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### **Individual risk attitudes and local unemployment: Evidence from Italy in the Great Recession**

by

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# **Individual risk attitudes and local unemployment: Evidence from Italy in the Great Recession**

## **Abstract**

The willingness to take risks is an important part of the economy as it underpins activities such as entrepreneurship and investments. Individual risk attitudes are likely to be shaped both by their personal characteristics and their local context. In this paper we investigate the extent to which individual risk-taking attitudes are influenced by the strength, or otherwise, of their local economy, using panel data on over 12,000 Italians. After controlling for individual characteristics - including individual job loss - and province fixed effects, we find that worsening unemployment reduces people's willingness to take risks. By reducing tolerance of risk, local unemployment may hinder the abilities of local economies to respond to shocks.

**Key words:** risk attitude; territorial impact of the crisis; uneven regional development; regional resilience; psychology

## 1. Introduction

Risk is an important part of the capitalist economy. Risk taking is associated with innovation (Roper and Tapinos, 2016), entrepreneurship (Cui et al., 2016), migration, and investment in education, human or physical capital.<sup>3</sup> All these activities are fundamental drivers of economic recovery, particularly during a period of economic stagnation in which demand in the labour market is weak, companies are reluctant to hire, the geography of job opportunities changes swiftly and the costs opportunity for investing in education are lower. Because of this, willingness to take risks – so-called ‘risk attitudes’ – are of considerable economic significance.

A wide range of studies in psychology consider the individual determinants of risk attitudes.<sup>4</sup> Yet there is good reason to think that risk attitudes may also be determined by the strength of the economy. Scholars have tended to argue that economic downturns provide an opportunity for people to take risks. As Phelps argued “When firms hit by reduced demand stop hiring for a time, some people who would have joined established firms use their situation to dream up new products or methods and organize start-ups to develop them. The growing number of aspiring innovators toiling in home garages may self-produce some of their capital goods” (Phelps, 2016). Unemployed or under-employed individuals can take the opportunity to become entrepreneurs and start their new firm. Both Bill Gates and Steve Jobs founded *Microsoft* and *Apple* respectively during the major crisis on the 1970s (Archibugi et al., 2013b). During recessions, the opportunity costs of investment in (re-) training and human capital are lower (Felstead et al., 2012; Brunello, 2009). Further, people can be encouraged to move to find a job.

However, the impact of the *local* economy on risk attitudes has been relatively neglected. This is an important omission and it isn’t clear whether a weaker local economy would increase people’s willingness to take risk or increase it. On the one hand, individuals in crisis-hit regions may try and hold onto what they have – reducing their propensity to take risks. If this is the case, a local economic shock would reduce willingness to take risks, and so hinder

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<sup>3</sup> The seminal contribution on risk and entrepreneurship is (Knight, 1921), and for risk in investment in human capital is (Becker, 1962); Schumpeter (1911) stressed the risk-taking nature of those entrepreneurs that introduced radical innovation. For more recent research, see among others: (Guiso and Paiella, 2004; Koellinger, 2008; Jaeger et al., 2010; Tsai et al., 2010).

<sup>4</sup> The psychological effects of economic downturns, is instead a well-established stream of research in other areas (e.g. Catalano et al., 2011); for recent studies on the current Great Recession see among others (Ayers et al., 2012; Tubadji et al., 2016).

the ability of the local economy to respond. Alternatively, individuals may see a crisis as an opportunity and so be more willing to take risks. In this case, individuals in crisis-hit regions might become more willing to take risks, start new ventures, innovate, and make productive investments.

In this paper we test the relationship between the strength of the local economy and risk attitudes using rich Italian panel data covering more than 12,500 individuals over the period 2008-2011 in the 110 Italian provinces. We address the following research question: *how do local economic conditions influence individual risk propensity?* We take change in unemployment as a measure of the magnitude of the shock brought about by the recession to predict individual willingness to take on risk. We take a regional perspective because individual risk propensity is more likely to be affected by the regional/local labour market conditions rather than by the national one. The Italian labour market is not characterized by high mobility. Further, the effects of the recession have been different across regions. The nature of our data means we focus on the period 2010 – 2011, a period where there was aggregate recovery but the recovery was uneven. Our paper has thus to be interpreted as a short-term analysis of the possible relationship between local recessions and local individual risk propensity.

