ADDRESSING REGIONAL INEQUALITY

A STUDY ON REGIONAL PLANNING IN INDONESIA

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Thesis Declaration

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Abstract

There is a longstanding recognition in economic geography that institutions play a critical role in shaping regional development. One of the most significant recent contributions is through the work on Evolutionary Economic Geography (EEG). This perspective aims to understanding how economies unfold over space and time, and gives detailed attention to the role of institutions in shaping economic growth. The research presented in this study uses EEG as a framework to explore the evolution of regional development policy in Indonesia during the period of 1993 to 2013. It argues that place-based policy initiatives embedded in the spatial planning system played a significant role in attempts to address the geography of the uneven development in the country. The national government employed a spatially selective strategy that aimed to foster the development of economic clusters to promote growth. This study reviews these policies and offers insights into their efficacy.

The contribution of this research to understanding regional inequality in Indonesia is twofold. First, it provides insight into the nature and extent of regional inequality at the district level in Indonesia. Additionally, the research assesses the role of spatial planning policy in addressing inequality. Second, it introduces evolutionary thinking in analysing the regional inequality in Indonesia. In particular, this study aims to identify path dependence in the economic growth of Indonesia from 1993 to 2013 and the role of institutions in shaping that particular process. In this sense, this study not only contributes to empirical research aligned to EEG, but also offers novel insights by drawing on a developing country as the case study.

On the contribution to the research context, this thesis reveals that there had been a slight increase in inequality across districts in Indonesia during the study period. In decomposing inequality, it is evident that since 2003 inequality between provinces had been increasing. On the other hand, inequality within provinces decreased slightly between 2003 and 2013. Overall, a weak convergence has been observed in the economic growth across districts in Indonesia. In addressing regional inequality, the spatial policy framework has taken into account complex criteria in defining lagging regions, rather than simple binary divisions at a large spatial scale (e.g. eastern versus western part of Indonesia, or Java versus non-Java islands). In the light of this, place-based policies adopted by the spatial planning system had proven to be only partly successful.

On the contribution to the theoretical knowledge, this present study demonstrates that the concept of path dependence is useful in explaining the regional economic growth. Through the usage of time-series econometric analysis, the study found that the path development of economic growth in Indonesia is dependent upon its past. In other words, there is evidence of the significant impact of history on the regional development in Indonesia. This finding contributes to the EEG literature that is mostly observing path dependence on the firms or clusters context. As an addition to this, a panel data analysis employed using potential growth determinant variables demonstrates that some of the regional policies adopted in the National Spatial Plan (NSP) were significant in their influence on economic growth. The result of the analysis implies that institutions, and in particular regional policy, provide feedback on the economic activities undertaken by the economic agents in shaping development paths.

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List of Abbreviations

ARIMA	Auto Regressive - Integrated - Moving Average
BPS	*Badan Pusat Statistik* (National Statistics Agency)
EEG	Evolutionary Economic Geography
DP-KTI	*Dewan Pengembangan Kawasan Timur Indonesia* (Development Council of the Eastern Part of Indonesia)
FDI	Foreign Direct Investment
FE	Fixed-Effect
FTZ	Free Trade Zone
GDP	Gross Domestic Product
GNP	Gross National Product
HDI	Human Development Index
IQR	Inter Quartile Range
JMA	Jakarta Metropolitan Area
KAPET	*Kawasan Pengembangan Ekonomi Terpadu* (Integrated Economic Development Zone)
LAC	Local Activity Centre
LGB	Local Government - Regency of Bogor
LGBM	Local Government - Municipality of Bekasi
LGBR	Local Government - Regency of Bekasi
LGD	Local Government - Municipality of Depok
LGJ	Local Government - Province of Jakarta
LGST	Local Government - Municipality of South Tangerang
LGT	Local Government - Municipality of Tangerang
LGWJ	Local Government - Province of West Java
MAR	Marshall-Arrow-Romer

