Regional differences in the risk tolerance of entrepreneurs in the European Union

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Abstract

This thesis studies the differences in risk tolerance between Western Europe and Eastern Europe. First, a general assessment of risk tolerance levels among the labour force is provided; second, the risk tolerance levels of entrepreneurs are compared with those of paid employees. Although earlier research has generally found a positive relationship between risk tolerance and entrepreneurship, very little information has been gathered about whether this relationship may be different across several regions. Therefore, this study tests whether the relation between the average risk tolerance of entrepreneurs in the Western countries of the European Union is different from the average risk tolerance of entrepreneurs in the Eastern countries of the European Union.

Cross-sectional data of the *Life in Transition Survey* of 2010 are used to investigate these possible differences in risk tolerance. Results obtained from several measures of risk tolerance among approximately 6,000 employees and self-employed individuals in sixteen different countries in the European Union reveal that the absolute risk tolerance of entrepreneurs in Western Europe does not statistically differ from the risk tolerance of entrepreneurs in Eastern Europe. Moreover, risk toleration does not play a different role in the engagement of entrepreneurship in the two regions.

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1. Introduction

Does the importance of risk tolerance differ in Western Europe compared to Eastern Europe with respect to the engagement of entrepreneurship? This question has only been partly answered in prior research. The present study investigates whether there are differences in the risk tolerance levels between entrepreneurs in the Western Member States of the European Union and the entrepreneurs in the Eastern member states of the European Union. Moreover, this study investigates the difference of the importance of risk tolerance in Western Europe and Eastern Europe with respect to the process of engaging in entrepreneurship.

Entrepreneurship is found to be an important driver of economic growth (Wennekers and Thurik, 1999; Van Praag and Versloot, 2007; Agarwal et al. 2007). It is important for the growth and prosperity of the European Union that the circumstances for entrepreneurs are optimal in every Member State of the European Union (European Action Plan, 2013). The present study aims to contribute to the existing literature by studying the relation between risk perception and the probability of becoming an entrepreneur. The definition of an *entrepreneur* is still subject to change, however, this study defines an entrepreneur as a person who recognizes entrepreneurial chances and is willing to seize these opportunities. Since this definition is hard to operationalize within a question in a survey, this thesis uses self-employment as a proxy for the definition. This is done more often in academic literature, for example Van Praag and Versloot (2007) and Masters and Meier (1988).

Prior empirical research already shows that risk perception plays an important role in the willingness to start a new business: "*Entrepreneurship is historically associated with risk bearing. Consequently, risk attitude is widely believed to affect the selection of individuals into entrepreneurial positions."* (Cramer, 2002, p.1). This is quite intuitive, since the reward of entrepreneurs depends directly upon the results of their own business. Hence, the rewards of entrepreneurs are less certain and more variable than the wages of employees (Moskowitz and Vissing-Jorgensen, 2002; Hamilton, 2000). In the recent past, researchers have shed their light on the risk tolerance of entrepreneurs compared to the risk tolerance of employees. For example, Cramer, Hartog, Jonker and Van Praag (2002) find a negative relation between risk aversion and entrepreneurship and, among others, Caliendo, Fossen and Kritikos (2007) agree upon this finding. Even Rosen and Willen (2002), who are critical about the relation between risk perception and entrepreneurship, find that risk perception cannot be ignored in explaining the variance in entrepreneurship. Risk tolerance may also affect a business' survival rate. For example, Caliendo, Fossen and Kritikos (2010) find that individuals with moderate risk

propensities survive significantly longer than individuals who are either relatively risk averse or are relatively risk tolerant. This inverted U-shaped relation is also found by Nieß and Biemann (2014, p. 1007), who conclude that "*different magnitudes of risk taking are associated with the decision to start a business and with succeeding in this occupation".*

The main purpose of this thesis is to examine whether there are differences between the risk perception of entrepreneurs from Western Europe and entrepreneurs from Eastern Europe. The intuition behind this purpose is that the entrepreneurial context of Western European entrepreneurs is different from that of Eastern European entrepreneurs. It is known that the communist legacy has a long-lasting influence on entrepreneurial engagement and opinions about entrepreneurs (and entrepreneurship) in the former socialist countries (Adam-Müller et al., 2015; Estrin and Mickiewicz, 2011; Wyrwich, 2013). Many of the Eastern Member States of the European Union belonged to the Soviet Union, or at least, faced immense influences from this communist regime. Moreover, the social security systems of the Western Member States of the European Union are usually more sophisticated and reliable (Laborde, 2005). These differences in the context of inhabitants of the European Union may influence the perception of risk and the willingness to start a new enterprise. Studying the regional differences of entrepreneurial determinants is not unique. Jack and Anderson (2002) and Minniti (2010), for example, conclude that the context in which individuals are located plays an important role in the decision to become an entrepreneur. A regional comparison about the influence of risk tolerance on entrepreneurial engagement has, however, not been performed earlier. The research question for this thesis is therefore:

What is the importance of risk tolerance to engage in entrepreneurship in Western Europe compared to Eastern Europe?

The data used in the research are derived from the *Life in Transition survey* which has been conducted jointly by the European Bank for Reconstruction and Development and the World Bank in 2010. Almost 39,000 households in 34 different countries have been surveyed. From the sixteen European Union Member States that participated, there are eleven Eastern European countries and five Western European countries. The dataset is very broad and gives insights in both the personal life of the individuals and their occupational status. Moreover, the *Life in Transition survey is* one of the few surveys that incorporates risk tolerance in multiple questions of the survey. These characteristics, combined with the fact that the dataset consists of multiple Member States of the European Union, makes this survey suitable for the present study.

Results obtained from binary logit regressions with approximately 6,000 employees and self-employed individuals in sixteen different countries in the European Union reveal that there is no significant difference in risk tolerance between Western European individuals and the risk tolerance of Eastern European individuals. This is not only true for the entire group of individuals, but is also true for the subset of entrepreneurs. Furthermore, the results of the present study tell us that risk tolerance has a significant and large positive relation with the probability of becoming an entrepreneur, and its magnitude does not seem to be different for the two samples of Eastern and Western Europe. These results imply that governments should pay attention to the role of risk perception in fostering entrepreneurship. It may be hard to influence the perception towards risk, but it might be possible to lower other thresholds towards entrepreneurship. A concrete example of such a policy may be to provide more social security to entrepreneurs of start-ups. However, the results of this study give no ground to believe that European Union should maintain a different policy with respect to risk perception in Eastern European Member States compared to Western European Member States, because the risk role of risk tolerance does not seem to differ between the two regions in Europe.

The remainder of this study is structured as follows. Part two provides insights in the existing literature about entrepreneurship and the important role of risk perceptions. Part three discusses the data, variables and methods that are used to conduct the analysis. In section four the results are presented, followed by a conclusion in section five. This study ends with a set of recommendations, limitations and a discussion.

2. Literature

2.1 Concept of entrepreneurship

The concepts *entrepreneurship* and *entrepreneur* are accepted definitions in our language. However, these terms are still ill-defined in academic literature and have a multidimensional character. Since entrepreneurship is a multidimensional concept and entrepreneurial activities find their basis in personal commitment, it is very difficult to measure the contribution of entrepreneurship for economy and society. Many studies identify the importance of entrepreneurship in society. In this chapter a few studies regarding the importance of entrepreneurship are cited to sketch the importance of entrepreneurship. The emphasis in these studies is on both the importance of entrepreneurship to the society and the role of risk in entrepreneurship.

Adam Smith (1776) was one of the first economists who described the importance of entrepreneurship. Smith does not mention the term 'entrepreneurship' in his Wealth of Nations, however, the core of Smith's masterpiece is based upon 'the invisible hand'. Smith recognized that a free market, competition and incentives are the fertile soil for prosperity. This conclusion was revolutionary at the time of Adam Smith, since he lived in the age of government chartered monopolies and protection of self-interests. Where Smith failed to see that entrepreneurship was at the core of his 'invisible hand-theory', Say (1803) argues that entrepreneurs have a coordination function in the economy.

Schumpeter (1942), on the other hand, identifies the entrepreneur as a risk bearer. According to the Austrian American economist, an entrepreneur is a 'creative destructor'. Multiple definitions of entrepreneurship have been proposed, and the role of risk-taking behaviour has been central in some of these definitions. For example, Hébert and Link (1989) put the emphasis on the risk taking behaviour of an entrepreneur; the reward for entrepreneurs depends directly on the success (or failure) of their organization. This immediately shows the difference between an entrepreneur and a manager, according to the researchers. Shane and Vankataraman (2000), however, point in their definition at the importance of the ability to see and exercise opportunities.

In sum, the different angles of previous researchers can be roughly divided into two dimensions (Sternberg and Wennekers, 2005):

1. **Occupational view**: individuals owning and managing a business for their own account and risk
2. **Behavioural view**: entrepreneurial behaviour in the sense of seizing an economic opportunity (which is also possible within a firm in the form of intrapreneurship)

As explained in the introduction, this study identifies an entrepreneur as a person who is self-employed. This measure is used more often in academic literature (Van Praag and Versloot, 2007 and Masters and Meier, 1988). The reward or compensation of an entrepreneur depends directly on the degree of success of his or her organization.

The above paragraphs sketched the general development of the concept *entrepreneurship* and *entrepreneur.* The remainder of this literature review elaborates on the contribution of entrepreneurship to the economy. Subsequently the importance of entrepreneurship in transition countries is amplified, together with the differences in determinants of entrepreneurs in transition countries and developed countries. Then the concept of risk tolerance is explained by means of the existing literature, together with the role of this risk tolerance on entrepreneurship, and the different measures of risk are discussed. The literature study ends with the evolvement of the hypotheses which are used as base of this research.

2.1.1 Importance of entrepreneurship

The importance of entrepreneurship is emphasized by many researches and governments (European Action Plan, 2013). In the studies of both researchers and governments, multiple contributions of entrepreneurship are listed. However, some of these contributions are not always in agreement with each other. Van Praag and Versloot (2007), therefore, examined the contribution of entrepreneurship on the basis of the existing empirical literature in the recent past. The researchers identify four different fields: innovation, productivity and economic growth, employment and utility. The same four social-economic fields are used by the present study to summarize the importance of entrepreneurship.

Innovation

Schumpeter was one of the pioneers who tried to explain the contribution of entrepreneurs towards society. After Schumpeter's *creative destruction* theory, many other researchers conducted research on the contribution of entrepreneurs to innovation. Love and Ashcroft (1999), for example,

investigated the relation between the number of innovations and the number of employees. They found a negative relation between these two parameters, which indicates that small firms (not the same as entrepreneurship, but often used as proxy for entrepreneurship) are able to produce innovations more efficiently (measured in registered patents). Subsequently, Van Praag and Versloot (2007) argue that entrepreneurs are relatively good in the commercialization of their innovations. Moreover, entrepreneurs are likely to adopt low-cost and radical innovations to be able to compete with large incumbent firms (Casson and Buckley, 2010). In this way the entrepreneurs contribute to the innovativeness of society and stimulate the process to improve innovations again and again.

