Schumpeter School
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SCHUMPETER DISCUSSION PAPERS

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The Schumpeter Discussion Papers are a publication of the Schumpeter School of Business and Economics, University of Wuppertal, Germany
For editorial correspondence please contact SSBEEditor@wiwi.uni-wuppertal.de

SDP 2010-009
ISSN 1867-5352

Impressum
Bergische Universiät Wuppertal
Gaußstraße 20
42119 Wuppertal
www.uni-wuppertal.de

BERGISCHE
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Mirror, mirror on the wall, who is the most entrepreneurial of them all?

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Abstract

Recent empirical studies have shown that many employees would prefer to be self-employed, just as many nascent entrepreneurs are also in fulltime, paid employment. This paper investigates the factors determining individual preference for being self-employed, entrepreneurial intention and individual decision in taking steps to start a new venture. We argue that a cluster of psychological characteristics related to the tasks of an entrepreneur in an early stage of the entrepreneurial process, which we call individual entrepreneurial aptitude (*IEA*), is an important determinant of potential entrepreneurship and early stage start-up activities. To test our hypotheses we make use of a large scale general population survey conducted in 36 countries in the year 2009. We find a considerable variation of *IEA* between occupational groups, as well as within occupational groups. Our results suggest a strong positive relationship between *IEA* and self-employment preference. *IEA* is also a strong and robust predictor of entrepreneurial intention and nascent entrepreneurship, where the relationship appears to be non-linear. The probability of having entrepreneurial intention and being a nascent entrepreneur increases drastically if the level of *IEA* is very high. Moreover, our results indicate that *IEA* is positively related to the exploitation of perceived entrepreneurial opportunities.

1. Introduction

Large numbers of employees in industrial countries say that they would prefer to be self-employed, which can be interpreted as empirical evidence for the existence of 'entrepreneurial spirit' or 'latent entrepreneurship' among employees (Blanchflower et al. 2001, Blanchflower and Oswald 1998). Likewise, recent empirical studies have found that a significant proportion of individuals who are engaged in start-up activities initiate their ventures while simultaneously working for pay (Folta et al. 2010) and that 'pure' entrepreneurs, who spend all of their time in self-employment, are outnumbered by those individuals who divide up their time between both self-employment and paid work. This suggests that the dichotomous depiction of entrepreneurship and paid work may indeed be misleading (Burke et al. 2008). Why do many employees prefer to be self-employed and why do some employees take steps to start new ventures while others do not?

In this paper we empirically investigate the factors which influence employees' preference for being self-employed, entrepreneurial intention and individual decision to start a new venture. In particular, we argue that a cluster of psychological characteristics related to the tasks of an entrepreneur in an early stage of the entrepreneurial process is conducive to the business creation activities of employees. We call this cluster of psychological characteristics *individual entrepreneurial aptitude (IEA*). It is the aim of this paper to clarify the theoretical basis of these relationships and to test the empirical implications. In doing so, this paper ties together partly related, but largely unconnected strands of literature: the studies dealing with the non-monetary benefits of self-employment (Benz and Frey 2008a, b, Blanchflower 2000, Hundley 2000) and the individual-opportunity nexus framework (Eckhardt and Shane 2003, Shane 2003, Shane and Venkataraman 2000, Venkataraman 1997).

The results of empirical studies suggest that self-employment offers significant non-monetary benefits, whereas the monetary benefits themselves seem to be relatively low (Hamilton 2000). Studies on the job satisfaction of the self-employed suggest that they are more satisfied with their work than those employed in firms or other organizations, because their work is more interesting and provides greater autonomy (Benz and Frey 2008a, Hundley 2000). Benz and Frey (2008b, p. 363) postulate that this may point to the existence of 'procedural utility' which "refers to the value that individuals place not only on outcomes, as usually assumed in economics, but also on the process and conditions leading to outcomes." We argue that the *expected* procedural utility of self-employment is higher for individuals with high levels of *IEA*, which in turn implies that these individuals are more likely to prefer being self-employed or to have entrepreneurial intentions. In other words, we argue that employees with a higher level of *IEA* are more likely to be *potential entrepreneurs*.

According to the individual opportunity nexus framework, psychological characteristics may influence the probability of exploiting opportunities, as they may lead people to make different decisions about the exploitation of opportunities even if they have the same information and skills (Shane 2003, p. 96).

With this in mind, we argue that *IEA* may be directly linked to the exploitation of opportunities in starting a new venture. Accordingly, employees with a higher level of *IEA* may be more likely to be *nascent entrepreneurs*, i.e. take steps to start a business.

In order to test empirical implications we develop a multidimensional measure of *individual entrepreneurial aptitude* (*IEA*) which comprises eight dimensions, each of them representing a psychological characteristic that can be matched to the tasks of entrepreneurs in the early stage of the entrepreneurial process, i.e. *autonomy, risk taking, innovativeness, proactiveness, competitiveness, general optimism, general self-efficacy*, and *internal locus of control* (Rauch and Frese 2007, Shane 2003).[1] Our empirical analysis consists of two steps: in the first step we focus on *potential entrepreneurs* and analyze the relationship between *IEA* and the general preference for being self-employed. We complement this with an analysis of the relationship between *IEA* and entrepreneurial intention. In the second step we examine the relationship between *IEA* and the probability of taking steps to start a venture. In addition, we investigate empirically whether *IEA* is related to the perceived exploitation of entrepreneurial opportunities as suggested by the individual-opportunity nexus.

Our empirical analysis is based on the "*Flash Eurobarometer Entrepreneurship* 2009" which is a general population survey conducted at the request of the *Directorate General (DG) "Enterprise and Industry"* of the European Commission. Approximately 26.000 people in 32 European countries and 4 countries outside Europe (China, Japan, South Korea, and USA) were surveyed at the end of 2009. DG "*Enterprise and Industry"* kindly allowed us to include eight items that measure individual entrepreneurial aptitude. Furthermore, the dataset contains information about interviewees' preferences for being self-employed, entrepreneurial intention, start-up activities, perceived entrepreneurial opportunities, income satisfaction and personal characteristics, like age, education or employment status.

To the best of the authors' knowledge there are no empirical studies analyzing the relationship between psychological characteristics and employees' general preferences for being self-employed and their influence on actual start-up activities of employees. Our study is related to the study by Folta et al. (2010) who analyze the incremental transition of employees into self-employment. Based on an occupational classification system scheme, they distinguish between paid workers, the self-employed, and hybrid entrepreneurs (primary classification is employed and secondary is self-employed) and analyze the transition from one status to another. However, their classification is based on sources of income, which implies that self-employment is already generating profits or losses. In contrast, we focus on earlier stages in the entrepreneurial process by investigating the influence of *IEA* on the

[1] Our multidimensional IEA measure strictly focuses on the individual, i.e. an individual's psychological characteristics. Another slightly related strand of research has examined the concept of entrepreneurial orientation (EO). Although entrepreneurial orientation comprises of similar dimensions, like autonomy, risk taking, innovativeness, proactiveness, and competitive aggressiveness, these dimensions refer to firm or organizational behavior but not to individual psychological characteristics (Lumpkin and Dess, 1996).

probability of being a *potential entrepreneur* and by analyzing the effect of *IEA* on the probability of taking steps to start a new business (*nascent entrepreneurship*), irrespective of whether these start-up activities lead to self-employment or hybrid entrepreneurship in the end or not. This allows us to analyze the relevance of *IEA* at a very early stage of the entrepreneurial process.

Furthermore, our study is related to the literature which deals with the relationship between personality traits and entrepreneurship (Cromie 2000). This line of research typically aims to identify differences between the personality traits of the self-employed (e.g. business owners) and the personality traits of a reference group (e.g. managers). This has been criticized because such studies suffer from a number of methodological problems (Aldrich 1999, Brockhaus and Horwitz 1986, Gartner 1988; Low and MacMillan 1988). They are based, for instance, on a static perspective, since the implicit assumption is: "once an entrepreneur, always an entrepreneur" (Gartner 1988, p. 12). Moreover, the results of these studies cannot be interpreted as causal, because they are typically based on cross-sectional data where only successful entrepreneurs are observed and which may result in reverse causality if business success affects personality traits (Rauch and Frese 2007).

However, our approach is quite different from other approaches used in entrepreneurial traits research. In our study self-employment and paid work are *not* treated as mutually exclusive categories and we do not ask 'Who is an entrepreneur?' but we take the heterogeneity of *IEA* within occupational categories explicitly into account. We investigate, for instance, whether managers with a higher level of *IEA* are more likely to take steps to start a business than managers with a low level of *IEA*. Moreover, we avoid the problem of reverse causality by focusing on a very early stage of the entrepreneurial process. Firstly, we exclude individuals with any start-up experience from our empirical analysis of *potential entrepreneurship*, i.e. the individual preference for being self-employed and entrepreneurial intention. Secondly, we analyze the factors influencing *nascent entrepreneurship*, i.e. the decision to take first steps to start a business.

Our findings suggest a strong and positive relationship between *IEA* and the preference for being self-employed. Moreover, *IEA* positively affects entrepreneurial intention and individual decision to take steps to start a business. Our results suggest that especially those employees with a very high level of *IEA* are more likely to have entrepreneurial intentions and to be nascent entrepreneurs. Even if the empirical analysis is restricted to the group of employees who show a preference for self-employment, *IEA* is still a strong and robust predictor of entrepreneurial intention and nascent entrepreneurship. Furthermore, our results point to the positive effect of *IEA* on opportunity exploitation in taking steps to start a business.

The article is organized as followed. Section 2 explains the theoretical framework of our study. Section 3 describes the data source, measurement of variables and presents descriptive statistics. The

empirical results are presented in Section 4. The results and limitations of our study are discussed in section 5. Section 6 concludes.

2. Theoretical Framework

2.1. Psychological Characteristics and Business Creation

While the relevance of non-psychological characteristics for business creation is widely accepted[2], the role of psychological characteristics in the decision to start a business is discussed controversially in entrepreneurship research (Rauch and Frese 2007). This is indeed surprising as classical researchers, such as Knight (1921) and Schumpeter (1934), considered the psychological characteristics of entrepreneurs as central to the explanation of entrepreneurship and very many scholars have contributed to this field of research in the past fifty years (Cromie 2000). However, the focus of entrepreneurship research has shifted away from the role of individuals to the role of environmental conditions (Thornton and Flynn 2003) and the characteristics of entrepreneurial opportunities (Shane et al. 2003). This may be explained by the fact that academic scholars have not yet reached consensus on the degree to which psychological characteristics and entrepreneurial behavior are related to one another, although this relationship has been studied for many decades. Rauch and Frese (2007, p. 354) state that a "deep-rooted skepticism prevails in the entrepreneurship literature about the presence and the strength" of the relationship between personality traits and entrepreneurial behavior. Sarasvathy (2004, p.708) concludes that "One of the most persistent and largely fruitless endeavors we have engaged in as entrepreneurship researchers consists in our efforts to understand differences between entrepreneurs and nonentrepreneurs, both with respect to the decision to become entrepreneurs as well as the propensity to succeed in new venture creation". Recent meta-analyses, however, suggest that personality traits do matter for entrepreneurial behavior (Rauch and Frese 2007, Zhao and Seibert 2006). Besides the plethora of methodological problems regarding prior empirical research on the relationship between psychological characteristics and business creation, the weak theoretical underpinning of many of these studies may also explain such skepticism.

In order to clarify the theoretical basis of the relationship between psychological characteristics and business creation, we make use of the individual-opportunity nexus framework and explain how *individual entrepreneurial aptitude* (*IEA*) might affect an employee's decision to exploit entrepreneurial opportunities by starting a new venture. We define *individual entrepreneurial aptitude* (*IEA*) as a cluster of psychological characteristics which are related to the tasks of entrepreneurs at an

[2] For instance, opportunity costs are related to income and empirical evidence suggests that those people who have higher incomes in fact have a lower probability of entering self-employment (Evans and Leighton 1989). Moreover, empirical evidence suggests an inverse U-shaped relationship between the probability of starting a business and age (Parker 2004) and gender seems also to be relevant, since most studies report that the probability of starting new businesses is significantly lower for women in comparison to men (Parker 2004).

early stage of the entrepreneurial process. Moreover, we argue that employees may prefer to be self-employed because of the expected non-monetary benefits associated with self-employment and that the latter is related to *IEA*.

By investigating the influence of *IEA* on *nascent entrepreneurship* and its relation to *potential entrepreneurship* we focus on an early stage of the entrepreneurial process. Shane and Venkataraman (2000, p.218) define entrepreneurship as a *process* by which "opportunities to create future goods and services are discovered, evaluated, and exploited." According to Schumpeter (1934, p. 254) entrepreneurship "consists in doing things that are not generally done in the ordinary course of business routine." Other scholars state that the creation of new enterprises lies at the heart of entrepreneurship (Low and MacMillan 1988; Gartner 1988; Shook et al. 2003). Consequently, a narrow definition would imply that entrepreneurship is restricted to the creation stage of an organization. However, more broadly defined entrepreneurship may also be comprised of independent business ownership. Shane and Venkataraman (2000) argue that the entrepreneurial process does not require, but can include, the creation of new organizations. Entrepreneurs are not necessarily founders of new organizations, since entrepreneurial opportunities may also be discovered and exploited within existing organizations by so called corporate entrepreneurs or intrapreneurs (Pinchot 1985; Fulop 1991). However, as pointed out by Shane et al. (2003), activities to start a business are an important special case of entrepreneurial behavior. Our empirical analysis focuses on this 'special case'.[3]

2.2. Individual Entrepreneurial Aptitude and the Exploitation of Entrepreneurial Opportunities

Eckhardt and Shane (2003), Shane and Venkataraman (2000), and Venkataraman (1997) propose the *individual-opportunity nexus* as a conceptual framework for analyzing entrepreneurship. They point out that the role and the relevance of individual and environmental factors depend on the stage of the entrepreneurial process, i.e. the discovery of entrepreneurial opportunities, their exploitation, and execution. Once an individual has discovered an opportunity, she or he has to decide whether or not to take steps to exploit it. In order to reap the fruits of just such a situation, individuals must weigh up potential investments (money and time), as well as possible mechanisms for exploiting the opportunity at this initial stage of the entrepreneurial process. Whether or not individuals are willing and able to act upon certain opportunities depends a great deal on the nature of the opportunities in question and individual differences (Shane et al. 2003). Consequently, individual characteristics – both psychological and non-psychological – tend to be of special importance in the exploitation phase.

According to the individual-opportunity nexus framework, such differences may lead people to make different decisions about opportunities even if they have the same information and skills (Shane 2003). People will take steps to exploit an opportunity if they "believe that the expected value of exploitation

[3] This does not mean that IEA may not be relevant for other steps of the entrepreneurial process. For instance, IEA may be relevant for financial success of an existing firm.

(both monetary and psychological) exceeds the opportunity cost for the alternative use of their time plus the premiums that they would like for bearing uncertainty and illiquidity" and the expected value, opportunity cost and premiums are influenced by the psychological and non-psychological characteristics of the entrepreneur (Shane 2003, p. 62). Shane et al. (2003, p. 258) argue that the decisions made after the discovery of opportunities are influenced by human motivations and that "the variance across people in these motivations will influence who pursues entrepreneurial opportunities, who assembles resources, and how people undertake the entrepreneurial process."

The results of recent meta-analyses point to the relevance of personality traits in the decision to start a business (Rauch and Frese 2007; Zhao and Seibert 2006). Referring to the psychological literature dealing with personality, Rauch and Frese (2007, p. 355) define personality traits "as dispositions to exhibit a certain kind of response across various situations" and conceptualize "personality traits as propensity to act". They assume "that personality traits are predictors of entrepreneurial behavior" because different propensities may facilitate or impede entrepreneurial behavior. Zhao and Seibert (2006) code various personality variables used in empirical studies into the Big Five Personality Factors and find statistically significant differences between entrepreneurs and managers on four personality dimensions. However, the effect size for each personality dimension is small and is moderate for the full set of variables. In contrast, Rauch and Frese (2007) analyze personality traits that are related to entrepreneurial tasks. They point out that it is important to distinguish between personality traits that can be theoretically matched to the tasks of entrepreneurs and other personality traits because traits that match personality with work characteristics are more likely to predict entrepreneurial behavior (Rauch and Frese 2007, p. 358). The results of their meta-analysis suggest that the relationship between business creation and personality traits matched to the tasks of entrepreneurs is indeed stronger than the relationship between business creation and traits that are *not* related to entrepreneurship.