Our results show that while individual characteristics predict risk attitude according to the theory and previous empirical research, local factors also matter. After controlling for individual characteristics, including labour market outcomes, and province fixed effects, the change in the rate of province unemployment is a strong predictor of change in risk attitude in individuals. Regions which experience a negative unemployment shock also find their residents are less willing to take risks. Given that studies suggest attitudes to risk are important for entrepreneurship, investment and other potentially economic outcomes, this change in risk attitudes may influence recovery. Our evidence has important implications for policy, discussed in detail in the concluding section.

The paper is organized as follows. In section two we discuss the economic and psychological literature on risk attitude and argue that the local economy is an underexplored area of research here. Next, we present descriptive data on the recession in Italy and describe the individual level data we will use. In section four we outline the results of a series of regression models which investigate the extent to which local factors help explain risk attitude. Finally, we conclude with the implications of our study for work in this area.

## ***2. The local determinants of risk attitudes***

### *Risk and economic crises*

The classic Schumpeterian arguments about entrepreneurship and innovation highlight the importance of risk-taking, particularly in post-crisis periods. In the Schumpeterian framework, recessions provide an opportunity for new innovation to emerge (Archibugi et al., 2013a). Also in the ‘Kondratieff waves’ innovations tend to cluster during major recessions although applied in the aftermath: “during the recession of the long waves, an especially large number of important discoveries and inventions in the technique of production and communication are made, which, however, are usually applied on a large scale only at the beginning of the next long upswing” (Kondratieff, 1935, p. 105). As demand for existing products falls, entrepreneurs may innovate to enter new markets and workers made redundant by existing firms may start new companies to compete. The result is that a recession can lead to a new wave of innovation and entrepreneurship. New firms are eager to exploit new technological opportunities as a way to challenge incumbent corporations; as Schumpeter suggested, “it is not the owner of the stage-coaches who builds railways” (Schumpeter, 1911, p. 66). Prospect theory suggests that the individual risk attitude depends on their idiosyncratic reference point, defined by the situation to which individual aspire (Kahneman and Tversky, 1979). Hence a recession may cause a significant drop in income below the individual reference point; this, in turn, may trigger risk seeking behaviour. This is confirmed for instance by Koellinger’s (2008) study showing that very innovative businesses are associated with high risk and are likely to be pursued from individuals who have less to lose. A recent study shows that German start-ups founded during the crisis introduce more radical innovation compared to start-ups founded in pre-crisis years (Lebdi and Hussinger, 2016).

Economic crises tend to have uneven spatial impacts, and some regions will suffer more than others, depending on their specific economic structure, industrial specialization, institutional capacity, and so forth (Lee, 2014). Within this context, mobility can play a great role in smoothing territorial imbalances by moving workers from high-unemployment areas to those where it is lower. According to human capital theory, mobility *is* in fact an investment in human capital (Becker, 1964). The remarkable rise in the number of recent migrants from the South of Europe towards Germany represents a case in point. If risk takers are more willing to invest in mobility this would make the labour market more efficient.

Each requires people to be willing to take a risk, and so start-up new companies, invest in new skills, or move to new areas. In entrepreneurship research, a higher tolerance for risk is seen as one determinant of entries into self-employment or entrepreneurship. Researchers in innovation, beginning with Schumpeter, highlighted the need for individuals to take risks to disrupt existing markets and drive economic growth. In finance, a tolerance for risk is seen as one factor shaping whether investors contribute to risky, innovative projects, and classic theories of finance suggesting that investment decisions are made according to expected returns, likely risk and the tolerance of the investor to facing that risk (Kaufmann et al., 2013).

#### *Local determinants of risk attitudes*

A wide literature in psychology and economics now considers the determinants of risk attitudes (e.g. Pierucci and Ventura, 2010). Studies tend to be based on survey data with the dependent variable being constructed from a question about a willingness to undergo some form of risk and a series of characteristics being associated with the risk propensity. For example, using German data Dohmen et al. (2009) show that in general being male, tall, young, unmarried, better educated, having higher life satisfaction and higher income, wealth and debt are all associated with a general measure of being riskier. They also show some variation by occupation.

