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Entrepreneurial Cognitions and Women Entrepreneurship: The Moderating Role of Culture

Abstract (146 words)

The purpose of this paper is to study how the effect of entrepreneurial cognition on women opportunity-based entrepreneurship entry (WOEE) is moderated by informal institutions. We employed data collected from the Global Entrepreneurship Monitor (GEM), Hofstede cultural dimensions, Index of Economic Freedom (IEF) and World Bank merged to build a data set of 435,351 observations from 89 countries for the period of 2010-2017. Using multi-level methodology, we observed that the positive effect of entrepreneurial cognition on WOEE is moderated by cultural dimensions. Our results uncovered that country-level individualism and intensify the positive relationship between individual entrepreneurial cognition and women opportunity-based entrepreneurs while the country-level power distance and uncertainty avoidance and masculinity weaken the positive relation between female entrepreneurial cognition and the likelihood of women entering opportunity-based entrepreneurial activities. We discussed the implication of findings in theory and policy for encouraging women entry into opportunity-based entrepreneurship in respect to national culture.

Keywords: Female Entrepreneurs, Women Opportunity-based Entrepreneurship Entry, Entrepreneurial cognition, Institutions, Culture, Multi-level, Cross countries

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Introduction

Entrepreneurship research has dragged the attention of many scholars and policy makers because of its significant effect on economic growth (Minniti 2008) and national prosperity (Lee and Peterson 2000). Over the years, a great deal of research has been conducted on both individual and national level factors shaping entrepreneurial activity in different countries; however, in many cases, the study is not gender specific while female entrepreneurs face different challenges and barriers (Mayer, 2018). Knowing the importance of women's entrepreneurship for employment and contributing to the social and economic growth of their societies (Aidis et al. 2007), yet the interaction of national factors on women's entrepreneurs is understudied (Bullough, 2022). Urbano et al. (2019) in their systematic literature review of twenty-five years research on entrepreneurship have also pointed to women's entrepreneurship as a research gap and calls for more research about female entrepreneurs.

The results of cross-country female studies (e.g. Minniti & Arenius, 2003; Kelly et al, 2010) show a significant difference in the national rate of women's entrepreneurship across countries. Minniti and Arenius (2003) revealed that on average men are 50% more likely to start a new venture than women do. Those few entrepreneurship studies that investigated gender roles, usually explored the effect of gender as an individual-level factor ignoring the effect of country-level factors on female entrepreneurs and their cognition in respect to entering into a new business (e.g. Estrin and Mickiewicz 2011). Therefore, it is necessary to investigate the influence of country institutional factors particularly on female entrepreneurial cognitions.

Entrepreneurial cognitions are the knowledge structures that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth (Mitchell et al., 2002, P. 97). Mitchell et al., (2000) suggested that entrepreneurial cognition plays an intermediary role between cultural values and venture creation decisions. In their study on seven countries, they found that individualism and power distance are associated with venture creation. In another study. Lim et al., (2010) suggested institutions such as legal and financial systems affect the relation of entrepreneurial cognitions and venture creation decisions.

Reviewing the entrepreneurship literature regardless of gender specific reveals that one line of entrepreneurship research employs social cognitive theory (Bandura, 1986) to elaborate the effect of individual entrepreneurs' traits on their decision to create a new business. The second line of studies is developed based on institutional theory (North 1990) to explain the effect of country factors -formal and informal institutions- on entrepreneurs' decisions. Recently, the third line of research suggests integrating these two theories for better understanding of how country-level institutional context interacts with individual-level socio-cognitive traits to promote entrepreneurship (e.g., Autio et al., 2013; Wennberg et al., 2013; Boudreaux et al., 2019)

Another identified gap in the prior entrepreneurship research is that single-level studies may suffer from either ecological or individualistic fallacies, because they mixed a country level phenomenon (macro level) with a fundamentally individual-level behaviour (Autio et al., 2013; Wennberg et al., 2013). To avoid this problem, a multilevel analysis will be conducted to investigate the relation.

The existing literature that has employed multilevel analysis, has focused on the role of either formal (Boudreaux et al., 2019) or informal institutions (Wennberg et al., 2013). However, multiple institutions should be examined simultaneously to understand the true effect of the environment (Holmes et al., 2013). Integrating formal and informal institutions analysis is one of the most important calls in the literature (e.g. Aidis et al., 2008; Li and Zahra, 2012; Holmes et al., 2013; Fuentelsaz et al., 2019).

Applying this knowledge in women's entrepreneurship, few studies in women's entrepreneurship have focused on the effects of institutions. Pathak and others (2013) emphasises that women's entrepreneurship is not isolated from the country's context and embedded in the country's cultural context. The lack of an integrated model to investigate the direct effect and interactions of the institutional factors on cognitions of female entrepreneurs is highlighted in the literature (Noguera et al. 2015; Santos et al. 2016). I address this gap in my research by integrating institutional theory and socio-cognitive theory to investigate this relation (Wennberg et al. 2013; Autio et al. 2013; Boudreaux et al. 2019)

The purpose of this research is to address one of the understudied phenomena in women entrepreneurship by investigating the moderating effect of informal institutions on women's cognitive traits to enter entrepreneurial activities in different countries, using institutional factors as the theoretical framework. In other words, this study examines how national cultural attributes facilitate or hinder women from starting a new business.

One important classification derived from the GEM survey is distinguishing between necessity and opportunity entrepreneurship that has received attention in the literature (Reynolds et al., 2005). Baumol (1990) suggested that not all types of entrepreneurial activities are related to growth and economic development. The quality entrepreneurial activities are income-driven and not necessity-driven due to no other job opportunity (Fuentelsaz et al., 2019). Therefore, opportunity entrepreneurship is defined by GEM as pursuing good business opportunities, expecting higher income (Aparicio et al., 2016) new job creation (Acs, 2006) and has a strong correlation with high growth firms (Wennekers et al., 2005; Hechavarria and Reynolds, 2009). This paper defines opportunity-based entrepreneurial behaviour as attempting or creating new ventures driven by opportunity. Similar definition has been used in literature applying GEM data (e.g. Boudreaux et al., 2019).

Despite the growing rate of new business formation by women in both developed and developing countries (Minniti & Naude, 2010), women entrepreneurs are in a minority. Given the

significance of the topic and scarcity of women entrepreneurship studies across countries (Urbano et al. 2019), this research is designed to fill up this gap by developing a multilevel model (Acs et al., 2014) built upon integrating institutions and cognitive theories (Boudrex et al., 2019). This study investigates both individual and country level factors' effects and interactions on women opportunity-based entrepreneurship (Wennberg et al., 2019). The uniqueness of this paper is to explore the moderating effect of informal institutions on women opportunity-based entrepreneurship through a multilevel analysis. This investigation contributes to literature not only by doing a joint analysis of formal and informal institutions (Hayton et al., 2002) on women entrepreneurship but also considering the interaction effects of culture dimensions.