Bearing this in mind, it could well be expected that those employees with certain psychological characteristics are more likely to exploit opportunities than other employees. Although employees might also exploit opportunities within existing organizations, our discussion of personality traits focuses on an employee's decision to exploit an opportunity by starting a new venture. Which psychological characteristics tend to influence this decision? From the entrepreneurial traits literature we identify eight psychological characteristics that are related to tasks of an entrepreneur in the very early stage of the entrepreneurial process, i.e. the exploitation of opportunities: *autonomy, risk taking, innovativeness, proactiveness, competitiveness, general self-efficacy, general optimism,* and *internal locus of control* (Cromie 2000; Rauch and Frese 2007). *Autonomy* captures the "desire for freedom to control one's own affairs" (Brandstätter 1997, p.164) and is closely related to independence. It is important for the exploitation of opportunities, as entrepreneurs often have to stand up against the opinions of others in order to get their business ideas accepted and they have to make autonomous

decision about investments and the mechanisms of exploitation. Moreover, autonomy is considered a crucial element of choice between self-employment and paid work and a as a career anchor (Katz 1992; Schein 1990). Employees showing *risk taking propensity* are more likely to start new ventures, because they are willing to bear risks associated with the entry into self-employment (Kihlstrom and Laffont 1979, Knight 1921). The trait of *innovativeness* is related to start-up activities, because the creation of new goods and services means that individuals must be willing to "reform or revolutionize the pattern of production by exploiting an invention . . . or untried technical possibility for producing a new commodity or producing an old one in a new way" (Schumpeter 1934, p.132). *Proactive* individuals try to shape their environment and tend to take the initiative (Kim et al. 2009). Employees high on proactive personality may therefore be more likely to take steps to start a new business in order to change their environment. *General self-efficacy* is relevant for start-up activities because employees exploiting entrepreneurial opportunities by starting new businesses must be confident in their general capabilities to perform in a variety of achievement situations (Chen et al. 2001). General *optimism* may also influence the decision to exploit discovered opportunities since more optimistic employees may perceive the chances of success higher than employees who are less optimistic (Shane and Venkataraman 2000). Another important aspect is *internal locus of control.* Employees who are high on internal locus of control believe that their life is determined by their own actions and not by others or by chance (Rotter 1966). Finally, *competitiveness* is likely to be a relevant psychological characteristic which influences an employee's decision to exploit opportunities by starting a new venture because market entry of a new firm may imply that the entrepreneur faces fierce competition by competitors. Schumpeter (1934, p. 93) states that "there is the will to conquer; the impulse to fight, to prove oneself superior to others, to succeed for the sake, not for the fruit of success, but of success itself." Competitiveness is usually not taken into account by entrepreneurial traits literature but the literature dealing with entrepreneurial orientation at the firm-level (corporate entrepreneurship) assesses the aggressiveness and competitive process used by managers to pursue rivals (Ginsberg 1985, Covin and Covin 1990). Hence, employees who do not avoid situations in which they compete with others are more likely to exploit opportunities and to enter self-employment. Although this enumeration of personality traits is certainly not exhaustive it comprises the most relevant traits that are associated with the exploitation of entrepreneurial opportunities. Hence, these psychological characteristics reflect *individual entrepreneurial aptitude* (*IEA*).

2.3. Individual Entrepreneurial Aptitude and Potential Entrepreneurship

Many employees in the industrialized countries are answering yes to a hypothetical question asking people whether they would prefer to be self-employed (Blanchflower et al. 2001; Blanchflower and Oswald 1998). It is likely that most of the employees surveyed who state a preference for self-employment, do not have a concrete entrepreneurial opportunity in mind that could be exploited by starting a business. Accordingly the preference expressed may not be directly linked to the

exploitation of opportunities, but instead may indicate that these employees are *potential entrepreneurs*.[4] Thus, one may ask himself why there are so many potential entrepreneurs. It is likely that employees form beliefs about the monetary and non-monetary benefits associated with self-employment which influence their answers.

The expected monetary benefits associated with self-employment do not seem to be the main reason for employees' preference for self-employment. Hamilton (2000) finds evidence that most self-employed people have lower initial earnings and lower earnings growth than in paid employment. Moskovitz and Vissing-Jorgensen (2002) report that entrepreneurs are willing to invest substantial amounts in their own firms, although the risk-adjusted returns on their entrepreneurial investments are lower than returns on the public equity market. Thus, employees may in fact prefer to be employed, for the very reason of monetary benefits gained unless those employees have, for instance, a lower risk aversion or perhaps erroneously believe that the expected earnings of the self-employed are relatively high.

That being said, the non-monetary benefits of self-employment may indeed be substantial. Hamilton (2000, p. 629) concludes that "the self-employment earnings differential reflects entrepreneurs' willingness to sacrifice substantial earnings in exchange for the non-pecuniary benefits of owning a business." Benz (2009, p. 42) states that monetary benefits are not the major reason why people engage in entrepreneurship, but that "it is more accurately characterized as a non-profit-seeking activity." Empirical studies investigating the job satisfaction of self-employed individuals and employees suggest that the former are more satisfied with their work than people employed in firms or other organizations, because their work is more interesting and provides greater autonomy (Benz and Frey 2008a, Hundley 2000). Benz and Frey (2008b, p. 363) postulate that this may point towards the existence of 'procedural utility' which "refers to the value that individuals place not only on outcomes, as usually assumed in economics, but also on the process and conditions leading to outcomes." In other words the self-employed are more satisfied with their work, because they do what they like and enjoy the utility of being engaged in the entrepreneurial process, i.e. the discovery, exploitation and execution of opportunities. Given the chance many employees might prefer self-employment to employment due to the *expected* gains from procedural utility. Of course, it is also possible that employees may engage in entrepreneurial activities within existing organizations because of the expected gains associated with these activities. However, the procedural utility from entrepreneurial activities within existing organizations tends to be lower, because "employed persons are subject to the institution of hierarchy" whereas self-employed are their own bosses (Benz and Frey 2008a, p.453).

[4] Blanchflower et al. (2001) interpret employees' preference for self-employment as empirical evidence for the 'entrepreneurial spirit' or 'latent entrepreneurship' of employees.

How can psychological characteristics influence the individual preference for being self-employed? We argue that the *expected* procedural utility from self-employment is higher for individuals with psychological characteristics that are related to the tasks of an entrepreneur, especially the exploitation of opportunities, which implies that these individuals are more likely to be potential entrepreneurs.[5] For instance, during the entrepreneurial process the entrepreneur usually has to bear risks, has to make autonomous decisions or may face fierce competition when introducing new products to markets. If an employee dislikes the situations in which she or he has to compete with others, does not like to take risks or feels uncomfortable when making autonomous decisions, the expected procedural utility from being self-employed tends to be low or even negative. Consequently, it is less likely that this employee would prefer to be self-employed. We do not want to rule out the possibility that psychological characteristics conducive to business creation may also positively influence the *expected* monetary benefits of self-employment. However, this would also imply a positive link between *IEA* and individual preference for self-employment.

2.4. Hypotheses Development

The foregoing discussion suggests that *IEA* may positively influence the probability of being a potential entrepreneur and that *IEA* may be directly related to the exploitation of entrepreneurial opportunities, which implies a positive influence of *IEA* on the probability of starting a business. Our empirical analysis consists of two steps: first, we investigate empirically the influence of *IEA* on individual preference for being self-employed and entrepreneurial intention (*potential entrepreneurship*). Second, we analyze the relationship between *IEA* and the probability of taking steps to start a business and examine whether *IEA* is related to the exploitation of entrepreneurial opportunities *(nascent entrepreneurship*).

Theoretical considerations do not allow us to draw conclusions on the relative importance of each of the eight psychological characteristics, i.e. whether certain traits have a stronger impact on the probability of being a potential entrepreneur or the probability of starting a new business. Instead, we hypothesize that employees with a higher level of *IEA* are more likely to be potential entrepreneurs and are more likely to exploit opportunities by starting a new business. In other words if an employee appears high on all eight dimensions he or she is ceteris paribus more likely to prefer self-employment and to start a venture than an employee who appears low on all dimensions. Of course, various combinations of psychological characteristics are possible. For instance, some employees may appear high on some dimensions and low on others, whereas other employees may be moderately high on all dimensions. We do not have prior opinions about the impact of certain combinations of psychological

[5] Alternatively, it can be argued that psychological characteristics shape the constraints of individuals. Certain psychological characteristics may limit individual occupational choice options. See Borghans et al. (2008).

characteristics. In our empirical analysis we make use of a comprehensive measure of *IEA* and assume that the level of *IEA* is reflected by this measure.

Although we argue that higher levels of *IEA* tend to separate those employees who prefer to be self-employed from those who do not, we do not postulate that a high level of *IEA* is a necessary or indeed a sufficient condition for preferring self-employment. The preference for self-employment is not only influenced by *IEA*, but also determined by other personal characteristics and environment factors, such as age, gender, current household income, education, social status of entrepreneurs and culture. For example, an employee may prefer self-employment, because he or she rates the social status of the self-employed as higher than the status of employees. Moreover, country-specific factors, such as culture or political system, may also be relevant. However, even if preference is influenced by such factors, we would expect a positive effect of *IEA* on an employee's preference for being self-employed, resulting in our first hypothesis.

HYPOTHESIS 1. *Individual Entrepreneurial Aptitude (IEA) has a positive influence on an employee's preference for being self-employed.*

By the same token it could be argued that self-employed individuals with a high level of *IEA* are less likely to prefer being employee. This does of course presume that not all self-employed individuals have a high level of *IEA*. Hence, we do not equate self-employed with entrepreneurs or assume homogeneity among self-employed which has been criticized by many scholars (e.g. Gartner 1988). Instead, we take explicitly into account the variation with respect to the level of *IEA* among self-employed. This leads to our second testable hypothesis.

HYPOTHESIS 2. *Individual Entrepreneurial Aptitude (IEA) has a negative influence on a self-employed individual's preference for being employee.*

However, mere preference for being self-employed is not the same as entrepreneurial intention. Many employees declaring that they would prefer to be self-employed may not have any intention to start a new venture in the future. As pointed out by Thompson (2009, p.671) "many individuals may abstractly have a whimsical desire, and, indeed the personality to become entrepreneurs in theory, yet in practice, never go beyond merely flirting casually with notion of in fact starting a new venture." According to Shook et al. (2003), venture creation starts with entrepreneurial intention which precedes individuals' actions in starting new ventures. Consequently, individuals with entrepreneurial intention are more likely to start a new venture than those with only a general preference for being self-employed (Kruger et al. 2000, Thompson 2009). Entrepreneurial intention may be caused by a trigger event, such as inheritance, which stimulates individuals to act on their preferences for being self-employed (Learned 1992). In our empirical analysis we identify potential entrepreneurs with entrepreneurial intention by using a hypothetical setup in which interviewees must decide whether to

use an (hypothetically) inherited amount of money for starting a business, to spend it, save it or work less. The hypothetical inheritance can be interpreted as a stimulus that relaxes the constraints under which the interviewees make their hypothetical choice. We expect that *IEA* positively affects the probability of opting for the hypothetical start-up, which indicates entrepreneurial intention. This leads to our third hypothesis.

HYPOTHESIS 3. *The higher an employee's level of Individual Entrepreneurial Aptitude (IEA) the higher the probability of entrepreneurial intention.*

A positive relationship between *IEA* and potential entrepreneurship does not necessarily imply a positive relationship between *IEA* and *actual* start-up activities. It is possible that *IEA* affects potential entrepreneurship, but it may not directly affect the decision to take steps to start a business once we focus on a group of potential entrepreneurs. Instead, external factors and non-psychological individual characteristics may influence this decision. For instance, potential entrepreneurs may be held back by the lack of capital (Blanchflower and Oswald 1998). In order to investigate empirically whether *IEA* has an impact on individual probability of actually starting a business, we identify those employees who are currently taking steps to start a business. This leads to our fourth hypothesis.

HYPOTHESIS 4. *The higher an employee's level of Individual Entrepreneurial Aptitude (IEA) the higher the probability of taking steps to start a new business.*

While potential entrepreneurship does not require the existence of entrepreneurial opportunities, the individual-opportunity nexus framework suggests that psychological characteristics are especially important for the exploitation of entrepreneurial opportunities. According to Shane et al. (2003, p. 260), "opportunities are aspects of the environment that represent potentialities for profit making" and "since potentialities are not yet actual, measuring them objectively and prospectively at the level of an individual entrepreneur poses daunting challenges." We agree that measuring opportunities objectively is difficult, but we argue that for the individual decision to start a business it might not be important whether something really is an opportunity or not, but instead whether the entrepreneur believes that it is an opportunity. For instance, an individual may believe that a business idea has promise when this is not the case from an objective point of view. Moreover, not all start-up activities are necessarily associated with the exploitation of entrepreneurial opportunities, but individuals may also start businesses out of necessity (Global Entrepreneurship Monitor 2009). While necessity driven entrepreneurs start businesses because they have no better option, opportunity driven entrepreneurs start a new enterprise because of the perceived entrepreneurial opportunities. In order to shed light on the relationship between the exploitation of entrepreneurial opportunities and *IEA*, we identify individuals with start-up experience who report that they are starting or started their business because of an opportunity and in addition report that the business idea was very important for their start-up

decision. In this way, we identify those individuals who *perceive* their start-up activity as an exploitation of a business opportunity, which brings us to our final prediction.

HYPOTHESIS 5. *Individual Entrepreneurial Aptitude* (*IEA) is positively related to the exploitation of perceived entrepreneurial opportunities.*

3. Method

3.1. Data

Our empirical analysis is based on the *Flash Eurobarometer (Flash EB) "Entrepreneurship"* 2009. This is a general population survey that was conducted by *EOS Gallup Europe* in 36 countries at the end of 2009. For each country a random sample of 500 or 1000 individuals was generated, representative on the national level of the population aged fifteen years and above. Approximately 26.000 people were surveyed.

In general, Flash Eurobarometer surveys are ad hoc thematical telephone interviews which provide information about people's opinions on various topics. They are conducted at the request of the European Commission or other EU institutions. The *Flash EB "Entrepreneurship"* is aimed to inform policy makers and others interested groups about people's entrepreneurial mindset, their experiences, and the obstacles inhibiting self-employment. It was conducted at the request of the *Directorate General "Enterprise and Industry"* of the European Commission. Previous waves of the Flash EB "Entrepreneurship" surveys were conducted in the years 2000-2004 and 2007.[6] However, these surveys were not specifically designed for academic entrepreneurship research and this may explain why the datasets have hardly been used by academic scholars.[7]

In May 2009 we approached DG "Enterprise and Industry" and proposed to use the Flash EB "Entrepreneurship" as a research tool. In particular, we suggested a set of statements measuring the eight dimensions of individual entrepreneurial aptitude discussed in the previous section, i.e. autonomy, risk taking, innovativeness, proactiveness, competitiveness, general optimism, general self-efficacy, and internal locus of control. The Directorate General "Entrepreneurship and Industry" of the European Commission kindly acted on the suggestion and we jointly implemented the statements in the questionnaire. In order to increase the expected response rate and to keep the costs of the survey down, we agreed to keep the questionnaire as short as possible and included only one statement for each of the eight dimensions of *IEA*. *EOS Gallup Europe* was responsible for the translation of statements into national languages.

[6] For more information about the Flash Eurobarometer "Entrepreneurship" refer to the following website: http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/eurobarometer/index_en.htm

[7] Exceptions are the studies by Grilo and Thrurik (2005, 2008).

The Flash EB "Entrepreneurship" questionnaire consists of two parts, the first part contains general questions concerning the respondents' demographic background, like age, education or occupation. Our statements measuring psychological characteristics were placed as a block at the end of the first part. The second part contains questions related to entrepreneurial attitudes and behavior. Therefore, the assessment of the eight statements is not influenced by the questions related to entrepreneurship.

Moreover, the interviewees were informed about the topic of the survey (entrepreneurship) only after completion of the first part which further ensures that interviewees assessed our statements without an entrepreneurial context. Furthermore, *general* statements are included which are not embed in an entrepreneurial context or any other context. This is important for our investigation since we analyze in how far an entrepreneurial aptitude measured by *general* psychological characteristics is conducive to potential entrepreneurship and start-up activities.

Our empirical analyses focus on employees and self-employed individuals. Plausibility checks and the exclusion of observations due to missing values for relevant variables lead to a final sample of 7630 employees and 1979 self-employed individuals from 36 countries including South Korea, China, Japan the US and 32 European countries, including the EU27. We further distinguish between three groups of employees, namely blue-collar employees, white-collar employees and managers who are considered a subgroup of white-collar employees. The definition of variables and the original questions of the Flash EB (Table A 1 and Table A 2), the sample description (Table A 3), and a the summary of occupational groups (Table A 4) are presented in the Appendix.

3.2. Dependent Variables

General preference for self-employment: The Flash EB comprises of information about employment-status preference. The interviewees report whether they would prefer – if they could choose – "*being an employee*" or "*being self-employed*". We compute a dummy variable for general preference for self-employment which takes on the value1 if a respondent says that she or he would prefer being self-employed and zero otherwise. In prior research this dummy variable was interpreted as an indicator for *latent entrepreneurship* or *entrepreneurial spirit* (Blanchflower et al. 2001).

