university of groningen / faculty of spatial sciences

ARE WEALTHY REGIONS ALSO ENTREPRENEURIAL?

The Case of Indonesia

WINI WIDIASTUTI

2013

MASTER THESIS

ARE WEALTHY REGIONS ALSO ENTREPRENEURIAL?

The Case of Indonesia

Student:

WINI WIDIASTUTI

Supervisor:

Dr. SIERDJAN KOSTER

RESEARCH MASTER ON REGIONAL STUDIES: Time, Space, Analyses and Intervention

FACULTY OF SPATIAL SCIENCE

UNIVERSITY OF GRONINGEN

2013

Acknowledgments

Alhamdulillah is the only way to express how grateful I'm that I finally reach the end of my Master study in the "happiest city in Europe".

First of all, I would like to thank Neso Indonesia for their financial support. Secondly, I thank my supervisor Sierdjan Koster for his supports and fruitful discussions. Then, I also thank my parents (*Bapak* Jufri and *Ibu* Rohani), my sisters (*kak* Rini, Yeni and Linda), my only brother (Dayat-miss you so much *yok*), my brothers in law (*mas* Hadi and *mas* Rohman) and especially to my biggest fans and lovely children (*kak* Nadan, *kak* Rafa and *adek* Rere).

I'm very grateful that I meet lots of friends who make living in this city feels like home: people of Diaconessen house 2011-2012, ReMa plus one—you know who, all my Indonesian family in Groningen, Opaalstraat family, Grote beerstraat family and of course absurd group chapter one and two. Thank you guys!

I would also like to thank my colleagues in BPS-Statistics Indonesia for providing the data and for making this analysis possible. Lastly, I would like to express my great appreciation to *pak guru*—*makasih kiiiii!*

"For some people this is the end of a journey, I would rather say this is just the beginning"

Groningen 2013

Wini Widiastuti

Abstract

The relationship between economic development and entrepreneurship is complex and dynamic especially when considered at the regional level. Entrepreneurship can emerge in both wealthy and poorer regions as triggered either by necessity or opportunity factors. Motivated by the lack of studies on this topic in particularly developing countries, this study performs an analysis on Indonesian data to identify the regional patterns of entrepreneurial activity and to test whether wealthy regions are more entrepreneurial than the second ones. In addition, it also examines how regional conditions affect different type of businesses, formal and informal firms.

The results of spatial regression analysis indicate that wealthy regions are more entrepreneurial with regard to informal firm but not for formal firm. The supply side analysis confirms that being unemployed stimulate individuals to become entrepreneurs that are necessity-based entrepreneurship. Meanwhile, the demand side analysis confirms that the size of market demand positively influence entrepreneurship that is opportunity-based entrepreneurship.

Keywords: Entrepreneurship, start-up rates, regional economic development, developing countries, Indonesia.

Table of Contents

List of tables

List of figures

1. Introduction

1.1 Importance of the topic

Entrepreneurship creates wealth by combining labour, capital and knowledge in a productive use. Many studies have shown that entrepreneurship plays an important role in enhancing economic growth (Acs et al., 2003; Audretsch et al., 2006; Wennekers and Thurik, 1999; Sobel, 2008; van Praag, 1999). Economic activities of firms generate income as well as jobs; therefore, entrepreneurship is considered as an important aspect of economic development. In this respect, actions to stimulate entrepreneurship could be critical to enhance economic performance.

The relationship between economic development and entrepreneurship, however, is rather complex and dynamic, especially when considered at the regional level. In fact, a country should not be seen as a single entity. The national economic growth might be high but it is not merely true that all the regions grow simultaneously. Entrepreneurship is a regional event (Sternberg and Rocha, 2007), partly because some regions may have a better opportunity to become entrepreneurial regions due to its environmental, demographic, economic and cultural conditions. Regions with abundant natural resources offer opportunities to stimulate businesses that depend on the availability of raw materials. Regions which are densely populated provide a wide scale of economic activity. Regions which have better business climate, i.e. ease access to capital, a pooled high skilled workers, and flexible entry regulations encourages entrepreneurship. In addition, cultural values that support entrepreneurial traditions enhance attitudes towards entrepreneurship. Therefore, analysing entrepreneurship at the regional level is as important as that at the national level (Bosma, 2009).

Entrepreneurs can emerge in both affluent and poorer regions. On the one hand, an advanced economy provides business opportunities due to the availability of capital. The wealthy regions, in general, have a relatively high purchasing power of consumers which stimulates entrepreneurship with regard to business profit. Nonetheless, the opportunity cost—an expected income when someone is employed—in the wealthy regions is higher, which may prevent individuals from becoming entrepreneurs. On the other hand, one characteristic of less developed regions is the high unemployment rate. The scarcity of jobs may motivate individuals to establish firms or other economic activities to generate income because no other options are available.

The level of economic development can also shape the type of firms located in the regions, i.e. sectors, business scale, and formality. One can predict a larger percentage of services oriented firms in the advanced regions compared to the emerging economies. Meanwhile, manufactured firms dominate business in the emerging regions. Large scale businesses probably mostly located in the

advanced regions due to relatively wide market opportunities, while small scale economic activities are favourable in less developed regions due to, for example, less capital intensity. In addition, large scale firms in wealthy regions require a higher capital that can encourage business founders to apply for formal business as it is usually included as prerequisite in loan application. Accordingly, small scale businesses in less developed regions may be prefer informal types to avoid taxes and others establishment fees.

The relationships between economic development and entrepreneurship have been extensively studied in the context of developed countries (Leibenstein, 1968, Acs et al., 2005;; Koster and Rai, 2008; Glaeser et al., 2012). Research on this topic in developing countries, however, is less advanced (Koster and Rai, 2008; Naude, 2010), yet many developing countries regard entrepreneurship as a cornerstone of their economic policies (Desai, 2009). Thus, studies in developing countries are needed in order to provide meaningful recommendations for policy makers.

With regard to this matter, the current study contributes to a better understanding of entrepreneurship issues in developing countries especially those related to regional economic development. Indonesia is chosen as the locus of the study because as an archipelago, its geographical conditions are naturally varied. Every island has its specific natural resources and culture which may directly or indirectly shape the presence of economic activities in the regions.

1.2 Aims of the research

This study aims to provide a better understanding on how regional economic development shape entrepreneurial activities in emerging economies. In addition, this study will provide an extended analysis of entrepreneurship in which the type of firms is categorized based on their registration status that is formal and informal business.

1.3 Research Question

The main research question of this study is “To what extent do regional differences play a role on shaping local entrepreneurial activities in Indonesia?”

To systematically answer the main research question, this study applies several sub questions as follows:

1. What are the spatial patterns of entrepreneurial activity in Indonesia?
2. How does the level of regional economic development influence entrepreneurial activity in Indonesia?
3. Does formal firms are favourable in wealthy regions?

1.4 Structure of the thesis

This thesis consists of five chapters. The outline of remaining chapters as follows:

Chapter 2 discusses conceptual framework of the topic. It begins with the general theory of entrepreneurship. Then, it is followed by understanding of the relationship between (regional) economic development and entrepreneurship. The discussion continues toward the opportunity and necessity entrepreneurs. It is ended up on the discussion of types of entrepreneurship.

Chapter 3 explains research methodology use in the study. It contains data, variables and methodologies.

Chapter 4 demonstrates place of the study, Indonesia. It provides the geography of Indonesia, economic trajectory as well as political dynamic of Indonesian regions.

Chapter 5 provides the results of analysis. It begins with explaining entrepreneurial pattern and follows by analysing regression results.

Chapter 6 concludes the study and provides some recommendations for future research.

2. Conceptual Framework

This framework aims to provide a prior understanding of the topic. In the beginning, this section discusses the concept of entrepreneurship. The second part addresses the concept of regional economic development. An elaboration of the inter-relationship between regional economic development and entrepreneurship will follow.

2.1 What is entrepreneurship?

In 1942, Joseph Schumpeter in his book 'Capitalism, Socialism, and Democracy' introduced a new view of entrepreneur as an innovator as well as destructor. According to his view, entrepreneurs who combine resources and create new products can lead to the obsolescence of existing businesses. These new innovations, or products, enter the market and compete with the existing products. For example, the development of recent data storage technologies such as clouds could decrease the demand for traditional data storage such as USB sticks, which in turn can cause some USB stick providers close their business. This disruptive role of entrepreneurship, which is called as 'creative destructive', disturbs the market equilibrium. Kirzner (1973), in contrast, perceived entrepreneurs as the equilibrating forces in the market process. He argued that in the continuing changes in supply and demand in the market, entrepreneurs play predominant roles in seizing previously unseen profit. At very least, entrepreneurs could discover opportunities to gain profits by buying products where its price cheaper and selling it where its price more expensive. These two discrete approaches to entrepreneurship, however, should not be seen as a contradiction. Holcombe (1998, 57) argued that 'new opportunities could arise from Schumpeterian entrepreneurship, which would create a disequilibrium situation with new profit opportunities for Kirznerian entrepreneurs to act upon.'

In more recent literature, scholars propose many ways of interpreting entrepreneurship. Entrepreneurship is defined as a new entry in the form of enterprises, businesses, firms or branches (Davidsson, 2004). The Global Entrepreneurship Monitor, a worldwide organization that focuses on the assessment of entrepreneurship across countries, introduces the notion of nascent entrepreneurship in which individuals who have taken some steps towards creating a new business are also included as entrepreneurs (Sautet, 2011). In this case, entrepreneurship is defined not only as an establishment but also as a process. Shrivastava and Shrivastava (2013), in a broader sense, concludes that entrepreneurship has two meanings—occupational and behavioural notion; occupational notion refers to owning and managing a business/firm, such as creation of new businesses, new enterprises or new organisations. The latter notion refers to entrepreneurial behaviour in which one seizes economic opportunities.

Audretsch (1993) argued that the start-ups can begin their activities on the basis of replication and innovation (Audretsch, 1993). New firms imitate the existing products and the production methods that are currently used. It is very common situation that is when a product gains its popularity or the demand is high, there will be some similar products in the market. Secondly, new firms innovate through introducing new products or producing the existing product using a new technology. In both cases, new entrepreneurs emerge.

Apart from these diverse definitions, analysing entrepreneurship could be performed at individual (or firm) and regional level. At the individual level, one's decide (or not) to become an entrepreneur. If they decide to do so, there will be a new entry in economic society (a firm). This innovative firm (in Schumpeter point a view) develops new ideas or new technologies and may also higher productivity. New firms changed the dynamics of the market as a whole and cause difficulties for other firms, destructive. New firms increased competition and acted as a catalyst in the market. In turn, it strikes established – existing- firms to innovate and to enhance their economic performance.

