

Human capital and the decision to exploit innovative opportunity

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Abstract:

Purpose: The main purpose of this study is to examine the direct and interaction effect of individuals' human capital input and human capital output in the form of entrepreneurial self-confidence on the decision to exploit innovative opportunities.

Design/methodology/approach: Using a strategic entrepreneurship perspective, we suggest that when individuals with high human capital decide to exploit opportunities they do so by thinking and acting strategically. Strategic action(s) involves pursuing competitive advantages that enable a new venture to get a foothold in the market. We argue that such competitive advantages arise from the exploitation of innovative opportunities rather than imitative entrepreneurial opportunities and individuals with high human capital are more likely to exploit innovative opportunities when they develop entrepreneurial self-confidence. Our empirical analysis is based on a random sample of individuals from the adult population who are in the process of creating a new venture.

Findings: Our results suggest that although human capital inputs and human capital output in the form of entrepreneurial self-confidence are significant factors in influencing the decision to exploit innovative opportunities, human capital inputs interact in different ways with human capital output in influencing this decision.

Practical Implications: From a macro perspective, the main implication of our study is that it is possible to assess the quality of entrepreneurship in an economy through individuals' human capital and the proportion of innovative opportunities in the economy. Moreover, because not all types of human capital inputs influences the exploitation of innovative opportunities, policy makers can be selective in their policy interventions in spawning quality entrepreneurship in their economy.

Originality/value: Based on population level data our study provides empirical evidence of the nature of entrepreneurial decisions being at the earliest phases of the entrepreneurial process. Our study shows the importance of founders' human capital inputs and outputs in influencing the quality of entrepreneurship in an economy. Moreover, our study extends the understanding the individual-opportunity nexus in promoting innovative entrepreneurship in an economy.

Keywords: Innovative opportunities, entrepreneurial self-confidence, competitive advantage, strategic actions

Paper type: Research paper

1. Introduction

There is a growing recognition that the field of entrepreneurship revolves around understanding the individual-opportunity nexus (Casson, 2005; Davidsson *et al.*, 2015; Eckhardt and Shane, 2003; Renko *et al.*, 2012). In examining the individual-opportunity nexus most empirical studies focus on opportunity identification (Gruber *et al.*, 2015; Haynie *et al.*, 2009; Short *et al.*, 2010; Ucbasaran *et al.*, 2008). The few studies that examine opportunity exploitation uses experienced, serial and/or portfolio entrepreneurs as the unit of analysis (Choi and Shepherd, 2004; Fuentes *et al.*, 2010). However, every year millions of individuals across the world decide to exploit opportunities by undertaking their first steps towards creating a new venture (Singer *et al.*, 2015). What kind of opportunities do they choose to exploit and why?

This question is important because the type of opportunity that an individual decide to exploit could influence the entrepreneurial outcome (Fossen and Buttner, 2013; Ucbasaran *et al.*, 2008) and hence the impact of entrepreneurship on the economy (Baumol, 1996; Shane, 2009). For instance, if most individuals choose to exploit imitative opportunities, the new ventures created by them could end up as wealth destroyers (or wealth re-distributors) instead of wealth creators (Baumol, 2002). On the contrary, the exploitation of innovative opportunities increases the probability of entrepreneurial success (at the individual level) and in the process contribute to economic renewal and growth (Anokhin and Wincent, 2012; Roberts and Eesley, 2011; Schumpeter, 1934; Van Praag and Versloot, 2007). In this study, we examine the choice of innovative opportunities by individuals with different levels and types of human capital.

Previously, Shepherd and DeTienne (2005) found positive relationship between the number of opportunities identified and the innovativeness of those opportunities. However, their study

focused on opportunity identification among university students. Similarly, Ucbasaran et al., (2008) examined the role of human capital profiles of individuals in opportunity identification and exploitation decisions without examining the type of opportunity pursued. Kollinger's (2008) study revealed the significantly positive role that human capital inputs like education, labor market experience as well as entrepreneurial self-confidence play in influencing some individuals to choose more innovative opportunities. However, their study did not reveal whether individuals with high educational attainment or labor market experience exploit innovative opportunities because of entrepreneurial self-confidence. Entrepreneurial self-confidence represents human capital output and may vary across individuals with similar human capital inputs (Marvel *et al*, 2014; Unger *et al*, 2011). Therefore, it is necessary to take into account how the two human capital dimensions are related to the opportunity exploitation decision. As far as we understand there are no studies that have examined the relationship between human capital output and the type of opportunity exploited by individuals with different human capital inputs. We fill this research gap by examining the interaction effect of human capital inputs (education, labor market status and entrepreneurial training) and human capital output (entrepreneurial self-confidence) in influencing the decision to exploit innovative opportunities.

By distinguishing human capital inputs from human capital outputs we provide empirical evidence on the important role played by the two human capital dimensions in influencing the quality of entrepreneurship in an economy. Although many studies have examined the role of human capital on new venture performance, most of these studies consider only the human capital input ignoring human capital outputs that have been found to play an important role in influencing entrepreneurial behavior (Bayon *et al.*, 2015; Townsend *et al.*, 2010). Moreover, as far as we know no studies have investigated the joint role of human capital inputs and outputs in

influencing the choice of innovative opportunities, especially at the earliest stages of the entrepreneurial process. Our results allow a better understanding of the quality of entrepreneurial spawning in an economy (Henreksson and Johansson, 2010; Shane, 2009; Vivarelli, 2013). Moreover, this study extends our understanding of the individual-opportunity nexus by connecting individuals' objective indicators of human capital and subjective indicators of human capital outputs with the type of opportunities pursued in an economy.