Productivity and economic growth

Koopmanschap et al. (2005) investigated the productivity of enterprises in the Netherlands. He concludes that there exists a negative relation between the size of a firm and the productivity growth rates. In other words, the productivity of smaller firms grows faster than the productivity of their larger counterparts. However, the productivity of one firm indirectly influences the productivity of other firms in the market due to competition. Geroski (1989) was one of the first researchers who looked on this issue from this perspective. The general conclusion of his study reads that competition plays an important role in improving the productivity. This competition increases when new firms (proxy for entrepreneurs) enter the market. This conclusion is also drawn in more recent literature like the work from Nickell, Nicolitsas and Dryden (1997) and Carree and Thurik (2006). Since productivity is closely related to economic growth, entrepreneurs also contribute to economic growth (Jorgenson, 1991). This contribution is also recognized by Carree and Thurik (1998, 2002 and 2003).

Employment

The contribution of entrepreneurship to employment may be less intuitive than it seems on first sight. Several researchers find that smaller firms tend to grow faster in terms of employment than larger firms do. Robins (2000) for example, finds that small firms in US grow faster than their larger counterparts. However, these jobs have a higher volatility and are less permanent (Davis and Haltiwanger, 1991; Davis, et al., 1996). Moreover, these findings do not cover the complete picture of the contribution of entrepreneurship to employment. Shaffer (2006) concludes that many studies focused on the employment development within a firm. However, as we have seen in the previous paragraphs, new entrants change the status quo. Enhanced competition and higher productivity have their effect on the employment in the economy. Shaffer therefore conducted an aggregated study in which he tried to include externalities. Shaffer finds that smaller organizations are associated with

faster growth in terms of employment. Where Shaffer conducted this study in the US, De Wit and De Kok (2014) based their conclusion upon European data. De Wit and De Kok (2014) find that smaller firms contribute on a larger scale towards job creation than larger firms. Within their study they took into account that the status quo changes when a new firm enters the market (dynamic classification).

Utility

Van Praag and Versloot (2007) end their review with a somewhat less tangible contribution of entrepreneurs. They try to describe on basis of the existing literature, whether entrepreneurs are better-off than wage workers. In this section of their study, they use the same measure for entrepreneurship as the present study does (self-employment as a proxy for entrepreneurship). Van Praag and Versloot (2007) conclude that the remuneration of entrepreneurs is very skewed and volatile. However, they find that almost every study on job satisfaction of self-employed people, conclude that entrepreneurs experience higher job satisfaction.

2.2 Determinants of entrepreneurship

Most of the academic literature on the determinants of entrepreneurship, has been conducted in developed countries like Germany, United Kingdom, United States and other Western countries. The first part of this section summarizes the findings of the current available literature, while the latter part tries to explain whether there is support that there are significant differences between the determinants of entrepreneurship in Western European countries compared to transition countries in general and Eastern European countries in specific.

Parker (2009) investigated the determinants of entrepreneurship in the United Kingdom by means of a survey. He identifies various determinants of entrepreneurship. He used these determinants to formulate the following equation:

$$Z^* = z\left(\pi - w, X_{huc}, X_{soc,} X_{risk,} X_{psy}, X_{dem,} X_{ind,} X_{mac}, X_{emp}\right) \qquad (equation\ 1)$$

In this equation, Z^* is the latent (unobserved) preference to be an entrepreneur. The vectors in the equation measure the different determinants of entrepreneurship. In his equation, Parker (2009) claims that the probability to become an entrepreneur is influenced by1) the difference between the profit of an entrepreneur and the wage the same person would get as an employee, 2) human capital, 3) social capital, 4) risk tolerance, 5) psychological factors, 6) demographic factors, 7) industrial factors, 8) macro-economic factors and 9) employment factors. Many of these factors are in accordance with other studies (among others: Davidsson and Honig, 2002 and Backes-Gellner and

Moog, 2008). Furthermore, Parker argues that macroeconomic factors play a role in the probability to become an entrepreneur. This is intuitive since macroeconomic factors influence both the chance of resignation and the chance of survival of start-ups. Moreover, Parker's equation includes $X_{risk,}$, which means that Parker (2009) sees risk as an important determinant of entrepreneurship. This supports the occupational choice setting which is also used in this study. The concept of risk and the relation of risk with entrepreneurship is discussed more thoroughly in the next part of this chapter

Hence, Parker identifies pecuniary incentives, non-pecuniary incentives, skills and external factors as determinants of entrepreneurship. More practically, he finds that relative earnings ($\pi - w$, in which π is the profit of the entrepreneur and w is the wage of an employee), human capital, risk perception and demographic circumstances influence the choice of becoming an entrepreneur. But also other incentives play a role. With his theory, Parker (2009) claims that the probability of becoming an entrepreneur depends on a variety of factors. This provides support to the research question of this study, since the research question segments a region into two areas and thereby implicitly influences multiple factors in the theory of Parker. The section 'Culture and society' will explain whether there is support to believe that entrepreneurial activity is also affected by culture and society. However, there will be a closer look at the concept of risk first.

2.2.1 Risk and entrepreneurship

In psychological literature, risk perception is a much discussed topic. The decision making process of individuals is a very popular subject within the field of risk perception. Weber and Richard (1997) conclude, for example, that the decision making process of individuals is dependent on the perceived risk tolerance of the individual. However, they also find that the perceived risk tolerance of two individuals who have to make the same choice at the same moment, perceive the risk different. This is possible due to the different knowledge the two individuals have. This difference in risk perception due to information asymmetry makes it also arguable that people who have grown up within a completely different context (say Eastern Europe versus Western Europe) perceive risk differently and hence, make different decisions.

Another important subject within the academic literature with respect to risk is how to measure risk perception. Many studies have been done by means of the self-esteemed risk perception. This is therefore accepted as a way of measuring risk. Sitkin and Pablo (1992), for example, describe risk perception as *the tendency to take actions that one has judged to be risky.* Since this study only has access to self-esteemed risk perception, this study also uses self-esteemed risk perception as a variable to test the hypotheses and hence, come to an answer of on the research question.

An academic description of the relation between risk perception and entrepreneurship usually starts with Knight (1921) or Kihlström and Laffont (1979). Knight was one of the first academics who tried to explain the relation between risk and entrepreneurship. Knight called the risk of entrepreneurship *'true uncertainty',* which is incalculable and he saw this risk inextricably connected with entrepreneurship. Knight shared this idea with the French-Irish economist Richard Cantillon, who argued that the entrepreneur is a bearer of risk.

Kihlström and Laffont (1979) introduced a theory which should catch the thoughts of Knight and Cantillon in a comprehensive equilibrium model. This model is based on a trade-off between the fixed wage of employees and risky profits of entrepreneurs. Individuals base their decision to become either an entrepreneur or an employee by comparing the non-risky wages with respect to the potential of the risky reward of entrepreneurs. Just like Knight, this model shows that an entrepreneur is characterized his readiness to bear risk. Cramer, Hartog, Jonker and Van Praag (2000) also conclude that a low risk aversion is somehow related to the choice of becoming an entrepreneur. However, they do not see enough reason to conclude that risk attitude has a causal relationship with entrepreneurship. The conviction that people with lower risk aversion choose to become an entrepreneur is a little shifted by Caliendo, Fossen and Kritikos (2009). They find that individuals with lower risk aversion, indeed, are more likely to become entrepreneur. However, this regularity is only valid for people coming out of regular employment. It is not valid for people who come out of unemployment.

Caliendo, Fossen and Kritikos (2009) also investigated the impact of risk attitudes on entrepreneurial survival. They found that risk attitude is also related with entrepreneurial survival and present an inverse U-shaped relationship between risk attitudes and entrepreneurial survival. This means that both people with a lot of risk aversion and people with little risk aversion have lower chances to survive. This inverted U-relation between risk tolerance and survival is also found by Nieß and Biemann (2014), who suggest that the U-shaped relation may explain why prior research concluded somewhat counter-intuitive findings. Hisrich (1990), for example, suggested that individuals who are relatively risk averse are not successful in the long run. However, Brockhaus (1980), finds that individuals with a high level of risk tolerance, have a greater chance to fail than individuals with a more moderate risk propensity. According to Nieß and Biemann (2014), the findings of Hisrich (1990) and Brockhaus (1980) fit in the U-shaped relation between risk tolerance and the survival of start-ups, since both entrepreneurs with low risk tolerance and entrepreneurs with high risk tolerance have lower chances to survive.

These findings show that the current literature is convinced about the correlation between risk and entrepreneurship. Furthermore, the previous chapters showed that cultural influences affect the ability to create and sustain entrepreneurial activity. This sketches the importance of the research question of this study.

2.2.2 Culture and society

Societies vary in their ability to create and sustain entrepreneurial activity (Carter and Wilton, 2006). However, it is arguable that Western European countries and Eastern European countries are two different societies, and therefore both societies may vary in their ability to exploit entrepreneurial activity. Moreover, the model of Parker (2009, equation 1) shows various vectors which are different for Eastern European countries compared to Western European countries. When one thinks of the differences between Western European countries and Eastern European countries, a few intuitive aspects come in mind. The first difference has to do with geopolitics since most Eastern European countries have been part of the Soviet Union. And although the fact that the Soviet Union collapsed almost 25 years ago, these countries still face influences of that era. For example, Wyrwich (2012) concludes that members of the workforce in East Germany are less likely to become an entrepreneur than their Western Germany counterparts. Another significant difference has a more economic character. Eastern European countries have a lower GDP per capita than Western European countries. This difference in prosperity is very large for some countries, for example, the GDP per capita in Germany is 1.5 times the GDP per capita of the Czech Republic, according to Eurostat (2015). This is a large difference for two countries which are direct neighbours. The next paragraphs show whether the differences stated above influence the state and the perception towards entrepreneurship and risk tolerance according to the present literature.