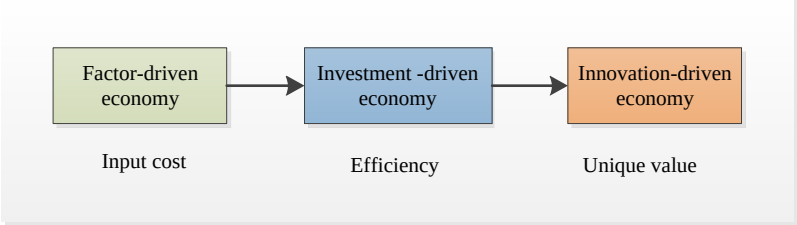
At the regional level a broad range approach has been implemented to account for the level of entrepreneurial activity. Some regions appeared to have higher level of entrepreneurship (Reynolds et al., 2004; Bosma, 2009). Entrepreneurship is start-up rates, SME (small medium enterprise) rates, self-employment rates, and business ownership rates (Acs et al, 2004; Acs and Armington, 2004; Baptista and Thurik, 2007). The rates are calculated by standardizes the number of new firms relative to either the labour force or the number of existing firms, which are called as the labour market and the ecological approach, respectively. Even though both approaches have their own underlying arguments, Acs and Armington (2004) argued that labour force is a better measurement of the entrepreneurial activity. The labour market approach gain more theoretical basis based on its implicit assumption that in line with the theory of Evans and Jovanovic (1989) regarding static model of entrepreneurial choice. That is, the persons, who starting a new firm, are workers in the same labour market within which their firms operates. A person chooses to either become an entrepreneur or remain a wage worker.

GEM, in addition, uses the average business start-up per 100 persons (Reynolds, 2001). The GEM data is widely used in recent entrepreneurship research (see for example, Bosma, 2009; Bosma and Schutjens, 2011). GEM also distinguished entrepreneurship based on their motivation to become entrepreneurs, opportunity or necessity (GEM, 2001). Opportunity-based entrepreneurship, if individuals starting their business because they seize a unique opportunity in the market. Meanwhile, necessity-based entrepreneurship is when individuals become entrepreneurs because there are no other options available.

2.2 Regional Economic development

There are three well-known theories which distinguish stages of economic development. The earliest is proposed by Rostow in 1959 (as cited by Wennekers, 2006). He divided the stages of economic growth into five categories, i.e. the traditional society, the pre-conditions for take-off, the take-off, the drive to maturity, and the age of high mass consumption. Almost two decades later, Chenery and Syrquin identified three stages of development (as cited by Wennekers, 2006; and Shrivastava and Shrivastava, 2013). The first stage is primary production, where the economy specializes in the production of agricultural products and small-scale manufacturing. The second stage is industrialization, where the economy shifts from small-scale production toward manufacturing. The last stage is the developed economy, in which the economy shifts away from manufacturing toward services.

Figure 2.1 Stages of economic development



Source: Porter (2001).

Meanwhile, a more recent argument by Porter (2001) proposed a more advanced division of economic development stages. Porter distinguished between countries based on their characteristic of competitive advantages and modes of competing. As can be seen in Figure 2.1, the framework identified three stages of development, the factor-driven economy, the investment-driven economy and the innovation-driven economy. These stages imply the evolution from resources-based economies toward knowledge-based economies. At the first stage, the economy mainly focuses on mobilization of primary production factors, such as land, primary commodities and unskilled labour. These production processes rely on technology that is adapted from advanced countries, in which the economy focuses on assembly, labour-intensive manufacturing and resources extraction. At the second stage, the economy focuses on manufacturing and outsourced service exports. The countries are able to produce more sophisticated products and services, yet they still implement technology and design introduced by advanced countries through licensing, joint ventures, foreign direct investment, and imitation. At the last stage, the country plays an important role in creating new technologies. They are able to commercialize knowledge and have a substantially high income status. In addition to these three stages of development, Sala-i-martin et al. (2012) also introduced

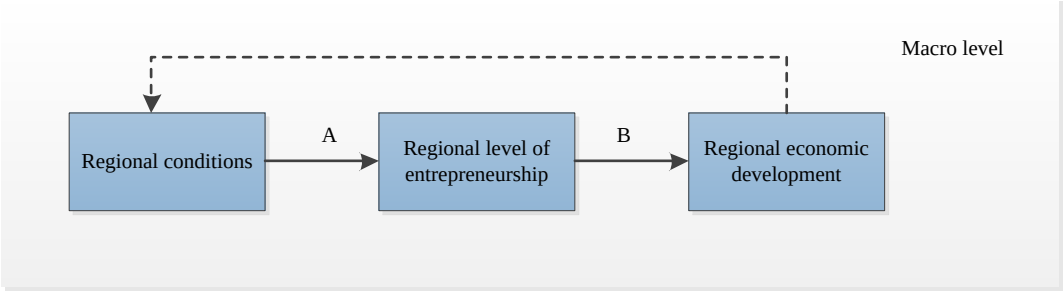
two intermediate phases of transition economies, between the factor-driven and investment-driven and between the investment-driven and innovation-driven stages. They argued that some countries stayed at the transition stages because of failures in economic development. All in all, each country has its own level of economic development.

Accordingly, the regional conditions are varied; there are factors which are specific to each region. With regard to entrepreneurship, these factors could foster or prevent entrepreneurship. It can be classified as environmental, demographic, economic, and cultural factors. Environmental factors include climate, infrastructures, geographic conditions, and natural endowments. Demographic factors are population density, population structure, level of education, and health. Economic factors are Gross domestic products (GDP), income, business climate, and business regulations. Finally, cultural factors include tacit knowledge and entrepreneur tradition.

2.3 Regional economic development and entrepreneurship at regional level

Bosma (2009) argued that regional economic development and regional entrepreneurship have twofold causal relationships (Figure 2.2). On the one hand, regional conditions influence the regional level of entrepreneurship (type A relationship). During decision making processes, individuals consider the past, the present, and the expected future of business environment in the regions where they intend to establish the firms (Wennekers et al. 2002). Regions which are more creative and diverse enjoy more dynamic entrepreneurship (Lee et al. 2004). On the other hand, regional entrepreneurship influences regional economic development (type B relationship), which is translated into regional conditions. Firms contribute to regional development by providing job opportunity, enlarging the market, enhancing economic growth, and increasing productivity as well as stimulating dynamic competition.

Figure 2.2 Macro relations between entrepreneurship and regional economic development



Source: Bosma, 2009.

To explain the inter-relationship between regional conditions and entrepreneurship, the current study employs approaches, which are introduced by Wennekers et al. (2002), including supply and demand side[1]. These approaches are widely used in entrepreneurship studies (see for example: Koster and Karlsson, 2010; Bosma, 2009). The first one refers to 'the pool of individuals with both the capabilities and preferences to start a business' and the latter refers to 'the opportunities available for starting business' (p. 36). In the remainder of this section, the discussions of those two sides are explained.

Supply side

Entrepreneurship is action by individuals in a population. Individuals with relevant preferences or attitudes, skills and resources represent the 'potential' supply of entrepreneurs (Wennekers et al., 2002). Entrepreneurial attitudes are influenced by the fear of failure, perceived opportunities and self-efficacy (Bosma, 2009). Skills are determined by the knowledge of individuals, i.e. level of education and talent. Meanwhile, resources are of financial such as capital, and of non-financial such as networks. Although becoming entrepreneur is an individual's choice, they also engaged in regional environments. A competitive business climate in the regions could foster entrepreneurship; reversely, a less supportive economic performance in the regions could hamper entrepreneurship. Indeed, regional conditions, such as financial resources and employment, also determine the regional supply of 'potential' entrepreneurs. Each regional condition is explained as follows.

Financial resources or capital include assets, income, saving and other financial sources owned by individuals. Because capital is needed to fund the business, so that when it is lacking, it could also be borrowed from external sources, either formal such as banks, venture capital, and micro finance or informal such as family, friends, and unauthorized money loan institutions. In other words, people will start a business if they have capital or if they have access to it. In general, wealthy regions have a higher accumulation of capital that is represented by the GDP, which means that potential entrepreneurs in wealthy regions also have a higher chance to commercialize their business plans. Accordingly, more entrepreneurs are expected to emerge in wealthy regions. Nonetheless, the access to funding is less substantial when firms are at the initial establishment stage compared to at the expansion business stage especially in the developing countries (Estrin et al., 2008). This is probably due to the fact that relatively minimum capital is required for self-employed entrepreneurs, small size firms and low-tech businesses. Moreover, ambitious potential entrepreneurs may adjust their plans by rescaling the business.

[1] This approach is influenced by the economics literature as well as an eclectic model proposed by Verheul et al. (2002).

Apart from the number of entrepreneurs, Klapper and Love (2010) found that business registration is positively correlated with GDP per capita. It suggests that individuals in high developed regions may favour formal firms. In order to achieve minimum capital they intended to borrow from banks or other institutions where the registration is compulsory requirement. Thus, more start-ups, may be also formal, as well as bigger firm size are expected to be found in wealthy regions. Nevertheless, as of in developing countries, even if the GDP is high, it might happens that the share of regional consumption to GDP is considerably higher than the share of regional saving. In this case, income is not always available to finance businesses resulting in less number of entrepreneurs. In general, size of firms in the regions is expected to be small. In order to cut spending, informal business might also be seen as a favourable option, there is no need to pay taxes. As of small firms, there is not necessary to apply for fund from banks or other formal institutions. Moreover, 'poor' quality management of government agency in developing countries lowered the willingness to legalize the firms. Illegal retribution, 'unclear' procedures and 'unspecified' actual time to complete application could be mentioned as examples.

Regional (un)employment rates also affect the supply of entrepreneurs. On the one hand, employed individuals gain higher opportunity costs define as 'the discounted present value of future earnings in the individual's most desirable career path' (Amit et al., 1995, 97). The opportunity costs restrict the choice of becoming entrepreneurs since individuals will start business when the expected discounted profits in the future are higher than the discounted sum of future earning as dependent employment (Evans and Jovanovic, 1989). Based on the data of Canadian workers, Amit et al. (1995) concluded that the likelihood of individuals starting entrepreneurial activities is higher when the opportunity costs are lower. According to this view, rich regions may have a smaller number of entrepreneurs. Nevertheless, the opportunity costs in developing countries are generally low compared to those in developed countries which can lead to different results.

On the other hand, if the unemployment rates are high, many people have no jobs. Unemployed residents may generate income by starting a firm or a business because they can immediately become self-employed, assuming that they have positive attitudes toward entrepreneurship (Audretsch et al., 2002). Especially in developing countries where social security programmes are not well established or even not available, these effects could be stronger. Therefore, the effects of regional un(employment) on entrepreneurship in developing countries remain unclear.

To conclude, the relationships of unemployment and start-ups are rather complicated (Armington and Acs, 2002). Regions with higher unemployment rate might be experienced decrease in its aggregate demand that is unwanted environment for start-ups. Applying time series analysis, Storey

(1991) found that unemployment is positively correlated with start-ups, while applying cross sectional or pooled cross sectional, the study found reverse conclusions. It suggests two indications, the first is there is a time lag between being unemployed and starting a business. Unemployed individuals need sometimes to make business plans, to gather ideas, and to provide resources. The second may be due to indifferent requirements for start-ups in each economic activity. In the case of high unemployment, the economic sectors that are required less amount of capital can have higher start-ups. In addition, one's cannot easily move from a particular sector to other sectors due to specific knowledge.

Demand side

Market demand determines the range of economic activities as of quantity and of quality. Assuming that entrepreneurs serve only the local market, the quantity of demand can be represented by the number of potential buyers residing in the regions. One proxy for representing potential buyers is population density in which densely populated areas provide a greater number of potential buyers. In other words, densely populated regions have a higher market demand. In this case, individuals perceive more opportunities to commercialize their knowledge and resources. They seize the opportunities and fill the gap in the market and this called an opportunity-based entrepreneurship (Audretsch et al., 2002). In addition, there are local markets that are unique for an archipelago country because the geography naturally isolates one island from another which can benefit local entrepreneurs to act upon the local markets. Even if there are expansions from the external market, local entrepreneurs gain competitive advantage as they can reduce the price because there is no need to pay extra transportation costs.