We ground our conceptual underpinnings on the concept of strategic entrepreneurship, the simultaneous pursuit of opportunity and advantage seeking behavior (Hitt *et al.*, 2001; Ireland *et al.*, 2003). We suggest that some individuals act strategically when they decide to pursue entrepreneurship through new venture creation. Such strategic actions involve pursuing competitive advantages (Porter, 1980; Barney, 2001) that the exploitation of the given opportunity provides to the new venture in the marketplace (Ireland *et al.*, 2003). We suggest that some individuals and not others seek competitive advantages, and the desire to seek such advantages lead them to exploit innovative opportunities as opposed to imitative opportunities. We carry our analysis using a random sample of individuals from the adult population who are in the process of creating a new venture.

The rest of the paper is as follows. In section 2, we discuss how the exploitation of innovative opportunities provides competitive advantages to a new firm, followed by hypotheses as to what makes some individuals and not others exploit innovative opportunities. Section 3 discusses the methodology followed by results in section 4, discussion and implications in section 5, and finally conclusion, limitations and future studies in section 6.

2. Conceptual underpinnings

2.1 Innovative opportunities and business creation

New venture creation represents the opportunity exploitation phase of entrepreneurship. Because new ventures are created in a competitive context where other ventures, old as well as new compete for resources and customers, the exploitation of opportunities through a new venture require an entrepreneurial mindset that combines opportunity seeking behavior with value creating behavior (Hitt *et al.*, 2001; Ireland *et al.*, 2003). Such a mindset is important because new ventures suffer from several competitive disadvantages (Shane, 2005), for instance, structural disadvantages arising from liabilities of smallness as well as strategic barriers that incumbents erect through actions such as product differentiation and advertising (Porter, 1980). Similarly, the lack of legitimacy linked to liabilities of newness (Freeman *et al.*, 1983; Rao *et al.*, 2008) compound the disadvantages for new ventures at entry. Therefore, the question is how can new ventures gain competitive advantage at entry?

Innovation is often invoked as a solution to overcome new ventures' competitive disadvantages (Drucker, 2007; Schumpeter, 1934). Entrepreneurial innovation includes the introduction of new goods/services with new value propositions and/or the creation of a product/service that satisfies consumers' latent needs (Christensen, 1997; Drucker, 2007; Markides, 2006).

Innovative opportunities allow new ventures at entering into the market (Drucker, 2007). Several empirical studies have demonstrated the important role that innovative opportunities play in creating competitive advantages for new ventures at entry (Baker and Nelson, 2005; Katila and Shane, 2005; Markides and Sosa, 2013). In addition, Markides and Sosa (2013) provide several examples on how by pursuing innovative opportunities new ventures have discovered new ways

of doing business that have dramatically lowered the cost of doing business, thus making it cheaper for new (entrepreneurial) ventures to compete with resource rich incumbents (Cohen and Klepper, 1996; Porter, 1996). In addition to creating competitive advantages at entry, innovative opportunities also reduce the impact of competitive disadvantages. Evidence points to higher survival rates for new ventures based on innovative opportunities (Aspelund *et al.*, 2005; Helmers and Rogers, 2010). Studies also reveal that even in direct market competition, new entry based on innovative opportunities delay incumbents' reaction and retaliation (Kuester *et al.*, 1999). As such by choosing innovative opportunities new ventures avoid expending valuable and scarce resources on competition and focus on creating the market for the innovative opportunity (Debruyne *et al.*, 2002). An entrepreneurial mindset that focuses on exploiting innovative opportunities is thus valuable because it provides protection to resource poor new ventures (from similar competitors) as well as the time in the market to the lack of legitimacy and liabilities of smallness. In the next section we hypothesize about the role of human capital inputs and outputs in influencing the choice of innovative opportunities.

2.2. Human capital and innovative opportunities

From an individual perspective the choice of an entrepreneurial career is a strategic decision because it involves long term commitment of time and resources that are costly to reverse (Levie and Autio, 2011). From an economic perspective such a decision requires the evaluation of long term entrepreneurial outcomes viz-.a-viz. wage employment. In this regard individuals' human capital inputs can act as an enabler or constraint to ones' entrepreneurial aspirations (Cassar, 2006). For instance, the high opportunity cost of entrepreneurship for individuals with high

human capital incentivizes these individuals to seek opportunities with higher returns or greater chances of success (Cassar, 2006). Increasing the chances of new venture success requires actions to not only identify valuable opportunities but also opportunities that provide competitive advantages to the new venture at entry (Hitt *et al.*, 2001).

We suggest that the individual's alertness about innovative opportunities increases with human capital (Kirzner, 1997) mainly for three reasons. First, by having higher levels (quantity) of human capital inputs such as education and experience, individuals with high human capital are better equipped to identify innovative opportunities (Shane, 2000). Second, individuals with high human capital inputs have higher levels of cognitive abilities that help them in seeing beyond the obvious tactical issue to strategic issues (Hartog *et al.*, 2010). Higher cognitive capabilities also allow individuals to withstand the risks and uncertainty of innovative opportunities (Falch and Massih, 2011). Third, individuals with high human capital inputs are likely more productive than individuals with lower human capital (Becker, 1993). Higher productivity helps in handling both the breadth and the depth of tasks involved in exploiting innovative opportunities (Lechmann and Schnabel, 2014). Therefore, we hypothesize:

H1: Individuals with higher levels of human capital are more likely to exploit innovative opportunity compared to those with lower levels of human capital.

