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Cross-country Differences in
Entrepreneurial Activity:
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and Economic Wealth

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Cross-country Differences in Entrepreneurial Activity:

The Role of National Cultural Practice and Economic Wealth

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Bionotes

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Cross-country Differences in Entrepreneurial Activity:

The Role of National Cultural Practice and Economic Wealth

Abstract

In this paper, two issues are examined: the direct relationship between national cultural practice and entrepreneurial activities, and the interaction effect between national cultural practice and GDP on entrepreneurial activities. Datasets from Global Leadership and Organizational Behavior Effectiveness (GLOBE) project and Global Entrepreneurship Monitor (GEM) study were analyzed. Canonical correlation analysis showed that national culture as a whole is significantly related to early-stage entrepreneurial activities, but not to established entrepreneurial activities. In addition, there are interaction effects between GDP and culture dimensions on entrepreneurial activities. More traditional cultures enhance entrepreneurship in low-and-medium GDP countries, but hinder entrepreneurship in high GDP countries.

Introduction

The theoretical discussion on whether and how national culture relates to entrepreneurship has persisted for decades (McClelland, 1961; Schumpeter, 1934; Weber, 1930). A number of studies also start to investigate the relationship empirically (e.g., Davidsson, 1995; Davidsson & Wiklund, 1997; Morris, Davis, & Allen, 1993; Shane, 1992, 1993). However, the hypothesized link between culture and entrepreneurship activity is still not well-established (see Hayton, George and Zahra (2002) for a comprehensive review).

Some lack of clarity in the relationship between culture and entrepreneurship can be accounted for by some methodological and theoretical limitations of previous studies. Some cross-cultural studies were based on only a few countries and in some cases the unit of the level of analysis was the firm instead of the national (or subnational) culture. The majority of studies have used Hofstede's (1991) model, or part of the model (Davidsson, 1995; Morris, Avila, & Allen, 1993; Shane, 1995) as an assessment of culture. In the meantime, there are newer data and advanced methodological development (Hanges & Dickson, 2006). It may also be useful to study entrepreneurship behavior along several dimensions. The Global Leadership and Organizational Effectiveness (GLOBE) project (House, Hanges, Javidan, Dorfman, & Gupta, 2004) and the Global Entrepreneurship Monitor (GEM) Project (Minniti, Bygrave, & Autio, 2005) provide two conceptualizations of culture and entrepreneurial activity that have a sound methodological and theoretical basis. Using the data from the above two projects allows us to base our analysis on a relatively large sample size. In addition, multiple types of entrepreneurial behavior are also analyzed.

A second shortcoming of the literature may be limiting theoretical thinking to direct relationships between culture and entrepreneurship. Recently, there has been a call to study the match between the type of culture and other variables, including a match between national wealth and cultural factors (Shane, Venkataraman, & MacMillan, 1995; Tung, Walls, & Frese, 2007). We shall examine the interaction between GDP, as a proxy of national wealth, and cultural factors that produce entrepreneurial activities in societies.

Additionally, our approach covers the multivariate nature of cultural practices by addressing the multivariate effects of culture on entrepreneurship activity. Finally, we address additional cultural dimensions that have not been addressed in the previous entrepreneurship literature.

National culture and entrepreneurial activity

Countries differ considerably in the level of entrepreneurial activity (Freytag & Thurik, 2007; Minniti et al., 2005). Knowing the causes for such cross-country differences is important for practice as well as theory. Scholars have explained variations of entrepreneurial activity across nations by economic development (please refer to the series report of GEM), the institutional environment (Lee, Peng, & Barney, 2007), and cultural values(Freytag & Thurik, 2007; Morris, Avila et al., 1993). In this study we explore how national culture relates to the multifaceted entrepreneurial activities.

National culture can be defined as a country's shared practices and values (House et al., 2004). Our theorizing about the effects of national culture draws on arguments about the direct relationships between culture and entrepreneurial activity, the

interaction effects between culture and economic wealth (GDP) and the

multi-dimensional nature of culture.

Direct relationships between culture and entrepreneurial activity

Hofstede (1980) assumed that culture has a direct manifestation in the behavior

of people belonging to a culture. Thus, national culture can support or impede

entrepreneurial behavior at the individual level (Hayton, George, & Zahra, 2002).

Thus, culture indicates the degree to which a society considers entrepreneurial

behavior such as thinking of opportunities, innovativeness, risk-taking and

independent thinking, to be desirable. In this view, a culture that supports

entrepreneurship produces more people with entrepreneurial potential and, as a

consequence, more entrepreneurial activity.

The majority of studies in the domain of entrepreneurship assumed a direct effect

of specific cultural dimensions on entrepreneurial activity, such as start up rates

(Davidsson & Wiklund, 1997; Levie & Hunt, 2004; Morris, Avila et al., 1993), and

innovation (Shane, 1993). Cultural factors frequently related to entrepreneurship

activities include individualism, power distance, and uncertainty avoidance (Hayton et

al., 2002). However, the empirical evidence for such relationships is weak and often

contradictory (c.f., Hayton, et al., 2002). For example, power distance was positively

related to innovation in one study (Shane, 1992), but this relationship was negative in

another (Shane, 1993). This suggests that there are moderators affecting the

relationship between culture and entrepreneurship.

Interaction effects between culture and economic wealth (GDP)

Here the issue is often how certain behaviors by entrepreneurs match certain cultural factors or how well a cultural factor matches other variables (Tung et al., 2007). The matching of behavior to a cultural situation is based on the work by Shane (1995). Shane (1995) showed that although there is a small relationship between innovation and uncertainty avoidance, the more important finding is that the innovation strategy has to be culturally appropriate. This implies that it is possible to develop innovation in any culture, but the hurdles that have to be addressed depend on the culture. Van der Vegt, Van de Vilert & Huang (2005) investigated the relationship between diversity and innovation and showed that the link between the demographic diversity and innovative climate is dependent on national power distance. The issue of a match also refers to the match between culture and wealth. Wealth can be conceptualized as an effect of culture (e.g., achievement motive was shown to be related to national development by McClelland (1961) as well as a cause of culture (e.g., Hofstede (2001) has argued that higher wealth leads countries to become less collectivistic). In contrast, we argue in this paper that wealth (measured as GDP per capita) is a moderator variable, and may affect the effects of culture on entrepreneurship.

The general form of our argument is following: in low-and-medium GDP societies entrepreneurship benefits from traditional societal values. In high GDP societies it is more useful for entrepreneurship if the society holds less traditional societal values. Traditional societies are often high on power distance, high on humane orientation, low on assertiveness, and high on in-group collectivism (all of these terms will be defined more formally below) (Inglehart & Baker, 2000). Non-traditional societies are low on these dimensions.

Our line of reasoning is based on two arguments: First, traditionalism of the society may be helpful in dealing with the insecurities and uncertainty of entrepreneurship by providing social support. Due to scarcity of alternatives and the undeveloped institutional supports, entrepreneurs in low-and-medium GDP countries have to rely much more on their cultural support systems than entrepreneurs in high GDP countries. Thus, traditionalism of a society helps entrepreneurship because traditional societies provide more help and support, in the form of family or friends (which is congruent with high in-group collectivism and high humane orientation). Similarly, a traditional society in terms of high power distance or low assertiveness may increase entrepreneurship because parents (fathers and mothers who will be respected and obeyed) will tell their sons and daughters to start a business because it is necessary in low-and-medium GDP countries to support their off-springs. This should be true only in low-and-medium GDP countries. Given the availability of alternative avenues to survive and lack of formal institutional support, the above argument does not hold for high GDP countries. The second line of reasoning is that in traditional societies the most promising avenue of actually escaping traditional paths of careers may be entrepreneurship. This line of reasoning can be most clearly developed for power distance. In societies with high power distance, a low status person will always continue to be a low status person: The only way out may be to become an entrepreneur. Not only does it allow a person to escape a dominant boss, entrepreneurship may also allow the person to escape the route that is preordained by the status of one's birth. As a matter of fact, Indian sagas of entrepreneurship are full of examples in which an "untouchable" escapes the low status by becoming rich as an entrepreneur. This approach is more likely to be successful in low-and-medium GDP

countries, because there are other avenues and resources to achieve a certain kind of independence in rich countries (e.g., by individually striving for further education, by moving away from a certain environment to another one, etc.).

The multi-dimensional nature of culture

National culture is usually conceptualized as a multidimensional construct (Hofstede, 1991; House, Javidan, Hanges, & Dorfman, 2002). However, most studies examined the effect of specific cultural dimensions in isolation. For example, studies selected specific cultural dimensions (Morris, Avila et al., 1993) or analyzed the effects of different cultural dimensions separately (Hayton et al., 2002). However, culture is a multidimensional phenomenon, and since the dimensions of culture co-vary, multidimensional models that include several cultural dimensions affecting entrepreneurship activity at the same time are needed (Hayton et al., 2002).We try to address the multi dimensions of culture by using the GLOBE study (House et al., 2004). The GLOBE study was based on sound theory, measured multiple dimensions of culture, focused explicitly on cultural practices and, provides data for as many as 61 societies. The GLOBE study (House et al., 2004) is based on the following nine dimensions: Performance orientation, future orientation, assertiveness, societal collectivism, in-group collectivism, gender egalitarianism, humane orientation, power distance, and uncertainty avoidance. It also differentiated cultural values from cultural practices. Cultural values address how members of a culture think their culture should be whereas cultural practices describe how people go about doing things. Since entrepreneurship is a set of activities initiated by an entrepreneur (Gartner, 1989), the cultural practices as a set of how things are done may be more important for

entrepreneurship than cultural values.