Population density can represent agglomeration effects. These effects are also known as urbanization effects that are density effects and spill-over effects. Density effects are based on the assumption that higher concentration of people can reduce production costs in terms of access to costumers as well as access to suppliers. Moreover, since the industry is closely located, each firm could easily update to the new development of their competitors such as new technology. Apart from population density, these effects could also be represented by population growth, the percentage of the population in their early adult years - 25-44 (Reynolds, 1991).

The quality of market demand can be represented by the range of products that are available on the market. Since rich regions are generally characterized by a relatively high consumer purchasing power, the residents are capable of buying more diverse products. In addition to the basic needs, people may start to spend money on complementary and luxury products. It encourages potential entrepreneurs (Kirznerian entrepreneurs) to create new products or to enhance the quality of

existing products. Moreover, as people are willing to increase their expenditure, this situation allows new firms to use advanced technology or production methods. In other words, these opportunities can creatively be combined which in turn increase entrepreneurial activities in the regions.

3. Data and Methodology

This chapter describes data and methodology that are used in the analysis. The first part explains the data. The latter describes two methods that are applied to obtain the results including mapping regional patterns and regression analysis.

3.1 Data and variables

This section consists of two parts. The first part explains the data including the firm level data, regional level data and spatial data. The latter part describes two methods that are mapping regional pattern using ArcGIS and regression analysis using Geoda.

Data

This research employs three types of data: firm level data, regional level data and spatial data. The first data is collected through the Indonesian Economic Census (Listing Sensus Ekonomi) in 2006 by BPS-Statistics Indonesia. It contains extended information on characteristics of each firm such as location, year of establishment, sector, formality, and production matrix. For the purpose of this study, the data is aggregated into the regional level. It is important to mention that missing values are found for 5 out of 440 regions, i.e. Tanjung Pinang, Pontianak, Minahasa, Manokwari, and Nabire; thus, these regions are omitted from the analysis.

The second set of data is retrieved from BPS-Statistics Indonesia and the Ministry of Home Affairs. From the first source, the data consists of Gross Domestic Product (GDP) at the constant market price, population and labour force. The GDP at the constant market price is chosen because it reflects the real change of economic development in the regions, while the GDP at the current market price is biased due to inflation effects. From the second source, the study uses the area of regions in square meters and the history of regional fragmentation. The later plays a substantial role in the matching of the regional and the firm level data. Lastly, the current map of Indonesia is provided by BPS-Statistics Indonesia on the basis of the Population Census of 2010. The spatial data, or map, contains polygons[2] of the third-tier regions that are municipalities (Kota) and regencies (Kabupaten). To enable the spatial analysis, the map is transformed from geographic coordinate system (GCS-WGS-1994), to projected coordinate system (DGN 1995 UTM zone 56N).

The number of regions in the regional level data is different from the firm level data which are 495 regions and 440 regions, respectively. Thus, the first is readjusted to the second one. The map is also

[2] It represents areas which are defined by borders (Mitchell, 1999).

edited according to the condition in 2006 by merging the polygons of areas which were split after 2005 into its original regions. At the end, all data are merged as an input for ArcGIS and Geoda.

Variables

To represent the level of entrepreneurship, the study calculates start-up rates adopting two approaches. The first method so called *the labour market approach* is calculated by standardizing the number of new firms in the respective regions relative to its labour force. Using this method, three start-up rates are computed that are total start-up rates, formal start-up rates and informal start-up rates. It can be illustrated by the equation below,

$$Y_i = \frac{F_i}{L_i} \times 1000$$

where Y represents the total or formal or informal start-up rates, F represents the number of new firms which are established in 2005 and later, and L represents the number of labour force. The subscript i refers to Indonesian regions. The second method, *the ecological approach,* considers the amount of start-ups relative to the size of existing population of firms. In other words, the number of new firms that are established from 2005 until the census date is divided by the number of existing firms that are established prior to 2004. Important to note that the number of start-ups in these two calculation is the amount of new firms that survive until the census period; thus, the actual start-ups can be higher.

To represent regional differences, the study employs demographic and economic data. The data includes population density, GDP at constant market price, diversity unemployment rate and size of firms. The explanation of each variable is as follows.

GDP per capita at constant market price

GDP per capita is retrieved from BPS-Statistics of Indonesia. It is calculated by dividing gross value added relative to size of the population in the regions.

Population density

It is computed as population in the respective regions divided by area per square kilometres. It is widely used to assess the potential for positive agglomeration effects in particular of the demand effects (Armington and Acs, 2002). Although this measurement is rather weak to identify potential spill-over effects because it does not provide the density of similar establishment in the regions (Armington and Acs, 2002).

Diversity

The study follows the calculation method performed by the Oxford Economy in The Global Diversity Report. The entropy index of economic diversity is defined as follows:

$$D_i = \sum_{i=1}^{N} S_i \ln\left(\frac{1}{S_i}\right)$$

where N is the number of sectors, S_i is share of firms in the sector and ln is natural logarithm. Higher entropy index values indicate greater relative diversification of entrepreneurial activities; on the other hand, lower values indicate relatively more specialisation of entrepreneurial activity in the regions.

Unemployment rate

It is retrieved from BPS-Statistics Indonesia as collected through the Indonesian Labour Force survey (*Survei Angkatan Kerja Nasional –Sakernas*). It is widely used in the previous studies (see for example, Audretsch and Fritsch, 1994, Guesnier, 1994, and Reynolds, 1994). The expected correlation of this variable to start-ups is mixed. The unemployment rate is expected to be negatively correlated with the start-ups of high capital sectors; conversely, it is expected to be positively correlated with start-ups of low capital industry. Therefore, the overall effects of unemployment rate are indeterminate. Nevertheless, a number of studies found that a higher level of unemployment is related to a greater new establishment (Reynolds, 1991)

Size of firms

Size of firms is a proxy of the structure of industry in the regions. It is measured by the average size of firms in the regions. The size refers to the number of workers; the larger the average size the greater the dominance by larger firms. Therefore, it is expected to negatively correlate with start-ups.

In addition, the study includes three dummy variables, including cityness (*kota/kabupaten* status), Java Island (or other islands) and mining area (or not). The first one is important due to the following reasons. Firstly, cities in general have better infrastructure facilities, such as transportation system, and ease access to financial resources, such as banks which encourage start-ups. In addition, cities attract younger, better educated adults which form a pool of potential entrepreneurs (Reynolds, 1991). The second dummy is used to divide the regions into two categories, i.e. Java and of non-java. It is important due to the historical trajectory of both economically and politically. Using the third

dummy, the regions are categorized as mining regions if the share of mining sector in GDP at the constant market price is 10% or higher. To our knowledge, there is no exact cutting point of the percentage to be called as mining regions or otherwise. Therefore, the study performs two calculations that are 10% and 20% share of mining sector. The results show that the direction and the significance test in the regression for both measurement are remain unchanged, thus to employ either measurement is valid.

3.2 Methodology

To answer the research questions, the study employs two tools of analysis, including mapping entrepreneurial activities and regression analysis. The process of analysis is explained as follow.

Step 1 Mapping entrepreneurial regions.

The start-up rates were being mapped using ArcGIS software. The mapping process uses the symbology query[3] based on the quantile approach[4].

Step 2 Regression analysis using Ordinary Least Square (OLS)

The regression analysis was performed by using Geoda. For this purpose, the study constructed as weight matrix using the first order Rook's contiguity-based matrix. The weight matrix is modified manually considering possible neighbouring region between islands. The regression began with defining the dependent variable and independent variables. The dependent variable was regional entrepreneurship which was represented by regional start-up rates. Independent variables that were used in the regression are as follows: GDP in 2005 at constant market price, population density in 2006, diversity index of sectors, unemployment rate in 2007, and the size of firms. In addition, three dummy variables are employed, i.e. cityness (*kota/kabupaten* status), Java Island (or other islands) and mining area (or not).

Step 3 Regression analysis using spatial lag and spatial error model

The OLS regression results indicated spatial dependence amongst observations. The value in one region is correlated to the value of its neighbouring regions. Therefore, the study employed the spatial regression model including spatial lag and spatial error models. This step was important to perform; otherwise, the conclusion can be misleading.

[3] This query is used to assign symbol to feature based on an attribute that contains a quantity (Mitchell, 1999).
[4] Each class contains equal number of features (Mitchell, 1999).

4. Indonesia, a place of the study

Indonesia is the largest archipelagic country in the world with its 13,000 islands. Those islands are located in an area of 1.9 million square metres. The country, which has tropical climate, has spatially diverse patterns in ethnicity, resources endowment, population settlement, and economic structure. The dynamics of Indonesia are explained briefly in the rest of this section.

4.1 Demographic dynamic

According to BPS-Statistics Indonesia, population in 2006 is around 224 million people. Those people were located equally in urban and rural areas, 47% and 53%, respectively. Figure 4.1 confirms spatially diverse patterns of population settlement in Indonesia. Some regions are densely populated such as Java, Bali and Lombok. Other regions such as Sumatera, Sumbawa, Nusa Tenggara Timur and Sulawesi are only partially densely populated. Meanwhile, the rest of the country is categorized as sparsely populated areas, i.e. almost all Kalimantan and eastern Indonesia (Maluku, Maluku Utara, and Papua).

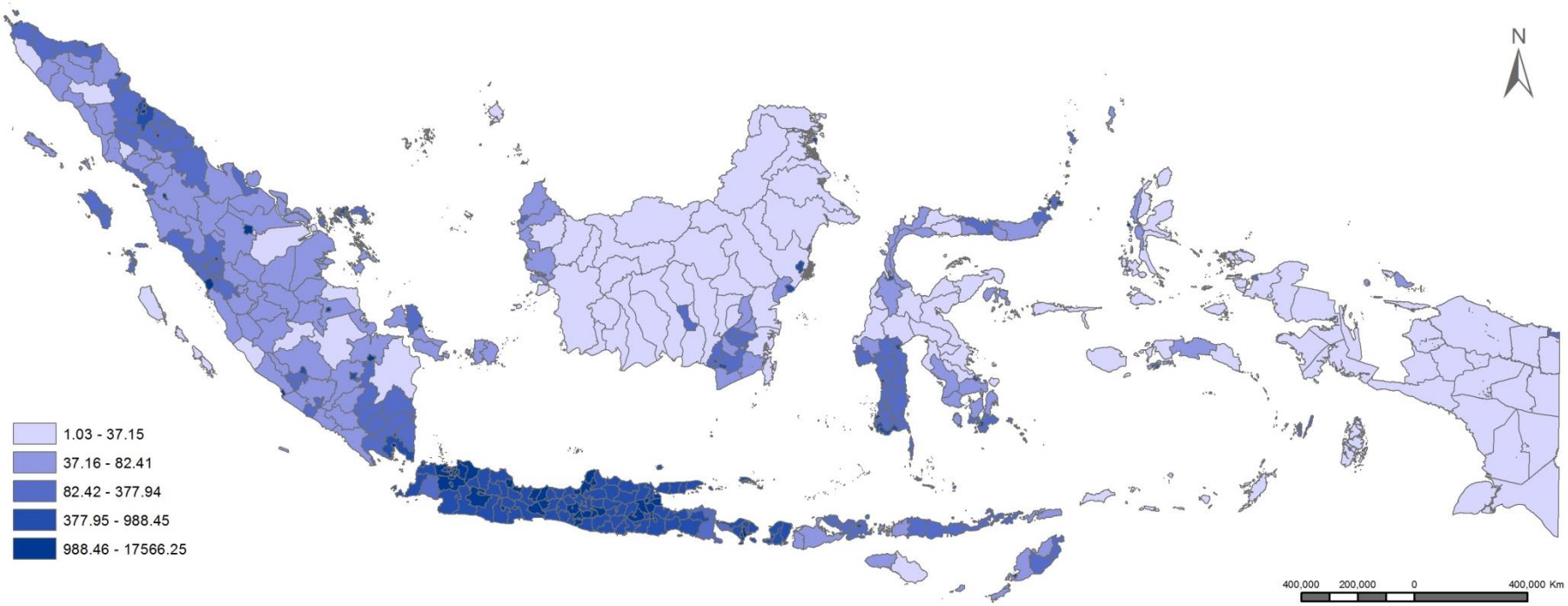
Table 4.1 Net enrolment rate and education attainment in 2004

	Net enrolment rate (%)			Mean of education attainment (years)
	Primary	Junior	Senior	
National	92.8	65.2	44.6	7.7
Urban	92.5	73.6	59.7	9.1
Rural	93.0	60.2	34.0	6.5
Difference	-0.5	13.4	25.7	2.6
Java + Bali	93.4	68.0	45.5	7.6
Outside Java + Bali	92.6	63.9	44.2	7.9
Difference	0.8	4.1	1.3	-0.3

Source: Modified by author based on Table 2 and 3 in Suryadarma et al. (2006).