Yet, while many studies consider cross-sectional variation in risk attitudes, fewer consider either the influence of local factors. But there are important reasons why individual risk attitudes might be influenced by the local economy, and particularly with the labour market performance. Firstly, the literature on determinants of risk attitudes suggests that it is determined partly by factors such as income, employment status and personal finances, and these are likely to change significantly in the event of an economic crisis which hit the labour market remarkably. In the current recession, the regional nature of the impact of the crisis makes the analysis of the local economic circumstances more significant. Secondly, an individuals' expectations of the future might also change or be shaped by their circumstances. Considering this phenomenon, Malmendier and Nagel (2011) find that economic events have long-term implications on the risk attitudes of the cohorts who experience them. They show that those for whom the stock market experienced higher returns when young are more likely to be tolerant of financial risk when older, whether this is defined using a self-reported risk tolerance variable or indicators of stock market investment. Thirdly, the consequences of a risk might become more apparent in the aftermath of a crisis. In depressed economic

conditions it may be harder to restore finances or alternative employment may be harder to obtain. In this case, “the shift in the distribution of willingness to take risks that accompanies the crisis is not only triggered by the realized decline in economic prosperity but also induced by changing expectations and the perception of increased uncertainty.” (Dohmen et al. 2015).

This limited literature shows that the risk attitude of people is shaped by local economic conditions. The issue here is to understand in what direction. In fact, it is possible to envisage two opposing hypotheses about the correlation between individual risk aversion and the magnitude of regional economic recession.

The former would envisage a situation in which the crisis represents an opportunity. This hypothesis echoes the works by Schumpeterian, whose quintessential dynamic entrepreneur would see a major crisis as an opportunity to react by introducing herself a new innovation and by creating a new firm (Schumpeter, 1911). The argument is restated by Schumpeter (1947) in an article which has been relatively neglected compared to the other works of the Austrian economist (Antonelli, 2015). In his article “The creative response in history”, Schumpeter makes an important distinction about the way in which economies respond to what today we could define as exogenous change. He distinguished between adaptive response and creative response. The former is a reaction to a change “in the way that traditional theory describes”; this is some form of change that can be predicted ex-ante on the base of current economic theories. By contrast, a creative response is when “the economy or an industry or some firms in an industry do something else, something that is outside of the range of existing practice”.

The latter contrasting hypothesis is that the dire straits of local economic shock might induce psychological distress on people making individuals less willing to take risks, hindering these activities. This would be more in line with the psychological literature discussed above.

Which one of the two hypotheses hold trues is relevant in that each scenario would require a different kind of policy intervention, and would shed more light on research about the relationship between local economic conditions and individual risk attitude.

### ***3. The impact of the crisis across Italian regions and our data***

#### *Looking within the North-South Italian territorial divide*

Italy is characterized by a deep territorial divide, in terms of economic and social performance, broadly between the Northern and Central regions and the Southern regions. The presence of this long-lasting divide has been explained as a result of differences in cultural development (Tabellini, 2010), the endowment of social capital (Helliwell and Putnam, 1995), quality of local political institutions (Felice, 2011; Percoco, 2014), differences in human capital and initial productivity (Ciccarelli and Fachin, 2016).

However, the much debated North-South divide hides important differences within both the Northern regions and the Southern regions. In fact, the North-west has been traditionally characterized by the presence of some large industries, as it is the case of the automotive Fiat in Turin, while the North-east and some regions of the Centre have been more centered on the role of small dynamic firms. This latter model has been discussed in the literature on the industrial districts (Becattini, 1990) and the so-called flexible specialization (Piore and Sabel, 1984). Further, also in the Southern regions we have been witnessing different patterns over the past decades, with some regions, like Campania and Puglia, that have managed to specialize more “smartly” than the remaining. And yet, one can further observe important industrial agglomeration phenomena in lagging behind regions, as in the cases of the Etna Valley in Sicily and Sardinia (Santangelo, 2004; Tola and Contini, 2015).

This has led scholars to go beyond the broad North-South territorial divide, to explore at a more local level the presence of these significant differences in the patterns of economic development, industrial specialization, and innovation (Cainelli et al., 2015; Evangelista et al., 2002; Faggian et al., 2017; Filippetti et al., 2019).