However, high human capital inputs can also lead to low willpower with respect to the choice of entrepreneurship over wage employment. This could explain why entrepreneurial intentions do not always lead to entrepreneurial actions such as new firm creation (Henley, 2007). Willpower can be enhanced and Benabou and Tirole (2002) suggest self-confidence as an antidote to low

willpower. Such task related self-confidence, for instance, the confidence that one has the ability to perform a given task represents ones' subjective assessment of task ability and can be considered as human capital output (Marvel *et al.*, 2014). Benabou and Tirole (2001) have suggested several functional utilities of such human capital outputs. First, self-confidence in one's ability provides the functional value of consumption utility. Consumption utility of entrepreneurial self-confidence could lead to positive affect which in turn influences confidence in ones' ability to respond effectively in dynamic environments such as those involved in the exploitation of innovative entrepreneurial opportunities (Baron, 2008).

Second, confidence has the strategic value of signaling. By believing and signaling that one possesses certain abilities, it is easier to convince others. This is particularly important for aspiring entrepreneurs who need external stakeholders to commit resources to the new entrepreneurial venture (Connelley *et al.*, 2011; Zott and Huy, 2007). Third, confidence has the functional value of enhancing motivation. Such motivation helps in undertaking ambitious goals. The goal of exploiting an innovative opportunity is ambitious because it requires one to address the higher levels of business risks compared to opportunities based on imitative opportunities (Koellinger, 2008). Therefore, we suggest that individuals with high human capital inputs who otherwise have low willpower for entrepreneurship are more likely to exploit innovative opportunities when they develop entrepreneurial self-confidence.

H2: Individuals with high human capital who develop entrepreneurial self-confidence are more likely to exploit innovative opportunities compared to those who lack entrepreneurial self-confidence.

3. Data and Method

3.1 Data and variable definition

Our empirical analysis is based on data sourced from the Global Entrepreneurship Monitor (GEM) adult population survey (APS) (Hernández *et al.*, 2013). The data used for our study was collected during a 3 month period in mid- 2012 from Spain. The respondents were selected randomly using multiple stage sampling technique in which at first, a random sample of municipalities was selected. This was followed by a random selection of telephone numbers from the annually updated official telephone directory. From these randomly generated telephone numbers, the chosen respondents were contacted and interviewed by a professional market research agency monitored by the Global Entrepreneurship Monitor (GEM) consortium (refer to Bosma *et al.*, 2012 for the detailed methodology)

The original dataset contained 21900 observations. From this dataset, we identified adult respondents who have initiated some concrete steps to create a new venture. In entrepreneurship studies this stage in which individuals take concrete steps towards creating a new venture but yet to have a fully operating new venture is known as nascent entrepreneurship (Reynolds *et al.* 2005). Nascent entrepreneurship represents the first stage when individuals take actions to exploit a perceived opportunity. In addition to several profile variables the respondents in our sample also reported their labor market status at the time of the survey. We removed the respondents who reported that they are working full time in their new ventures. Our final sample comprises of two groups of respondents 1) Concurrently working (have a job) and in the process of creating a new venture 2) those who are in the process of creating a new venture but still looking for work (job). This is done to reduce response bias for one of the independent variables

used in this study (entrepreneurial self-confidence). Classified this way our final sample comprises 235 respondents between the ages of 18 and 64 years.

Dependent Variable: There is a multiplicity of definition of innovation. However, three broad categories of innovation can be identified 1) product innovation: related to newness of new product/service idea, 2) process innovation: newness of processes or raw materials and 3) Business model innovations: newness in organizational form and/or management processes (Birkinshaw *et al.*, 2008; Christiansen, 1997; Johannessen *et al.*, 2001; Schumpeter, 1934; Utterback and Abernathy, 1975). In empirical studies innovation is often operationalized using investment in research and development (R & D) activities or in terms of the number of new patents. However, for most nascent entrepreneurial initiatives R & D expenses are difficult to estimate because of lack of formalization of business practices/processes. Similarly, patents are more likely to be unavailable for nascent entrepreneurial initiatives that are in development or planning stages. In this study, we operationalize innovation through a self-reported questionnaire item in the GEM APS in which respondents were asked “do all, many or none of your customers consider the product/service new/unfamiliar”. This measure is suited for our study because our focus is on market filling or customer innovations exploited by aspiring entrepreneurs. Those who reported that all or many of their customers consider the product/service new or unfamiliar are aspiring nascent entrepreneurs who are considered to be in the process of exploiting the entrepreneurial opportunity through innovation. It is true that our measure of innovation is perceptual in nature and could be positively biased. At the same time measuring innovation this way captures the aspiring entrepreneur’s apparent knowledge about customers. Such knowledge is a source of opportunity. Moreover, the ability to identify unique customer needs is one of the fundamental requirements of a new business and hence can be considered a useful indicator of

innovative entrepreneurial opportunity, especially at the nascent entrepreneurial stage. In our sample, 48.93% of the respondents report innovative product/services for their target customers.