We merge data from Global Entrepreneurship Monitor (GEM), Hofstede Cultural Dimensions, the Index of Economic Freedom (IEF) and World Bank to build the research sample including 435,351 observations from 89 countries for the period of 2010 to 2017. We apply mixed-effect logistic regression, a multilevel analysis in Stata to test our model. The results reveal that entrepreneurial cognition that measures the entrepreneur readiness at individual-level has a positive effect on women opportunity-based entrepreneurship. The interaction analysis shows that national culture moderates the positive effect of entrepreneur readiness. Individualism, power distance, uncertainty and masculinity deteriorate the positive effect of entrepreneurship readiness on women opportunity-based entrepreneurship. Our research contributes to literature by providing support for the moderating effect of national culture on female entrepreneurial cognitions

The next section is a review of existing literature, followed by underpinned theories structure this research and hypotheses development. Thereafter, the methodology and data collection will be discussed and followed by results and discussion. Finally, in the conclusion section, we discuss how findings are associated with literature or contribute to theory and practice. It also highlights limitations and suggestions for future research.

Theoretical framework and hypotheses development

This research has built upon integrating two theories, Institutional Theory and Socio Cognitive Theory, to create a multilevel model. This model aims to study the direct and moderating effect of institutions on women's cognitive traits to enter entrepreneurial activities across countries. Therefore, it answers the research questions and responds to multiple calls (e.g. Wennberg et al., 2013; Boudreaux et al., 2019) in literature for multilevel analysis.

Socio Cognitive Theory (SCT) introduced by Bandura (1986a) examines individuals' behaviour and motivation within a given situation (Mitchell et al., 2002). Individuals perceive their environment through cognitive processes and make decisions on how to behave (Bandura, 1989). In the context of entrepreneurship external influences such as norms, culture and regulations affect individuals to create a perception on their skills, business opportunities, and risk; hence,

motivate or deter them to allocate their resources to entrepreneurial activities (Rauch & Frese, 2007; Boudreaux et al., 2019). This theory explains the effect of micro-level determination of entrepreneurship by focusing on Entrepreneurial cognitions.

The findings of the systematic literature review (SLR) conducted by Urbano et al. (2019) in their systematic literature review highlights that “institutional factors shape entrepreneurial activities”. Empirical evidence demonstrates important cross-country variation in entrepreneurship (Autio et al., 2013; Fuentelsaz et al., 2019). To investigate reasons for variation in entrepreneurship among countries, scholars have studied the institutional factors that may encourage or discourage entrepreneurial activities (e.g., Aidis et al., 2008; Urbano and Alvarez, 2014; Aparicio et al., 2016; Fuentelsaz et al., 2019).

North (1990) categorises institutions to formal and informal institutions. Formal institutions represent structures of codified and explicit rules and standards providing authoritative behavioural instructions that shape interaction among members of a society (North, 1990; Scott, 2005; Holmes et al., 2013).

There are three types of formal institutions - political, regulatory and economic institutions- usually linked with government activities. A vast majority of research findings demonstrate that a favourable regulatory, normative, and cultural-cognitive environment increases the probability of being an entrepreneur (e.g., Urbano and Alvarez, 2014; Aidis et al., 2008). Given the significant influence of institutional theory on entrepreneurship, this subject is reviewed more thoroughly.

Government size or government spending (expenditure) is used as one of the measures of political institutions. Although in theory greater government spending may be associated with better entrepreneurial conditions, stronger institutions, the empirical results (e.g. Parker 2004; Aidis 2010) indicated a negative relation. Parker (2004) discussed that a larger state may discharge entrepreneurship by increasing tax on business income and providing higher welfare support for employees.

Property Rights is a regulative institution that enforces laws to create a legal protection of private property rights. Literature evidence (e.g., Fuentelsaz et al., 2015; Chowdhury et al., 2015) unveils that people of countries with higher property rights protections are encouraged to start a new venture and create more wealth.

Financial freedom is a measure of economic institutions, which are rules and standards that shape the financial resources and investment market of societies (Holmes et al., 2013). Heritage foundation defines Financial Freedom the extent to which the government regulates the financial sector and influences the allocation of credit, country's monetary and fiscal policies (Lucas, 2003; Holmes et al., 2013).

Formal institutions are embedded within a broader context represented by informal institutions, which operate at a deeper level than formal ones (North, 1990; Holmes et al., 2013; Autio et al., 2013; Fuentelsaz et al., 2019). So, understanding formal institutions requires understanding the rationale behind the solutions (Scott, 2005), and this rationale is symbolised in the society's informal institutions (North, 1990; Holmes et al., 2013).

Informal institutions, which reflect a socially constructed reality, shape cohesion, and coordination among individuals in a society (Scott, 2005). They are durable systems of shared meanings and collective understandings that are not codified into written rules and standards (Scott, 2005; Holmes et al., 2013). Culture, values, and norms of society have been recognized as informal institutions. Particularly, Culture is an important reflection of a country's informal institutions (North, 1990) that symbolises society's norms and values (Holmes et al., 2013). In other words, culture is the "software of the mind" (Hofstede et al., 2005) and formal institutions are "products of the dominant cultural value systems" (Hofstede, 2001, P.34).

Holmes et al. (2013) propose culture as the country's informal institutions that shape and develop the countries' formal institutions. Thus, the literature indicates that a driving force in the development and maintenance of formal institutions is the society's culture (Holmes et al., 2013).

The theory of cultural dimensions developed by Hofstede (1980) has been frequently applied by scholars to study informal institutions in the context of entrepreneurship. Individualism versus collectivism and uncertainty avoidance are the two cultural dimensions have been widely used in the literature (e.g., Mueller and Thomas, 2001; Li and Zahra, 2012; Autio et al., 2013; Wennberg et al., 2013; Fuentelsaz et al., 2019).

Women Opportunity-based Entrepreneurship (WOEE)

There is no widely accepted definition of entrepreneurship in the literature (Thurik and Wennekers, 2004; Reynolds et al., 2005). While some use a comprehensive description and define entrepreneurship as all types of creating new businesses (e.g., Gartner, 1985), measured by business registration, others consider a more specific definition and see entrepreneurship a very specific occupation such as creation of a business to pursue a business opportunity emphasised by Kirzner, (1979) and applied in prior studies such as (e.g., Reynolds 2005; add Bosma, Autio, Boudreaux et al., 2019). Although there is no single accepted definition of entrepreneurship in the research community, many researchers relied on Global Entrepreneurship Monitor (GEM) for entrepreneurship definition. I elaborate GEM definition in this section because the GEM project has played an important role in facilitating cross-national analysis in entrepreneurship (Bosma, 2013), and it has been selected as the main source of data for cross-country entrepreneurship studies.

GEM defines entrepreneurship as “Any attempt at new business or new venture creation, such as self-employment, a new business organisation, or the expansion of an existing business, by an individual, a team of individuals, or an established business.” (Reynolds et al., 2005, p. 223). Gem classifies this broad definition to necessity and opportunity entrepreneurship (Bosma, 2013; Reynolds et al., 2005).

