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# Temporal Stability of Risk Attitudes and the Impact of Adverse Shocks—A Panel Data Analysis from Thailand and Vietnam

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**Summary.** — Exogenous negative shocks and intrinsic risk attitudes are two important elements characterizing the vicious cycle of poverty associated with rural households in developing countries. Recent empirical studies suggest that adverse shocks—a key driver of poverty—can trigger substantial changes in the risk attitudes of poor people, leading to decisions that perpetuate their lives in poverty. Although the temporal variability of risk attitudes is a controversial topic, the literature advocating the temporal variability of risk attitudes suggests that covariate shocks, such as natural disasters, alter risk attitudes over time, whereas idiosyncratic shocks show no such significant impact.

This paper aims to test the temporal stability of risk attitudes in rural households in Thailand and Vietnam to determine whether this pattern—covariate shocks that affect risk attitudes and idiosyncratic shocks that do not—can be confirmed for these households. I use an exogenous measure of shocks to explain temporal variation in risk attitudes. Thus, I estimate variation in consumption using a multilevel model in which variation in consumption at the individual level serves as a proxy for idiosyncratic shocks, while variation in consumption at the aggregate level is used to measure covariate shocks.

My study finds temporal variability in risk attitudes that is driven by covariate shocks in Vietnam and—in contrast to past research—by idiosyncratic shocks in Thailand.

The results suggest that Vietnamese respondents may be better in insuring idiosyncratic risks for example through safety nets, while mutual insurance across individuals does not seem to work well in Thailand. In addition, results indicate that the mutual insurance problem in Thailand seems to increase in wealth.

The differences that I find between Thailand and Vietnam and across poverty types correspond to the difference in political systems and consequently the focus of socio-political measures. Thailand's recent political volatility and the growing lack of social cohesion in Thai society support these findings.

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## 1. INTRODUCTION

Negative shocks can destroy assets and reduce income. In particular, in developing countries in which the poor face liquidity and asset constraints, negative shocks can keep them below the poverty line or push them even deeper into poverty, sometimes leading to poverty traps (Barrett & Carter, 2013). In this context, risk attitudes play an important role (Mosley & Verschoor, 2005). If negative shocks increase risk aversion, a doubly negative effect may result, as poor and risk-averse people are likely to invest in low-risk and low-return activities, increasing the likelihood that they will remain below the poverty line (Dercon, 1996; Morduch, 1994; Mosley & Verschoor, 2005; Naschold, 2012; Rosenzweig & Binswanger, 1993).

In this paper, I seek to determine whether—and to what extent—shocks affect people's willingness to undertake risk. I argue that certain events may change human risk attitudes over time. Such events can appear on two different levels: (i) idiosyncratic shocks at the individual level, such as sudden unemployment or illness, and (ii) covariate shocks at the aggregate level that affect groups of individuals, such as natural disasters or economic crises.

Long-term panel data studies that have investigated the impact of idiosyncratic and covariate shocks on individual risk attitudes have arrived at one common conclusion: idiosyncratic shocks show no significant impact on risk attitudes, whereas covariate shocks significantly affect risk attitudes (Brunnermeier & Nagel, 2008; Callen, Isaqzadeh, Long, & Sprenger, 2014; Cassar, Healy, & Kessler, 2017; Doss, McPeak, & Barrett, 2008; Guiso, Sapienza, & Zingales,

2013; Hanaoka, Shigeoka, & Watanabe, 2015; Malmendier & Nagel, 2011; Sahm, 2012; Voors *et al.*, 2012; Willinger, Bchir, & Heitz, 2013).

In this paper, I aim to test whether this pattern holds for rural Thailand and Vietnam. Gloede, Menkhoff, and Waibel (2015) have investigated the correlation between self-reported idiosyncratic and covariate shocks and risk attitudes using data collected in 2010 from more than 4,000 households in rural Thailand and Vietnam. In their cross-sectional study, these authors find that idiosyncratic shocks are correlated with higher risk aversion in Vietnam, whereas covariate shocks are associated with higher risk aversion in Thailand. However, I enhance Gloede *et al.* (2015) in several ways. First, I use a panel data set of 2,812 identical respondents from rural Thailand (1,431) and Vietnam (1,381) and analyze the impact of idiosyncratic and covariate shocks on changes in individual risk attitudes from 2008 to 2010. Second, I do not use self-reported shocks because I posit that individual perceptions and emotions strongly influence a respondent's propensity to

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report a shock. For example, a risk-averse respondent might perceive a shock differently than a risk-taking respondent and thus report more shocks, which would lead to bias in the explanation of risk attitudes through self-reported shocks. With this in mind, I use a more objective measure of experienced shocks and assume that the impact of a shock is reflected in the variation in consumption. Therefore, I estimate the variation in consumption using Günther and Harttgen's (2009) concept of vulnerability to idiosyncratic and covariate shocks. Third, I apply multilevel modeling to distinguish between the impact of idiosyncratic shocks and covariate shocks over time. In particular, I estimate the variation in consumption at the individual level and at the community level to use as proxies for idiosyncratic and covariate shocks, respectively. In the next step, I use these proxies to explain changes in risk attitudes over time. Finally, I examine the estimated impact of shocks on changes in risk attitudes for various poverty groups.