Entrepreneurial Intention: The Flash EB provides interviewees with a hypothetical situation in which the interviewees imagine that they have suddenly inherited the amount of X (local currency, e.g. 100T Euro or 150T US dollar) and must decide what they would do with that money. They must choose between five given options, one of which is to use the money to start a business. We construct a dummy variable that takes on the value 1 if a respondent opts for starting a business and zero otherwise. We use this variable as an indicator for *individual entrepreneurial intention*. Thompson (2009, p. 676) defines individual entrepreneurial intent as "a self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in

the future." We acknowledge that our measure is a crude indicator for individual entrepreneurial intention, for the reason that it might be better measured by means of a multiple reflective-item scale (Thompson 2009). On the other hand, some empirical studies find a positive relationship between the receipt of inheritances and entry to self-employment (Blanchflower and Oswald 1998, Holtz-Eakin et al. 1994) and the hypothetical inheritance may therefore stimulate entrepreneurial intention. Of course, it is still a hypothetical situation and real world decisions may indeed differ from decisions made in hypothetical situations.

Nascent Entrepreneurs: The questionnaire contains a filter question which asks whether respondents have ever started a business or are taking steps to start one. Those who answer this question with 'yes' are asked to choose between five statements that best describes their situation. One statement refers to current start-up activities while the other statement refers to past start-up activities. We construct a dummy variable that takes the value one if the respondent is *currently taking steps to start a business* and zero otherwise. We call individuals reporting such early stage start-up activities nascent entrepreneurs. Measuring nascent entrepreneurship by self-reported current start-up activities is common practice and used, for example, in the Global Entrepreneurship Monitor (GEM) or the Panel Study of Entrepreneurial Dynamics (PSED).

Opportunity exploitation: In order to construct an indicator for opportunity exploitation we refer to two questions which are answered by respondents with start-up experience. The first question asks whether interviewees started or are starting a business because they see an *opportunity*, or whether they have started or are starting it out of necessity. The second question asks for the importance of several elements for the start-up decision. One of these elements is an *appropriate business idea*. We construct a dummy variable which takes on the value 1 if the respondent states that s/he started or is starting the business because s/he exploited or is exploiting an opportunity *and* if the respondent reports that an appropriate business idea was *very important* for making them take steps to start a business. We employ this dummy variable as an indicator for opportunity exploitation. We make use of both questions as the first question is not specific with respect to the type of opportunity. We do not have any information about the nature of the business idea. Instead, our measure reflects if the individuals *perceive* their start-up activities as an exploitation of a business opportunity.

3.3. Independent Variables

Measurement of Individual Entrepreneurial Aptitude

We define *IEA* as a cluster of psychological characteristics conducive to business creation. Consequently, *IEA* is a multidimensional construct. Based on entrepreneurial personality research we suggest an eight dimensional measurement of individual entrepreneurial aptitude, comprising *autonomy, risk taking, innovativeness, proactiveness, competitive aggressiveness, general optimism,*

general self-efficacy, and *internal locus of control.* Each dimension is measured by a single item chosen according to two criteria: *Firstly*, we refer to different validated scales, predominantly provided by psychological research and include – when possible – items already tested in an entrepreneurial context.[8] The Appendix (A 2) provides more detailed information about the scales from which we obtained the single items. *Secondly*, the simplicity of the items is important because the Flash EB was addressed to the general population. Therefore, the statements had to be plain for everyone, independent of social and educational background or work experience. Moreover, simplicity was advantageous for the translation of statements into the various languages. All implemented items were adjusted to the methodology of the Flash EB, which means that each item is measured on a 4-point scale where the interviewees had to state if they *strongly agree, agree, disagree* or *strongly disagree* with the respective statement. The statements used to measure the multidimensional *IEA* construct are presented in Table 1.

Insert Table 1: ***The Multidimensional Construct of Individual Entrepreneurial Aptitude (IEA)****here*

The correlation matrix of the eight dimensions of our *IEA* measure is presented for employees in Table 2. The correlation coefficients are positive and of high statistical significance. However, the values of the correlation coefficients are relatively low, ranging between 0.13 and 0.32. This suggests that each item reflects another dimension within the *IEA* construct. This result holds if other groups of the population are included. Although not reported here, the correlation matrix is very similar for the total sample, i.e. all respondents for which we have complete information about *IEA* (22554).

Insert Table 2: ***Correlation Matrix of the Single IEA Dimensions*** *here.*

We do not make any assumptions about the relative importance of each of the dimensions or certain combinations of dimensions for opportunity exploitation and potential entrepreneurship. Instead of analyzing the effects of single items we believe that it is more useful to identify a cluster of relevant psychological characteristics in order to assess the entrepreneurial personality (Cromie 2000). Therefore, we compute a comprehensive measure of *IEA* as the unweighted sum of scores over all dimensions for each observation. This is in line with Caird (1991) who suggests the unweighted sum of scores for interpretation of her comprehensive six dimensional measure of *General Enterprising Tendency (GET).* The maximum score of each of our items is 4 if interviewees fully agree with the respective statement and the minimum is 1 if they strongly disagree. Consequently, our implemented *IEA* measure ranges between the value 8 at minimum and 32 at maximum. As all items are positively

[8] To identify the appropriate items we conducted a pilot study testing different items for each dimension. Criteria for the selection of items implemented in the Flash EB are high inter-item correlation and high correlation with single items implemented into our test measuring entrepreneurial attitude, intention or activity. For a short description of the pilot study, see Appendix A 1.

directed, higher values (sum of scores) are interpreted as higher levels of *IEA*. Using the comprehensive measure might also be more appropriate for statistical reasons. Single item measurement is problematic because we cannot test for measurement error within each of the single dimensions. In contrast, the comprehensive measure of *IEA* should be less affected by measurement error if the measurement errors of single items are uncorrelated.

Control Variables

In our empirical analyses we control for demographic background, parental self-employment and start-up experience, opportunity cost (income satisfaction), procedural utility, the perceived relative social status of entrepreneurs, diverse obstacles linked to start-up activities, for occupation, area and country effects (Table 3).

Procedural utility: Benz and Frey (2008a) investigate procedural utility as a possible driver for job satisfaction and suggest autonomy and interesting work as non-monetary benefits from self-employment. We cannot measure these benefits separately as well as proxy autonomy together with interesting work for the following reason for self-employment preference: "*personal independence/ self-fulfillment/ interesting tasks*". In addition, we include the indicator "*freedom to choose place and time of working*" as a proxy for autonomy as procedural utility. Because the Flash EB allows for multiple answers to this particular question, we created two binary variables that were set to 1 if the respondent mentioned the particular reason, and to zero otherwise. The measures for procedural utility are only available for those respondents who prefer being self-employed.

Income satisfaction (opportunity cost): Theoretical considerations point to the relevance of opportunity cost. We argue that opportunity costs are high if an individual is very satisfied with current household income and are low if an individual is dissatisfied with the current income. The Flash EB does not provide any information about the absolute annual income, but about the interviewee's feelings about the household income, ranging from "*live comfortable on the present income"* to finding it *"very hard to manage on the present income"*. The answer provides information about the "value of money" which differs between individuals (van Praag B. M. 1985). A further advantage of this measure is that the respondent is asked to judge not his particular income, but the *household* income, with the intention that the judgment be adjusted to family size. Refining our analysis in the case of opportunity costs, we supplement the measure for income satisfaction with a measure for income *prospects*. The interviewee had to state if s/he prefers self-employment due to better income prospects, thus stating her/his income expectation relative to their current income. This measure is only available for those respondents who prefer being self-employed. The implemented binary variable is set to 1 if the interviewee mentioned better income prospects as reason for their self-employment preference otherwise the value is set to zero.

Social status of entrepreneurs: We control for the social status assigned to entrepreneurs by the respondent. The interviewees had to state if their opinion of persons belonging to different occupational groups – namely entrepreneurs, civil servants, top-managers in large production companies, and others – was *"rather favorable (1)", "neutral (2)"* or *"rather unfavorable (3)"*. To generate a relative measure, we revised the scoring and computed the value assigned to entrepreneurs over the averaged scoring assigned to the other occupational groups. Thus, the higher the computed value, the higher the respondent values entrepreneurs compared to the other proposed occupational groups on average. We assume a positive relation between the relative social status assigned to entrepreneurs and the preference for self-employment, entrepreneurial intention and nascent entrepreneurship, whereby the direction of the interdependency is not clear.

Obstacles: We further control for several burdens that might hinder entrepreneurial activity. These burdens are the lack of information about how to start a business, lack of financial support, and administrative burdens. The latter two obstacles are proposed to be determinants of entrepreneurship by Grilo and Thurik (2005, 2008). Each obstacle is integrated as a binary variable into our regression and was set to 1 if the respondent *strongly agrees* with the statement that it is difficult to start a business because of a particular obstacle, and otherwise set to zero.

Demographic background: In our analysis, the demographic background comprises gender, age, education, and parental self-employment. The dummy variable for gender is set to one, if the respondent stated that she is female and to zero otherwise. Age is measured by the stated value of the interviewee. We assume the probability of entrepreneurial activity to rise with age due to better access to human and physical capital, e.g. job experience conducive to entrepreneurship (Lucas 1978), to network-building or the accumulation of financial capital (Parker 2004). Otherwise, although opportunities may rise with age, we assume that the willingness to become an entrepreneur decreases (van Praag and van Ophem 1995). Accordingly, we assume an inverse U-shaped curve to approximate the relation between age and the dependent variables and therefore include the squared age term in our regression. As a measure for educational background, we implement the reported age when completed fulltime education into our analysis. In our sample, we find the population's average age of completed fulltime education to be about twenty years old, corresponding roughly to A-level graduation. Students (1227 observations) at school or university are excluded, as their age when completing their fulltime-education is not determined. Those individuals who never stayed in fulltime education (154 observations) are also excluded. Thus with regards to education, the sample is restricted from primary school education to PhD study. We refrain from building education groups running a cross-country analysis, where the education systems differ considerably. Although the correlation between self-employment and education is ambiguous, e.g. dependent on industry (Bates 1995), it is predominantly supposed to be positive, assuming individuals of higher education level as having more information about business opportunities (Parker 2004). Accordingly, we propose a positive, but diminishing

relationship between education age and the dependent variables, and therefore include the logarithmic term in our analysis.

Parental self-employment: We control for entrepreneurial family background, i.e. parental self-employment. Besides simple heritage in the case of second generation entrepreneurship, Parker (2004) sums up the access to business methods, experience and equipment as well as cultural values to be conducive to children's entrepreneurship. Thus, we assume parental self-employment to effect one's own entrepreneurial attitude, intention and activity. The integrated dummy variable is set to 1 if the respondent stated that their mother and/or father, thus a minimum of one parent, is self-employed and to zero otherwise.

Country and occupation effects: We control for occupation, because entrepreneurial activities are more likely to be observed for some occupations in comparison to others, like Evans & Leighton (1989) find for managierial occupations. Analyzing the subgroups of dependent employment, which are blue-collar employees, white-collar employees and their subgroup of managers, data is broken down to professions which we control for by integrating dummy variables. A detailed summary of the occupational dummies included into regression analysis can be found in Appendix (Table A 4). Further, dummy variables for the area and country where the respondent lives in are included in order to control for country-specific effects, such as culture, political system and economic conditions.

Insert Table 3: ***Summary Statistics*** *here.*

4. Results

4.1. Descriptive Statistics

Figure 1 shows the distribution of our *IEA* measure for employees (7360 individuals) and for the total sample, i.e. all respondents for which we have complete information about *IEA* (22554 individuals). Our *IEA* measure ranges from 8, if the interviewee *strongly disagrees* with each of the eight statements, to 32, if the interviewee *strongly agrees* with each of the eight statements. The average score of our *IEA* measure is 23.88 (23.73 for the total sample), the median is around 24 (23 for the total sample). Only 15% of the individuals have a score of 26 and above and the fraction of individuals with a very high level (over 30) is less than 2 %. This may corroborate Schumpeter (1934) who states that entrepreneurial aptitude is present in only a small fraction of the population. On the other hand, only a small fraction of individuals score low, 13% (15% for the total sample) have an *IEA* score of below 20, which suggests that the majority of individuals have at least some entrepreneurial aptitude. Although employees tend to score a bit higher in *IEA* compared to the total sample, the distribution of the *IEA* measure is quite similar.

Insert Figure 1: ***Distribution of the Comprehensive IEA Measure*** *here.*

The score of the comprehensive *IEA* measure will be very high, if individuals strongly agree with all or almost all of the eight statements reflecting the dimensions of IEA. Table 4 shows how employees score in each dimension of the *IEA* construct.[9] *Competitiveness* and *risk taking* are those dimensions where the fraction of employees who strongly agree with the respective statement is relatively low. Merely 15% of employees strongly agree that they like situations in which they compete with others and they are willingness to take risks. Accordingly, many employees disagree with these statements (competitiveness: 43%, risk taking: 35%). In contrast, agreement with statements reflecting the other dimensions of *IEA* is much higher, e.g. 33% of the employees strongly agree with the statement reflecting internal locus of control. Consequently, especially those interviewees who also score high in the competitiveness and risk-taking dimension exhibit a very high score of *IEA*.

Insert Table 4: ***Distribution for the Single*** **IEA** ***Dimensions*** *here*

The distribution of the *IEA* measure for various occupations is presented in Table 5, where the *IEA* measure is divided into five categories ranging from low scorers (*IEA* of 8 to 20) to top scorers (*IEA* of 30 to 32). As compared to employees the fraction of individuals with *IEA* scores above the full sample median of 23 is higher for self-employed individuals, hybrid entrepreneurs and for managers. In addition, these groups have the highest shares of top scorers in comparison with the other occupational groups.[10] In the last column we also present the distribution of *IEA* for individuals who once started a business, but are no longer entrepreneurs, because their businesses have failed. Here, the fraction of high scorers is remarkably lower as compared to hybrid entrepreneurs, the self-employed and managers. This may indicate that individuals with low level of *IEA* are more likely to be unsuccessful but it is equally possible that business failure has a negative impact on *IEA*. By the same token it could be argued that individuals with a high level of *IEA* are more likely to be of self-employed or hybrid entrepreneurs but one cannot exclude the possibility that the very success of their business might influence their *IEA* scores. In order to reduce the problem of reverse causality, we therefore focus on potential and nascent entrepreneurship. As one might expect, the distribution of *IEA* scores changes if individuals with start-up experience are excluded: the fraction of individuals with low *IEA* scores increase while the fraction of top scorers decreases. Interestingly, this is true for all occupational groups. However, there is also a lot of variation within occupational groups. For example, within the self-employed group roughly 36% of the individuals have an *IEA* score below the full sample median.

[9] More information about the country-specific results of the survey can be obtained from the Analytical Report of the Flash Eurobarometer "Entrepreneurship" 2009 (http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/eurobarometer/fl283_en.pdf).

[10] Although not reported here, the comparison of business owners and top managers shows that the distributions of *IEA* scores of both groups are very similar.

This suggests that there is no such thing as 'the entrepreneur' or the 'employee' but that *IEA* not only varies considerably between occupations, but also within occupations.

Insert Table 5: ***Relationship between* IEA *and Employment Status*** *here*

Table 6 presents the statistics for the dependent variables 'preference for elf-employment', 'entrepreneurial intention' and 'nascent entrepreneurship'. Roughly 40% of employees say that they would prefer to be self-employed rather than being employee. Moreover, the share of employees with a preference for being self-employed does not vary substantially between the occupational subgroups of blue-collar employees (42.41%), white-collar employees (39.28%), and managers (42.18%). In contrast, 82.11% of the self-employed individuals prefer to be self-employed which implies that roughly 18% of self-employed individuals would rather be an employee than be self-employed.

The share of individuals with entrepreneurial intention and the share of nascent entrepreneurs are much lower compared to the share of individuals stating self-employment preference. In the total sample, 15% of the individuals would use a hypothetically inherited amount of money to start a new business, whereas just 4.75% of the individuals are currently taking steps to start a business. Hence, the share of individuals with a general preference for self-employment is three times higher than the share of individuals with entrepreneurial intention and nine times higher than the share of nascent entrepreneurs. Similar results can be observed for employees and the occupational subgroups. However, within the group of employees managers especially would use the inherited money for starting a business (18.08%) and are engaged in startup-activities (7%). Thus, the preference for self-employment is far more widespread among employees than entrepreneurial intention and nascent entrepreneurship.

Insert Table 6: ***Relationship between Preference for Self-employment, Entrepreneurial Intention, and nascent entrepreneurs and Employment Status*** *here*

Table 7 reports the shares of individuals with a preference for being self-employed, entrepreneurial intention and start-up activities (nascent entrepreneurship) for different levels of *IEA*. As can be seen from the table, these shares increase significantly with the level of *IEA*. In the group of individuals with very high *IEA* scores the share of individuals with a preference for self-employment is two times higher as compared to the group of individuals with low *IEA* scores. The share of hypothetical business starters is nearly three times higher in the group of high scorers as compared to the group of low scorers. Moreover, the fraction of nascent entrepreneurs is merely 1.9% if *IEA* level is very low, but increases to 11.60% if the level of *IEA* is very high, which means an increase of roughly 600%. These descriptive statistics point towards a very strong and positive relationship between *IEA* and the dependent variables.

