Risk Attitudes and Entrepreneurship

Claire Chi-Hung Kang

University of Houston

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Abstract

Risk preferences are often considered as an individual-specific permanent trait which determines the occupational choice. However, recent studies have shown that risk attitudes can be affected by environmental factors and life events, implying that risk preferences may endogenously respond to the choice of employment type. Using data from the Indonesia Family Life Survey, I again distinguish entrepreneurship from necessity self-employment. I first estimate the correlation between current risk attitudes and current employment type and find a strong negative relationship between self-employment and risk aversion compared to wage workers. Moreover, entrepreneurs are even less risk averse than the necessity self-employed for both men and women. Next, I examine how current risk attitudes are associated with employment type 7 years ago. For men, I continue to find distinct differences in risk preferences: the necessity self-employed are less risk averse than wage workers, and the entrepreneurs are even less risk averse than the necessity self-employed. However, the distinctions are less clear for women. Lastly, I examine how the transition from wage work to other employment types is correlated with changes in risk attitudes. For my preferred measure I find a significant decrease in risk aversion for men who switch from wage work to entrepreneurship. Overall, I find suggestive evidence that men's entrepreneurial experiences may affect the risk attitudes, but no such relationship for women.

Keywords: Risk Attitudes, Entrepreneurship

1 Introduction

Economic theory traditionally maintains that preferences and tastes do not change over time (Stigler and Becker, 1977), and risk preferences are often assumed as an individual-specific permanent trait which determines the choice of employment type. Hence, empirical studies typically study the relationship between risk preferences and entrepreneurship based on the following question: How do risk attitudes affect the selection into entrepreneurship? However, recent empirical work has explored the stability of risk preferences (Schildberg-Hörisch, 2018; Chuang and Schechter, 2015; Dohmen et al., 2017). Particularly, Brachert et al. (2019) show evidence that individuals who have higher risk taking propensity are more likely to be self-employed, and their risk-taking propensity becomes even higher after entry into self-employment. The studies suggest that risk preferences may also endogenously respond to the choice of occupation.

In this paper, I study how risk preferences are associated with entrepreneurship. In particular, I use the panel data from the Indonesia Family Life Survey (IFLS), in which risk preferences are measured in 2007 and 2014, and distinguish entrepreneurship from necessity self-employment. The risk preferences are elicited by two sets of questions, asking the respondents to choose between two options, one with a guaranteed amount per month, the other is a lottery with 50-50 chance earning either more or less than the guaranteed amount. By ranking their final choice, I define two indicators: one is "Very Risk Averse", those who choose the most risk averse final choice; the other one is "Very Risk Tolerant", those who choose the least risk averse final choice.

I first estimate the correlation between current risk attitudes and current employment type and find strong evidence that all the self-employed are less risk averse and more risk tolerant than wage workers. Moreover, entrepreneurs are less risk averse and more risk tolerant than the necessity self-employed for both men and women. Next, I examine how current risk attitudes are associated with employment type 7 years ago. For men, I continue to find distinct risk preferences with the

necessity self-employed being less risk averse and more risk tolerant than wage workers, and the entrepreneurs being even more risk tolerant than the necessity self-employed. In particular, for my preferred measure, being an entrepreneur 7 years ago predicts higher linear probability of being very risk tolerant currently — 60 percent higher than men who were wage workers 7 years ago, and 41 percent higher than men who were necessity self-employed 7 year ago. However, the distinctions are less clear for women. Lastly, I examine how the change in risk attitudes is correlated with the transition from wage work to other employment types. The results are mixed and imprecise, but for my preferred measure of risk attitudes, I find an increase in becoming more risk tolerant for men who switch from wage work to entrepreneurship.

One possible channel through which entrepreneurial experiences shape preferences is through an occupational "anchoring effect". As pointed out by Macko and Tyszka (2009), occupations have specific "rules of thumb" in the decision making processes, and entrepreneurs who are used to making decisions under risky environment may not even be aware of their risk-taking tendencies. The adaptive instinct developing from occupational decision making might also affect personal behaviors. For example, stock traders, whose job is to seek out investment opportunities, may behave differently regarding risky investments than auditors whose job is to ensure the financial soundness of businesses. Moreover, behaviors may not only change due to occupational decision-making routines but can also altar due to self-perception. The experimental results of Adam and Galinsky (2012) find that participants wearing a lab coat described as a doctor's coat have more lasting attention compared to others who wear a coat described as a painter's coat.

This paper contributes to the existing literature in two ways. First, the results show suggestive evidence that the employment type can endogenously affect the risk attitudes. Therefore, when examining the relationship between contemporaneous risk attitudes and the status of self-employment, one should also reflect on how entrepreneurial activities may in turn contribute to the change of

risk attitudes. Second, the distinction of risk attitudes between entrepreneurs and necessity self-employed shows the importance of distinguishing between different types of self-employment. For example, studies on how risk attitudes determine the entry and exit of entrepreneurs may show different patterns if we distinguish between entrepreneurship and the necessity self-employment.

The rest of the paper is organized as follows. Section 2 reviews the related literature. Section 3 describes the data used in this paper, with details regarding how the risk attitudes are measured. Section 4 presents the estimation results. Section 5 shows robustness checks. Section 6 concludes.

2 Literature Review

The empirical literature on risk preferences and entrepreneurship mostly focus on how risk attitudes affect the selection into entrepreneurship. Cramer et al. (2002) find that low risk aversion *ex post* is associated with ever having a self-employed episode using the Brabant survey from the Dutch province. Fairlie (2002) uses data from the National Longitudinal Survey of Youth (NLSY) and shows that individuals who have involved in drug dealing as a youth, an experience demonstrating high risk-seeking tendencies, are more likely to become self-employed in their adulthood. Ekelund et al. (2005) employ the psychometric data collected from the Northern Finland 1966 Birth Cohort Study, and find that higher risk aversion is related to a lower probability of self-employment.[1] Fairlie and Holleran (2012) randomly assigned the members of Growing America through Entrepreneurship (GATE) to entrepreneurial training, and find a modest effect of risk tolerance on the choice to start a business. Hvide and Panos (2014) use the investment on common stock as a proxy of risk tolerance, and show that the investors of common stock in Norway are more likely to start an incorporated firm later on in life. Using data from the German Socio-Economic Panel (SOEP), Caliendo et al. (2009) find that individuals whose entry into self-employment from regular employment have

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[1]The psychometric measures are based on the biosocial concept of personality. Ekelund et al. (2005) use one of the temperament dimensions, Harm Avoidance, as the measure of risk attitudes.

the higher risk tolerance, but do not find the same pattern for those enter from unemployment and inactivity. Caliendo et al. (2010) further argue that self-employed individuals with a medium range of risk attitudes survive longer than self-employed individuals with low or high risk attitudes. Caliendo et al. (2014) show that the self-employment probability and the entry probability increase in an accelerating rate with the risk tolerance scale, and the risk tolerance is related to the exit probability in a U-shaped function.

Fewer studies have explored how entrepreneurship may in turn affect the risk attitudes. Palich and Ray Bagby (1995) show that: despite entrepreneurs do not perceive themselves as more risk-taking than non-entrepreneurs, they are more likely to view uncertain business scenarios more positively than non-entrepreneurs. Entrepreneurs tend to perceive the situations as strengths rather than weaknesses, opportunities rather than threats. Macko and Tyszka (2009) conduct a lab experiment that recruits three groups of participants: The First group consists of students who have not shown any interest in becoming self-employed, the second group is students who have taken a course designed for future entrepreneurs, and the third group is students or alumni who are self-employed. They find that individuals who have started their own business are more likely to take risk-taking actions than others in hypothetically risky business scenarios. In particular, using data from SOEP, Brachert et al. (2019) show that individuals who have a higher propensity in risk-taking are more likely to be self-employed, and the risk-taking propensity becomes even higher after their entry into self-employment. Hence, Brachert et al. (2019) suggest that the risk attitudes are not only intrinsic but could also be further shaped by the entrepreneurial experiences.

A growing empirical literature also supports the hypothesis that important life events and environmental factors can alter risk attitudes. Malmendier and Nagel (2011) show that experiences of financial downturns such as low stock market returns can affect the risk attitudes in financial investment later on. Hryshko et al. (2011) show that compulsory education resulting in higher

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parental education leads to lower risk aversion in the next generation. Kettlewell (2019) find that parenthood and loss of spouse or child predict a positive change in risk aversion, and soundness of financial condition predicts negative change in risk aversion. Dohmen et al. (2017) study the age profile of risk attitudes from using the Dutch DNB Household Survey and German SOEP, and find that the willingness to take risks decline with the age and becomes more constant after age 65.

Risk preferences have also been shown to change after traumatic experiences such as natural disasters and violent environment. However, the results are mixed regarding the direction of change in risk attitudes after these events. For example, Page et al. (2014); Hanaoka et al. (2018); Abatayo and Lynham (2020) find individuals become more risk taking after experiencing natural disasters, while Cameron and Shah (2015); Cassar et al. (2017) find individuals become more risk averse. Similarly, Voors et al. (2012); Callen et al. (2014) find individuals who have exposed to violent conflict become more risk taking, while Kim and Lee (2014); Moya (2018); Brown et al. (2019) find individuals become more risk averse. Imas (2016) explains that the differences result from the realized losses versus the paper losses: individuals become more risk averse after the realized loss, and become more risk taking if the loss is not realized.

3   Data

To understand the relationship between risk attitudes and choice of employment type, I use data from the Indonesia Family Life Survey (IFLS), a longitudinal survey that started in 1993 and was designed to provide information on the socioeconomic and health status of households in Indonesia. IFLS1, the initial sample was representative of 83% of the Indonesian population in 13 provinces (out of the country's 27 provinces), and included 7,224 households where over 22,000 individuals were interviewed. The later survey waves in 1997, 2000, 2007, and 2014 recontacted and followed more than 86% of the original IFLS1 households and their split-off households. For the purposes of my

analysis, two measures are particularly important: risk attitudes and the definition of employment types. I next describe how the risk attitudes are elicited in the IFLS, and how I define and construct the variables of risk attitudes and employment types.

