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**INNOVATION ACROSS COUNTRIES: HOW DO NATION-LEVEL
INSTITUTIONAL ARRANGEMENTS INFLUENCE THE DEGREE OF
ENTREPRENEURIAL ACTIVITY**

DEVELOPING VS DEVELOPED COUNTRIES

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The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

ABSTRACT

In the past, various studies have investigated an explicit institutional approach by classifying the institutional arrangements into three pillars: regulative, cultural and normative. This paper specifically focuses on the regulative and cultural dimensions of institutions where control of corruption, rule of law and regulatory quality are studied as proxies of regulative institutional dimension. On the other hand, power distance, individualism and uncertainty avoidance are studied as proxies of cultural institutional dimensions. Most researchers suggest a clear direct influence of institutional arrangements on innovation as well as entrepreneurial activity. This thesis takes a different approach from past studies by investigating the mediating role of innovation in building an indirect relationship between institutional arrangements (regulative and cultural dimensions) and entrepreneurial activity. By adding a macroeconomic element to the mix, the research further attempts to compare the extent to which the relationship between institutional arrangements (regulative and cultural dimensions), innovation and entrepreneurial activity differs across developing and developed countries. Using a panel-data set drawn from World Bank, Hofstede's model and World Intellectual Property Organization for a sample of 132 countries during the years 2016-2021, the empirical results found that innovation mediates an indirect relationship between all chosen variables for regulative institutional dimension (control of corruption, rule of law and regulatory quality) and entrepreneurial activity. On the other hand, the empirical results found that only power distance and individualism have an indirect relationship with entrepreneurial activity, through innovation as a mediator. Moreover, an interesting find of the study was that the mediating role of innovation for institutional arrangements and entrepreneurial activity is stronger in developed countries.

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1. INTRODUCTION

Research on entrepreneurial activity started gaining recognition with the growing interest of quantifying the development process of new business ventures and understanding the phenomenon beyond attitudes and intentions. This entrepreneurial research suggests a potential link between entrepreneurial activity and economic development (Estrin et al., 2013) The emergence of self-employed individuals through entrepreneurship has led to job creation and economic growth in many economies. This has shifted the focus of policymakers into entrepreneurial regimes as they aim to prioritize economic development of the country. According to van Praag and van Stel (2013), policymakers have attempted to boost economic value creation by encouraging increased business ownership rates (BOR) in their respective countries.

Diving deep into the topic of entrepreneurial activity, various existing studies have found that the level of entrepreneurship differs across countries due to three crucial factors. The first factor suggests that the differences in entrepreneurship levels depends on varying types of entrepreneurships (Baumol, 1990). Wennekers et al. (2005) illustrates entrepreneurship into two types. **Opportunity entrepreneurship** includes entrepreneurs that identify business opportunities and voluntarily choose to start a business to grasp these opportunities. In contrast, **necessity entrepreneurship** discusses entrepreneurs that engage in starting a business due to lack of alternatives in the labor market. Naudé (2010) suggests that opportunity entrepreneurship occurs in developed countries where lack of formal business opportunities is not a problem while necessity entrepreneurship occurs specifically in developing countries where poverty levels are significant. Thus, in previous literature, opportunity and necessity entrepreneurship have been addressed occasionally to draw a comparison between developed and developing countries respectively.

The second factor suggests that differences in entrepreneurship levels depends on a country's economic development levels. Wennekers et al. (2005) have observed a U-shaped relationship between nascent entrepreneurship and economic development. From a graphical point of view of a U-form curve, the economic development indicator is measured by income per capita on the horizontal axis while the entrepreneurial activity rates are on the vertical axis. The implication of a U-shaped relationship is that as economies develop, entrepreneurial rates decline initially but then begin to rise again with increasing income per capita. In such a case, nascent entrepreneurial rates are high at two extreme points of income per capita, suggesting that entrepreneurial creation peaks in countries with extremely low economic development and high economic development (Vivarelli, 2012). However, Van Stel et al. (2005) found that some countries such as Belgium, France, Australia, Canada and US have the same level of economic development, but with differential rates of entrepreneurial activities which are not in line with the U-shaped relationship drawn by Wennekers et al. (2005). Thus, a possible explanation towards why countries with same levels of economic development tend to have a different entrepreneurial activity ratio, could be institutional differences prevalent across countries. Empirical evidence by Noorderhaven (2004)

supports the notion that cultural factors play a crucial role in justifying the differences in entrepreneurial rates across different countries.

Hence, the third factor suggests that the differences in entrepreneurship levels are due to distinctions in institutional settings. Valdez and Richardson (2013) suggest that an institutional perspective helps to explore the extent to which societal factors influence entrepreneurial activity. The authors highlight an explicit institutional approach to study the determinants of entrepreneurial activity by dividing the institutional settings into three dimensions: regulative, cultural and normative. The 'regulative' dimension represents a formal institution comprising of rules, laws, political rights and written constitutions enforced by the official authorities. The 'normative' dimension refers to an informal institution that creates stability in determining socially guided behavior, driven by morals and obligations. The 'cultural' dimension represents an informal institution that appeals to unwritten laws and cultural values enforced outside of the official environment. According to the framework proposed by Scott (1995), the institutional context facilitates entrepreneur's decision in starting a venture, the type of business they form, financing methods they employ and potential business growth opportunities. Thus, institutional framework is justified to assess the degree to which a society is entrepreneurial. Moreover, certain studies such as Hirsch (1997) and Trevino et al. (2008) found that that cultural-cognitive and normative pillars of institutional theory conceptually overlap in the institutional literature, which triggers potential empirical inconsistencies in the research. Furthermore, normative dimension of institution guides individual decision-making by defining expectations and shaping the value system. This normative system is more relevant in research that work with individual-level data to quantify the individualistic choices and expectations. Thus, I specifically focus on regulative and cultural dimensions of institutions to study potential determinants of innovation as well as entrepreneurship, using country-level data. In this paper, I study control of corruption, rule of law and regulatory quality as proxies of regulative institutional dimension whereas on the other hand, power distance, individualism and uncertainty avoidance are studied as proxies of cultural institutional dimensions.

Some studies have attempted to examine empirically how institutional factors affect entrepreneurial activity in a positive or a negative way. Nyström (2008) provides some theoretical perspectives regarding the direct relationship between regulative institutional factors and entrepreneurial activity, where the author uses legal structure and the security of property rights as formal institutional proxies. The theoretical perspectives show that countries with a better legal structure and more secured property rights encouraged entrepreneurial activities. Similarly, Dheer (2017) found a possible direct relationship between informal institutions and entrepreneurial activity, where the author demonstrated individualism as a proxy of cultural institutional factor. The study suggests that countries with individualistic societies, have a positive impact on the level of entrepreneurial activity prevalent in that country. This is reasoned with the fact that individualistic cultures favor personal recognition instead of collective achievements. Hence, these cultures can boost risk-taking initiatives in the business environment and encourage entrepreneurs to open new firms by establishing rewarding criteria (Hayton et al. 2002) Moreover, various

studies have attempted to investigate a direct link between institutions and innovation. For instance, Tebaldi et al. (2011) found a positive direct relationship between institutional arrangements and variation of patent production across countries. The authors found that regulative institutional arrangements such as control of corruption, sound market policies and effective judiciary system ease the process of patent application without a bureaucratic hassle. This in turn, boosts market entries and facilitates a country's rate of innovation as seen through the average rise in patent production of that country. Although several studies have researched on the topics of institutions, innovation and entrepreneurship, many gaps remain. One example of this gap is that previous studies do not explain the indirect effects of institutional arrangements on entrepreneurship through innovation. As previously discussed, existing studies have found a direct relationship between institutional arrangements and entrepreneurial activity. Additionally, the researchers have also found a direct relationship between institutional arrangements and innovation across countries. Moreover, authors such as González- Pernía et al. (2015) have established a direct link between innovation and entrepreneurial activity across countries. Hence, based on the established direct links amongst the stated concepts, we can derive that innovation plays a crucial role in influencing entrepreneurial activity while on the other hand, the institutional arrangements have a substantial direct impact on both innovation as well as entrepreneurial activity. Hence, the research attempts to highlight the extent to which innovation could be a mediator towards building a relationship between institutional arrangements (regulative and cultural dimensions) and entrepreneurial activity, as seen in figure 1.

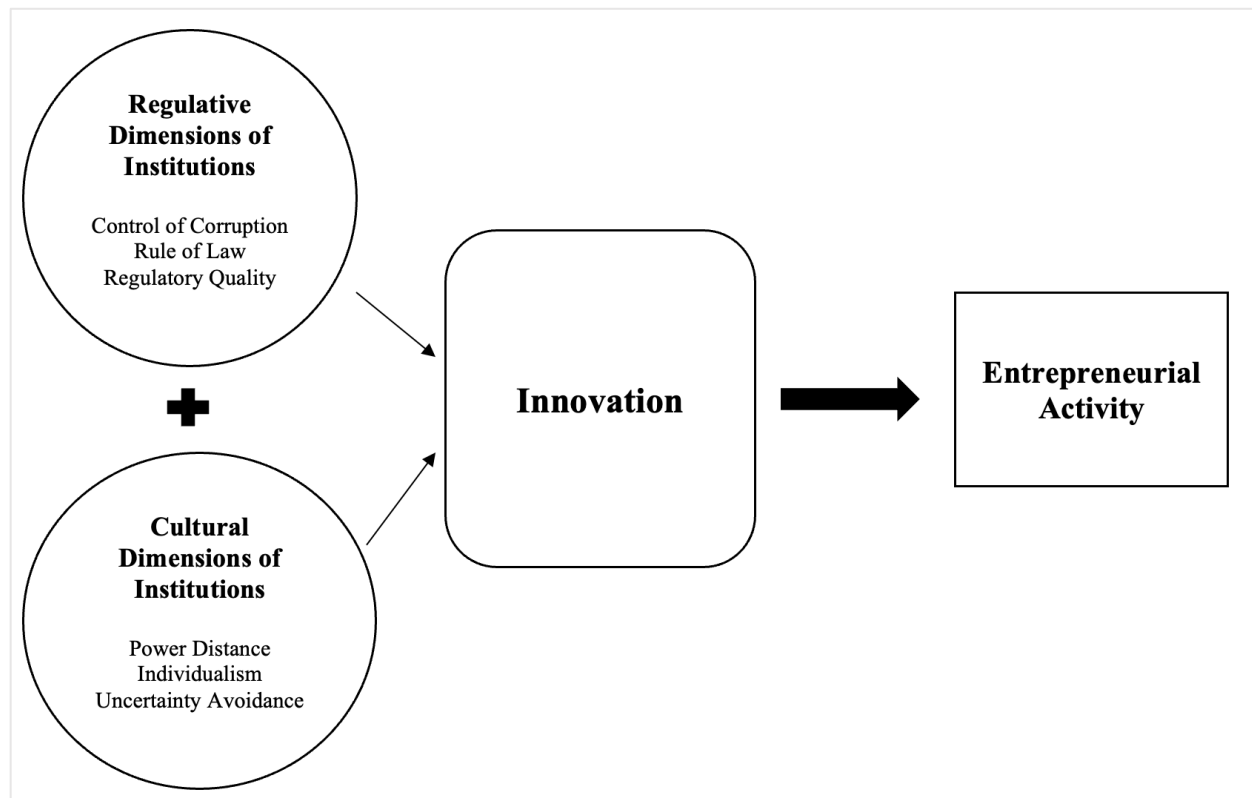


Figure 1: Conceptual Framework: National institutions, Innovation and Entrepreneurial Activity (structure of the framework is referred from Crossland and Hambrick (2011))