-----Insert Table 1 about here-----

-----Insert Table 2 about here-----

Independent variable: We measure the human capital inputs of our respondents through their level of formal education, labor market status at the time of the survey and entrepreneurship training. Our formal education variable is divided into two broad categories: High education and low education. The former comprises individuals with education up to the secondary level while the latter comprises respondents with above secondary level of education. We use this segregation because education up to the secondary level is compulsory. It is the minimum level of education before an individual becomes eligible for entry into the formal labor market. As such any decision to continue formal education beyond secondary level is an investment of time (and also monetary investment) in one's human capital (Becker, 1993). The labor market status of the respondents is dichotomous and coded as 1 (yes: meaning active in the labor market) and 0 (no: no active in the labor market and looking for a job). Entrepreneurship training is also measured using dichotomous yes/no answer. Entrepreneurship training is a specific form of human capital input.

Measured this way in our sample, 42.1 % of our respondents have high education and there is a significant difference in the mean of those who have high education and are in the process of exploiting innovative opportunities versus those with low education and exploiting imitative opportunities (Table 1). Similarly, we find significant differences in entrepreneurship training between those individuals who are in the process of exploiting innovative entrepreneurial opportunities versus those who are exploiting imitative opportunities (Table 1).

The indicator that we use to measure human capital output (entrepreneurial confidence) is self-reported. The respondents were asked “*if they have the knowledge, skills and experience to pursue entrepreneurship*”. This self-reported measure has been used in previous studies to assess entrepreneurial confidence (Driga *et al.*, 2009; Koellinger *et al.*, 2007; Lafuente *et al.*, 2007; McGee *et al.*, 2009; Townsend *et al.*, 2010). Given that this measure is self-reported we expect some upward bias in response (Trevelyan, 2008). This is evident from the 90.6% of the respondents who reported that they have entrepreneurial self-confidence. We control for age and gender because they are related to willingness (willpower) towards entrepreneurship as well as the risk preferences and the choice of innovative versus imitative opportunities (Calinedo *et al.*, 2009; Driga *et al.*, 2009; Langowitz and Minniti, 2007; Verheul *et al.*, 2012).

3.2 Method

Given the nature of our dependent variable we use the logistic regression technique for our empirical analysis. In limited dependent variable models such as logistic regression, a more robust method of interpreting the relationship between the variables is through the marginal effect of the independent variable(s) on the dependent variable (Wiersema and Bowen, 2009).

Moreover, because of intrinsic non-linearity of logistic regression the correct estimation of marginal effect of any interaction term in the regression model requires estimation of the marginal effect of each observation in the sample (Ai and Norton, 2003; Wiersema and Bowen, 2009). Therefore, to correctly measure the impact of our interacting variables we use the method suggested by Ai and Norton (2003). The procedure developed by Ai and Norton (2003) also allows us to test whether the real (true) magnitude of the interaction term is different from zero even if the coefficient obtained from the (traditional) logistic output is not statistically significant. As a measure of goodness of fit we calculate the proportion of correctly classified (predicted) observations.

4. Results

The marginal effects of our logistic regression models are shown in table 3 (The coefficients of the same are shown in the appendix). As mentioned previously, in non-linear models the correct interpretation of regression outcomes requires estimating the marginal effect of the interaction term for each observation (235) in the sample¹ (Ai and Norton, 2003). To aid in the interpretation of the results presented in models 2, 3 and 4 of table 2, we plot, for each individual in the sample, the estimated interaction effects on the probability of entrepreneurship in Figures 1a, 2a and 3a; and do the same for the significance (Z-value) of the interaction effects in Figures 1b, 2b and 3b. Control variables are set to their sample mean values. In the figures, the vertical axis represents the estimated interaction effects (Figures 1a, 2a and 3a) and their significance level (Figures 1b, 2b and 3b), while the horizontal axis indicates the probability to engage in entrepreneurship.

¹ The partial regression coefficient and the standard error of the interaction term of labor status and entrepreneurial confidence as shown in model 2 of table 3 is an incorrect estimate because it does not take into account the effect of second differentiation of the interaction term.

Among the human capital inputs, high education and entrepreneurship training show statistically significance (model 1 of table 2) while entrepreneurial confidence has no effect (positive but not significant). If we compare the human capital variables across the models, we find that effects of the variables are inconsistent. However, if we look at the model with the best goodness of fit i.e. Model 4 of table 2 and corroborating it with model 4 of table 3, the relationship between high education and exploitation of innovative opportunities is significantly positive and there is a 16.9 % increase in the exploitation of innovative entrepreneurial opportunities when individuals with high education decide to initiate nascent entrepreneurial activities. Model 4 (table 2 and Table 3) also shows that there is 37.4% decrease in innovative opportunities among individuals in active labor market. Surprisingly, entrepreneurial training has no effect on the exploitation of innovative opportunities. These results provide partial support to our hypothesis, H1, which suggested that individuals with high human capital are more likely to exploit innovative opportunities.

----- Insert Tables 2 and 3 about here -----

In order to test hypothesis H2 we use two figures 1(a) and 1(b) for interpreting the interaction effect of education and entrepreneurial confidence on innovative opportunities (case 1). Similarly, figure 2(a) and figure 2(b) is used for interpreting the interaction effect of entrepreneurship training and entrepreneurial self-confidence (case 2) and figure 3(a) and figure 3(b) for the interaction effect of labor market status and entrepreneurial self-confidence (case 3). It can be seen in case 1 that the interaction effect for all observations in the sample is negative

but not significant. The same holds for case 2. Here the interaction effect is positive but non-significant. However, in case 3 we find that interaction effect is positive and values range from 0.293 to 0.429 (Figure 3a) with corresponding z-values between 1.34 and 2.04 (Figure 3b). By looking at the z-values in figure 3(b) we find that the z-value is significant at the 5% level for the overwhelming majority of observations. Now, if we compare model 1 in Table 2 without the interaction terms and the one with the interaction term (Model 4) we find that interaction effect of positive labor market status and entrepreneurial self-confidence significantly influences the exploitation of innovative opportunities. This effectively means that although human capital inputs and human capital output in the form of entrepreneurial self-confidence are significant factors in influencing the exploitation of innovative opportunities, the different components of human capital inputs interact in different ways with entrepreneurial self-confidence to influence the choice of innovative opportunities.