Insert Table 7: ***Relationship between IEA and Preference for Self-Employment, Entrepreneurial Intention and Nascent Entrepreneurship*** *here.*

As discussed above, not all individuals decide to start a business just because they have come across an opportunity. In our sample, we identify about 32% of all start-up experienced individuals as exploiters of a business opportunity, among nascent entrepreneurs the share is about 37.7%. The share of business opportunity exploiting individuals among nascent entrepreneurs who start their business out of dependent employment is about 43.7% (not shown).

4.2. Potential Entrepreneurship: Preference for Self-employment and Entrepreneurial Intention

In order to analyze the impact of *IEA* on employees' general preference for being self-employed, we focus on potential entrepreneurs. Accordingly, we exclude employees with any start-up experience from the analysis.[11] We perform logit regressions since the dependent variable is a binary variable which takes on the value 1 if an individual prefers to be self-employed and zero otherwise. Table 8 reports the marginal effects of the independent variables on the probability of preferring self-employment for all employees and subgroups (white-collar, blue-collar, and managers).

The marginal effect of *IEA* on the probability of preferring self-employment is positive and statistically significant at the 1% level throughout all regressions. This confirms our first hypothesis that employees with a higher level of *IEA* are more likely to prefer self-employment.

Moreover, opportunity costs seem to be relevant. Employees who are satisfied with their income are less likely to prefer to be self-employed and there is some empirical evidence that employees, who are dissatisfied with their household income are more likely to prefer self-employment. The perceived relative social status of entrepreneurs has a positive and statistically significant effect, except for blue-collar employees. Being a woman affects negatively the probability of self-employment preference. Parental self-employment has a positive effect that turns out to be statistically insignificant in the case of white-collar employees and managers. The probability of preferring to be self-employed decreases with age, but the effect is predominantly insignificant. In addition, country-specific effects are statistically significant which implies that unobserved country effects influence the preference for self-employment.

Insert Table 8: ***Logit Estimation –Preference of Employees for being Self-Employed*** *here*

In order to test our second hypothesis we restrict the analysis to the sample of the self-employed and conduct logit regressions where the dependent variable takes on the value 1 if a self-employed

[11] Including individuals with start-up experience may result in endogeneity problems, since we cannot exclude the possibility that past start-up experience may influence psychological characteristics and therefore IEA.

individual prefers being an employee and zero otherwise. We conduct regressions based on the total sample of the self-employed population (regressions 1a and 1b) and based on a sample where agricultural self-employment is excluded (regressions 2a and 2b). Estimation results are reported in Table 9. The marginal effect of *IEA* on the preference for being an employee is negative and statistically significant which confirms our Hypothesis 2 that self-employed individuals with higher levels of *IEA* are less likely to prefer being employee.

The marginal effects of control variables are also statistically significant. Women and self-employed individuals who are dissatisfied with their current household income are more likely to prefer being an employee. In contrast, those self-employed individuals with start-up experience are less likely to prefer being employee. Relative social status seems to be irrelevant. Again, country effects are statistically significant.

Insert Table 9: ***Logit Estimation – Preference of Self-Employed Individuals for being Employee*** *here*

Our second measure of potential entrepreneurship is entrepreneurial intention. Again, we focus on employees without start-up experience. To test our third hypothesis postulating a positive relationship between *IEA* and the probability of entrepreneurial intention, we conduct logit regression where the dependent variable takes on the value 1 if the employee would spend the (hypothetically) inherited amount of money to start a business and zero otherwise (Table 9). We stepwise enlarge our basic model (regression (a)) by taking into account the income prospects and procedural utility of self-employment (regression (b)) as well as diverse obstacles to business creation (regression (c)). In regression b and c we include only those individuals who prefer self-employment because indicators for procedural utility are only available for these individuals. By restricting the sample to employees with a preference for self-employment, we investigate whether *IEA* can separate individuals with entrepreneurial intentions from those who only have a desire for being self-employed.

Our baseline model confirms our third hypothesis, where we find the effect of *IEA* on entrepreneurial intention to be positive and statistically significant at the 1 percent level (regression (a)). The results of our extended models (regressions (b) and (c)) also suggest a positive effect of *IEA* on the probability of entrepreneurial intention which is statistically significant at the 1 percent level, for blue collar employees at the 5 percent level. Hence, *IEA* predicts entrepreneurial intention even within the group of employees with a preference for self-employment. This is a strong result since other significant factors loose explanatory power if the sample is restricted to individuals with self-employment preference. While income satisfaction and gender effects (except for managers) as well as parental

self-employment play a role in our baseline model, the effects turn out to be statistically insignificant in the restricted sample.[12]

Autonomy and interesting tasks associated with self-employment (procedural utility) do not have a statistically significant effect on entrepreneurial intention. This result may be explained by the fact that 60% of the employees with self-employment preference report that autonomy and interesting tasks make self-employment attractive. Consequently, this indicator may not predict entrepreneurial intention, because many employees without entrepreneurial intention value the procedural utility of self-employment. Furthermore, barriers that might hinder the hypothetical start-up decision are not as relevant for entrepreneurial intention[13]. Country effects, however, have a statistically significant influence on entrepreneurial intention.

Insert Table 10: Logit ***Estimation – Entrepreneurial Intention of Employees*** *here.*

4.3. Nascent Entrepreneurship and Opportunity Exploitation

Next we investigate how far the actual decision to start a business is driven by individual entrepreneurial aptitude. Again, we start with our baseline model and stepwise include procedural utility and obstacles to business creation. We run a logit regression where the dependent variable takes on the value 1 if the employee is currently taking steps to start a business and zero otherwise (Table 11).

In our baseline model we observe a positive effect of *IEA* on the probability of being a nascent entrepreneur which is statistically significant at the 1 percent level, for blue-collar employees and managers at the 5 percent level. This result provides empirical supports to our Hypothesis 4 that a higher level of *IEA* increases an employee's probability of taking steps to start a new business. In contrast to the *hypothetical* start-up decision, we find *actual* start-up activity not to be affected by income satisfaction or parental self-employment. The negative effect of being female remains statistically significant at the 10 percent level. In restricting the analysis to the sample of individuals preferring self-employment we find that *IEA* tends to be the only variable that affects the probability of nascent entrepreneurship. Its effect is statistically significant at the 1 percent level throughout all regressions. This means that *IEA* has a direct effect on start-up activity beyond the mere preference for self-employment.

[12] Differences between results of the baseline model (a) and models (b) and (c) might be driven by different samples sizes. We therefore re-estimate the models with the same sample but the results are hardly affected.
[13] We also check the robustness of the results with respect to the measurement of obstacles. Our indicators for the lack of financial support, lack of information, and administrative burdens take on a value of one, if the respondent strongly agrees with the respective statement. Alternatively, we set the indicators to 1 if the respondent strongly agrees *or* agrees with the statement. The results, however, are hardly affected by this.

As for the hypothetical start-up decision we do not find any impact of procedural utility on nascent entrepreneurship. Surprisingly, estimation results do not provide evidence for the negative effects of obstacles that might hinder actual start-up activities. This may explained by the fact that our measure of nascent entrepreneurship identifies those individuals who are in a very early stage of their start-up activity as nascent entrepreneurs. For example, those individuals who are taking the first, initial steps towards starting a new venture might not have started activities to obtain external finance or may not have gathered experience with administrative burdens. Moreover, such obstacles tend to be country-specific and their effects might therefore already be captured by country-specific effects.

Insert Table 11: ***Logit Estimation –Nascent Entrepreneurship*** *here*

To test whether *IEA* is positively related to the exploitation of business opportunities (Hypothesis 5), we refer to the group of individuals with start-up experience and the subgroup of nascent entrepreneurs. We conduct a logit regression in which the dependent variable takes on the value 1 if the interviewee states that she or he has started or is currently starting a business, because she or he came across an opportunity and in addition reports that an appropriate business idea was or is very important for starting the business. Otherwise the dependent variable takes on the value zero. We conduct our analysis for the total sample of individuals with start-up experience and the total sample of nascent entrepreneurs, as well as for the subsample of employees with start-up experience and employees who are currently starting a business. We control for demographic background, parental self-employment, occupation, area, and country effects (Table 12, regressions 1 & 2). We find a positive marginal effect of *IEA* on the probability of exploiting a business opportunity by actually starting a business to be statistically significant at the 1 percent level throughout all regressions. This result confirms our Hypothesis 5. In order to check the robustness of our results, we additionally run regressions analyzing the effect of *IEA* on both components of our combined measure separately. Although not reported here, we find a positive and statistically significant effect of *IEA* for both estimations, where the relationship between the importance of the business idea and *IEA* is stronger than the relationship between our opportunity measure and *IEA*. It might be much more difficult for interviewees to understand the question related to the relevance of a business idea than the question related to opportunity, as the answer to the latter may be strongly affected by the individual situation at work or in general. Our results are not affected when obstacles supposed to hinder start-up activities are controlled for (regressions 3 & 4). Again, country effects turn out to be statistically significant.

*Insert Table 12: Logit Estimation –****Exploitation of a perceived Business Opportunity*** *here.*

4.4. Additional Results

Figure 2 illustrates the relationship between *IEA* and the probability of having a preference for self-employment, entrepreneurial intention, and being a nascent entrepreneur. It is based on the estimation results of the baseline model. Comparing employees who scored lowest on individual entrepreneurial orientation (*IEA*=8) to those who scored highest(*IEA*=32), we find the probability of preferring self-employment to rise from 13.5% to around 48%, the probability of entrepreneurial intention from about 2 % to approx. 17%, and the probability of being a nascent entrepreneur from about 0.4% to approx. 9%. Furthermore, the relationship between *IEA* and self-employment preference tends to be linear, compared to a tendency to be non-linear in case of entrepreneurial intention and nascent entrepreneurship, where the probabilities drastically increase if the level of *IEA* is very high.

*InsertFigure 2**: Predicted Probabilities of* **Preference** *for Self-Employment, Entrepreneurial Intention and Nascent Entrepreneurship here.*

In order to check the robustness of our results we include dummy variables reflecting the *IEA* categories into regression instead of the continuous indicator for *IEA*. The group of employees who scored from 21 to 23 is defined as reference group (Table 13). We find low scores negatively effect the probability of being a potential entrepreneur or being a nascent entrepreneur. The higher the *IEA* category the stronger the positive effect, especially on entrepreneurial intention and nascent entrepreneurship. Hence, these results confirm the positive impact of IEA and the non-linear relationship between IEA and nascent entrepreneurship. The probability of being a nascent entrepreneur increases drastically if an employee has an IEA score of 30 to 32. As pointed out in Section 4.1, competitiveness and risk taking are the dimensions with the lowest average scores (see Table 4) which implies that especially those employees who score high in these dimensions tend to exhibit a very high *IEA* score. Consequently, the non-linear relationship may point to the crucial role of a strong competitive spirit and the willingness to take risks.

Insert Table 13: ***Logit Estimation*** **- IEA Categories** *here.*

Our estimation results suggest that country specific effects are relevant. However, including country dummies may not be sufficient if the effects of *IEA* are related to country characteristics like culture. In some countries, for instance, certain personality characteristics may be more important for business creation than in other countries. Although not reported here, we test whether our results are driven by certain countries by conducting our empirical analyses for the EU27 and the EU15 countries. The results are hardly affected. The marginal effect of *IEA* still shows the expected signs throughout all regressions, predominantly significant at the 1 percent level and at least at 5 percent level.

5. Discussion

While prior research has shown that preference for being self-employed is widespread among employees and that a large fraction of nascent entrepreneurs are working fulltime for wages, our knowledge of the factors determining an employee's preference for self-employment and the decision to take steps to start a new business is still limited.

We argue that a cluster of psychological characteristics related to the tasks of entrepreneurs in an early stage of the entrepreneurial process, which we call individual entrepreneurial aptitude (*IEA*), is of special importance for business creation. Our theoretical considerations suggest that *IEA* may separate those individuals who have a preference for self-employment from those who do not and may also separate those who actually take steps to start a new venture from those who do not. Individuals with a high level of *IEA* may be more likely to prefer self-employment because they put a higher value on the expected non-monetary benefits (e.g. procedural utility) from self-employment than others and may be more likely to be *nascent entrepreneurs* as *IEA* is conducive to the exploitation of entrepreneurial opportunities. Our empirical analyses, which are based on a large scale general population survey conducted in 36 countries, provide strong empirical evidence for the relevance of *IEA* for potential as well as for nascent entrepreneurship.

Our empirical results suggest that *IEA* positively affects employees' preference for being self-employed as well as employees' entrepreneurial intentions. Since we restrict our empirical analyses to a sample of employees without any start-up experience we conclude that *IEA* positively affects *potential* entrepreneurship. Roughly 40% of the employees in our sample have a general preference for self-employment and 16% have entrepreneurial intentions. Even if the sample is restricted to employees who have a general preference for being self-employed, *IEA* is a strong predictor of entrepreneurial intent. Hence, *IEA* tends to separate those individuals who have entrepreneurial intentions from those who merely have a desire to become self-employed. Moreover, our results suggest that *IEA* does not only predict employees' preference for being self-employed but also the preference of self-employed individuals for being employee. Roughly 18 % of the self-employed individuals in our sample are *potential* employees, who would prefer dependent employment. According to our results, *IEA* negatively affects self-employed individuals' preference for being an employee, which implies that self-employed individuals with a low level of *IEA* are more likely to prefer being employee.

IEA is also a major determinant for *nascent entrepreneurship* and perceived opportunity exploitation. Our results suggest that *IEA* has a positive impact on the probability of being a nascent entrepreneur. Moreover, this relationship appears to be non-linear where employees are much more likely to be nascent entrepreneurs if their level of *IEA* is very high. The probability of being a nascent entrepreneur increases from about 0.4% at the lowest level of *IEA* to approximately 9% at the highest level of *IEA*.

Restricting the empirical analyses to a sample of employees with a general preference for self-employment does not change this result. Hence, *IEA* is not only related to potential entrepreneurship, but also predicts why some individuals who prefer self-employment decide to start a business while others do not. Moreover, *IEA* is related to opportunity exploitation. Nascent entrepreneurs with a high level of *IEA* tend to exploit an opportunity resulting from an appropriate business idea by starting the new business rather than starting a business due to necessity. This result confirms the individual-opportunity nexus framework which emphasizes the relevance of psychological characteristics for opportunity exploitation.

Although *IEA* positively affects the preference for self-employment, entrepreneurial intention, and the exploitation of entrepreneurial opportunities by starting a new business, our results point to two important differences between the preference for self-employment on the one hand and entrepreneurial intention and nascent entrepreneurship on the other hand. Firstly, our multivariate results suggest a non-linear relationship between the latter dependent variables and *IEA*, whereas the relationship seems to be linear for the preference for self-employment. The probability of having entrepreneurial intention especially, and the probability of taking steps to start a business are drastically increased if the level of *IEA* is very high. Secondly, some explanatory variables predict individual preference for self-employment, but their effects on entrepreneurial intention and nascent entrepreneurship are statistically insignificant. This is especially true if the analyses are restricted to samples of employees with a general preference for self-employment. For instance, gender, parental self-employment, and satisfaction with present household income have a statistically significant impact on entrepreneurial intent, but these effects become statistically insignificant if the analysis is restricted to employees with a preference for self-employment. Our multivariate results suggest that among all explanatory variables, *IEA* is the only strong and robust predictor for entrepreneurial intention and nascent entrepreneurship, while other individual variables are statistically insignificant in most regressions. All in all, our results suggest that *IEA* is very important for the early steps of the entrepreneurial process.

Furthermore, our dataset shows that entrepreneurship is episodic, a finding also reported in other empirical studies (Folta et al. 2010, Burke et al. 2008). Roughly 15% of the employees in our sample state that they owned or are owners of a company. This calls into questions the results of studies in the field of entrepreneurial traits research which adopt a static design and treat self-employed and employees as mutually exclusive groups. These studies typically compare the personality traits of entrepreneurs (e.g. business owners) with those of employees (e.g. managers) and often do not find significant differences. Based on narrative surveys and because of the methodological shortcomings of this approach, several scholars concluded that a relationship between personality traits and entrepreneurial behavior does not exist and that personality trait research does not add much to the understanding of entrepreneurship (Aldrich 1999, Brockhaus and Horwitz 1986, Gartner 1988, Low and MacMillan 1988).