3.1 Measuring Risk Attitudes

In 2007, IFLS included a new module to elicit an individual's risk preferences, which was a shorter version of questions asked in the Mexican Family Life Survey (MxFLS).[2] The module includes two sets of questions yielding two alternative risk aversion measures. I will call these measures Measure1 and Measure2 respectively. Both sets of questions are asked of all household members who are aged 15 years old or older. In 2014, the same two sets of questions were asked, but the order in which the sets of questions were asked was randomized. Measure1 is based on the following set of questions:

> Suppose you are offered two ways to earn some money. With option 1, you are guaranteed Rp 800 thousand per month. With option 2, you have an equal chance of earning either the same income, Rp 800 thousand per month, or, if you are lucky, Rp 1.6 million per month, which is more. Which option will you choose?

Respondents can answer option 1, option 2, or "Don't Know". If respondents choose option 1, the field interviewer reconfirms their choice by explaining the two options again:

> Are you sure? In option 2 you will get at least Rp 800 thousand per month and you may get Rp 1.6 million per month. In option 1 you will always get Rp 800 thousand per month.

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[2]MxFLS2 developed a new module which incorporated two parts to elicit risk attitudes. The first part included a series of questions asking respondents to choose between two lotteries. The second part included a series of questions regarding the probabilities of risky behaviors such as the probability of investing in an informal savings group and accessing electricity illegally, and also questions regarding personal expectations such as the expectation of living longer than 75 years. IFLS only adopted the first series of questions–those choosing between two lotteries, and also redesigned the questions. The IFLS module also included two sets of questions to elicit time preferences.

If respondents do not wish to switch to option 2, this series of questions ends and the interviewer proceed to next set of questions. In particular, I call these respondents having an "irrational" answer hereafter. These respondents, however, should not necessarily be viewed as irrational agents who could not make optimized decisions in other situations.

If respondents choose option 2 or switch to option 2 for the first question, they would answer two more questions to choose between lotteries depending on their answers. Figure 1 illustrates the sequential steps of questions for Measure1. For example, after choosing option 2 for the first question, respondents are asked to choose between one lottery which guaranteed Rp 800 thousand per month and another lottery which has an equal chance earning of Rp 400 thousand or Rp 1.6 million per month. In all questions, respondents can answer "Don't Know". For the first question, if respondents answer "Don't Know", the interviewer proceeds to the next lottery question assuming they chose the rational option. If respondents answer "Don't Know" in the next question, the interviewer proceeds to the next lottery question as if they chose the more risk-averse lottery.

Measure2 has a similar set of questions, with different numbers and the possibilities of losing money. The options and lotteries for Measure 2 are illustrated in Figure 2. The first question starts with two options, where option 1 guarantees Rp 4 million per month where option 2 has an equal chance of earning Rp 4 million or Rp 2 million. If respondents choose option 1, again, the interviewer asks them if they are sure with the option and further explain the two options. I define respondents who do not change their choice to option 2 as "irrational".

For both Risk Attitudes Measure1 and Measure2, I rank the final choice from 1 to 4, with 4 being the most risk-averse and 1 being the most risk-tolerant (RA Measures used as short for Risk Attitudes Measures hereafter). If respondents choose a guaranteed amount over the other lottery,

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the expected utility theory suggests that

$$U(c) \geq \frac{1}{2}U(kc) + \frac{1}{2}U(\lambda c), \text{ where } k > 1, \lambda < 1.$$

By assuming that respondents rank the choice according to the constant relative risk aversion (CRRA) utility function

$$U(c) = \frac{c^{1-\rho}}{1 - \rho}$$

I calculate the range of ρ for each final choice.

Keeping panel respondents in 2007 and 2014 aged 20-60, Table 1 and Table 2 show the tabulations of responses from men and women respectively. Four features are noticeable. First, the percentage of irrational answers is higher for Measure1 than for Measure2 for both men and women. Moreover, in 2014, the randomization of which set of questions was asked first does not seem to alter the higher percentage of irrational answers for Measure1. While the percentage choosing the irrational answer does go down for Measure1 and go up for Measure2 in 2014, the pattern that respondents are more likely to choose the irrational answer for Measure1 persists. Men are 2-4 times more likely to choose the irrational answer for Measure1 than for Measure2, and women are 3-7 times more likely to choose the irrational answer for Measure1. Second, women are more likely to choose the irrational answer for Measure1 compared to men, but are less likely to choose the irrational answer for Measure2. Third, for those who go on to answer more questions, both women and men are more likely to choose the most risk averse answer for Measure2 than for Measure1. Between 32-44% of men choose the most risk averse answer for Measure1, and about 78% choose the most risk averse answer for Measure2. Similarly, 39-56% of women choose the most risk averse answer for Measure1, and 83-87% choose the most risk averse answer for Measure2. Lastly, for both women and men, the distribution of the final choice is more persistent for Measure2 from 2007 to 2014, while more

people move to a less risk averse final choice for Measure 1 from 2007 to 2014.

Do respondents repeatedly choose irrational answers? Are respondents who choose the irrational answer for Measure1 also more likely to choose the irrational answer for Measure2? Table 3 and Table 4 show the numbers of irrational choices from Measure1 and Measure2 using the panel aspect of the data. Each individual is interviewed in both 2007 and 2014, and therefore the times they may choose irrational choices for each measure could be none, once, or twice. About 40% of men never choose the irrational choice for both measures, and around 32% of men choosen the irrational choice once for Measure1. On the other hand, about 33% of women never choose the irrational choice for both measures, and about 38% of women choose the irrational choice once for Measure1. About 11% of men and 15% of women always choose the irrational choice for Measure1. Table 5, 6, 7, and 8show the distributions of choices for Measure 2 for those who choose the irrational answer in Measure1. The tables show that the majority of individuals who choose irrational choice for Measure1 choose the most risk averse final choice for Measure2. One interpretation of these findings is that given the format of the questions for Measure1, the most risk averse individuals chose the certainty option (corresponding to Rp 800 thousand per month) even though it was the irrational choice. Given this is the case, Measure1 is likely to understate the level of risk aversion if we ignore the irrational responses. For this reason, I view Measure2 as my preferred measure of risk aversion in the results that follow.

In addition to the irrational answer, we may also be curious about how the final choice of Measure1 is correlated to Measure2. If we believe that respondents make decision based on CRRA expected utility function, as stated in Table 1 and 2, then we should see that the final choice of Measure1 maps to Measure2 as follows: Measure1 $\in \{1\} \equiv$ Measure2 $\in \{1\}$, Measure1 $\in \{2\} \equiv$ Measure2 $\in \{2,3\}$, and Measure1 $\in \{3,4\} \equiv$ Measure2 $\in \{4\}$. However, CRRA parameter does not well explain the actual distributions of the RA Measures from Table 5, 6, 7, and 8. Regardless the

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choice in Measure1, the majority of respondents choose the most risk averse final choice for Measure2. A possible explanation is that the measures of risk attitude in IFLS use the same absolute amount of lotteries for both 2007 and 2014, which may be unsuitable to infer the parameter in CRRA utility function.[3] For one, individual's current wealth and income anchor how they perceive the amount of lotteries.[4] Moreover, from 2007 and 2014, the 7-year price inflation may also play a role in how they perceive the relative amount of the lotteries.

Figures 3 and 4 depict how the final choice of RA Measures have changed from 2007 to 2014 for the same individual. More than 65% of individuals choose a different final choice for RA Measure1, and more than 25% of individuals choose a different final choice for RA Measure2. The correlation coefficients of RA Measure1 between 2007 and 2014 are 0.0865 and 0.0819 for men and women respectively, and the correlation coefficients of RA Measure2 between 2007 and 2014 are 0.1183 and 0.0687 for men and women respectively, all significant at 1% significance level. The persistence within measures mainly comes from the most risk-averse final choice.[5]

3.2 Employment Types

To distinguish entrepreneurship from the necessity self-employment, I utilize the detailed definition of types of employment in the IFLS. IFLS surveys household members aged 15 and above regarding their employment status. First, respondents are asked about their primary activities during the past week. If their answer is "Working/trying to work/helping to earn income", I classify them as workers,

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[3]Ideally, we should consider the current wealth of individuals when inferring the CRRA parameter:

$$U(W) \geq \frac{1}{2}U(W + kI) + \frac{1}{2}U(W + \lambda I), \text{ where } k > 1, \lambda < 1$$

where W is the wealth, and I is the lottery income given different scenarios. Instead of using absolute lottery amounts, the Panel Study of Income Dynamics solicits the risk attitudes by asking the respondents to choose between half-half chance in double the current income or $(1 - \lambda)$ of the current income, where $\lambda \in (0, 1)$, which may be more suitable for calculating the CRRA parameter. See Hryshko et al. (2011) for details regarding measures of risk aversion in PSID.

[4]In fact, from Table A1, A2, A3, and A4, we can see that people who choose the irrational answer have generally the lowest median earnings and household asset index.

[5]Tables A5, A6, A7, and A8 show the tabulations of RA Measures from 2007 to 2014.

otherwise they are classified as non-workers (who can be either unemployed or not in labor force)[6]. Next, respondents are asked about the characteristics of their primary job, which is the one they spend the most time on. One of the questions is "Which category best describes the work that you do?" The respondents then choose one of the following: (i) Self-employed (without help), (ii) self-employed with unpaid family worker/temporary worker, (iii) self-employed with permanent worker, (iv) government worker, (v) private worker, (vi) casual worker in agriculture, (vii) casual worker not in agriculture, (viii) unpaid family worker. Using this question, I define the employment types in this paper: "Entrepreneurs" are self-employed with permanent workers; "Necessity self-employed" are self-employed without help or with temporary workers/unpaid family worker; "Wage (workers)" are government workers, private workers, casual workers not in agriculture, unpaid family workers. If the job is in agricultural sector, I categorize them as "Agriculture", including all self-employment and wage work.