Another important feature of demographic dynamics is human capital. It could be represented by the level of education. Table 4.1 provides an overview of spatial patterns of education attainment based on net enrolment rate. It shows that at the primary level, the net enrolment rate is almost similar in all regional categories. The junior and senior secondary, on the other hand, indicates regional inequality in education.

Figure 4.1 Population density in 2006



Source: Author's own calculation based on BPS-Statistics Indonesia data.

Spatial inequality occurs between urban and rural areas as well as between Java + Bali and the outside islands. Variations between rural and urban areas arise as the level of education increased. Indeed, the difference of senior secondary level is the highest amongst all, 26 percentage points. Meanwhile, the gap between Java + Bali and the outer islands is small for both junior and senior level especially for the second one, only one percentage point. With regard to education attainment, the average level of education in Indonesia is 7.7 years which means most people in Indonesia only finished the second year of junior high school. The difference between urban and rural is significant which is almost about the time of completing junior secondary education (2.5 years). Meanwhile, there is almost no difference between Java + Bali and the outers islands.

4.2 Economic structure

There are variations in the level of economic development of Indonesian regions. Based on local economic indicators, i.e. GDP, Non mining GDP and consumption expenditure per capita, Hill et al. (2008) categorized Indonesian provinces into four category, namely 'consistently wealthy', 'consistently non-poor', 'very poor', and 'slipping behind'.

- The first category (consistently wealthy) includes Jakarta, Kalimantan Timur, and Riau.
- The second category (consistently poor) includes Sumatera Utara, Kalimantan Tengah, Jawa Barat, Jawa Timur, Bali, and Sumatera Barat.
- The third category (very poor) consists of Nusa Tenggara Barat, Nusa Tenggara Timur, Maluku, and Sulawesi Tenggara
- The fourth category rest of the provinces are categorized as 'slipping behind' province such as Sumatera Utara, Jambi, Bengkulu, Kalimantan Barat, Kalimantan Selatan, and Lampung.

The contribution of sector in the Indonesian economy can be seen in Table 4.1. Economic activities are concentrated in three major sectors: manufacturing industry; wholesale or retail trade, restaurants, and hotels; and agriculture which are 24.9%, 19.3%, and 15.85, respectively. This indicates that Indonesia is now in the period of industrialization which can be linked to rapid export-industrialization due to the major policy reforms of the 1980s (Hill et al., 2008). Meanwhile, three sectors that obtained the lowest share in Indonesian economy consist of electricity, gas and water (1.1%); construction (5.7%); and transport, storage, and communications (6.5%).

Table 4.2 also shows that the economic structure of Java and the outer islands is different. Three largest sectors of Java are manufacturing industry, wholesale, or retail, restaurants, and hotels, and finance, insurance, real estate, and business. Meanwhile, the major sectors of the outer islands are agriculture, mining and quarrying, and manufacturing industry. These patterns can also suggest that

the level of economic development is different. With regards to Porter's argument (2001) on the stages of economic development, in a general sense, Java can be categorized as investment-driven economy. Business activities utilized production factors through industrialization as well as service-based activities such as banks, restaurants, and hotels. Accordingly, the outer islands can be categorized as factor driven economy. Economic activities are mainly depends on natural endowments such as land, minerals, oil and gas.

Table 4.2 Share of GDP at constant market price per sector in 2006

Sector	Percentage of total		
	National	Java	The outer islands
1 Agriculture	15.8	11.3	22.4
2 Mining and quarrying	9.1	1.4	20.3
3 Manufacturing industry	24.9	29.7	17.8
4 Electricity, gas and water	1.1	1.5	0.6
5 Construction	5.7	6.0	5.2
6 Wholesale or retail trade, restaurants, and hotels	19.3	22.3	14.9
7 Transport, storage, and communications	6.5	6.7	6.2
8 Finance, insurance, real estate, and business	8.8	12.1	3.9
9 Public services	8.8	8.9	8.7

Source: Author own calculation based on BPS-Statistics Indonesia data.

4.3 Political dynamic

It can be said that the devastating economic crisis in 1998 in which the level of economy contracted over 13% (Hill and Shiraishi, 2007) was closely linked to the political instability that followed. The country experienced a massive protest against the central government because of issues related to corruption, collusion, and nepotism of the New Order (*Orde Baru*), a centralist authoritarian regime. The student protests and decreasing political support forced Soeharto, who had been rolling the country for more than 30 years, announced his resignation on May 1998 (Fitrani et al., 2010).

B.J. Habibie, Soeharto's successor, intertwined the rule of the nation towards democratisation and decentralisation. Two new laws were introduced as a cornerstone of decentralisation (autonomy policy) that are Law No. 22/1999 on regional government (UUPD) and Law No. 25/1999 on fiscal relation. These two laws affected local, or regional, dynamic both politic and economic. As a result,

Indonesia experienced a “big bang” of new local governments. The number of third-tier government increased as many as 141 regions that is almost half of its original size in 1998 (298 regions). These new regions comprises of cities and of regencies which are 43 and 115, respectively. All new regions, except two cities (Depok and Cilegon) are located outside Java Island.

The second law also strengthen local economy by introducing revenue sharing between provinces and regencies (Alm et al., 2001). This regulation mainly benefits resource-rich regions because they are allowed to reserve most of the local revenues which formerly goes to the central government (Hill and Shiraishi, 2007). Nevertheless, the fixed general transfer from central to new regions provides decentralisation of fiscal resources which can support regional economy. In fact, the overall share of regional relative to the total government expenditures after decentralisation was almost double from approximately 17% in 2000 to over 30% after 2001 (Fitriani et al., 2010).

5. Results

This chapter provides results of the analysis both mapping entrepreneurial regions and regression. It begins with presenting the pattern of entrepreneurial activity in Indonesia. It continues by presenting the regression results. Some brief conclusions will follow in the end of this section.

5.1 Mapping entrepreneurial regions

The number of firms in Indonesia in 2006 is around 13 million. Of those, around 16% can be categorized as start-ups. This indicates a large number of new establishments, yet the actual new establishments might be larger since the data contains only the survival firms. Table 5.1 shows that the share of wholesale or retail trade, restaurant and hotels is the largest for both established firms and start-ups. Meanwhile, the share of electricity, gas and water is the lowest. One possible reason is that the size of firms which involve in the first one are relatively small compared to the latter. This is confirmed by the percentage of employment. Another reason is that anyone with relevant preferences and resources can be easily doing business, especially unregistered, in wholesale or retail trade, restaurants and hotels businesses. Meanwhile, it is unlikely to be the case in electricity, gas and water sector because investments in this sector require capital as well as technology intensity that can cause significant entry barriers.

Table 5.1 Share of firms by sector

Sector	Share Established firms	Share Start-ups	Share Employment
2 Mining and quarrying	1.8	2.5	1.6
3 Manufacturing industry	26.2	15.9	30.3
4 Electricity, gas and water	0.1	0.1	0.4
5 Construction	1.4	0.6	1.9
6 Wholesale or retail trade, restaurants, and hotels	47.7	58.5	37.3
7 Transport, storage, and communications	3.0	5.0	3.1
8 Finance, insurance, real estate, and business	6.8	6.7	6.9
9 Public services	13.0	10.8	18.9

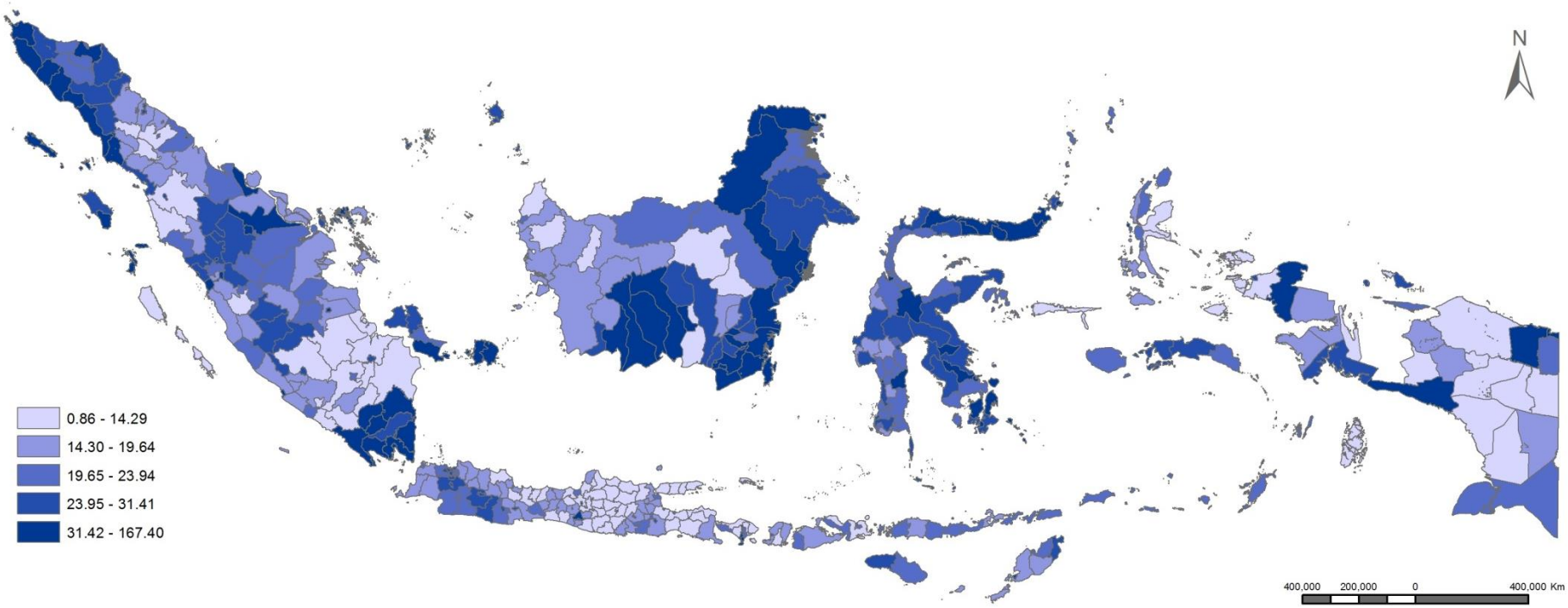
Source: Author's own calculation based on BPS-Statistics Indonesia data.