Our data also show that the *IEA* distributions of business owners and general managers are very similar. This does by no means imply, however, that *IEA* is irrelevant for business creation. Our results suggest, for instance, that managers with a high level of *IEA* are more likely to prefer to be self-employed and are also more likely to take steps to start a business than managers with a low level of *IEA*. Entrepreneurial aptitude does not only vary between occupational groups, but also varies considerably within occupational groups. Therefore it would be inappropriate to refer to self-employed individuals as 'the entrepreneurs'. Our data show that there are business owners with a low level of *IEA* and blue collar workers with a high level of *IEA*. However, our estimation results also suggest that the former are more likely to prefer being employees whereas the latter are more likely to prefer being self-employed.

Since our results provide strong empirical evidence for the relevance of psychological characteristics in the decision to start a business they also contribute to a broader strand or research dealing with the effects of personality. Economists are beginning to study the effects of personality traits and noncognitive abilities on various socioeconomic outcomes (Borghans et al. 2008, Heckman et al. 2006) as well as in the field of entrepreneurship research where there is renewed interest in the role of psychological characteristics in the tendency of people to engage in entrepreneurial activity (Shane and Eckhardt 2003, Shane and Nicolaou 2009).

Our results might also be relevant for a related strand of literature examining the concept of entrepreneurial orientation (EO) and the relationship between EO and firm performance (Lumpkin and Dess 1986). The results of a large number of theoretical and empirical studies have led to wide acceptance of the conceptual meaning and the relevance of entrepreneurial orientation (Rauch et al. 2009). Although EO is measured on firm or organizational level, it might be related to our concept of *IEA* which is measured at the individual level, i.e. individual psychological characteristics. On the one hand, it could be argued that firm founders with a high level of *IEA* start new ventures with a strong entrepreneurial orientation and may therefore leave an imprint on organizational culture and organizational structure. On the other hand, individuals with a high level of *IEA* may select themselves into firms with a strong entrepreneurial orientation. Hence, the psychological characteristics of firm founders and employees may be related to EO and business performance. Future research should therefore investigate the relation between individual entrepreneurial aptitude and the entrepreneurial orientation of firms.

Finally, our results suggest that self-employed individuals with a low level of *IEA* are more likely to prefer being employee which may indicate that they are not satisfied with their work. Nevertheless these individuals seem to stay in self-employment which may be due to barriers to market exit, e.g. sunk costs. This finding may point to policy implications which are not studied here. Public policies encouraging more people to become entrepreneurs by subsidizing the formation of start-ups may distort the individual decision to start a new venture. Individuals with a low level of *IEA* may not start

a business without government intervention but may be encouraged to do so because of government support. Such policies might be justified by market failures and positive effects of start-ups on economic growth. For instance, innovative start-ups without an established reputation may have problems to obtain external finance. However, "the typical start-up is not innovative, creates few jobs, and generates little wealth" (Shane 2009, p. 141). Hence, it is unlikely that subsidization of such start-ups will increase economic growth but it may result in dissatisfied self-employed who do not like what they do.

Limitations and Future Research

Although our empirical analyses are based on a cross-country dataset, we do not really focus on cross country variation of dependent and independent variables, but instead simply use country dummies to control for country-specific fixed effects and conduct robustness checks by running regression with different country samples (e.g. EU 27 or EU 15). It is interesting that country effects are statistically significant in almost all regressions suggesting that country-specific factors, like political system, economic system or culture, seem to be relevant for potential and nascent entrepreneurship. Moreover, our *IEA* measure varies considerably between countries. The United States exhibits the highest share of top scorers, whereas Japan has the lowest share. An analysis of these differences is beyond the scope of this study, but future research could analyze the cross country variation and examine the country-specific determinants of *IEA*.

Moreover, the multivariate results are cross sectional and therefore do not allow us to track the development of individuals. We do not know, for instance, whether employees with entrepreneurial intention become nascent entrepreneurs or individuals who take first steps to start a business will actually set up the business. Moreover, we do not know whether *IEA* is related to business success. Our descriptive statistics provide some evidence for a positive relationship between *IEA* and business success. For instance, individuals who once started a business in the past, but who are no longer entrepreneurs, due to their businesses having failed, have a relatively low average level of *IEA*, whereas self-employed and hybrid entrepreneurs have a relatively high average level of *IEA*. However, these results cannot be interpreted as causal because interviewing firm founders years after they successfully (unsuccessfully) started a business may result in reverse causality as we cannot exclude the possibility that business success (failure) affects psychological characteristics. In order to avoid such reverse causality problems, our empirical analyses therefore focus on *potential* and *nascent entrepreneurship*. In addition, we use very *general* statements to measure psychological characteristics which are not embedded in an entrepreneurial context or any other context. It is likely that these measures reflect personality traits which are enduring and stable (Rauch and Frese 2007). However, in order to analyze the impact of *IEA* on later steps in the entrepreneurial process, future research should make use longitudinal data.

Another potential concern with our data is that the relationship between *IEA* and the dependent variables (potential and nascent entrepreneurship) may be inflated because of common method bias. However, this type of bias should be less of a concern because we follow Podsakoff et al. (2003) and separate the measurement of *IEA* and the measurement of dependent variables. Firstly, interviewees assessed our statements measuring *IEA* dimensions *before* they answered questions related to entrepreneurial attitudes and were not informed about the topic of the survey (entrepreneurship) at this stage of the telephone interview. Secondly, single *IEA* dimensions were measured on four-point scales whereas the dependent variables reflect hypothetical choices (preference for self-employment, entrepreneurial intention) or reflect actual behaviour (nascent entrepreneurship). Thirdly, there is no obvious connection between the *general* statements measuring single dimensions of *IEA* and entrepreneurship. It is therefore unlikely that the assessment of general statements is affected by social desirability, i.e. tendency of interviewees to present themselves in favourable light. Even for the statement measuring the innovativeness of interviewees the fraction of respondents who fully agree with this statement is relatively low. Moreover, correlations between the measures are very low which suggests that each item reflects another dimension of the *IEA* construct.

Furthermore, we identify those employees as nascent entrepreneurs who report that they are currently taking steps to start a business. Our dataset does not contain further information about the start-up (stage of the start-up, number of founders, ownership) and we do not know whether these employees really are *nascent entrepreneurs* who initiate an independent start-up or whether they are *nascent intrapreneurs* who are sponsored by an existing business (Parker 2009; Wagner 2004). Moreover, even employees who initiate an independent start-up may intend to stay employed and to combine self-employment with a wage earning position (Folta et al. 2010). Our dataset does not allow us to distinguish between these types of entrepreneurs, but there is some indirect evidence that these employees are predominantly nascent entrepreneurs who want to transit into self-employment. Interviewees were asked whether it would be feasible for them to be self-employed within the next five years. While roughly 90 percent of the nascent entrepreneurs answer that this is very feasibly or quite feasible, only 30 percent of the other employees answer in this way. Furthermore, estimations based on the subsample of employees with a preference for self-employment confirm a positive relationship between *IEA* and nascent entrepreneurship. Nevertheless, better information about start-up activities would be useful for future research.

In this study we do not investigate the relevance of single psychological characteristics for potential and nascent entrepreneurship. One reason for employing a comprehensive measure instead of including single item measures is the problem of measurement errors using single items. However, our results point to a non-linear relationship between the comprehensive measure of *IEA* and nascent entrepreneurship, implying that those employees with a very high level of *IEA* have a high probability of being a nascent entrepreneur. Since competitiveness and risk taking are the dimensions with the

lowest average scores among the eight dimensions analyzed, especially those employees who score high in these dimensions tend to exhibit a very high *IEA* score. Although not reported here, the results of regressions where the eight dimensions are included as separate variables do also suggest that especially competitiveness and risk taking have a positive and statistically significant impact on nascent entrepreneurship. Hence, our results provide some empirical evidence for the relevance of competitiveness and risk taking for business creation. While the relevance of risk taking attitude has been already emphasized in prior research (Kihlstrom and Laffont 1979, Knight 1921), our results indicate that the competitive spirit of individuals is also very important and should therefore be considered in future entrepreneurship research. This does not necessarily imply, however, that other dimensions are not important. Our empirical results suggest that an increase of *IEA* at lower levels also leads to an increase in the probability of entrepreneurial intent and nascent entrepreneurship. Although we consider *IEA* as a multidimensional construct, future research may analyze the relative importance of single dimensions. Of course, this would require multi-item measurement for each dimension.

6. Conclusion

Why do employees prefer to be self-employed and why do they take steps to start new ventures? In short, the results of this study indicate that some employees are more entrepreneurial than others. We find that a cluster of psychological characteristics, which we call *individual entrepreneurial aptitude,* is a strong and robust predictor of the potential and nascent entrepreneurship of employees. Hence, our results suggest that psychological characteristics are of great importance in the early phase of the entrepreneurial process. Those individuals with a very high level of entrepreneurial aptitude in particular, are likely to take steps to start a business. However, a high level of *IEA* is present only in a small fraction of the population.

Appendix

A 1: **Pilot Study: Identification of best Single Item Measurement implemented in the Flash EB**

Each item integrated into the Flash EB was previously tested. Therefore, we designed a questionnaire with multi-item scales of 12 to 17 items for each dimension. Items were taken from validated scales predominantly provided by psychology research. We adopt items already successful used in the context of entrepreneurship when available. We used a 7-point Likert scale and included reversed items. The test was conducted in Winter 2008 with 151 students at the Schumpeter School of Business and Economics in Germany. The test was repeated in Winter 2009 where 137 students were surveyed. We included measures from the Flash EB, other questionnaires and self-developed items to measure entrepreneurial attitudes, intentions and activities.

A 2: **Single Item Measurement of the Dimensions of the *IEA* Construct – Relevant Scales**

Autonomy: We considered existing autonomy scales emphasizing independence (e.g. Anderson et al. 1994), individualistic achievement and assertiveness against others (e.g. Clark and Beck 1991), taking personal responsibility for decisions (e.g. Anderson et al. 1994) and the attractiveness of self-control (e.g. Burger and Cooper 1979). For our single item measurement, we refer to the *individualistic achievement* subscale of the validated *Sociotropy-Autonomy Scale* (Clark and Beck 1991, Clark et al. 1995): *The possibility of being rejected by others for standing up for my decisions would not stop me*.[14] In Clark and Beck's (1991) investigation, this item performed best with a factor loading of 0.45 and item-total correlation of 0.47.

Risk taking: According to Mullins and Forlani (2005) we consider an individual's risk propensity as the general tendency to seek or avoid risks, a given trait-like attitude independent from situational contexts. So it can be measured by self-reports, which have their advantage in respondents' direct self-evaluation and their simplicity and are successfully used in previous studies (MacCrimmon and Wehrung 1990). Indicating nascent entrepreneurship by persons who were actually undergoing a transition to self-employment, Caliendo et al. (2009) suggested self-evaluation to be an appropriate measure for risk propensity. In their study they referred to the *SOEP* (*Deutsches Sozio-ökonomisches Panel)* where individual risk propensity of nascent entrepreneurs is measured on a 11-point Likert scale, asking the respondent *to which extent she is generally willing to take risks*. The authors showed that the probability to become self-employed rises statistically significant if the respondent reported also a high willingness to take risks. This relationship only held for those nascent entrepreneurs who were actually employed, whereas for unemployed individuals the relation turns out statistically insignificant. We refer to the *SOEP* risk measurement and integrate into the Flash EB the following item: *In general, I am willing to take risks.* Like for each other item, the respondent has to state her level of agreement on a 4-point scale.

Innovativeness: We consider innovativeness as a personal (global) trait (Goldsmith and Foxall, 2003). Four relevant self-report instruments emerged from psychological research literature: the *Innovativeness Scale* developed by Hurt et al. (1977), the *Kirton Adaptor-Innovator Inventory* (Kirton, 1976), the *Jackson Personality Inventory-Revised* (Jackson, 1994), and the *Revised NEO Personality Inventory* (Costa and Mc Crea, 1992). The first two instruments are developed exclusively to measure innovativeness, the latter two are scales developed to capture the whole personality, including innovativeness subscales. The authors agree in basic characteristics concerning innovativeness. A high scorer on the Jackson Personality Inventory-Revised is defined as a "creative and inventive individual, capable of originality of thought; motivates to develop novel solutions to problems; values new ideas; likes to improvise" (JPI-R 2008, p.5). Kirton's innovator has "original ideas" and a "fresh perspective

[14] Original version: The possibility of being rejected by others for standing up for my *rights* would not stop me

at problems" (Kirton 1976, p. 623 Table 1). This scale is predominantly used to compare entrepreneurs to managers. An individual's *openness to change* measured by Cattell's (1946) personality factors ranges between two poles, conservatism and radicalism, where the latter one is defined as experimental, flexible and free thinking. We refer to the Innovativeness Scale by Hurt et al. (1977) that is based on Rogers and Shoemaker's (1971) view of innovativeness, centering the personal attitude towards changes, the willingness to change, and stresses additional a creative and original character. Because of its simplicity and generality this scale is suitable for an ad hoc interview hold on a random sample like the Flash EB. We implemented one item centering inventiveness showing a factor loading of 0.62 (Hurt et al. 1977, p.61) and added the capability to develop new ideas, stressed in the Revised NEO Personality Inventory and the Kirton Adaptor-Innovator Inventory: *I'm an inventive person who has ideas*.

Proactiveness: Measuring the extent of proactiveness, we refer to the Proactive Personality Scale (Bateman and Crant 1993). The authors characterize a proactive personality by "the relatively stable tendency to effect environmental change" (p.103). The Proactive Personality Scale is frequently in use in an entrepreneurial context (e.g. Becherer and Maurer 1999, Acedo and Florin 2006). We integrate the following item, slightly modified in wording due to translation: *If I see something I don't like, I change it.*[15] This item showed among the highest factor loadings (.60 to .64) (Bateman and Crant 1993, p. 112) and it performed well showing a significant difference between individuals of different nationalities (Claar et al. 2009). Furthermore it is part of a shortened version, used to providing some evidence for a positive relation between a proactive personality and career satisfaction (Kim et al. 2009) and career success (Seibert et al. 1999, 2001).

Competitiveness: Psychological literature provides a couple of scales measuring competitiveness, where to the authors' best knowledge no scale clearly emerged being especially appropriate and validated to measure competitiveness as a general personal trait in the context of entrepreneurship. We considered the ongoing validated scales (Griffin-Pierson 1990, Smither and Houston 1992, Helmreich and Spence 1978, Ryckman et al. 1996, Martin and Larsen 1976) and those scales emphasizing the aggressive component of competitiveness (Ryckman et al. 1990; in the field of sports Maxwell and Moores 2007 and Gill and Deeter 1988). The item implemented into the Flash EB is taken from the *competitiveness* subscale of the *Work and Family Orientated Questionnaire* (Helmreich and Spence 1978), slightly modified in wording: *I like situations in which I compete with others.* This item measures the *general* enjoyment of competitive interpersonal situations in an everyday setting, like also operationalized in the *Competitiveness Index* (Smither and Houston, 1992) and the *Sports Orientation Questionnaire* (Gill and Deeter 1988).

[15] Original version: "If I see something I don't like, I fix it." (Bateman & Crant, 1993)

General self-efficacy: Measures for general self-efficacy applied in entrepreneurship research are provided by Sherer et al. (1982), Schwarzer and Jerusalem (1995), Maurer and Pierce (1998) and by Chen et al. (2001). Against critics, Scherbaum et al (2006) classified GSE as a theoretically and practically useful construct, comparing Scherer et al.'s, Schwarzer and Jerusalem's, and Chen et al.'s scales to each other. They find the commonly used general self-efficacy scales to be psychometrically sound instruments which differentiate between people with various levels of general self-efficacy and that they are related to the latent construct. They come to the conclusion, that "the measurement criticisms of GSE-measures may be overstated" (p. 1061) and "may not be justified" (p. 1059). In our study we refer to the validated *New General Self-Efficacy Scale* (Chen et al. 2001), which is supposed to have a slight advantage to Sherer et al.'s and Schwarzer and Jerusalem's measures (Scherbaum et al. 2006). Into the Flash EB, we integrated the item: *Generally, when facing difficult tasks, I am certain that I will accomplish them.* "*Generally*" was added to the original version.