Table 9 summarizes the sample characteristics by RA measures and by gender. Specifically, the distribution of employment types is quite different between men and women. About 91% of men are workers, while only 45% of women are workers. In particular, 97% of female non-workers are housewives. Among all male workers, 48% of men are wage workers, about 29% are in the agricultural sector, 20% are necessity self-employed, and 2-3% are entrepreneurs. On the other hand, among all female workers, around 46-47% are wage workers, 18-19% are in the agricultural sector, 33% are necessity self-employed (around 40-50 observations), and 2% are entrepreneurs. Conditional on being a worker, the percentage of women who are necessity self-employed is higher, and employment in the agricultural sector is lower compared to men.

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[6]Other primary activities include job searching, attending school, housekeeping, retired, sick/disable, and other uncategorized activities.

4 Estimation and Results

Using OLS regression, I estimate the association between risk attitudes and entrepreneurship. For all regressions, I include controls of asset index, education, a quadratic function in age Javanese (main ethnicity in Indonesia), Muslim, married and urban dummies, survey wave fixed effects and region fixed effects, except in the case of first-difference OLS regressions.[7] Standard errors are clustered at the sub-district level.

Table 10 and 11 show the association between current risk attitudes and current employment type for men and women, respectively, where I regress current risk attitude measures on current employment type (where the omitted category is wage worker). Each column represents an OLS regression with different dependent variables. Very Risk Averse is defined as 1 if the RA measure is 4 (the most risk averse choice), 0 otherwise; Very Risk Tolerant is defined as 1 if the RA measure is 1 (the most risky choice), 0 otherwise. First, the results show that for both men and women, entrepreneurs and the necessity self-employed have lower magnitudes in both RA Measures, implying they are less risk averse than wage workers. Second, the difference of RA Measures between entrepreneurs and necessity self-employed workers is significant at the 5% significance level for men, except for the difference of Very Risk Averse Measure1 (Table 10 Column (2)). The significant difference indicates that entrepreneurship is associated with higher risk tolerance than necessity self-employment, even though both employment types tolerate higher risk levels compared to wage workers. The differences of RA Measures between female entrepreneurs and female necessity self-employed workers are less clear: The differences are not significant for all RA Measure1 (Table 10 Column (1)-(3)), but are significantly different at 5% significance level for RA Measure2 and Very

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[7]Asset Index is constructed from a series of questions regarding the ownership of the household asset. The type of assets includes ownership of house and land occupied by this household, other house/building (including land), land(not used for farm or non-farm), vehicles (cars, boats, bicycles, motorbikes), household appliances (radio, tape recorder, tv, fridge, sewing or washing machine, VCD player, etc.), savings/ certificate of deposit/ stocks, receivables, jewelry, household furniture and utensils. I then use Principal Component Analysis (PCA) to predict asset index. The asset index is standardized by each wave with all respondents in IFLS.

Risk Tolerant Measure2 (Table 10 Column (4) & (5)). Given that Measure2 is my preferred measure, I interpret the results as broadly consistent with the results for men. Another contributing factor to the imprecise estimates for women can be due to the small size of entrepreneurs: Only around 40-50 observations are entrepreneurs in the samples.

While it is more standard to consider employment type being determined by individual-specific permanent trait–risk aversion, Figures 3 and 4 show that individuals do switch across risk aversion categories. One possibility is that risk preferences endogenously respond to the choice of employment type. In Table 12 and 13, I regress current risk measures on last wave's employment type to begin exploring the idea that employment type may endogenously determine risk attitudes. Since employment type from 7 years ago is not directly determined by current risk attitudes, this regression moves closer to estimating the effect of employment type on risk attitudes. Nevertheless, because employment types and risk preferences are persistent the estimation does not necessarily indicate a causal effect.

Table 12 shows a strong relationship between 7-year-ago employment type and the current risk attitudes especially for male entrepreneurs: They are less risk averse and more risk tolerant for both RA Measures. Moreover, the differences of current risk attitudes between the 7-year-ago entrepreneurs and the 7-year-ago necessity self-employed are significant at 1% significance level. Specifically, compared to the 7-year-ago necessity self-employed, the RA Measure1 of the 7-year-ago entrepreneurs is 60 percentage points lower, which is more than one-third of one standard deviation; and the RA Measure2 is 51.2 percentage points lower, which is more than half of one standard deviation. Table 13 shows a less consistent picture of 7-year-ago female entrepreneurs and the coefficients are imprecisely estimated. This pattern, again, can be due to the small size of female entrepreneurs, which only constitutes 25-30 observations out of the sample. The 7-year-ago necessity self-employed female workers still show a significant pattern of being less risk averse and

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more risk tolerant compared to wage workers.

To understand how the change in risk attitudes is related to the transition from wage work to other employment types, I estimate first-differences via OLS in Table 10. The dependent variables are (1) the change of RA Measures from 2007 to 2014, ranging from -3 to 3; (2) Become More Risk Averse is a dummy if the change in RA Measure is greater than 0; (3) Become Less Risk Averse is a dummy if the change in RA Measure is less than 0. The right-hand-side includes the dummies of change from wage workers to other types of employment and the change of asset index. Therefore, the omitted group is those who have no transition from wage jobs. Table 14 has similar sign patterns compared to Table 10 and 12 despite being less precise. In Column (6), those who transitioned from wage work to entrepreneurship are positively associated with "Become less risk averse" in RA Measure2, and is the only one that appears to be significantly different from those who transitioned to necessity self-employment in all RA Measures. Table 15 shows the first-difference OLS regression for women. The individuals who transition from wage work to entrepreneurship, however, are too few to interpret the results meaningfully.[8]

5   Robustness Checks

As noted in Guiso and Paiella (2008) and Liu (2013), risk aversion is negatively related to wealth. Guiso and Paiella (2008) also point out that individuals who may face uninsurable risks such as income uncertainty and liquidity constraint appear to be more risk averse. Therefore, an estimation including change of asset index may have a different result compared to an estimation without change of asset index, especially if we expect that transition into different employment types would pay differently. Compared Table 14 to Table A9, including the change of asset index has little effect on the magnitudes of coefficients for ΔEntrepreneur and ΔNecessity Self-employed. For my

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[8]For both Measure1 and Measure2, only 4 observations transition from wage work to entrepreneurship. 17 observations transition to necessity self-employment in Measure1 sample, and 29 observations in Measure2 sample.

preferred measure, RA Measure2, the significances of coefficients remain the same. Similar pattern is found for women in Table 15 and Table A10. However, because I have little information on the actual value of wealth and the household asset index is not a perfect proxy for personal wealth, this pattern may not accurately reflect how the change of wealth is related to the change in risk preferences.

To address concerns in top coding, I rerun the first-difference regression for men where the dependent variables are indicators and exclude the observations that are top coded in 2007. In Table A11, "Become more risk averse" excludes observations which RA Measure is 4 (most risk averse) in 2007, and "Become less risk averse" excludes observations which RA Measure is 1 (most risk tolerant) in 2007. The results show a consistent pattern as in Table 14 and Table A9 for my preferred measure: Individuals who transitioned from wage work to entrepreneurship are positively associated with a higher likelihood of becoming less risk averse.

6   Conclusion

Using panel data from the IFLS, this paper explores how the risk attitudes may be endogenously affected by employment types. Distinguishing between entrepreneurship and self-employment, I first estimate the correlation between current risk attitudes and current employment type, and find strong evidence that the self-employed are less risk averse and more risk tolerant than wage workers, and also the entrepreneurs are less risk averse and more risk tolerant than the necessity self-employed for both men and women. Next, I examine how current risk attitudes are associated with employment type 7 years ago. For men, I continue to find distinct risk preferences with the necessity self-employed being less risk averse and more risk tolerant than wage workers, and the entrepreneurs being even more risk tolerant than the necessity self-employed. This displays suggestive evidence that the past employment type has a strong correlation with the current risk

attitudes. However, due to the persistence of employment type, this result should not necessarily be viewed as a causal effect. Lastly, I examine how the change in risk attitudes is correlated with the transition from wage work to other employment types. The results are mixed and imprecise, but for my preferred measure of risk attitudes, RA Measure2, I find an increase in becoming more risk tolerant for men who switch from wage work to entrepreneurship. Overall, my findings are suggestive evidence that men's entrepreneurial experiences may affect the risk attitudes, but no such relationship for women. Future work can explore further on how the duration of employment type may affect the risk attitudes, which could also be a channel that results in the differences between men and women.

My results also show that the measurement of risk preferences can contribute to the stability of risk preferences. I find that individuals are more likely to choose the irrational answer for Measure1, and show a less persistent pattern. Future work could explore a design for a consistent measure of risk preferences as suggested by the evidence from Chuang and Schechter (2015), especially in a developing country context. For example, questions for general risk attitudes in life and risk attitudes towards risky choices (health behaviors such as smoking, and willingness to make financial changes) may result in a more consistent risk attitude measure.