Opportunity-based entrepreneurs can recognize attractive business opportunities for higher income that can result in more new jobs and economic growth (Hechavarria and Reynolds, 2009; Acs, 2006; Aparicio et al., 2016). Therefore, entrepreneurs pursue a business opportunity to create higher income. On the other hand, in necessity entrepreneurship, individuals start new businesses due to lack of employment opportunity (Autio, 2005). Fuentelsaz and others (2019) stated that the quality entrepreneurial activities are income-driven and not necessity-driven. In another research, Acs and Verga (2005) proposed that opportunity-based entrepreneurship has a positive effect on economic development whereas necessity entrepreneurship has no effect (Raza et al., 2020). In this paper, we focus on women opportunity-based entrepreneurial entry by looking at female entrepreneurs who plan to start a new business or have created nascent and young firms because of perceived business opportunities. Entrepreneurial Cognition and Female Entrepreneurs

Entrepreneurial cognitions consist of knowledge, skills, attitudes and norms that shape entrepreneur judgments of business opportunities and uncertainty involved in venture creation, and growth (Mitchell et al., 2000; Mitchell et al., 2002;). In this paper, we follow Aragon-Mendoza et al., (2016) to measure entrepreneurial cognition by aggregation of self-efficacy, perceived opportunity and fear of failure. A similar approach was employed by Raza et al., 2020.

Bandura (1986b) describes self-efficacy as people’s beliefs in their skills and capabilities that control people’s motivation to achieve their goals. Literature clarifies that having skills is different from having self-belief in one’s skills and actually using them in uncertain circumstances (Boudreaux, Nikolaev, & Klein, 2019). Thus, self-efficacy beliefs are linked to people’s intention to engage in entrepreneurship (Wilson et al., 2007; Sequeira, Mueller, & McGee, 2007) and literature provides evidence that higher perceived self-efficacy increases the likelihood of entering an entrepreneurial activity (Drnovsek et al., 2010).

Consistent with the SCT, people who have a clear vision of the future are motivated to create goals and make an effort to achieve them which means they are future-oriented (Wood and Bandura, 1989). In the context of entrepreneurship, many businesses start as a result of perceived opportunities (Boudreaux et al., 2019). This implies that entrepreneurs’ perception of recognizing business opportunities motivates them to create new ventures. Existing literature provides empirical evidence that perception of business opportunities increases the likelihood of entering an opportunity-based entrepreneurial activity (e.g., Boudreaux et al., 2019; Schillo et al., 2016). An increasing number of scholars agree that opportunity recognition characterises the fundamental entrepreneurial behaviour (Eckhardt & Shane, 2003; Langowitz and Minniti, 2007).

Moreover, alertness to perceived business opportunity encourages entrepreneurs to get involved in entrepreneurial activities (Arenius and Minniti, 2005; Boudreaux et al., 2019).

Literature suggests that although perceived self-efficacy and business opportunities are important to encourage entrepreneurs, it is not sufficient for entering an entrepreneurial activity due to uncertainty and risk to achieve the expected outcome. The entrepreneur's willingness to bear risk is a critical trait in one's decision to create new business while uncertainty is involved in creating a new business (Boudreaux, Nikolaev, & Klein, 2019). Consequently, uncertainty creates fear of failure and hinders the entrepreneurial activities (Wennberg et al., 2013; Schillo et al., 2016; Boudreaux et al., 2019; Raza et al., 2019). High likelihood of failure in entrepreneurship creates fear of failure; however, this fear will be particularly intensified when people tie an entrepreneurship failure with its entrepreneur failure (Boudreaux et al., 2019).

In the context of women entrepreneurship, studies such as Mueller and Dato-On (2008) and research conducted by Wilson and others (2007) evidenced that women have lower self-efficacy and lower entrepreneurial intentions than men have. They revealed that women compared to men tend to perceive themselves and the environment less favourable for entrepreneurial activities. The perception of low self-efficacy may deter women in recognizing a business opportunity to start a new business. Women also report a lower propensity toward risk than men (Johnson & Powell, 1994). Langowitz and Minniti (2007) affirmed the literature evidence about the female entrepreneurs' attitude toward risk and higher fear of failure. Overall, fear of failure is an important determinant of involvement in new business creation for both men and women. Therefore, it is hypothesised that:

H1: There is a positive relation between entrepreneurial cognition and the likelihood of WOEE

Cultural Dimensions' Effects on Entrepreneurial Cognition

Entrepreneurship is fundamentally individual-level behaviour (Autio et al., 2013); however, individuals with the similar entrepreneurial cognition behave differently in engaging entrepreneurial activities in various societies (Boudreaux et al., 2019). The literature suggests that the effect of entrepreneurial cognition is contingent on the institutional environment. Similar entrepreneurial attributes are more likely to lead to new ventures in countries with higher quality institutions that support entrepreneurship (Boudreaux et al., 2019; Wennberg et al., 2013).

In this paper, we focus on the moderating effect of culture. Cultural norms and practices are known to shape individuals' entrepreneurial behaviours (Bowen and De Clercq, 2008; Wennberg et al., 2013). Various dimensions of culture influence the entrepreneurs' intention in creating business ventures. In this paper we test four Hofstede cultural dimensions interactions with entrepreneurial cognition for female entrepreneurs.

Hofstede cultural dimensions developed by Geert Hofstede and his team to measure the national culture preference. The initial model included four dimensions: the power distance (PDI), individualism vs. collectivism (IDV), Masculinity versus femininity (MAS), uncertainty avoidance index (UAI) (Hofstede 1998).

In the Hofstede theory, Individualism versus collectivism (IDV) is defined as the extent to which individuals in a society have ties with groups (Hofstede 2001). Individualistic societies emphasise the "I" versus the "we". Collectivism is the degree to which group loyalty is preferred over the individual benefits in societies (Hofstede 2001).

Previous studies show a mixed result about the influence of individualism/collectivism on entrepreneur's behaviour. Despite the mixed empirical evidence, most studies (e.g. Mueller and Thomas, 2000; Hayton et al., 2002) found support for the positive effect of individualism on entrepreneurship; while, other studies (e.g. De Clercq et al., 2010; Wennberg et al., 2013) challenged this relation.

In respect to women entrepreneurship, Bullough and others (2017) found that autonomy to pursue individual goals (in-group individualism), combined with support from the in-group collectivism encourages women to enter entrepreneurial activities businesses, especially in cultures with extreme levels of institutional collectivism.

H2a: The positive relation between individual-level entrepreneurial cognition and the likelihood of WOEE is moderated by country-level individualism

Hofstede describes Power Distance (PDI) the degree to which authority is accepted and followed. Governments or structured political systems of countries define the nature of political process (Hillman & Keim, 1995) by establishing rules and standards to distribute and exercise power (Holmes et al., 2013). The distribution of power is considered a spectrum ranging from autocratic institutions that concentrate power to democratic institutions that distribute power among citizens/organisations and encourage them to participate (Ross, 2001; Holmes et al., 2013).

Therefore the next hypothesis formulated as:

H2b: The positive relation between individual-level entrepreneurial cognition and the likelihood of WOEE is moderated by country-level power distance

Uncertainty Avoidance (UAI)

Hofstede (1991) describes the UAI to what extent nations avoid the unknown. Uncertainty avoidance is defined as "a society's tolerance for ambiguity". It refers to the extent to which people in society feel threatened in ambiguous situations and how they tolerate uncertainty (Wennberg et al., 2013) consistent with the theory of Hofstede. Entry into entrepreneurship is an

unknown path and society uncertainty avoidance practices increase the cost of entrepreneurial entry and demotivate entering entrepreneurship activities. Hayton et al., (2002) argued that countries with high uncertainty avoidance provide less supportive conditions for entrepreneurs. Therefore, individuals with a high level of entrepreneurial cognition are more likely to create a new venture in countries categorised by a low level of uncertainty avoidance. The fourth hypothesis is formulated as:

H2c: The positive relation between individual-level entrepreneurial cognition and the likelihood of WOEE is moderated by country-level uncertainty avoidance

Hofstede (1991) defines Masculinity the extent to which a society values achievement, assertiveness, and material rewards for success." in contrast to "a preference for cooperation, caring for others, and quality of life." which is defined as femininity (Hofstede 2015; Hofstede 1991).