General Optimism: To measure optimism, we refer to the widely used validated 10-item *Revised Life Orientation Test* (Scheier et al. 1994). We understand optimism not as an individual (mis-) judgment of a specific situation he or she is engaged in, usually specified as *over*-optimism or over-confidence, but as a general attitude towards life. This understanding reflects the underlying concept the Revised Life Orientation Test is designed for, that is to measure an individual's "generalized expectations of good versus bad outcomes" (Scheier et al. 1994, p. 1072). In the Flash EB, we implemented the item: *I'm always optimistic about my future.*

Locus of Control. The construct of locus of control (Rotter 1966) is measured in the usual way by Levenson's (1974) IPC scale (Internal–Powerful Others–Chance) that extent Rotter's scale by control beliefs in powerful others and chance. To differentiate internal locus of control from powerful others and chance by a single item measurement, we derived a combined item: *My life is determined by my own actions, not by others or by chance.*

Table A 1: **Variable Definition**

Variable Name	**Definition**
Preference for Self-Employment	Dummy variable = 1 if the respondent prefers to be self-employed if he could choose between being self-employed and being employee
Entrepreneurial Intention	Dummy variable = 1 if the respondent would spend the hypothetical inherited amount of money to start a business
Nascent Entrepreneurship	Dummy variable = 1 if the respondent is currently taking steps to start a business
Opportunity Exploitation	*To those individuals with start-up experience*. Dummy variable = 1 if the respondent has started or is starting the business due to a perceived opportunity rather than due to necessity. Additional the respondent states that an appropriate business idea was very important to make him take steps to start a business
IEA – Individual Entrepreneurial Aptitude	Discrete variable in the limits of 8 to 32. For single item measurement of the dimensions of the *IEA* construct see Table 1
Age	Age reported by the respondent
Age²	age²/100
Education (ln)	ln of age finished fulltime education reported by the respondent
Female	Dummy variable = 1 if the individual is female
Parental Self-Employment	Dummy variable = 1 if the individual has at least one parent to be self-employed
Start-up Experience	Dummy variable =1 if the respondent has ever started a business or is currently taking steps to start one
Income Satisfaction high	Dummy variable = 1 if the individuals lives comfortable on the present household income
Income moderate	Dummy variable = 1 if the individual gets along with the present household income
Income Dissatisfaction	Dummy variable = 1 if the individual finds it difficult or very hard to manage on the present household income
Income Prospects	*To those individuals with self-employment preference.* Dummy variable = 1 if the respondent prefers self-employment because of better income prospects
Social Status of Entrepreneurs	How the respondent values the status of entrepreneurs relative to civil servants, top-managers in large production companies, managers in a bank or similar institutions, politicians, liberal professions (architect, lawyers, artists etc.)
Lack of financial Support	Dummy variable = 1 if the respondent strongly agrees with the statement that it is difficult to start one's own business due to the lack of available financial support
Insufficient Information	Dummy variable = 1 if the respondent strongly agrees with the statement that it is difficult to start one's own business due to the complex administrative procedures
Administrative Burdens	Dummy variable = 1 if the respondent strongly agrees with the statement that it is difficult to obtain sufficient information on how to start a business
Autonomy + Interesting Tasks	*To those individuals with self-employment preference.* Dummy variable = 1 if the respondent prefers self-employment because of personal independence, self-fulfillment, interesting tasks
Autonomy (working place/time)	*To those individuals with self-employment preference.* Dummy variable = 1 if the respondent prefers self-employment because of the freedom to choose place and time of working

Table A 2: **Questions of the Flash EB "Entrepreneurship" survey 2009 used for analysis**

D9:Which of the following phrases describe best your feelings about your household's income these days:
-Live comfortably on the present income …… 1
-Get by on the present income …… 2
-Find it difficult to manage on the present income …… 3
-Find it very hard to manage on the present income …… 4

Q1. Suppose you could choose between different kinds of jobs, which one would you prefer:
being an employee …… 1
being self-employed …… 2
non of these …… 3 (excluded in our investigation)

Q3: Why would you prefer to be self-employed rather than an employee?
[multiple answers possible]
- Personal independence/ self-fulfillment/ interesting tasks …… 1
- …
- better income prospects …… 3
- freedom to choose place and time of working …… 4
…..

Q8. Have you ever started a business or are you taking steps to start one?
yes …… 1
no …… 2

Q9. How would you describe your situation:
- It never came to your mind to start up a business …… 1
- You are thinking about starting up a business …… 2
- You thought of it or have already taken steps to start a business but gave up …… 3

Q10. How would you describe your situation:
- You are currently taking steps to start a new business …… 1
- You have started or taken over a business in the last three years which is still active today …… 2
-You started or took over a business more than three years ago and it's still active …… 3
-Once stares a business, but currently you ate no longer an entrepreneur since business has failed …… 4
-……..

Q11. For each of the following elements, please tell me if it was very important, rather important, rather not important or not important at all for making you take steps to start a new business or take over one
very important …… 1
rather important …… 2
not important …… 3
or not important at all …… 4
…
b) an appropriate business idea 1 2 3 4
-…

To be continued

Q12. All in all, would you say you starts, or starting, your business because you saw in opportunity or you started it out of necessity?

- *You started it because you came across an opportunity … 1*
- *You started it because it was a necessity ……..... 2*
- *[Both – Spontaneous] ……. 3 (excluded in our investigation)*

Q15. What is your opinion about the following groups of persons? Is it….

- *rather favorable ……. 1*
- *neutral ……. 2*
- *rather unfavorable ……. 3*

a)	*Entrepreneurs*	*1 2 3*
b)	*Civil servants*	*1 2 3*
c)	*Top-managers in large production companies*	*1 2 3*
d)	*Managers in a bank or similar institutions*	*1 2 3*
e)	*Politicians*	*1 2 3*
f)	*Liberal professions (architect, lawyers, artist etc.)*	*1 2 3*

Q16. Please imagine that you suddenly inherited X Euro. What would you do with the money?

- *start a business (alone or with a partner) ……... 1*
- *buy a house (or repay my mortgage) ……. 2*
- *save the money (saving account, shares etc.) ……. 3*
- *spend it on things I always wanted to buy (voyages, car, luxury items ……... 4*
- *work less/ stop working ……... 5*

Q18. Do you strongly agree, agree, disagree or strongly disagree with the following opinion?

a) It is difficult to start one's own business die to la lack of available financial support

b) It is difficult to start one's own business due to the complex administrative procedures

c) It is difficult to obtain sufficient information on how to start a business

…

Table A 3: **Sample Description: Employment Status and Start-up Experience**

	Share	Frequency	Sample size
Employees	**78.81%**	**7,360**	**9339**
Blue-collar Employees	18.41%	1,719	9339
White-collar Employees	60.40%	5,641	9339
Managers	11.91%	1112	9339
Self-employed Individuals	**21.19%**	**1,979**	**9339**
Self-employed Individuals, excluding Agriculture	18.49%	1,727	9339
Self-employed Owner Manager of a Company	4.63%	432	9339
Hybrid Entrepreneurs [a)]			
- Employees	4.59%	338	7360
- Blue-collar Employees	3.43%	59	1719
- White-collar Employees	4.95%	279	5641
- Managers	6.39%	71	1112
Individuals with Start-up Experience [b)]			
- Employees	19.88%	1463	7360
- Blue-collar Employees	19.37%	333	1719
- White-collar Employees	20.03%	1130	5641
- Managers	25.54%	284	1112

Notes. The sample consist of self-employed individuals (n= 1979) and employees (n= 7360). The table shows the shares of self-employed individuals, employees and subgroups of employees. The shares of hybrid entrepreneurs and individuals with start-up experience are computed over the sample of employees and subgroups. a) Hybrid entrepreneurs are employees who have started a business in the past that is still active. b) Individuals with start-up experience are those individuals, who have ever started a business or are currently taking steps to start one.

Our sample consists of employees (approx. 80%) and self-employed individuals (approx. 20%). The group of employees is further divided into blue-collar employees (18.41%) and white-collar employees (ca. 60.40%). Dependent employed managers (11.91%) are a subgroup of white-collar employees comprising *general management*, *management*, and *middle management*. Additional to self-employment, we can identify a further form of entrepreneurial activity which is *hybrid* entrepreneurship. We use this term according to Folta et al. (2010), who defined those individuals as hybrid entrepreneurs who are working for pay and have a secondary classification as self-employed. The authors argue that hybrid entrepreneurs constitute a connotatively group among self-employment. Because we cannot differentiate between primary and secondary classification based on the Flash EB, in our investigation hybrid entrepreneurs are proxied by those employees who have started a business in the past that is still active. In our sample, hybrid entrepreneurs build 4.59% of employees and 6.39% of managers. We cannot make any assumption about the motivation of those hybrid entrepreneurs concerning their entry into self-employment and according to Folta et al. (2010), we

assume to find among the group of hybrid entrepreneurs those individuals who will last run their business aside working for pay as well as those individuals who explicitly consider a full transition into self-employment.

About 20% of employees have gained start-up experience, i.e. they have ever started a business or are currently taking steps to start one. The highest share of individuals with start-up experience can be found among employed managers (approx. 25.5%).

Table A 4: **Descriptive Statistics - Occupational Groups integrated as Dummy Variables**

EMPLOYMENT STATUS	Frequency	Percent
Self-Employed	**1979**	**21.19%**
Farmer, Forester, Fisherman	252	2.70%
Owner of a Shop, Craftsman	540	5.78%
Professional (Lawyer, Medical Practitio, ...)	414	4.43%
Owner-Manager of a Company	432	4.63%
Other	341	3.65%
White-collar Employee	**5641**	**60.40%**
Professional (empl.Doctor, Lawyer, etc.)	975	10.44%
General Management, Director/ Top Management	187	2.00%
Management	237	2.54%
Middle Management	688	7.37%
Civil Servant	1224	13.11%
Office Clerk	1299	13.91%
Other	1031	11.04%
Blue-collar Employee	**1719**	**18.41%**
Supervisor / Foreman (Team Manager, etc)	153	1.64%
Skilled Manual Worker	945	10.12%
Unskilled Manual Worker	458	4.90%
Other	163	1.75%
Total	**9339**	**100%**

Notes: The sample is restricted to self-employed individuals and employees. The table shows the frequency and share of occupational subgroups of self-employed individuals (n= 1979), white collar employees (n= 5641), and blue-collar employees (n=1719).

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Table 1: **The Multidimensional Construct of Individual Entrepreneurial Aptitude (*IEA*)**

In general, I am willing to take risks	*(Risk taking)*
Generally, when facing difficult tasks, I am certain that I will accomplish them	*(General Self-Efficacy)*
My life is determined by my own actions, not by others or by chance	*(internal vs. external Locus of Control)*
If I see something I do not like, I change it	*(Proactiveness)*
The possibility of being rejected by others for standing up for my decisions would not stop me	*(Autonomy)*
I am an inventive person who has ideas	*(Innovativeness)*
I am optimistic about my future	*(General Optimism)*
I like situations in which I compete with others	*(Competitiveness)*

Table 2: **Correlation Matrix of the Single *IEA* Dimensions**

	AUTO	RISK	INNO	PROAC	COMP	OPT	GSE
RISK	0.2295***						
INNO	0.2874***	0.2657***					
PROAC	0.2719***	0.2066***	0.2730***				
COMP	0.2084***	0.2903***	0.2100***	0.1956***			
OPT	0.2293***	0.2087***	0.2618***	0.2312***	0.1897***		
GSE	0.2800***	0.2318***	0.3128***	0.2861***	0.2079***	0.3062***	
LOCINT	0.2298***	0.1323***	0.1964***	0.2555***	0.1553***	0.2437***	0.2631***

Notes: Pairwise correlation of the *IEA*-dimensions is shown for employees. Number of observations: 7360
RISK (risk-taking), GSE (general self-efficacy), LOCINT (internal locus of control), PROAC (proactiveness), AUTO (autonomy), INNO (innovativeness), OPT (general optimism), and COMP (competitiveness)
***statistically significant at the 1 % level

Table 3: **Summary Statistics**

	Obs	Mean	Std. Dev.	Min	Max
Individual Entrepreneurial Aptitude (*IEA*)	9339	24.078	3.366	8	32
Age	9339	43.820	11.489	15	84
Education	9339	20.637	4.533	9	45
Female	9339	0.520	0.500	0	1
Parental Self-Employment	9339	0.285	0.451	0	1
Income Satisfaction high	9339	0.267	0.442	0	1
Income Dissatisfaction	9339	0.241	0.428	0	1
Social Status of Entrepreneurs	8760	1.254	0.392	0.333	3
OBSTACLES					
Lack of Financial Support	8233	0.345	0.475	0	1
Insufficient Information	8233	0.172	0.377	0	1
Adiministrativ Burdens	8233	0.276	0.447	0	1
To those who prefer Self-Employment					
Better Income Prospects	4513	0.213	0.410	0	1
NON-MONETARY BENEFITS					
Autonomy+Interesting Tasks	4513	0.673	0.469	0	1
Autonomy (working place/time)	4513	0.363	0.481	0	1

Notes: Summary statistics are based on employees (n= 7360) and self-employed individuals (n= 1979). Age is measured in years. Education is measured by the age when the respondent has finished his fulltime education. Individuals still in fulltime education are excluded. Income satisfaction is measured by a set of dummy variables, capturing individuals who are very satisfied, dissatisfied, and can get along with their household income.

Table 4: **Distribution for the Single *IEA* Dimensions**

	strongly disagree	*disagree*	*agree*	*strongly agree*
Competitiveness	8.18%	34.76%	42.02%	15.04%
Risk taking	5.67%	29.51%	49.43%	15.39%
Proactiveness	1.37%	13.99%	61.66%	22.98%
Innovativeness	2.20%	15.56%	57.73%	24.51%
General Self-Efficacy	1.14%	11.56%	62.27%	25.03%
Autonomy	2.43%	16.32%	54.57%	26.68%
General Optimism	3.18%	15.61%	54.50%	26.71%
Locus of Control (internal)	1.78%	12.27%	52.91%	33.04%

Notes: Distribution is shown for employees. Number of observations: 7360

Table 5: **Relationship between *IEA* and Employment Status**

	Total	all Employees	Blue-collar Employees	White-collar Employees	Managers	Self-employed	Hybrid Entrepreneurs [a)]	Failed Entrepreneurs [b)]
8 to 20	14.80%	12.61%	16.17%	11.52%	8.54%	8.79%	5.62%	11.24%
21 to 23	35.38%	36.02%	35.89%	36.06%	29.95%	27.08%	29.59%	33.22%
24 to 26	29.29%	30.53%	28.85%	31.04%	34.62%	33.8%	32.54%	33.73%
27 to 29	14.26%	14.77%	13.21%	15.25%	18.35%	19.35%	20.12%	16.52%
30 to 32	6.27%	6.07%	5.88%	6.13%	8.54%	10.97%	12.13%	5.28%
Exclusion of Individuals with Start-up Experience [c)]								
8 to 20	17.19%	14.36%	18.54%	13.08%	9.78%	-	-	-
21 to 23	37.42%	37.63%	36.44%	38%	32.85%	-	-	-
24 to 26	27.97%	29.91%	28.86%	30.24%	35.14%	-	-	-
27 to 29	12.52%	13.41%	11.4%	14.03%	16.55%	-	-	-
30 to 32	4.90%	4.68%	4.76%	4.66%	5.68%	-	-	-

Notes: The total Sample covers the maximum number of individuals (n=22554) who answered to each of the eight items of the multi-dimensional *IEA* construct; all employees: n= 7360; blue-collar employees: n= 1719; white-collar employees: n= 5641; managers: n=1112; self-employed: n=1727; hybrid entrepreneurs: 338; entrepreneurs who failed: 587

a) Hybrid entrepreneurs are employees who report that they have set up a business in the past that is still active. b) Failed entrepreneurs covers all individuals who once started a business but currently are no longer entrepreneurs since their businesses has failed. c) All individuals are excluded who have ever started a business or are currently taking steps to start one: Total sample: n= 16587; all employees: n= 5897; blue-collar employees: n= 1386; white-collar employees: n= 4511; managers: n=828

Table 6: **Relationship between *Preference for Self-Employment, Entrepreneurial Intention,* and *Nascent Entrepreneurs* and Employment Status**

	Preference for Self-Employment	*Entrepreneurial Intention*	*Nascent Entrepreneurs*
Self-employed			
all Self-Employed	81.76%	23.75%	7.63%
Self-Employed, excluding Agriculture	82.11%	23.16%	7.82%
Self-Employed Owner Manager of a Company	86.11%	25.93%	6.71%
Employees			
all Employees	40.01%	16.01%	5.07%
Blue-collar Employees	42.41%	17.57%	4.42%
White-collar Employees	39.28%	15.53%	5.27%
Managers	42.18%	18.08%	7.01%

Notes: The table shows the relation between employment status and *potential* (preference and intention) and *nascent entrepreneurship*. Preference for self-employment means that an individual would prefer to be self-employed rather than being employee if she or he could choose between these two possibilities. Individuals show entrepreneurial intention if they would spend a hypothetical heritage to start a business. Nascent entrepreneurs are those individuals who are currently taking steps to start a business.
Sample: self-employed: n=1979; self-employed, excluding agriculture: n=1727; self-employed owner manager of a company: n= 432; all Employees: n= 7360; blue-collar employees: n= 1719; white-collar employees: n= 5641 managers: n=1112

Table 7: **Relationship between *IEA* and Preference for Self-Employment, Entrepreneurial Intention and Nascent Entrepreneurship**

IEA	*Preference for Self-Employment*	*Entrepreneurial Intention*	*Nascent Entrepreneurs*
Total Sample			
8 to 20	33.58%	9.53%	1.91%
21 to 23	42.74%	15.31%	4.11%
24 to 26	51.92%	18.72%	5.93%
27 to 29	59.18%	22.11%	8.30%
30 to 32	67.32%	27.71%	11.60%
Exclusion of Individuals with Start-up Experience [a)]			
8 to 20	27.03%	7.69%	-
21 to 23	34.24%	12.00%	-
24 to 26	39.13%	13.17%	-
27 to 29	43.31%	15.14%	-
30 to 32	51.27%	20.25%	-

Notes: The summary is based on 9339 individuals (7360 employees, 1979 self-employed) Exclusion of individuals with start-up experience: 6311 observations. The table shows the relation between *IEA* categories and *potential* (preference and intention) and *nascent entrepreneurship* Preference for self-employment means that an individual would prefer to be self-employed rather than being employee if she or he could choose between these two possibilities. Individuals show entrepreneurial intention if they would spend a hypothetical heritage to start a business. Nascent entrepreneurs are defined as those individuals who are currently taking steps to start a business. a) All individuals are excluded who have ever started a business or are currently taking steps to start one.