In this paper, I also investigate whether macroeconomic income-level indicators of a country influence the relationship between regulative and cultural dimensions of institutions, and entrepreneurial activity. By adding the macroeconomic element to the analysis, the research

attempts to compare the extent to which the relationship between institutional arrangements (regulative and cultural dimensions), innovation and entrepreneurial activity differs across countries with low economic development (developing countries) and high economic development (developed countries). As discussed before, Naudé (2010) found that opportunity entrepreneurs are prevalent in developed countries with better formal business opportunities whereas necessity entrepreneurs are prevalent in developing countries with lack of infrastructure. Both Wenneker et al. (2005) and Naudé (2010) further suggest that opportunity and necessity entrepreneurship have been addressed occasionally to draw a comparison between developed and developing countries respectively. Thus, in this research, I include the concepts of opportunity and necessity entrepreneurship in my analysis to showcase how the relationship between institutional arrangements (regulative and cultural dimensions), innovation and entrepreneurial activity differs between developing and developed countries. For instance, opportunity entrepreneurs are more inclined towards starting new ventures and grasping business opportunities than necessity entrepreneurs. In that case, improved regulative dimensions would benefit the opportunity entrepreneurs more as the institutional arrangements would provide better entrepreneurial environment to start a business without potential bureaucratic delays. Hence, it can be concluded that the positive relationship between regulative dimensions of institutions and entrepreneurial activity is stronger in developed countries. As seen in the example, the analysis regarding countries with different sets of economic characteristics (developing and developed countries) is conducted from an entrepreneurial point of view. This brings up the central research question of the paper:

“To what extent does innovation mediate the impact of regulative and cultural dimensions of institutions on entrepreneurial activity and how does it differ between developing and developed countries?”

This paper aims to reinforce previous findings related to institutions and entrepreneurial activity with new and more varied data, collected within the time frame of 2016-2021. This would help understand how the relations have developed in the recent times and could be compared from the past studies to determine potential trends. Over time, institutional changes are caused by external shocks such as radical economic change through technological advancements and structural overlap where the public sectors get converted into private sector due to a strong wave of privatization. Enhanced technological advancements with substantial support from private sectors could evolve the regulative and cultural dimensions in a way that it boosts entrepreneurial activity even more over time. The study further attempts to add value to the existing research on the role of institutions on entrepreneurship from an innovational perspective. Hence, I differentiate my approach from past studies by studying an indirect role of institutions on entrepreneurial activity through innovation as a mediator, instead of a simple direct relationship between institutions and entrepreneurship. As discussed before, institutional arrangements have a direct influence on innovation whereas on the other hand, innovation has a direct relationship with entrepreneurial activity. Thus, as a central piece between institutions and entrepreneurship, the role of innovation as a mediator could be investigated further to determine potential indirect impact of regulative and cultural dimensions of institutions on entrepreneurial activity.

Furthermore, the dataset of this research paper consists of developing and developed countries, categorized according to country income level classifications as of 2021, based on the GNI per capita thresholds that are obtained from World Bank. To study the topics of regulative and cultural dimensions of institutions, I use World Governance Indicators from World Bank and Hofstede's cultural indices respectively. In this research, entrepreneurial activity is measured using "new business density rate" by World bank while innovation is measured using "global innovation indices" from World Intellectual Property Organization (WIPO) Both World Bank and WIPO account for a compilation of high-quality indicators for over 150 economies across the globe. The panel-dataset used for this research includes a sample of 132 countries that consist of over 80 developed countries and around 50 developing countries (See Appendix) The specific time frame chosen for this research ranges from the years 2016 till 2021, suggesting that the data on the stated variables are collected for a span of five years for each country. Moreover, I use random effects regression analysis to explore the relationship between institutions, innovation and entrepreneurship in the study. Furthermore, this research is also socially relevant as the findings of the paper can be used to derive governmental policies that aim to enhance entrepreneurial cultures and boost economic development through improved innovation levels as well as institutional efficiency.

The remainder of the research paper is structured as follows. In section 2, I establish the theoretical framework for the paper by reviewing existing literature on major topics covered in the research question and consecutively, determining relevant hypothesis that will be tested with my research. This is followed by outlining the relevant data and variables in section 3, and the methodology used for the empirical estimations in section 4. Section 5 incorporates the presentation and discussion of the empirical results derived from the analysis. To conclude the paper in section 6, I outline potential limitations of the research and include recommendations for future research, review the hypotheses and draw all relevant conclusions to answer the central research question, and evaluate certain policy implications related to the findings of the paper.

2. THEORETICAL FRAMEWORK

In order to answer the research question, I have evaluated the existing academic research through a literature review and presented the hypotheses that are required to be tested. By taking upon a holistic approach, I conduct a study on institutional theories by diving deeper into the regulative and cultural pillars institutions respectively. Next, I introduced the general topics of innovation as well as entrepreneurial activities and discussed the persisting relationship between the two concepts. Finally, I present literature on how a country's economic condition influences the relationship between regulative and cultural dimensions of institutions, and entrepreneurial activity through innovation as a mediator. Additionally, I compare these relations across developing and developed countries, even from an entrepreneurial point of view. In simple words, the literature also attempts to differentiate between countries through the different types of entrepreneurs prevalent in the countries: Necessity entrepreneurs for developing countries and Opportunity entrepreneurs for developed countries. By investigating these topics, I aim to build a strong academic foundation for this research paper.

2.1 Institutional Theory

Before discussing the literature on specific regulative and cultural dimensions of institutions, it is important to understand what institutions are, and the extent to which they play a role in the society. North (1990) was one of the pioneers of institutions and its impact on the performance of economics. Illustrated as the rule of the game, North (1990) defines institutions as a set of rules and norms that are designed to guide social, political and economic interactions. He believes institutions contribute to the incentive structure of the economy which gives it the power to influence the course of structural economic change. Since the concept of institutional theory is broad. North (1990) classifies the institutions into two groups: formal and informal institutions. Formal institutions refer to the political, legal and economic rules designed to facilitate social interaction. For example, the study by Gnyawali and Fogel (1994) illustrate a set of regulative institutional dimensions that are relevant from an entrepreneurial point of view, including governmental policies, socioeconomic conditions, financial and non-financial assistance. On the other hand, informal institutions refer to the behavior, values and beliefs that stand to be the cultural foundation of a society. For example, the paper by Sambharya and Musteen (2014) examine the impact of cultural dimension of institutional environment on entrepreneurship by studying certain informal institutions, including market openness, power distance and collectivism. Thus, both formal and informal institutions are believed to frame the crucial norms and behaviors in a society, facilitating decision-making for both individuals as well as organizations. (Williams and Vorley, 2015) However, the work by North (1990) have received substantial criticism regarding the conceptualization of institutions. For instance, Pande and Udry (2006) use a similar definition for potential institutional analysis where they suggest the emergence of institutions to be more organic and unplanned, disagreeing the notion that institutions are “designed” to guide social behavior, as mentioned in the definition above. Hodgson (2006) addresses these issues with North (1990) and suggests various other perspectives towards defining institutions rather than “intangible social structure that shape human interactions” (p. 2.). The

author incorporates the aspects of rules and norms into the institutional study since these aspects are immensely internalized by individuals to guide their behavior, decision and preference, while shaping social interactions. Thus, in this research paper, the definitions and conceptualization of institutions is adopted from the work by Hodgson (2006) As rules of the game, both formal and informal institutions could guide an individual's behavior, including influencing an individual's intentions towards entrepreneurship (Aidis, 2017) Adding on to the study by Aidis (2017), this research has taken institutional theory as the theoretical framework to explain the differences in levels of nascent entrepreneurial activities across countries.

2.2.1 Regulative Pillars of Institutions

The regulative pillars shape human interaction through a set of political, economic and legislative rules (Li and Zahra, 2012) These regulative system is the foundation of formal institutions which comprises of written constitutions, policies, laws, rights and regulations enforced by official authorities of the governmental system (Boston, 2016) In this paper, I study the regulative dimension of institutions through control of corruption, rule of law and regulatory quality, that are represented as the government indicators within a country. These three factors are chosen due to how well they fit under the regulative pillar and the readily available data in the World Bank dataset. Additionally, these factors have a substantial influential power on entrepreneurial activity, as I will describe in the following paragraphs.

Anokhin and Schulze (2009) examine that corruption hampers potential entrepreneurial opportunities as it inclines entrepreneurs to have a sense of distrust towards the market mechanisms. Similarly, Baumol (1990) suggest that corruption undermines the foundations of institutional trust. Sønderskov and Dinesen (2016) define institutional trust as the faith that an individual has on the security of an institution. This dynamic relationship between an individual and an institution is crucial for the development of entrepreneurial and innovative activities. Building on this, Baker et al. (2005) found that entrepreneurial or innovative opportunities depend on the portion of value that entrepreneur could reap through its venture. With persistent corruption in the economy, the business value chains might face enormous risk and uncertainty which will curb the potential profits that the entrepreneurs are entitled to gain while discouraging their pursuit to potential entrepreneurial activities. Additionally, uncertainty in value chains makes it difficult and expensive to monitor the entrepreneur's payoffs to innovative activities. This added transactional costs act as a disincentive for nascent entrepreneurship (Teece, 1981) Furthermore, prior research on the topics of entrepreneurial entry highlights the government's influence on the levels of entrepreneurial activity. According to the study by Millan et al. (2012), governmental spending on startup subsidies reduces the risk of entrepreneurial exit due to higher survival chances. Therefore, countries where governments prioritize their private gain and engage in corruptive activities would discourage entrepreneurial entry, thus further stressing upon how corruption would have a detrimental effect on overall nascent entrepreneurship levels in the country. Hence, various literary contributions focus on justifying the feasibility of corruption controls. Anokhin and Schulze (2009) suggest that countries with better control of corruption is

much likely to invest in improved institutional systems which will boost entrepreneurship in the economy. Thus, the following hypothesis is formulated:

Hypothesis 1a: Control of corruption has an overall significant and positive relationship with entrepreneurial activity