Cultural influences may affect the fundamental theories of entrepreneurship according to Bruton, Ahlstrom and Krzysztof (2008). Entrepreneurial theories in North-American countries and Western European countries are usually based on assumptions as profit maximization and self-interest maximization. However, this may not be true in every country. This may also be the case in former communistic countries such as in Eastern Europe, where people were used to rely on a centrally organized institute. During the communistic era, the society was based upon state-owned enterprises and characterized by absence of social classes and incentives for personal development. This background may influence the pro-activeness of people in the Eastern European countries. This thought is also supported by Kreiser, Marino, Dickson and Weaver (2010). They see culture as a framework, or a reference, on which societal members base their perceptions towards organizations,

relations between one another and the environment. Based on their study, they conclude that national culture has an impact on the proactivity of small- and medium enterprises, but also on the willingness to take risks. This conclusion brings us to core of entrepreneurship, since pro-activeness and the willingness to take risks are two primary dimensions of entrepreneurship. Kreiser et al. (2010) show that there may be a difference between the risk tolerance of Eastern European entrepreneurs compared to entrepreneurs in Western Europe. Based on the results of Kreiser et al. (2010) this study hypothesizes (see also next subsection) that Western European individuals and entrepreneurs are more willing to take risks than Eastern European individuals and entrepreneurs.

The above paragraphs show that both cultural influences and demographic factors influence the willingness and ability to conduct entrepreneurship. Moreover, Wyrwich's (2012) conclusion gives us reason to believe that the communistic influences still echo in Eastern Europe. More specifically, it gives us reason to believe that there are substantial differences in the entrepreneurial culture between Eastern European countries and Western European countries. The conclusion of Wyrwich (2012) is supported by the authors of the book '*Surviving Post-Socialism: Local Strategies and Regional Responses in Eastern Europe and the former Soviet Union*' (Bridger and Pine, 1998). They believe that the policymakers in Western countries should not underestimate this influence of post-socialism in the Eastern parts of Europe. Bridger and Pine (2013) explain that Eastern European countries still face difficulties to adjust to the dynamic realities of economies in which competition and decentralized planning are commonly accepted for centuries. This is consistent with the opinion of Smallbone and Welter (2001 and 2012) who argue that there was at least a radical shift needed in societal norms and values if sustainable entrepreneurship is embedded in the economy of former Soviet countries, since private entrepreneurship was illegal in the communistic period. More specifically, Schwartz and Bardi (1997) conclude that countries with a socialistic regime promote a security over risk. And as Kihlström and Laffont (1979) and other researchers (e.g. Caliendo et al., 2009 and Stewart and Roth, 2001) conclude, willingness to take risk is a key to entrepreneurship.

Proceeding to the other intuitive difference between Eastern European countries and Western European countries, one may argue that it is more attractive to exploit entrepreneurial activities in a country with a lower GDP per capita, since there is less to lose and the consequences of failing are less severe than in countries with higher prosperity. On the other hand, in more prosperous countries, the social arrangements are more reliable and there is more knowledge available for entrepreneurs. These considerations are all more or less related to the risk propensity of entrepreneurs. The existing literature provides us some insights in the differences between individuals' risk tolerance in developed and developing countries. Van der Zwan et al. (2012) for

example find that the risk tolerance in non-transition countries in Europe (mostly Western European countries) is indeed higher than the risk tolerance in European transition countries. Furthermore, Grilo and Thurik (2006) conclude that risk tolerance has a larger (positive) relation on both latent and actual entrepreneurship in transition economies compared to market economies.

Since institutions in developing and transition countries are less developed and therefore most often are not able to stimulate entrepreneurship, the barrier to start a business is expected to be higher in transition economies than in non-transition economies. This line of reasoning is researched by Tan (2001) and Luthans and Ibrayeva (2006). Both studies emphasize that the personality of the latent entrepreneur is more important in transition countries. In other words, there is more perseverance and energy required to start a business when entrepreneurship is not stimulated. In combination with the results of Grilo and Thurik (2006) this leads to an expectation about the relationship between risk tolerance and entrepreneurial in engagement in Eastern Europe versus Western Europe. Specifically, we expect risk tolerance to be more important for entrepreneurial engagement in Eastern Europe than in Western Europe.

The hypotheses to be tested are presented in the next section.

2.3 Hypotheses development

The literature review presents two important points that form the basis of the research question. First of all, the literature review underlines the relation between risk and entrepreneurship and second, the literature review explains why the risk perception between inhabitants of Eastern European may differ from inhabitants from Western Europe. Both findings are based upon the current academic literature and this study tries to combine these findings to see whether there is a difference between the risk tolerance of Eastern European entrepreneurs and Western European entrepreneurs and whether there is a difference in the role of risk tolerance in the process of becoming an entrepreneur.

The research question will be answered by means of three hypotheses. The first hypothesis tests whether the average risk tolerance of individuals in the working force (employees and self-employed people) differs between Eastern Europe and Western Europe. As explained in the literature review, a difference in the risk tolerance can be expected because people may be less used to take risks when living in a society in which state enterprises provided sufficient security and own initiative was not (or only to a limited extent) rewarded. This is true for a large part of Eastern Europe. Hence, the

hypothesis reads that Western European individuals are less risk averse than their Eastern European counterparts. Hypotheses one therefore is as follows:

Hypothesis 1: *The average risk tolerance is higher among Western European individuals than among Eastern European individuals*

Hypothesis one elaborates on the idea that the risk tolerance between Eastern European individuals and Western European individuals is not the same. Hypothesis one only has implications regarding the level of risk tolerance for the complete working force. Hypothesis two therefore focuses on the difference in risk tolerance between entrepreneurs from Western Europe compared to entrepreneurs from Eastern Europe. Hypothesis two reads:

Hypothesis 2: *The average risk tolerance among Western European entrepreneurs is higher than among Eastern European entrepreneurs*

Hypothesis two gives a clear picture about the absolute differences in risk tolerance. However, for a thorough understanding of the role of risk tolerance in entrepreneurial engagement, we need a different approach. Therefore, this study uses an occupational choice framework which explains entrepreneurial involvement as a function of several variables of which risk tolerance of the main variable of interest. By comparing the coefficients of risk tolerance for Western Europe and Eastern Europe one retrieves information about the importance of risk tolerance in engaging in entrepreneurial involvement in both areas. The results obtained by the occupational choice framework are tested by means of the following hypothesis:

Hypothesis 3: *Risk tolerance is a larger driver of entrepreneurship in Eastern Europe than it is in Western Europe*

3. Data & Methodology

The data used in the research is derived from the *Life in Transition survey* which has been conducted by the European Bank for Reconstruction and Development and the World Bank in 2010. Almost 39,000 individuals in 34 different countries have been surveyed in the *Life in Transition survey*. The *Life in Transition survey* aims to monitor public attitudes, well-being and the impacts of economic and political change in order to stimulate private and entrepreneurial initiative in central Europe, Eastern Europe, the Baltic States, the Commonwealth and Mongolia. The *Life in Transition Survey* was the first region-wide survey that monitored the experiences and attitudes towards transition. The first survey was held in 2006 and the most recent survey was conducted in 2010. This study uses the most recent survey of the *Life in Transition survey*, this makes this study cross-sectional rather than longitudinal. Within this cross-sectional analysis, risk tolerance of people in Eastern European countries are compared to the attitudes of people in Western European countries.

Since the survey looks at the attitudes and experiences of transition in general, the survey is rather broad and can be divided into seven different sections: 1) personal questions; 2) labour and education 3) attitudes and values 4) household composition 5) housing and expenses 6) current activities 7) life history. This study uses different parts of each section to answer the research question.

The remainder of this chapter looks at the sampling method of the *Life in Transition survey*, the sample used for this study, the various variables that are used for the analysis and some descriptive statistics.

3.1 Sampling methodology

The survey was constructed by teams from the World Bank and the EBRD in collaboration with partners from research institutes. These teams constructed a two-stage sampling procedure to select the households to be included in the survey:

1. Establishing sample frame of primary sampling units (PSUs)
2. Selection of households and selection of the respondent within a household

The first stage the PSUs were used as a starting point and used to systematically select households with equal probability. The second stage consists of the selection of the right household and the selection of the individuals within a household. In one household, either one or two individuals were

sampled. The head of the household (or another person with knowledge about the household expenses) was asked to answer the sections about housing and expenses; the remainder of the survey was conducted with a randomly selected household member of at least 18 years.

3.2 Sample

The sample of the *Life in Transition survey* for this thesis is limited to the Member States of the European Union that have participated in the survey. From the sixteen members that participated, there are eleven Eastern European countries and five Western European countries. Table 1 summarizes all countries in the sample. Many of the Eastern European countries have been part of the Soviet Union and others faced immense influences from the communism. As been thoroughly discussed in the literature review, this makes this research even more interesting and relevant. Moreover, one of the goals of the *Life in Transition survey* is to follow the attitudes and experiences of people with a background in a different economic system. The three hypotheses of this study therefore focus on the contextual differences between the two regions.

Moreover, this study only focuses on the persons that are either 1) employee or 2) self-employed. This decision is made to extract people from the dataset who are not actively looking for a job, because it is arguable that these people have another risk tolerance than the workforce. It is common practice in self-employment studies to contrast self-employed individuals with paid employees, and it is analogous to the occupational choice models discussed in the next sections of this chapter.

Table 1: Research sample

Eastern Europe	Western Europe
Bulgaria	France
Croatia	Germany
Czech Republic	United Kingdom
Estonia	Italy
Hungary	Sweden
Latvia	
Lithuania	
Poland	
Romania	
Slovania	
Slovak Republic	

3.3 Variables

In the next paragraphs the different variables will be discussed including their hypothesized influence on the research question. Table 2 specifies the survey questions that formed the basis for the data and presents insights in the values and types of the various variables.

3.3.1 Dependent variable

This section of the study explains the different dependent variables used to examine the three hypotheses. The dependent variables of hypotheses one and two are explained together, since they use the same dependent variables.

Hypothesis 1 and hypothesis 2

Hypothesis 1: *'The average risk tolerance among Western European individuals is higher than among Eastern European individuals'*

Hypothesis 2: '*The average risk tolerance among Western European entrepreneurs is higher than among Eastern European entrepreneurs'*

Dependent variables hypothesis 1 and hypothesis 2 (risk measures):

- Self-perceived risk tolerance

  This variable is based upon a question in the survey in which the interviewer asks the respondent:

  > *Please, rate your willingness to take risks, in general, on a scale from 1 to 10, where 1 means that you are not willing to take risks at all, and 10 means that you are very much willing to take risks.*

  The results of this questions have been re-organized towards two groups. The first group (value 0) answered the above question with 1-5, which means that the person is relatively risk averse. The second group (value 1) answered the question with 6-10, which means that the respondent is relatively risk tolerant according to this study. A dichotomization of the original scale has taken place to allow for a uniform treatment of the three different measures of risk tolerance (see below). Measuring risk attitudes by self-reported risk tolerance is a common way to measure risk tolerance in academic literature. For example, the aforementioned study of Caliendo, Fossen and Kritikos (2009) uses the same way of measuring risk tolerance.