#### *The local impact of the crisis across Italy*

The importance of the economic territorial difference aroused also recently during the Great Recession that started in 2008 (Lagravinese, 2015; Faggian et al., 2017). Italy consists of 110 provinces and 20 regions. In our empirical analysis we consider how province level

*change* in the rate of unemployment in the period 2008-2011 addresses individual risk attitude.<sup>5</sup>

We focus on a period of moderate economic recovery between 2010 and 2011, in the context of a significant increase in unemployment from 6.8 per cent in 2008 up to 8.4 in 2011. However, this swift rise in unemployment is marked by significant differences across Italy. By looking at the *change* in the rate of unemployment over the same years, the Northern regions registered an increase of the rate of unemployment larger than 40%, while the Southern regions registered an increase equal to 15%. The fact that the crisis hit relatively harder in the Northern regions can depend on different factors. The lower rate of unemployment at the beginning of the period in the first place; the fact that in the South a larger fraction of employment is in the public sector compared to the North; and finally, the acceleration of the decline of the industrial model of specialization of the North, especially in the North-west, in which the transition from an industrial model toward a post-industrial one is still far from being completed (Governa et al., 2009; Petsimeris, 1998).

#### ***4. Data and our measure of risk***

In the empirical analysis we employ data from the PLUS Survey (Participation Labour Unemployment Survey), a sample survey on the Italian labour market supply developed and administered by ISFOL, a national research institute reporting to the Italian Ministry of Labour and Social Policy (Mandrone and Radicchia, 2006). The Survey annually samples, on average, 40,000 individuals, contacted through a dynamic CATI system without proxy interviews. The survey sample design is stratified over the Italian population aged 18-64: strata are defined by region (20 administrative regions), type of city (metropolitan/not metropolitan), age (5 classes), sex, and employment status of the individual (employed, unemployed, student, retired, other inactive/housewife). The reference population is derived from the annual averages of the ISTAT Labour Force Survey.<sup>6</sup>

In the present paper we use a 3-year panel – from the 2008, 2010, and 2011 survey waves – including 12,593 individuals in each wave. The survey is extremely rich in information on individual job features, employer characteristics, type of training activities both within and

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<sup>5</sup> One concern is that there will be spillovers with unemployment in one province influencing individuals in another. Most workers are in a relatively local labour market, but this is a concern which we cannot rule out.

<sup>6</sup> The ISFOL PLUS data are available online by accessing the open data section <http://www.isfol.it/open-data-delle-ricerche/isfol-microdati>

outside the workplace, income, and educational history, at the same time providing detailed information on other crucial aspects of the respondents such as, for instance, family background, residential mobility, general skills (i.e. knowledge of English, information and communication technology (ICT) skills), geographical location, personal life satisfaction, and risk propensity.

Our dependent variable is a measure of individual risk propensity which is not derived by the actual behaviour of the individuals, but rather by asking a hypothetical question about their willingness to risk. In our analysis we use data on 2008 to control for a number of initial conditions and the question about risk in 2011 (the same question is not available for 2008). We then exploit the panel by employing some change in the individual characteristics, namely their change of status in the labour market, to control for some important drivers of risk attitude.

Our measure of risk propensity is derived by the combination of the following two questions:

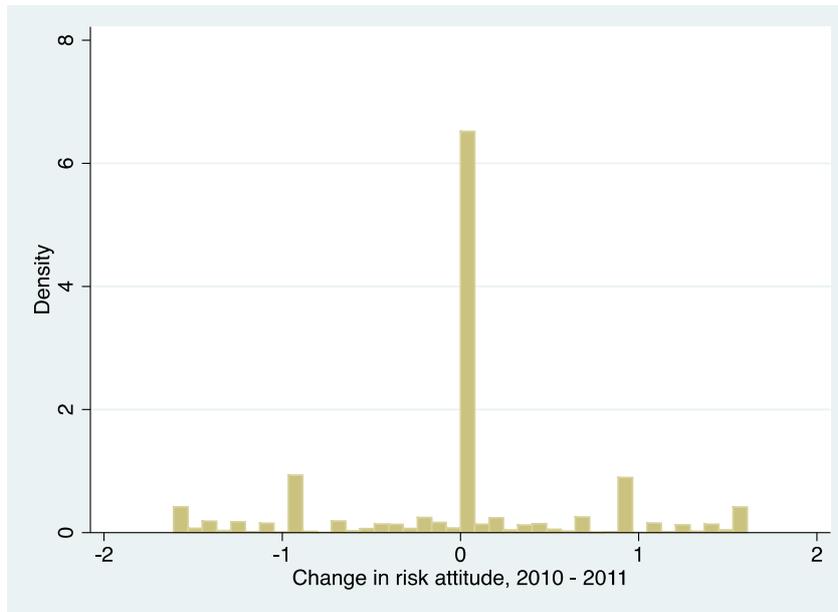
1. *There are 2 closed envelopes: one with euro 100.000 and one with euro 0, you can pick one. For your envelope I offer you euro 20,000, will you accept?" YES, or NO;*