Zhang et al. (2014) found that disparities in innovative entrepreneurship across nations can be explained through a clear distinction between countries with different levels of economic development. When drawing this comparison, it is known that developed countries are prone to higher income levels, improved infrastructure and stable political system. All this together, has a significant effect on the institutional quality of the country. Blackburn et al. (2006) found empirical evidence supporting the fact that countries with better institutional quality and efficient governmental systems are less prone to corruption, thus breeding entrepreneurial culture in that country. Although, the extent to which a country reaps the entrepreneurial benefits from control of corruption measures depends on certain factors. González- Pernía et al. (2015) stress upon the weaker connections between knowledge spill overs, entrepreneurship and innovation in developing countries compared to developed countries due to differential institutional settings, as mentioned before. Building on this, Avinmelech et al. (2014) provided empirical evidence, suggesting that the adverse effects of corruption on entrepreneurial activity levels is stronger in developed countries. Hence, the following hypothesis is formulated:

Hypothesis 1b: The positive relationship between control of corruption and entrepreneurial activity is stronger in developed countries than developing countries

Another principle of governance that builds up the foundation of formal institutions is known as the “Rule of Law” The World Bank Governance department defines rule of law as a mechanism that captures the extent to which agents of the society have confidence and abide by the rules. Some of the rules that are more relevant towards boosting entrepreneurial activities include the quality of property rights and particularly, intellectual property rights protection. Bjornskov and Foss (2013) suggest that a good legal system of intellectual property rights encourages innovative and risk-taking behavior among entrepreneurs. This could be justified with the fact that proper intellectual property rights protection implies efficient patent development which reassures entrepreneurs that their innovation is protected and is not subject to imitation. The reassurance fuels nascent entrepreneurs to pursue more entrepreneurial activities regardless of the risk it partakes. Overall, a well-defined judiciary system and a profound set of legal attitudes towards commerce that encourages people to reasonably conduct business transactions will boost economic efficiency (North, 1986) It will also create a safer business environment for entrepreneurs to calibrate supernormal profits through effective innovational and entrepreneurial activities. Thus, the following hypothesis is formulated:

Hypothesis 2a: Rule of law has an overall significant and positive relationship with entrepreneurial activity

As mentioned before, more regulatory protection through secured property rights will encourage all types of entrepreneurships since it allows businesses to yield its expected profit margins. Thus, both opportunity as well as necessity entrepreneurs are in advantage from the provision of secured property rights. However, opportunity entrepreneurs are known to be having more growth and employment aspirations which leads them to invest more capital into the business (Levie and Autio, 2011) These investments could be in machinery, patent development or any other assets, and are at higher risk without a good regulatory protection of property rights (Fuentelsaz et al., 2019) Furthermore, risk-taking and innovative behaviors tend to be present in opportunity entrepreneurs more than in necessity entrepreneurs which suggests that a good protection of property rights is more relevant to the opportunity entrepreneurs prevalent in developed countries (Hessels et al., 2008) Hence, the following hypothesis is formulated:

Hypothesis 2b: The positive relationship between rule of law and entrepreneurial activity is stronger in developed countries than developing countries

Regulatory quality is a governance indicator that captures the abilities of government towards formulating sound policies and regulations to promote the development of the private sector (WGI, 2022). This principle of governance indicates various formal mechanisms that are relevant towards encouraging business activities in the private sectors, including fiscal freedom. Fiscal freedom measures the extent to which governments formulate policies that facilitates higher disposable income for individuals as well as businesses, which is determined by the taxation measures levied on the society. Various researchers such as Balamoune-Lutz and Garello (2014) and Giroud and Rauh (2019) emphasize on a negative effect of over-taxation on business activities. The authors suggest that with lower net profit margins, individuals may be demotivated towards potential entrepreneurial intentions while existing entrepreneurs may be discouraged to take upon innovation initiatives. Building on this, Djankov et al. (2002) highlight that complexity of taxation procures has a discouraging effect on the private sector due to intensive administrative effort, thus hampering the growth of entrepreneurship. Additionally, a great burden of taxation is usually associated with a large public sector, which occupies relevant economic areas of private sector. This diverts the resources from private sector to public sector, constraining potential profit-making entrepreneurial activities (McMullen et al., 2008) Thus, the following hypothesis is formulated:

Hypothesis 3a: Regulatory Quality has an overall significant and positive relationship with entrepreneurial activity

As mentioned before, Giroud and Rauh (2019) believe that over-taxation curbs fiscal freedom as it forces entrepreneurs to yield a net profit which is not adequate to compensate the resources utilized to start the business. Adding on to this, Fuentelsaz et al. (2019) found that entrepreneurs from developing countries (necessity entrepreneurs) are more sensitive to tax increases because their income margins stand to be lower than the entrepreneurs' income margins from developed countries (opportunity entrepreneurs), implying that higher fiscal freedom levels will favor

developing countries relatively more than developed countries. Hence, the following hypothesis is formulated:

Hypothesis 3b: The positive relationship between regulatory quality and entrepreneurial activity is stronger in developing countries than developed countries

2.2.2 Cultural Pillars of Institutions

The cultural pillars guide human behavior by representing shared values, understanding and norms that is shaped by the society. These socially shared norms are the foundation of informal institutions which are reflected as unwritten rules, being created and enforced outside of official channels (North, 1990) In this paper, I study the cultural dimensions of institutions through power distance, individualism and uncertainty tolerance, that are embedded within the normative aspects of a country. These three factors are chosen due to how well they fit under the cultural pillar and the readily available data in Hofstede's dataset. Additionally, these factors have a substantial influential power on entrepreneurial activity, as I will describe in the following paragraphs.

Power distance is a fundamental informal institution that represents the relative status of leaders in a society. House et al. (2004) expresses power distance as the extent to which less powerful members within a culture accept social inequalities caused through unfair distribution of power. This principle reflects upon various beliefs that discourage innovation, including hierarchy, centralization of power and control over subordinates. Some academic researchers such as Dwyer et al. (2005) suggest that people in high power-distance societies tend to imitate innovations adopted by their superiors, which has a positive effect on the country's entrepreneurial activities. However, the extent to which these superiors are successful towards expressing innovational development patterns is still unjustified. Instead, various academic literature attempts to criticize societies with power-distance. Thompson (1967) found that societies with strong hierarchical system curbs free communication patterns amongst people. These strict vertical communicational patterns give rise to information asymmetries which hinder potential entrepreneurial opportunities in the country (Kende et al., 2017) Additionally, Crossland and Hambrick (2011) found that in societies where power distance is greater, more powerful members are seen as figureheads rather than empowered decision makers which curbs positive radical strategic decision-making, hindering one's choice of nascent entrepreneurship in the society. Thus, the following hypothesis is formulated:

Hypothesis 4a: Power Distance has an overall significant and negative relationship with entrepreneurial activity

Furthermore, various academic literature such as Tarhini et al. (2016) shed light on a higher power-distance culture in developing countries due to prevalence of autocratic leadership and social inequalities. In these higher power countries, greater respect is given to authorities while very little priority to socio-economic mobility. Thus, entrepreneurs that are willing to create wealth and

business ventures may disrupt the existing norms and economic structures, which would not be encouraged in high-power distance societies. Hence, the following hypothesis is formulated:

Hypothesis 4b: The negative relationship between power distance and entrepreneurial activity is stronger in developing countries than developed countries

The social norm concerning autonomous vs consensus-based actions represents the fundamental foundation of Individualism as a cultural value. Individualism refers to the extent to which an individual could prevail his or her interests onto the society. This principle reflects upon certain beliefs that encourage entrepreneurship, including strategic freedom, flexibility and outward orientation. Individualistic societies emphasize on one's initiatives and achievements which facilitates stronger entrepreneurial orientation amongst the members of the society, leading to more invention as well as innovation (Hofstede, 2001). Building on this, Pinillos and Reyes (2011) found that business aspects such as structural flexibility and employee's freedom facilitates empowerment and unilateral decision-making that stand to be the determinants of nascent entrepreneurship. Employees of individualistic organizations have more freedom to develop new products, which leads to the fact that more patents are granted to breed innovation amongst these organizations (Waarts and van Everdingen, 2005). Individualistic cultures emphasize more on autonomous decision-making which gives a certain extent of strategic leeway to the members of the society for possible innovation initiatives in contrast to collectivistic societies where the process is rather more consultative in nature (Crossland and Hambrick, 2011). Additionally, outward orientation encourages individuals to contact the outsiders for ideas and potential knowledge exchange. This phenomenon stimulates creativity and boosts entrepreneurship in the country. Building on this notion based on the previous stated hypothesis, the following hypothesis is formulated:

Hypothesis 5a: Individualism has an overall significant and positive relationship with entrepreneurial activity

According to Morris et al. (1994), entrepreneurship is an individualistic pursuit. Thus, the extent to which societies consider one's individualistic actions is likely to impact the entrepreneurial intentions prevalent in that society. However, this impact differs amongst opportunity and necessity entrepreneurs. Opportunity-driven entrepreneurs are pulled by the chances of making wealth or pursuing innovation even if it compels them to switch to different livelihood. It is known that pursuing strong entrepreneurial endeavors often requires an individual to leave their existing place of employment and consider the title of "self-employed", which tends to be a norm in developing countries with highly collectivistic cultures (Sambharya and Musteen, 2014) Hence, the following hypothesis is formulated:

Hypothesis 5b: The positive relationship between individualism and entrepreneurial activity is stronger in developed countries than developing countries

Another fundamental cultural value that has been discussed in Hofstede's dimensions is uncertainty avoidance. Uncertainty avoidance is expressed as the extent to which members of the society can accept uncertainty and ambiguous circumstances. Thus, uncertainty avoidance as a cultural value, is directly proportional to risk-averse attitudes and behaviors persistent amongst members of the society. According to Efrat (2014), societies with high uncertainty tolerance tend to be less open to new ideas and change. These societies perceive innovation as a carrier of change and portray resistance towards it. This notion is supported by Kaasa and Vadi (2008) as the authors found that countries with lower uncertainty tolerance had fewer patent applications. Additionally, societies with low uncertainty avoidance breed openness in their culture while having greater tolerance towards unpredictable actions will provide broader zones of acceptance for strategic actions, which will encourage potential technological change and promote nascent entrepreneurship in an economy. Thus, the following hypothesis is formulated:

Hypothesis 6a: Uncertainty Avoidance has an overall significant and positive relationship with entrepreneurial activity.