Second, entrepreneurial activity is a multidimensional construct and can be assessed along several dimensions. Therefore, it may pay off to include a multidimensional model for entrepreneurial activity as well. Therefore, we build on the entrepreneurship model of GEM study (Minniti et al., 2005). This model, for several reasons, is useful in the context of the present study. First, it distinguishes between early-stage entrepreneurship and established entrepreneurship. Given that the prevalence rates of business formation are more important than the amount of self-employment (Reynolds, 1987), GEM provides a valid assessment of the amount of entrepreneurial activity. Second, the GEM model also provides assessments of the amount of early stage and established entrepreneurship, and of the different types of entrepreneurship activity, specifically the prevalence of high expectation and growth entrepreneurship, and the prevalence of female entrepreneurship. The prevalence of high expectation and growth entrepreneurship is important because high growing firms positively affect economic growth (Valliere & Peterson, 2009). Similarly, a greater proportion of female entrepreneurship may positively affect macroeconomic outcomes. We assume that cultural practice do affect both the prevalence and the type of entrepreneurial activity.

In the following we address general relationship between national culture as a whole and entrepreneurship before we decompose such a general relationship and discuss individual dimensions.

Hypotheses development

Culture as a whole: As culture is multidimensional, one should test the combined

effect of cultural practices on entrepreneurial activities firstly. We argue that national culture should play an important role for the early-stage entrepreneurship. The decision to start an enterprise may be directly affected by society's practices to some extent. At a later stage, when the business is established, other factors such as economic and institutional variables may influence the success of entrepreneurship more. Thus, early-stage entrepreneurship activities (nascent and new entrepreneurship, female early-stage entrepreneurship rates, high-expectation early-stage entrepreneurship) should be directly affected by cultural practices. Success of entrepreneurship (established entrepreneurship, high-growth established entrepreneurship and female established entrepreneurship) is affected by economic and institutional variables, and thus only indirectly by cultural practices. Thus, we assume that:

H1: National cultural practice is related to early-stage entrepreneurial activity.

Individual dimensions of cultural practice: direct effects and moderator effects of GDP

In the following, we discuss the individual dimensions. We first describe those cultural dimensions that signify traditionalism of the society: assertiveness, in-group collectivism, humane orientation, and power distance. We then discuss the other dimensions. However, since we are skeptical in most cases that there is such a direct relationship, we will develop hypotheses only in a few cases. For a number of dimensions, we shall discuss the effect of GDP as moderator as well.

Assertiveness: Assertiveness is the degree to which individuals are assertive,

confrontational, and aggressive in social relationships (House et al., 2002). Societies that score high on assertiveness tend to have sympathy for the strong, value competition and believe that everyone can succeed if he or she tries hard enough. People in high assertiveness societies try to control the environment, emphasize results over relationships, reward performance, and value taking initiative. Assertiveness may be important because it is closely related to competitive aggressiveness, the competitiveness associated with entrepreneurship (Lumpkin & Dess, 1996). On the other hand, entrepreneurs need to cooperate with partners, stakeholders and customers, and they benefit from networking activities (Peng & Luo, 2000; Zhao, Frese, & Giardini, 2009). Thus, it is unlikely that there is a direct relationship of assertiveness to entrepreneurship in general.

However, we think that role congruity theory (Eagly & Karau, 2002) is relevant for this dimension. This theory predicts that assertiveness is negatively associated with female entrepreneurship. In general, entrepreneurship is often associated with male roles, such as dominance, aggressiveness, and confrontation (Sexton & Bowman-Upton, 1990). Such attributes are even pronounced in countries high in assertiveness. As a consequence, female entrepreneurs can activate perceptions of incongruence between their entrepreneurship role and their gender role, for example when they exhibit less assertive behaviors. Consequently, people perceive and evaluate female entrepreneurs less favorably than male entrepreneurs. Hence, it is more difficult for females to become entrepreneurs and be successful in countries high in assertiveness than in countries low in assertiveness. Thus we hypothesize:

H2a: Assertiveness is negatively related to female entrepreneurship.

On a more general level, we assume that GDP affects this relationship. As traditional societies are less assertive (and high on power distance), people easily accept the counsel of elders. In low-and-medium GDP societies the recommendations of elders may often be to start a business. Therefore, in low-and-medium GDP societies, a low degree of assertiveness should be associated with more entrepreneurship, while this relationship should be opposite in high GDP societies.

H2b: In low-and-medium GDP societies there is a negative relationship between assertiveness and entrepreneurial activity, while in high GDP societies this relationship is positive.

In-group collectivism: In-group collectivism measures the degree to which individuals express pride, loyalty and cohesiveness in their groups and families (House et al., 2002). Societies high on in-group collectivism make greater distinction between in-group and out-group (Gelfand, Bhawuk, Hishi, & Bechtold, 2004). In high in-group collectivistic societies, people greatly depend on their special personal relationships, like *guanxi* in Chinese context, *Inhwa* in Korea and *blat* in Russia instead of institutional supports. Moreover, in-group collectivism emphasizes group goals, socialization, high loyalty and commitment, and a cohesive management team (Hofstede, 1980).

In-group collectivism has been related to entrepreneurial activities for a number of reasons. First, entrepreneurship is an activity of enterprising individuals who are individually rewarded (see review by Hayton et al., 2002). Second, entrepreneurship includes taking personal risks associated with market entry and innovation (Shane et al., 1995). Third, successful entrepreneurs must have characteristics such as creativity

and the ability to develop new and unique ideas, characteristics that are typically associated with individualistic orientations (Bhawuk & Udas, 1996). These arguments favor the position that collectivism is negatively related to entrepreneurial activities (e.g., review by Hayton et al., 2002).

However, the position that individualism is related directly to innovation and entrepreneurship is not uncontested. Shane et al (1995) showed that individualism should influence the type , rather than the absolute levels, of innovation strategy.. Moreover, Morris, Avila, & Allen (1993) argued that both high individualism and high collectivism can be dysfunctional for innovation, and found a curvilinear relationship between individualism, collectivism and entrepreneurship. These arguments illustrate that there are no simple relationships between entrepreneurship, individualism and collectivism.

It has been argued that collectivism helps entrepreneurship because collectivistic societies provide more social support and resources. For example, family in collectivistic societies should be more helpful in providing the needed resources for one's entrepreneurial endeavors and the needed social security in the event that things do not work out. Moreover, collectivistic orientation fosters commitment and sacrifice amongst employees (Gelfand et al., 2004). High collectivism is helpful in the start-up process of business because strong in-groups provide more emotional supports, financial and material resources. Moreover, collectivism may provide a protected environment that minimizes the uncertainty associated with business creation and innovation implementation (Stewart, 1989). However, all of these aspects are important only in low-and-medium GDP countries and not in high GDP countries because of the availability of alternative resources in the latter. It is only in

low-and-medium GDP countries that starting entrepreneurs need to be able to fall

back on these traditional resources of in-group collectivism[1]. Thus, we hypothesize

that:

H3: There is an interaction effect between in-group collectivism and wealth on

entrepreneurship. In low-and-medium GDP countries there would be a positive

relationship between in-group collectivism and entrepreneurial activity, but there

would be no such relationship in high GDP countries.

Humane orientation: Humane orientation is the degree to which societies

encourage and reward individuals for being fair, altruistic, friendly, generous, caring,

and being kind to others (House et al., 2002). In high-humane oriented societies,

people within a close circle receive material, financial, and social support (Kabasakal

& Bodur, 2004). In addition, it means that there is a high degree of compassion and

help for people in the immediate neighborhood, and also a certain conservative

attitude and pressure for conformism towards people (Schloesser, Frese, & al., 2010).

As it is a new variable in the context of cross-cultural psychology, its precise meaning

is still unclear. However, we would argue similarly as with in-group collectivism, that

humane orientation helps the development of entrepreneurship because it provides

resources and support in the event that things go wrong within the immediate

environment of the entrepreneur. Thus, would-be entrepreneurs would feel supported

and sufficiently secure to start and develop a business. Over and above in-group

collectivism, humane orientation speaks more directly to issues important for

would-be-entrepreneurs. Humane orientation allows errors and failures. This means

that the social environment will still be supportive and people will not be ostracized

when they fail. Moreover, people who had failed may actually be encouraged to try again. Given that the fear of failure is one of the reasons why people do not start a business even though they might want to (Sternberg, 2000), there might be a direct effect between humane orientation and entrepreneurial activity. We hypothesize that the effect of humane orientation is likely to be stronger in low-and-medium GDP countries because the consequences of in low-and-medium GDP countries without welfare systems is worse than those in high GDP countries.