- Hypothetical job question

  The life in transition survey incorporated a question in which the following hypothetical question was asked:

  > *Imagine you could choose between two jobs, Job A and Job B.*
  > *Job A offers an average salary, and not much chance for promotion, but it is a safe long-term job. Job B offers a high salary, and a lot of chance for promotion, but significantly less job security. Which of the two would you choose?*

  In this question the answer of the respondent is used as an indication of one's risk tolerance, in which a respondent who prefers Job A gets value 0 and a respondent who prefers Job B gets value 1. A similar measure is used by Caliendo, Marco and Kritikos (2010) in their study on the characteristics of unemployment.

- Willingness to move

  Question in survey:

  > *Would you be willing to move elsewhere for employment reasons?*

  This dependent variable uses the willingness to move of a respondent to measure the risk of a specific person. According to Jeager et al. (2010), a person who is willing to move is less risk averse than a person who is not willing to move. Again, this is a binary variable. The individuals who are not willing to move are indicated with values 0 and the individuals who are willing to move get value 1.

Hypothesis 3

Hypothesis 3: *Risk tolerance is a larger driver of entrepreneurship in Eastern Europe than it is in Western Europe*

Dependent variable hypothesis 3 (self-employment):

- Self-employment status

  The independent variable of hypothesis 2 makes clear whether the respondent is a wageworker or self-employed. The variable used to distinguish between these two groups has two outcomes: 0 and 1, in which 0 means that the respondent is a wageworker at this moment and 1 means that the respondent is self-employed. As discussed earlier, this self-

employment is seen as a proxy entrepreneurship in this study. This proxy is used by more researchers such as Masters and Meier (1988) and also Van Praag en Versloot (2007) use self-employed people as a proxy for entrepreneurship in a part of their review on the value of entrepreneurship.

3.3.2 Independent variables

Independent variables hypothesis 1 and hypotheses 2:

The regressions of hypothesis 1 and hypothesis 2 are conducted in the same way. However, the sample of both hypotheses is different. Hypothesis 1 tests the risk tolerance of the whole working force, while hypothesis 2 only tests the difference in risk tolerance between Western European entrepreneurs and Eastern European entrepreneurs. Both hypotheses will be tested in a two-stage design. In the first set of regressions the independent will be based upon the two regions (West versus East), this will be enough to test the hypothesis. However, to gain insights in the specific risk tolerance differences across countries, the second stage consists of three regressions in which the region dummy variable (West versus East) is replaced with country dummies. Since there are three different risk measures, each stage consists of three regressions, one for each risk measure.

- Region dummy
  This variable takes two values (0 and 1), in which 0 is Eastern Europe and 1 is Western Europe (classification according to Table 1).

- Country dummies
  15 country dummy variables are included that control for country-specific influences. The base country is Bulgaria. Integrating this variable into the regression gives information about the relation between risk tolerance and a specific country, rather than a general region.

Independent variables hypothesis 3:

- Risk tolerance variables
  Hypothesis 1 and 2 use the risk tolerance variables as dependent variables, in hypothesis 3 however, these risk variables are used as independent variables.

- Risk tolerance × region dummy
  This interaction term is used to identify whether there is a statistical difference in risk tolerance between entrepreneurs in Eastern Europe and in Western Europe and to test whether risk tolerance is more important in the process of becoming an entrepreneur.

3.3.3 Control variables

Besides the dependent and independent variables which are used to test the two hypotheses of this research, this study includes several control variables to avoid spurious relations. These observable characteristics might have an impact on the risk tolerance of a person or the occupational status of a respondent. The various control variables are enumerated below, including an explanation why the variable is included as a control variable and how it is generated from the original data.

Gender. The control variable 'gender' is included as a dummy variable in which the value 1 means that the respondent is a male and the value 0 means that the respondent is a female. Most European entrepreneurs are male (GEM Consortium, 2012) and males are on average less risk averse than females (Gustafsod, 1998). This makes it useful to control for the effects of gender in the regressions of this study.

Age. Age is included as a continuous variable. The data excluded the non-adult individuals (seven observations), since they are found to be not representative in this study. As Tränkle, Gelau and Metker (1989) concluded, younger people are on average less risk averse than older people. Hence, age might influence the outcome of the two hypotheses of this study and therefore age is included as a control variable in the regressions.

Age^2. Squared age is integrated as a control variable to test whether there is a non-linear relation between age and the other variables in the dataset. For example, the inverse U-relation between age and entrepreneurship has been demonstrated in earlier studies (Lévesque, 2006).

Marital status. Marital status is included as a dummy variable. The variable has the value 1 if the respondent is married and has value 0 when the respondent is not married. Various studies showed that having a relationship, influences the risk behavior of people (Eckel and Grossman, 2008).

Education. This variable is included as a categorical variable with four different categories and measures the highest level of education that the respondent completed. The categories are ranked as follows:

1. No education or only primary education
2. Secondary education
3. Post-secondary or tertiary education
4. Bachelor degree or more

The variable is included since it is arguable that education has an effect on both risk tolerance and entrepreneurship. Le (1999) for example mentioned education as one of the most important determinants of entrepreneurship. This was again found by Van der Sluis, Van Praag and Vijverberg (2008). Besides the relation between education and entrepreneurship, multiple researches found significant relations between education and risk tolerance (e.g. Deery and Hamish, 2000 and Wildavsky and Dake, 1990).

Income. It is arguable that income influences the risk tolerance of people. A higher income might result in less risk aversion since a loss is oversee able. On the other hand, might people with low incomes take higher risks to gain more wealth. The thought that income is related to risk tolerance is acknowledged by Sjoberg (2000), who says that income is a significant factor in risk perception.

Education parents. Risk tolerance is shaped in the context (or background) of persons, this context is for a great part dependent of the parents of a person. By integrating the education of the parents into the regression, this study controls for this influence. The choice of integrating the parents' education as a control variable can for example be defended by means of a study of Koe and Nga (2010), who found that parental influence is a determinant for entrepreneurship. Moreover, Borawski, Iever-Landis, Lovegreen and Trapl (2003) found that parental influence is related to risk perception of the children. Although parental education does not cover the complete parental influence on children, this control variable is used to control for both possible present entrepreneurial effects and risk tolerance effects.

Table 2: Variable descriptions

Variable name	Original survey question	Values	Type
Self-perceived risk tolerance	Please, rate your willingness to take risks, in general, on a scale from 1 to 10, where 1 means you are not willing to take any risk at all.	0= Low willingness to take risks (1-5) 1= High willingness to take risks (6-10)	Binary
Hypothetical job question	Imagine you could choose between two jobs. Job A offers an average salary, and not much chance for promotion, but is safe. Job B offers a high salary, lot of chance of promotion, but less job security	0= Job A; 1= Job B	Binary
Willingness to move	Would you be willing to move elsewhere in our country for employment reason?	0= No; 1= Yes	Binary
Self-Employment	Are you an entrepreneur at this moment?	0=No; 1= Yes	Binary
West versus East	Based on the country the respondent lives in	0=East; 1=West	Binary
Respondent gender	What is your gender?	1= male; 0= female	Binary
Age	What is your current age in years?	Continuous starting at the age of 18 with a maximum of 99	Continuous
Age^2	Square of the variable age	324 to 9801	Continuous
Marital status	What is your present marital status?	0= not married 1=married	Binary
Education	What is the highest level of education you already completed?	1= Primary education or no education; 2= Secondary education; 3= Post-secondary education; 4= Bachelor or more	Categorical
Income	Imagine a ten-step ladder where on the bottom stand the poorest 10% in your country and the highest step stand the richest 10%. On which step is your household?	1-10	Continuous
Education father	How many years of full education does your father have?	5-15	Continuous
Education mother	How many years of full education does your father have?	5-15	Continuous

3.4 Methodology

To answer the research question of this study, three different hypotheses are used. These hypotheses are tested by running different regressions. All these regressions have a dependent variable with two possible outcomes. Therefore, the regressions are conducted by means of a binary logistic model. These models effectively transform the values of the variables into probabilities. However, the output of the logistic regression does not immediately give insights in the magnitude of the independent variables. In order to enhance interpretation this study calculates average marginal effects. From these marginal effects, one can conclude whether the magnitude of the relation is both economically and statistically significant for all regressions in the different hypotheses. The outcomes of the regressions are discussed in section 4. In the following paragraphs the different regressions are explained.

3.4.1 Model hypothesis 1 and hypothesis 2

To test the first hypothesis of this study, six different regressions are examined. Regressions 1a, 1b and 1c are regressed with three different measures for risk tolerance as the dependent variable and a regional variable as independent variable. Regressions 1d, 1e and 1f are regressed with the same three dependent variables, but the region dummy is replaced with the country dummies.

Base model of hypothesis 1 and hypothesis 2

1. $\Pr(\textit{Risk tolerance} = 1) = F(\alpha_1 X_1 + \alpha_n X_n)$

In which X_1 is the relevant independent variable (region or country) and X_n (n=1,…,k) denotes the control variables.

The dependent variable (risk tolerance) has three different measures in this study:

1. Self-perceived risk tolerance
2. Hypothetical job question
3. Willingness to move

3.4.2 Model hypothesis 3

Where hypothesis 1 investigates whether there is a statistical significant difference between the risk tolerance of the work force in Eastern Europe compared to Western Europe, hypothesis 2 tests whether there is a significant difference between the risk tolerance of entrepreneurs and non-entrepreneurs in Eastern Europe compared to Western Europe. By testing hypothesis 2, the present study tests the relation between risk and entrepreneurship for each risk measure per region. This adds up to six different regressions. Subsequently, the two regions are incorporated in one regression by means of an interaction term. The region dummy variable interacts with the risk measure variable to make it possible to test whether risk tolerance is a more important determinant for entrepreneurship in one of the two regions.

Regressions for testing hypothesis 2

1. Pr(*Self-employed* = 1) = $(\alpha_1 X_1 + \alpha_n X_n)$ *(subsample West)*

2. Pr(*Self-employed* = 1) = $(\alpha_1 X_1 + \alpha_n X_n)$ *(subsample East)*

3. Pr(*Self-employed* = 1) = $(\alpha_1 X_1 + \alpha_2 X_2 + \alpha_{12} X_1 X_2 + \alpha_n X_n)$ *(interaction)*

In which X_1 are the different risk measures, X_2 are the region dummies and X_n (n=1,…,k) denotes the k control variables.

3.5 Descriptive statistics

Before the explained model of section 3.4 is tested, this study took a glance at the content of the dataset and the simple relations between the variables. These descriptive statistics include both the correlations between the variables as well as some standard descriptive statistics.

Table 3 shows an overview of the values of the used variables. The average self-perceived risk tolerance is somewhat higher than the risk tolerance measured by the other two risk measures. Furthermore, table 3 shows that there are more female individuals in the dataset than male individuals.