individuals who say NO to the previous question, and then have chosen to take an envelope, are then asked the following:

2. *How much would you give me your envelope for, between 20,000 and 100,000 euros?"*

So individuals who ask this second question will establish their premium for risk between euro 20,000 and euro 100,000. Summing up, we obtain a premium for risk from each individual. This will be equal to euro 20,000 for those who have answered YES at the first question, and a sum between euro 20,000 and euro 100,000 for those who have answered NO. We can hence build a continuous premium for risk for two years – 2010 and 2011 - which we then use to compute our measure of risk propensity which is simply the difference between the two. Figure 1 plots the histogram of this value. We note that it while most change their risk propensity little, there is some variation which is both positive and negative. Those on the left hand side become less willing to take risks; those on the right more so. We deal with potential alternative measures later in the paper.

Figure 1. Change in risk attitude between 2010 – 2011, histogram



## 5. Model and Results

### Model and control variables

As is common in the psychological literature on risk attitudes we estimate a cross-section basic model, similar to a Mincer wage equation, where an individual's psychological profile is a function of a series of control variables including geographical variables. Our basic model is as follows:

$$\Delta \text{Risk}_i = \alpha + \beta_1 \Delta \text{UNEMP}_p + \beta_2 \text{INITIALRISK}_i + \beta_3 \text{LOCAL}_p + \beta_4 \text{PERSONAL1}_i + \beta_5 \text{PERSONAL2}_i + \beta_6 \text{STATUS}_i + \varphi_i + \varepsilon$$

For individual 'i' in province 'p'. Where  $\Delta \text{UNEMP}_p$  is the change in province unemployment between 2010 – 2011 (our main variable of interest) and, to control for lagged values, the level of the rate of unemployment in 2008. Because change in risk attitudes will depend on initial levels, we also include a variable for risk attitudes in 2010 (INITIALRISK). Attitudes to risk will depend on several personal factors, so we include the following controls: age, education, gender, whether individuals are foreign born or live in urban areas, whether they are married, whether they have children, family income and whether they live in a house they own (PERSONAL1).

PERSONAL2 is a set of additional variables for self-reported health, individual satisfaction with life, whether individuals received high grades at school, their English language skills and computer skills. Finally, we control for individual labour market factors (STATUS) at the beginning of the period, and those which might have changed in the period between 2008 and 2011.

Because there are a host of province specific factors which may influence individual psychology, we also include a set of province fixed effects in our full specification ( $\varphi$ ). The error term is  $\varepsilon$ . Standard errors are clustered by province in all regression models.

### *Results*

The results of the model estimated using OLS (with standard errors calculated as cluster in provinces) are outlined in table 1. Our main explanatory variable is the change in the provincial unemployment rate between 2010 and 2011, a period where there was a large shock to the Italian economy. We enter our sets of variables step by step, and all models include province fixed effects. The principal concern in our model is likely to be regression to the mean in our risk attitude variable. To control for this, we begin in column 1 by simply including a variable for initial risk attitude in 2010. This is negatively related to subsequent change, suggesting that those showing higher willingness to take risks moderate down these issues.

Column 2 includes our two geographical variables – the change in province unemployment between 2010 – 11 and the unemployment rate in 2008. Both variables are negatively related to changes in risk attitudes. Without controlling for individual characteristics, and controlling for the level of unemployment in 2008, people in provinces with higher change in unemployment rates have, on average, falls in their attitudes to risk.