Thus, it follows:

H4a: There is a direct and positive relationship between humane orientation and entrepreneurial activity.

H4b: There is also an interaction effect: The positive relationship between humane orientation and entrepreneurial activity is stronger in low-and-medium GDP countries than in high GDP countries.

Power distance: Power distance measures the degree to which members of a society expect and agree that power should be unequally distributed (House et al., 2002). Societies higher in power distance only have limited upward social mobility, localized information, and social status that is distributed based on established power relationships, as opposed to merit. Researchers have argued that entrepreneurial activity should be higher in low power distance countries (Hayton et al., 2002). High power distance is associated with maintaining the status quo(Gelekanycz, 1997). Accordingly, there is little acceptance for the initiatives and innovations created by new business ventures. Moreover, high power distance countries distribute resources unequally. It makes difficult for potential entrepreneurs of low power groups to take

advantage of profitable opportunities and, as a result, reduces access to resources, skills, and information for potential entrepreneurs who are in a lower position. Unfortunately, reduced resources and information reduces both the existence and the discovery of valuable business opportunities (Kirzner, 1997). Power distance can have positive effects on entrepreneurial behavior. Power distance can positively affect entrepreneurial activity because the only way to be independent is to be an entrepreneur. Entrepreneurship can be used as one of the tools to struggle for independence and to increase one's power position.

Empirically, the relationship between power distance and entrepreneurial activity is inconsistent. For example, while Shane (1992) and Dwyer, Mesak & Hsu (2005) reported positive relationships between power distance and innovation, Shane (1993) reported negative relationships. Moreover, Gelekanycz (1997) indicated that power distance is related to a reduced level of resistance to change.

Thus, there may be positive or negative effects of power distance on entrepreneurship. For all of these reasons, we do not think that there will be a direct effect of power distance on entrepreneurship. However, we do think that there may be an interaction effect with GDP. In low-and-medium GDP countries, the traditional hierarchy may actually work in favor of would-be-entrepreneurs. First, the insecurities and uncertainty of entrepreneurship may be overcome by the support of traditional hierarchies. Second, entrepreneurship may be the only way out of having an all-powerful boss above the person. All of these factors should be stronger in low-and-medium GDP countries, because there are no other alternatives of obtaining resources or mobility outside traditional boundaries.

H5: There is an interaction effect between GDP and power distance on

entrepreneurial activity. While there is a positive relationship between power distance and entrepreneurship in low-and-medium GDP countries, there is no such relationship in high GDP countries.

In the following we discuss the other cultural factors that are unrelated to the traditionalism of societies. We do not believe that there are any moderator effects of GDP for the following cultural dimensions. The following dimensions may have small direct relationships to entrepreneurship.

Performance orientation: Performance orientation refers to the extent to which a society encourages and rewards its members for performance improvement and excellence (House et al., 2002). This dimension is clearly based on to the achievement motive idea by McClelland (1961). Entrepreneurs often strive for challenging tasks. They believe that they can succeed and they want to harvest the benefits for doing so. Thus, performance orientation should be associated with a society's entrepreneurial activity. Moreover, since performance orientation focuses on demanding targets and financial rewards, we expect that countries with high performance orientation to have a higher prevalence of high growth entrepreneurship. Therefore, we propose the following hypotheses:

H6a: Performance orientation is positively related to entrepreneurial activities.

H6b: Performance orientation is positively related to the prevalence of high growth entrepreneurship.

Future orientation: Future orientation addresses the degree to which individuals engage in future-oriented behaviors such as planning, investing in the future, and

delaying gratification (House et al., 2002). Countries with high future orientation have

a strong capability and willingness to imagine future contingencies, formulate future

goal states, seek to achieve goals, and to develop strategies for meeting their future

aspirations (Shane & Venkataraman, 2000). Future orientation is related to two, and at

times competing, orientations. First, countries high in future orientation should have

high entrepreneurial activity. Individuals anticipate potential future opportunities in a

changing environment and would think of investing now in order to reap future profits

(Shane & Venkataraman, 2000). Second, future orientation also implies that one

thinks about the future because one is worried about the future. Future orientation is

highly related to uncertainty avoidance (Ashkanazy et al., 2004). Thus, one anticipates

not opportunities, but failures. Thus, this part of future orientation should be

negatively related to entrepreneurship because people might be too worried about

future problems to get themselves involved in uncertain endeavors. Given that both

underlying orientations may be present, it is unclear in which direction future

orientation is related to entrepreneurship. Thus, we do not develop any hypotheses on

future orientation.

Uncertainty avoidance: Uncertainty is a conceptual cornerstone in the theory of

entrepreneurship (Knight, 1921; McMullan & Shepherd, 2006). Entrepreneurs have to

recognize opportunities in the face of uncertainty (Knight, 1921) and are willing to

bear uncertainty when exploiting opportunities (Schumpeter, 1934). People in high

uncertainty avoidant countries are threatened by new and unpredictable future

situations (Hofstede, 1980). They show a stronger desire to establish rules, allowing

predictability of behavior (Sully de Luque & Javidan, 2004). Members of such

cultures tend to avoid uncertainty by reliance on social norms, rituals, and bureaucratic practices to alleviate the unpredictability of future events (House et al., 2002). Such practices include formalized interaction, documentation and planning, as well as resistance to risk, change and new product development. Such practices may suggest that high uncertainty avoidant countries have little support for entrepreneurship (Hayton, et al, 2002). Two studies found indirect support for a negative relationship between uncertainty avoidance and entrepreneurial activities (Muller & Thomas, 2000; Shane, 1995). In contrast to this, one study indicated that uncertainty avoidance is positively related to the prevalence of business ownership across countries (Wennekers, Thurik, van Stel, & Noorderhaven, 2007), possibly because entrepreneurial employees are discriminated by the formal structure of organizations, and are therefore pushed into entrepreneurship. We think that there are different effects of uncertainty avoidance, depending on the stages of entrepreneurship.

H7a: Uncertainty avoidance is negatively related to early-stage entrepreneurial activities.

While we assume that uncertainty avoidance is negatively related to the emergence of entrepreneurship, it can very well be functional with regards to some types of entrepreneurial activity. High uncertainty avoidance emphasizes long-term planning, environment scanning and the prediction of future developments. Thus, uncertainty avoidance directly addresses the uncertainties associated with business venturing, for example, by reducing the risk in business and creating a safe environment. Thereby, uncertainty avoidance helps to implement opportunity exploitation and growth.

H7b: Uncertainty avoidance is positively related to established entrepreneurship and high-growth entrepreneurship.

Gender egalitarianism: Gender egalitarianism reflects a society that minimizes gender role differences and gender discrimination (House et al., 2002). Societies that score higher on gender egalitarianism tend to have more women in positions of authority, afford women a higher status in society and a greater role in community decision making, have a higher percentage of women participating in the labor force, have less occupational sex segregation, and have similar levels of education amongst females and males (Emrich, Denmark, & Hartog, 2004). All these practices should result in a high female participation in entrepreneurship in countries high in gender egalitarianism.

H8: Gender egalitarian is positively related to female entrepreneurship.

Method

Sample

We based our analyses on 42 countries data for both cultural practices (GLOBE) (taken from House et al (2004)) and entrepreneurship activity (taken from the series reports of GEM (Acs, Arenius, Hay, & Minniti, 2004; Bosma & Harding, 2006; Bosma, Jones, Autio, & Levie, 2007; Minniti et al., 2005; Reynolds, Bygrave, & Autio, 2003; Reynolds, Bygrave, Autio, & Hay, 2002; Reynolds, Camp, Bygrave, Autio, & Hay, 2001) are available for these countries: Argentina, Australia, Austria, Brazil, Canada, China, Colombia, Denmark, Ecuador, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan,

Kazakhstan, Korea, Malaysia, Mexico, New Zealand, Netherlands, Philippines,

Poland, Portugal, Russia, Singapore, Slovenia, South Africa, Spain, Sweden,

Switzerland, Thailand, Turkey, United Kingdom, United States, and Venezuela.

Following with the classification of GEM, it includes 24 high GDP countries and 18

low-and-medium GDP countries (the cutting point of GDP per capita is around 20,000

US$).

Measurement

   National culture: We used the data of national cultures from the GLOBE project

to measure cultural practices (House et al., 2004). This instrument is based on 39

items, with a 7-point scale, measuring the nine cultural dimensions discussed in the

theoretical section (Hanges & Dickson, 2004). We only used societal culture practices

('As Is') in our study because cultural practices show higher correlations with

objective societal characteristics than the "Should Be" scales (Javidan, House, &

Dorfman, 2004).

   Entrepreneurial activities: Since the number of participating countries of the

GEM project varied from year to year, and not all countries participated in each year,

we utilized GEM data from several years and computed the average score across these

years. National cultures are stable for a long time (Braudel, 1987). Due to economic

cycles and changes across time in entrepreneurship activities, averaging the

entrepreneurial activities takes out random fluctuations and makes it possible to

measure national cultures and entrepreneurial activities on the same level of relative

stability across time.