Our two variables measuring total start-up rates are presented in Figures 5.1 and 5.2. Both approaches show that regional variation of start-ups is present. These two maps also show that the start-up rates on Java and Bali islands are generally lower compared to the rest of the country. This finding is opposite to the expectation since these islands are well known as the leading regions in the Indonesian economy. This unexpected finding could be related to the following reasons. First, an advanced development in Java and Bali provides more job opportunities which can constrain the choice of becoming entrepreneurs. Second, the minimum wage, especially in Jakarta, is high which in turn can increase opportunity cost and restrict entrepreneurship. Lastly, changes in fiscal policy have enhanced the attractiveness of the outer islands in terms of business climate. The augmentation of fiscal transfer from central to local government stimulates local business climate and supports local entrepreneurs.

There are, however, some distinctive patterns between the labour market approach and the ecological approach. Using the labour market approach, there is a great variation in start-ups outside Java, Bali and Lombok. Meanwhile, there is not much of variations when applying the ecological approach. One of the possible explanations is that the structure of population outside Java, Bali and Lombok are varied. These three islands have similar pattern of population structure which is densely populated areas.

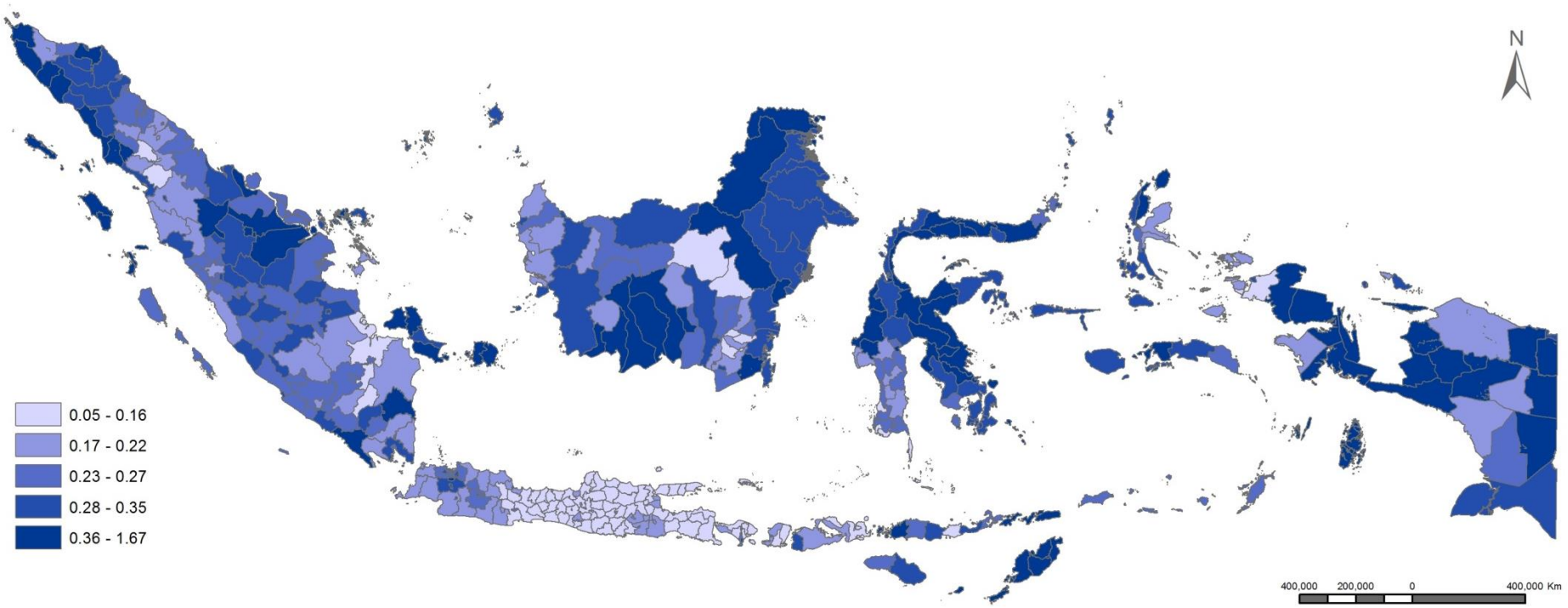
With regard to the formality of business, regional variations are higher in the informal start-up rates compared to the formal start-up rates. It is important to note that, around 91% of all new firms are informal businesses. As can be seen in Figure 5.3 and 5.4, regions can be divided, in a general sense, into three categories that are informal, formal and mixed regions. Informal regions are areas dominate by unregistered firms including Sulawesi Island, in East Nusa Tenggara and in Maluku. Formal regions are areas dominate by registered business as in Kalimantan and in Papua. Meanwhile, mixed regions are in Sumatera and in Java. Another interesting observation is that the rates in cities are high although it is surrounded by less entrepreneurial areas. This indicates a greater concentration of economic activities in cities that might be related to localization economies and knowledge spill over.

Figure 5.1 Mapping total start-up rates using labour market approach



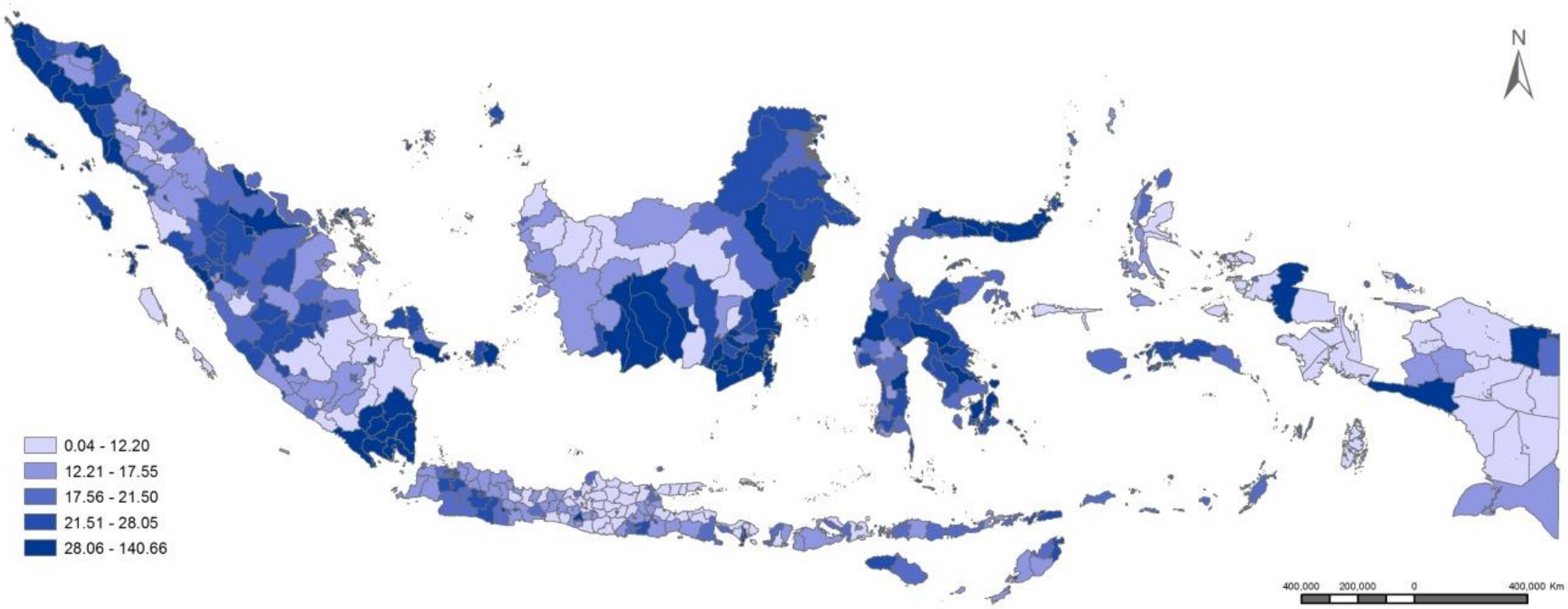
Source: Author's own calculation based on BPS-Statistics Indonesia data.

Figure 5.2 Mapping total start-up rates using ecological approach



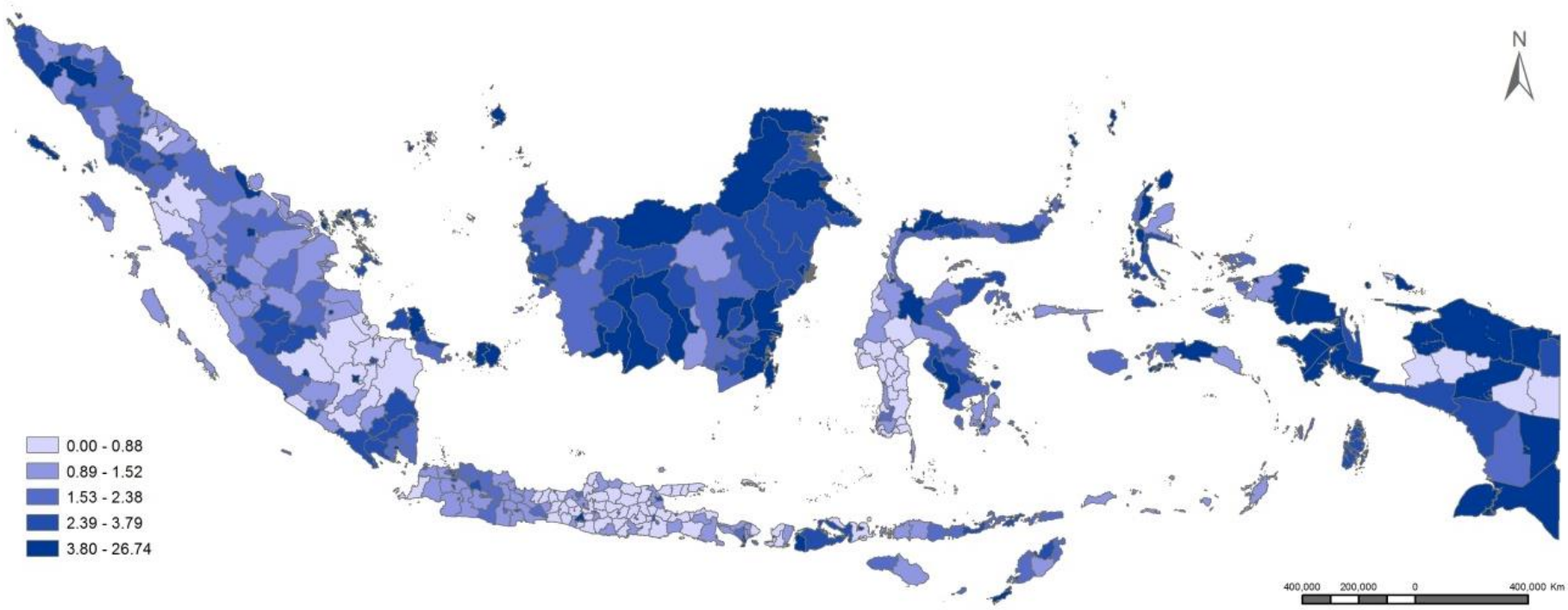
Source: Author's own calculation based on BPS-Statistics Indonesia data.