NAC	National Activity Centre
NGF	National Government - Ministry of Finance
NGLSP	National Government - Ministry of Land and Spatial Planning
NGPA	National Government - National Development Planning Agency
NGPW	National Government - Ministry of Public Works
NSA	National Strategic Area
NSAC	National Strategic Activity Centre
NSP	National Spatial Plan
OLS	Ordinary Least Square
PODES	*Potensi Desa* (Village Potential Survey)
RAC	Regional Activity Centre
RC	Regional Cluster
RE	Random-Effect
RKP	*Rencana Kerja Pemerintah* (Yearly Development Plan)
RPJM	*Rencana Pembangunan Jangka Menengah* (Mid-Term Development Plan)
RPJP	*Rencana Pembangunan Jangka Panjang* (Long-Term Development Plan)
SEZ	Special Economic Zone
SPL	Spatial Planning Law
SUSENAS	*Survey Sosial Ekonomi Nasional* (National Socio-Economic Household Survey)
SVO	*Stadvorming Ordonatie* (Town Planning Ordinance)
UH	Urban Hierarchy

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Chapter One
Introduction

1.1. Introduction

Over the past three decades, disparities between poorer and wealthier regions in Indonesia have gradually been reduced on a range of economic and social indicators (Aritenang, 2008, 2009; Aritenang & Sonn, 2018; Garcia Garcia 2& Soelistianingsih, 1998; Hill, Resosudarmo, & Vidyattama, 2008). Yet, in general terms there remains a distinct geography of uneven development within Indonesia, with the western regions tending to outperform those in eastern parts of the country (Hill & Vidyattama, 2014; Kuncoro, 2013).

Successive Indonesian governments have recognised that this entrenched pattern of uneven development is problematic in social, political and economic terms. Socially, the evidence suggests that inequality correlates strongly with the rate of poverty (Miranti, Duncan, & Cassels, 2014; van Leeuwen & Földvári, 2016). In Indonesia, richer regions tend to have lower rates of poverty, while poorer regions demonstrate higher levels of poverty (Hill et al., 2008; Hill & Vidyattama, 2014). These patterns are also apparent for other social indicators, including education and health status (Booth, 2006; Hadiz, 2004). In broad terms, disadvantage is highest in regions such as Papua and the Nusa Tenggara islands in the east of the country, while lowest in the 'core' areas of Jakarta, the capital city, Java and Sumatra (Hill & Vidyattama, 2014; Sagala, Akita, & Yusuf, 2014).

The issue of inequality is of importance in Indonesia as it is closely associated with political unrest. Particularly, where the division of lagging and advanced regions coincides with either ethnic or religious divisions (Hill, 2002; Milankovic, 2005). Indeed, regional inequality was one of the key reasons for the emergence of the political turmoil in 1998 (Cerra & Saxena, 2002; Firman, 2009; Hadiz, 2004). This ultimately led to the transfer of significant powers from central to local governments through decentralisation. During this process of decentralisation, the dissolution of formal administrative regions was a common occurrence. In large part this was because people from lagging regions were not satisfied with the policy approaches of these broader governance structures, and agitated for the creation of new, smaller administrative regions. These were viewed as being more responsive to local needs and issues. The process of administrative devolution saw the number of provinces increase from 26 in 1999 to 34 in 2018. Over the same period, the number of districts increased from

291 to over 500. The central objective was to contribute to more effective economic and social development that was responsive to local and regional context, as opposed to a more centralised governance structure.

At the heart of uneven development is the structure of the Indonesian economy, where economic activity is concentrated in a number of 'core regions' with many rural and remote regions lagging significantly (Resosudarmo & Vidyattama, 2006). In response, successive Indonesian governments have implemented various redistributive policies that aim to address shortfalls in infrastructure, investment and competitiveness in lagging regions, while at the same time promoting growth in more prosperous areas. While these policies are generally regarded as important, there is some evidence that they may hamper national economic growth (Farole, 2013; Tambunan, 2008). It is also clear that the outcomes of economic development are not straightforward. For example, Miranti et al. (2014) found that the overall growth of the Indonesian economy contributed to a reduction of the poverty rate by 5.7% between 2002 and 2010. However, at the same time, the income inequality increased as measured by the nation's Gini coefficient. The evidence also suggested that both poverty and inequality were highly variable across the country (Miranti, 2010).

While most research on the geography of uneven development in Indonesia has been devoted to a consideration of the dynamics of regional inequality (see, for example, Akita, Kurniawan, & Miyata, 2011; Hill et al., 2008; Hill & Vidyattama, 2014; Resosudarmo & Vidyattama, 2006; Skoufias, 2001; Yusuf, Sumner, & Rum, 2014), or to examine the impact of fiscal decentralisation on the regional inequality (see, for example, Akita & Szeto, 2000; Aritenang, 2008, 2009, 2012; Booth, 2003; Wibowo, 2011), specific research on how spatial planning has impacted on regional inequality is rare. This is surprising given the emphasis that Indonesian governments have placed on various forms of spatial planning.