   We used six indicators of entrepreneurial activities reported by the GEM Project

(Acs et al., 2004; Bosma & Harding, 2006; Bosma et al., 2007; Minniti et al., 2005; Reynolds et al., 2003; Reynolds et al., 2002; Reynolds et al., 2001). These six indicators fall into two groups: early-stage entrepreneurship and established entrepreneurship. The former includes early-stage entrepreneurship in general, high-expectation early-stage entrepreneurship and female early-stage entrepreneurship. The latter includes established entrepreneurship in general, high-growth established entrepreneurship and female established entrepreneurship. For the limitation of space, readers can refer to the serial GEM reports for the specific definition of each kinds of entrepreneurial activity.

To measure early-stage entrepreneurship activity in general, we used the data of the GEM studies in the years 2001 to 2007(Acs et al., 2004; Bosma & Harding, 2006; Bosma et al., 2007; Minniti et al., 2005; Reynolds et al., 2003; Reynolds et al., 2002; Reynolds et al., 2001). To measure high-expectation early-stage entrepreneurship, we utilized the data of GEM studies between 2000 and 2006 (Autio, 2007). To measure female early-stage entrepreneurial activity we employed the GEM data of 2006 and 2007 (Allen, Elam, Langowitz, & Dean, 2007).

Similarly, to measure established entrepreneurship in general, we utilized the data of established entrepreneurship in general between years 2005 and 2007 (Bosma & Harding, 2006; Bosma et al., 2007; Minniti et al., 2005). To measure high-growth established entrepreneurship, we included the GEM data between years 2000 and 2006 (Autio, 2007). Finally, the GEM data of the female established entrepreneurial activity in 2006 and 2007 were employed (Allen et al., 2007).

The number of countries was reduced to 32 countries for high expectation early stage entrepreneurship and high growth established entrepreneurship, because the

GEM project did not measure this information in 10 countries. Therefore, the set of analysis including these variables is based on a smaller sample size.

GDP^2: We employed the GDP per capita in 2005 in this study. GDP per capita was corrected for purchasing power and we used the data from the International Monetary Foundation (IMF, 2007).

Analysis method

We conducted canonical correlation analysis to test the relationship between our multiple measures of national cultures and of entrepreneurial activities. A canonical correlation is the correlation of two canonical (latent) variables, one representing a set of predictors, the other representing a set of dependent variables. Each set may be considered a latent variable based on measured indicator variables in its set. The canonical correlation is optimized such that linear correlation between the two latent variables is maximized. The purpose of canonical correlation is to explain the relation of the two sets of variables, not to model the individual variables.

To test the significance of the canonical correlation, we employed Wilks' lambda, In addition, we report canonical correlation R_c squared and the redundancy index. The redundancy coefficient measures the percent of the variance of the original variables of one set (here entrepreneurial activities) may be predicted from a canonical variable from the other set (here national culture dimensions). High redundancy means high ability to predict. Analogous to the squared determination coefficient in ordinary correlations, the squared canonical correlation is the percent of variance of the dependent set of variables explained by the independent set of variables. Canonical factor loadings are the correlations of a variable with the full set of variables. As a rule

of thumb, variables with canonical loadings of .45 or greater should be included in the interpretation (Baloglu, Weaver, & Mccleary, 1998).

We performed moderator regression analysis to test the interaction effects by following the instruction of Aiken and West (1991). We also draw corresponding figures by following the instruction of Dawson and Richter (2006) and the assistance of the program produced by Dawson (http://www.jeremydawson.co.uk/slopes.htm).

Results

Insert Table 1 about here

Table 1 displayed the descriptive statistics and intercorrelations of the studied variables. The results show that the richer the countries, the less active they are on entrepreneurial 'quantity' (for early-stage entrepreneurship, r= -.56, p< .01; for established entrepreneurship, r= -.34, p< .05). Similarly, high GDP countries are also less active on female early-stage entrepreneurship (r= -.45, p< .01). On the other hand, high GDP countries are more active in high 'quality' entrepreneurship (for high-growth established entrepreneurship, r= .44, p< .05).

Insert Table 2 and 3 about here

The results of the canonical correlations are presented in Table 2. Our first hypothesis assumed a positive relationship between national culture and early-stage entrepreneurial activity. The canonical correlation analysis of Model 1 (relating early-stage entrepreneurship to national cultures) rendered one significant correlation of .80 (Table 2). Multivariate test including Wilks' Lamda and Chi-square test also supported that this three-function solution fitted the data well. Table 2 also showed that for early-stage entrepreneurship, the total redundancy index was 56.5% (the sum

of 30.60, 14.40 and 11.50). Thus, 56.5% per cent of the variance in the early-stage entrepreneurship set was explained by cultural values. The first and significant function contributed the most to the total redundancy. Thus, Hypothesis 1 was supported for the relationship between national cultures and early-stage entrepreneurship. Meanwhile, Model 2 (analyzing the canonical correlations between cultural variables and established entrepreneurial activities) did not produce significant results (There is no significant function and only 36.60% of variance in the set of established entrepreneurship was explained).

The canonical factor loadings of the first model (between the variables that make up national culture and early stage entrepreneurship) are presented in Table 3. Only the first function related to the significant canonical correlation can be used for interpretation. Table 3 shows that the first canonical function was made up of early-stage entrepreneurial activity in general and female early-stage entrepreneurship (the canonical factor loading were .75 and .93, respectively), but not high-expectation early-stage entrepreneurship (the canonical factor loading was .09). Furthermore, Table 3 shows that four cultural variables displayed factor loadings above .45 on early-stage entrepreneurship. This indicates that in-group collectivism (.57) and humane orientation (.50) were positively related to early-stage entrepreneurship whereas uncertainty avoidance (-.47) and gender egalitarianism (-.58) were negatively related to early-stage entrepreneurship. In addition, it also shows that the other five cultural practice variables, which include assertiveness, societal collectivism, power distance, performance orientation and future orientation, were not significantly related to early-stage entrepreneurial activities (the corresponding factor loadings were -.30, -.05, .35, -.02 and -.31, respectively). Therefore, we have to reject Hypothesis 2a,

which assumes that assertiveness is negatively related to female entrepreneurship, and

Hypothesis 6a, which assumes that performance orientation is positively related to

entrepreneurial activities. Meanwhile, Hypothesis 4a (humane orientation is positively

related to entrepreneurship) and Hypothesis 7a (uncertainty avoidance is negatively

related to early-stage entrepreneurship) are supported. In contrast, Hypothesis 8,

which assumed that gender egalitarian is positively related to female entrepreneurship,

is rejected. The results show that the opposite effect may be true because the factor

loading was negative. Finally, since the canonical correlation between national

cultures and established entrepreneurial activities in Table 2 were not significant, we

have to reject Hypotheses 6a (performance orientation is positively related to

high-growth entrepreneurship) and 7b (uncertainty avoidance is positively related to

high-growth established entrepreneurship).

Insert Table 4 about here

Table 4 presents the results of hierarchical regression analyses investigating the

effects of the moderator GDP per capita on the relationships between cultural

variables and various kinds of entrepreneurial activities. Since we tested 54 models (9

cultural practice x 6 entrepreneurial activities) and there is a lot of information, which

needs to be presented, we only report the results in the second step of hierarchical

regression analyses, where we introduced the interaction effects into the equation. The

most important information in Table 4 relates to the moderator effects. The fact that

only eleven moderator effects are significant among 54 models may at first sight look

like a small effect. However, the explained variances ($\triangle R^2$) are quite high (going up

to 25%), and even the non-significant effects often explain up to 5 % additional

variance – a result that is unusually high in moderated regression analyses (Aiken &

West, 1991). We interpret this to mean that a higher number of participating countries would have produced more significant effects. All of these interaction effects exist even when the direct effects of GDP and the particular cultural variable are controlled for. The eleven significant moderator effects are also displayed in Figure 1.

Insert Figure 1 about here

They show a rather uniform picture: In each case there was a cross-over effect, meaning that a high degree of cultural variables (particularly on those traditional values including low assertiveness, high in-group collectivism and high power distance) leads to high entrepreneurship in the low-and-medium GDP societies, while there was a negative slope in high GDP societies – here higher values on the above cultural factors contribute to a decreasing degree of entrepreneurship. We discuss the specific interaction effect below.

For assertiveness, Table 4 shows that after controlling for GDP and assertiveness, the interaction item between them was significant in predicting for high expectation early-stage entrepreneurship (the beta was .50, p< .05; the $\triangle R^2$ is .19, p< .05) and female established entrepreneurship (the beta was .35, p< .05; the $\triangle R^2$ was .11, p< .05). Figures 1(1) and 1(2) shows that in low-and-medium GDP countries, increasing assertive culture decreased high-expectation early-stage entrepreneurship and female established entrepreneurship, whereas in high GDP countries, increasing assertive culture increased high-expectation early stage entrepreneurship, but did not affect female established entrepreneurship. This result confirmed our Hypothesis 2b, which assumes that in low-and-medium GDP societies there is a negative relationship between assertiveness and entrepreneurship, while in high GDP societies, this relationship is positive.