Changes in risk attitude will be largely determined by individual characteristics, so we include these in columns 3 - 6. Older people are likely to become more risk-averse, but only before controlling for individual circumstances. Being male matters similarly only before controlling for factors such as presence of children. Columns 4 and 5 introduce a second set of controls for individual characteristics, such as marital status and the ownership of the house, and basic characteristics such as individual satisfaction with life and skills which the psychological literature suggests are related to risk attitudes. Having children is associated with reduced risk propensity in this period (albeit only at the 10% significance level), perhaps

because of the need for stability. In contrast, a higher income is associated with increased risk propensity.

Column 5 introduces a battery of additional controls designed to reflect otherwise unobserved factors such as ability or individual life satisfaction. Of these, individual life satisfaction seems to matter positively, with those happier likely to experience an increase in risk propensity. Similarly, having computer skills seems positively associated with higher risk attitudes. One hypothesis here is that computer skills reflect an ability to adapt to the changing economy.

In column 6 we introduce variables regarding work status, and its change over the considered period. This is our purest case of whether results are driven by individual exposure to unemployment, relative to the perceptions of a weaker local economy. Employment in 2008 is associated with increased propensity to take risk but the coefficient on change in province unemployment, while lower, remains statistically significant even when controlling for individual employment change. In short, local unemployment seems to exert an effect on risk propensities even when controlling for individual unemployment transitions.

The literature on psychology suggests that local effects may be felt particularly for certain groups. In particular, we are interested in two factors. The first is whether effects exist for those of different labour market groups, or whether this applies simply to those who are unemployed. The second is if the effects vary according to educational group. The better educated tend to have more options in the labour market than those who are less educated, and are generally seen as more resilient to local shocks (Lee, 2014). To address these to questions, we run two models with interaction terms. Fitted plots are given in figure 2.

The left-hand panel shows the interaction between employment status and change in unemployment rate, 2010-11. The effect is essentially zero for the inactive, negative but with considerable margin of error for the unemployed, but statistically significant and negative for the employed. The transmission of risk attitudes matters only for those in employment. In contrast, for education (right hand side), there is no effect amongst the less well educated. The coefficient for the high educated is negative, but with a high degree of error. But the only statistically significant result is those who are medium educated. In short, our results seem to be driven by those in work and particularly by those of middle-education level.

*Table 1. Change in risk attitude and local unemployment change, 2010-11, OLS regression*