Table 8**: Logit Estimation –Preference of Employees for being Self-Employed**

VARIABLES	all Employees	Blue-collar	White -collar	Managers
	(1)	(2)	(3)	(4)
IEA	0.0156***	0.0127***	0.0160***	0.0129***
	(0.00125)	(0.00327)	(0.00134)	(0.00357)
Social Status of Entrepreneurs	0.0455***	0.0396	0.0494**	0.101**
	(0.0169)	(0.0340)	(0.0197)	(0.0480)
Income Satisfaction high [a)]	-0.0696***	-0.148***	-0.0555***	-0.0796**
	(0.0158)	(0.0382)	(0.0173)	(0.0397)
Income Dissatisfaction [a)]	0.0493***	0.0387	0.0517***	0.123**
	(0.0161)	(0.0290)	(0.0194)	(0.0547)
Female	-0.0658***	-0.0729***	-0.0653***	-0.0561*
	(0.0129)	(0.0273)	(0.0148)	(0.0334)
Parental Self-Employment	0.0261*	0.0767**	0.0114	0.0366
	(0.0147)	(0.0315)	(0.0166)	(0.0380)
Age	-0.00109	-0.00191	-0.000666	-0.0293***
	(0.00367)	(0.00713)	(0.00433)	(0.00983)
Age²	-0.0873	0.0225	-0.145	3.145***
	(0.426)	(0.852)	(0.498)	(1.093)
Education (ln)	0.00233	0.00957	0.00513	-0.0944
	(0.0374)	(0.0923)	(0.0410)	(0.0999)
Area Dummies	YES**	YES	YES**	YES
	8.40	2.65	6.29	1.24
Occupation Dummies	YES	YES	YES	YES**
	9.87	2.68	7.72	6.94
Country Dummies	YES***	YES***	YES***	YES**
	216.86	60.50	182.06	49.41
Observations	5558	1294	4264	786
Wald chi^2	433.09***	128.09***	337.76***	97.52***
Pseudo-R^2	0.0696	0.0883	0.0707	0.1039

Notes: Average Marginal Effects are reported. The sample is restricted to employees. All individuals reporting that they have ever started a business or are currently taking steps to start one are excluded from the regressions.
a) Income satisfaction is measured by a set of dummy variables, where those individuals who can get along with their income are defined as reference group.
Standard errors in parentheses; Level of significance: *** p<0.01, ** p<0.05, * p<0.1

Table 9: **Logit Estimation – Preference of Self-Employed Individuals for being Employee**

VARIABLES	Self-Employed (1a)	Self-Employed (1b)	Self-Employed, non-agricultur (2a)	Self-Employed, non-agriculture (2b)
IEA	-0.0165**	-0.0166**	-0.0181**	-0.0179**
	(0.00697)	(0.00732)	(0.00821)	(0.00844)
Social Status of Entrepreneurs	-0.00466	-0.0133	-0.0227	-0.0274
	(0.0210)	(0.0220)	(0.0234)	(0.0246)
Income Satisfaction high [a)]	-0.0262	-0.0430**	-0.0172	-0.0366
	(0.0215)	(0.0208)	(0.0225)	(0.0224)
Income Dissatisfaction [a)]	0.0595***	0.0513**	0.0689***	0.0612**
	(0.0220)	(0.0220)	(0.0241)	(0.0244)
Start-up Experience [b)]	-0.172***	-0.162***	-0.183***	-0.172***
	(0.0251)	(0.0269)	(0.0284)	(0.0298)
Female	0.0467***	0.0536***	0.0486**	0.0599***
	(0.0180)	(0.0178)	(0.0189)	(0.0187)
Parental Self-Employment	-0.0329*	-0.0271	-0.0191	-0.0200
	(0.0178)	(0.0189)	(0.0188)	(0.0197)
Age	0.0150***	0.0141***	0.0141***	0.0139**
	(0.00503)	(0.00516)	(0.00535)	(0.00563)
Age^2	-1.667***	-1.546***	-1.542***	-1.512**
	(0.545)	(0.553)	(0.581)	(0.607)
Education (ln)	-0.0535	-0.0610	-0.0582	-0.0605
	(0.0418)	(0.0428)	(0.0436)	(0.0443)
Area Dummies	YES	YES	YES	YES
	3.17	2.61	3.52	3.68
Occupation Dummies	-	YES	-	YES
		0.67		0.67
Country Dummies	-	YES***	-	YES***
		72.91		68.46
Observations	1831	1831	1597	1582
Wald chi^2	154.02***	218.94***	140.61***	201.51***
Pseudo-R^2	0.1030	0.1484	0.1123	0.1611

Notes: Average Marginal Effects are reported. Only self-employed individuals are considered. Self-employed in the agricultural sector are excluded in regressions (2). Dummy variables for area, occupation and country are included in regressions (b).
a) Income satisfaction is measured by a set of dummy variables, where those individuals who can get along with their income are defined as reference group. b) We control for individuals who have ever started a business or currently taking steps to start one.
Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 10: **Logit Estimation – Entrepreneurial Intention of Employees**

	all Employees			Blue-collar Employees			White-collar Employees			Managers		
		Preference for Self-Employment = 1			Preference for Self-Employment =1			Preference for Self-Employment =1			Preference for Self-Employment =1	
VARIABLES	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)	(4a)	(4b)[1)]	(4c)[1)]
IEA	0.00922***	0.0107***	0.0105***	0.00653***	0.00943**	0.0104**	0.00955***	0.0106***	0.00998***	0.0104***	0.0141***	0.0173***
	(0.000571)	(0.00113)	(0.00142)	(0.000838)	(0.00396)	(0.00419)	(0.000880)	(0.00115)	(0.00167)	(0.00208)	(0.00114)	(0.00158)
Social Status of Entrepreneurs	0.0138	0.0221	0.0265	0.0259	0.0520	0.0506	0.00909	0.0124	0.0197	0.000759	0.0626	0.0598
	(0.0112)	(0.0240)	(0.0258)	(0.0222)	(0.0441)	(0.0461)	(0.0131)	(0.0284)	(0.0307)	(0.0315)	(0.0580)	(0.0558)
Autonomy+Interesting Tasks		0.0286	0.0270		0.0661	0.0457		0.0236	0.0244		-0.000235	0.00309
		(0.0200)	(0.0215)		(0.0446)	(0.0491)		(0.0228)	(0.0250)		(0.0467)	(0.0512)
Autonomy (working place/time)		-0.0285	-0.0294		-0.0254	-0.0397		-0.0268	-0.0256		-0.0750	-0.0706
		(0.0196)	(0.0213)		(0.0420)	(0.0447)		(0.0225)	(0.0250)		(0.0521)	(0.0524)
Better Income Prospects		0.0426*	0.0313		-0.00467	-0.0270		0.0746***	0.0678**		0.0721	0.0883
		(0.0232)	(0.0247)		(0.0487)	(0.0505)		(0.0280)	(0.0300)		(0.0573)	(0.0627)
Lack of Financial Support			0.0281			0.0893*			0.0102			-0.0778
			(0.0232)			(0.0506)			(0.0267)			(0.0483)
Insufficient Information			0.0221			0.00865			0.0151			0.0730
			(0.0275)			(0.0533)			(0.0327)			(0.0923)
Adiministrative Burdens			-0.0230			-0.0641			-0.00326			0.114
			(0.0247)			(0.0510)			(0.0295)			(0.0715)
Income Satisfaction high[a)]	-0.0294***	-0.0308	-0.0410	-0.0706**	-0.147*	-0.158*	-0.0220*	-0.0113	-0.0198	-0.0321	-0.0545	-0.0478
	(0.0108)	(0.0266)	(0.0285)	(0.0280)	(0.0863)	(0.0925)	(0.0117)	(0.0285)	(0.0314)	(0.0283)	(0.0539)	(0.0610)
Income Dissatisfaction[a)]	0.0133	0.00401	0.0118	-0.00965	-0.0391	-0.0242	0.0215*	0.0118	0.0176	0.0587	0.0941	0.0863
	(0.0106)	(0.0219)	(0.0234)	(0.0199)	(0.0417)	(0.0434)	(0.0128)	(0.0263)	(0.0287)	(0.0453)	(0.0649)	(0.0637)
Female	-0.0298***	-0.0257	-0.0297	-0.0376**	-0.0259	-0.0328	-0.0292***	-0.0243	-0.0280	-0.0272	-0.0279	-0.0514
	(0.00876)	(0.0191)	(0.0204)	(0.0190)	(0.0424)	(0.0448)	(0.00999)	(0.0216)	(0.0236)	(0.0252)	(0.0477)	(0.0448)
Parental Self-Employment	0.0289***	0.0180	0.00917	0.0396*	-0.00587	-0.00380	0.0255**	0.0201	0.00887	0.0541*	0.0532	0.00285
	(0.00983)	(0.0218)	(0.0234)	(0.0225)	(0.0470)	(0.0500)	(0.0110)	(0.0244)	(0.0269)	(0.0279)	(0.0470)	(0.0555)
Age	0.00177	0.000421	0.000651	0.00775	0.00794	0.00977	1.68e-05	-0.00231	-0.00185	-0.00832	-0.0161	-0.0148
	(0.00251)	(0.00540)	(0.00589)	(0.00554)	(0.0104)	(0.0119)	(0.00278)	(0.00626)	(0.00695)	(0.00712)	(0.0148)	(0.0147)
Age^2	-0.416	-0.437	-0.463	-1.263*	-1.654	-1.914	-0.177	0.0142	-0.0114	0.716	1.057	0.983
	(0.302)	(0.652)	(0.713)	(0.689)	(1.302)	(1.494)	(0.330)	(0.739)	(0.822)	(0.808)	(1.681)	(1.692)
Education (ln)	0.000403	-0.0219	0.0223	-0.0279	-0.127	0.0106	0.00505	0.00502	0.0255	0.0566	0.107	0.137
	(0.0263)	(0.0547)	(0.0584)	(0.0697)	(0.142)	(0.155)	(0.0284)	(0.0606)	(0.0669)	(0.0725)	(0.140)	(0.141)

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Area Dummies	YES*	YES	YES	YES	YES*	YES*	YES*	YES	YES	YES	YES	YES
	5.57	3.66	4.19	1.54	5.50	5.27	5.74	1.83	2.04	1.08	1.47	3.30
Occupation Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	12.53	4.96	4.17	4.89	1.82	1.83	7.16	4.31	2.86	0.24	0.70	0.68
Country Dummies	YES***	YES***	YES***	YES***	YES**	YES**	YES***	YES***	YES***	YES***		
	305.65	137.06	118.64	96.18	50.44	45.99	224.46	111.78	97.80	52.13		
Observations	**5558**	**1911**	**1721**	**1259**	**457**	**416**	**4264**	**1437**	**1272**	**720**	**276**	**246**
Wald chi^2	446.74***	212.34***	193.00***	140.44***	73.41**	71.00**	329.92***	172.18***	152.20***	81.04***	59.72***	75.70***
Pseudo-R^2	0.1321	0.1185	0.1166	0.1660	0.1563	0.1697	0.1291	0.1264	0.1200	0.1856	0.0877	0.1219

Notes: Average Marginal Effects are reported. The sample is restricted to employees. All individuals reporting that they have ever started a business or are currently taking steps to start one are excluded from the regressions. In regressions (b) and (c), the sample is restricted to those individuals who prefer self-employment rather than being employee.
a) Income satisfaction is measured by a set of dummy variables, where those individuals who can get along with their income are defined as reference group.
Robust standard errors in parentheses, 1) Clustered standard errors; Level of significance: *** p<0.01, ** p<0.05, * p<0.1

Table 11: **Logit Estimation –Nascent Entrepreneurship**

	all Employees			Blue-collar Employees			White-collar Employees			Managers		
		Preference for Self-Employment = 1			Preference for Self-Employment =1			Preference for Self-Employment =1			Preference for Self-Employment =1	
VARIABLES	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)	(4a)	(4b)[1)]	(4c)[1)]
IEA	0.00637***	0.00940***	0.00980***	0.00666**	0.00817***	0.00833***	0.00679***	0.0103***	0.0110***	0.0105**	0.0106***	0.0119***
	(0.00137)	(0.00151)	(0.00152)	(0.00303)	(0.00170)	(0.00171)	(0.00167)	(0.00183)	(0.00189)	(0.00460)	(0.00262)	(0.00313)
Social Status of Entrepreneurs	0.0161**	0.0308**	0.0342**	-0.0103	-0.0658*	-0.0584	0.0220***	0.0484**	0.0523**	0.000795	-0.0343	-0.0405
	(0.00699)	(0.0154)	(0.0168)	(0.0166)	(0.0388)	(0.0398)	(0.00831)	(0.0193)	(0.0211)	(0.0230)	(0.0465)	(0.0442)
Autonomy+Interesting Tasks		0.00751	0.00799		0.0384	0.0331		0.00304	0.00431		-0.0614	-0.0656
		(0.0123)	(0.0133)		(0.0294)	(0.0316)		(0.0148)	(0.0160)		(0.0432)	(0.0482)
Autonomy (working place/time)		-0.0105	-0.0117		-0.00771	-0.00612		-0.0160	-0.0167		-0.0146	-0.0254
		(0.0120)	(0.0131)		(0.0312)	(0.0336)		(0.0142)	(0.0155)		(0.0193)	(0.0237)
Better Income Prospects		0.0170	0.0217		0.0161	0.0111		0.0210	0.0283		-0.00294	-0.00780
		(0.0147)	(0.0162)		(0.0353)	(0.0364)		(0.0179)	(0.0199)		(0.0378)	(0.0367)
Lack of Financial Support			0.00799			0.0616*			-0.00679			0.0125
			(0.0142)			(0.0373)			(0.0167)			(0.0387)
Insufficient Information			0.0190			0.00674			0.0177			0.0634
			(0.0171)			(0.0347)			(0.0214)			(0.0418)
Adiministrativ Burdens			-0.0220			-0.00951			-0.0251			-0.0607
			(0.0147)			(0.0396)			(0.0178)			(0.0396)
Income Satisfaction high[a)]	0.00586	0.0168	0.0137	-0.00362	-0.00824	-0.0235	0.00725	0.0220	0.0220	-0.00502	-0.00983	-0.00176
	(0.00699)	(0.0163)	(0.0176)	(0.0191)	(0.0439)	(0.0425)	(0.00793)	(0.0187)	(0.0207)	(0.0226)	(0.0302)	(0.0356)
Income Dissatisfaction[a)]	0.00818	0.00817	0.00240	-0.0163	-0.0379	-0.0483	0.0165*	0.0201	0.0160	0.0245	0.0312	0.0300
	(0.00741)	(0.0149)	(0.0159)	(0.0136)	(0.0299)	(0.0309)	(0.00956)	(0.0194)	(0.0209)	(0.0308)	(0.0483)	(0.0494)
Female	-0.0140***	-0.0161	-0.0171	-0.0235*	-0.0586**	-0.0677**	-0.0120*	-0.00405	-0.00250	-0.0378**	-0.0401	-0.0429
	(0.00539)	(0.0117)	(0.0126)	(0.0132)	(0.0259)	(0.0266)	(0.00616)	(0.0140)	(0.0153)	(0.0176)	(0.0338)	(0.0345)
Parental Self-Employment	0.00428	0.0149	0.0133	0.00189	-0.0114	-0.0187	0.00650	0.0262*	0.0248	-0.00368	-0.00239	-0.00210
	(0.00595)	(0.0128)	(0.0139)	(0.0151)	(0.0327)	(0.0347)	(0.00683)	(0.0149)	(0.0165)	(0.0212)	(0.0305)	(0.0315)
Age	-0.00366***	-0.00546*	-0.00720**	-0.00576*	-0.00961	-0.0107	-0.00250	-0.00377	-0.00578	-0.00305	-0.00936	-0.00884
	(0.00134)	(0.00307)	(0.00339)	(0.00307)	(0.00620)	(0.00715)	(0.00159)	(0.00385)	(0.00426)	(0.00453)	(0.0115)	(0.0114)
Age^2	0.272*	0.344	0.521	0.410	0.630	0.736	0.167	0.201	0.415	0.194	0.728	0.630
	(0.159)	(0.373)	(0.413)	(0.391)	(0.793)	(0.921)	(0.186)	(0.458)	(0.508)	(0.504)	(1.219)	(1.237)
Education (ln)	0.0421***	0.0661**	0.0634*	0.0710*	0.124	0.124	0.0396**	0.0664*	0.0614	0.0386	0.0893	0.0730
	(0.0145)	(0.0305)	(0.0336)	(0.0407)	(0.0947)	(0.101)	(0.0163)	(0.0358)	(0.0399)	(0.0482)	(0.0756)	(0.0740)

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Area Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	0.14	0.06	0.18	3.11	3.67	2.48	0.51	0.34	0.36	0.22	0.33	0.43
Occupation Dummies	YES***	YES**	YES**	YES	YES	YES	YES***	YES***	YES**	YES	YES	YES
	31.18	18.80	19.03	5.40	2.07	2.19	22.63	14.03	14.59	2.79	2.62	3.41
Country Dummies	YES***	YES***	YES***	YES**	YES*	YES*	YES***	YES***	YES***	YES		
	121.37	92.76	79.98	43.34	33.64	32.39	103.30	80.19	71.70	35.16		
Observations	**6929**	**2761**	**2489**	**1275**	**516**	**481**	**5322**	**2050**	**1836**	**920**	**445**	**407**
Wald chi^2	379.52***	211.44***	196.27***	128.34***	65.46***	70.95***	290.06***	167.90***	156.49***	78.87***	68.45***	140.85***
Pseudo-R^2	0.1299	0.1184	0.1190	0.1635	0.1679	0.1773	0.1326	0.1280	0.1279	0.1350	0.0543	0.0749

Notes: Average Marginal Effects are reported. The sample is restricted to employees. Regressions (a) are based on the total sample of employees and subgroups. In regressions (b) and (c), the sample is restricted to those individuals who prefer self-employment rather than being employee.

a) Income satisfaction is measured by a set of dummy variables, where those individuals who can get along with their income are defined as reference group.

