0.01)*
<i>HH Education</i>	0.02	(0.07)
<i>HH Gender</i>	-0.43	(0.41)
<i>Children per Parent</i>	-0.30	(0.15)*
<i>MVP</i>	-0.37	(0.42)
<i>Constant</i>	-0.78	(0.86)
<i>R</i> ²	0.31	
Observations	77	
<i>F</i> -value	2.70	

Note: Standard errors in parentheses: ***p<0.01, **p<0.05, *p<0.1. Data is unweighted.

HH Age = household age, HH Education = household education, HH Gender = household gender, MVP = millennium village project.

Interestingly, participation in an Iddir and Ekub is not significantly related to risk preference. To the extent that Iddir and Ekub are a substitute for formal insurance, this is a surprise as insurance plays an obvious role in facilitating risk taking through shifting risk to third parties (Fafchamps & Gubert, 2007). This suggests that Iddir and Equub are not a substitute for a functioning financial market in terms of facilitating risk taking investments. This is not surprising given that two exemplary institutions have been a long standing institution in village life. At the same time, as Duflo's (2006) view of village institution, the proximity to the village might play a partial overall insurance role, meaning there are substitutes for Iddir's financial role, such as kin or friends.

(Table 8) The result of Model 2

Variables	Model 2	
<i>SPV</i>	-1.09	(0.15)***
<i>FAV</i>	0.27	(0.29)
<i>Land Size</i>	-0.17	(0.19)
<i>Livestock</i>	0.02	(0.04)
<i>Family Size</i>	0.12	(0.08)
<i>HH Age</i>	-0.02	(0.01)**
<i>HH Education</i>	-0.01	(0.05)
<i>HH Gender</i>	-0.57	(0.32)*
<i>Children per Parent</i>	-0.36	(0.12)***
<i>MVP</i>	-0.66	(0.33)**
<i>Constant</i>	0.03	(0.66)
<i>R</i> ²	0.51	
Observations	81	
<i>F</i> -value	7.30	

Note: Standard errors in parentheses: ***p<0.01, **p<0.05, *p<0.1. Data is unweighted. SPV = social proximity variable, FAV = financially associated variable, HH Age = household age, HH Education = household education, HH Gender = household gender, MVP = millennium village project.

In regard to asset variables, land size does not show any significant relationship to risk preference. This is inconsistent with the view of Yesuf & Bluffstone (2009) that if farmers consider the size of plot land as a kind of wealth, it might encourage them to invest in non-farm activities associated with risk preference. Also, because of constraints of substituting from an asset to other assets in a market, individual assets can independently influence risk aversion. However, livestock is also not significantly associated with risk aversion in Models 1 and 2.

Pertaining to household characteristics, the household head age is significantly and negatively related to risk aversion. The younger the household head is, the less risk averse it is. The household head education is not related to the risk preference. Weir & Knight (2004) argue that the average household education level is associated with the early adoption of new techniques and less-educated households progressively adopt new techniques through social learning. It implies that there is another channel other than risk preference in which education level influences adoption. Additionally, the number of children per parent is negatively associated with risk preference. On the other hand, the gender of household head partly provides a significant relationship as a female household head is likely to be risk averse. The number of family members is not related to risk aversion.

(Table 9) The result of Model 3

Variables	Model 3	
<i>Debo</i>	-0,980	(0,311) ^{***}
Interaction	-0,367	(0,452)
<i>MVP</i>	-0,181	(0,302)
<i>Land Size</i>	-0,042	(0,203)
<i>Constant</i>	-0,062	(0,232)
R^2	0,20	
Observations	124	
F-value	7,38	

Note: Standard errors in parentheses: ***p<0,01, **p<0,05, *p<0,1. Data is unweighted, MVP represents millennium village project.

Residence in an MV provided a weak significant difference in the risk preference. One possible interpretation is that support from the MVP enables households to adopt a risk loving attitude.

Most of the households have lived in their villages from before the onset of the MVP, so it does not seem plausible that less risk averse households have migrated to the MVs. It is possible that a factor that influences risk preference also influenced the inclusion of a village in the MVP. However, as shown in Table 9, participation in a Debo has nothing to do with MV residence. Hence, a general helper appears to influence risk preference in combination with MVP.