For in-group collectivism, Table 4 shows that after controlling for GDP and in-group collectivism, the interaction term between them was significant in predicting for early-stage entrepreneurship (the beta was -.33, p< .05; the $\triangle R^2$ was .08, p< .05), established entrepreneurship (the beta was -.41, p< .05; the $\triangle R^2$ was .12, p< .05) and female early-stage entrepreneurship (the beta was -.63, p< .01; the $\triangle R^2$ was .25, p< .01). Figures 1(3), 1(4) and 1(5) show that in low-and-medium GDP countries with increasing in-group collectivism there was an increase of early-stage entrepreneurship in general, female early-stage entrepreneurship and established entrepreneurship. In contrast in high GDP countries in-group collectivism was not related to these three kinds of entrepreneurial activities. This result supported our Hypothesis 3, which assumes that there is an interaction effect of GDP and in-group collectivism. In low-and-medium GDP countries, there should be a positive relationship between in-group collectivism and entrepreneurship, but there should be no such relationship in high GDP countries.

For humane orientation, Table 4 shows that after controlling for GDP and humane orientation, the interaction term between them was significant in predicting for established entrepreneurship (the beta was -.27, p< .10; the $\triangle R^2$ was .06, p< .10). Figure 1(6) shows that in both low-and-medium GDP and high GDP countries, an increase of humane orientation was related to established entrepreneurship, but the add-on effect in low-and-medium GDP countries is more pronounced than the add-on effect in high GDP countries. This supports our Hypothesis 4b, which assume that there is an interaction effect: The positive relationship between humane orientation and entrepreneurship is stronger in low-and-medium GDP countries than in high GDP countries.

For power distance, Table 4 shows that after controlling for GDP and power distance, the interaction term between them was significant in predicting for early-stage entrepreneurship in general (the beta was -.37, p< .05; the $\triangle R^2$ was .09, p< .05), female early-stage entrepreneurship (the beta was -.41, p< .05; the $\triangle R^2$ was .10, p< .05) and female established entrepreneurship (the beta was -.33, p< .10; the $\triangle R^2$ was .07, p< .10). Figures 1(7), 1(8) and 1(9) show that that in low-and-medium GDP countries, increasing power distance is related to early-stage entrepreneurship, female early-stage entrepreneurship and female established entrepreneurship, whereas in high GDP countries higher power distance was related to slightly decreased entrepreneurial activities. Thus, these results supported our Hypothesis 5, which assumes that there is an interaction effect between GDP and power distance on entrepreneurial activity: While there is a positive relationship between power distance and entrepreneurship in low-and-medium GDP countries, there is no such relationship in high GDP countries.

For uncertainty avoidance, Table 4 shows that after controlling for GDP and uncertainty avoidance, the interaction term between them was marginally significant in predicting for high expectation early-stage entrepreneurship (the beta was -.41, p< .10; the $\triangle R^2$ was .11, p< .10). Figure 1(10) also shows that in low-and-medium GDP countries high uncertainty avoidance is related to increased high-expectation early-stage entrepreneurship, whereas in high GDP countries, low avoidance is related to low high-expectation early-stage entrepreneurship. Since we did not develop any hypothesis on this interaction effect, we regard this finding as an exploratory result. We interpret the above finding as such: In low-and-medium GDP countries, high uncertainty avoidance can be functional because owners can reduce the risk associated

with venturing in resource constraint environments, for example by planning,

environment scanning and creating a safe environment for experimentation and

innovation. In high GDP countries, uncertainty avoidance has negative effects on

high-expectation early-stage entrepreneurship because uncertainty avoidance

increases resistance to innovation and growth although the environment provides the

resources to do so.

Table 4 also shows that after controlling for GDP and future orientation, the

interaction term between them was significant in predicting for high-growth

established entrepreneurship (the beta was .44, p< .10; the $\triangle R^2$ was .12, p< .10).

Figure 1(11) also shows that in low-and-medium GDP countries, high future

orientation is related to low decreased high-growth established entrepreneurship,

whereas in high GDP countries there is a small positive relationship between future

orientation and high-growth established entrepreneurial activity. Similarly, since we

did not develop any hypothesis on future orientation, we regard this finding as an

exploratory result. Future orientation might help to implement and sustain growth in

resource constraint environments. In high GDP countries, the environment does not

require future-oriented behavior. Instead, it requires anticipation and exploitation of

available opportunities in the markets.

Discussions

The prevalence of entrepreneurial activity differs strongly between countries

(Freytag & Thurik, 2007). This study addressed the role of cultural practice to explain

country level differences in entrepreneurial activity. We were motivated to conduct

this study because the role of culture on entrepreneurial activity seems to be under

researched (Hayton et al., 2002). Moreover, cross-cultural research indicated that the role of culture is much more complex than previous entrepreneurship research has suggested; for example both direct and moderator effects need to be considered at the same time. Finally, recent conceptualizations of culture allow a theoretically and empirically rigor test of the relationship between culture and entrepreneurial activity to be applied. In general, our study indicated that entrepreneurial activity is explained by the match between culture and national wealth.

We found that culture as a whole affects early-stage entrepreneurial activity. The multivariate effect of cultural practices explained 56.5 % of variance in early-sage entrepreneurial activity. This is a substantial effect size that stimulated us to decompose the effect of specific cultural practice. Cultural practices that were directly related to early-stage entrepreneurial activity were in-group collectivism, humane orientation, low uncertainty avoidance and low gender egalitarian. It is interesting that cultural practices are positively related to the prevalence of early-stage entrepreneurship while we did not find any relationship between cultural practices and other types of entrepreneurial activity, such as the prevalence of established entrepreneurship. We interpret this finding to reflect a relatively direct effect of cultural practices on the decision to start an enterprise. Once the enterprise is established, institutional and economic variables affect the venture as well, and therefore, the overall effect of culture is reduced.

The most interesting findings are certainly the moderator effects reported in Table 4. We interpret all of the cultural variables to signify a certain kind of traditionalism – cultures with high in-group collectivism, high power distance, and high humane orientation can be interpreted to be more traditional than the one with

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low values on these dimensions. In most of the cases there are strong positive slopes between these cultural dimensions and entrepreneurial activity in low-and-medium GDP countries and negative slopes in high GDP countries. This means that if there is large national wealth, traditional cultures pay with a lower degree of entrepreneurship (both in terms of early stage entrepreneurship and established entrepreneurship) while in those societies with little wealth, the traditionalism of the culture actually helps in the development of entrepreneurship.

Implications

This study is among the few attempts in the entrepreneurship literature to provide insights into the role of culture on country level entrepreneurial activity. While we find that culture does matter, the question of how it matters is also addressed. Our results indicate that entrepreneurship theory needs to include culture in a model explaining entrepreneurship. Moreover, while we found some direct effects of culture on entrepreneurial activity, the more interesting finding was that culture interacts with national wealth (measured as GDP). It is well known that wealth is negatively related to the amount of entrepreneurial activity (e.g., Wennekers et al., 2007). We found that the effect of culture on entrepreneurial activity depends on the economical development of a country. Thus, entrepreneurship theory needs to address the interactions between culture and other variables. Such potential moderators might include the institutional environment (Lee et al., 2007), which is shaped by cultural values (Hofstede, 1980). For example, cultural values might be less important in societies with a strong institutional context because tight regulations and legislations do determine individuals' decisions rather than cultural values. In societies with a

weak institutional context, culture may function as a support system for entrepreneurial activities.

Second, our study indicated the importance of cultural dimensions that have been ignored in previous entrepreneurship literature. These dimensions were, for example, humane orientation and assertiveness. Actually, humane orientation was the cultural value predicting entrepreneurship most strongly in our analysis. Humane orientation supports entrepreneurship because it provides support in case of errors and failure. Moreover, assertiveness is positively related to entrepreneurship activities in high GDP countries, while this relationship is negative in low-and-medium GDP countries. As such, future research should analyze the effect of these new dimensions, as well as their interaction with national wealth, rather than focusing solely on the dimensions proposed by Hofstede (1980).

Third, our finding that national culture plays a different role on entrepreneurial activities depending on the economic development has important practical implications. Most theories in entrepreneurship research were developed in the Western and wealthy countries. Without specifying the cultural context to which such theories apply, one assumes that the effectiveness of entrepreneurial values is universally valid in different countries. However, our study indicates that culture plays a different role in fostering entrepreneurial activity. The practices that are successful in one culture may very well be dysfunctional in other cultures. Therefore, it would be ill advice to suggest that, for example, individual rewards and tolerance to uncertainty per se stimulate entrepreneurial activity. Rather, practice recommendations need to take the cultural context into account.

Limitations

Some limitations need to be discussed in order to assess the generalizability of our results. First, although our analysis has a decent sample size for studies of this kind, there are restrictions with an N of 42 and this clearly affected the range of statistical procedures possible and the way we approached our data. On the other hand, we relied on data from two independent datasets and, therefore, there is no common method bias in our analysis.

Second, we studied culture at the national level to predict prevalence rates at the national level. Thus, there was a good match between the independent and dependent variables in our study. Moreover, the study variables were based on validated measurement. However, we do not propose that culture directly affects an individual's decision to start up a company. Culture is a multi-level construct with reciprocal relationships between different levels of culture (Erez & Gati, 2004). In order to study how the effects of culture are transmitted to individual-level activity, one needs to study multiple levels of culture. Thus, our study results should be generalized to the country level and not to the level of the individual entrepreneur.