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Tables and Figures

Figure 1: Risk Preferences Measure 1 (in Indonesia Rupiah)

```
                              /\
                             /  \
                            /    \
                        800K    ½(800K) ⊕ ½(1600K)
                          |           /\
                        Sure?        /  \
                          |         /    \
                        End      800K    ½(1600K) ⊕ ½(400K)
                                   /\            /\
                                  /  \          /  \
                             800K  ½(1600K)⊕½(600K)  800K  ½(1600K)⊕½(200K)
                               |        |              |           |
                            RA=4     RA=3           RA=2        RA=1
```
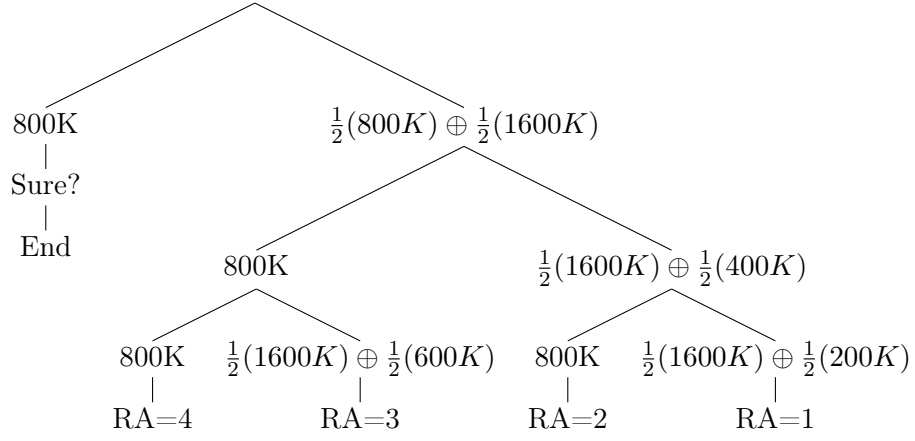
Figure 2: Risk Preferences Measure 2 (in Indonesia Rupiah)

```
                              /\
                             /  \
                            /    \
           ½(4M) ⊕ ½(2M)            4M
                 |                  /\
               Sure?              /  \
                 |              /    \
               End          4M    ½(12M) ⊕ ½(0M)
                             /\           /\
                            /  \         /  \
                        4M  ½(8M)⊕½(2M) 4M  ½(16M)⊕½(-2M)
                         |       |       |        |
                       RA=4    RA=3    RA=2     RA=1
```
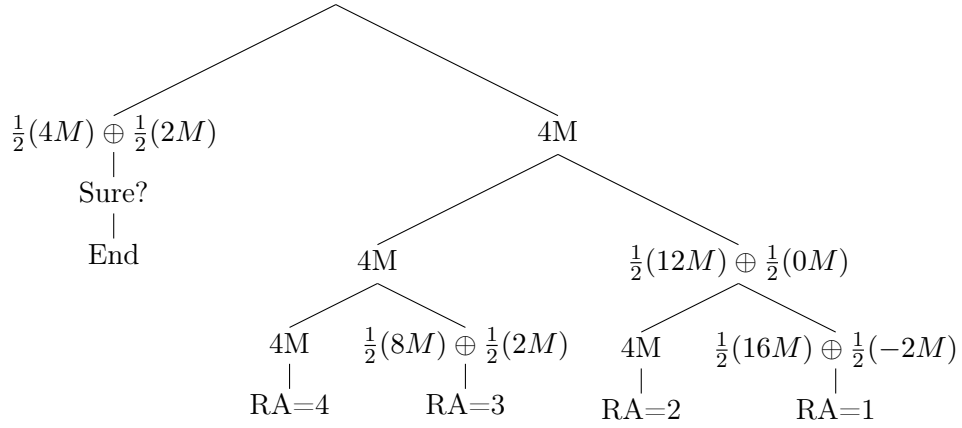
Table 1: Risk Attitudes Measures for Men

| | | Risk Attitudes Measure1 for Men | |
		2007	2014
Total Obs.		3703	3703
Irrational answer		33.73%	26.87%
Final Choice Obs.		2454	2708
Final Choice	CRRA	Percent(%)	Percent(%)
1	$\rho \in [0, 0.3058]$	31.54	39.93
2	$\rho \in [0.3058, 1)$	14.10	17.65
3	$\rho \in (1, 2.915]$	9.90	15.18
4	$\rho \in [2.915, \infty)$	44.46	32.24
		Risk Attitudes Measure2 for Men	
		2007	2014
Total Obs.		3703	3703
Irrational answer		8.24%	12.80%
Final Choice Obs.		3398	3229
Final Choice	CRRA	Percent(%)	Percent(%)
1	$\rho \in [0, 0.3058]$	8.65	7.15
2	$\rho \in [0.3058, 0.3691]$	3.24	3.25
3	$\rho \in [0.3691, 1)$	9.51	11.18
4	$\rho \in (1, \infty)$	78.61	78.41

Table 2: Risk Attitudes Measures for Women

| | | Risk Attitudes Measure1 for Women | |
		2007	2014
Total Obs.		3455	3455
Irrational answer		44.34%	32.10%
Final Choice Obs.		1923	2346
Final Choice	CRRA	Percent(%)	Percent(%)
1	$\rho \in [0, 0.3058]$	20.12	24.47
2	$\rho \in [0.3058, 1)$	14.09	19.91
3	$\rho \in (1, 2.915]$	9.36	16.33
4	$\rho \in [2.915, \infty)$	56.42	39.30
		Risk Attitudes Measure2 for Women	
		2007	2014
Total Obs.		3455	3455
Irrational answer		6.43%	10.77%
Final Choice Obs.		3233	3083
Final Choice	CRRA	Percent(%)	Percent(%)
1	$\rho \in [0, 0.3058]$	3.59	3.08
2	$\rho \in [0.3058, 0.3691]$	2.54	2.47
3	$\rho \in [0.3691, 1)$	6.62	11.32
4	$\rho \in (1, \infty)$	87.26	83.13

Table 3: Irrational responses of RA Measure1 and Measure2 for Men

RA Measure1 Irrational count	RA Measure2 Irrational count			
	0	1	2	Total
0	1477	345	31	1853
1	1184	254	18	1456
2	317	72	5	394
Total	2978	671	54	3703
Observations	3703			

Table 4: Irrational responses of RA Measure1 and Measure2 for Women

RA Measure1 Irrational count	RA Measure2 Irrational count			
	0	1	2	Total
0	1137	201	9	1347
1	1327	238	10	1575
2	421	107	5	533
Total	2885	546	24	3455
Observations	3455			

Table 5: Tabulation for Men's Choice of Risk Attitudes Measures in 2007

| | | | RA Measure2 | | | |
RA Measure1	1	2	3	4	Irrational	Total
1	219	44	113	231	167	774
	[5.91]	[1.19]	[3.05]	[6.24]	[4.51]	[20.90]
2	18	23	68	214	23	346
	[0.49]	[0.62]	[1.84]	[5.78]	[0.62]	[9.34]
3	18	7	76	128	14	243
	[0.49]	[0.19]	[2.05]	[3.46]	[0.38]	[6.56]
4	10	12	32	1018	19	1091
	[0.27]	[0.32]	[0.86]	[27.49]	[0.51]	[29.46]
Irrational	29	24	34	1080	82	1249
	[0.78]	[0.65]	[0.92]	[29.17]	[2.21]	[33.73]
Total	294	110	323	2671	305	3703
	[7.94]	[2.97]	[8.72]	[72.13]	[8.24]	[100.00]

Notes: The table displays number of observations. Percentage of total observations in brackets.

Table 6: Tabulation for Men's Choice of Risk Attitudes Measures in 2014

| | | | RA Measure2 | | | |
RA Measure1	1	2	3	4	Irrational	Total
1	162	54	140	345	245	946
	[4.37]	[1.46]	[3.78]	[9.32]	[6.62]	[25.55]
2	23	15	79	317	44	478
	[0.62]	[0.41]	[2.13]	[8.56]	[1.19]	[12.91]
3	22	9	68	285	27	411
	[0.59]	[0.24]	[1.84]	[7.70]	[0.73]	[11.10]
4	12	13	32	772	44	873
	[0.32]	[0.35]	[0.86]	[20.85]	[1.19]	[23.58]
Irrational	12	14	42	813	114	995
	[0.32]	[0.38]	[1.13]	[21.96]	[3.08]	[26.87]
Total	231	105	361	2532	474	3703
	[6.24]	[2.84]	[9.75]	[68.38]	[12.80]	[100.00]

Notes: The table displays number of observations. Percentage of total observations in brackets.

Table 7: Tabulation for Women's Choice of Risk Attitudes Measures in 2007

RA Measure1	RA Measure2 1	2	3	4	Irrational	Total
1	82 [2.37]	28 [0.81]	47 [1.36]	138 [3.99]	92 [2.66]	387 [11.20]
2	9 [0.26]	13 [0.38]	46 [1.33]	185 [5.35]	18 [0.52]	271 [7.84]
3	3 [0.09]	9 [0.26]	52 [1.51]	106 [3.07]	10 [0.29]	180 [5.21]
4	8 [0.23]	15 [0.43]	29 [0.84]	1012 [29.29]	21 [0.61]	1085 [31.40]
Irrational	14 [0.41]	17 [0.49]	40 [1.16]	1380 [39.94]	81 [2.34]	1532 [44.34]
Total	116 [3.36]	82 [2.37]	214 [6.19]	2821 [81.65]	222 [6.43]	3455 [100.00]

Notes: The table displays number of observations. Percentage of total observations in brackets.