Where table 1 gives a simple overview of the key figures of the various variables, table 4 gives an overview of the values of the occupational status and risk tolerance of the individuals per country and per region. These statistics show some interesting findings and differences between the various countries and the two regions. According to this table, the Czech Republic has relatively the most entrepreneurs in the sample (11.12%), whereas Estonia has the lowest percentage of entrepreneurs (2.99%). The differences between the percentages of entrepreneurs between the regions do not

seem to be that large in table 4. A notable difference in one of the risk measures between the countries is the willingness to move. In Western Europe more than 40% of the individuals is willing to move elsewhere for job reasons, whereas in Eastern Europe only 34% of the individuals is willing to move for the same reason. With respect to the risk measures, there are also a few interesting findings on country level. The individuals in Sweden for example, are relatively willing to give up a safe job in favour of a job which offers low safety and high potential. In Croatia, however, the people seem to asses themselves relatively risk seeking and in Lithuania the individuals answer the same question with more cautiousness.

Table 5 shows the correlations between the different variables. The first noticeable result in this table is the fact that the three different risk measures are positively correlated with each other. This supports the choice of taking these three different variables as a proxy for risk tolerance. However, the three risk variables are not perfectly correlated. Although all three risk measures are positively correlated with the *West versus East* variable, just one of these three relations can be marked as statistically significant (willingness to move). There is also a significant positive relation between *West versus East* and the self-employment variable.

Furthermore, some control variables seem to have the expected relation with the different risk measures. For example, there is a negative relation between *age* and all the different risk measures, which implicates that younger individuals are on average less risk averse than older individuals. Moreover, there is a significant positive relation between *education* and the three risk measures. This implies that higher educated individuals are on average less risk averse than low educated individuals. The same influence is noticeable for the education of the parents.

When one looks at the differences between the two regions, there are some intuitive relations between the regions and some control variables. There is, for example, a significant positive relation between education and the region dummy, which means that respondents in Western Europe are on average higher educated than their Eastern European equivalents.

Table 3: Variable overview

Variable name	Observations	Mean	Std. Dev.	Min. Value	Max. Value
Self-perceived risk tolerance	8287	0.43	0.49	0	1
Hypothetical job question	7947	0.37	0.48	0	1
Willingness to move	7912	0.37	0.48	0	1
Self-employed	8363	0.11	0.316	0	1
West versus East dummy	8363	0.35	0.48	0	1
Gender	8359	0.45	0.50	0	1
Age	8356	42.11	11.95	18	99
Age^2	8356	1916.03	1048.91	324	9801
Married	8304	0.50	0.50	0	1
Education	8363	2.68	1.00	1	4
Income	8250	4.97	1.61	1	10
Education father	6285	10.09	3.10	5	15
Education mother	6495	9.93	3.05	5	15

Data source: *Life in Transition Survey* (LITS, 2010)

Table 4: Origin of individuals and the number of observations per country

Country	Observations	Self-employed	Self-perceived risk tolerance	Hypothetical job question	Willingness to move
Bulgaria	414	5.52%	0.51	0.44	0.43
Croatia	389	2.88%	0.52	0.35	0.40
Czech Republic	684	11.12%	0.38	0.44	0.29
Estonia	408	2.99%	0.44	0.35	0.37
France	514	4.06%	0.47	0.38	0.52
Germany	629	7.77%	0.41	0.32	0.38
Great Britain	678	7.51%	0.45	0.31	0.45
Hungary	415	4.94%	0.38	0.26	0.34
Italy	526	8.77%	0.41	0.29	0.36
Latvia	478	2.58%	0.42	0.32	0.34
Lithuania	405	2.37%	0.29	0.34	0.20
Poland	687	5.69%	0.50	0.40	0.32
Romania	384	2.97%	0.44	0.36	0.30
Slovakia	546	7.62%	0.38	0.42	0.32
Slovenia	473	4.70%	0.40	0.41	0.41
Sweden	581	4.44%	0.48	0.50	0.41
Region					
East	5418	10.64%	0.42	0.38	0.34
West	2941	12.48%	0.44	0.36	0.43

Table 5: Correlation table

	1	2	3	4	5	6	7	8	9	10	11	12
1.Self-perceived risk tol.	1											
2.Hypothetical job quest.	0.29*	1										
3.Willingness to move	0.19*	0.18*	1									
4.Self-employment	0.14*	0.12*	0.02	1								
5.West versus east	0.02	-0.02	0.09*	0.03*	1							
6.Age	-0.15*	-0.15*	-0.19*	0.07*	0.08*	1						
7.Age^2	-0.14*	-0.15*	-0.18*	0.07*	0.08*	0.99*	1					
8.Gender	0.12*	0.11*	0.08*	0.09*	0.03*	-0.03*	-0.02*	1				
9.Education	0.09*	0.16*	0.10*	-0.01	0.07*	-0..01	-0.01*	-0.03*	1			
10.Marital status	-0.07*	-0.06*	-0.13*	0.03*	-0.07*	0.19*	0.15*	0.05*	-0.02	1		
11.Income	0.15*	0.15*	0.02	0.07*	0.13*	-0.04*	-0.05*	0.06*	0.18*	0.11*	1	
12.Education father	0.09*	0.16*	0.09*	0.02	-0.12*	-0.30*	-0.29*	0.02	0.25*	0.09*	0.16*	1
13.Education mother	0.11*	0.17*	0.10*	0..02	-0.13*	-0.37*	-0.36*	0.01	0.22*	0.10*	0.14*	0.78*

* *p*-value<0.05

4. Empirical results

In this chapter the results derived from the binary logistic regressions and the associated marginal effects are discussed. The three hypotheses are discussed separately. First of all the effects of the main variables of both hypotheses are discussed and subsequently the effects of the most notable control variables are shortly discussed.

Hypothesis 1

Hypothesis 1 tests whether Western European individuals are less risk averse than Eastern European individuals. This means that hypothesis 1 rather tests the differences in risk attitude of the whole group instead of the risk attitude of entrepreneurs. The group of individuals is narrowed down to employees and self-employed people to make the sample consistent with the sample used to test hypothesis 3.

Risk attitude is measured by means of three self-assessed risk related variables, which are thoroughly explained in the previous chapter. Table 6 shows the results of the regressions with the region dummy variable included whereas table 7 shows the results when the country dummy variables are included.

Table 6 –Results hypothesis 1 – Regional level

Variable	Self-perceived risk tolerance (binomial)	Risk tolerance (hypothetical job question)	Risk tolerance (Willingness to move)
West versus East	0.003(0.013)	-0.0149(0.013)	0.085(0.013)***
Gender	0.108(0.013)***	0.097(0.012)***	0.083(0.013)***
Age	-0.013(0.003)***	-0.010(0.003)***	-0.011(0.003)***
Age^2	0.000(0.000)***	0.000(0.000)	0.000(0.000)
Marital status	-0.043(0.013)***	-0.025(0.013)	-0.068(0.013)***
Education			
Primary education	-0.029(0.035)	0.035(0.034)	0.010(0.033)
Lower secondary education	0.026(0.038)	0.116(0.037)***	0.060(0.036)*
Upper secondary education	0.033(0.036)	0.169(0.035)***	0.114(0.035)***
Income	0.037(0.004)***	0.033(0.004)***	-0.014(0.004)***
Education father	-0.001(0.003)	0.006(0.003)*	0.000(0.003)
Education mother	0.006(0.003)*	0.007(0.003)**	0.004(0.003)
Pseudo R2	*0.041*	*0.062*	*0.049*
Observations	*6048*	*5865*	*5835*

*p < 0.1 **p < 0.05 *** p < 0.01
(standard errors between parentheses)

One of the three relations shows a significant relation between risk tolerance and region. The coefficient shows a positive relation between region and willingness to move, which indicates that Western European individuals are on average more risk tolerant than Eastern European individuals according to this particular measure. The other two risk measures, on the other hand, do not have a significant relation with the native region of the individuals.

Furthermore, it is notable that males are on average significantly less risk averse than females for each measurement of risk. Moreover, there is a statistically significant negative relation between the three risk related variables and age, which means that younger individuals are on average less risk averse than older people. These two findings are consistent with the current academic (Gustafsod, 1998 and Tränkle, Gelau and Metker (1989). Although the linear relation between risk and age is negative, the results also show a significant relation between age-squared and risk tolerance. This means that risk tolerance tends to fall to a certain age level, but increases again when the individuals reach a certain age. This U-formed relation may have multiple reasons, for example the fact that people get less liabilities because their children grow up and leave home. Furthermore, relative income is significantly related to risk tolerance. Two out of three variables show a significant and relatively large positive relation between income and risk tolerance. However, the relation between education and risk tolerance is less clear. There seems to be a positive relation between education and risk tolerance, however, this relation is not statistically significant for the variable that measures risk by means of the self-perceived risk tolerance question. Last finding of the results in table 6 show that the relation between the parental education and the risk tolerance of the individuals is not statistically significant.

Table 7 shows the results of the three regressions which incorporates the individual countries rather than using the region dummy variable. The marginal results must be interpreted relative to the base country Bulgaria. According to the results in table 7, Bulgaria seems to have relatively risk seeking inhabitants, since most of the relations in table 7 have a negative sign. Only France individuals are on average significantly more risk tolerant than the Bulgarian individuals. Moreover, the individuals of all Western European countries have on average less objection to move for job reasons. Since the control variables are based upon the same aggregated data, the magnitude and signs of the control variables do hardly differ from the values in table 6.

Hypothesis 1 stated that Western European individuals are less risk averse than Eastern European individuals. The results in table 6 do not completely support this hypothesis, therefore, hypothesis 1 is only partially supported.