Reynolds and others (2005) found that the positive relationship between masculinity and entrepreneurial activity is strongest in community cultures that are perceived to be supportive of entrepreneurship. In respect to women, Bullough and others (2022) in their literature review identified that women in a masculinity society are more likely to develop entrepreneurial activities.

H2d: The positive relation between individual-level entrepreneurial cognition and the likelihood of WOEE is moderated by country-level masculinity

Conceptual model

Insert Figure-1 here

Methodology

Sample and Data collection

Considering the research aims and objectives, to test the research hypotheses, a large scale of quantitative data of female entrepreneur decisions from multiple countries should be collected. The most appropriate tool is a structured survey responded to by a large number of adults in different countries.

The research data was obtained from Global Entrepreneurship Monitor (GEM) Adult Public Survey and Hofstede cultural dimensions, Index of Economic Freedom (IEF) and World Bank

merged to build a sample of 435,351 observations from 89 countries for the period of 2010 to 2017. We apply mixed-effect logistic regression, a multilevel analysis in Stata to test our model.

The GEM dataset has been widely used in research, affirming its suitability for the study of entrepreneurship (Alvarez et al., 2014; Wennberg et al., 2013; Freytag and Thurik, 2007; Bowen and De Clercq, 2008). This research uses a cross-sectional panel dataset grouped by country, combining the secondary data collected from the GEM and Hofstede datasets at the individual and country levels. To account for the hierarchical nature of our data a multi-level model will be used to avoid the so-called *ecological fallacy* (Autio et al., 2013).

Measures

Dependant variable

The dependent variable in this study is “Early-stage Opportunity-driven Entrepreneurship” for women, which was obtained from GEM’s adult population survey and labelled in this research as women opportunity-based entrepreneurship.

GEM explains the ventures’ life cycle phases as nascent, owing-managing a new firm (also mentioned as baby business managers), established, and discontinuation (Bosma, 2013). Nascent and baby business managers together are considered as total early-stage entrepreneurial activities. Nascent entrepreneurs are individuals who are actively involved in establishing a new firm, but who have not established their firm yet. The second phase of entrepreneurship identified as Baby business managers are owner-managers of a new entrepreneurial firm which is younger than 42 months old (Autio, 2005).

Opportunity motivated entrepreneurship in GEM APS is distinguished when entrepreneurs are involved in entrepreneurial activities to take advantage of a business opportunity and not because of no better choices for work. Therefore, in this study, the dependent variable includes female entrepreneurs, who attempt for or have created a venture in the last 42 months and are driven by opportunity instead of necessity. This variable is controlled by age to include only adult working age females between 18 to 64 years old.

The dependent variable defined as a binary variable taking value either zero or one. Mixed-effects logistic regression can be applied to model binary outcome variables when the predictor variables have both fixed and random effects. Similar method was used in previous research (e.g. Boudreaux et al., 2019) is an appropriate method for a multilevel model with binary variables.

Individual-level Predictor Variables

We measure entrepreneurial cognition by aggregating three cognitive variables from GEM APS that have been used in recent research (Raza et al., 2020; Aragon-Mendoza et al., 2016). Self-efficacy indicates whether the respondents perceive to have the knowledge, skills, and

experience required to create a venture. If the answer is yes it takes value one; otherwise, zero (1 = yes, 0 = no). The second component of cognition is perceived business opportunity. It is measured by respondents' replies to the following question: "In the next six months will there be good opportunities for entrepreneurial activities in the area where you live?" If the answer is yes, it takes value one; and otherwise, zero (1 = yes, 0 = no). Third, fear of failure is determined by the answer to the question "Will fear of failure prevent them from starting a new business". It is coded 1 if the respondent answers "No" and if the respondent does not recognize a business opportunity and gives a negative answer, it is coded 1 (1 = no, 0 = yes).

Country-level Predictor Variables

As mentioned, the research adopted institution theory in a multilevel model including both individual and country-level predictors. For measuring the formal institutions, we use the Index of economic freedom (IEF) dimensions developed by Heritage consisting of 12 dimensions. Property Rights Protection and Financial Freedom (employed by Holmes et al. 2013) and Government Spending (Aidid 2010) have been selected for this study. Each of these IEF variables is graded on a scale from 0 to 100.

We employed four national cultural indices developed by Hofstede's (1980) that frequently have been used in literature (e.g. George and Zahra 2002; Hayton et al. 2002; sahasranamam et al. 2021) as a framework for cross-cultural analysis.

These four indices include the power distance index (PDI), individualism vs. collectivism (IDV), masculinity versus femininity (MAS), uncertainty avoidance index (UAI) that score the country's cultural attributes in a scale of 0 to 100.

Power distance is the extent to which power is distributed unequally. It is related to the different solutions to the basic problem of human inequality; the higher score of power distance means higher centralization and hierarchy in society (Hofstede 2001; Hofstede 2011).

People in individualistic societies have loose ties and emphasise the "I" versus the "we". In contrast, collectivism describes a society in which individuals prefer group interests to their personal needs when a conflict happens (Hofstede 2001; Hofstede 2011).

Hofstede (1991) defines Masculinity the extent to which a society values achievement, assertiveness, and material rewards for success." in contrast to "a preference for cooperation, caring for others, and quality of life." which is defined as femininity (Hofstede 2015; Hofstede 1991).

Uncertainty avoidance is "the extent to which the members of a culture feel threatened by uncertain or unknown situations" (Hofstede 1991: 113). Individuals in such a society are anxious about the unpredictable nature of the future (Sahasranamam et al. 2021).

Control Variables

The three micro-level control variables age, Household income and education- have been derived from GEM's APS. Age is a continuous variable include respondents between 18 and 64 years old; education level defined as a five-step categorical scale: i) no education= 0, ii) some secondary education=1, iii) secondary education = 2, iv) post-secondary education = 3, and v) graduate school = 4. The GEM dataset categorised country household income into three groups; Lowest 33% tile which includes countries with lower average income taking value equal to 1; the second 33% tile is labelled average income with value 2 and upper average is categorised as 3.

Moreover, the study controls for two country-level variables captured from the World bank's Development Indicators. Literature supports the relation of country population and GDP current. GDP measures gross domestic production and it shows economic productivity. Another control variable adopted in the study is the country's total population that indicates a positive relation with entrepreneurship in literature (Autio et al. 2013).

The country-level control variable derived from the World Bank's Development Indicators dataset for 2010–2017 and all country level variables were z-standardized to create Z-scores value.

Because the variables are taken from different sources with various scales. Raw scores have different interpretations and merging them in one dataset for comparison and analysis will not be meaningful unless they are all standardised. Z-scores generate reference points (mean = 0 and standard deviation = 1) so comparisons will be meaningful, and they reduce the chances of multicollinearity (Pathak et al., 2015).