Table 8: Tabulation for Women's Choice of Risk Attitudes Measures in 2014

RA Measure1	RA Measure2 1	2	3	4	Irrational	Total
1	49 [1.42]	25 [0.72]	96 [2.78]	286 [8.28]	118 [3.42]	574 [16.61]
2	15 [0.43]	12 [0.35]	81 [2.34]	322 [9.32]	37 [1.07]	467 [13.52]
3	14 [0.41]	9 [0.26]	70 [2.03]	274 [7.93]	16 [0.46]	383 [11.09]
4	4 [0.12]	11 [0.32]	58 [1.68]	801 [23.18]	48 [1.39]	922 [26.69]
Irrational	13 [0.38]	19 [0.55]	44 [1.27]	880 [25.47]	153 [4.43]	1109 [32.10]
Total	95 [2.75]	76 [2.20]	349 [10.10]	2563 [74.18]	372 [10.77]	3455 [100.00]

Notes: The table displays number of observations. Percentage of total observations in brackets.
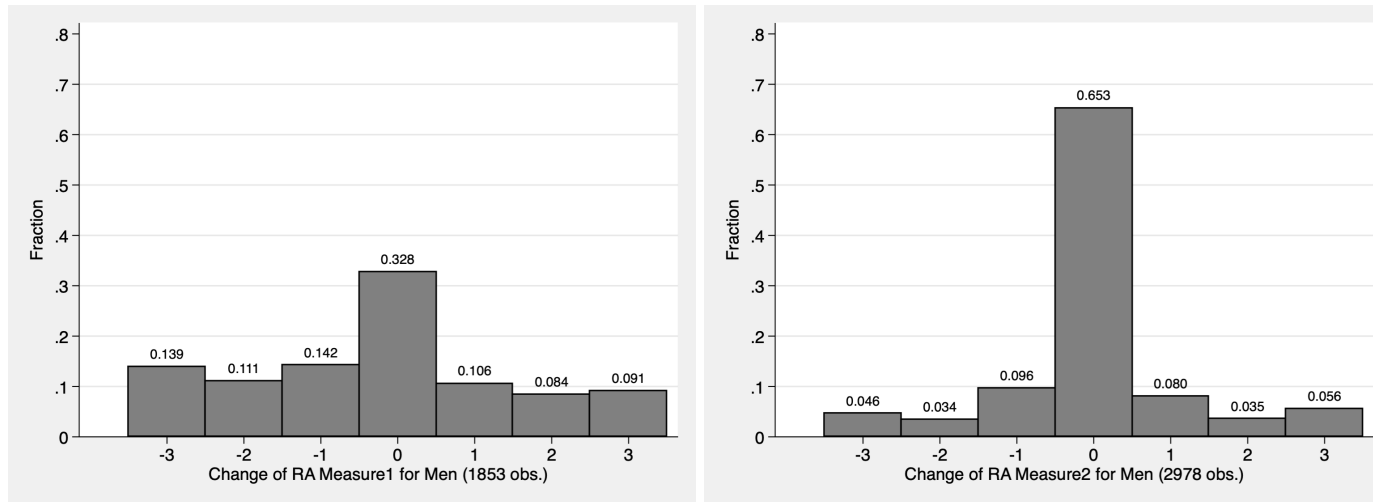
Figure 3: Change in RA Measure1 & Measure2 for Men

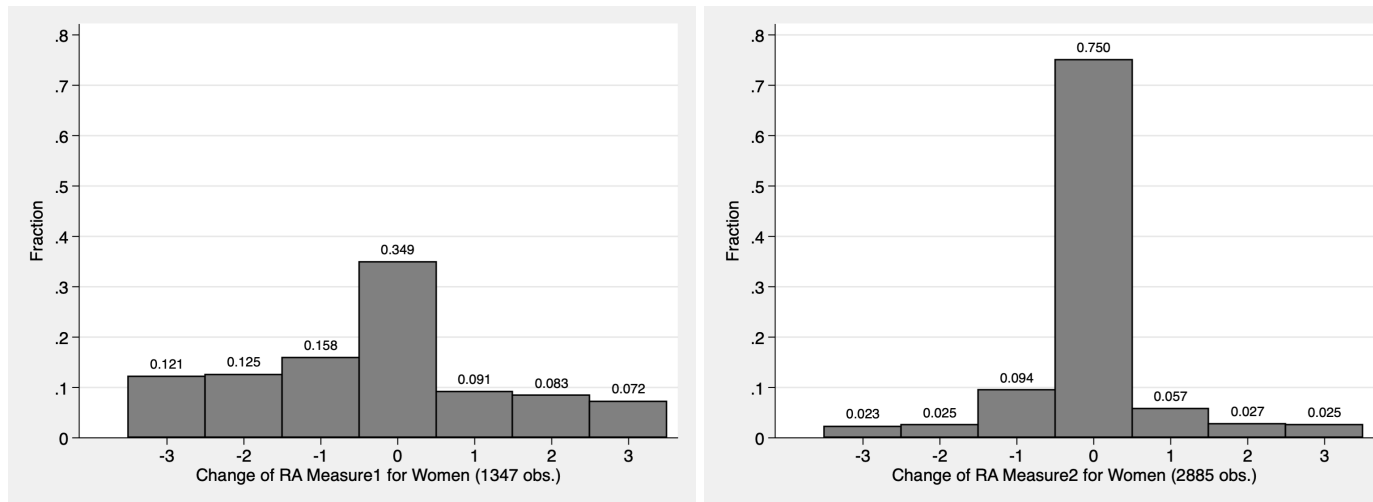Figure 4: Change in RA Measure1 & Measure2 for Women

Table 9: Summary Statistics of Regression Sample By RA Measures and Genders

	Risk Aversion Measure1		Risk Aversion Measure2	
	Men	Women	Men	Women
Risk Aversion (measured in 1 to 4)	2.59	2.85	3.61	3.77
	(1.29)	(1.23)	(0.87)	(0.65)
Very Risk Averse (RA Measure = 4)	0.39	0.47	0.79	0.86
	(0.49)	(0.50)	(0.40)	(0.35)
Very Risk Tolerant (RA Measure = 1)	0.32	0.22	0.08	0.03
	(0.47)	(0.42)	(0.27)	(0.18)
Age	39.12	37.82	39.06	37.59
	(9.36)	(9.34)	(9.44)	(9.36)
Years of schooling	9.23	8.80	8.94	8.40
	(4.54)	(4.57)	(4.51)	(4.48)
Highest education level (%)				
less than elementary	15.08	16.87	16.72	18.23
elementary graduate	22.80	24.21	23.93	26.49
junior high school graduate	16.33	19.01	16.34	19.28
high school graduate	30.10	27.10	28.70	25.17
some college	15.70	12.82	14.32	10.82
Employment type (%)				
Wage	43.94	21.27	43.99	20.06
Entrepreneur	2.75	0.96	2.14	0.78
Necessity Self-employed	18.61	14.87	17.43	14.77
Agriculture	26.57	7.90	27.91	8.42
Non-worker	8.13	55.00	8.53	55.97
Asset Index	0.05	0.17	0.02	0.11
	(0.98)	(0.95)	(0.97)	(0.94)
Javanese	0.47	0.47	0.48	0.47
	(0.50)	(0.50)	(0.50)	(0.50)
Muslim	0.91	0.92	0.91	0.93
	(0.28)	(0.27)	(0.28)	(0.26)
Married	0.90	0.85	0.90	0.85
	(0.30)	(0.36)	(0.30)	(0.36)
Urban	0.54	0.59	0.52	0.56
	(0.50)	(0.49)	(0.50)	(0.50)
Median earning last year	10,800,000	6,000,000	10,000,000	5,000,000
from primary job (Rupiah)	[4789]	[2305]	[6137]	[3282]
Observations	5127	4251	6586	6285

Notes: 1) The samples in this table correspond to the regression samples in Table 10 and 11, pooling all panel individuals together aged 20-53 in 2007 and 27-60 in 2014. 2) Employment type of individuals is based on the primary activity in the past week: if respondents state that they are "working/trying to work/helping to earn income", then they are considered as in the labor force, otherwise as Non-workers. "Entrepreneurs" are those who self-report as self-employed with permanent worker for their primary job (job which consumes the most time), and "Necessity Self-employed" are those who self-report as self-employed with unpaid family worker/temporary worker or self-employed own-account. 3) Asset Index is constructed from a series of questions regarding the ownership of household asset. I then use Principal Component Analysis (PCA) to predict asset index. The asset index is standardized by each wave with all respondents in IFLS. 4) Median earning last year is based on the primary job. If the respondents are self-employed, net profit is reported. 5) Standard deviations in parentheses, and number of observations for median earning in brackets.

Table 10: OLS Regression - Current RA on Current Wave's Employment Type (Men)

	(1) Measure1	(2) Very Risk Averse Measure1	(3) Very Risk Tolerant Measure1	(4) Measure2	(5) Very Risk Averse Measure2	(6) Very Risk Tolerant Measure2
Entrepreneur	-0.437***	-0.105***	0.187***	-0.457***	-0.178***	0.131***
	(0.111)	(0.039)	(0.042)	(0.098)	(0.041)	(0.032)
Necessity Self-employed	-0.194***	-0.074***	0.044**	-0.151***	-0.048***	0.045***
	(0.046)	(0.017)	(0.018)	(0.033)	(0.014)	(0.010)
Non-worker	-0.022	-0.009	-0.012	-0.090**	-0.023	0.034***
	(0.067)	(0.025)	(0.025)	(0.041)	(0.019)	(0.013)
Agriculture	-0.034	-0.024	-0.013	-0.081**	-0.036**	0.013
	(0.045)	(0.018)	(0.017)	(0.032)	(0.015)	(0.009)
Asset Index	0.007	-0.003	-0.008	-0.028**	-0.015**	0.006
	(0.020)	(0.008)	(0.008)	(0.013)	(0.006)	(0.004)
elementary graduate	0.029	0.019	0.000	0.027	0.009	-0.011
	(0.066)	(0.025)	(0.023)	(0.033)	(0.016)	(0.009)
junior high school graduate	0.046	0.002	-0.021	0.031	0.013	-0.006
	(0.070)	(0.026)	(0.025)	(0.039)	(0.018)	(0.011)
high school graduate	0.054	0.010	-0.011	-0.068*	-0.017	0.029***
	(0.067)	(0.025)	(0.024)	(0.037)	(0.018)	(0.011)
some college	-0.051	-0.041	0.012	-0.316***	-0.112***	0.099***
	(0.077)	(0.029)	(0.027)	(0.050)	(0.022)	(0.015)
Observations	5127	5127	5127	6586	6586	6586
Adjusted R^2	0.038	0.037	0.029	0.037	0.033	0.032