We assumed that wealth (GDP) is the moderator affecting the strength of the relationship between culture and entrepreneurial activity. However, we cannot rule out alternative explanations. For example, some additional socio-economic variables may affect entrepreneurial activity. Moreover, while a negative relationship between entrepreneurship and GDP is well established, Wennekers at al (2007) suggested that culture moderated the relationship between income and entrepreneurship. Our objective was different here: We were interested to test whether or not cultural practices are efficient in a certain context.

We cannot assess reverse causality here although we think that it is unlikely that entrepreneurial activity affects the relatively stable culture. It would be interesting to include repeated measures of culture and entrepreneurial activity in a study in order to address the dynamics of entrepreneurship, although the lack of available data may inhibit such an effort at least in the near future.

Future directions

Our results suggest several areas for future research on the role of culture on entrepreneurial activity. First, future research needs to include culture as an antecedent construct into models of entrepreneurial behavior in order to test the boundaries of the theory. Culture can be studied as a distal variable to explain entrepreneurship. However, it would be oversimplified to analyze only direct effects of culture on entrepreneurial behavior, assuming that some countries are more entrepreneurial simply because the citizens have more entrepreneurial values. Culture interacts with economic variables and such interactions need to be identified in order to contribute to entrepreneurship theory and practice recommendations.

Second, future studies should include more than one level of culture into their design (Erez & Gati, 2004). Cultural levels that might be important in entrepreneurship research include national culture, firm culture and the owners' cultural orientations. While such different levels reciprocally affect each other, they may not match with each other (Morris, Davis et al., 1993). For example, an owner from a high power distance country may very well establish flat hierarchies in his venture in order to stimulate experimentation and innovation. Moreover, addressing

different levels of culture allows a more dynamic model of culture's consequences to be developed.

Finally, entrepreneurship research should rely on more sophisticated approaches of culture and study the effectiveness of multiple dimensions of culture. While there is no doubt that the Hofstede (1980) model has its value (but also critics) in the literature, there are alternative conceptualizations of culture in the literature (House et al., 2004; Koenig, Frese, Steinmetz, Rauch, & Wang, 2007; Schwartz, 1992; Triandis, 1994). Such different conceptualizations of cultures can affect the results. For example, Wennekers et al. (2007) used Hofstede's (1980) framework to study entrepreneurship in 23 OECD-countries and concluded that there is a positive relationship between uncertainty avoidance and entrepreneurial activity. Using more countries and relying on the GLOBE study (House et al., 2004), our study reports a negative relationship between uncertainty avoidance and entrepreneurship activity. Such differences may be due to different conceptualizations of national culture. Therefore, the selection of the appropriate model of culture should be based on sound theoretical and empirical arguments.

Notes:

1. Schwartz and Bilsky (1990) argued for a distinction between in-group collectivism and societal collectivism (which was put into effect by the GLOBE study). Societal collectivism reflects the degree to which institutional practices encourage and reward collective distribution of resources and collective action. Our arguments on the moderator effects of GDP work only for in-group collectivism, but not for societal collectivism. As a matter of fact, we are silent on the effects of societal collectivism.

2. In additional to national wealth, we also tested one institutional variable – Entrepreneurship Framework Conditions (EFC), which was employed in GEM reports –as the potential moderator variable. The results showed that EFC was only negatively related to high expectation early-stage entrepreneurship ($r= -.43$, $p< .05$). There was no any significant direct effect of EFC in predicting for entrepreneurship after controlling GDP. In addition, there was no any significant interaction effect between EFC and cultural variables in predicting for entrepreneurship. Because of space limitations, we do not report the relevant results in this paper. However, the results are available from the first author on request.

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Table 1. The intercorrelations matrix of this study (with means, S.D. and sample size).

	Mean	S.D.	N	1	2	3	4	5	6	7	8
1. GDP per capita (US $)	20165	12247	42	--							
2. Performance orientation	4.11	0.43	42	.29	--						
3. Future orientation	3.90	0.50	42	.45**	.68**	--					
4. Assertiveness	4.14	0.36	42	.12	.02	.02	--				
5. Societal collectivism	4.29	0.46	42	.16	.47**	.50**	-.53**	--			
6. In-group collectivism	5.03	0.75	42	-.74**	-.21	-.41**	.08	-.22	--		
7. Gender egalitarian	3.43	0.36	42	-.03	-.42**	-.20	-.12	-.07	-.07	--	
8. Humane orientation	4.03	0.47	42	-.27	.26	.17	-.53**	.43**	.17	-.10	--
9. Power distance	5.16	0.39	42	-.54**	-.42**	-.60**	.08	-.46**	.72**	-.16	-.10
10. Uncertainty avoidance	4.21	0.65	42	.51**	.62**	.79**	-.15	.43**	-.60**	-.15	.06
11. Early-stage entrepreneurial activity	10.09	6.99	42	-.56**	.06	-.25	-.14	-.09	.45**	-.21	.53**
12. Established entrepreneurship in general	6.89	3.97	42	-.34*	.12	-.11	-.27	.02	.30	-.21	.51**
13. High-expectation early-stage entre.	0.67	0.42	32	.19	.48*	.02	-.09	.17	-.08	-.14	.40*
14. High-growth established entrepreneurship	8.99	3.58	32	.44*	.37	.39*	-.06	.34	-.29	.17	.16
15. Female early-stage entrepreneurship	7.50	6.48	42	-.45**	.02	-.22	-.28	.10	.47**	.04	.55**
16. Female established entrepreneurship	4.56	3.19	42	-.27	-.07	-.22	-.32*	-.02	.28	-.11	.40*

Table 2. (Continued)

	9	10	11	12	13	14	15
9. Power distance	--						
10. Uncertainty avoidance	-.65**	--					
11.Early-stage entrepreneurial activity in general	.37*	-.30	--				
12. Established entrepreneurship in general	.22	-.12	.72**	--			
13.High-expectation early-stage entre.	-.19	.19	.51**	.43*	--		
14.High-growth established entrepreneurship	-.41*	.45*	-.03	.05	.64**	--	
15.Female early-stage entrepreneurship	.30	-.34*	.67**	.70**	.35	-.17	--
16.Female established entrepreneurship	.24	-.27	.47**	.64**	.18	-.31	.72**

Note: ** significant at .01 level. *significant at .05 level (2-tailed).

Table 2. Measures of overall model fit and multivariate tests of significance (with redundancy analysis)

	Canonical function	Canonical correlation	Wilks' Lamda	Chi-SQ	DF	Sig.	Canonical R^2	Proportion of variance of entrepreneurial activities explained by culture (redundancy analysis)
Model 1: Early-stage Entrepreneurship	1	.80*	.09	41.80	27	.03	.64	30.60
	2	.71+	.25	24.07	16	.09	.50	14.40
	3	.70+	.50	12.00	7	.10	.49	11.50
Model 2: Established Entrepreneurship	1	.75	.24	24.73	27	.59	.56	21.70
	2	.62	.56	10.29	16	.85	.38	11.90
	3	.32	.90	1.86	7	.97	.10	3.00

Note: The sample size in the above calculation is 32.

Table 3. Canonical factor loadings between variables and their corresponding canonical functions

		Early-stage entrepreneurship: Canonical Loadings		
		1	2	3
National Cultural Practice	1. Assertiveness	-.30	-.47	-.29
	2. In-group Collectivism	.57	-.25	-.24
	3. Societal Collectivism	-.05	.42	.59
	4. Humane orientation	.50	-.11	.54
	5. Power distance	.35	-.10	-.48
	6. Performance orientation	-.02	-.24	.59
	7. Future orientation	-.31	.14	.33
	8. Uncertainty avoidance	-.47	-.06	.32
	9. Gender egalitarian	-.58	.00	-.09
Entrepreneurship Activity				
Early-stage entrepreneurship	1. Early-stage entrepreneurial activity in general	.75	-.65	.12
	2. High-expectation early-stage entrepreneurship	.09	-.66	.74
	3. Female early-stage entrepreneurship	.93	.05	.36

Note: the sample size is 32. There were fewer participating countries for the two variables high-expectation early stage entrepreneurship and high-growth established entrepreneurship (as indicated in Table 1 – we had these data only for 32 countries). To test for the robustness of the canonical correlation, we redid the canonical correlations leaving out these two variables and, thus, including 42 countries in this analysis. We received essentially the same results as when we included these two variables.