Table 7 –Results hypothesis 1 – Country level

Variable	Self-perceived risk tolerance	Risk tolerance (hypothetical job question)	Risk tolerance (Willingness to move)
Croatia	-0.031(0.0374)	-0.066(0.035)*	-0.058(0.035)*
Czech Republic	-0.174(0.031)***	0.016(0.036)	-0.144(0.031)***
Estonia	-0.102(0.036)***	-0.060(0.036)*	-0.073(0.036)**
Hungary	-0.185(0.031)***	-0.154(0.031)***	-0.113(0.033)***
Latvia	-0.098(0.035)***	-0.115(0.032)***	-0.142(0.030)***
Lithuania	-0.167(0.040)***	-0.067(0.045)	-0.211(0.033)***
Poland	-0.127 (0.033)***	-0.059(0.034)*	-0.110(0.032)***
Romania	-0.068(0.038)**	-0.073(0.036)**	-0.177(0.030)***
Slovakia	-0.179(0.031)***	-0.025(0.035)	-0.136(0.032)***
Slovenia	-0.144(0.033)***	0.003(0.036)	-0.025(0.033)
France	-0.074(0.34)**	-0.039(0.033)	0.058(0.036)
Germany	-0.140 (0.032)***	-0.084(0.032)***	-0.076(0.032)**
Great Britain	-0.111 (0.032)***	-0.109(0.030)***	-0.027(0.033)
Italy	-0.142(0.033)***	-0.102(0.033)***	-0.085(0.033)**
Sweden	-0.103(0.032)***	0.022(0.035)	-0.025(0.033)
Gender	0.102(0.013)***	0.096(0.012)***	0.079(0.127)***
Age	-0.013(0.003)***	-0.010(0.003)***	-0.012(0.003)***
Age^2	0.000(0.000)***	0.000(0.000)**	0.000(0.000)
Marital status	-0.049(0.013)***	-0.025 (0.013)	-0.074(0.013)***
Education			
Primary education	-0.021(0.035)	0.039(0.034)	0.036(0.033)
Lower secondary education	0.005(0.038)	0.118(0.037)***	0.056(0.035)
Upper secondary education	0.013(0.365)	0.161(0.035)***	0.116(0.034)***
Income	0.041(0.0041)***	0.029(0.004)***	-0.011(0.004)***
Education father	0.000(0.003)	0.005(0.003)*	0.000(0.003)
Education mother	0.007(0.003)	0.007(0.003)**	0.004(0.003)
Pseudo R^2	*0.049*	*0.072*	*0.059*
Observations:	*6048*	*5865*	*5835*

*p < 0.1 **p < 0.05 *** p < 0.01

(standard errors between parentheses)

Hypothesis 2

Hypothesis 2 uses the same method and variables as hypothesis 1. However, the sample is reduced to the entrepreneurs in the dataset. This gives insights in the absolute risk differences between entrepreneurs in Western Europe compared to the entrepreneurs in Eastern Europe. In accordance to the approach of hypothesis 1, this hypothesis also gives insights in the differences in risk tolerance between the individual countries. The results of hypothesis 2 are summarized in table 8 and table 9.

Although the size of the sample used in hypothesis 2 is significantly smaller than it is in hypothesis 1, the results are very comparable. The only risk proxy that shows a statistical significant difference between the two regions is the willingness to move. Just like in the previous hypothesis, Western European entrepreneurs are more willing to move for occupational reasons. With respect to the control variables, it is striking that age does not seem to have a significant relation with risk perception. Furthermore, the relation between gender and risk perception is less appear than it is in hypothesis one.

Table 8 –Results hypothesis 2 – Regional level

Variable	Self-perceived risk tolerance (binomial)	Risk tolerance (hypothetical job question)	Risk tolerance (Willingness to move)
West versus East	0.024 (0.038)	-0.022 (0.040)	0.083 (0.039)**
Gender	0.075 (0.036)**	0.064 (0.038)*	0.088 (0.037)**
Age	-0.001 (0.009)	0.010 (0.009)	-0.007 (0.009)
Age2	-0.000 (0.000)	(0.000) (0.249)	0.000 (0.000)
Marital status	-0.036 (0.038)**	-0.078 (0.000)	-0.142 (0.040)***
Education			
Primary education	-0.225 (0.083)***	0.039 (0.125)	0.143 (0.102)
Lower secondary education	-0.148 (0.090)	0.164 (0.131)	0.056 (0.110)
Upper secondary education	-0.181 (0.088)**	0.199 (0.129)	0.208 (0.052)*
Income	0.042 (0.010)***	0.065 (0.011)***	-0.027 (0.011)**
Education father	0.005 (0.10)	0.000 (0.010)	-0.000 (0.010)
Education mother	0.003 (0.10)	0.008 (0.011)	0.015 (0.010)
Pseudo R^2	*0.022*	*0.026*	*0.024*
Observations:	*682*	*646*	*665*

*p < 0.1 **p < 0.05 *** p < 0.01

(standard errors between parentheses)

Table 9 –Results hypothesis 2 – Country level

Variable	Self-perceived risk tolerance (binomial)	Risk tolerance (hypothetical job question)	Risk tolerance (Willingness to move)
Croatia	-0.047 (0.131)	-0.038 (0.137)	-0.079 (0.116)
Czech Republic	-0.230 (0.096)**	-0.129 (0.095)	-0.149 (0.082)**
Estonia	-0.136 (0.125)	-0.203 (0.116)**	-0.096 (0.109)
Hungary	-0.118 (0.109)	-0.235 (0.099)**	-0.051 (0.098)
Latvia	-0.057 (0.140)	0.048 (0.140)	-0.230 (0.091)**
Lithuania	0.045 (0.145)	-0.178 (0.156)	-0.213 (0.115)*
Poland	0.003 (0.107)	-0.036 (0.111)	0.046 (0.104)
Romania	-0.057 (0.126)	-0.336 (0.103) ***	-0.166 (0.098)*
Slovakia	-0.215 (0.105)**	0.014 (0.105) **	-0.019 (0.102)
Slovenia	-0.031 (0.112)	-0.183 (0.105) **	-0.171 (0.088)*
France	-0.052 (0.098)	0.036 0.116)	0.212 (0.111)**
Germany	-0.114 (0.091)	-0.157 (0.094) **	-0.058 (0.091)
Great Britain	-0.112 (0.109)	-0.171 (0.088)**	-0.063 (0.084)
Italy	-0.047 (0.091)	-0.187 (0.091)**	0.010 (0.092)
Sweden	0.061 (0.104)	0.038 (0.115)	0.004 (0.105)
Gender	0.065 (0.036)**	0.096(0.012)***	0.079(0.127)***
Age	0.001 (0.009)	-0.010(0.003)***	-0.012(0.003)***
Age^2	(0.000) (0.000)	0.000(0.000)**	0.000(0.000)
Marital status	(0.035) (0.038)	-0.025 (0.013)	-0.074(0.013)***
Education			
Primary education	-0.021(0.084)**	0.039(0.034)	0.036(0.033)
Lower secondary education	-0.175 (0.092)**	0.118(0.037)***	0.056(0.035)
Upper secondary education	-0.211 (0.089)**	0.161(0.035)***	0.116(0.034)***
Income	0.048 (0.011)***	0.029(0.004)***	-0.011(0.004)***
Education father	0.006 (0.010)	0.005(0.003)*	0.000(0.003)
Education mother	0.006 (0.010)	0.007(0.003)**	0.004(0.003)
Pseudo R^2	*0.024*	*0.026*	*0.026*
Observations:	*682*	*646*	*665*

*p < 0.1 **p < 0.05 *** p < 0.01

(standard errors between parentheses)

Hypothesis 3

While hypothesis 1 concluded that there is little statistical evidence that Western European individuals are less risk averse then their Eastern European counterparts and hypothesis 2 concluded that this is also true for the subsample of entrepreneurs, hypothesis 3 investigates the importance of risk tolerance in the process of becoming an entrepreneur. To examine this hypothesis, the same risk proxies are used as in hypothesis 1 and hypothesis 2. The difference however is that the risk variables now act as independent variables. The occupational choice is the dependent variable. Within this dependent variable, 1 means that the respondent is self-employed and 0 means that the respondent is a wage worker. The results of the different regressions are summarized in tables 10 and 11. Table 10 shows the results of the binary logistic models – in terms of coefficients – and table 11 shows the relevant marginal effects. These marginal effects are used to answer the hypothesis.

The coefficients in table 10 first of all show that the relation between the three risk proxies is highly statistical significant. Two out of three risk proxies are significant on a 1% significance level. This implies that individuals with a higher (self-perceived) risk tolerance, have a higher probability to engage in entrepreneurship on average. This is in accordance with the existing academic literature. Tables 14 and 15 in the appendix show that this is not only true for the whole sample, but this is also true for both Western Europe and Eastern Europe samples on their own. Hence, this study finds that risk tolerance is an important predictor of self-employment, and that this relationship holds for both Western *and* Eastern Europe.

However, the model tests whether there is a difference in the magnitude of the role of risk difference in Western Europe compared to Eastern Europe with respect to the process of engaging in entrepreneurship. This is tested by means of the interaction term in the different regressions. The results in table 10 show us that the coefficients of the interaction term are not statistically significant for all different risk proxies. This implicates that based on the sample used, there is no statistical evidence that risk tolerance in Western Europe is a more important determinant for entrepreneurship than it is in Eastern Europe. Table 11 gives more information about the interaction term. Since the results in table 10 are the coefficients of a binary logistic regressions, nothing can be concluded with respect to the magnitude of the relations. Therefore, table 11 shows the relevant marginal effects. These marginal effects show that for both the self-perceived risk tolerance and the hypothetical job question, risk toleration is a more important determinant for entrepreneurship in Western Europe than in Eastern Europe. However, based on the lack of statistical significance of the

interaction term shown in table 10, the difference in magnitude is not enough to support hypothesis 3. Therefore, hypothesis 3 is rejected.

With respect to the control variables in the regressions, it is noticeable that gender and age are highly statistical significant as a predictor for entrepreneurship. Both gender and age have a positive significant relation with self-employment. Furthermore, income shows a significant positive relation with self-employment.

Table 10 - Differences in risk tolerance between Western and Eastern European entrepreneurs (in interaction terms)

Variable	Self-employment	Self-employment	Self-employment
Self-perceived risk tolerance	0.957 (0116)***		
Hypothetical job question		0.848 (0.120)***	
Willingness to move			0.288 (0.118)**
Interaction term	0.035 (0.173)	0.067 (0.173)	-0.214 (0.171)
West versus East	0.178 (0.137)	0.248 (0.126)**	0.261 (0.112)**
Gender	0.044 (0.085)***	0.489 (0.087)***	0.508 (0.085)***
Age	0.003 (0.021)	0.020 (0.022)	0.017 (0.021)
Age^2	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Marital status	0.145 (0.091)	0.117 (0.093)	0.000 (0.010)*
Education			
Primary education	0.041 (0.276)	0.322 (0.266)	0.251 (0.252)
Lower secondary education	0.361 (0.281)	0.273 (0.282)	0.271 (0.267)
Upper secondary education	-0.020 (0.275)	-0.200 (0.276)	-0.118 (0.262)
Income	0.057 (0.027)**	0.053 (0.028)*	0.100 (0.027)***
Education father	0.042 (0.021)*	0.035 (0.022)	0.040 (0.002)*
Education mother	0.020 (0.022)	0.283 (0.023)	0.024 (0.022)
Pseudo R^2	*0.0631*	*0.0593*	*0.0325*
Observations	*6048*	*5865*	*5835*

*p < 0.1 **p < 0.05 *** p < 0.01

(standard errors between parentheses)

Table 11 – Marginal effects of risk toleration per region

Variable	Self-employment
Self-perceived risk tolerance (binomial)	
West	0.102 (0.014)***
East	0.086 (0.011)***
Risk tolerance (hypothetical job question)	
West	0.102 (0.015)***
East	0.078 (0.012)***
Risk tolerance (Willingness to move)	
West	0.008 (0.014)
East	0.028 (0.012)**

*p < 0.1 **p < 0.05 *** p < 0.01

(standard errors between parentheses)

5. Discussion, limitations and conclusion

Discussion

This study expected a significant difference in risk tolerance based on the different contexts of the two geographical areas. The expectation was that Western European entrepreneurs are more risk tolerant since the social security system in Western Europe is more sophisticated and Eastern Western entrepreneurs may still face the effects of the socialist regime which affected the mentality of the inhabitants of former Soviet Union countries. However, the results in this study find that 1) Western European individuals do on average not have a significant different risk tolerance than Eastern European individuals, 2) Western European entrepreneurs do on average not have a significant different risk tolerance than Eastern European entrepreneurs and 3) risk toleration does not play a significant different role in Western Europe compared to Eastern Europe.