Notes: 1) Each column represents an OLS regression with different dependent variables. The samples pooling all panel individuals together aged 20-53 in 2007 and 27-60 in 2014. 2) Very Risk Averse is defined as 1 if the RA measure is 4 (the most risk averse choice), 0 otherwise; Very Risk Tolerant is defined as 1 if the RA measure is 1 (the most risky choice), 0 otherwise. 3) Employment type of individuals is based on the primary activity in the past week: if respondents state that they are "working/trying to work/helping to earn income", then they are considered as in the labor force, otherwise as Non-workers. "Entrepreneurs" are those who self-report as self-employed with permanent worker for their primary job (job which consumes the most time), and "Necessity Self-employed" are those who self-report as self-employed with unpaid family worker/temporary worker or self-employed own-account. 4) Asset Index is constructed from a series of questions regarding the ownership of household asset. The asset index is standardized by each wave with all respondents in IFLS. 5) All regressions include controls for quadratic age function, Javanese (main ethnicity in Indonesia), Muslim, Married and Urban dummies, survey wave (year) fixed effects and region fixed effects. Standard errors are clustered at subdistrict level. Significant level: *0.10**0.05***0.01.

Table 11: OLS Regression - Current RA on Current Wave's Employment Type (Women)

	(1) Measure1	(2) Very Risk Averse Measure1	(3) Very Risk Tolerant Measure1	(4) Measure2	(5) Very Risk Averse Measure2	(6) Very Risk Tolerant Measure2
Entrepreneur	-0.222	-0.116*	0.095	-0.426**	-0.183**	0.122**
	(0.188)	(0.068)	(0.069)	(0.180)	(0.081)	(0.052)
Necessity Self-employed	-0.198***	-0.056**	0.079***	-0.064**	-0.042***	0.011
	(0.066)	(0.027)	(0.022)	(0.031)	(0.016)	(0.009)
Non-worker	0.038	0.010	-0.014	-0.003	-0.011	-0.006
	(0.048)	(0.019)	(0.017)	(0.024)	(0.013)	(0.007)
Agriculture	-0.036	-0.010	0.018	-0.053	-0.034	0.007
	(0.081)	(0.030)	(0.031)	(0.039)	(0.021)	(0.010)
Asset Index	-0.029	-0.015*	0.005	-0.018*	-0.009*	0.003
	(0.022)	(0.009)	(0.007)	(0.010)	(0.006)	(0.003)
elementary graduate	0.179***	0.063**	-0.064***	0.077***	0.039***	-0.013*
	(0.063)	(0.025)	(0.021)	(0.027)	(0.015)	(0.007)
junior high school graduate	0.221***	0.069***	-0.085***	0.059*	0.031*	-0.008
	(0.067)	(0.026)	(0.024)	(0.031)	(0.016)	(0.009)
high school graduate	0.314***	0.119***	-0.091***	0.055*	0.025	-0.004
	(0.066)	(0.027)	(0.023)	(0.031)	(0.016)	(0.009)
some college	0.260***	0.094***	-0.076***	-0.014	-0.015	0.000
	(0.081)	(0.031)	(0.028)	(0.043)	(0.023)	(0.012)
Observations	4251	4251	4251	6285	6285	6285
Adjusted R^2	0.042	0.046	0.026	0.018	0.019	0.013

Notes: 1) Each column represents an OLS regression with different dependent variables. The samples pooling all panel individuals together aged 20-53 in 2007 and 27-60 in 2014. 2) Very Risk Averse is defined as 1 if the RA measure is 4 (the most risk averse choice), 0 otherwise; Very Risk Tolerant is defined as 1 if the RA measure is 1 (the most risky choice), 0 otherwise. 3) Employment type of individuals is based on the primary activity in the past week: if respondents state that they are "working/trying to work/helping to earn income", then they are considered as in the labor force, otherwise as Non-workers. "Entrepreneurs" are those who self-report as self-employed with permanent worker for their primary job (job which consumes the most time), and "Necessity Self-employed" are those who self-report as self-employed with unpaid family worker/temporary worker or self-employed own-account. 4) Asset Index is constructed from a series of questions regarding the ownership of household asset. The asset index is standardized by each wave with all respondents in IFLS. 5) All regressions include controls for quadratic age function, Javanese (main ethnicity in Indonesia), Muslim, Married and Urban dummies, survey wave (year) fixed effects and region fixed effects. Standard errors are clustered at subdistrict level. Significant level: *0.10**0.05***0.01.

Table 12: OLS Regression - Current RA on Last Wave's Employment Type (Men)

	(1)	(2) Very Risk Averse	(3) Very Risk Tolerant	(4)	(5) Very Risk Averse	(6) Very Risk Tolerant
	Measure1	Measure1	Measure1	Measure2	Measure2	Measure2
Last wave Entrepreneur	-0.693***	-0.212***	0.204***	-0.566***	-0.226***	0.154***
	(0.128)	(0.042)	(0.057)	(0.138)	(0.055)	(0.047)
Last wave Necessity Self-employed	-0.094*	-0.048**	0.013	-0.054	-0.011	0.021*
	(0.053)	(0.020)	(0.021)	(0.036)	(0.017)	(0.011)
Last wave Non-worker	-0.079	-0.031	0.019	-0.130***	-0.055***	0.029*
	(0.071)	(0.027)	(0.027)	(0.047)	(0.021)	(0.015)
Last wave Agriculture	-0.035	-0.031	0.004	-0.090***	-0.041**	0.018*
	(0.057)	(0.022)	(0.021)	(0.034)	(0.016)	(0.010)
Asset Index	-0.012	-0.011	-0.004	-0.034**	-0.016**	0.009**
	(0.022)	(0.008)	(0.008)	(0.014)	(0.007)	(0.004)
elementary graduate	0.041	0.028	0.005	0.025	0.010	-0.008
	(0.068)	(0.026)	(0.023)	(0.034)	(0.017)	(0.010)
junior high school graduate	0.082	0.009	-0.032	0.033	0.019	-0.003
	(0.075)	(0.028)	(0.027)	(0.043)	(0.021)	(0.012)
high school graduate	0.103	0.023	-0.021	-0.048	-0.007	0.028**
	(0.070)	(0.027)	(0.024)	(0.039)	(0.019)	(0.011)
some college	0.048	0.002	0.002	-0.275***	-0.087***	0.093***
	(0.082)	(0.030)	(0.029)	(0.057)	(0.025)	(0.017)
Observations	4306	4306	4306	5440	5440	5440
Adjusted R^2	0.034	0.032	0.026	0.033	0.028	0.029

Notes: 1) Each column represents an OLS regression with different dependent variables. The samples pooling all panel individuals together aged 20-53 in 2007 and 27-60 in 2014. 2) Very Risk Averse is defined as 1 if the RA measure is 4 (the most risk averse choice), 0 otherwise; Very Risk Tolerant is defined as 1 if the RA measure is 1 (the most risky choice), 0 otherwise. 3) Last Wave employment type of individuals is based on the primary activity in the past week *last wave (7 years ago)*: if respondents state that they are "working/trying to work/helping to earn income", then they are considered as in the labor force, otherwise as Non-workers. "Entrepreneurs" are those who self-report as self-employed with permanent worker for their primary job (job which consumes the most time), and "Necessity Self-employed" are those who self-report as self-employed with unpaid family worker/temporary worker or self-employed own-account. 4) Asset Index is constructed from a series of questions regarding the ownership of household asset. The asset index is standardized by each wave with all respondents in IFLS. 5) All regressions include controls for quadratic age function, Javanese (main ethnicity in Indonesia), Muslim, Married and Urban dummies, survey wave (year) fixed effects and region fixed effects. Standard errors are clustered at subdistrict level. Significant level: *0.10**0.05***0.01.

Table 13: OLS Regression - Current RA on Last Wave's Employment Type (Women)

	(1) Measure1	(2) Very Risk Averse Measure1	(3) Very Risk Tolerant Measure1	(4) Measure2	(5) Very Risk Averse Measure2	(6) Very Risk Tolerant Measure2
Last wave Entrepreneur	0.078 (0.216)	-0.013 (0.096)	-0.024 (0.071)	-0.031 (0.145)	-0.014 (0.080)	-0.013 (0.032)
Last wave Necessity Self-employed	-0.240*** (0.070)	-0.069** (0.027)	0.075*** (0.026)	-0.021 (0.034)	-0.023 (0.018)	-0.002 (0.009)
Last wave Non-worker	-0.101* (0.054)	-0.017 (0.022)	0.034* (0.018)	0.004 (0.026)	0.004 (0.014)	-0.002 (0.007)
Last wave Agriculture	-0.104 (0.082)	-0.018 (0.033)	0.038 (0.029)	-0.088** (0.041)	-0.040* (0.022)	0.017 (0.012)
Asset Index	-0.051** (0.024)	-0.020** (0.009)	0.013 (0.008)	-0.029*** (0.011)	-0.015*** (0.006)	0.006** (0.003)
elementary graduate	0.180*** (0.066)	0.062** (0.026)	-0.062*** (0.022)	0.086*** (0.028)	0.045*** (0.015)	-0.014* (0.008)
junior high school graduate	0.195*** (0.072)	0.063** (0.028)	-0.069*** (0.026)	0.035 (0.034)	0.018 (0.018)	-0.005 (0.010)
high school graduate	0.303*** (0.072)	0.116*** (0.029)	-0.084*** (0.025)	0.054* (0.032)	0.025 (0.017)	-0.005 (0.009)
some college	0.200** (0.087)	0.080** (0.033)	-0.055* (0.031)	-0.007 (0.046)	-0.000 (0.024)	0.005 (0.013)
Observations	3632	3632	3632	5245	5245	5245
Adjusted R^2	0.032	0.035	0.016	0.013	0.016	0.007