My main findings are as follows. First, risk attitudes significantly change over the three-year period both in Thailand and Vietnam. Second, I find that idiosyncratic shocks affect the risk attitudes of respondents in Thailand, whereas covariate shocks impact the risk attitudes of respondents in Vietnam. Third, the Thai pattern that only idiosyncratic shocks affect respondents' risk aversion also holds across various poverty groups, which could indicate that mutual insurance against idiosyncratic shocks, such as risk sharing or safety nets, is not effective in Thailand. Fourth, the overall magnitude of the idiosyncratic shock impact seems to increase with rising poverty thresholds, which could suggest that the mutual insurance problem in Thailand is increasing with wealth. Fifth, the examination of the impact of shocks for various poverty groups in Vietnam shows that across all thresholds the impact of covariate shocks is stronger for the poor. This observation may indicate the existence of a negative feedback loop in which shocks increase poor individuals' risk aversion and (consequently) their likelihood of remaining in poverty (Dercon, 1996; Morduch, 1994; Mosley & Verschoor, 2005; Naschold, 2012; Rosenzweig & Binswanger, 1993).

The country-specific differences in the types of shocks that affect risk attitudes in Thailand and Vietnam might be explained by political differences. Until 2011, the Thai government's sparse public investment in social protection schemes left most small-scale farmers in rural areas unprotected (Schmitt, Sakunphanit, & Prasitsiriphol, 2013). In particular, the unstable political situation and the increasing social gap increased this group's sensitivity to idiosyncratic risk. Conversely, Vietnam has witnessed an extensive public investment in social protection over the most recent ten years that has targeted vulnerable groups, in particular, which might lead to reduced idiosyncratic risk, but such investments are not effective at reducing covariate risk (Bonnet, Cichon, Galian, Mazelkaite, & Schmitt, 2012; Cuong, Tung, & Westbrook, 2014).

My findings are both similar to and different from findings of recent studies applying longitudinal data from developing countries. My finding that risk attitudes are time-variant in Thailand and Vietnam corresponds with other long-term panel studies in rural areas of Southeast Asia. Respondents from rural areas who have experienced natural disasters, such as the 2004 tsunami in Thailand (Cassar *et al.*, 2017) or the 2010 volcanic eruption in central Java (Willinger *et al.*, 2013), showed significant changes in risk attitudes. My finding that covariate shocks affect risk attitudes in Vietnam is therefore consistent with these studies. However, my finding that idiosyncratic shocks alter risk attitudes in Thailand contradicts findings from East Africa, where the impact of idiosyn-

cratic shocks on farmers' risk attitudes was found to be less salient than the impact of covariate shocks (Doss *et al.*, 2008).

In the next section, I review the literature and develop my conceptual framework, which is followed in the subsequent section by a description of the data. Section four introduces the empirical strategy. In section five, I present the results, and I draw conclusions in section six.

## 2. CONCEPTUAL FRAMEWORK

There are two strands of literature on time-variant risk attitudes. On the one hand, some studies find that risk attitudes are a stable function of time. However, all these studies were conducted with small samples of respondents from developed countries (mostly students) who were interrogated in an experimental laboratory set up over short time horizons (Harrison, Johnson, McInnes, & Rutström, 2005; Love & Robison, 1984; Lönnqvist, Verkasalo, Walkowitz, & Wichardt, 2015; Schoemaker & Hershey, 1992; Smidts, 1997; Vlaev, Chater, & Stewart, 2009; Wölbelt & Riedl, 2013).

On the other hand, some studies investigate the causality between shocks and risk attitudes using long-term panel data. These studies reach a common conclusion: idiosyncratic shocks at the individual level show no significant impact on risk attitudes, whereas covariate shocks at the aggregate level have significant effects on risk attitudes.

Long-term studies using panel data that cover large samples of respondents from the US over ten years (Sahm, 2012) and over 20 years (Brunnermeier & Nagel, 2008) find that idiosyncratic shocks (such as unemployment, health shocks, or changes in income, assets or wealth) do not affect the stability of risk attitudes over time. Empirical evidence from East Africa also suggests that the influence of idiosyncratic shocks is weak (Doss *et al.*, 2008). In contrast, long-term panel studies that measure covariate shocks, including economic shocks (Guiso *et al.*, 2013; Malmendier & Nagel, 2011; Sahm, 2012), social shocks (Callen *et al.*, 2014; Voors *et al.*, 2012), and natural disasters (Cassar *et al.*, 2017; Hanaoka *et al.*, 2015; Willinger *et al.*, 2013) at an aggregate level find that these shocks alter risk attitudes over time. For example, Malmendier and Nagel (2011) and Sahm (2012) find that macro-economic shocks have a significant effect on the risk attitudes of US citizens over time. Guiso *et al.* (2013) investigate changes in the risk attitudes of Italian investors following the 2008 financial crisis. The literature on social shocks has shown that risk attitudes change over time when people suffer through violent conflicts and war. For example, Voors *et al.* (2012) and Callen *et al.* (2014) have reported this effect in rural Burundi and Afghanistan, respectively. Panel studies that investigate the impact of natural disasters, including the 2004 tsunami in Thailand (Cassar *et al.*, 2017), the volcanic eruption in Java (Willinger *et al.*, 2013) and the great East Japan earthquake (Hanaoka *et al.*, 2015), also find that these disasters significantly affect individual risk attitudes over time.

This commonly observed phenomenon—that covariate shocks matter and that idiosyncratic shocks do not—may be explained by the notion that insurance mechanisms for consumption are more effective with idiosyncratic shocks than with covariate shocks. A community's mutual insurance mechanisms are more likely to mitigate idiosyncratic shock impacts because such shocks, by definition, are not correlated across individual households (Ray, 1998). Alternatively, Guiso *et al.* (2013) suggest that large-scale negative shocks may create a state of collective fear that individuals are likely to absorb, thereby leading to increased risk aversion.

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