The outcomes of this study imply therefore that risk tolerance cannot be a driver of the difference of preparedness to get self-employed or deploy other entrepreneurial activities between Eastern European people and Western European people. However, the existing literature shows that there is still a large difference between the percentage of entrepreneurs in the working force. Table 1 is illustrative for this finding. Despite the finding of this study that risk tolerance cannot be a driver of the difference between the preparedness to get self-employed in the two regions of the European Union, this study recommends to conduct further research to the regional differences of determinants of entrepreneurship. As sketched in chapter 2, entrepreneurship is an important driver for our economy and therefore it is important to have a comprehensive picture of the factors that influence occupational choice.

Limitations

As every research, this study has its limitations. First of all, the risk perception is self-reported. This is done by multiple previous studies, but in an ideal study, the risk tolerance is measured by means of objective and generally accepted measures of risk tolerance. Besides, two of the risk measures are related to occupational choice (hypothetical job question and willingness to move), but they are not directly related to entrepreneurship. It is arguable whether incorporating an entrepreneurially related question, would give different results. Furthermore, the group of Eastern European individuals is larger than the group of Western European individuals. Although the subsample of Western European individuals is still sufficiently large, the present study recommends to conduct further research with more equal groups.

Moreover, the dataset of this study does not include every country within the European Union. The research would have been more applicable when there was data from each and every country within the European Union. Thereby, the proxy for entrepreneurship (self-employment) is an arguable proxy, since not every self-employed person chooses to be self-employment voluntarily. Some were forced because they did not have a paid job anymore. The previous limitation directly leads to the next limitation; the *Life in transition survey* is a very general survey. Therefore, this study chose to extract only the employed and self-employed people in the dataset as participant in the regressions. Moreover, the data in the dataset was collected in a period of a global economic recession or downturn. This means that one should be cautious with comparing the results of this study with results of studies that gathered their data in times of economic prosperity.

Furthermore, as depicted in the introduction, several studies find a relation between the risk propensity of the entrepreneur and the survival rate of their business. This study does only take existing firms into account and does not measure whether people have tried to start their own business, but failed to continue it.

Conclusion

The research question of this study asked itself whether there were significant differences between the risk tolerance of Eastern European entrepreneurs and Western European entrepreneurs.

By means of three hypotheses, this study draws the conclusion that:

1. The risk tolerance of individuals to the *Life in transition survey* does not significantly differ between Eastern Europe and Western Europe (hypothesis 1)
2. The risk tolerance of entrepreneurs to the *Life in transition survey* does not significantly differ between Eastern Europe and Western Europe (hypothesis 2)
3. Risk tolerance is not a larger driver for entrepreneurship in Eastern Europe than it is in Western Europe (hypothesis 3)

By finding these results, this study makes a contribution to the existing academic literature with respect to regional differences in the determinants of entrepreneurship. Based on the results of this study, it is not necessary to implement different policies with respect to influence risk tolerance in either Western Europe or Eastern Europe.

6. Bibliography

Acs, Zoltan J., and David B. Audretsch. "Innovation in large and small firms: an empirical analysis." *The American Economic Review* (1988): 678-690.

Adam-Muller, A. F., Andres, R., Block, J. H., & Fisch, C. (2015). Socialist Heritage and Image of Entrepreneurs in Europe: Micro-Level Evidence, forthcoming

Agarwal, Rajshree, David Audretsch, and M. B. Sarkar. "The process of creative construction: knowledge spillovers, entrepreneurship, and economic growth." *Strategic Entrepreneurship Journal* 1.3-4 (2007): 263-286.

Arrow, Kenneth J. "Risk perception in psychology and economics." *Economic inquiry* 20.1 (1982): 1-9.

Backes-Gellner, U., & Moog, P. M. (2008). Who chooses to become an entrepreneur? The Jacks-of-All-Trades in Social and Human Capital. *The Jacks-of-All-Trades in Social and Human Capital (February 2008). University of Zurich Institute for Strategy and Business Economics Working Paper*, (76).

Baumol, William J. *Education for innovation: entrepreneurial breakthroughs vs. corporate incremental improvements*. No. w10578. National Bureau of Economic Research, 2004.

Bridger, Sue, and Frances Pine, eds. *Surviving post-socialism: Local strategies and regional responses in Eastern Europe and the former Soviet Union*. Routledge, 2013.

Bridger, Susan, and Frances Pine. *Surviving post-socialism: Local strategies and regional responses in Eastern Europe and the former Soviet Union*. Vol. 4. Psychology Press, 1998.

Brockhaus, Robert H. "Risk taking propensity of entrepreneurs." *Academy of management Journal* 23.3 (1980): 509-520.

Bruton, Garry D., David Ahlstrom, and Krzysztof Obloj. "Entrepreneurship in emerging economies: Where are we today and where should the research go in the future." *Entrepreneurship theory and practice* 32.1 (2008): 1-14.

Caliendo, Marco, and Alexander S. Kritikos. "Start-ups by the unemployed: characteristics, survival and direct employment effects." *Small Business Economics* 35.1 (2010): 71-92.

Caliendo, Marco, Frank M. Fossen, and Alexander S. Kritikos. "Risk attitudes of nascent entrepreneurs–new evidence from an experimentally validated survey." *Small Business Economics* 32.2 (2009): 153-167.

Caliendo, Marco, Frank Fossen, and Alexander Kritikos. "The impact of risk attitudes on entrepreneurial survival." *Journal of Economic Behavior & Organization* 76.1 (2010): 45-63.

Cantillon, R. (1931). Essai sur la Nature du Commerce en Général. (H. Higgs, Ed.) London: Macmillan.

Carree, Martin, and A. Roy Thurik. "Small firms and economic growth in Europe." *Atlantic Economic Journal* 26.2 (1998): 137-146.

Carree, Martin, and A. Roy Thurik. "The impact of entrepreneurship on economic growth." *Handbook of Entrepreneurship Research*. Springer US, 2003. 437-471.

Carree, Martin, and A. Roy Thurik, eds. *Entrepreneurship and economic growth*. Cheltenham: Edward Elgar, 2006.

Carter, Steven, and Wilton Wilton. "Don't blame the entrepreneur, blame government: The centrality of the government in enterprise development; lessons from enterprise failure in Zimbabwe." *Journal of Enterprising Culture*14.01 (2006): 65-84.

Casson, Mark, and Peter J. Buckley. *Entrepreneurship*. Edward Elgar Publishing, 2010.

Christiansen, C. (1997). The innovators dilemma. Cambridge: Harvard Business School Press.

Cramer, Jan S., et al. "Low risk aversion encourages the choice for entrepreneurship: an empirical test of a truism." *Journal of economic behaviour & Organization* 48.1 (2002): 29-36.

Cramer, Jan S., et al. "Low risk aversion encourages the choice for entrepreneurship: an empirical test of a truism." *Journal of economic Behaviour & Organization* 48.1 (2002): 29-36.

Davidsson, Per, and Benson Honig. "The role of social and human capital among nascent entrepreneurs." *Journal of business venturing* 18.3 (2003): 301-331.

Davis, Steve J., and John Haltiwanger. *Gross job creation, gross job destruction and employment reallocation*. No. w3728. National Bureau of Economic Research, 1991.

Davis, Steven J., John Haltiwanger, and Scott Schuh. "Small business and job creation: Dissecting the myth and reassessing the facts." *Small Business Economics* 8.4 (1996): 297-315.

Deery, Hamish A. "Hazard and risk perception among young novice drivers."*Journal of safety research* 30.4 (2000): 225-236.

Eckel, Catherine C., and Philip J. Grossman. "Men, women and risk aversion: Experimental evidence." *Handbook of experimental economics results* 1 (2008): 1061-1073.

Entrepreneurial Development Bank. “Anual Report 2013”, 2013.

Estrin, S., and Mickiewicz, T. (2011). Entrepreneurship in transition economies: the role of institutionand generational change. In Minniti, M. (Ed.), The dynamics of entrepreneurship: evidence from the global entrepreneurship monitor data, pp. 181-208.

Eu-Celac action plan 2013,2015, Council of the European Union, http://www.eeas.europa.eu/la/summits/docs/2013_santiago_summit_eu-celac_action_plan_en.pdf

Eurostat (2014). Regional Yearbook 2014, Theme: General and regional statistics.

Eurostat (2015). Obtained on 02-11-2015 from http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tec00114&plugin=1

Geroski, Paul A. "Entry, innovation and productivity growth." *The Review of Economics and Statistics* (1989): 572-578.

Grilo, I., & Thurik, A. R. (2006). Entrepreneurship in the old and new Europe. In *Entrepreneurship, Growth, and Innovation* (pp. 75-103). Springer US.

Hamilton, Barton H. "Does entrepreneurship pay? An empirical analysis of the returns to self-employment." *Journal of Political Economy* 108.3 (2000): 604-631.

Hébert, Robert F., and Albert N. Link. "In search of the meaning of entrepreneurship." *Small Business Economics* 1.1 (1989): 39-49.

Hisrich, Robert D. "Entrepreneurship/intrapreneurship." *American Psychologist*45.2 (1990): 209.

Jaeger, David A., et al. "Direct evidence on risk attitudes and migration." *The Review of Economics and Statistics* 92.3 (2010): 684-689.

Jorgenson, Dale W. "Productivity and economic growth." *Fifty years of economic measurement: The Jubilee of the Conference on Research in Income and Wealth*. University of Chicago Press, 1991.