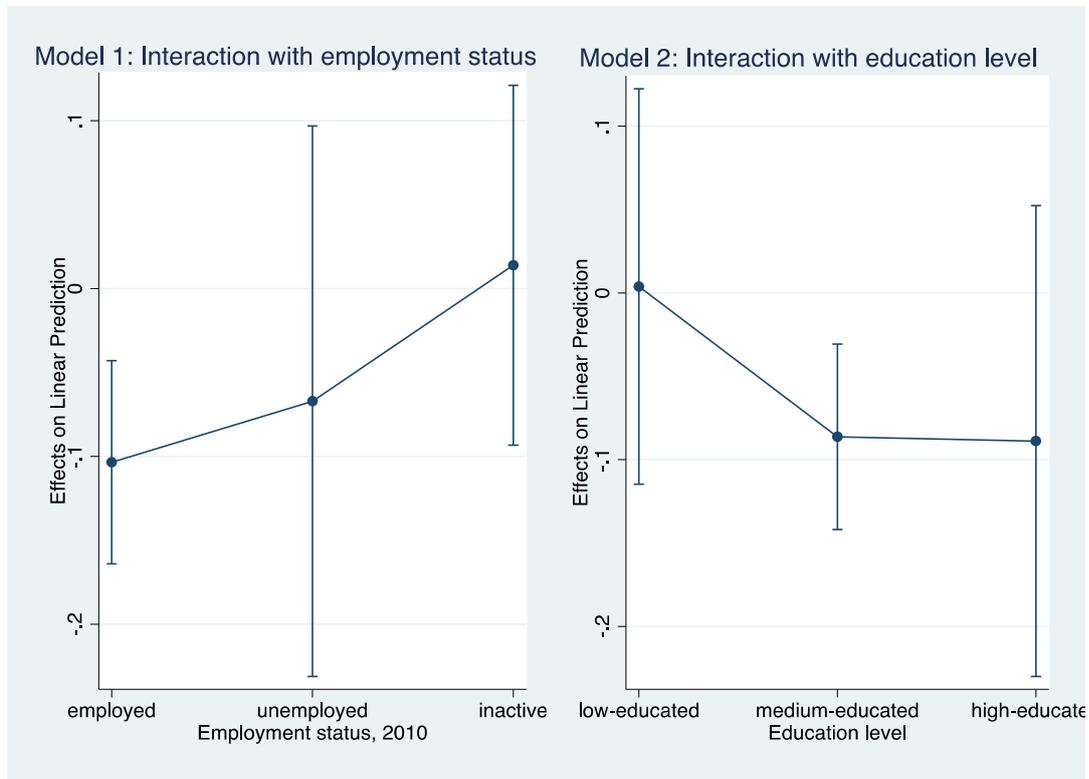
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Dependent variable:</i>	<i>Change in individual risk attitudes, 2010 – 2011 (positive value means increased willingness to take risks)</i>					
Risk attitude, 2010	-0.660*** (0.010)	-0.660*** (0.010)	-0.669*** (0.010)	-0.674*** (0.010)	-0.677*** (0.010)	-0.678*** (0.010)
Change in province unemployment 2010- 11		-0.109*** (0.000)	-0.138*** (0.006)	-0.106*** (0.011)	-0.077*** (0.015)	-0.065*** (0.016)
Province unemployment rate, 2008		-0.005*** (0.000)	-0.006*** (0.000)	-0.004*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)
Age			-0.002*** (0.000)	-0.001 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Medium-educated			0.092*** (0.012)	0.076*** (0.012)	0.059*** (0.012)	0.056*** (0.012)
High-educated			0.113*** (0.016)	0.077*** (0.016)	0.063*** (0.021)	0.057*** (0.021)
Male			0.031*** (0.010)	0.019* (0.010)	0.016 (0.010)	0.013 (0.010)
Foreign citizen			-0.053 (0.064)	-0.027 (0.066)	-0.025 (0.066)	-0.026 (0.067)
Married				-0.003 (0.019)	-0.006 (0.019)	-0.009 (0.019)
Presence of children				-0.043* (0.024)	-0.045* (0.024)	-0.046* (0.024)
Family income				0.032*** (0.006)	0.029*** (0.006)	0.025*** (0.006)
House property				0.015 (0.018)	0.012 (0.017)	0.013 (0.017)
Level of mother's education				0.005 (0.005)	0.003 (0.005)	0.004 (0.005)
Health: sport & no- smoking					-0.004 (0.018)	-0.003 (0.019)
Life satisfaction					0.010** (0.005)	0.009* (0.005)
High marks at school					-0.014 (0.017)	-0.014 (0.017)
English writing skills					0.022 (0.014)	0.022 (0.014)
Computer skills					0.045** (0.019)	0.042** (0.019)
Employed in 2008						0.032*** (0.012)
Unemployed in 2008						-0.030 (0.018)

Transition to employment						0.005
						(0.021)
Transition to unemployment						-0.050**
						(0.022)
Worker with unemploy. spell 2008-11						-0.015
						(0.017)

Constant	6.767*** (0.107)	6.792*** (0.107)	6.891*** (0.106)	6.809*** (0.113)	6.751*** (0.116)	
	10,929	10,929	10,929	10,929	10,929	10,929
R <sup>2</sup>	0.340	0.340	0.346	0.349	0.350	0.351

Notes: Standard errors clustered for provinces in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; province fixed effects included. Base variable for employed and unemployed is inactive.

Figure 2. Interaction: Local unemployment increases and risk attitude



As set out in figure 1, the distribution of risk attitude leads to the concern that our results may be skewed by a few outliers. To test this, table 2 tests these results with two alternative indicators. The first removes any ‘scale’ from the risk attitude measure, but simply estimates the regression with three variables – reduced risk propensity, stays the same, and increases risk propensity. For simplicity, we estimate as a simple OLS regression with the latter category valued 3 and reduced risk propensity at 1. We include all variables from the full model in table 1, column 6. The coefficient is negative and statistically significant. An alternative way of dealing with outliers is given in column 2, which windsorises the risk propensity variables for each year at the 5<sup>th</sup> and 95<sup>th</sup> percentile. This will reduce the spread in the variable, so any significant outliers should be reduced. The coefficient is only slightly reduced from that without the windsorisation, and remains statistically significant. Regardless, the regression shows that increased local unemployment reduces the willingness of local people to take risks.