Arguably one of the most important of the public policy interventions has been the National Spatial Plan (NSP), which was initiated in 1997. The document provided a guide for the local governments in developing both the built and conservation areas. Additionally, the NSP was also established specifically to address inequality by promoting growth in areas with significant economic potential. Through the NSP, the national government determines a number of built areas that are determined to be economically prospective areas (e.g. metropolitan areas, industrial clusters, agricultural clusters, mining clusters, etc.). These areas are regarded as the 'engines' of economic growth for their surrounding areas. For more than

two decades, this policy has been implemented and therefore it is assumed as one of the most critical responses to the geography of uneven development in Indonesia.

1.2. The Geography of Uneven Development in Indonesia

The geography of uneven development in Indonesia is perhaps most easily identifiable across three different scales of regions: major islands groups, provinces and districts. At the level of major islands, most scholars (see, for example, Akita & Alisjahbana, 2002; Garcia Garcia & Soelistianingsih, 1998; Hill & Vidyattama, 2014; McCulloch & Sjahrir, 2008) classify Indonesia into five broad spatial units: Sumatra, Java-Bali, Kalimantan, Sulawesi and Eastern Islands, which is comprised of Maluku, Papua and Nusa Tenggara islands (see Figure 1.1). During the period 1975 to 2012, there was no major change in either the share of each spatial unit's Gross Domestic Product (GDP) to the national GDP or the relative GDP per capita rank among the units.

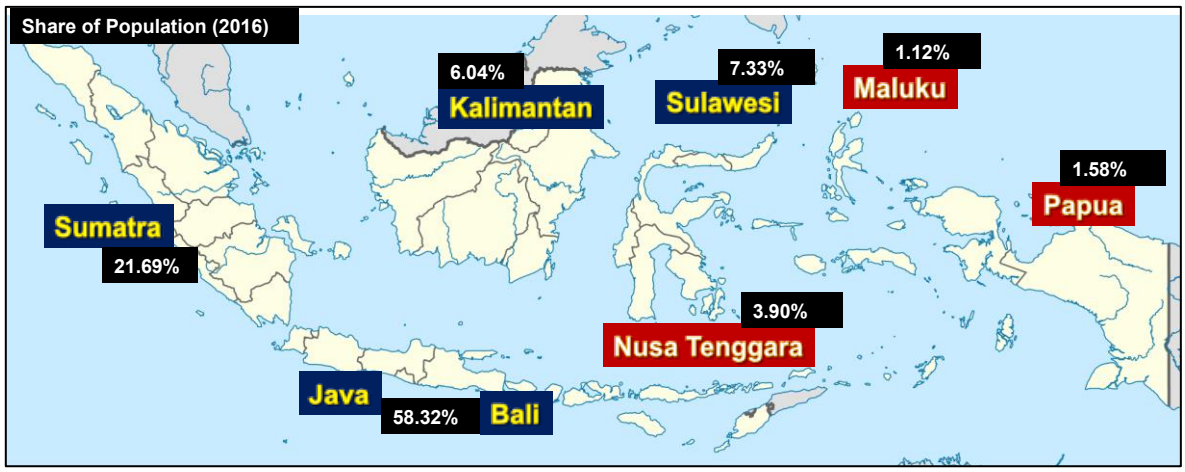

Figure 1.1. Major Islands Grouping in Indonesia
(Source: Dedering, n.d. (base map); Indonesian National Development Planning Agency, 2017)

Java-Bali remains the top contributor of the national GDP (Figure 1.2), with its contribution around 50-60%[1], Sumatra and Kalimantan follow, while Eastern Islands remains at the bottom of the rankings (Hill et al., 2008). In terms of GDP per capita (Figure 1.3), the order is slightly different, where Kalimantan has consistently been at the top, owing largely to its smaller population when compared to both Sumatra and Java. If Jakarta, the capital city as well as a stand-alone province, is removed from the data, the GDP per capita of Java-Bali in 2010 was only 78.2% when compared to the national GDP per capita. The figure for Jakarta alone was 402.8% in 2010, reflecting the relative economic dominance of the province. Akita

[1] The figure of Java-Bali includes the huge portion of Jakarta GDP, which is around a quarter of the figure during the time of observation.

and Alisjahbana (2002) found that between the major island groups, inequality increased slightly between 1993 and 1997 because the growth rate of Java-Bali, Sumatra and Kalimantan exceeded the growth rate of both Sulawesi and Eastern Islands. The differential decreased slightly after the Asian financial crisis in 1998, largely because the impact of this was particularly severe in both Java-Bali and Sumatra (see, for example, Firman, 2002).