Notes: 1) Each column represents an OLS regression with different dependent variables. The samples pooling all panel individuals together aged 20-53 in 2007 and 27-60 in 2014. 2) Very Risk Averse is defined as 1 if the RA measure is 4 (the most risk averse choice), 0 otherwise; Very Risk Tolerant is defined as 1 if the RA measure is 1 (the most risky choice), 0 otherwise. 3) Last Wave employment type of individuals is based on the primary activity in the past week *last wave (7 years ago)*: if respondents state that they are "working/trying to work/helping to earn income", then they are considered as in the labor force, otherwise as Non-workers. "Entrepreneurs" are those who self-report as self-employed with permanent worker for their primary job (job which consumes the most time), and "Necessity Self-employed" are those who self-report as self-employed with unpaid family worker/temporary worker or self-employed own-account. 4) Asset Index is constructed from a series of questions regarding the ownership of household asset. The asset index is standardized by each wave with all respondents in IFLS. 5) All regressions include controls for quadratic age function, Javanese (main ethnicity in Indonesia), Muslim, Married and Urban dummies, survey wave (year) fixed effects and region fixed effects. Standard errors are clustered at subdistrict level. Significant level: *0.10**0.05***0.01.

Table 14: First-Difference OLS Regression - Change of RA on Change of Employment Type From Wage Work (Men)

	(1) Change of Measure1	(2) Become More Risk Averse Measure1	(3) Become Less Risk Averse Measure1	(4) Change of Measure2	(5) Become More Risk Averse Measure2	(6) Become Less Risk Averse Measure2
Δ Entrepreneur	-0.262	-0.120	-0.020	-0.791**	-0.031	0.336**
	(0.325)	(0.096)	(0.119)	(0.371)	(0.093)	(0.135)
Δ Necessity Self-employed	-0.574*	-0.046	0.150*	-0.244	-0.007	0.064
	(0.294)	(0.071)	(0.079)	(0.167)	(0.048)	(0.054)
Δ Non-worker	-0.003	0.034	0.001	-0.253*	-0.055	0.033
	(0.239)	(0.066)	(0.067)	(0.130)	(0.036)	(0.046)
Δ Agriculture	0.137	0.117	0.006	0.012	0.051	-0.005
	(0.282)	(0.073)	(0.068)	(0.132)	(0.045)	(0.041)
Δ Asset Index	-0.045	-0.007	0.005	-0.009	-0.004	0.004
	(0.056)	(0.015)	(0.016)	(0.032)	(0.010)	(0.010)
Observations	760	760	760	1220	1220	1220
Adjusted R^2	0.001	0.001	-0.001	0.006	-0.001	0.007

Notes: 1) Each column represents a first-difference OLS regression with different dependent variables. The dependent variables are define as (i) the change of RA Measures from 2007 to 2014, ranging from -3 to 3; (ii) Become More Risk Averse =1 if change of RA Measure > 0, =0 if change of RA Measure ≤ 0; (iii) Become Less Risk Averse =1 if change of RA Measure < 0, =0 if change of RA Measure ≥ 0. 2) The independent variables includes the dummies of change from wage workers to other types of employment and the change of asset index. For example, ΔEntrepreneur is 1 if the individual transitions from a wage worker to an entrepreneur from 2007 to 2014. The omitted group is those who have no transition from wage jobs. 3) Standard errors in parentheses, clustered at subdistrict level. Significant level: *0.10**0.05***0.01.

Table 15: First-Difference OLS Regression - Change of RA on Change of Employment Type From Wage Work (Women)

	(1) Change of Measure1	(2) Become More Risk Averse Measure1	(3) Become Less Risk Averse Measure1	(4) Change of Measure2	(5) Become More Risk Averse Measure2	(6) Become Less Risk Averse Measure2
Δ Entrepreneur	0.511 (0.554)	0.047 (0.214)	-0.134 (0.223)	0.008 (1.070)	0.157 (0.219)	0.135 (0.215)
Δ Necessity Self-employed	-0.128 (0.424)	-0.018 (0.094)	0.141 (0.131)	-0.238 (0.211)	0.009 (0.057)	0.098 (0.077)
Δ Non-worker	0.065 (0.195)	0.094* (0.055)	-0.022 (0.061)	-0.022 (0.075)	0.004 (0.027)	0.046 (0.031)
Δ Agriculture	1.679 (1.093)	0.265 (0.361)	-0.370*** (0.055)	-0.131 (0.144)	-0.093*** (0.017)	0.023 (0.137)
Δ Asset Index	-0.070 (0.085)	-0.027 (0.024)	0.012 (0.025)	0.016 (0.034)	0.003 (0.013)	-0.022* (0.013)
Observations	290	290	290	535	535	535
Adjusted R^2	-0.003	0.002	-0.006	-0.005	-0.006	0.002

Notes: 1) Each column represents a first-difference OLS regression with different dependent variables. The dependent variables are define as (i) the change of RA Measures from 2007 to 2014, ranging from -3 to 3; (ii) Become More Risk Averse =1 if change of RA Measure > 0, =0 if change of RA Measure ≤ 0; (iii) Become Less Risk Averse =1 if change of RA Measure < 0, =0 if change of RA Measure ≥ 0. 2) The independent variables includes the dummies of change from wage workers to other types of employment and the change of asset index. For example, ΔEntrepreneur is 1 if the individual transitions from a wage worker to an entrepreneur from 2007 to 2014. The omitted group is those who have no transition from wage jobs. 3) Standard errors in parentheses, clustered at subdistrict level. Significant level: *0.10**0.05***0.01.

Appendix

Table A1: Men's Median Earnings from Primary Job Last Year by Risk Attitudes Measures

	RA Measure1 2007	RA Measure2 2007	RA Measure1 2014	RA Measure2 2014
1	7,500,000 [718]	9,900,000 [262]	18,000,000 [902]	26,900,000 [219]
2	7,200,000 [310]	7,500,000 [101]	18,000,000 [447]	14,400,000 [101]
3	7,200,000 [225]	7,200,000 [303]	16,650,000 [386]	15,815,000 [342]
4	7,200,000 [1004]	7,000,000 [2464]	15,100,000 [825]	14,400,000 [2376]
Irrational	6,187,500 [1158]	6,000,000 [285]	10,800,000 [923]	12,000,000 [445]
Total	7,150,000 [3415]	7,150,000 [3415]	14,400,000 [3483]	14,400,000 [3483]

Notes: The table displays the median earnings from primary job last year in Rupiah within the group of certain choice of RA measure and year. If the respondents are self-employed, the earning is self-reported net profit (can be less than zero). Total number of observations in brackets.

Table A2: Women's Median Earnings from Primary Job Last Year by Risk Attitudes Measures

	RA Measure1 2007	RA Measure2 2007	RA Measure1 2014	RA Measure2 2014
1	3,750,000 [194]	6,000,000 [61]	6,050,000 [338]	8,520,000 [67]
2	3,550,000 [130]	6,000,000 [43]	6,000,000 [279]	3,150,000 [41]
3	4,100,000 [96]	3,000,000 [108]	7,300,000 [225]	6,000,000 [208]
4	4,800,000 [506]	3,600,000 [1284]	7,200,000 [545]	6,000,000 [1486]
Irrational	3,000,000 [682]	3,040,000 [112]	5,000,000 [624]	5,000,000 [209]
Total	3,600,000 [1608]	3,600,000 [1608]	6,000,000 [2011]	6,000,000 [2011]

Notes: The table displays the median earnings from primary job last year in Rupiah within the group of certain choice of RA measure and year. If the respondents are self-employed, the earning is self-reported net profit (can be less than zero). Total number of observations in brackets.

Table A3: Men's Average Household Asset Index by Risk Attitudes Measures

	RA Measure1 2007	RA Measure2 2007	RA Measure1 2014	RA Measure2 2014
1	0.04 [774]	0.16 [294]	0.09 [945]	0.35 [231]
2	-0.06 [346]	0.05 [110]	0.20 [478]	0.04 [105]
3	0.15 [243]	0.10 [323]	0.13 [411]	0.13 [361]
4	0.07 [1091]	-0.02 [2671]	0.08 [873]	0.06 [2531]
Irrational	-0.07 [1249]	-0.01 [305]	-0.05 [994]	-0.06 [473]
Total	0.01 [3703]	0.01 [3703]	0.07 [3701]	0.07 [3701]

Notes: The table displays the average asset index within the group of certain choice of RA measure and year. Asset index is constructed from a series of questions regarding the ownership of household asset. The asset index is standardized by each wave with all respondents in IFLS. Total number of observations in brackets.

Table A4: Women's Average Household Asset Index by Risk Attitudes Measures

	RA Measure1 2007	RA Measure2 2007	RA Measure1 2014	RA Measure2 2014
1	0.131 [387]	0.241 [116]	0.183 [574]	0.168 [95]
2	0.198 [271]	0.278 [82]	0.155 [467]	0.026 [76]
3	0.250 [180]	0.131 [214]	0.215 [382]	0.158 [349]
4	0.245 [1084]	0.140 [2819]	0.136 [920]	0.106 [2558]
Irrational	0.046 [1531]	0.058 [222]	-0.048 [1107]	-0.036 [372]
Total	0.141 [3453]	0.141 [3453]	0.096 [3450]	0.096 [3450]

Notes: The table displays the average asset index within the group of certain choice of RA measure and year. Asset index is constructed from a series of questions regarding the ownership of household asset. The asset index is standardized by each wave with all respondents in IFLS. Total number of observations in brackets.