Insert the table 1-Variable Definition and Source here

Results

The research aims to determine first, the direct effect of entrepreneurial cognition on women's entrepreneurship; then the moderating effect of culture on women's cognitive traits to enter entrepreneurial activities in different countries.

Insert Table2- Characteristic of Variables

Table 2 indicates the characteristic of predictor variables which are the aggregate value for 89 countries in the sample. Table 3 demonstrates descriptive statistics for individual and country-level variables included in our models. It reports mean and standard deviation of selected variables in our research sample with 435,351 observations for 89 countries, including mean and standard deviation of interested variables. Table 3, the correlation matrix, shows correlation

between all variables. The highest correlation is between property right and financial freedom 0.73. In addition to correlation, we calculated variance inflation factor (VIF) score for all variables to check for multicollinearity, and found that the maximum VIF score was 3.54. Therefore, there is no concern for multicollinearity between variables in our model. Table 5 is the output of the mixed-effects logistic regression and shows the effect of variables on WOEE.

Insert Table 4- Correlation Matrix here

Insert Table 5- Results here

To analyse the hypotheses, we adopted a three steps strategy used in previous research (e.g. Autio et al., 2013). First, all individual-level and country-level control variables are included to find the proportion of variance of women opportunity-based entrepreneurship caused only by the individual-level and country-level controls. The second step, entrepreneurial cognition is added to estimate the influence of individual-level predictors on WOEE. Finally, in the third step, the interaction terms (moderating effect) of each cultural dimension are added. For interaction effect, four new variables are defined by multiplying the individual-level entrepreneurial cognition and four country-level informal institutions (cultural dimensions). The first two column in table 5 reports the odds ratio (OR), where $OR > 1$ indicates a positive and $OR < 1$ means a negative relationship between variables.

The model 2 of table 5, shows ($OR = 2.18$, $p < 0.000$) for entrepreneurial cognition. This means female individuals with higher entrepreneurial cognition (meaning higher perceived self-efficacy, higher perceived business opportunities and lower fear of failure) are on average, 2.18 times more likely to enter into opportunity-based entrepreneurship than are those who have low entrepreneurial cognition. Therefore, these findings support our individual-level hypothesis (H1) in that individuals' entrepreneurial cognition positively affects WOEE.

This study does not hypothesise the direct effect of formal and informal institutional factors on WOEE, however they are included as control variables since their effects have been discussed in literature. The odd ratios' outcomes indicate that the effect of property rights and financial freedom on WOEE is not statistically significant; while The direct effect between government spending and WOEE is negative and significant ($OR = 0.86$; $p < 0.000$). An odds ratio of 0.86 would imply that, for each additional government spending, the odds of WOEE condition decrease by 14% ($1 - 0.86 = 0.14$ or 14%). The direct effect of informal institutions on WOEE are highlighted by cultural dimensions. Country level power distance, individualism and uncertainty avoidance have a negative influence on WOEE in our sample and are statistically significant; where relation between masculinity and WOEE is not statistically significant.

H2a, H2b, H2c and H2d are formulated to hypothesise the moderating role of country-level informal institutions (national cultural dimensions) and the coefficient is reported. They are

associated with the interaction of country-level individualism on relation between entrepreneurial cognition and WOEE. This means female individuals with higher entrepreneurial cognition in a country with higher national level individualism are on average 14% more likely to enter into opportunity-based entrepreneurial activities compared to identical individuals in a lower country-level individualism. This result supports the proposed hypothesis (H2a) that country-level individualism moderate the relation between the individual-level entrepreneurial cognition and WOEE. It also demonstrated that national individualism culture positively encourages WOEE.

The findings for the effect of power distance on relation between entrepreneurial cognition and indicates that female individuals with higher entrepreneurial cognition in a country with higher level of power distance are on average 11% less likely to enter into opportunity-based entrepreneurial activities. Therefore, it supports the proposed hypothesis (H2b) that country-level power distance moderate the relation between the individual-level entrepreneurial cognition and WOEE. Furthermore, it indicates that the power distance deteriorates this relation.

With respect to uncertainty avoidance, the results confirmed H2c hypothesis proposing the moderating effect of the country-level uncertainty avoidance on relation between entrepreneurial cognition and WOEE. It shows that female individuals with higher entrepreneurial cognition in a country with higher level of power distance are less likely to enter into opportunity-based entrepreneurial activities. Although this difference is statistically significant, its low value, indicates a low proportion of WOEE country differences because of the uncertainty avoidance interaction.

The result reveals that country level masculinity decreases the positive relationship between entrepreneurial cognition and WOEE. Accordingly, the H2d hypothesis proposing the moderating effect of masculinity on the relationship between entrepreneurial cognition and WOEE is backed up by the research results.

Discussion and Conclusion

This study is among the few studies to jointly analyse the moderating effect of national cultural attributes on relation between individual-level female entrepreneurial cognitions and women opportunity-based entrepreneurship through a multilevel analysis. Previous research (e.g. Wennberge et al., 2013; Raza et al., 2020) point out the moderating effect of institutions; however, they have not been gender specific. The interaction of national factors on women's entrepreneurs is understudied (Bullough, 2022). Urbano et al., (2019) and Bullough (2022) in their systematic literature review have also pointed to women's entrepreneurship as a research gap and calls for more research about the moderating effect of national institutions on female entrepreneurs.

Pathak and others (2013) showed support for the moderation effect of Global Gender Gap Index (GGGI) on relation between individual socio cognitive traits and women entrepreneurship. They

suggested testing alternative variables to have a better understanding of the female entrepreneurial decisions.

The cross-level moderations show how the cultural context moderates the effect of individual-level cognitive attributes on women opportunity-based entrepreneurial entry. In this study, we found several contingent effects of nation cultural attributes on women opportunity-based entrepreneurship. The results revealed that cultural attributes of power distance and uncertainty avoidance moderate the positive relation between female entrepreneurial cognition and the likelihood of women opportunity-based entrepreneurial entry. These cross-level effects hinder women opportunity-based entrepreneurship, which means in a country with higher level of power distance and uncertainty avoidance in their culture, females with entrepreneurial cognition are less likely to get involved in business opportunities compared to females with similar cognition traits in a country with lower power distance and uncertainty avoidance.

On the other hand, our findings showed that country-level individualism and masculinity intensify the positive relationship between individual entrepreneurial cognition and women opportunity-base entrepreneurs. This indicates that the likelihood of females with entrepreneurial cognition to enter a business opportunity increases in a country with higher individualism and masculinity. Therefore, all five hypotheses of this research are accepted and provide support for the claim that females with similar cognition act differently in making an entrepreneurial decision depending on cultural context. This result is in lined with literature (e.g. Pathak et al., 2013; Aragon-Mendoza et al. 2016)

Our results indicated that national individualism has a direct negative effect on women opportunity-based entrepreneurship. This is consistent with some prior studies (e.g. Wennberge et al., 2013; Morris et al. 1993) but challenges the view that positively associates entrepreneurship with individualism (Mueller and Thomas 2000). More interestingly, in our findings, the moderating effect of individualism is positive, which means the direct negative impact of individualism on WOEE was minimised in interactions with entrepreneurial cognition. Therefore, our research concluded that national culture representing the country-level informal institutions influence the relation between individual-level entrepreneurial cognition and WOEE.