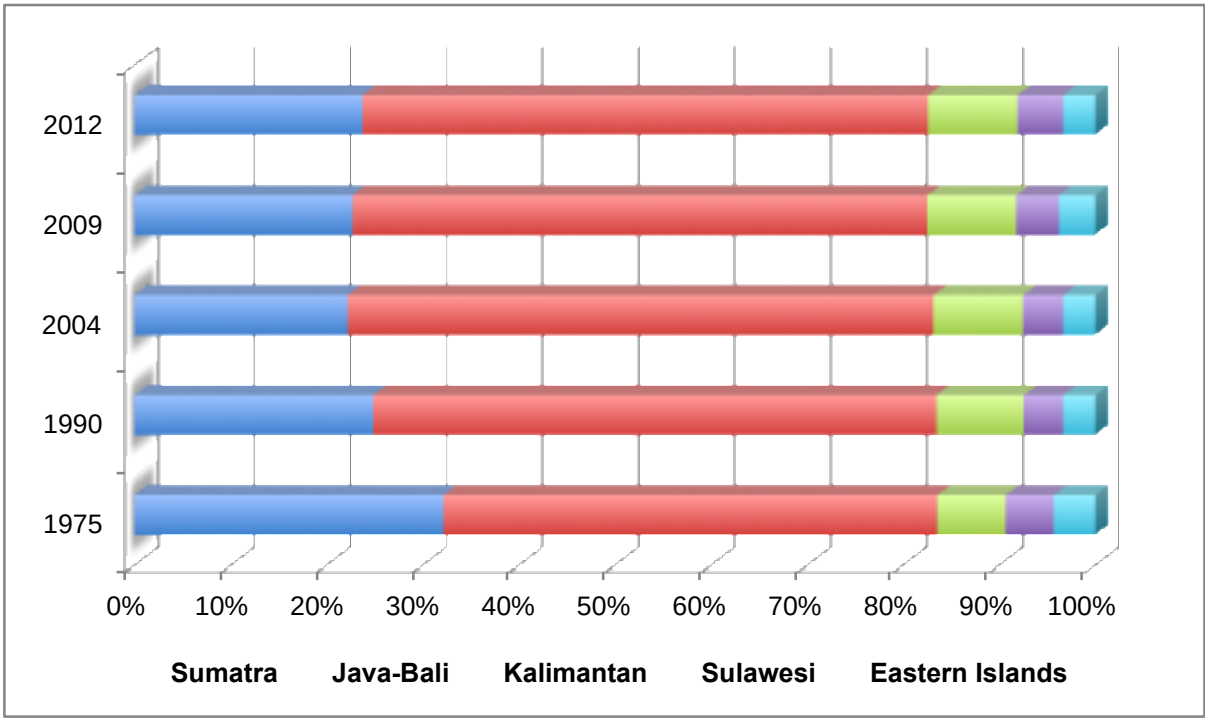

Figure 1.2. Shares of Island Gross Domestic Product to National Gross Domestic Product
(Source: Hill and Vidyattama, 2014; Indonesian National Development Planning Agency, 2017)

At the provincial level, Hill et al. (2008) and Hill and Vidyattama (2014) suggest that based on overall economic performance[2] there are four groups of provinces. Table 1.1 shows the relative GDP per capita compared to the national average. The consistently wealthy provinces include Jakarta, East Kalimantan, Riau and Papua; the consistently non-poor provinces consist of 10 provinces, including East Java, Bali and North Sumatra; the very poor provinces consist of seven provinces, including all provinces in the Sulawesi Islands; and the falling behind provinces, such as all provinces in the Nusa Tenggara Islands[3]. The entrenched nature of the