Figure 5.3 Mapping informal start-up rates using labour market approach



Source: Author's own calculation based on BPS-Statistics Indonesia data.

Figure 5.4 Mapping formal start-up rates using labour market approach



Source: Author's own calculation based on BPS-Statistics Indonesia data.

5.2 Regression Results

Using OLS regression, we test three models on total start-up, formal start-up and informal start-up using the labour market approach, and total start-up using ecological start-up rates. It includes interpreting the regression results on the effects of economic development. Then, we will compare the differences between formal and informal start-ups. We begin this discussion by explaining about descriptive statistics and correlation amongst those variables.

Summary statistics and correlation

The summary statistics of the variables is presented in Table 5.2. The table shows that there are some missing values on our data which are Tanjung Pinang, Pontianak, Minahasa, Manokwari, and Nabire; therefore, these regions are omitted in the analysis. It also shows that the variation of some variables is quite large such as GDP per capita and population density. The large variation of GDP per capita suggests that there is large regional income inequality; indeed, the amount of GDP per capita in the wealthiest region is 114 times of the poorest regions. It can be result in different probability of becoming entrepreneurial region.

Table 5.2 Summary statistics of the variables

	N	Minimum	Maximum	Mean	Std. Deviation
Total start-up rates	435	0.86	167.4	24.1997	13.84647
Formal start-up rates	435	0	26.74	2.6173	2.49545
Informal start-up rates	435	0.04	140.66	21.5825	12.41013
Ecological start-up rates	435	0.048767874	1.667002012	0.274929681	0.168289898
GDP per capita	440	0.00E+00	114.8443111	7.561373925	10.74826231
Density	440	1.029119564	17566.25089	1091.673735	2538.004016
Diversity	435	0.733102	1.977278	1.63452697	0.163495911
Unemployment rate	440	1.36882345	22.14708248	8.329762665	4.15806032
Size	435	1.59	7.59	2.7811	0.71618
Dummy_city	440	0	1	0.2	0.404
Dummy_java	440	0	1	0.26	0.44
Dummy_mining	440	0	1	0.15	0.357
Valid N (listwise)	435				

Source: Author's own calculation based on BPS-Statistics Indonesia data.

The deviation of population density is twice as much as the mean. This suggests that some regions are more densely populated than others. Thus the pattern of population settlement is varied. It can be caused regional differences of demographic dynamic such as population growth, migration pattern, as well as regional attractiveness such as liveability. Some areas can attract in-migration because of its abundant employment opportunities, high quality of regional liveability and educational advantage. In densely populated areas, the entrepreneurs and their customers could be closely located to each other which in turn beneficial for entrepreneurship activities in terms of, for example, transportation or delivery costs.

The correlation matrix of the variables is provided in Table 5.3. As can be seen, some independent variables are significantly correlated with each other. Density is positively correlated with all dependent variables except to dummy mining. It shows that mining area is not preferable for living due to environmental issues such as chemical waste. In addition, mining areas are in many cases located in remote areas.

Moreover, density is highly correlated with unemployment rate, size, dummy city and dummy java. These relationships can be explained due to the following reasons. First, the highly positive relationship between density and unemployment rate suggests that people in densely populated areas are more likely to be unemployed. Perhaps it is because job seeking in those areas is more competitive. Second, it confirms the attractiveness of cities as place for living.

Apart from highly correlated to density, dummy city also highly correlated to unemployment rates and size. Cities may attract migrants that are more likely to be economically active in pursuing jobs or becoming part of labour force. Therefore, the labour force in cities could be greater compared to non-city areas which can increase degree of competition amongst job seekers that in turn influence unemployment rates.

The effects of economic development on start-ups

We run three models for each independent variables, labour market start-up rates and ecological start-up rates[5]. Surprisingly, the results for both approaches are different. Sectoral diversity has a significant negative effect when the labour market approach is used; conversely, it has a significant positive effect when using the ecological approach. The rest of the explanatory variables, except for dummy-Java, provide mixed interpretations. The GDP, density and unemployment rate are only significant in the first approach, while size of firm is only significant in the second one.

[5] See appendix A for the regression results using ecological approach.

Table 5.3 Correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	Total start-up rates	1											
(2)	Formal start-up rates	.636**	1										
(3)	Informal start-up rates	.988**	.508**	1									
(4)	Ecological start-up rates	.443**	.334**	.427**	1								
(5)	GDP per capita	.205**	.135**	.201**	0.088	1							
(6)	Density	.098*	.098*	0.09	-0.09	.235**	1						
(7)	Diversity	.205**	.245**	.179**	-.276**	.097*	.178**	1					
(8)	Unemployment rates	.220**	.172**	.211**	-0.01	.223**	.417**	.208**	1				
(9)	Size	0.09	.272**	0.046	.114*	.383**	.445**	.224**	.356**	1			
(10)	Dummy_city	.321**	.391**	.279**	0.006	.184**	.608**	.299**	.577**	.408**	1		
(11)	Dummy_java	-.264**	-.279**	-.238**	-.390**	0.03	.421**	.110*	.155**	.196**	.109*	1	
(12)	Dummy_mining	0.069	-0.01	0.078	0.026	.320**	-.159**	0.061	-0.07	0.025	-.181**	-.163**	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Source: Author's own calculation based on BPS-Statistics Indonesia data.

Following Acs and Armington (2004) argument, we basing our analysis based on the labour market approach. They argued that the labour force is better measurement of start-up rates because of its implicit assumption that persons that choose to either become entrepreneurs or remain a wage workers are in the same labour market within which their firms operates.

As can be seen in Table 5.4, the R squared increase when the regressions include dummy variables for both labour market and ecological approach. It suggests that model (2) and (3) are better statistical fit in estimating start-up rates. The R squared indicates that model (2) is better estimation compared to model (3). Nevertheless, it seems that dummy-city variable interact with other variables in the model, i.e. density and unemployment rate. For the purpose of our analysis, it is more suitable to choose model (3).

Table 5.4 Regression results of total start-up rates using labour market approach

	OLS			Lag	Error
	(1)	(2)	(3)	(3)	(3)
W				0.229(0.000)***	
Constant	-1.890(0.778)	5.892(0.357)	-2.008(0.747)	-4.532(0.454)	2.054(0.745)
GDP per capita	0.231(0.000)***	0.203(0.001)***	0.202(0.001)***	0.192(0.001)***	0.204(0.001)***
Density	-0.00008(0.769)	0.00006(0.846)	0.0007(0.014)**	0.0006(0.015)**	0.0008(0.006)***
Diversity	14.358(0.000)***	12.111(0.001)***	15.674(0.000)***	13.745(0.000)***	12.985(0.000)***
Unemployment rate	0.591(0.000)***	0.248(0.157)	0.558(0.000)***	0.501(0.001)***	0.541(0.001)***
Size	-1.424(0.183)	-1.633(0.100)	-1.174(0.243)	-1.039(0.279)	-0.965(0.345)
Dummy_city		9.331(0.000)***			
Dummy_java		-9.823(0.000)***	-11.438(0.000)***	-9.204(0.000)***	-11.756(0.000)***
Dummy_mining		0.558(0.760)	-0.776(0.673)	-0.981(0.577)	-1.144(0.533)
Lambda					0.241(0.000)***
R Squared adjusted	0.09	0.22	0.19		
Log likelihood	-1736	-1699	-1708	-1696	-1696
AIC	3484	3417	3433	3411	3408
SC	3509	3453	3465	3447	3441
Moran's I	8.150(0.000)***	6.520(0.000)***	6.330(0.000)***		
LM (lag)	62.790(0.000)***	39.741(0.000)***	35.224(0.000)***		
Robust LM (lag)	1.055(0.304)	1.608(0.204)	0.360(0.548)		
LM (error)	62.601(0.000)***	38.534(0.000)***	36.278(0.000)***		
Robust LM (error)	0.866(0.351)	0.401(0.526)	1.414(0.234)		

***: p<0.01; **: p<0.05; *: p<0.10.

Source: Author's own calculation based on BPS-Statistics Indonesia data.

In all OLS results, we obtain statistically significant spatial autocorrelation in which Moran's I indices are highly significant for both the labour market and ecological approach. It implies that neighbouring regions is important. Thus, it is necessary to employ either spatial lag or error model because the OLS regression is not valid anymore. In this issue, OLS may leads to an overestimation of the magnitude of the parameters (Anselin, 2005). Following Anselin framework, there is not much to say about which model is fit better because both robust LM (lag) and (error) are not significant. In this case, we refer to Log likelihood, the Akaike Information Criterion (AIC) and Schwartz Criterion (SC). The lowest number of both AIC and SC confirms that the error model is the best results.

Comparing the OLS and spatial error results, we conclude that the magnitude of independent variables is slightly changed when the regression accounts for spatial dependence that is spatial error model. Nonetheless, the significance of all variables is remained. It suggests that the regional characteristics matter regardless dependency to neighbouring areas.

Analysing the spatial error model, we obtain several important influences of regional variable to entrepreneurship. Firstly, the regional economic performance is significant for entrepreneurship. In other words, wealthy areas are more likely of becoming entrepreneurial regions. The availability of capital as represented by GDP per capita encourages entrepreneurship. Secondly, the quantity of market demand represented by population density is as important as that the quality of market demand represented GDP per capita. Greater size of market demand provides opportunities which allow potential to act upon. A high range of consumer's expenditure allows for more diverse products which also benefit entrepreneurs. Thirdly, a positively significant effect of unemployment rate confirms a high degree of necessity-based entrepreneurship. Unemployed individuals are pushed to start a firm because no other option available for them. Lastly, being in Java is not as important as expected because it has a negative influence on start-ups. This can be due to the different stages of economic development between Java and the outer islands as explained in the previous chapter. The relationship between entrepreneurship and economic development is a U-shaped pattern that is the amount of active entrepreneurs is lower when the GDP begins to increase (Bosma, 2009).

Formal vs Informal start-ups

The results of spatial regression for formal and informal start-ups are presented in Figure 5.5. Similar to the explanation above, we analyse formal and informal start-ups based on Model (3) using spatial error model. This shows that the result for informal start-ups is similar to the total start-up except for the size of firm. It is as expected since the informal businesses account for slightly more than 90% of the total start-ups.

There are others interesting findings of our regression results. The GDP per capita is only significant for informal start-ups. This finding is rather surprising because formal firm requires a higher capital. One possible explanation is that the wealth of individual might be high yet it is slightly more than enough for consuming expenditure. As a result, individuals can only be able starting businesses which are small and informal in order to avoid additional costs such as registration fee.

Population density is positively significant which indicates that the quantity of market demand plays an important role for both formal and informal firm. Accordingly, the diversity of sector is significant for both start-ups; thus, this confirms that the diversity of productive activity foster entrepreneurship regardless the type of businesses. Meanwhile, unemployment rate is significant for informal start-ups but not for the second one. These finding are in line with the nature of both types. Unemployed individuals may choose informal business because of the lack of capital. In contrast, unemployed individuals may not be able to establish formal firms due to its additional requirements such as establishment fees.