----- Insert Figures 1a-3b about here -----

5. Discussion and Implications

The dominant discourse in entrepreneurship revolves around opportunities. This discourse would suggest that *ceteris paribus* individuals with high human capital choose to exploit opportunities when they identify opportunities. However, the exploitation of opportunities through business ownership (new venture creation) requires understanding of the competitive forces that the new venture is likely to face in the market place. Moreover, opportunities are valuable when its exploitation provides competitive advantages to the new venture at entry. Otherwise,

opportunities are better exploited through corporate entrepreneurship. In this paper we suggested that the choice of innovative opportunities provides competitive advantages to the new venture at entry. We also suggested that when individuals with high human capital exploit opportunities they are more likely to choose innovative opportunities because they are more likely to think strategically and hence take into consideration the competitive issues involved in opportunity exploitation. Our results suggest that formal education as the source of human capital have a significantly positive effect on the exploitation of innovative opportunities, while labor market experience has a negative effect. The latter result is surprising because, although similar to Koellinger (2008), those in active labor market are more likely to have access to knowledge about customers and markets that are possible sources of innovative opportunities (Shane, 2000). One explanation for this result could be that individuals in active labor market lack entrepreneurial self-confidence to undertake not just the implicit risk of entrepreneurship, but also the additional risk that comes with the exploitation of innovative opportunities. The result of the interaction effect of labor market status and entrepreneurial self-confidence support this explanation. Another important result of our study is that human capital input in the form of entrepreneurship training has no effect on the choice of innovative opportunities. Similarly, entrepreneurial self-confidence has no effect on the choice of innovative opportunities by those with high education. The main implications of our results are: not all aspects of individuals' human capital inputs are important for influencing the spawning of innovative opportunities in an economy. Secondly, general human capital inputs (high formal education) has a more significant effect on the exploitation of innovative opportunities rather than specific human capital inputs like entrepreneurship training. Thirdly, human capital outputs in the form of entrepreneurial confidence which has been found to have a dominant effect in influencing the

quantity of entrepreneurship (Arenius and Minniti, 2005; Bayon *et al.*, 2015) is not so significant factor in influencing the quality of entrepreneurship in an economy. Fourthly, human capital input like labor market status by itself does not influence the exploitation of innovative opportunities unless a positive labor market status (having a job) is accompanied by entrepreneurial self-confidence. However, the positive relationship between labor market status and entrepreneurial self-confidence on the exploitation of innovative opportunities must be treated with caution. It could be that individuals in active labor market take unnecessary risk, i.e. more risks than they can handle because of entrepreneurial self-confidence (Hyytinen *et al.*, 2015). Moreover, the perceived opportunity might not be an opportunity at all. At the same time from a macro-perspective the evidence that entrepreneurial self-confidence lead individuals active in the labor market to exploit innovative opportunities is encouraging. It has important policy implications.

5.1 Policy Implications

From a policy point of view exploitation of innovative opportunities is good for the economy as it could be an indicator of the quality of entrepreneurship in an economy (Shane, 2009). From a macro perspective, the main policy implication of our study is that it is possible to assess the quality of entrepreneurship in an economy through individuals' human capital and the proportion of innovative opportunities in the economy. Assuming that exploitation of innovative opportunities lead to successful new venture, economies with higher rates of entrepreneurship based on innovative opportunities are more likely to prosper (Anokhin and Wincent, 2012; Gans *et al.*, 2000). However, it should also be noted that it might not be possible to discern, especially

at the earliest stages of entrepreneurship if exploitation of innovative opportunities would also lead to new venture success. Therefore, policy support would still be necessary for individuals who exploit innovative opportunities. Policy support in such cases could require unconventional mechanisms. For instance, if the exploitation of innovative opportunity involves significant upfront investment in the creation of new products/service (Research and Development), then financial support in the spirit of high risk venture capital rather than conventional commercial finance would be necessary. Therefore, in an economy if more individuals are in the process of exploiting innovative opportunities it becomes necessary for industrial or entrepreneurship policy to support the development of an ecosystem of providers who are better able to assess and handle the risks and uncertainty of entrepreneurship based on innovative opportunities.

5.2 Management Implications

On the question on whether individuals should pursue innovative or imitative opportunities, we suggest that the answer depends on the careful analysis of competitive advantages that the type of the opportunity can provide to the new venture at entry. We suggest that in the exploitation of innovative opportunities individuals should combine strategic thinking with tactical actions. In practical terms, this could mean continued moonlighting or opportunity exploitation while keeping their job before making a full commitment to new venture creation and management (Folta *et al.*, 201; Raffiee and Feng, 2014). This strategy can reduce the personal risk of venturing. Such a strategy is also important because individuals might be biased in assessing their entrepreneurial skills or their ability to exploit an innovative opportunity. Under such

circumstances, it is necessary to seek out role models or mentors who can validate both the innovativeness of the opportunity as well as entrepreneurial abilities of the aspiring entrepreneur.