This paper contributes to the female entrepreneurship literature by investigating the moderation effects of national-level institutional conditions on relation between individual-level entrepreneurial cognition and women opportunity-based entrepreneurship. It is an answer to multiple calls in literature for studying female entrepreneurship from institutional theory perspective (e.g. Urbano et al. 2019). Institutional theory (North 1990) suggests that a country's values, norms, and “rules of the game” motivate certain types of behaviour that are acceptable by society (Raza et al. 2020). The results of this study reveal that the national culture is one of the factors that shape the female entrepreneurs’ decision to apply their individual cognition to start a new business opportunity.

It is particularly motivated to fill up the literature gap suggested by Pathak et al. (2013) and Bullough (2022). It provides support for the argument that national culture and individual attributes jointly shape individuals' entrepreneurial behaviours (Wennberge et al. 2013). It also criticised those studies that only focus on direct effect through a single-level framework. The application of multi-level analysis uncovered how national culture attributes influence females entrepreneurs' decision to get involved in business opportunities.

The result is applicable to policy makers, who seek to interfere with context to generate desired outcomes. The findings revealed how individual female entrepreneurs are more likely to allocate their resources to pursue business opportunities and start new businesses depending on national culture. For instance, societies with low institutional collectivism should seek different mechanisms than societies with high institutional collectivism. In other words, policy makers should seek to promote entrepreneurial role models that emphasise entrepreneurship as an attractive norm rather than as a behaviour that conflicts with established norms.

We suggest future research apply the multilevel model and test other national variables that can influence women entrepreneurship. We also recommend comparing a similar multilevel model in two groups of countries such as developed and developing countries or high income and low income countries.

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Figure 1- Conceptual Model

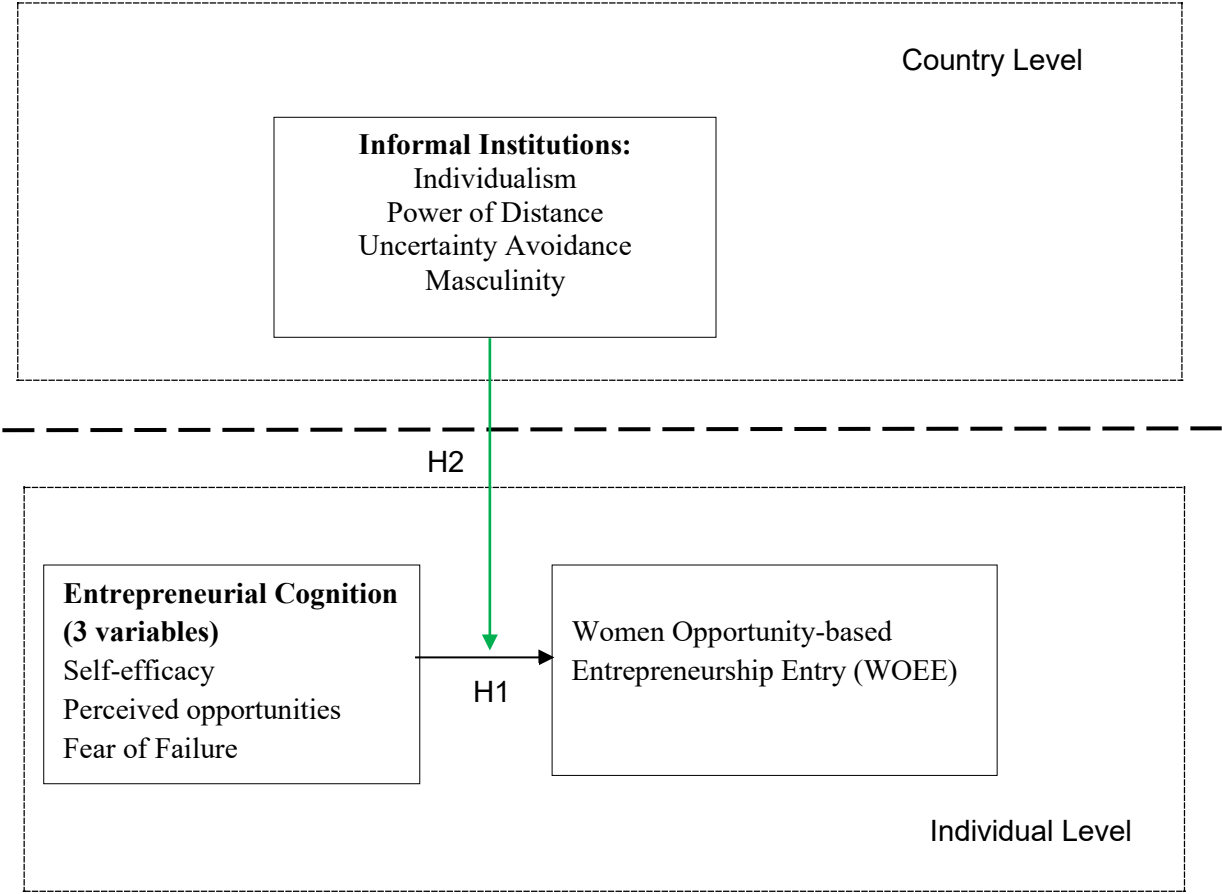


Table 1- Definition of Variables and Sources

Variables	Variable	Description	Source
Dependent Variable	Early-stage Opportunity entrepreneurship for women	It coded 1 if female adult entrepreneurs (age 18 to 64) are either nascent or new entrepreneurs (owner of a firm with less than 42 months old) indicating to be driven by an opportunity instead of a necessity, and 0 otherwise.	GEM
Individual-level Independent Variables	Entrepreneurial Cognition	Dummy variable: Coded 1 if a woman believes to have entrepreneurial cognition to become an entrepreneur and 0 otherwise.	GEM
Individual-level Control Variable	Age	The age of the individual at the time of responding to the GEM survey. A continuous variable 18 to 64 years	GEM
	Education	a five-step categorical scale, where no education = 0, some secondary education = 1, secondary education = 2, post-secondary education = 3, and graduate school = 4	GEM
Country-level Control Variables	Population	Country total population	World Bank
	GDP	Gross Domestic Product	World Bank
	Formal institutions	Government Spending, Property Rights Protection and Financial Freedom	IEF
Country-level Independent Variables	Informal Institutions: Culture Dimensions	Individualism, Power Distance, Financial Freedom, Uncertainty Avoidance	Hofstede

Table2- Characteristic of Variables

	N	Minimum	Maximum	Mean	Std. Deviation
All Variables					
Individual-level Variables					
Women Opportunity-based Entrepreneurship Entry (Dependent Variables)	435,351	0	1	0.08	0.264
Control Variables					
Age	435,351	18	64	39.70	12.820
Knowing other entrepreneurs	435,351	0	9	0.37	0.586
Education	435,351	0	4	1.98	1.087
Household Income	435,351	1	3	2.00	0.816
Entrepreneurial Cognition (Predictor)	435,351	0	3	1.4229	0.98215
Country-level Variables					
Control Variables					
Total Population	89	318,041	1,386,395,000	107,634,968	261,885,310
GDP (current Billion US\$)	89	4.14	19,542.98	1,345.77	2,718.28
Formal Institutions					
Property Rights	89	10.0	95.0	57.2	23.4
Financial Freedom	89	10	90.0	60.2	16.2
Government Spending	89	0.0	94.8	58.8	22.3
Country-level Predictors					
Informal Institutions					
Individualism vs Collectivism	89	6	91	41.5	22.8
Power of Distance	89	11	100	62.2	19.2
Uncertainty Avoidance	89	5	100	48.6	17.1
Masculinity vs Femininity	89	8	100	69.7	20.6