According to Valdez et al. (2011), both opportunity and necessity entrepreneurship entails different levels of uncertainty. Opportunity entrepreneurs experience high uncertainty as they pursue entrepreneurial opportunities with new business ideas and models. On the hand, necessity entrepreneurs pursue ventures that imitates an existing established business concept and model, involving relatively lower opportunity costs than opportunity entrepreneurs (Sambharya and Musteen, 2014) Thus, if opportunity entrepreneurs (from developed countries) are uncertainty resistant, the thrive towards starting new business ventures will decline more than that in the case with necessity entrepreneurs (from developing countries) Hence, the following hypothesis is formulated:

Hypothesis 6b: The negative relationship between uncertainty avoidance and entrepreneurial activity is stronger in developed countries than in developing countries

2.2 Innovational Theory

In the recent decade, the structural change brought about in the economy has led to many different views about what constitutes as an economic asset. While traditional economists have deeply focused on labor and machinery as key economic assets, morn economists view knowledge as their major strength (Jaffe and Trajtenberg, 2005) However, knowledge is a very holistic concept to be incorporated as a measure for any study. Thus, innovation is seen to mobilize existing knowledge and cumulatively create new knowledge that results in effective product and/or process innovation (Kogut and Zander, 1992) Additionally, studies in innovation have suggested that the differences in innovational capabilities across countries is caused by the differential rates of research and development (Khan et al., 2017) For instance, developed countries have more resources and ambitions towards potential research and development as well as knowledge creation than developing countries. Formally, Entrepreneurial activity is defined as the enterprising human

behavior towards the creation of value and expansion of economic activity through exploiting new products, processes or markets (Ahmad and Seymour, 2008) Thus, the research paper aims to investigate the influence of innovation on entrepreneurship and the extent to which the two concepts complement each other.

Various studies such as González- Pernía et al. (2015) suggest a positive relationship between stock of new knowledge and entrepreneurship. In simple words, creation and accumulation of new ideas leads to possible innovation in the economy where the creation of this innovational output drives the individuals to pursue entrepreneurial opportunities and earn substantial income out of their knowledge creation. Thus, innovation may facilitate the entrepreneurial intentions of existing entrepreneurs to the extent that they take upon more entrepreneurial initiatives in terms of exploring new markets. Hence, the following hypothesis is formulated:

Hypothesis 7a: Innovation has an overall positive and significant relationship with entrepreneurial activity

Furthermore, González- Pernía et al. (2015) found that knowledge spillover linkage between innovation and entrepreneurial activities is weaker in developing economies since the necessity entrepreneurs are more concerned towards the survival of the business rather than potential positive disruption. This is reasoned with the fact that entrepreneurs from developed countries (opportunity entrepreneurs) are more open towards introduction of new technological processes or products and prioritize knowledge production, unlike the entrepreneurs in developing countries that are engaging in survival-focused self-employed activities. Thus, the following hypothesis is formulated:

Hypothesis 7b: The relationship between innovation and entrepreneurial activity is stronger for developed countries than developing countries

As stated earlier, the first part of the research includes hypotheses that support a relationship between institutions (regulative and cultural dimensions) and entrepreneurship while the second part of the research includes hypotheses that sheds light on the association of innovation with entrepreneurial activity. Additionally, the direct relationship between institutions and entrepreneurship in the first part of the research showcases potential link between institutions and innovation based on the existing academic research discussed in the sections 2.2.1 and 2.2.2. Upon combining these stated relationships together, the research could attempt to assess the mediating role of innovation towards building a relationship between respective institutions and entrepreneurial activity. The nature of relationship with entrepreneurship differs for the stated regulative and cultural dimensions of institutions. Thus, the empirical analysis for this mediation aims to assess the mediation effect of innovation on the respective institutions separately. The conclusion towards whether the mediation is supported would be determined based on most institutions that have passed the mediation test. Thus, based on the previous derived literature, the following hypothesis is formulated to answer the research question:

Hypothesis 8a: Innovation mediates the relationship between the regulative and cultural dimensions of institutions and entrepreneurial activity

Noticing the derived hypotheses [1] till [6], on average developed countries are more prone to a stronger association between institutions and entrepreneurship. Moreover, as seen in hypotheses [7], it has been illustrated that the direct relationship between innovation and entrepreneurial activity stands to be stronger in developed countries. Thus, taking upon a derivative approach from the previously discussed literature, the following hypothesis is formulated:

Hypothesis 8b: The mediating role of innovation is stronger in developed countries than in developing countries.

3. DATA AND VARIABLES

This section of the research focuses on explaining and justifying various aspects of the data that will be used in the analysis. I elaborate on the sample, relevant variables, data sources and crucial descriptive statistics of the collected data.

3.1 Sample

One of the main datasets used for this study is from the World Bank. The World Bank database contains around 1400 time-series indicators for over 200 economies. In this study, the regulative dimensions of institutions (World Bank Governance Indicators), control variables (Unemployment rate and female ratio), dependent variable (new business density rate) and country classifications are taken from the World Bank. The second dataset used in this study is from the World Intellectual Property Organization (WIPO) and is utilized to obtain an innovation measure for over 132 economies. The Global Innovations Index (GII) variable used to proxy the innovation levels in developing and developed countries. The GII is standardized to a scale from 0 to 100 where 0 is the lowest rank of innovational performance while 100 is the highest rank of innovational performance. Finally, the study uses the Hofstede model to derive relevant informal institutions indices for the research. Overall, the panel-dataset used for this study includes a sample of 132 countries that consist of over 80 developed countries and around 50 developing countries (See Appendix) The time frame chosen for this study ranges from the years 2016 till 2021. Thus, data on the variables are collected for a span of five years for each country.

3.2 Dependent and Independent Variables

3.2.1 Entrepreneurial Activity

Entrepreneurial activity is measured by the “New Business Density Rate” indicator, adopted from the World Bank. The World Bank Database provides access to Development indicators, international debt statistics and data on population, education and some entrepreneurial regimes. It expresses new business density rate as the number of newly registered corporations per 1,000 working-age population, within the ages 15-64 (World Bank, 2022)

3.2.2 Innovation

Innovation is measured by the Global Innovations Index (GII), published by World Intellectual Property Organization (WIPO). The GII derives the most recent innovational trends across 132 economies based on 80 indicators, including political measures, educational environment, infrastructure and knowledge generation persistent in respective economies (WIPO, 2022) Thus, by offering these different metrics, the GII could be used to monitor and benchmark innovational performance against different economies based on regions or specific income thresholds.

3.2.3 Regulative dimensions of Institutions

Regulative dimensions of institutions refer to the political, legal and economic dimension of rules that are formulated to facilitate individual behavior and necessary exchange in the society (North, 1990) Kaufmann et al. (2009) developed six government variables for the World Bank, known as the Worldwide Governance Indicators (WGI). The WGI indicators are derived by combining the relevant data from the population, enterprises and expert survey respondents in developing and developed countries. In this study, three out of six governmental indicators are used to represent the regulative dimensions of institutions, including control of corruption, rule of law and regulatory quality (See Table 4 for the description of the variables)

Table 1: Descriptions of variables concerning the regulative dimensions of institutions

Variable	Description	Data Source
Control of Corruption	It represents the extent to which personal gain, comprising of small (petty) and extensive forms of corruption, exercising public power and the "capture" by elites	WGI
Rule of Law	It represents the extent to which agents have faith and comply to the rules, specifically quality of contracts enforcements, property rights and the probability of committing crime	WGI
Regulatory Quality	It represents the extent to which the government is capable to compose and implement well-structured regulations and policies that allows the expansion and growth of private sector	WGI

3.2.4 Cultural dimensions of Institutions

Cultural dimensions of institutions shed light upon behavior, beliefs, cultural values and norms of a society (North, 1990) Hofstede (2001) studied informal institutions and developed six cultural dimensions for these institutions. The cultural indicators in the Hofstede model report around 100,000 surveys from over 80 companies' employees in 72 countries (Hofstede, 2001). In this study, three out of six Hofstede's cultural indices are used to represent the cultural dimensions of institutions, including power distance, individualism and uncertainty avoidance (See Table 2 for the description of the variables)

Table 2: Descriptions of variables concerning the cultural dimensions of institutions

Variable	Description	Data Source
Power Distance	It represents the extent to which the less powerful members of the society accept and adhere to unfair power distribution	Hofstede's Indicators
Individualism	It portrays the extent to which individuals favor personal interests and feel recognized with individualistic pursuits instead of being a part of a group	Hofstede's Indicators

3.2.5 Country-level Classifications

In this research, country income-levels are based on specific GNI thresholds to represent the economic development since it is closely related to other macroeconomic indicators such as GDP (Deacon and Maha, 2015) Countries are grouped according to country income level classifications as of 2021, based on the GNI per capita thresholds that are obtained from World Bank shown in Table (3)

Table 3: 2021 World Bank Country Income-Level Classifications

Income Group	GNI per Capita Threshold (2021US\$)
Low-income	< \$1,045
Lower-middle income	\$1,046 - \$4,095
Upper-middle income	\$4,096 - \$12,695
High-income	> \$12,695

According to World Bank, low-income and lower-middle income countries are grouped as “developing” countries while upper-middle income and high income are grouped as “developed” countries (See Appendix) In this study, the two country groups are assigned with dummy variables to conduct separate analysis for each group; developing countries are assigned with the dummy variable “0” while developed countries are assigned with the dummy variable “1” With the help of these separate dummy variables, the research paper attempts to include the country effects onto the regression analysis in order to draw a comparison between developing and developed countries.

3.3 Control Variables

The research includes some control variables that may influence the extent of entrepreneurial activity in a country. Some of the relevant control variables include population growth, education level, unemployment rate and female ratio. However, we cannot control for population growth because the variable which is used to measure entrepreneurial activity in this study, i.e., new business density rate, accounts for the newly registered companies “per 1000 individuals of a working-age population”. Thus, controlling for population growth would curb the validity of the measure. Moreover, the study does not include education level as a control variable as the data sources lacked country-level data (between 2016 and 2021) on education level for various developing countries, which are included in the sample. Thus, we specifically control for unemployment rate and proportion of female population (within ages 15-64), obtained from the World Bank.

3.3.1 Unemployment rate

Higher rates of unemployment breeds austerity in an economy, which hinders entrepreneurial opportunities to the extent that entrepreneurship is discouraged in a country (Wennekers et al.,

2007) The World Bank measures unemployment as a percentage of the total labor force (who are available and actively seeking employment) that are not employed.

3.3.2 Female Ratio

Various studies and findings reveal that men are more engaging in entrepreneurial endeavors than women, resulting in differential outcomes and opportunities in society (Bosma et al., 2004) The World Bank measures female ratio as the percentage of the working population (aged 15-64), which is female.

3.4 Descriptive Statistics

Including the descriptive statistics helps the reader better understand the characteristics and dimensions of the data used in the research. Table 4 shows the descriptive statistics, i.e., number of observations, the mean, standard deviation, minimum value and maximum value, for each variable. It can be noticed that the observed new business density rate (n=792) in all 132 countries along the five years observed averaged around 3.882 percent (s=5.052) In other words, around 3.882 percent of the 15-64 working age population of all countries combined in the 2016-2021 period were nascent entrepreneurs that had intentions of newly registering their corporations. Furthermore, control of corruption has the lowest mean while power distance has the highest mean out of all the independent variables.