6. Conclusion, Limitation, future studies

This study is intended to explore the individual-opportunity nexus in entrepreneurship by focusing on the exploitation phase of the entrepreneurial process. Our paper examines the role of human capital inputs in the form of education, labor market experience and entrepreneurship training and human capital output in the form of entrepreneurial self-confidence in influencing the choice of innovative opportunities. We suggest that individuals with high human capital input act strategic when they decide to pursue entrepreneurship through new venture creation. Hence they exploit innovative opportunities that provide competitive advantages to the new venture in the market place. Our results indicate the importance of both human capital inputs and human capital output in the exploitation of innovative opportunities. The main contribution of our study is to empirically show the interaction of human capital input and human capital output in influencing the exploitation of innovative opportunities. Considering that our study is based on population level data, our results provide a way for policy makers to assess the quality of entrepreneurial initiatives in an economy. We suggest several ways how such information can be used to promoting quality entrepreneurship in an economy.

The main limitation of our study is the use of single item measures as indicators of innovative opportunity and human capital output (entrepreneurial self-confidence). Moreover, although we have taken account of specific human capital inputs like entrepreneurship training; future studies

can refine the human capital indicators to provide greater insights into the relationship between human capital inputs and outputs in the opportunity exploitation decision. In addition our study is focused on individuals who have taken their first (tentative) steps towards opportunity exploitation. Many of such initiatives may not be converted into operating new ventures. Therefore, future studies can explore the role of the type of opportunity in influencing the successful emergence of new ventures.

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Table 1: Descriptive statistics

	Innovative opportunities	Non-Innovative Opportunities	Overall	Chi-square
Age	36.521 (9.848)	39.808 (10.675)	38.2 (10.3885)	6.11**
Gender	0.565 (0.497)	0.667 (0.473)	0.617 0.48	2.547
High Education	0.513 (0.502)	0.333 (0.473)	0.421 (0.494)	7.746***
Entrepreneurship Training	0.591 (0.493)	0.466 (0.500)	0.527 (0.500)	3.645*
Labor market status (1 for employed)	0.495 (0.502)	0.541 (0.500)	0.519 (0.500)	0.496
Entrepreneurial Confidence	0.921 (0.269)	0.891 (0.312)	0.906 (0.291)	0.623
Observations	115	120	235	

Note: standard deviation is presented in brackets

Table 2: Logistic Regression of Innovative versus Imitative entrepreneurial opportunities

	I	II	III	IV	V
VARIABLES	Model 1	Model 2	Model 3	Model 3	Model 4
Age	-0.032** (0.013)	-0.032** (0.013)	-0.032** (0.013)	-0.032** (0.013)	-0.032** (0.014)
Gender	-0.317 (0.290)	-0.317 (0.290)	-0.311 (0.289)	-0.311 (0.289)	-0.363 (0.294)
High Education (HE)	0.720** (0.295)	0.985 (1.060)	0.709** (0.296)	0.709** (0.296)	0.727** (0.295)
Entrepreneurship Training (ES)	0.474* (0.274)	0.483* (0.276)	0.148 (0.872)	0.148 (0.872)	0.423 (0.276)
Labor Market Status (LMS) (1 for positive)	-0.281 (0.295)	-0.284 (0.295)	-0.290 (0.296)	-0.290 (0.296)	-1.991* (1.031)
Entrepreneurial Confidence (EC)	0.242 (0.468)	0.299 (0.531)	0.072 (0.583)	0.072 (0.583)	-0.947 (0.883)
TE × EC		-0.282 (1.094)			
ES × EC				0.358 (0.921)	
LMS × EC					1.867*
Constant	0.759 (0.706)	0.714 (0.736)	0.914 (0.766)	0.914 (0.766)	1.907 (0.981)
Model Chi ² (d.f)	17.11***	17.18**	17.09**	17.09**	20.62***
Pseudo R ²	0.0604	0.060	0.060	0.060	0.0705
Log Likelihood	-153.0	-152.967	-152.923	-152.923	-151.4
Count R ²	63.83%	62.55%	61.07%	61.07%	64.26%
Mean VIF	1.07	5.81	2.93	2.93	2.22
Observations	235	235	235	235	235

Note: robust standard errors are in brackets

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

Table 3: Logistic Regression of Innovative versus Imitative entrepreneurial opportunities (Average Marginal Effect)^a

	I	II	III	IV	V
VARIABLES	Model 1	Model 2	Model 3	Model 3	Model 4
Age	-0.008** (0.003)	-0.008** (.003)	-0.008** (0.003)	-0.008** (0.003)	-0.007** (0.003)
Gender	-0.079 (0.072)	-0.079 (0.072)	-0.077 (0.071)	-0.077 (0.071)	-0.083 (0.067)
High Education (TE)	0.177** (0.071)	0.241 (0.249)	0.175** (0.071)	0.175** (0.071)	0.169** (0.067)
Entrepreneurship Training (ES)	0.117* (0.067)	0.120* (0.068)	0.037 (0.217)	0.037 (0.217)	0.097 (0.063)
Labor Market Status (LMS) (1 for positive)	-0.070 (0.067)	-0.070 (0.073)	-0.072 (0.073)	-0.072 (0.073)	-0.374** (0.179)
Entrepreneurial Confidence (EC)	0.060 (0.115)	0.074 (0.129)	0.018 (0.145)	0.018 (0.145)	-0.202 (0.197)
TE × EC		-0.070 (0.271)			
ES × EC				0.089 (0.228)	
LMS × EC					0.402* (0.188)

Note (a): The marginal effect shown in the table is the change in the probability of dependent variable due to a discrete change from zero to one of the independent variable(s), keeping all the other variables constant at their means.