Robust standard errors in parentheses, 1) Clustered standard errors; Level of significance: *** p<0.01, ** p<0.05, * p<0.1

Table 12: **Logit Estimation –Exploitation of a perceived Business Opportunity by Individuals with Start-up Experience**

VARIABLES	Individuals with Start-up Experience		Nascent Entrepreneurs		Individuals with Start-up Experience		Nascent Entrepreneurs	
	Total	all Employees	Total	all Employees	Total	all Employees	Total	all Employees
	(1a)	(1b)	(2a)	(2b)[1)]	(3a)	(3b)	(4a)	(4b)[1)]
IEA	0.0163***	0.0181***	0.0153***	0.0244***	0.0149***	0.0172***	0.0173***	0.0300***
	(0.000991)	(0.00265)	(0.00369)	(0.00498)	(0.00116)	(0.00296)	(0.00365)	(0.00579)
Lack of Financial Support					0.0280*	0.00391	0.0309	-0.0359
					(0.0170)	(0.0302)	(0.0406)	(0.0579)
Insufficient Information					0.0117	0.00393	0.0630	0.0731
					(0.0185)	(0.0329)	(0.0463)	(0.0740)
Adiministrativ Burdens					0.00423	0.00522	-0.0788*	-0.103
					(0.0207)	(0.0378)	(0.0448)	(0.0690)
Female	-0.0259*	-0.0182	-0.0538	-0.0416	-0.0214	-0.0136	-0.0513	-0.0412
	(0.0148)	(0.0266)	(0.0367)	(0.0673)	(0.0153)	(0.0278)	(0.0374)	(0.0749)
Parental Self-Employment	0.00671	0.0119	-0.0541	-0.0712	0.00936	0.0136	-0.0460	-0.0758
	(0.0154)	(0.0289)	(0.0370)	(0.0485)	(0.0160)	(0.0301)	(0.0372)	(0.0523)
Age	-0.00745**	-0.0106	-0.00502	0.00666	-0.00845**	-0.0105	0.00139	0.0105
	(0.00326)	(0.00776)	(0.00939)	(0.0123)	(0.00337)	(0.00816)	(0.00892)	(0.0131)
Age^2	0.441	0.731	-0.107	-1.534	0.555	0.742	-0.955	-1.970
	(0.345)	(0.896)	(1.167)	(1.541)	(0.357)	(0.945)	(1.088)	(1.638)
Education (ln)	0.0495	0.0151	0.0641	0.300	0.0604*	0.0292	0.0484	0.268
	(0.0344)	(0.0648)	(0.0914)	(0.198)	(0.0355)	(0.0671)	(0.0934)	(0.208)
Area Dummies	YES*	YES*	YES	YES	YES	YES*	YES	YES
	5.80	5.76	2.44	3.55	4.07	4.78	1.85	4.10
Occupation Dummies	YES***	YES	YES*	YES	YES***	YES	YES**	YES
	40.85	7.08	29.29	6.15	40.07	8.50	34.25	9.97
Country Dummies	YES***	YES***	YES***		YES***	YES***	YES***	
	141.00	71.76	76.81		136.60	67.84	71.10	
Observations	**4218**	**1400**	**737**	**357**	**3944**	**1306**	**710**	**339**
Wald chi^2	274.80***	118.44***	105.86***	95.52***	267.91***	114.00***	110.97***	101.42***
Pseudo-R^2	0.0586	0.0739	0.1388	0.0623	0.0603	0.0744	0.1519	0.0818

Notes: Average Marginal Effects are reported. The sample is restricted to individuals who have ever started a business or are currently taking steps to start one. Additional the subgroup of nascent entrepreneurs, i.e. individuals who are currently taking steps to start a business are considered. In regressions (a) the total sample of individuals with start-up experience resp. nascent entrepreneurs are considered. In regressions (b) the sample is restricted to employees.
Robust standard errors in parentheses, 1) Clustered standard errors; Level of significance: *** p<0.01, ** p<0.05, * p<0.1

Table 13: **Logit Estimation - *IEA Categories* (Dummies) as Explanatory Variables**

VARIABLES	Self-Employment Preference		Entrepreneurial Intention			Nascent Entrepreneurship	
				Preference for Self-Employment =1			Preference for Self-Employment =1
		no Start-up Experience			no Start-up Experience		
	(1a)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)
IEA (8-20)	-0.0569***	-0.0652***	-0.0610***	-0.0615*	-0.0324	-0.0324***	-0.0526***
	(0.0192)	(0.0199)	(0.0131)	(0.0329)	(0.0349)	(0.00713)	(0.0193)
IEA (24-26)	0.0413***	0.0301**	0.0150	0.0275	0.0179	0.0170**	0.0232
	(0.0138)	(0.0152)	(0.0101)	(0.0199)	(0.0225)	(0.00739)	(0.0160)
IEA (27-29)	0.0791***	0.0652***	0.0408***	0.0609**	0.0586*	0.0363***	0.0521***
	(0.0178)	(0.0206)	(0.0136)	(0.0248)	(0.0307)	(0.0106)	(0.0202)
IEA (30-32)	0.134***	0.134***	0.104***	0.149***	0.155***	0.0790***	0.115***
	(0.0262)	(0.0324)	(0.0220)	(0.0343)	(0.0448)	(0.0185)	(0.0323)
Social Status of Entrepreneurs	0.0520***	0.0467***	0.0163	0.0128	0.0231	0.0162**	0.0311**
	(0.0150)	(0.0170)	(0.0107)	(0.0204)	(0.0236)	(0.00696)	(0.0152)
Income Satisfaction high[a)]	-0.0591***	-0.0690***	-0.0408***	-0.0397*	-0.0319	0.00549	0.0169
	(0.0142)	(0.0158)	(0.0102)	(0.0217)	(0.0265)	(0.00696)	(0.0162)
Income Dissatisfaction[a)]	0.0409***	0.0469***	0.00927	0.0184	0.00861	0.00811	0.00887
	(0.0144)	(0.0161)	(0.0101)	(0.0192)	(0.0218)	(0.00739)	(0.0147)
Start-up Experience[b)]	0.206***		0.131***	0.149***			
	(0.0154)		(0.0122)	(0.0191)			
Female	-0.0744***	-0.0663***	-0.0314***	-0.0293*	-0.0286	-0.0137**	-0.0168
	(0.0117)	(0.0129)	(0.00849)	(0.0165)	(0.0189)	(0.00538)	(0.0117)
Parental Self-Employment	0.0258*	0.0273*	0.0329***	0.0259	0.0204	0.00471	0.0149
	(0.0132)	(0.0149)	(0.0100)	(0.0187)	(0.0222)	(0.00617)	(0.0133)
Age	-0.00291	-0.00141	0.000888	0.00139	0.000313	-0.00366***	-0.00637**
	(0.00331)	(0.00368)	(0.00234)	(0.00449)	(0.00528)	(0.00134)	(0.00301)
Age^2	0.0776	-0.0567	-0.404	-0.647	-0.420	0.273*	0.445
	(0.382)	(0.427)	(0.280)	(0.539)	(0.639)	(0.159)	(0.364)
Education (ln)	0.0114	0.000769	0.00811	0.000268	-0.0235	0.0417***	0.0645**
	(0.0326)	(0.0374)	(0.0244)	(0.0452)	(0.0549)	(0.0144)	(0.0304)

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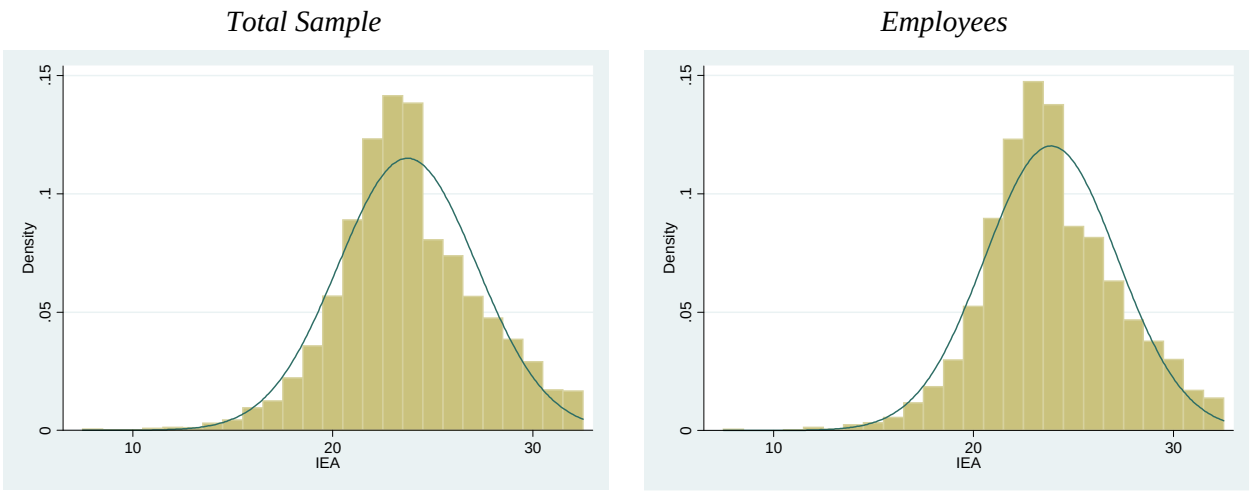
Area Dummies	YES***	YES**	YES	YES	YES**	YES	YES
	11.77	8.53	0.12	0.01	7.37	4.00	3.36
Occupation Dummies	YES	YES	YES	YES*	YES*	YES	YES
	12.59	10.48	31.12	16.59	16.68	9.90	5.12
Country Dummies	YES***	YES***	YES***	YES***	YES***	YES	YES
	255.23	221.60	122.62	92.95	415.51	237.77	155.79
Observations	**6929**	**5558**	**6929**	**2790**	**1933**	**6929**	**2790**
Wald chi^2	818.03	430.31	385.56	217.32	838.14	412.00	221.67
Pseudo-R^2	0.1007	0.0681	0.1338	0.1220	0.1734	0.1520	0.1203

Notes: Average Marginal Effects are reported. The sample is restricted to employees. The *IEA* measure is divided into categories each included as dummy variable into regressions, whereby individuals with an *IEA* score of 21 to 23 are defined as reference group. Regressions (a) are based on the total sample of employees. In regressions (b) and additional in regression (c) for entrepreneurial intention, the sample is restricted to those individuals who prefer self-employment rather than being employee. In regressions (c), individuals are excluded who have ever started a business or are currently taking steps to start one. Exclusion of individuals with start-up experience is not possible in case of nascent entrepreneurs.
a) Income satisfaction is measured by a set of dummy variables, where those individuals who can get along with their income are defined as reference group. b) We control for individuals who have ever started a business or currently taking steps to start one.
Robust standard errors in parentheses, 1) Clustered standard errors; Level of significance: *** p<0.01, ** p<0.05, * p<0.1

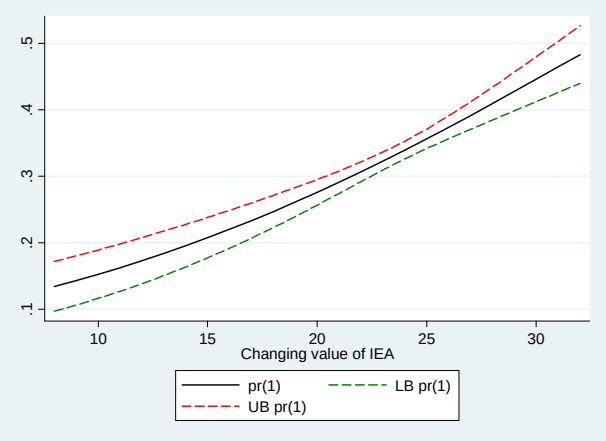
Figure 1: **Distribution of the Comprehensive *IEA* Measure**



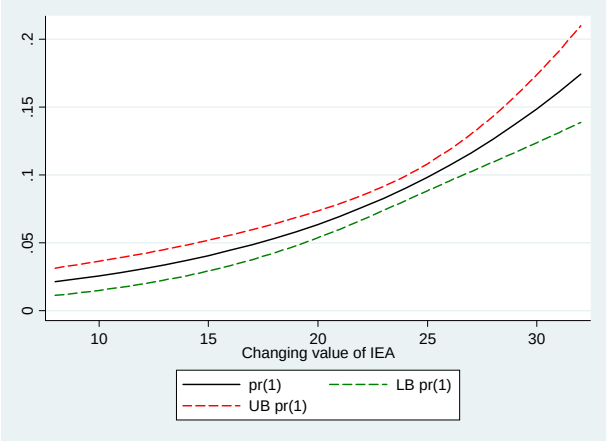
Notes: *Left:* The distribution of the comprehensive *IEA* measure is presented for the total sample of 22554 individuals, i.e. all respondents for which we have complete information about *IEA. Right:* The distribution of the comprehensive *IEA* measure is presented for employees (7360 individuals). The score of the comprehensive *IEA* measure ranges from 8 to 32. Normal density is added to the graph.

Figure 2: **Predicted Probabilities of Preference for Self-Employment, Entrepreneurial Intention and Nascent Entrepreneurship**

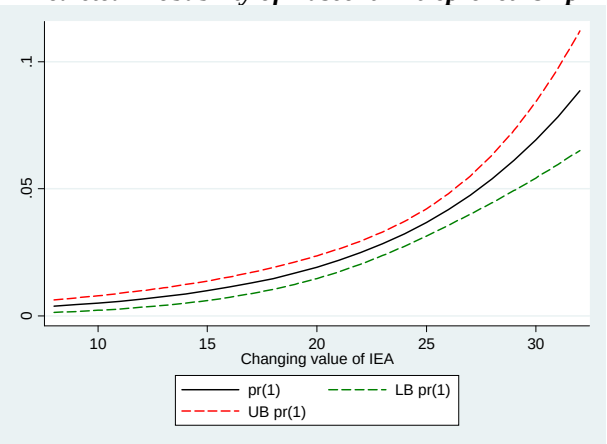
Predicted Probability of Self-Employment Preference
Excluding Individuals with Start-up Experience [a)]



Predicted Probability of Entrepreneurial Intention
Excluding Individuals with Start-up Experience [a)]



Predicted Probability of Nascent Entrepreneurship



Notes: Graphs from logit estimations. Predicted values and confidence intervals are computed for the case that *IEA* varies from the minimum of 8 to the maximum of 32 while the other variables are held constant at their mean. The predicted probabilities are shown for the unrestricted sample of all employees (regression 1, Table 8; basic model (a), Table 10 and Table 11). Lower bound and upper bound dashed.
a) All individuals are excluded who have ever started a business or are currently taking steps to start one.