Table A5: Distribution of Risk Attitudes Measure1 in 2007 and 2014 (Men)

RA Measure1 in 2007	RA Measure1 in 2014					
	1	2	3	4	Irrational	Total
1	235 [6.35]	94 [2.54]	76 [2.05]	168 [4.54]	201 [5.43]	774 [20.90]
2	101 [2.73]	39 [1.05]	44 [1.19]	80 [2.16]	82 [2.21]	346 [9.34]
3	59 [1.59]	33 [0.89]	38 [1.03]	58 [1.57]	55 [1.49]	243 [6.56]
4	258 [6.97]	146 [3.94]	129 [3.48]	295 [7.97]	263 [7.10]	1091 [29.46]
Irrational	293 [7.91]	166 [4.48]	124 [3.35]	272 [7.35]	394 [10.64]	1249 [33.73]
Total	946 [25.55]	478 [12.91]	411 [11.10]	873 [23.58]	995 [26.87]	3703 [100.00]

Notes: The table displays number of observations. Percentage of total observations in brackets.

Table A6: Distribution of Risk Attitudes Measure2 in 2007 and 2014 (Men)

RA Measure2 in 2007	RA Measure2 in 2014					
	1	2	3	4	Irrational	Total
1	39 [1.05]	12 [0.32]	31 [0.84]	166 [4.48]	46 [1.24]	294 [7.94]
2	9 [0.24]	5 [0.14]	11 [0.30]	74 [2.00]	11 [0.30]	110 [2.97]
3	34 [0.92]	10 [0.27]	24 [0.65]	216 [5.83]	39 [1.05]	323 [8.72]
4	137 [3.70]	67 [1.81]	267 [7.21]	1876 [50.66]	324 [8.75]	2671 [72.13]
Irrational	12 [0.32]	11 [0.30]	28 [0.76]	200 [5.40]	54 [1.46]	305 [8.24]
Total	231 [6.24]	105 [2.84]	361 [9.75]	2532 [68.38]	474 [12.80]	3703 [100.00]

Notes: The table displays number of observations. Percentage of total observations in brackets.

Table A7: Distribution of Risk Attitudes Measure1 in 2007 and 2014 (Women)

RA Measure1 in 2007	RA Measure1 in 2014					
	1	2	3	4	Irrational	Total
1	82	49	43	97	116	387
	[2.37]	[1.42]	[1.24]	[2.81]	[3.36]	[11.20]
2	53	40	24	69	85	271
	[1.53]	[1.16]	[0.69]	[2.00]	[2.46]	[7.84]
3	22	33	28	50	47	180
	[0.64]	[0.96]	[0.81]	[1.45]	[1.36]	[5.21]
4	163	147	127	320	328	1085
	[4.72]	[4.25]	[3.68]	[9.26]	[9.49]	[31.40]
Irrational	254	198	161	386	533	1532
	[7.35]	[5.73]	[4.66]	[11.17]	[15.43]	[44.34]
Total	574	467	383	922	1109	3455
	[16.61]	[13.52]	[11.09]	[26.69]	[32.10]	[100.00]

Notes: The table displays number of observations. Percentage of total observations in brackets.

Table A8: Distribution of Risk Attitudes Measure2 in 2007 and 2014 (Women)

RA Measure2 in 2007	RA Measure2 in 2014					
	1	2	3	4	Irrational	Total
1	9	2	16	73	16	116
	[0.26]	[0.06]	[0.46]	[2.11]	[0.46]	[3.36]
2	2	1	13	61	5	82
	[0.06]	[0.03]	[0.38]	[1.77]	[0.14]	[2.37]
3	8	3	31	150	22	214
	[0.23]	[0.09]	[0.90]	[4.34]	[0.64]	[6.19]
4	65	63	266	2122	305	2821
	[1.88]	[1.82]	[7.70]	[61.42]	[8.83]	[81.65]
Irrational	11	7	23	157	24	222
	[0.32]	[0.20]	[0.67]	[4.54]	[0.69]	[6.43]
Total	95	76	349	2563	372	3455
	[2.75]	[2.20]	[10.10]	[74.18]	[10.77]	[100.00]

Notes: The table displays number of observations. Percentage of total observations in brackets.

Table A9: First-Difference OLS Regression - Change of RA on Change of Employment Type From Wage Work (Men)

	(1) Change of Measure1	(2) Become More Risk Averse Measure1	(3) Become Less Risk Averse Measure1	(4) Change of Measure2	(5) Become More Risk Averse Measure2	(6) Become Less Risk Averse Measure2
Δ Entrepreneur	-0.265	-0.120	-0.020	-0.792**	-0.031	0.337**
	(0.324)	(0.096)	(0.119)	(0.373)	(0.093)	(0.135)
Δ Necessity Self-employed	-0.581**	-0.047	0.150*	-0.245	-0.007	0.065
	(0.292)	(0.071)	(0.079)	(0.167)	(0.047)	(0.054)
Δ Non-worker	0.017	0.037	-0.002	-0.252*	-0.055	0.033
	(0.239)	(0.066)	(0.066)	(0.130)	(0.036)	(0.046)
Δ Agriculture	0.147	0.118	0.005	0.012	0.051	-0.005
	(0.283)	(0.074)	(0.068)	(0.132)	(0.045)	(0.041)
Observations	761	761	761	1220	1220	1220
Adjusted R^2	0.001	0.002	0.000	0.007	-0.000	0.007

Notes: 1) Each column represents a first-difference OLS regression with different dependent variables. The dependent variables are define as (i) the change of RA Measures from 2007 to 2014, ranging from -3 to 3; (ii) Become More Risk Averse =1 if change of RA Measure > 0, =0 if change of RA Measure ≤ 0; (iii) Become Less Risk Averse =1 if change of RA Measure < 0, =0 if change of RA Measure ≥ 0. 2) The independent variables includes the dummies of change from wage workers to other types of employment and the change of asset index. For example, ΔEntrepreneur is 1 if the individual transitions from a wage worker to an entrepreneur from 2007 to 2014. The omitted group is those who have no transition from wage jobs. 3) Standard errors in parentheses, clustered at subdistrict level. Significant level: *0.10**0.05***0.01.

Table A10: First-Difference OLS Regression - Change of RA on Change of Employment Type From Wage Work (Women)

	(1) Change of Measure1	(2) Become More Risk Averse Measure1	(3) Become Less Risk Averse Measure1	(4) Change of Measure2	(5) Become More Risk Averse Measure2	(6) Become Less Risk Averse Measure2
Δ Entrepreneur	0.541	0.058	-0.140	0.006	0.157	0.137
	(0.564)	(0.222)	(0.222)	(1.067)	(0.218)	(0.218)
Δ Necessity Self-employed	-0.121	-0.015	0.140	-0.235	0.010	0.094
	(0.433)	(0.099)	(0.131)	(0.211)	(0.058)	(0.077)
Δ Non-worker	0.059	0.092*	-0.021	-0.020	0.004	0.043
	(0.193)	(0.054)	(0.061)	(0.074)	(0.027)	(0.031)
Δ Agriculture	1.791*	0.308	-0.390***	-0.136	-0.093***	0.030
	(1.082)	(0.358)	(0.038)	(0.144)	(0.017)	(0.138)
Observations	290	290	290	537	537	537
Adjusted R^2	-0.002	0.000	-0.003	-0.004	-0.004	-0.000

Notes: 1) Each column represents a first-difference OLS regression with different dependent variables. The dependent variables are define as (i) the change of RA Measures from 2007 to 2014, ranging from -3 to 3; (ii) Become More Risk Averse =1 if change of RA Measure > 0, =0 if change of RA Measure ≤ 0; (iii) Become Less Risk Averse =1 if change of RA Measure < 0, =0 if change of RA Measure ≥ 0. 2) The independent variables includes the dummies of change from wage workers to other types of employment and the change of asset index. For example, ΔEntrepreneur is 1 if the individual transitions from a wage worker to an entrepreneur from 2007 to 2014. The omitted group is those who have no transition from wage jobs. 3) Standard errors in parentheses, clustered at subdistrict level. Significant level: *0.10**0.05***0.01.

Table A11: First-Difference OLS Regression - Excluding Top Coding in RA Measures (Men)

	(1) Become More Risk Averse Measure1	(2) Become Less Risk Averse Measure1	(3) Become More Risk Averse Measure2	(4) Become Less Risk Averse Measure2
Δ Entrepreneur	-0.303**	0.133	-0.140	0.405***
	(0.131)	(0.159)	(0.280)	(0.143)
Δ Necessity Self-employed	-0.053	0.208***	0.110	0.063
	(0.110)	(0.079)	(0.085)	(0.057)
Δ Non-worker	0.009	-0.008	-0.021	0.024
	(0.089)	(0.081)	(0.116)	(0.047)
Δ Agriculture	0.094	0.038	0.063	-0.008
	(0.091)	(0.082)	(0.077)	(0.044)
Observations	418	527	259	1118
Adjusted R^2	0.005	0.003	-0.008	0.009

Notes: 1) Each column represents a first-difference OLS regression with different dependent variables. The dependent variables are define as (i) Become More Risk Averse =1 if change of RA Measure > 0, =0 if change of RA Measure ≤ 0, excluding those who chose most risk averse option in 2007; (ii) Become Less Risk Averse =1 if change of RA Measure < 0, =0 if change of RA Measure ≥ 0, excluding those who chose most risk tolerant option in 2007. 2) The independent variables includes the dummies of change from wage workers to other types of employment and the change of asset index. For example, ΔEntrepreneur is 1 if the individual transitions from a wage worker to an entrepreneur from 2007 to 2014. The omitted group is those who have no transition from wage jobs. 3) Standard errors in parentheses, clustered at subdistrict level. Significant level: *0.10**0.05***0.01.