Table 4: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Entrepreneurial Activity					
New Business Density Rate	792	3.882	5.052	0.040	30.016
Innovation					
Global Innovations Index	792	35.467	12.343	13.6	68.4
Formal Institutions					
Control of Corruption	792	0.083	0.985	-1.816	2.284
Regulatory Quality	792	0.240	0.905	-1.800	2.226
Rule of Law	792	0.139	0.933	-1.787	2.079
Informal Institutions					
Power Distance	792	65.212	19.164	11	100
Individualism	792	37.788	20.034	6	91
Uncertainty Avoidance	792	62.644	20.386	8	100
Control Variables					
Unemployment	792	6.966	5.127	0.100	33.559
Female Ratio	792	6.326	7.400	2.966	76.225

4. METHODOLOGY

In this section, I outline and justify the various methods used to examine the collected data and test the stated hypotheses. In the process, I also explain certain statistical methods and mathematical models used for the data analysis.

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4.1 Methodology for Hypothesis 1 till 6

The first part of the research focuses on investigating a possible direct relationship between the institutions (regulative and cultural dimensions) and entrepreneurial activity levels prevalent in both developing and developed countries. Thus, the dependent variable in this part of the research is the New Business Density rate. I use the new business density rate for several countries that are categorized based on developing and developed economic standards (GNI thresholds) Next, I attempt to conduct a formal test for multicollinearity problems in the regression model by using the Variance Inflation Factor (VIF). The VIF will indicate the existence and strength of possible correlations between the independent variables by assigning values that start from 1 and range till vast limits. A VIF value that is larger than 5 reflects possible multicollinearity issues and poor statistical results. Additionally, the study conducts a cross-check for the internal consistency of the variables by using a statistical instrument called Cronbach Alpha to test composite reliability.

For Hypotheses [1], [2] and [3], the independent variables are the regulative dimensions of institutions that capture legal and governmental structures, comprising of rules and regulations enforced by official authorities. I will use three of out the six governmental indicators as independent variables for this research, namely control of corruption, rule of law and regulatory quality. Further, for hypotheses [4], [5] and [6], the independent variables are the cultural dimensions of institutions that represent a shared understanding of cultural norms and values, directly shaped by the society. In this research, I will use three out of the six cultural indicators for the analysis, namely individualism, uncertainty avoidance and power distance.

The panel data set of the stated independent variables from 2016-2021 requires longitudinal country level analysis. To make the cross-country comparisons between the two sets of countries (developing and developed) during the years 2016-2021 (i.e., to examine the panel data), Random Effects Regression Model is chosen to test the hypotheses [1] till [7] The general idea is that the list of countries chosen incorporated in the panel data set still omits some countries such as Andorra, Bhutan, Cuba, Liechtenstein, Monaco and North Korea, due to lack of data availability. There is a possibility in the future that data sources such as the World Bank can provide necessary data for the stated countries, which could alter the country effects of our research if incorporated later to the panel dataset. Thus, treating the country dummy as a random effect could allow us to incorporate the variability in the country effect due to omitting a few countries from the country dataset. Furthermore, Hofstede's indices for cultural institutional dimensions does not change over

the chosen time frame of this research (2016-2021) for every country in the dataset. Hence, random effects analysis is feasible in this case as it allows the regression coefficients and intercepts to vary across countries, facilitating potential cross-country analysis for cultural institutional dimensions within the chosen time frame (2016-2021)

Next, I will conduct a holistic analysis to study the relationship between regulative and cultural dimensions of institutions, and entrepreneurial activity based on two extended models of Random effects regression. The first extended random effects regression model regresses new business density rate on all independent variables concerning formal institutions with country effects that are added as country dummies. Similarly, the second extended random effects regression model regresses new business density rate on all the independent variables concerning informal institutions while adding country dummies to represent the country effects. Hence, the two extended models incorporated in this research are as follows:

(1) Extended Model for Regulative Dimensions of Institutions:

$$\text{New business density rate} = \beta_1 * (\text{Control of Corruption}) + \beta_2 * (\text{Rule of Law}) + \beta_3 * (\text{Regulatory Quality}) + C_i \quad (1)$$

(2) Extended Model for Cultural Dimensions of Institutions:

$$\text{New business density rate} = \beta_4 * (\text{Power Distance}) + \beta_5 * (\text{Individualism}) + \beta_6 * (\text{Uncertainty Avoidance}) + C_i \quad (2)$$

In the above models, C_i is an additional variable that represents the country dummies in the analysis.

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4.2 Methodology for Hypothesis 7

The second part of the research examines the influence of innovation on entrepreneurial activities prevalent in developing and developed countries. For Hypothesis 7, the dependent variable in this part of the research is the new business density rate by World Bank. This is the same dependent variable used for the previous hypotheses. As stated in Section 3.2.1, new business density rate expresses new business density rate as the number of newly registered corporations per 1,000 working-age group, within the ages 15-64 (World Bank, 2022)

Further, global innovation index (GII) is taken as the independent variable for this hypothesis. An extended random effects regression model is used to regress total entrepreneurial activity with global innovations index and assessing this effect for selected developing and developed countries

by adding country dummy variables. Hence, the extended model incorporated in the research is as follow:

(3) Extended Model for Innovations:

$$\text{New Business Density rate} = \beta_7 * (\text{Global Innovations index}) + C_i \quad (3)$$

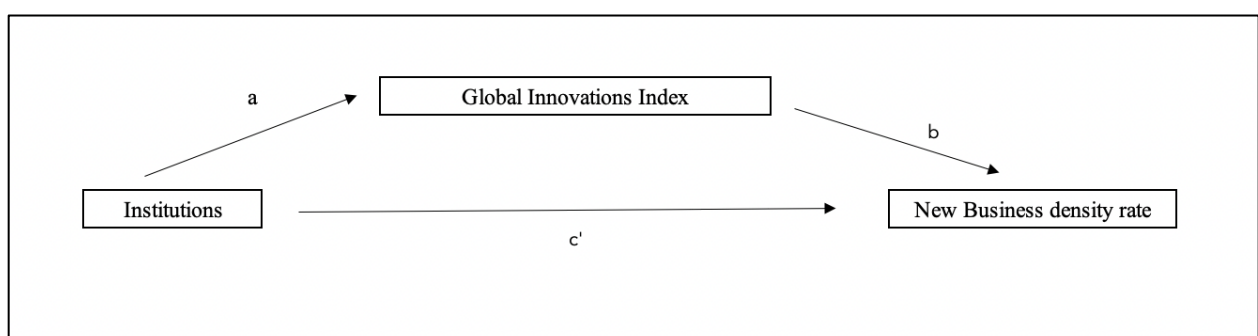
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4.3 Methodology for Hypothesis 8

The final part of the research assesses whether innovation mediates a relationship between the stated regulative and cultural institutional dimensions, and entrepreneurial activity prevalent in developing and developed countries. This mediation analysis is conducted using Sobel tests. A Sobel test examines the extent to which the inclusion of a mediator (innovation) stimulates the effect of the independent variables (regulative and cultural dimensions of institutions) on the dependent variable (entrepreneurial activity). Additionally, the test indicates the statistical significance of the hypothetical mediation in the analysis for empirical stability. If a significant statistical result is achieved, then the hypothetical total or partial mediation is supported through a three-step process. Firstly, the causal variable (X) is significantly correlated with the outcome variable (Y). Secondly, the causal variable (X) has significant effects on the mediator (M). Thirdly, the mediator (M) should affect the outcome variable (Y) while the causal variable (X) should affect Y to a least possible scale. If the effect of X on Y completely vanished upon intervention of M, then complete mediation exists whereas if the effect only reduces it is considered a partial mediation. Finally, the coefficient and p-value of the indirect effects is calculated with Stata v.17, using the “sem” and “medsem” commands for retrieving possible mediation effects for the stated hypotheses.

The models to be investigated in the study are shown in Figure 2. The global innovation index indicator is depicted as the mediator variable, as that is how innovation levels are measured for countries in this research. Furthermore, the indirect effect is the multiplication of *a* and *b*, whereas *c'* represents the institutions' direct effect on new business density rate.

Figure 2: Mediation analysis model for entrepreneurial activity



5. RESULTS & DISCUSSION

In this section, the results of the analysis are presented. Firstly, I portray multicollinearity concerns by estimating the mean VIF of the chosen independent and control variables in the research. Additionally, I conduct a cross-check for composite reliability between the variables by calculating the average Cronbach alpha. Secondly, I test hypotheses 1 till 7, using the Extended Models of random effects regression to explore possible predictors of entrepreneurial activity. Lastly, I test hypothesis 8 by using a mediation test which showcases possible direct and indirect effects of determined predictors on entrepreneurial activity. Overall, this section focuses on interpreting the results and discussing the extent to which the hypotheses are supported.

5.1 VIF and Cronbach Alpha

Table 5: Variance Inflation Factors (in descending order)

	VIF	1/VIF
Rule of Law	19.57	0.075243
Control of Corruption	13.29	0.075243
Regulatory Quality	9.70	0.103096
Power Distance	1.88	0.532201
Individualism	1.86	0.536261
Uncertainty Avoidance	1.15	0.872433
Unemployment rate	1.11	0.899918
Female ratio	1.09	0.913758
Mean VIF	6.21	

The VIF estimates the mean correlation and recognizes the strength of the inter-correlation between the independent variables. This paper uses Stata to determine the VIF for each for independent variable chosen for the analysis. Midi et al. (2010) suggest that average VIF values higher than 10 tend to be problematic in terms of multicollinearity. As seen in Table 5, the mean VIF value of independent variables (6.21) is less than a 10, which eases up the collinearity concerns for the study. However, on a more conservative level, various studies suggest that the multicollinearity problem appears where average VIF value for variables is larger than 5 (Dodge, 2008) Thus, the paper attempts to conduct a composite reliability test on the variables to cross-check its fit for the analysis.

Table 6: Cronbach Alpha (To test composite reliability)

	Average interitem correlation	alpha
GII	0.2786	0.7555
Control of Corruption	0.2811	0.7578
Rule of Law	0.2766	0.7536
Regulatory Quality	0.2760	0.7530
Power Distance	0.3301	0.7976
Individualism	0.3210	0.7909
Uncertainty Avoidance	0.4295	0.8576
Unemployment Rate	0.4387	0.8621
Female Ratio	0.3853	0.8337
Test Scale	0.3352	0.8194

Cronbach’s alpha is seen as one of the crucial statistical instruments that estimates the composite reliability or internal consistency of a set of variables. If the average test scale of Cronbach’s alpha is larger than 0.7, it qualifies for acceptable reliability standards. Further, higher alpha coefficient may raise collinearity concerns parallelly. However, as seen in Table 6, the average interim correlations between the independent variables falls under the ideal range of 0.15-0.50 for internal consistency. Additionally, the composite reliabilities of the variables (0.82) are well above 0.70 which presents strong evidence that multicollinearity and internal unreliability is unlikely to be a concern for this study.