Table 4. Moderator analysis of cultural practice and GDP on entrepreneurial activities

Early-stage entrepreneurship	Assertiveness	In-group collectivism	Societal collectivism	Humane Orientation	Power distance	Performance orientation	Future orientation	Uncertainty avoidance	Gender egalitarian
GDP	-.60**	-.41*	-.63**	-.47**	-.51**	-.71**	-.66**	-.63**	-.62**
Culture	-.11	.27	-.05	.40**	.29$^+$	.25$^+$	.02	.01	-.23$^+$
Interaction	.16	-.33*	.18	-.11	-.37*	.09	.12	.07	.01
R^2	.41	.45	.41	.53	.47	.45	.39	.38	.43
$\triangle R^2$	.02	.08*	.03	.01	.09*	.01	.01	.01	.00
$\triangle F$	1.54	5.22*	1.79	.80	6.57*	.48	.86	.28	.00

Established entrepreneurship	Assertiveness	In-group collectivism	Societal collectivism	Humane Orientation	Power distance	Performance orientation	Future orientation	Uncertainty avoidance	Gender egalitarian
GDP	-.34*	-.09	-.38*	-.16	-.31$^+$	-.41*	-.42*	-.42*	-.39*
Culture	-.29$^+$	.40	.10	.48**	.21	.29$^+$	.07	.10	-.23
Interaction	.22	-.41*	-.05	-.27$^+$	-.27	-.20	.02	-.01	.00
R^2	.24	.26	.15	.39	.19	.24	.15	.15	.20
$\triangle R^2$	.05	.12*	.00	.06$^+$	.05	.04	.00	.00	.00
$\triangle F$	2.08	5.52*	.10	3.56$^+$	1.94	1.54	.01	.01	.00

High Expectation entrepreneurship	Assertiveness	In-group collectivism	Societal collectivism	Humane Orientation	Power distance	Performance orientation	Future orientation	Uncertainty avoidance	Gender egalitarian
GDP	.17	.17	.12	.08	.04	-.03	.03	.12	.16
Culture	-.34	.16	.33	.42$^+$	-.24	.41$^+$	-.22	.37	-.17
Interaction	.50*	-.19	-.33	-.04	.08	.11	.38	-.41$^+$	.15
R^2	.21	.03	.11	.17	.04	.23	.10	.15	.05
$\triangle R^2$	.19*	.02	.08	.00	.00	.01	.08	.11$^+$	.02
$\triangle F$	5.41*	.46	1.90	.02	.07	.19	2.15	2.90$^+$	.44

High growth entrepreneurship	Assertiveness	In-group collectivism	Societal collectivism	Humane Orientation	Power distance	Performance orientation	Future orientation	Uncertainty avoidance	Gender egalitarian
GDP	.49**	.34	.43*	.45*	.34$^+$	.38$^+$	.37$^+$	.45*	.47*
Culture	-.42**	-.18	.45*	.29	-.34	.28	-.27	.21	-.03
Interaction	.31	.01	-.26	-.08	.06	.04	.44$^+$	-.19	.05
R^2	.35	.23	.35	.28	.28	.29	.33	.25	.21
$\triangle R^2$	.07	.00	.05	.00	.00	.00	.12$^+$	.02	.00

	Assertiveness	In-group collectivism	Societal collectivism	Humane Orientation	Power distance	Performance orientation	Future orientation	Uncertainty avoidance	Gender egalitarian
$\triangle$F	2.50	.00	1.61	.11	.05	.02	3.95^{+}	.74	.06

Female early stage entrepreneurship	Assertiveness	In-group collectivism	Societal collectivism	Humane Orientation	Power distance	Performance orientation	Future orientation	Uncertainty avoidance	Gender egalitarian
GDP	-.47**	.07	-.53**	-.32*	-.42*	-.58**	-.55**	-.47**	-.54**
Culture	-.28+	.77**	.20	.47**	.31	.20	.00	-.13	.01
Interaction	.23	-.63**	-.07	-.21	-.41*	.00	.12	.10	-.19
R^2	.36	.53	.30	.49	.37	.30	.28	.28	.30
$\triangle R^2$	.05	.25**	.00	.04	.10*	.00	.01	.01	.03
$\triangle$F	2.60	17.92**	.21	2.61	5.53*	.00	.63	.44	1.67

Female Established entrepreneurship	Assertiveness	In-group collectivism	Societal collectivism	Humane Orientation	Power distance	Performance orientation	Future orientation	Uncertainty avoidance	Gender egalitarian
GDP	-.30*	-.16	-.37*	-.23	-.26	-.37*	-.36*	-.30	-.38*
Culture	-.37*	.26	.03	.34	.29	.04	-.10	-.12	-.13
Interaction	.35*	-.26	.02	-.11	-.33^{+}	-.01	.12	-.02	-.09
R^2	.32	.17	.13	.24	.20	.13	.15	.14	.15
$\triangle R^2$	.11*	.04	.00	.01	.07^{+}	.00	.01	.00	.01
$\triangle$F	5.73*	1.75	.01	.49	2.85^{+}	.01	.54	.02	.32

Note: ** significant at .01 level; * significant at .05 level; $^{+}$significant at .10 level. The sample size is 42. Only the results in the second step of hierarchical regression analysis were presented.

Figure 1. The Relationships between culture dimensions and entrepreneurial activities: GDP as a moderator
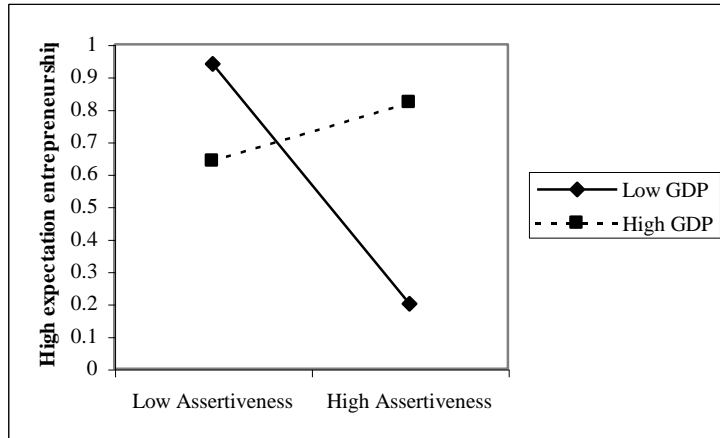

Figure 1(1). Assertiveness and GDP on high expectation entrepreneurship
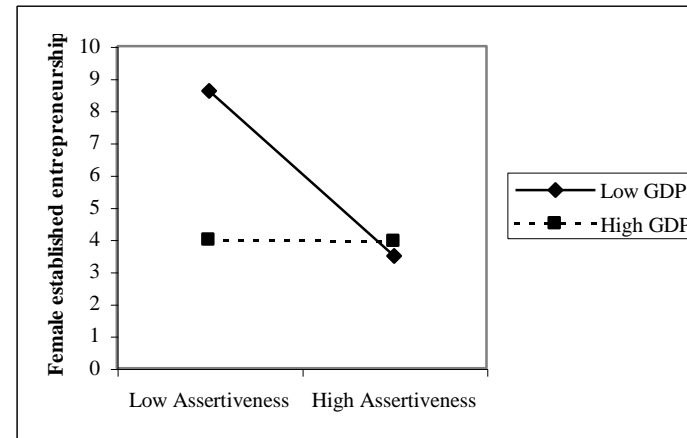

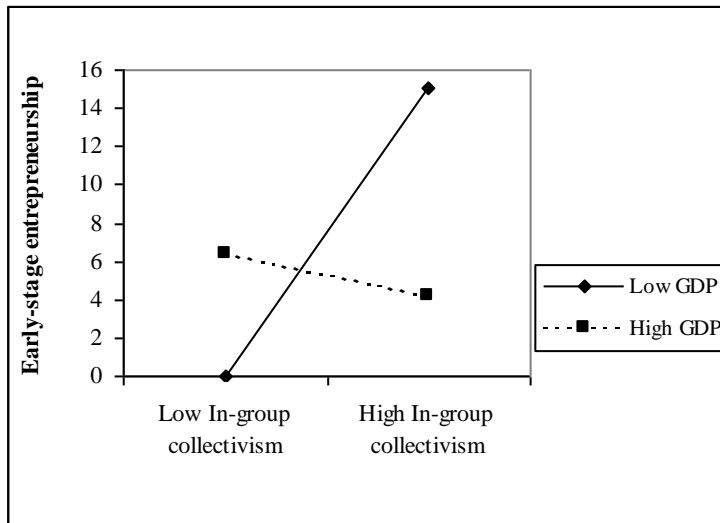Figure 1(2). Assertiveness and GDP on female established entrepreneurship

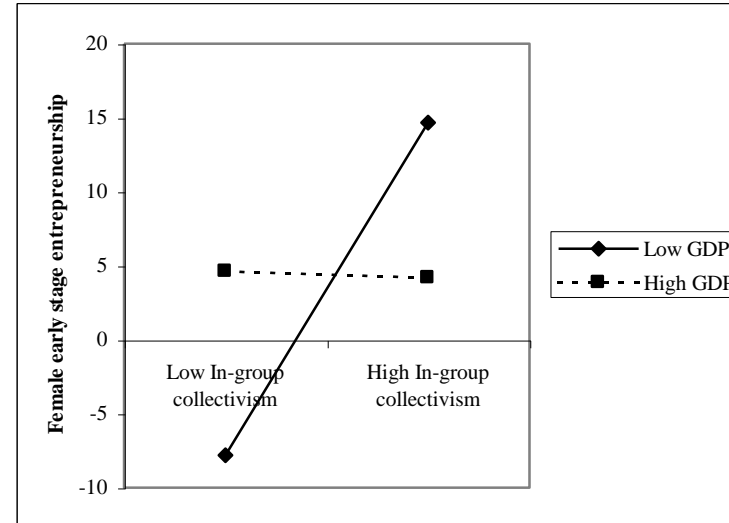Figure 1(3). In-group collectivism and GDP on early-stage entrepreneurs