Figure 1a: Interaction effect of high education and entrepreneurial confidence

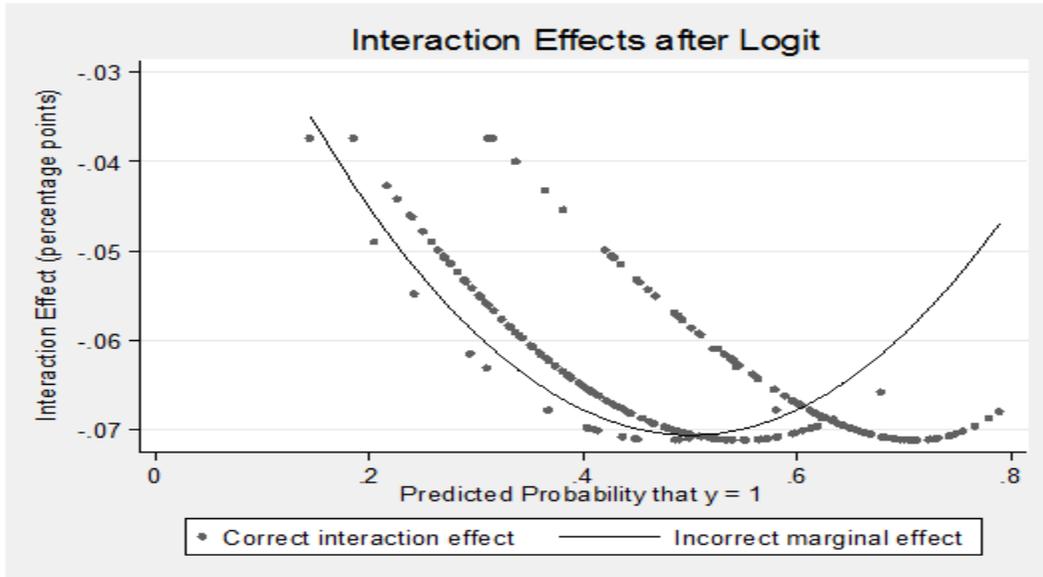


Figure 1b: Z value of the interaction effect

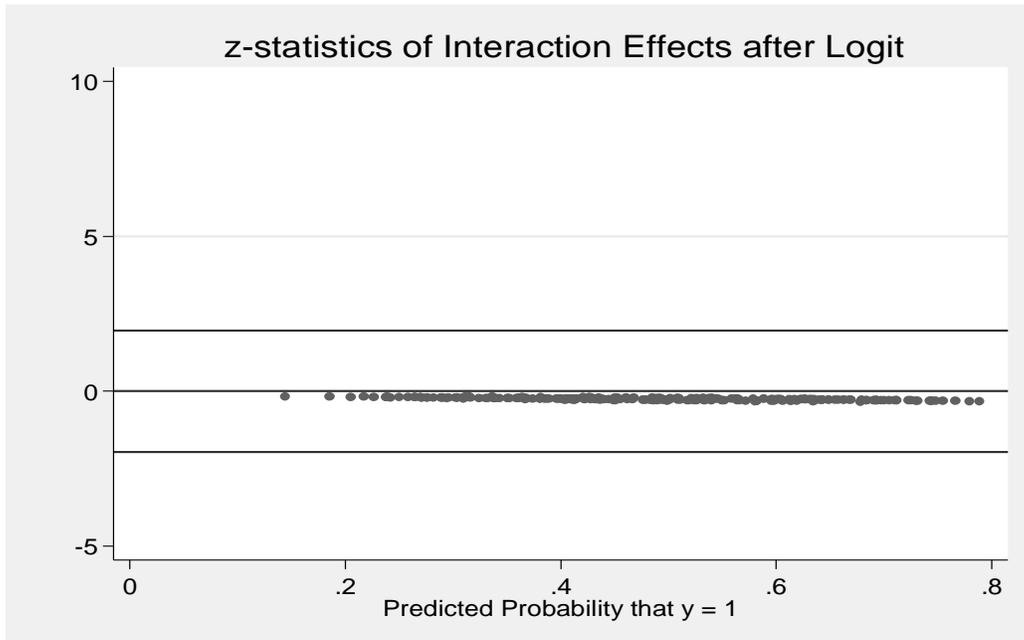


Figure 2a: Interaction effect of entrepreneurship training and entrepreneurial confidence