*Table 2. Alternative indicators of change in risk attitude, OLS regressions*

	(1)	(2)
	Risk propensity 2010-2011 categorical (1 = reduces risk propensity, 2 = stays same, 3 = increases)	Change in windsorised risk propensity, 2010 - 11 (at 5 <sup>th</sup> and 95 <sup>th</sup> percentiles)
Change in province unemployment 2010-11	-0.101*** (0.0136)	-0.0649*** (0.0159)
Controls	Yes	Yes
Observations	11,170	10,929
R <sup>2</sup>	0.621	0.351

*Notes:* Standard errors clustered for provinces in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; province fixed effects included. Base variable for employed and unemployed is inactive. Controls used same as table 1, column 7.

In short, it seems that geography matters for individual risk attitudes. Controlling for province level fixed effects and several individual factors, the province change in unemployment rate is associated with higher propensities to take risks.

## ***6. Conclusion***

Despite the recent growth in the literature on regional studies, the relationship between regional economy and the individual and psychological factors have been largely ignored. In this paper we have begun to address this gap, by focusing on the relationship between local economic shocks and the willingness of individuals to take risks. We find that an increase in unemployment in the local economy is associated with a reduced propensity to take risks. Importantly, this effect seems to be independent of personal circumstances - including recent changes in labour market circumstances, and initial unemployment rate – implying that living in a region which has just experienced increases in unemployment is associated with lower propensity to take risks, even if the individual is not directly affected.

These results have important implications for the regional dimension of economic recovery, as well as for policy. Since the crisis, policy makers have identified entrepreneurship, investment in human capital and mobility as some of the key drivers for economic recovery. One example is the recent large-scale European programme, the Youth Guarantee, focused on re-training for young unemployed people. The Entrepreneurship 2020 Action Plan is another recent answer of the European Union to foster entrepreneurship.

Naudé (2016) argues that the impact of this policy is overestimated for three reasons, (i) entrepreneurship promotion is a last-resort policy, (ii) the impact of entrepreneurs is often overestimated, and (iii) entrepreneurs are too often allowed to capture policy. In fact, policy intervention has been largely ineffective in spurring entrepreneurship in poor countries (Karlán and Valdivia, 2011).

Our evidence suggests the presence of a differentiated local potential capacity to react to policy incentives. These types of policies incentivizing investment in human capital and entrepreneurship are more likely to be successful in the more advanced regions, while they can be hampered by the characteristics of the individuals in the less advanced regions. Consistently with the view of elaborating smart policies that are tailored on the specific characteristics of the regions (Iammarino et al., 2017; Barca et al., 2012; Evangelista et al.,

2017), in less developed regions policy makers should overcome the lack of risk aversion of people for instance by elaborating tools for transferring risk from the individuals to other actors, e.g. the State, income insurance scheme, the companies.<sup>7</sup>

There are important limitations that are worth discussing also in the light of suggesting further research into this area. We employ a measure of self-perception risk that is based on a hypothetical situation rather than of a factual one. This type of measure has been largely employed and some recent research show its consistency with real measures such as those employed in experimental situations (Jaeger et al., 2010). However, research dealing with risk in the entrepreneurial literature has shown that entrepreneurs are not more willing to risk in fact, rather that they do not perceive risk, or they frame it differently from other people (Palich and Ray Bagby, 1995; Simon et al., 2000). Secondly, our results might hinder more local patterns that we were not able to detect given the limitation in the disaggregation of our data (i.e. the province level), as a recent work by Faggian et al., 2017 on local resilience in Italy over the same period shows. Future work may want to test the knock-on effect of reduced risk attitudes on individual and regional behaviour.

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<sup>7</sup> Studies on the role of entrepreneurship as a response to the economic crisis has also shed light on the importance of cultural effects which could neutralize the (assumed) effect of incentives on individuals (Tubadji et al., 2016).

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