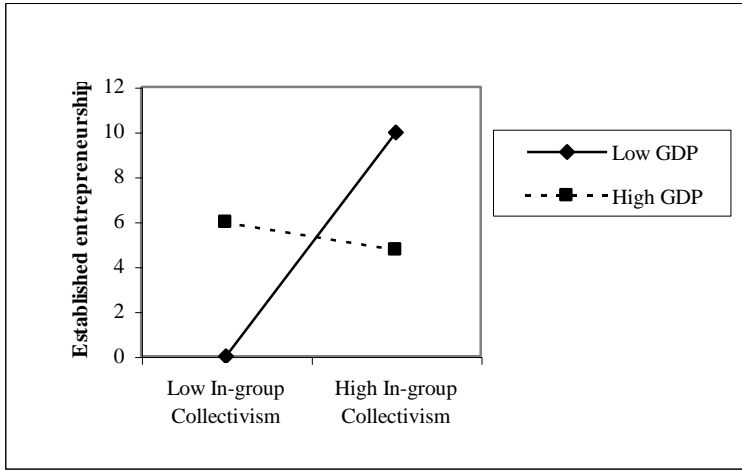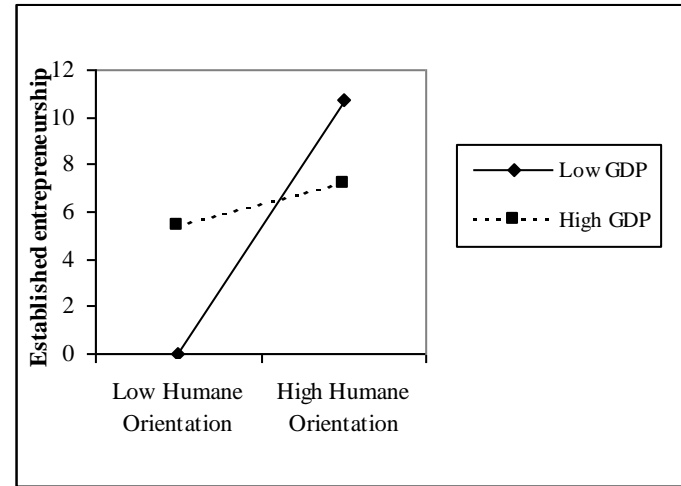Figure 1(4). In-group collectivism and GDP on female early-stage entrepreneurship

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Figure 1(5). In-group collectivism and GDP on established entrepreneurship

Figure 1(6). Humane orientation and GDP on established entrepreneurship
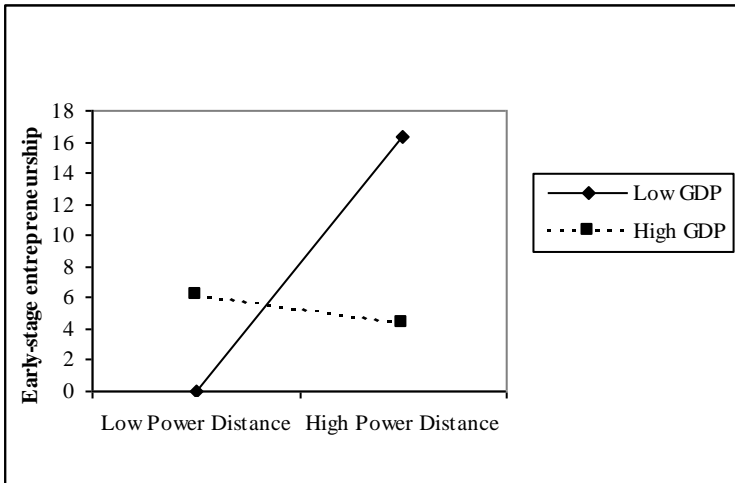
Figure 1(7). Power distance and GDP on early-stage entrepreneurship
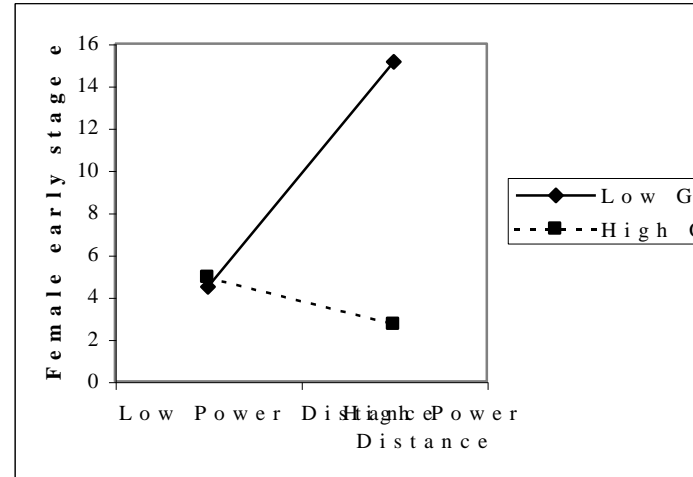
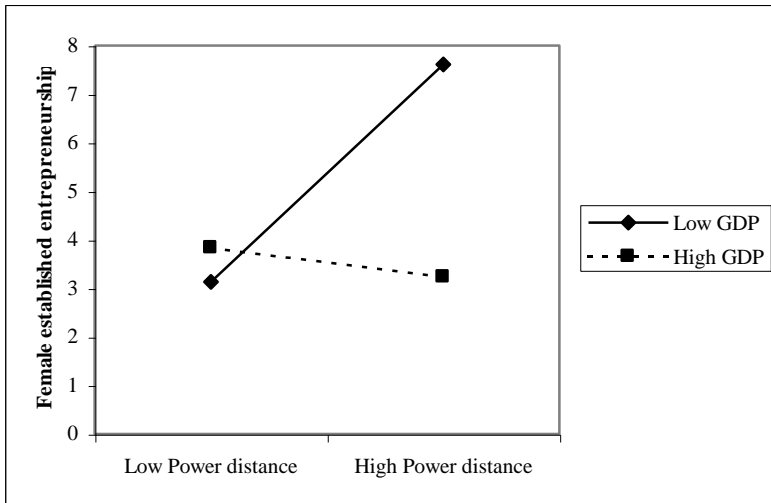Figure 1(8). Power distance and GDP on female early-stage entrepreneurship

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Figure 1(9).Power distance and GDP on female established entrepreneurship

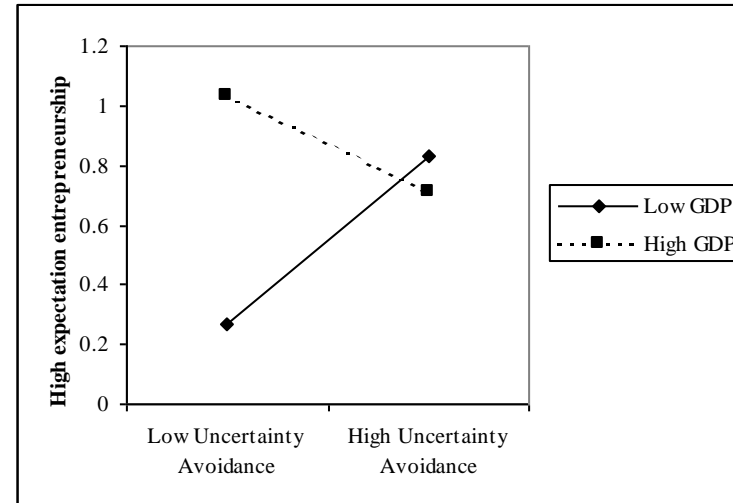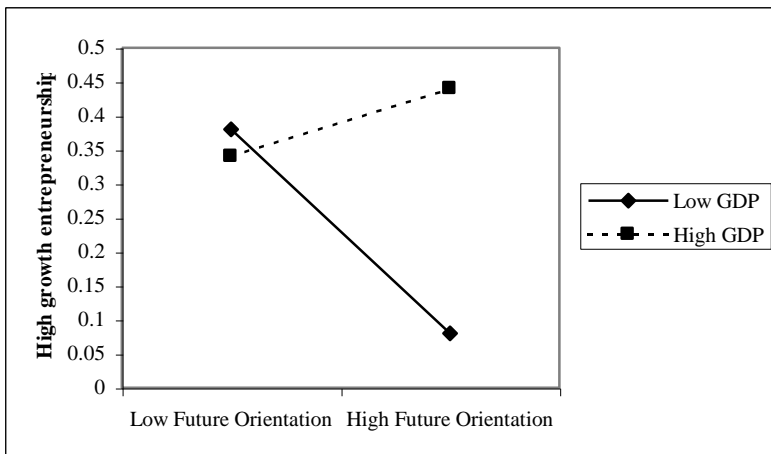Figure 1(10).Uncertainty avoidance and GDP on high-expectation entrepreneurship

Figure 1(11). Future orientation and GDP on high-growth entrepreneurship