Dummy Java is found to be negatively significant in both measurements which suggest that Java is not favourable place for new entrepreneurs partly due to the U-shaped relationship between economic development and. Lastly, the size of firm affects both start-ups but towards different direction. It gives negative effect on informal start-ups but positive effect on formal start-ups. One possible explanation of this finding is that competitive business climate is not favourable for informal firms but favourable for the second one. Formal firms might tend to locate close to other large firms in order to gain positive effect of localization. In addition, the abundant natural resources are hardly given any impact on entrepreneurship.

Table 5.5 Regression results of formal and informal start-up rates

	Dependent variable: Formal start-up rates					Dependent variable: Informal start-up rates				
	OLS			Lag	Error	OLS			Lag	Error
	(1)	(2)	(3)	(3)	(3)	(1)	(2)	(3)	(3)	(3)
W				0.164(0.002)***					0.275(0.000)***	
Constant	-4.617(0.000)***	-2.650(0.015)**	-4.701(0.000)***	-5.222(0.000)***	-5.091(0.000)***	2.726(0.647)	8.542(0.146)	2.692(0.635)	0.535(0.921)	8.039(0.161)
GDP per capita	0.007(0.527)	0.007(0.489)	0.007(0.522)	0.006(0.555)	0.006(0.541)	0.224(0.000)***	0.196(0.000)***	0.195(0.000)***	0.183(0.000)***	0.197(0.000)***
Density	-0.00007(0.160)	-0.00009(0.091)*	0.00007(0.135)	0.00008(0.097)*	0.0001(0.017)**	-0.00001(0.962)	0.0001(0.598)	0.0006(0.016)**	0.0005(0.020)**	0.0007(0.009)***
Diversity	2.880(0.000)***	2.301(0.000)***	3.226(0.000)***	3.414(0.000)***	3.713(0.000)***	11.477(0.001)***	9.809(0.005)***	12.448(0.000)***	9.819(0.002)***	8.593(0.015)**
Unemployment rate	0.046(0.131)	0.043(0.150)	0.037(0.190)	0.041(0.139)	0.047(0.111)	0.545(0.000)***	0.291(0.070)*	0.521(0.000)***	0.446(0.001)***	0.488(0.001)***
Size	0.777(0.000)***	0.705(0.000)***	0.824(0.000)***	0.728(0.000)***	0.666(0.000)***	-2.202(0.022)**	-2.338(0.010)**	-1.999(0.029)**	-1.676(0.052)*	-1.532(0.099)*
Dummy_city		2.421(0.000)***					6.909(0.000)***			
Dummy_java		-1.887(0.000)***	-2.306(0.000)***	-2.048(0.000)***	-2.449(0.000)***		-7.935(0.000)***	-9.131(0.000)***	-6.881(0.000)***	-9.335(0.000)***
Dummy_mining		-0.260(0.404)	-0.607(0.060)*	-0.685(0.028)*	-0.802(0.013)**		0.819(0.626)	-0.169(0.919)	-0.284(0.857)	-0.353(0.831)
Lambda					0.215(0.000)***					0.283(0.000)***
R Squared adjusted	0.10	0.30	0.24			0.08	0.19	0.17		
Log likelihood	-987	-930	-950	-944	-942	-1689	-1661	-1667	-1650	-1651
AIC	1986	1878	1917	1907	1900	3391	3341	3351	3319	3318
SC	2011	1915	1950	1944	1932	3415	3378	3384	3356	3351
Moran's I	6.760(0.000)***	5.154(0.000)***	5.192(0.000)***			8.587(0.000)***	7.300(0.000)***	7.117(0.000)***		
LM (lag)	36.950(0.000)***	22.590(0.000)***	17.171(0.000)***			72.163(0.000)***	51.299(0.000)***	47.457(0.000)***		
Robust LM (lag)	0.424(0.514)	0.348(0.555)	1.794(0.180)			2.690(0.100)	2.743(0.097)**	1.640(0.200)		
LM (error)	42.693(0.000)***	23.593(0.000)***	23.986(0.000)***			69.633(0.000)***	48.693(0.000)***	46.254(0.000)***		
Robust LM (error)	6.167(0.013)**	1.351(0.245)	8.609(0.003)***			0.159(0.689)	0.137(0.710)	0.437(0.508)		

***: p<0.01; **: p<0.05; *: p<0.10.

Source: Author's own calculation based on BPS-Statistics Indonesia data.

6. Conclusions and discussion

This chapter aims to provide concluding remarks of the study. The first part concludes meaningful findings which obtained in this study. Some discussion which can be benefited future research will follow.

6.1 Conclusion

In short, this study aims to examine the relationship between economic development and entrepreneurship in the context of developing country. Based on our findings, the level of entrepreneurship is determined by the regional economic development as well as the economic development of its surrounding regions. Wealthy regions with high GDP per capita are more entrepreneurial with regard to informal businesses. In addition, entrepreneurs can emerge both because of necessity and opportunity. The supply side confirms that being unemployed stimulate individuals to become entrepreneurs which are necessity-based entrepreneurship. They begin with informal businesses due to some limitations such as capital. Meanwhile, the demand side confirms that the size of market demand influence entrepreneurship. More individuals are willing to become entrepreneurs in the regions where opportunities are abundant that leads to opportunity-based entrepreneurship. Surprisingly, Java is not favourable for new businesses.

Most of the start-ups in Indonesia are unregistered businesses. It suggests two explanations. Firstly, individuals unwilling to register their businesses in order to reduce additional cost and shorten the planning period. Secondly, business owners may not be found benefits of registering their business. Lastly, it also suggests that government has a weak bargaining power in controlling business activities. Such condition is evident in developing countries where the capability of the government sometimes is underrepresented.

With regard to the measurement of regional start-ups, we conclude that the type of measurement plays an important role in explaining entrepreneurship at the regional level. Different approach leads to slightly different results.

6.2 Discussion

It could be a critical step in the future research to classify regions not only based on its legal basis (cities and regencies) but also on their nature of dominant economic activity. In the regions where the large scale business is dominant, the amount of new firms can be small but the size is relatively big. Hence, their start-up rates are smaller compared to regions with dominant small scale business. In addition, it might be necessary to control aggregation effects since each sector can have different sensitivities towards regional characteristics or local market conditions (Acs and Armington, 2004).

For example, the requirements for energy sector are stricter compared to others such as trades. Extraction or mining sector, as another example, has a high degree of spatial dependence because it is limited by the local supply of natural resources. Moreover, if the probability to establish a business is equal to its risk of success or failure, thus it is obvious that the probability between sectors is quite different.

With regard to the fact that most of firms are unregistered business, there is a possibility that the owner simplified the answer when asked about the year of establishment. Similar to when one asked about age, people will tend to simplified it into the year that ended with five or zero. Moreover, the informal business owner might be not exactly certain about when they starting the business especially if there are some fluctuations in their businesses.

References

Acs, Z. J. and Armington, C. (2004) Employment groth and entrepreneurial activity in cities. Discussion paper on entrepreneurship, growth and public policy. Max Planck Institute, Jena.

Acs, Z. J., Audretsch, D. B., Braunerhjelm, P, and Carlsson, B. (2004) The missing Link: The Knowledge Filter and Entrepreneurship in Endogenous Growth. Discussion Paper No. 4783, Centre for Economic Policy Research, London.

Acs, Z.J., Audretsch, D.B., Braunerhjelm, P. and Carllson, B. (2005) Growth and entrepreneurship: An empirical assessment. Discussion Paper No. 5409, Centre for Economic Policy Research, London.

Alm, J., Aten, R. H., and Bahl, R. (2001). Can Indonesian decentralise successfully? Plans, Problems and Prospects. *Bulletin of Indonesian Economic Studies*, Vol. 37, No. 1, 83-102

Amit, R., Muller, E., and Cockburn, I. (1995) Opportunity costs and entrepreneurial activity. *Journal of Business Venturing*. 10:95-106.

Armington, C. and Acs, Z., J. (2002) The determinant of regional variation in new firm formation. *Regional Studies*, 36(1). 33-45. DOI: 10.1080/00343400120099843

Audretsch, D. B., Thurik, R., Ingrid, V., and Wennekers, S. (2002) Entrepreneurship: Determinants and Policy in a European-U.S. Comparison. Boston: Kluwer Academic Publishers, 2002.

Baptista, R. and Thurik, A. R. (2007) The relationship between entrepreneurship and employment: is Portugal an outlier?. *Technological Forecasting & Social Change*. 74: 75-89.

Bosma (2009) The Geography of Entrepreneurial Activity and Regional Economic Development. Multilevel analysis for Dutch and European Regions. Dissertation theses.

Bosma, N. and Schutjens, V. (2011) Understanding regional variation in entrepreneurial activity and entrepreneurial attitude in Europe. *Annals of Regional Science*. 47: 711-742. DOI: 10.1007/s00168-010-0375-7.

Davidsson, P. (2004) *Researching Entrepreneurship*. New York: Springer.

Desai, S. (2009) Measuring entrepreneurship in developing countries. United Nations University-World Institute for Development Economic Research (UNU-WIDER) research paper no. 2009/10.

Estrin, S., Meyer, K. E., and Bytchkova, M. (2008) Entrepreneurship in transition economies. In Basu, A., Casson, M., Wadeson, N., and Yeung, B. (eds). *The Oxford Handbook of Entrepreneurship. Oxford handbook online*. DOI: 10.1093/oxfordhb/9780199546992.001.0001.

Evans, D. S. and Jovanovic, B. (1989) An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy*. 97(4): 8808-827.

Fitrani, F, Hofman, B., and Kaiser, K. (2010). Unity in Diversity? The Creation of New Local Governments in a Decentralising Indonesia. *Bulletin of Indonesian Economic Studies*, 41:1, 57-79 DOI 10.1080/00074910500072690

Glaeser, E.L., Kerr., S.P., and Kerr., W.R. (2012) Entrepreneurship and urban growth: an empirical assessment with historical mines. National Bureau of Economic Research (NBER) working paper no 18333.

Hill, H. and Shiraishi, T. (2007). Indonesia After the Asian Crisis. *Asian Economic Policy Review*. 2. 123-141 DOI: 10.1111/j.1748-3131.2007.00058.x

Holcombe, R. G. (1998) Entrepreneurship and Economic Growth. *The Quarterly Journal of Austrian Economics*. 1(2): 45-62.

Kirzner, I. M. (1973) *Competition and Entrepreneurship*. Chicago: University of Chicago Press.

Koster, S. and Karlsson, C. (2010) New firm formation and economic development in globalizing economy in Karlsson, C., Johansson, B., and Stough R. R. (eds) *Entrepreneurship and Regional development. Local Processes and Global Patterns.* Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 44-66.

Koster, S. and Rai (2008). Entrepreneurship and Economic Development in a Developing Country : case study of India. *Journal of Entrepreneurship*. 17: 117 DOI: 10.1177/097135570801700202.

Lee, S.Y., Florida, R., and Acs, Z. (2004) Creativity and Entrepreneurship: A regional Analysis of New Firm Formation. *Regional Studies*, 38(8): 879-891, DOI: 10.1080/0034340042000280910.

Leibenstein, H. (1968) Entrepreneurship and Development. The American Economic Review, Vol. 58, No. 2, Papers and Proceedings of the Eighteenth Annual Meeting of the American Economic Association. pp. 72-83.

Mitchell, A. (1999) *The ESRI Guide to GIS Analysis. Volume 1: Geographic patterns & relationships*. California: Environmental System Research Institute (ESRI).