Table 3- Aggregation value of variables for 89 countries

Country	Frequency	Percentage of WOEE	Property Rights	Gov Spending	Financial Freedom	Power Distance	Individualism	Uncertainty Avoidance	Masculinity
United States	7,963	8.8%	83.25	51.75	70	40	91	62	46
Russia	4,730	2.5%	24.12	58.52	35.79	93	39	36	95
Egypt	3,716	2.8%	30.29	67.43	42.42	70	25	45	80
South Africa	7,828	4.3%	52.38	69.44	58.65	49	65	63	49
Greece	6,295	3.1%	46.36	17.37	50.74	60	35	57	100
Netherlands	6,079	6.8%	89.73	30.11	80	38	80	14	53
Belgium	2,923	2.7%	80	16.86	70	65	75	54	94
France	4,682	2.9%	80.58	8.17	70	68	71	43	86
Spain	45,251	3.0%	70.14	43.25	73.7	57	51	42	86
Hungary	4,252	3.1%	60.79	26.84	70	46	80	88	82
Italy	4,162	2.5%	54.93	24.25	58.59	50	76	70	75
Romania	3,827	4.7%	40	59.62	50	90	30	42	90
Switzerland	4,300	4.8%	89.6	66.54	81.29	34	68	70	58
Austria	2,964	6.1%	90	20.58	70	11	55	79	70
United Kingdom	11,340	4.4%	90.07	33.82	80	35	89	66	35
Denmark	2,502	2.9%	90	10.6	90	18	74	16	23
Sweden	3,785	5.7%	90.35	17.8	80	31	71	5	29
Norway	3,743	3.6%	90	43.71	60	31	69	8	50
Poland	4,944	4.0%	60.66	44.35	67.02	68	60	64	93
Germany	11,538	3.5%	89.15	39.12	66.27	35	67	66	65
Peru	5,376	18.2%	42.19	89.01	60	64	16	42	87
Mexico	9,235	10.6%	51.88	78.64	60	81	30	69	82
Argentina	4,194	9.1%	18.71	58.66	31.86	49	46	56	86
Brazil	18,425	10.9%	49.99	53.88	57.96	69	38	49	76
Chile	19,948	13.7%	84.19	84.47	70	63	23	28	86
Colombia	17,901	12.8%	50.7	75.74	63.69	67	13	64	80
Malaysia	6,423	6.0%	57.8	75.79	53.92	100	26	50	36
Australia	3,407	8.1%	88.81	62.65	90	38	90	61	51

Indonesia	8,919	13.9%	32.03	89.17	57.52	78	14	46	48
Philippines	3,343	12.7%	30	90.52	53.15	94	32	64	44
Singapore	2,037	8.3%	90	91.27	77	74	20	48	8
Thailand	8,288	14.1%	44.07	84.69	65	64	20	34	64
Japan	3,303	1.8%	81.28	51.96	51	54	46	95	92
South Korea	4,820	4.3%	71.97	70.65	72.64	60	18	39	85
Vietnam	2,858	10.0%	15	73.63	30	70	20	40	30
China	10,709	8.3%	23.75	81.69	29	80	20	66	30
Turkey	8,832	4.5%	49.29	66.77	58.37	66	37	45	85
India	6,840	4.7%	53.15	77.89	40	77	48	56	40
Pakistan	1,901	0.9%	30	88.51	40	55	14	50	70
Iran	8,521	5.7%	12.74	85.62	10	58	41	43	59
Canada	3,218	10.7%	89.74	48.13	80	39	80	52	48
Morocco	2,189	3.8%	46.38	65.9	64.25	70	46	53	68
Algeria	2,246	3.0%	30	50.97	30	80	35	35	70
Tunisia	1,061	3.8%	41.7	72.27	30	70	40	40	75
Senegal	737	28.5%	40	74.6	40	70	25	45	55
Burkina Faso	1,970	21.2%	28.18	79.5	40	70	15	50	55
Ghana	2,357	22.7%	50	53.72	60	80	15	40	65
Nigeria	2,999	25.1%	30	73.44	40	80	30	60	55
Angola	1,340	24.0%	17.62	57.81	40	83	18	20	60
Ethiopia	1,392	9.1%	30	91.1	20	70	20	65	55
Zambia	1,968	25.0%	30	82.19	50	60	35	40	50
Anguilla	493	8.9%	30	73	40	65	30	40	45
Malawi	1,768	15.3%	42.21	60.97	50	70	30	40	50
Portugal	3,710	4.3%	70	29.35	60	63	27	31	99
Luxembourg	2,009	6.2%	89.16	45.29	80	40	60	50	70
Ireland	5,719	4.0%	88.96	43.7	71.45	28	70	68	35
Iceland	577	6.4%	90	45.8	60	30	60	10	50
Finland	3,968	3.7%	90	12.24	80	33	63	26	59
Bulgaria	1,557	2.6%	40.94	60.97	60	70	30	40	85
Lithuania	2,956	5.0%	60	53.24	80	42	60	19	65

Latvia	4,404	6.5%	53.38	54.83	52.45	44	70	9	63
Estonia	3,189	9.3%	86.34	52.45	80	40	60	30	60
Montenegro	655	7.2%	40	54.4	50	88	24	48	90
Croatia	5,805	3.1%	42.5	43.79	60	73	33	40	80
Slovenia	4,590	2.6%	61.56	24.51	50	71	27	19	88
Bosnia and Herzegovin	4,313	1.5%	20.02	26.82	60	90	22	48	87
Macedonia	3,274	1.5%	35	67.27	60	90	22	45	87
Czech Republic	2,582	3.2%	68.59	43.87	80	57	58	57	74
Slovakia	4,354	4.9%	51.91	54.68	70	100	52	100	51
Guatemala	6,252	10.2%	30.31	94.14	50	95	6	37	98
El Salvador	1,817	10.6%	38.14	87.34	66.28	66	19	40	94
Costa Rica	2,274	9.2%	51.73	89.52	50	35	15	21	86
Panama	6,489	10.5%	37.23	81.82	70	95	11	44	86
Bolivia	2,613	24.8%	10	65.45	50	78	10	42	87
Ecuador	6,072	18.4%	21.14	52.98	40	78	8	63	67
Suriname	1,055	2.7%	40	75.85	30	85	47	37	92
Uruguay	4,893	7.4%	70.68	69.72	30	61	36	38	98
Kazakhstan	1,841	9.2%	33.49	85.75	50	88	20	50	88
Hong Kong	450	6.9%	90	90.7	90	68	25	57	29
Trinidad and Tobago	2,794	12.3%	50	66.59	63.39	47	16	58	55
Jamaica	2,859	7.2%	40.91	69.26	54.03	45	39	68	13
Bangladesh	978	3.0%	20	92.4	20	80	20	55	60
Lebanon	2,346	13.0%	26.89	74.05	53.47	75	40	65	50
Jordan	841	2.5%	60	62	60	70	30	45	65
Saudi Arabia	3,842	7.8%	48.74	58.1	50	95	25	60	80
United Arab Emirates	1,940	5.3%	62.81	73.24	57.25	90	25	50	80
Israel	3,489	6.0%	71.73	43.12	70	13	54	47	81
Qatar	1,834	10.0%	70.14	71.75	52.78	93	25	55	80
Georgia	1,168	3.1%	40	72.65	60	65	41	55	85