[2] Currently, there are 34 provinces in Indonesia. The studies undertaken by Hill, et al (2008) and Hill & Vidyattama (2014) consider 26 provinces and disregard the proliferation of provinces that took place after the implementation of decentralisation in 1999. These studies are using the administrative boundaries before 1999, which consisted of 27 provinces, but excluded East Timor, which gained independence in 1999.
[3] The consistently wealthy, consistently non-poor, very poor and slipping behind categories correspond to the above half of and less than half of the national average of GDP/capita during 1975-2010 (Hill & Vidyattama, 2014).

economic performance over time within provinces is reflected in the measurement of the inter-provincial inequality (based on non-mining GDP per capita). In using the population-weighted Williamson index during 1975 to 2011, Hill and Vidyattama (2014) observed only a slight increase in inequality. This finding corresponds to previous research by Garcia Garcia and Soelistianingsih (1998), which found that there was persistence of inter-provincial inequality between 1975 and 1993. Factors they noted that affected provincial economic performance included strategic location and supportive infrastructures towards international markets, the availability of precious natural resources and industrialisation (Garcia Garcia & Soelistianingsih, 1998; Hill & Vidyattama, 2014; Suryahadi, Suryadarma, & Sumarto, 2009).

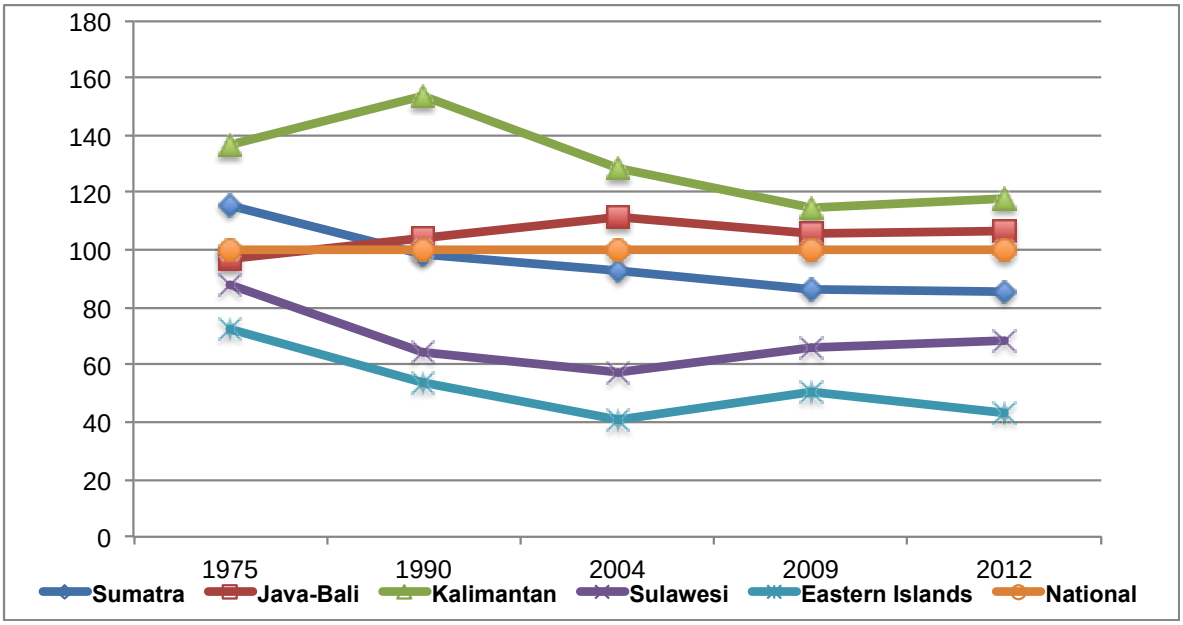

Figure 1.3. GDP per Capita as Compared to the National GDP per Capita
(Source: Hill and Vidyattama, 2014; Indonesian National Development Planning Agency, 2017)

Akita and Alisjahbana (2002) suggest that district, or within-province, inequality contributed the most to the national inequality when compared to between island group and between province inequalities. Looking at the top and bottom performers during the period 1999 to 2011, Hill and Vidyattama (2014) found a fairly consistent pattern over time that suggests uneven development is somewhat entrenched. They noted that rich districts were usually either the capital cities or locations with considerable natural resources endowments (Hill & Vidyattama, 2014). Yet, they also found that there was a weak convergence in economic performance between districts, with their evidence based on an observation that the majority of rich districts experienced slower economic growth when compared to their poorer counterparts. Relating poverty and economic growth, Hill and Vidyattama (2014) also noted that poverty tended to be more severe in eastern parts of the country. Districts in Papua Islands,

for example, stand out as an extreme case in which they demonstrate high poverty rates, while at the same time Papua Province records a quite high figure in GDP/capita (see Table 1.1)[4].