To sum up, the social proximity to the village through a general helper and participation in a Debo is clearly associated with the self-reported risk preference. Although there is no clear-cut channel through which risk preference influences performance, it is reasonable to expect that extremely risk averse farmers will find it difficult to exit from poverty because they will not invest aggressively. If social proximity influences households to be less risk averse by providing insurance through the village social network or providing emotional support, interventions to improve community cohesion may prove effective in building the confidence necessary to facilitate productive investment.

5. Conclusion

Although this analysis is based on very limited information due to a small number of observations and cross-section observations, it provides interesting results on the relationship between risk preference and participation in informal institutions at the community level. We find that households which participate in Debo or have a helping friend are less likely to be risk-averse. However, participation in Iddir is not significantly associated with risk preference. This suggests that Iddir is not a substitute for a functioning financial market in terms of facilitating risk taking investments or that there are substitutes for this role⁷⁾. As an academic contribution, the services provided by Iddir and Equub on one hand and Debo and friendship on the other are not interchangeable. For a future study, this highlights the non-insurance-like functions of these latter two,

7) See Boucher & Guirking (2007). In developing countries, lenders have more information of borrowers in informal credit sector. Credits by informal sector can be provided with the borrowers who do not have enough the collateral required or any willingness to provide it.

such as social cohesion and emotional support.

For a practitioner such as a NGO, this paper can be read in a difference sense. Risk plays an important role in economic decision making in general. As a consequence, understanding risk preferences of farmers is intimately linked to the goal of understanding and predicting economic behavior such as the adoption of new technologies regarding major agricultural activities. In that sense, providing support for a labor-sharing institution might be beneficial. Those institutions are likely to contain smallholder households that are relatively open to making productive investments. It means that direct support for participation in Debo could create a positive incentive effect. These households are less risk averse, so it is reasonable to expect that they would invest such support more actively. In a general sense, utilizing the human networks in a village would facilitate the transplantation of advanced agricultural technology.

Some policy recommendations derive from these findings. An overly risk-averse attitude will hinder wealth creation where opportunities for productive investments exist (Wolgin, 1975). Debo and friendship provide the support to take risks. Interventions aimed at encouraging this kind of reciprocity and social support may indirectly lead to higher incomes. This could include programs to enhance networks of natural helpers holistically, or programs that strengthen networks through key opinion leaders who are engaged in the community. Both of these approaches have been effective in the area of health (Israel, 1985). Also, to the extent that effective insurance should mitigate risk, Iddir seems to not be functioning at that level. This suggests there is room for extension of more formal financial institutions such as microfinance (Matin, Hulme, & Rutherford, 2002). In terms of assistance, selective aid for an active household which participates in various labor sharing institutions would be encouraged. There has been some indication that food aid reduces participation in labor sharing groups. However, once endogeneity is controlled for, support for this disincentive affect evaporates (Abdulai, Barrett, & Hoddinott, 2005).

In addition, beyond the results of this paper, investments in infrastructure such as roads to increase accessibility to markets, the introduction of formal financial institutions, insurance and welfare services would likely have a strong impact on the ability

of smallholder farmers to take productive risks. Building roads provides not only a chance to mitigate the difficulty of getting finance, but also increases access to a wide range of beneficial information to enable those households to become active investors.

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APPENDIX A: Glossary

Iddir

These are indigenous burial associations that provide financial as well as psycho-social support. They also have other functions such as insurance against the cost of weddings, and provide loans for shocks experienced by members. In this study, Iddirs are conceived of primarily as a form of informal financial insurance.

Equub

An informal pseudo-banking based on a social network. Members contribute an agreed amount at regular intervals. At intervals, a member receives a lump sum. In this study, Equub are conceived of primarily as a form of informal credit.

Debo

An agricultural labor sharing group, in which labor is allocated to Debo participants rotationally. In this study, Debo are primarily conceived of as a form of reciprocal cooperation.

Friendship

This last institution is arguably even less formal than the preceding three. Nevertheless, the existence of a friend from whom the household can receive help plays at least as important a role as the larger groupings. Like Debo, friendship is primarily conceived of as a form of reciprocal cooperation.