Kihlstrom, Richard E., and Jean-Jacques Laffont. "A general equilibrium entrepreneurial theory of firm formation based on risk aversion." *The Journal of Political Economy* (1979): 719-748.

Koopmanschap, Marc, et al. "Measuring productivity changes in economic evaluation." *Pharmacoeconomics* 23.1 (2005): 47-54.

Knight, Frank H. Risk, Uncertainty and Profit. Boston: Houghton Mifflin. 1921. On the History and Method of Economics. Chicago: Univ. Chicago Press.

Kreiser, Patrick M., et al. "Cultural influences on entrepreneurial orientation: The impact of national culture on risk taking and proactiveness in SMEs."*Entrepreneurship Theory and Practice* 34.5 (2010): 959-983.

Laborde, Jean-Pierre. "Social security and the European Union." *Managerial Law* 47.6 (2005): 59-67.

Lazear, Edward P. "Balanced skills and entrepreneurship." *American Economic Review* (2004): 208-211.

Le, Anh T. "Empirical studies of self-employment." *Journal of Economic surveys* 13.4 (1999): 381-416.

Levesque, Moren, and Maria Minniti. "The effect of aging on entrepreneurial behavior." *Journal of Business Venturing* 21.2 (2006): 177-194.

Love, James H., and Brian Ashcroft. "Market versus corporate structure in plant-level innovation performance." *Small Business Economics* 13.2 (1999): 97-109.

Luthans, F., & Ibrayeva, E. S. (2006). Entrepreneurial self-efficacy in Central Asian transition economies: quantitative and qualitative analyzes. Journal of International Business Studies, 37 (1), 92-110.

Martin, Bruce C., Jeffrey J. McNally, and Michael J. Kay. "Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes." *Journal of Business Venturing* 28.2 (2013): 211-224.

Masters, Robert, and Robert Meier. "Sex differences and risk-taking propensity of entrepreneurs." *Journal of Small Business Management* 26.1 (1988): 31.

Moskowitz, Tobias J., and Annette Vissing-Jorgensen. *The returns to entrepreneurial investment: A private equity premium puzzle?* No. w8876. National Bureau of Economic Research, 2002.

Nickell, Stephen, Daphne Nicolitsas, and Neil Dryden. "What makes firms perform well?" *European Economic Review* 41.3 (1997): 783-796.

Parker, Simon C. *The economics of entrepreneurship*. Cambridge University Press, 2009.

Van Praag, C. Mirjam, and Peter H. Versloot. "What is the value of entrepreneurship? A review of recent research." *Small Business Economics*29.4 (2007): 351-382.

Reynolds, Paul, et al. "Global entrepreneurship monitor." *Executive Report* (2000).

Robbins, D. Keith, et al. "An ampirical assessment of the contribution of small business employment to US State economic performance." *Small Business Economics* 15.4 (2000): 293-302.

Jean-Baptiste, S. A. Y. "Traité d'économie politique ou simple exposition de la manière dont se forment, se distribuent et se consomment les richesses."*Paris: Guillaumin, 1841. –640 p* (1803).

Schultz, Theodore W. "Investment in entrepreneurial ability." *The Scandinavian Journal of Economics* (1980): 437-448.

Schumpeter, Joseph. "Creative destruction." *Capitalism, socialism and democracy* (1942).

Schwartz, Shalom H., and Anat Bardi. "Influences of adaptation to communist rule on value priorities in Eastern Europe." *Political psychology* 18.2 (1997): 385-410.

Shaffer, Sherrill. "Establishment size and local employment growth." *Small Business Economics* 26.5 (2006): 439-454.

Shane, Scott, and Sankaran Venkataraman. "The promise of entrepreneurship as a field of research." *Academy of management review* 25.1 (2000): 217-226.

Simon, Mark, Susan M. Houghton, and Karl Aquino. "Cognitive biases, risk perception, and venture formation: How individuals decide to start companies."*Journal of Business Venturing* 15.2 (2000): 113-134.

Sitkin, Sim B., and Amy L. Pablo. "Reconceptualizing the determinants of risk behavior." *Academy of management review* 17.1 (1992): 9-38.

Sjöberg, Lennart. "Factors in risk perception." *Risk analysis* 20.1 (2000): 1-11.

Van der Sluis, Justin, Mirjam Van Praag, and Wim Vijverberg. "Education and entrepreneurship selection and performance: A review of the empirical literature." *Journal of economic surveys* 22.5 (2008): 795-841.

Smallbone, David, and Friederike Welter. "The distinctiveness of entrepreneurship in transition economies." *Small business economics* 16.4 (2001): 249-262.

Smallbone, David, and Friederike Welter. "Entrepreneurship and institutional change in transition economies: The Commonwealth of Independent States, Central and Eastern Europe and China compared." *Entrepreneurship & Regional Development* 24.3-4 (2012): 215-233.

Smith, Adam. *The wealth of nations [1776]*. na, 1937.

Sørensen, Jesper B., and Toby E. Stuart. "Aging, obsolescence, and organizational innovation." *Administrative science quarterly* 45.1 (2000): 81-112.

Sternberg, R., & Wennekers, S. (2005). Determinants and effects of new business creation using global entrepreneurship monitor data. *Small Business Economics*, *24*(3), 193-203.

Stewart Jr, Wayne H., and Philip L. Roth. "Risk propensity differences between entrepreneurs and managers: a meta-analytic review." *Journal of applied psychology* 86.1 (2001): 145.

Stuetzer, Michael, Martin Obschonka, and Eva Schmitt-Rodermund. "Balanced skills among nascent entrepreneurs." *Small Business Economics* 41.1 (2013): 93-114.

Tan, J. (2001). Innovation and risk-taking in a transitional economy: A comparative study of Chinese managers and entrepreneurs. Journal of Business Venturing, 16 (4), 359-376.

Wennekers, Sander, and Roy Thurik. "Linking entrepreneurship and economic growth." *Small business economics* 13.1 (1999): 27-56.

Wildavsky, Aaron, and Karl Dake. "Theories of risk perception: Who fears what and why?" *Daedalus* (1990): 41-60.

Wyrwich, M. (2013). Can socioeconomic heritage produce a lost generation with regard to entrepreneurship? Journal of Business Venturing, 28(5), 667-682.

Yang, Jing Yu, and Jiatao Li. "The development of entrepreneurship in China."*Asia Pacific Journal of Management* 25.2 (2008): 335-359.

Van der Zwan, Peter, Ingrid Verheul, and A. Roy Thurik. "The entrepreneurial ladder, gender, and regional development." *Small Business Economics* 39.3 (2012): 627-643.

7. Appendices

Table 12 - Differences in risk tolerance per region based on whole sample (not only the working force)

Variable	Risk tolerance (binomial)	Risk tolerance (hypothetical job question)	Risk tolerance (Willingness to move)
West versus East	0.011 (0.009)	-0.006 (0.009)	0.109 (0.009)***
Gender	0.109 (0.009) ***	0.103 (0.009) ***	0.077 (0.009)***
Age	-0.007 (0.002) ***	-0.008 (0.002) ***	-0.010 (0.002)***
Age^2	0.000 (0.000)	0.000 (0.000) ***	0.000 (0.000)**
Marital status	-0.016 (0.015) *	-0.013 (0.012)*	-0.026 (0.012)***
Education			
Primary education	0.062 (0.015) ***	0.042 (0.015)***	0.030 (0.014)**
Lower secondary education	0.103 (0.015) ***	0.112 (0.018)***	0.068 (0.018)***
Upper secondary education	0.123 (0.017) ***	0.182 (0.017)***	0.130 (0.017)***
Income	0.032 (0.003) ***	0.028 (0.003)***	-0.014 (0.002)***
Education father	0.001 (0.002)	0.005 (0.002)**	0.003 (0.002)
Education mother	0.006 (0.002) **	0.008 (0.002)***	0.003 (0.002)
Pseudo R^2	*0.073*	*0.089*	*0.097*
Observations	*11764*	*11279*	*11462*

*p < 0.1 **p < 0.05 *** p < 0.01

(standard errors between parentheses)

Country

Table 14 - Risk tolerance of Western European entrepreneurs

Variable	Self-employment	Self-employment	Self-employment
Risk tolerance (binomial)	0.108 (0.014)***		
Risk tolerance (hypothetical job question)		0.104 (0.014)***	
Risk tolerance (Willingness to move)			0.016 (0.014)
Gender	0.047 (0.013)***	0.048 (0.014)***	0.058 (0.014)***
Age	0.004 (0.001)***	0.004 (0.001)***	0.004 (0.001)***
Age^2			
Marital status	-0.019 (0.017)*	-0.012 (0.018)	-0.0023 (0.018)
Education			
Primary education	0.0535 (0.039)	0.047 (0.039)	0.050 (0.030)
Lower secondary education	0.0421 (0.041)	0.027 (0.042)	0.051 (0.042)
Upper secondary education	-0.001 (0.040)	-0.024 (0.041)	0.002 (0.041)
Income	0.005 (0.004)	0.005 (0.004)	0.010 (0.004) **
Education father	0.007 (0.003) **	0.007 (0.003) **	0.007 (0.003)**
Education mother	-0.002 (0.003)	-0.002 (0.004)	0.002 (0.004)
Pseudo R^2	*0.082*	*0.078*	*0.047*
Observations	*2418*	*2390*	*2388*

*p < 0.1 **p < 0.05 *** p < 0.01

(standard errors between parentheses)

Table 15 - Risk tolerance of Eastern European entrepreneurs

Variable	Self-employment	Self-Employment	Self-Employment
Risk tolerance (binomial)	0.081 (0.011)***		
Risk tolerance (hypothetical job question)		0.067 (0.011)***	
Risk tolerance (Willingness to move)			0.022 (0.011) **
Gender	0.042 (0.010)***	0.046 (0.010)***	0.048 (0.011) ***
Age	0.002 (0.000)***	0.002 (0.000)***	0.002 (0.001)***
Age^2	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Marital status	0.003 (0.014)	-0.004 (0.013)	0.002 (0.014)
Education			
Primary education	0.033 (0.034)	0.021 (0.033)	0.008 (0.031)
Lower secondary education	0.033 (0.036)	0.026 (0.034)	0.011 (0.033)
Upper secondary education	0.002 (0.035)	-0.012 (0.034)	-0.019 (0.033)
Income	0.005 (0.003)	0.005 (0.003)	0.009 (0.003)**
Education father	0.001 (0.003)	0.000 (0.003)	0.002 (0.003)
Education mother	0.005 (0.003) *	0.006 (0.003)	0.006 (0.003)**
Pseudo R^2	*0.051*	*0.0451*	*0.0239*
Observations	*3630*	*3475*	*3447*

*p < 0.1 ** p < 0.05 *** p < 0.01

(standard errors between parentheses)