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5.2 Hypothesis 1 till 6 Testing

In section 2.2.1, I hypothesized that [1a] control of corruption has a positive relationship with entrepreneurial activity [2a] rule of law has a positive relationship with entrepreneurial activity while the relationship is stronger in developed countries than in developing countries for both control of corruption and rule of law [1b & 2b]. Additionally, I hypothesized that [3a] regulatory quality has a positive relationship with entrepreneurial activity and [3b] the relationship is stronger in developing countries than in developed countries. Similarly, in section 2.2.2, I hypothesized that [4a] power distance has a negative relationship with entrepreneurial activity and [4b] the relationship is stronger in developing countries than in developed countries, [5a] individualism has a positive relationship with entrepreneurial activity and [6a] uncertainty avoidance has a negative relationship with entrepreneurial activity while [5b & 6b] the relationship is stronger in developed countries than in developing countries for both individualism as well as uncertainty avoidance. Table 7 shows the Extended model of random effects regression results that help test these hypotheses. The column “Developing” and “Developed” show the coefficients concerning the developing and developed country dummies respectively, while the column “Total” showcases the overall regression effects regardless of country dummies.

As seen in Table 7, control of corruption has an overall statistically significant relationship with new business density rate, at more than a 99% confidence level, suggesting that the variable is a good predictor of entrepreneurial activity. Furthermore, based on the coefficients illustrated in all the columns of the extended regression model, control of corruption has an overall negative relationship with entrepreneurial activity, rejecting hypothesis 1a. The findings by Anokhin and Schulze (2009) suggest that control of corruption and entrepreneurship have a nonlinear convex (concave upward) relationship, that is, first downward and then upward. This relationship is initially negative because when inefficient governments are in power, there is a lack of institutional trust amongst the entrepreneurs towards the government's attempt in anti-corruption regimes. Several studies have found that building institutional trust takes a certain amount of time. Thus, the time frame chosen for this research (2016-2021) is not adequate to indicate possible changes in institutional trust amongst entrepreneurs, thus failing to showcase an upward-sloping relationship between control of corruption and entrepreneurship. Furthermore, the more the government is deemed inefficient, the lower the institutional trust amongst the entrepreneurs. As discussed before, developing countries are more prone to government inefficiency which leads to a stronger upward-concave relationship. In simple words, developing countries experience a stronger resistance to entrepreneurship initially upon implementing corruption control measures, hence the coefficient of control of corruption is negative for developing countries. However, as seen in table 7, the coefficients of control of corruption are positive for developed countries which further validates the study by Anokhin and Schulze (2009). Various studies such as Knack (2003) found that individuals from developed countries tend to have higher institutional trust which is in turn correlated towards the fact that high-income countries have relatively lower levels of corruption and increased efficient government, supporting hypothesis [1b].

Furthermore, rule of law and regulatory quality, have an overall positive and statistically significant relationship with new business density rate, at more than a 99% confidence level. This implies that there is a less than a 1% chance of these relationships occurring by random chances, suggesting that both rule of law and regulatory quality are strong predictors of entrepreneurial activity. To reiterate the interpretation, both the variables have a positive coefficient in the extended regressions model, supporting hypotheses 2a and 3a that attempts to test a positive relationship with entrepreneurial activity. Additionally, the coefficients of rule of law in the "Developed" column is larger than the coefficient in the "Developing" column which implies that the strength of positive relationship between rule of law and entrepreneurial activity is stronger in developed countries, supporting hypothesis 2b. Moreover, the coefficients of regulatory quality in the "Developing" column is larger than the coefficient in the "Developed" column which indicates that developing countries tend to be more prone to a positive association between regulatory quality and entrepreneurial activity, supporting hypothesis 3b.

According to the results from Table 7, power distance has an overall statistically significant relationship with new business density rates regardless of country dummies, suggesting the variable is a strong predictor of entrepreneurial activity. To reiterate the interpretation, the overall coefficient of power distance indicates a negative relationship with new business density rate,

regardless of country dummies, supporting hypothesis 4a that attempts to test a negative relationship with entrepreneurial activity. Additionally, the coefficients of power distance in the “Developing” column is higher than the coefficient of power distance in the “Developed” column. This implies that the negative relationship between power distance and entrepreneurial activity is stronger in developing countries, supporting hypothesis 4b.

Furthermore, individualism has an overall statistically significant relationship with new business density rate, at more than a 99% confidence interval. This implies that probability of this relationship occurring by random chance is less than 1%, suggesting that individualism is a strong predictor of entrepreneurial activity. To reiterate the interpretation, the variable has an overall positive coefficient in the extended regressions model, supporting hypothesis 5a that attempts to test a positive relationship with entrepreneurial activity. However, the coefficient of individualism in the “developing” column has a negative value, implying an inverse relationship between individualism and entrepreneurial activity in the developing countries. According to the study by Tiessen (1997), both individualism and collectivism contribute to entrepreneurial activity of a country, however the relationship is strongly moderated by the economic characteristics of that country. In countries with low levels of economic development (developing countries), collectivism is the central cultural value where priority is shifted from individualistic interests to group interests. Collectivist countries give utmost importance to commitment and ties to others which drives the people of the society to grasp upon potential business opportunities that prioritize the welfare of the entire group. Meanwhile, in countries with high levels of economic development (developed countries), individualism is the core cultural value where individuals associate entrepreneurial activity with personal achievement (Pinillos and Reyes, 2011). Thus, collectivist cultures breed entrepreneurial activity in low economically developed countries, justifying the inverse relationship between individualism and entrepreneurial activity for developing countries. The magnitude of positive association between individualism and new business density rate in developed countries is larger than the magnitude of negative association between the two variables in developing countries, supporting hypothesis 5b.

The regression results from table 7 indicate that uncertainty avoidance has a highly statistically insignificant relationship with new business density rate for all criterion in the extended regressions model. This implies that uncertainty avoidance does not influence entrepreneurial activities across countries, rejecting hypothesis 6. However, this research paper focuses on Hofstede’s dimensions on uncertainty avoidance whereas the findings may tend to differ for GLOBE uncertainty dimension. Rossberger and Krause (2012) found that the GLOBE Uncertainty avoidance dimension is related to entrepreneurial activity, as measured by Global Entrepreneurship Monitor (GEM) Hence, various existing literature suggest that the foundation of uncertainty avoidance differs between the two frameworks (GLOBE and Hofstede) which tend to alter findings concerning the two variables. Venaik and Brewer (2010) found that Hofstede’s framework represents the “stress” dimension of uncertainty avoidance while the GLOBE framework represents the “rule orientation practices” dimension of uncertainty avoidance. Over

time, studies have suggested that rule orientation influences entrepreneurship while the stress caused by uncertainty may not (Cox and Khan, 2017).

Table 7: Regression results testing H1 till H6

	<i>Total</i>	<i>Developing</i>	<i>Developed</i>
New Business Density Rate			
	Coefficient	Coefficient	Coefficient
Regulative Dimensions of Institutions			
Control of Corruption	-1.253*** (0.000)	-0.321*** (0.000)	1.958** (0.021)
Rule of law	0.269*** (0.000)	0.452*** (0.000)	0.789*** (0.000)
Regulatory Quality	0.342*** (0.000)	1.004*** (0.000)	0.065*** (0.000)
Cultural Dimensions of Institutions			
Power Distance	-0.015*** (0.002)	-0.018** (0.023)	-0.007** (0.033)
Individualism	0.035*** (0.000)	-0.013*** (0.000)	0.027*** (0.000)
Uncertainty Avoidance	-0.029 (0.135)	-0.036 (0.845)	-0.054 (0.310)
Control Variables			
Unemployment rate	-0.045*** (0.000)	-0.070*** (0.000)	-0.056** (0.000)
Female ratio	-0.051*** (0.000)	-0.086*** (0.005)	-0.043*** (0.000)
<i>Constant</i>	3.560*** (0.000)	0.780*** (0.000)	1.983*** (0.000)

Note: Robust Standard Error in parenthesis; ***p≤0.01, **p≤0.05, *p≤0.10

Table 8: Summary of results (Hypotheses 1-6)

Hypothesis	Result
H1a: Control of corruption has an overall positive and significant relationship with entrepreneurial activity	Not supported
H1b: The positive relationship between control of corruption and entrepreneurial activity is stronger in developed countries than in developing countries	Supported
H2a: Rule of law has an overall positive and significant relationship with entrepreneurial activity	Supported
H2b: The positive relationship between rule of law and entrepreneurial activity is stronger in developed countries than in developing countries	Supported
H3a: Regulatory quality has an overall positive and significant relationship with entrepreneurial activity	Supported
H3b: The positive relationship between regulatory quality and entrepreneurial activity is stronger in developing countries than in developed countries	Supported
H4a: Power distance has an overall negative and significant relationship with entrepreneurial activity	Supported
H4b: The negative relationship between power distance and entrepreneurial activity is stronger in developing countries than in developed countries	Supported
H5a: Individualism has an overall positive and significant relationship with entrepreneurial activity	Supported
H5b: The positive relationship between individualism and entrepreneurial activity is stronger in developed countries than in developing countries	Supported
H6a: Uncertainty avoidance has an overall negative and significant relationship with entrepreneurial activity	Not supported
H6b: The negative relationship between uncertainty avoidance and entrepreneurial activity is stronger in developed countries than in developing countries	Not supported

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5.3 Hypothesis 7 Testing

In section 2.2, I hypothesized that [7a] innovation has a positive relationship with entrepreneurial activity and [7b] the relationship is stronger for developed countries than for developing countries. Table 9 shows the results of the extended regression model, regressing new business density rate on global innovations index. It can be seen that global innovations index has a significant relationship with new business density rate, at more than 99% confidence level. This implies that there is a less than a 1% chance of these relationships occurring by random chances, suggesting that global innovation index is a strong predictor of new business density rate. To reiterate the interpretation, the variable has a positive coefficient for all the columns in the extended regressions model, supporting hypothesis 7a that attempts to test a positive relationship with entrepreneurial activity. Additionally, the coefficients of in the “Developed” column is larger than the coefficient in the “Developing” column which implies that the strength of positive relationship between innovation levels and entrepreneurial activity are stronger in developed countries, supporting hypothesis 7b. Hence, the results are in line with the expectations discussed in the theoretical framework section of the research, implying that innovational activities are more likely to encourage opportunity entrepreneurship prevalent in developed countries.