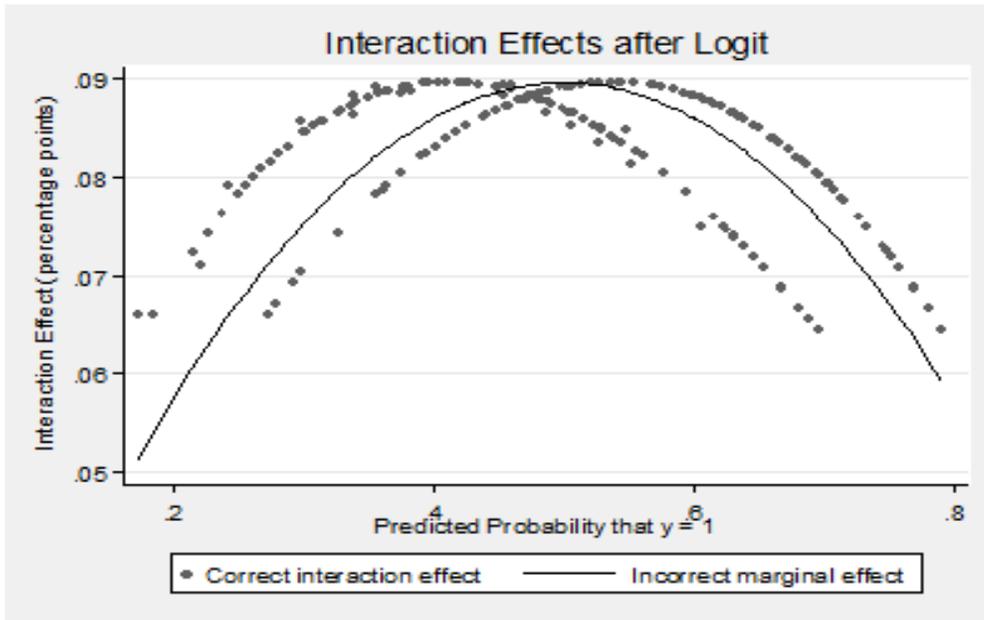


Figure 2b: Z value of the interaction effect

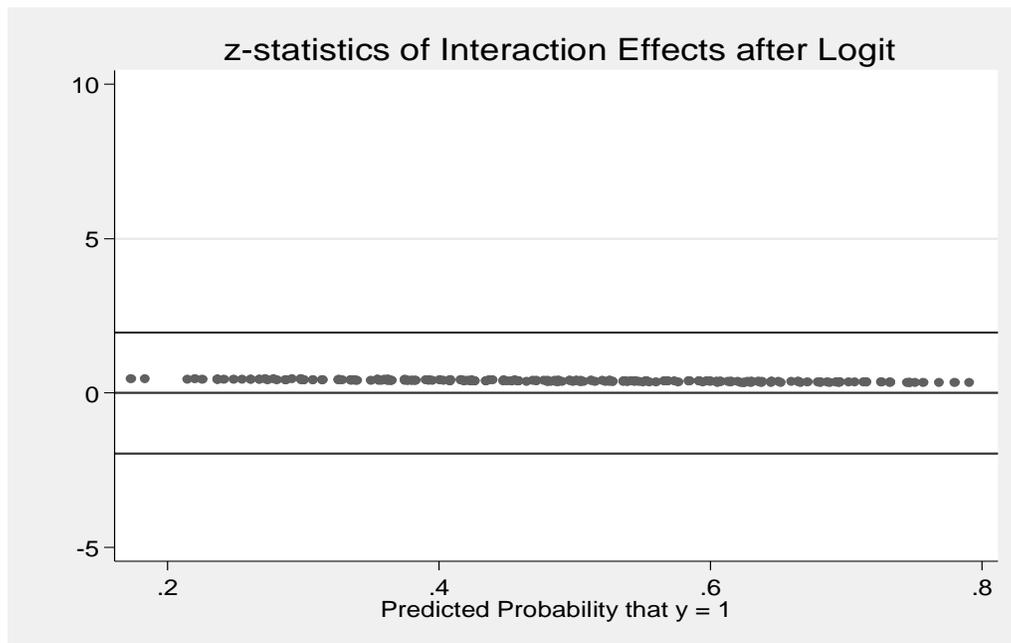


Figure 3a: Interaction effect of labour market status and entrepreneurial confidence

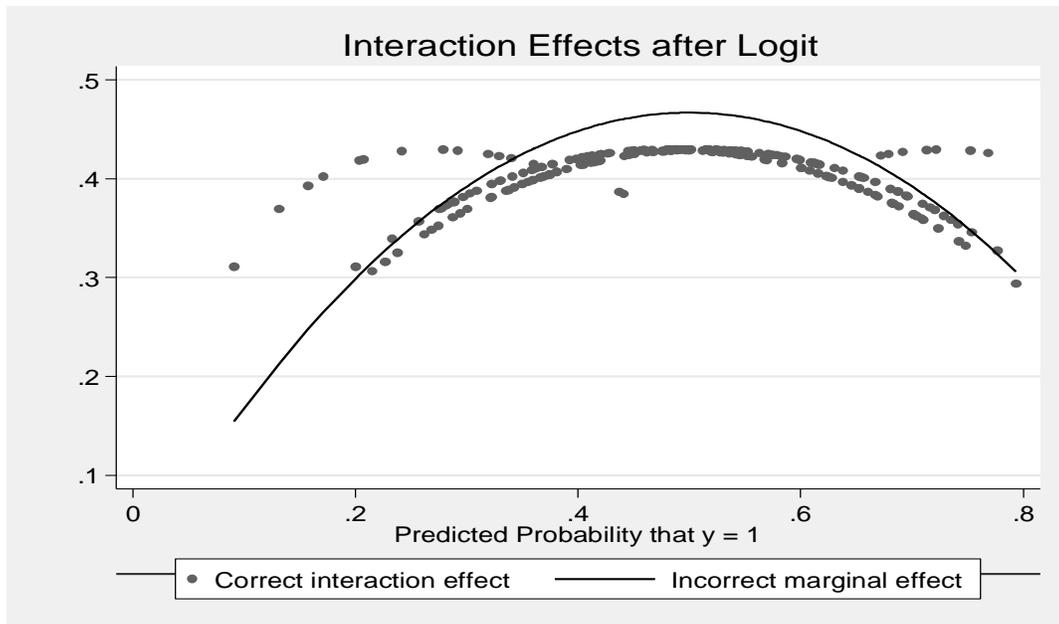


Figure 3b: Z value of the interaction effect