Table 1.1. GDP per Capita (Nominal GDP) Compared to the National GDP per Capita (National GDP per Capita = 100)
(*Source: Hill and Vidyattama, 2014; Indonesian National Development Planning Agency, 2017)*

Islands/Provinces	1975	1990	2000	2012
Sumatra Island				
Aceh	98.4	219.2	168	73.4
North Sumatra	86.7	87.7	90.8	96.4
West Sumatra	70.8	72.4	80.8	80.4
Riau	1,504.4	514.0	286.9	260.5
Jambi	74.8	58.2	59.5	81.3
South Sumatra	123.1	94.1	92.0	97.1
Bengkulu	52.4	56.9	47.2	49.5
Lampung	57.6	41.5	53.1	67.5
Java-Bali Island				
Jakarta	262.3	335.3	405.2	406.7
West Java	73.9	82.6	83.0	75.7
Central Java	39.0	52.4	55.1	62.2
Yogyakarta	64.5	67.0	65.0	58.8
East Java	72.9	84.0	75.5	95.9
Bali	72.3	99.4	82.2	75.1
Kalimantan Island				
West Kalimantan	78.7	77.9	72.1	61.0
Central Kalimantan	85.9	94.8	88.6	88.6
South Kalimantan	72.8	89.0	94.9	73.3
East Kalimantan	507.1	491.3	519.2	397.7
Sulawesi Island				
North Sulawesi	92.0	63.2	67.3	61.3
Central Sulawesi	51.6	51.4	58.6	67.9
South Sulawesi	62.4	55.5	57.0	67.2
Southeast Sulawesi	42.3	48.0	47.6	57.2
Eastern Islands				
West Nusa Tenggara	38.9	33.1	45.5	39.3
East Nusa Tenggara	41.1	35.6	30.2	26.2
Maluku	75.5	65.1	35.0	24.6
Papua	241.2	138.2	150.9	110.1

[4] Such a phenomenon is due to the limited spillover from clustered mining areas located in some districts in Papua (Akita & Alisjahbana, 2002; Hill et al., 2008)

1.3. The Spatial Planning System in Indonesia

The persistent regional inequality described above has resulted in successive Indonesian governments implementing a range of policy responses to address the problem of uneven development. The most important of these are the national spatial planning policies.

The modern spatial planning system in Indonesia was established in 1992, with the passing of the Spatial Planning Law (SPL) 24/1992. This new law replaced the Stadvorming Ordonantie - SVO (Town Planning Ordinance), an inherited law passed in 1948 during the Dutch colonial era. The SPL 24/1992 is different from its predecessor in that it provided a comprehensive regulatory framework by defining a planning hierarchy for the national and local governments, in which the contents of spatial plan documents in the lower administrative hierarchies must adhere to, or be recursive with, higher level planning documents. The hierarchy enables the spatial planning to cover all regions in Indonesia in an integrated way. Moreover, the scope of this framework is broader, as the earlier SVO was largely preoccupied with urban areas, particularly in Java (Roosmalen, 2008; Setiawan & Timothy, 2000).

The Town Planning Ordinance (SVO) was also deemed unable to overcome inter-sectoral rivalry in the spatial management. Therefore, the hierarchical set-up aimed to clarify the duty of relevant sectoral authorities in the making and implementation of the spatial plan documents (Hudalah & Woltjer, 2007). The Spatial Planning Law (SPL) 24/1992, however, reduced the authority of local governments when compared to the SVO. Local governments could not stipulate any spatial planning documents without the approval of the national government, while in the SVO the autonomy of local governments was acknowledged (Moeliono, 2011).