Table 9: Regression results testing H7

	<i>Total</i>	<i>Developing</i>	<i>Developed</i>
New Business Density Rate	Coefficient	Coefficient	Coefficient
Global Innovations Index	0.217*** (0.000)	0.079*** (0.000)	0.207*** (0.000)
Control Variables			
Unemployment rate	0.034 (0.204)	0.057 (0.129)	0.029 (0.394)
Female ratio	0.108 (0.802)	0.035 (0.178)	-0.175** (0.042)
<i>Constant</i>	-3.814*** (0.000)	-0.791 (0.145)	-3.179*** (0.000)

Note: Robust Standard Error in parenthesis; *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.10$

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5.4 Hypothesis 8 Testing

In section 2.3, I hypothesized that [8a] innovation mediates a relationship between institutions (regulative and cultural dimensions) and entrepreneurial activity, where [8b] the mediation role of innovation is stronger in developed countries than in developing countries. Table 10 presents the results of the mediation tests conducted to test the stated hypothesis. Upon conducting the mediation test on STATA, the statistical results indicated a significant direct path between global innovations index and new business density rate for all the variables. Additionally, the coefficients of all the variables except uncertainty avoidance, indicated reduced but significant figures. This implies that direct effects of control of corruption, rule of law, regulatory quality, power distance and individualism, on entrepreneurial activity has reduced upon intervention of innovation, suggesting a partial mediation. Thus, table 10 illustrates Sobel test statistics for all the variables to demonstrate possible significant as well as insignificant mediation results.

To begin with, when looking at control of corruption coefficients in table 10, it can be seen that the ratio of the indirect effects over the standard error is overall significant, regardless of country dummies. As per the total effect (sum of direct and indirect effects), the link between control of corruption and new business density rate is overall mediated by 20.19%. However, this ratio is significant for developing countries but not for developed countries, implying that control of corruption stands to have an indirect relationship with entrepreneurial activity only in developing countries. Based on the results presented in table 11, the link between control of corruption and new business density rate is mediated by 6.21% in developing countries. According to table 8, the coefficient for control of corruption indicates a positive indirect relationship with entrepreneurial activity while it shows a negative direct relationship with entrepreneurial activity in this research (See table 7). As discussed in section 5.2, control of corruption and entrepreneurship tend to have a strong upward-concave relationship initially due to lack of institutional trust on the inefficient governments. There is a possibility that the intervention of innovation eases the initial inverse relationship between control of corruption and entrepreneurship in developing countries. In simple words, when necessity entrepreneurs pursue innovational opportunities, they tend to levy increased responsibility on the government to compensate their risk-taking approach as they shift from their core goals of “business survival”. This reliability on the governmental system during a risky business pursuit is strongly reasoned with the collectivist culture prevalent in developing countries, where one needs social support to grasp upon new business opportunities. In that case, government’s anticorruption regimes provide reassurance to the entrepreneurs and builds the adequate level of institutional trust for them to proceed with the innovational and entrepreneurial endeavors

Secondly, the ratio of the indirect effects over the standard error for rule of law is overall significant, regardless of country dummies (See table 10). As per the total effect, the link between

rule of law and new business density rate is overall mediated by 13.29%. Moreover, this ratio is significant for both developing as well as developed countries, implying that rule of law has a strong indirect relationship with entrepreneurial activity across all economies. As seen in table 11, the link between rule of law and new business density rate is mediated by 2.72% in developing countries while 6.90% in developed countries. This suggests that the mediation effect of innovation on the relation between rule of law and entrepreneurial activity is stronger for developed countries. This is in line with the study by Elert et al. (2017) which found that economic agents can reap the utmost benefits of the rule of law if the government is sufficiently efficient to maintain the rule of law. It is known that government efficiency is higher in developed countries due to more controlled corruption levels, which in turn makes developed countries more susceptible to positive mediation effects as derived in this research.

Thirdly, the ratio of the indirect effects over the standard error for regulatory quality is overall significant, regardless of country dummies (See table 10). As per the total effect, the link between rule of law and new business density rate is overall mediated by 14.63%. Moreover, the coefficients of indirect effects are significant for both developing as well as developed countries, implying that regulatory quality has a strong indirect relationship with entrepreneurial activity across all countries. The link between regulatory quality and new business density rate is mediated by 31.82% in developing countries while 8.42% in developed countries. This suggests that the mediation effect of innovation on the relation between regulatory quality and entrepreneurial activity is stronger for developing countries. The finding contradicts the study by De Soto (1989) which explains that poorly regulated economies are suitable for informal businesses. These businesses often constitute one of the largest parts of developing economies. However, various studies suggest that the quality of laws and regulations in the developing countries tend to be higher than its government's efficiency towards enforcing compliance (Elert et al. 2017). Thus, the positive mediation effects concerning regulatory quality is more inclined towards developing countries which is in line with the findings of this research paper.

Fourthly, when looking at power distance coefficients in table 10, it can be seen that the ratio of the indirect effects over the standard error is overall significant, regardless of country dummies. As per the total effect, the link between power distance and new business density rate is overall mediated by 72.73%. However, this ratio is significant for developed countries but not for developing countries, implying that power distance stands to have an indirect relationship with entrepreneurial activity only in developed countries. The link between power distance and new business density rate is mediated by 68.72% in developed countries. This could be explained by the differential impact of power distance on necessary versus opportunity-driven entrepreneurs that are prevalent in developing and developed countries respectively. In high power distance countries, the wealth is unfairly distributed in a society where authorities are given utmost priority while comprising the socio-economic mobility (House et al. 2004). Hence, entrepreneurs who are more inclined towards seizing opportunities to create wealth by disrupting existing norms and economic structures are not encouraged in high power distance societies. Necessity-driven

entrepreneurship is more likely to sustain in such societies due to its relatively unsophisticated business models (Sambharya and Musteen, 2014). Thus, the studies by House et al. (2004) and Sambharya et al. (2014) are in line with the findings of the research, suggesting that the negative mediation effect by innovation on the relationship between power distance and entrepreneurial activity should be stronger for developed countries.

Furthermore, the ratio of the indirect effects over the standard error for individualism is overall significant, regardless of country dummies (See table 10). As per the total effect, the link between individualism and new business density rate is overall mediated by 70.26%. Moreover, this ratio is significant for both developing as well as developed countries, implying that individualism has a strong indirect relationship with entrepreneurial activity across all economies. The link between individualism and new business density rate is mediated by 64.13% in developing countries while 59.69% in developed countries. This suggests that the mediation effect of innovation on the relation between individualism and entrepreneurial activity is stronger for developing countries. The finding could be explained by the differential impact of individualistic cultural dimensions on opportunity versus necessity entrepreneurs. As Morris et al. (1994) suggests, the degree to which a society encourages individual actions is likely to influence the extent to which the society breeds entrepreneurial intentions amongst people. Opportunity-driven entrepreneurs entail higher opportunity costs of pursuing a venture to create wealth than necessity-driven entrepreneurs, enhancing the degree of risk in prioritizing entrepreneurial activities. For instance, necessity-driven entrepreneurs often receive substantial social support in pursuing their ventures by their family and rest of the social circle, indicating a strong collectivist side of the society (Hessels et al. 2008). Thus, necessity entrepreneurs take the advantage of these collectivist cultural norms and are more encouraged towards exploring innovational and entrepreneurial endeavors.

Finally, when looking at uncertainty avoidance, it can be seen that the ratio of the indirect effects over standard error is overall insignificant, regardless of country dummies (See table 10). Additionally, this ratio is statistically insignificant for both developing as well as developed countries, implying that uncertainty avoidance stands to have no indirect relationship with entrepreneurial activity across all economies. Thus, there is no mediation between the two variables by innovation in this research. Although, studies such as Kaasa and Vadi (2008) found that countries with a lower tolerance towards unpredictability have fewer patent applications, which is seen as a deterrent to innovation and further entrepreneurial activities. The study is not in line with the findings of this research paper as the foundation of the uncertainty avoidance variable used may have different implications. As stated earlier in section 5.2, many existing literatures have illustrated the fact that Hofstede's uncertainty avoidance index is not compatible to showcase a relationship with innovational activity whereas the GLOBE uncertainty avoidance index does. This could provide a possible explanation to the insignificant relationship derived in this research paper.

Moreover, upon summarizing the mediation results of this research, the average proportion of mediation effect in developed countries is larger than that in developing countries, as seen in table 11 (23.95% > 17.48%). This suggests that the role of innovation in stimulating a relationship

between national (formal and informal) institutions and entrepreneurial activity is stronger for developed countries, supporting hypothesis 8b of the research paper.

Table 10: Mediation results testing H8

	<i>Total</i>	<i>Developing</i>	<i>Developed</i>
Sobel Test Statistic Estimates	Coefficient	Coefficient	Coefficient
<i>Indirect Effects</i>			
Regulative Dimensions of Institutions			
Control of Corruption	0.606*** (0.006)	0.118** (0.013)	0.356 (0.242)
Rule of Law	0.420*** (0.000)	0.050*** (0.007)	0.216*** (0.000)
Regulatory Quality	0.049*** (0.008)	0.367*** (0.001)	0.322** (0.040)
Cultural Dimensions of Institutions			
Power Distance	-0.073*** (0.000)	-0.002 (0.558)	-0.052*** (0.000)
Individualism	0.072*** (0.000)	-0.005** (0.008)	0.056*** (0.000)
Uncertainty Avoidance	0.007 (0.134)	0.001 (0.581)	-0.021 (0.305)

Note: Robust Standard Error in parenthesis; *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.10$

Table 11: Summary of Mediation Results (Hypothesis 8)

Mediation	<i>Total</i>	<i>Developing</i>	<i>Developed</i>
Control of Corruption	20.19%	6.21%	-
Rule of Law	13.29%	2.72%	6.90%
Regulatory Quality	14.63%	31.82%	8.42%
Power Distance	72.73%	-	68.72%
Individualism	70.26%	64.13%	59.69%
Uncertainty Avoidance	-	-	-
Test Average	31.85%	17.48%	23.95%

6. CONCLUSION

6.1 Conclusion

The aim of this paper was to study the role of innovation in mediating a relationship between regulative and cultural dimensions of institutions, and entrepreneurial activity. Additionally, the study investigates the extent to which this phenomenon differs with economic characteristics of a country by drawing a comparative study between developing and developed countries. This was done by deriving the following central research question:

“To what extent does innovation mediate the impact of regulative and cultural dimensions of institutions on entrepreneurial activity and how does it differ between developing and developed countries?”

This question was explored using variables such as new business density rate (measuring entrepreneurial activity) and World Governance Indicators (measuring regulative dimensions of institutions) from the World Bank (WB, 2022), cultural indices (measuring cultural dimensions of institutions) from the Hofstede model (Hofstede, 2010) and global innovation indices (measuring innovation) from the World Intellectual Property Organization (WIPO, 2022). To group countries by economic characteristics, the paper used the United Nations classifications, based on GNI per capita. Based on these classifications, the low-income and lower-middle income countries are considered as developing countries whereas the upper-middle income and high-income countries are classified as developed countries in this research (See Appendix). I used this data to first study the influence of regulative and cultural dimensions of institutions on entrepreneurial activity and how does it differ between developing and developed countries [1a-6b]. Then, I focused on studying the impact of innovation on entrepreneurial activities for both developing and developed countries. [7a & 7b]. Lastly, the study investigates the mediating role of innovation in building a relationship between the stated institutions and entrepreneurial activity, and the extent to which this phenomenon differs across countries with varying economic characteristics [8a & 8b].