Table 4- Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1-WOEE	1	-.073**	.154**	.028**	.067**	.232**	0.002	-.013**	-.060**	-.033**	.101**	-.100**	.051**	-.018**	-.009**
2-Age	-.073**	1	-.088**	-.113**	-.038**	-.078**	-.036**	.048**	.153**	.142**	-.155**	.141**	-.120**	.026**	-.005**
3-Knowing other entrepreneurs	.154**	-.088**	1	.055**	.101**	.227**	.029**	-.020**	-.086**	-.070**	.086**	-.091**	.078**	-.044**	-.028**
4-Education	.028**	-.113**	.055**	1	.285**	.025**	-.054**	.090**	.225**	.169**	-.173**	.235**	-.201**	-.039**	-.039**
5-Household Income	.067**	-.038**	.101**	.285**	1	.096**	-.010**	-0.002	.026**	.017**	.008**	.009**	-.019**	-.009**	-.003*
6-Entrepreneurial Cognition	.232**	-.078**	.227**	.025**	.096**	1	-.016**	-.044**	-.098**	-.082**	.185**	-.157**	.082**	-.035**	-.024**
7-Total Population	0.002	-.036**	.029**	-.054**	-.010**	-.016**	1	.543**	-.219**	-.366**	.226**	-.078**	.187**	-.382**	.208**
8-GDP (current B.US\$)	-.013**	.048**	-.020**	.090**	-0.002	-.044**	.543**	1	.129**	-.034**	-.059**	.303**	-.132**	-.289**	.266**
9-Property Rights	-.060**	.153**	-.086**	.225**	.026**	-.098**	-.219**	.129**	1	.730**	-.457**	.624**	-.635**	-.068**	-.090**
10-Financial Freedom	-.033**	.142**	-.070**	.169**	.017**	-.082**	-.366**	-.034**	.730**	1	-.392**	.444**	-.438**	.027**	-.067**
11-Government Spending	.101**	-.155**	.086**	-.173**	.008**	.185**	.226**	-.059**	-.457**	-.392**	1	-.631**	.467**	-.084**	.026**
12-Individualism vs Collectivism	-.100**	.141**	-.091**	.235**	.009**	-.157**	-.078**	.303**	.624**	.444**	-.631**	1	-.696**	-.291**	.112**
13-Power of Distance	.051**	-.120**	.078**	-.201**	-.019**	.082**	.187**	-.132**	-.635**	-.438**	.467**	-.696**	1	.232**	.073**
14-Uncertainty Avoidance	-.018**	.026**	-.044**	-.039**	-.009**	-.035**	-.382**	-.289**	-.068**	.027**	-.084**	-.291**	.232**	1	-.166**
15-Masculinity vs Femininity	-.009**	-.005**	-.028**	-.039**	-.003*	-.024**	.208**	.266**	-.090**	-.067**	.026**	.112**	.073**	-.166**	1

†p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001 N = 435,351

Table 5- Mixed Effect Logistic Regression Results - Women Opportunity-based Entrepreneurship Entry

Individual Level Control V	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Knowing other entrepreneurs	2.033***(0.022)	1.70***(0.17)	0.53***(0.010)	0.53***(0.010)	0.53***(0.010)	0.53***(0.010)
Age	0.99***(0.0005)	0.99***(0.0005)	-0.01***(0.001)	-0.01***(0.001)	-0.01***(0.001)	-0.01***(0.001)
Education	1.20***(0.008)	1.16***(0.008)	0.14***(0.007)	0.14***(0.007)	0.15***(0.007)	0.15***(0.007)
Household Income	1.22***(0.010)	1.17***(0.009)	0.16*** (0.008)	0.16***(0.008)	0.16*** (0.008)	0.16***(0.008)
Country Level Control V						
GDP Current	1.02(0.040)	1.01(0.040)	-0.009(0.040)	-0.002(0.039)	-0.011(0.039)	-0.010(0.039)
Total Population	1.02(0.103)	1.00(0.083)	0.008(0.084)	0.007(0.084)	0.002(0.083)	0.002(0.083)
Government Spending	0.86*** (0.023)	0.84*** (0.023)	-0.18*** (0.03)	-0.18*** (0.027)	-0.18*** (0.03)	-0.18*** (0.027)
Property Rights	1.05*(0.027)	1.02(0.026)	0.02(0.03)	0.02(0.026)	0.02(0.026)	0.02(0.026)
Financial Freedom	1.00(0.029)	1.05(0.03)	0.04(0.03)	0.04(0.029)	0.044(0.029)	0.044(0.029)
12-Individualism vs Collectivism	0.60** (0.064)	0.66*** (0.06)	-0.41*** (0.09)	-0.42*** (0.091)	-0.42*** (0.09)	-0.42*** (0.090)
13-Power of Distance	0.95(0.95)	0.94(0.77)	-0.07(0.08)	0.17*(0.085)	-0.07(0.08)	-0.07(0.08)
14-Uncertainty Avoidance	0.76** (0.061)	0.82** (0.055)	-0.19** (0.07)	-0.20** (0.068)	-0.18** (0.07)	-0.20** (0.067)
15-Masculinity vs Femininity	1.04(0.081)	1.06(0.067)	0.07(0.06)	0.06(0.065)	0.05(0.06)	0.07(0.065)
Individual Level Variable effect						
entrepreneurial cognition (H1)		2.18*** (0.016)	0.84** (0.008)	0.805*** (0.01)	0.78*** (0.01)	0.78*** (0.01)
Country Level (Interaction effects)						
Entrepreneurial cognition X Individualism (H2a)			0.148*** (0.007)			
Entrepreneurial cognition X Power Distance (H2b)				-	0.115*** (0.007)	
Entrepreneurial cognition X Uncertainty Avoidance (H2c)					-0.01+ (0.007)	
Entrepreneurial cognition X Masculinity (H2d)						-0.0069*** (0.01)
Random part estimates						
Variance of intercept	0.787	0.589	0.358	0.358	0.347	0.347
Model fit statistics						
Number of Observations	435,351	435,351	435,351	435,351	435,351	435,351

Number of Group (Country)	89	89	89	89	89	89
Degree of freedom (# variables)	6	14	15	15	15	15
Chi-square (01)	12589.89	4152.24	4233.7	4248.12	4154.09	4147.07
Prob > Chi-square	0.000	0.000	0.000	0.000	0.000	0.000
Log likelihood	-105560.12	-99106.1	-98890.3	-98991.3	-99104.7	-99105.7
LR test for goodness of fit	0.000	0.000	0.000	0.000	0.000	0.000
Wald chi2	7819.7	18728.83	19034.91	18870.88	18732.79	18727.85
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Standard errors are in parentheses. Bold values indicate variables testing the hypotheses. ***p < 0.001; **p < 0.01; *p < 0.05; +p < 0.10, ORs in Model 1 and 2, above 1 represent a positive relationship, ORs below 1 represent a negative relationship; model 3–6 explained beta coefficients