Naudé, W. (2010) Entrepreneurship, developing countries, and economic development: new approaches and insights. *Small Business* Economics, 34:1-12. DOI: 10.1007/s11187-009-9198-2

Porter, M. E. (2001) Enhancing the microeconomic foundations of prosperity: The current competitiveness index in Schwab, K., Porter, M. E., and Sachs, J. D. (eds) *The Global Competitiveness Report 2001-2002*, Geneva: World Economic Forum.

Reynolds, P. (1994) Autonomous firm dynamic and economic growth in the United States, 1986-1990. *Regional Studies*, 28(4): 429-442. DOI: 10.1080/00343409412331348376

Reynolds, P. D., Camp, S. M., Bygrave, W. D., Autio, E., and Hay, M. (2001) *Global Entrepreneurship Monitor: 2001 Executive Report. Global Entrepreneurship Monitor*. Geneva: World Economic Forum, 52-76.

Sala-i-martin et al. (2012) The global competitiveness index 2012-2013: Strengthening recovery by raising productivity in Schwab, K. (ed) *Global Competitiveness Report*. Geneva: World Economic Forum, 3-48.

Sautet, F. (2011) Local and Systematic Entrepreneurship: Solving the Puzzle of Entrepreneurship and Economic Development. Entrepreneurship Theory and Practice. 37(2): 387-402, DOI: 10.1111/j.1540-6520.2011.00469.x.

Schumpeter, J. A. (2003) *Capitalism, Socialism & Democracy*. London: Taylor and Francis e-Library.

Shrivastava, S. and Shrivastava, R. (2013) Role of entrepreneurship in economic development. International Journal of Management and Social Sciences Research. 2(2): 1-5.

Sobel, R. S. (2008) Testing Baumol: Institutional quality and the productivity of entrepreneurship. *Journal of Business Venturing*. 23: 641-655.

Sternberg, R and Rocha, H. O. (2007). Why entrepreneurship is a regional event: theoretical arguments, empirical evidence and policy concequences in Mart P. Rice and Timothy G. Habbershon (eds) *Entrepreneurship: The Engine of Growth*, London and Westport, CT: Praeger, 215-38.

Suryadarma, D., Widyanti, W., Suryahadi, A., and Sumarto, S. (2006) From access to Income: Regional and ethnic inequality in Indonesia. SMERU Research Institute.

van Praag, C.M. (1999) Some classic views on entrepreneurship*. De Economist*, 147(3): 311-335.

Verheul, I., Wennekers, S., Audretsch, D, and Thurik, R. (2002) An eclectic theory of entrepreneurship: Policies, institutions and culture in Audretsch, D. B., Thurik, I., Wennekers, S. (eds)

Entrepreneurship: Determinant and Policy in European-US Comparison. Boston/Dordrecht/London: Kluwer Academic Publishers, 11-81.

Wennekers, S. (2006) Entrepreneurship at country lavel. Economic and non-economic determinants. Dissertation Theses.

Wennekers, S., Uhlaner, L. M., and Thurik, R. (2002) Entrepreneurship and its Conditions: a Macro Perspective. *International Journal of Entrepreneurship Education*, 1(1):25-65.

Appendix A. Regression results using ecological approach

SUMMARY OF OUTPUT: ORDINARY LEAST SQUARES ESTIMATION (MODEL 1)

Data set	: Startups_Geoda		
Dependent Variable	: SU_ECO_5	Number of Observations:	435
Mean dependent var	: 0.27493	Number of Variables :	6
S.D. dependent var	: 0.168096	Degrees of Freedom :	429
R-squared	: 0.129068	F-statistic	: 12.7151
Adjusted R-squared	: 0.118917	Prob(F-statistic)	: 1.5502e-011
Sum squared residual	: 10.7051	Log likelihood	: 188.518
Sigma-square	: 0.0249536	Akaike info criterion	: -365.036
S.E. of regression	: 0.157967	Schwarz criterion	: -340.584
Sigma-square ML	: 0.0246094		
S.E of regression ML	: 0.156874		

Variable	Coefficient	Std.Error	t-Statistic	Probability
CONSTANT	0.6467338	0.07942694	8.1425	0.0000000
GDK_P_05	0.00102114	0.0007644003	1.33587	0.1822987
DENS_06	-1.024549e-005	3.505615e-006	-2.922595	0.0036549
DIV_ALL	-0.3173731	0.04812239	-6.595123	0.0000000
UNRATE_07	0.0008837803	0.002069977	0.4269517	0.6696251
SIZE	0.05142989	0.01279377	4.019916	0.0000688

REGRESSION DIAGNOSTICS
MULTICOLLINEARITY CONDITION NUMBER 30.726341
TEST ON NORMALITY OF ERRORS

TEST	DF	VALUE	PROB
Jarque-Bera	2	5618.785	0.0000000

DIAGNOSTICS FOR HETEROSKEDASTICITY
RANDOM COEFFICIENTS

TEST	DF	VALUE	PROB
Breusch-Pagan test	5	196.2029	0.0000000
Koenker-Bassett test	5	21.0284	0.0008001

SPECIFICATION ROBUST TEST

TEST	DF	VALUE	PROB
White	20	59.66653	0.0000080

DIAGNOSTICS FOR SPATIAL DEPENDENCE
FOR WEIGHT MATRIX : Startups-Geoda_Final.gal
(row-standardized weights)

TEST	MI/DF	VALUE	PROB
Moran's I (error)	0.374576	10.1496089	0.0000000
Lagrange Multiplier (lag)	1	102.8545147	0.0000000
Robust LM (lag)	1	5.3039218	0.0212775
Lagrange Multiplier (error)	1	97.8688357	0.0000000
Robust LM (error)	1	0.3182428	0.5726656
Lagrange Multiplier (SARMA)	2	103.1727575	0.0000000

========== END OF REPORT ==========

SUMMARY OF OUTPUT: ORDINARY LEAST SQUARES ESTIMATION (MODEL 2)

Data set	: Startups_Geoda		
Dependent Variable	: SU_ECO_5	Number of Observations:	435
Mean dependent var	: 0.27493	Number of Variables :	9
S.D. dependent var	: 0.168096	Degrees of Freedom :	426
R-squared	: 0.272423	F-statistic	: 19.9381
Adjusted R-squared	: 0.258759	Prob(F-statistic	: 1.32284e-025
Sum squared residual	: 8.94304	Log likelihood	: 227.634
Sigma-square	: 0.020993	Akaike info criterion	: -437.268
S.E. of regression	: 0.14489	Schwarz criterion	: -400.59

Sigma-square ML : 0.0205587
S.E of regression ML: 0.143383

Variable	Coefficient	Std.Error	t-Statistic	Probability
CONSTANT	0.6547698	0.07617436	8.595671	0.0000000
GDK_P_05	0.000741117	0.0007546688	0.9820426	0.3266340
DENS_06	1.279073e-007	3.991756e-006	0.03204285	0.9745910
DIV_ALL	-0.3021641	0.0454584	-6.647046	0.0000000
UNRATE_07	-6.195424e-005	0.00209159	-0.02962064	0.9762316
SIZE	0.05422139	0.01181189	4.590406	0.0000058
CITY	0.01292969	0.0260638	0.4960782	0.6201013
JAVA	-0.158225	0.01811268	-8.735595	0.0000000
MINING_10	-0.0184498	0.02182042	-0.845529	0.3982868

REGRESSION DIAGNOSTICS
MULTICOLLINEARITY CONDITION NUMBER 34.956989
TEST ON NORMALITY OF ERRORS

TEST	DF	VALUE	PROB
Jarque-Bera	2	9700.849	0.0000000

DIAGNOSTICS FOR HETEROSKEDASTICITY
RANDOM COEFFICIENTS

TEST	DF	VALUE	PROB
Breusch-Pagan test	8	303.4359	0.0000000
Koenker-Bassett test	8	25.13176	0.0014766

SPECIFICATION ROBUST TEST

TEST	DF	VALUE	PROB
White	44	N/A	N/A

DIAGNOSTICS FOR SPATIAL DEPENDENCE
FOR WEIGHT MATRIX : Startups-Geoda_Final.gal (row-standardized weights)

TEST	MI/DF	VALUE	PROB
Moran's I (error)	0.276258	7.6220439	0.0000000
Lagrange Multiplier (lag)	1	52.6182623	0.0000000
Robust LM (lag)	1	0.8657299	0.3521402
Lagrange Multiplier (error)	1	53.2347323	0.0000000
Robust LM (error)	1	1.4821999	0.2234306
Lagrange Multiplier (SARMA)	2	54.1004622	0.0000000

========== END OF REPORT ==========

SUMMARY OF OUTPUT: ORDINARY LEAST SQUARES ESTIMATION (MODEL 3)

Data set	: Startups_Geoda		
Dependent Variable	: SU_ECO_5	Number of Observations:	435
Mean dependent var	: 0.27493	Number of Variables :	8
S.D. dependent var	: 0.168096	Degrees of Freedom :	427

R-squared	: 0.272002	F-statistic	: 22.7915
Adjusted R-squared	: 0.260068	Prob(F-statistic)	: 2.9892e-026
Sum squared residual	: 8.9482	Log likelihood	: 227.509
Sigma-square	: 0.020956	Akaike info criterion	: -439.017
S.E. of regression	: 0.144762	Schwarz criterion	: -406.414
Sigma-square ML	: 0.0205706		
S.E of regression ML	: 0.143424		

Variable	Coefficient	Std.Error	t-Statistic	Probability
CONSTANT	0.6438229	0.0728437	8.838416	0.0000000
GDK_P_05	0.0007398882	0.0007539983	0.9812863	0.3270071
DENS_06	1.065534e-006	3.512818e-006	0.3033275	0.7617970
DIV_ALL	-0.2972272	0.04431653	-6.706915	0.0000000
UNRATE_07	0.0003683321	0.001901582	0.1936977	0.8465056
SIZE	0.05485686	0.01173186	4.675889	0.0000039
JAVA	-0.1604627	0.01752651	-9.15543	0.0000000
MINING_10	-0.02029979	0.0214804	-0.9450377	0.3451764

REGRESSION DIAGNOSTICS
MULTICOLLINEARITY CONDITION NUMBER 32.555232
TEST ON NORMALITY OF ERRORS

TEST	DF	VALUE	PROB
Jarque-Bera	2	9584.212	0.0000000

DIAGNOSTICS FOR HETEROSKEDASTICITY
RANDOM COEFFICIENTS

TEST	DF	VALUE	PROB
Breusch-Pagan test	7	302.7609	0.0000000
Koenker-Bassett test	7	25.222	0.0006930

SPECIFICATION ROBUST TEST

TEST	DF	VALUE	PROB
White	35	N/A	N/A

DIAGNOSTICS FOR SPATIAL DEPENDENCE
FOR WEIGHT MATRIX : Startups-Geoda_Final.gal (row-standardized weights)

TEST	MI/DF	VALUE	PROB
Moran's I (error)	0.274904	7.5822072	0.0000000
Lagrange Multiplier (lag)	1	51.7437803	0.0000000
Robust LM (lag)	1	0.7391276	0.3899405
Lagrange Multiplier (error)	1	52.7142628	0.0000000
Robust LM (error)	1	1.7096101	0.1910360
Lagrange Multiplier (SARMA)	2	53.4533903	0.0000000

========== END OF REPORT ==========