For regulative dimensions of institutions, the results showed that both rule of law and regulatory quality have a significant positive relationship with entrepreneurial activity [Supporting H2a and H3a]. However, control of corruption has an overall significant negative relationship with entrepreneurial activity [Rejecting H1a]. Anokhin and Schulze (2009) found that initially control of corruption and entrepreneurship tend to have a negative relationship. Over time, this relationship moves in an upward direction, illustrating an overall nonlinear convex relationship between control of corruption and entrepreneurship. The initial negative relationship is reasoned due to an entrepreneur’s lack of institutional trust in governmental system and its regimes. Thus, an interesting find of this study was that the time frame chosen for this research (2016-2021) is not adequate to indicate possible variations in institutional trust amongst entrepreneurs, thus failing to showcase a positive relationship between control of corruption and entrepreneurship.

For cultural dimensions of institutions, the results showed that power distance has a significant negative relationship with entrepreneurial activity and individualism has a significant positive relationship with entrepreneurial activity [Supporting H4a and H5a]. However, developing countries are more prone to a negative relationship between individualism and entrepreneurial activity. This validates the notion that collectivism is the core cultural value in countries with low economic development, where the society prioritizes group interests over individualistic interests. Thus, with the social support from in-group members, necessity-driven entrepreneurs pursue business ventures and justify the inverse relationship between individualism and entrepreneurial activity derived for developing countries. Furthermore, our empirical results failed to illustrate a direct relationship between uncertainty avoidance and entrepreneurial activity [Rejecting H6a]. This is reasoned with the fact that the differences in the definition of uncertainty avoidance between the two frameworks (Hofstede and GLOBE) leads to two different sets of empirical findings and conclusion. In this study, Hofstede's framework has been incorporated which represents the "stress" dimension of uncertainty avoidance. According to our empirical findings, the stress caused by uncertainty may not have substantial influence on the level of entrepreneurial activity prevalent across countries, which is in line with the existing study by Cox and Khan (2017).

Next, the research focuses on exploring the influence of innovation on entrepreneurial activities of developing versus developed countries and the results showed that innovation has a positive relationship with entrepreneurial activity and this relationship is stronger in developed countries [Supporting 7a and 7b]. This is in line with the study by González- Pernía et al. (2015) that suggests a positive relationship between stock of new knowledge and entrepreneurship. In simple words, creation and accumulation of new ideas leads to possible innovation in the economy. This innovational output drives the individuals to pursue entrepreneurial opportunities and earn substantial income out of their knowledge creation. The phenomenon is more prevalent in developed countries as opportunity-driven entrepreneurs take the initiative of exploring new ideas and risk-taking business opportunities whereas necessity-driven entrepreneurs are known to prioritize survival by sticking to less risk-taking unsophisticated business models.

Finally, the research aims to investigate the role of innovation as a mediator for regulative and cultural dimensions of institutions, and entrepreneurial activity in developing and developed countries. The results showed that control of corruption, rule of law, regulatory quality, power distance and individualism have significant indirect effects on entrepreneurial activity upon intervention by innovation, except uncertainty avoidance. An interesting new find was that innovation mediates an indirect positive relationship between control of corruption and entrepreneurial activity whereas previously, our empirical results suggest a negative direct relationship between control of corruption and entrepreneurial activity. This study found a possibility that entrepreneurs in developing countries (necessity entrepreneurs) tend to build institutional trust on the governmental system only when they are required to pursue risky innovation-driven business endeavors due to a strong collectivistic culture prevalent in developing countries. Thus, government's corruption control regimes provide reassurance to the necessity

entrepreneurs to compensate their risk-taking approach in entrepreneurial activities, suggesting that the intervention of innovation eases the initial inverse relationship between control of corruption and entrepreneurship in developing countries.

Furthermore, another primary new finding of this study is that the average mediation effect of innovation on the national institutions is higher for developed countries compared to developing countries, suggesting developed countries are more prone to the mediation. This is in line with views by Schumpeter (1934) and González- Pernía et al. (2015) that believe developed countries are more prone to efficient knowledge creation, which further leads to a knowledge-spillover linkage to effective innovation-driven entrepreneurship. On the other side, developing countries often struggle in similar entrepreneurial environment, thus they resort to foreign firms to import knowledge or take an imitative approach. Entrepreneurs from developed countries (opportunity entrepreneurs) are more open towards introduction of new technological processes or products. Thus, the role of innovation in mediating an indirect relationship between institutions and entrepreneurial activity is more relevant for entrepreneurs in developed countries. On an aggregate level, the conclusions of this study are subject to change with a different chosen time frame, which labels the research topic academically worthy for extended future research.

6.2 Limitations and Future Research

Despite the insights brought to light by this research, it is crucial to note some important limitations of the study. Firstly, the country sample derived from World Bank omits some countries such as Andorra, Bhutan, Cuba, Liechtenstein, Monaco and North Korea. Thus, despite of using random effects regression methods, the sample still may not be fully representative of the comparative trends derived for institutions, innovation and entrepreneurial activity across different economies. Therefore, for future studies, the sample should not omit countries that have a significant population in order to yield externally valid results. Secondly, the country-level statistical analysis chosen for this research may lack certain comprehensive research that the topic could entail. Thus, for future research, this topic could be researched further based on individual-level analysis through effective probit models. By predicting the effects of informal institutions on innovation and entrepreneurial activity while incorporating individual-level control variables, a more robust set of findings can be yielded in terms of individualistic cultural choices in the society. Thirdly, the research generalizes the conclusions on regulative and cultural dimensions of institutions by selecting few variables. This opens doors for future research where the other World Bank Governance Indicators, i.e., voice and accountability, political stability, government effectiveness and absence of violence, could be assessed. Similarly, the future research could also explore the other Hofstede's cultural dimensions, i.e., masculinity vs femininity, long vs short-term orientation and indulgence vs restraint, for enhanced holistic conclusions about the relationship between cultural dimensions of institutions, innovation and entrepreneurial activity. Additionally, from an institutional point of view, the future research could also include normative dimensions in the analysis. Since the overlap between normative and cultural institutional dimensions is usually persistent in an analysis with country-level data, the future study can incorporate both the

dimensions onto the research by collecting individual-level survey data for normative and cultural dimensions. Lastly, the time frame chosen for this research is relatively short to showcase potential trends with the cultural dimensions of institutions chosen for the study as they alter over a longer period. For instance, Hofstede's cultural indices were last updated in 2010 and before that, in the year of 1990, suggesting two decades for a prominent change in the variables. Hence, a larger time-series data sample is recommended for a more detailed understanding and comprehensive analysis on this research topic for future research.

6.3 Policy implications

The findings of this paper bring forward some relevant short-term as well as long-term policy implications. The results showed that the mediation effect of innovation is stronger for rule of law, regulatory quality and individualism as they cumulatively mediate majority of the total effects (See table 11). Policies should be structured in a way that it encourages the listed institutions to enhance innovation, implying that a direct effect of institutions on innovation could have potential indirect effects on entrepreneurship. In terms of rule of law, the government can encourage innovation by implementing regimes that facilitates easy flow of patent applications, access to intellectual property rights and enhanced intellectual property rights protection for developed countries. In terms of regulatory quality, the government can alleviate fiscal freedom by taking an expansionary fiscal approach. This approach may include lower business tax for necessity entrepreneurs in developing countries, which leads to higher after-tax profits and hence, higher disposable income. On the other hand, it is argued that aspects of informal institutions are likely to take a longer span of time to change due to rigid societal norms. Thus, a change can still be levied upon these cultural dimensions by devising a long-term strategy. With regards to individualism, Hofstede (2001) demonstrates a strong correlation between individualistic and power distance societies, that is, lower power distance countries tend to have higher individualistic cultural value persistent in the society. Although developing countries substantially contribute to entrepreneurship with a collectivist cultural background, our findings indicate an overall positive relationship between individualism and entrepreneurial activity. Thus, long-term strategies can be implemented which focuses on the acceptance of strategic freedom given to employees, despite the prevalent hierarchy in companies. Additionally, mandates on strong employee flexibility regimes should be levied on large and matured companies in the long run for developing countries. Thus, all in all, regulative as well as cultural dimensions of institutions have high potential to influence innovation, which in turn has a strong impact on entrepreneurial activity. By taking active measures to maximize this potential, the countries will breed entrepreneurship regardless of any economic characteristics.

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APPENDIX

High-Income	Upper-middle Income	Lower-middle Income	Low-Income
Switzerland	China	Vietnam	Rwanda
Sweden	Bulgaria	India	Malawi
United States of America	Thailand	Ukraine	Madagascar
United Kingdom	Brazil	Philippines	Tajikistan
Republic of Korea	Iran	Mongolia	Burkina Faso
Netherlands	South Africa	Republic of Moldova	Uganda
Finland	Peru	Tunisia	Mozambique
Singapore	Malaysia	Morocco	Mali
Denmark	Turkey	Kenya	Togo
Germany	Russian Federation	United Republic of Tanzania	Niger
France	Montenegro	Uzbekistan	Ethiopia
Japan	Serbia	Cabo Verde	Guinea
Hong kong	Mexico	El Savador	Yemen
Israel	Costa Rica	Kyrgyzstan	
Canada	North Macedonia	Pakistan	
Iceland	Belarus	Bolivia	
Austria	Georgia	Senegal	
Ireland	Colombia	Honduras	
Norway	Armenia	Cambodia	
Estonia	Jamaica	Nepal	
Belgium	Bosnia and Herzegovina	Ghana	
Luxembourg	Azerbaijan	Zimbabwe	
Czech Republic	Jordan	Zambia	
Australia	Albania	Egypt	
New Zealand	Indonesia	Sri Lanka	
Malta	Paraguay	Cote d'Ivoire	
Cyprus	Ecuador	Bangladesh	
Italy	Namibia	Lao People's Democratic Republic	
Spain	Guatemala	Nigeria	
Portugal	Argentina	Algeria	
Slovenia	Kazakhstan	Cameroon	
Hungary	Lebanon	Myanmar	
Slovakia	Dominican Republic	Benin	
Latvia	Botswana	Angola	
Poland			
Croatia			
Mauritius			
Chile			

Uruguay

United Arab Emirates

Lithuania

Greece

Romania

Saudi Arabia

Qatar

Kuwait

Oman

Bahrain

Brunei Darussalam

Panama

Trinidad and Tobago