The SPL 24/1992 was then translated to the National Spatial Plan (NSP) in 1997, stipulated through the Government Regulation 47/1997. The NSP 47/1997 was a spatial arrangement for all regions in Indonesia through a binary division of land use: the conservation area and the built area. The conservation area is the area where development activities are prohibited or limited. These areas include conservation forests, agricultural lands and hazard-prone areas. On the other hand, built areas are those where development is promoted. The built area consists of the area in which the national government has strategic interests and the area in which the development is devolved to the local governments. To ensure that the NSP 47/1997 is implemented, local government spatial plans are obligated to follow this binary division of land use and translate it to more detailed maps in accordance with the hierarchy set-up in the SPL 24/1992.

Due to the political and economic turmoil in Indonesia during 1998, there was an interruption to the implementation of the SPL 24/1992. The top-down approach adopted in the SPL 24/1992 was deemed incompatible with the decentralisation that was implemented in 2001. However, it took a while before the new Spatial Planning Law (SPL) 26/2007 was stipulated in 2007 to replace the SPL 24/1992.

The SPL 26/2007 adopts a more bottom-up approach by acknowledging the authority of the local governments and allowing greater participation from the citizens in the plan-making process (Hudalah & Woltjer, 2007). The SPL 26/2007 also applies the rule of law in a stricter manner as compared to the SPL 24/1992, by introducing a detailed plan in the form of zoning regulation. However, despite all these changes brought by the SPL 26/2007, some prominent features of the SPL 24/1992 remain in effect. For example, the hierarchy of spatial plan documents in accordance to the administrative tiers of government is still adopted by the SPL 26/2007.

The new National Spatial Plan was then issued in 2008 and stipulated through the Government Regulation 26/2008. In this new NSP, the strategic interests of the national government over selected built areas are also maintained. The aims of the national government through this policy are to promote economic growth throughout Indonesia, and to alleviate regional inequality. Whether or not these aims have been achieved, is subject to the focus of this thesis.

1.4. Aim and Objectives

The aim of this thesis is to examine the geography of uneven development in Indonesia, focussing on the potential impact of policies adopted in the National Spatial Plan.

The specific objectives of this thesis are to:

1. Assess the applicability of path dependence as a theoretical construct with which to understand changes in the geography of uneven development in Indonesia;
2. Examine spatial and temporal changes across the Indonesian regional economic system during the period 1993 to 2013;
3. Examine the nature of the relationship between the changing regional economic system and the emergence of the National Spatial Plan framework;
4. Assess the effectiveness of the National Spatial Plan framework in addressing uneven development across the regional economic system.

1.5. The Structure of the Thesis

The thesis consists of eight chapters that cover three thematic areas:

1. The research challenge, research context and methods, including the rationale for the conceptual and analytical frameworks that are applied in this thesis;
2. The empirical analysis using Indonesian regional economic data to address the objectives of the thesis;
3. The major findings, discussion and overall conclusion.

Chapter Two provides a discussion on evolutionary economic geography (EEG), the theoretical framework within which the aims and objectives of this thesis are addressed. Chapter Three outlines the methodology used to answer the key research questions of this thesis. Chapter Four provides an account of changes in the geography of uneven development in Indonesia in detail during the period of 1993 to 2013. Chapter Five discusses various regional policies taken by the Indonesian government to address the regional inequality, including the policies adopted in the Indonesia spatial planning system. Chapter Six provides a discussion on whether the persistent uneven development of the country resembles path dependence or not. Chapter Seven tests the effectiveness of the spatial planning policy in addressing the geography of uneven development in Indonesia. Chapter Eight concludes the thesis and reviews the aims and objectives of the thesis.

Chapter Two
Evolutionary Thinking in Economic Geography: On Path Dependence and Institutions

2.1. Introduction

Inquiry into the dynamics of uneven development across the economic landscape has long been at the heart of economic geography (Kogler, 2015). Over the past decade, the discipline has witnessed the emergence of an 'evolutionary' approach to the dynamics of uneven development. The emergence of Evolutionary Economic Geography (EEG) can be traced to an article by Boschma and Frenken (2006) that demarcated EEG from both neoclassical and institutional approaches to understanding uneven development. In the decade or so since the publication of this paper, progress has been made at both the conceptual level (see, for example, Boschma & Frenken, 2017; Boschma & Martin, 2007; MacKinnon, Cumbers, Pike, Birch, & McMaster, 2009; Martin & Sunley, 2006) and in terms of empirical evidence (see, for example, Boschma & Wenting, 2007; Cho & Hassink, 2009; Essletzbichler & Rigby, 2007; Hassink, 2010a; Plummer & Tonts, 2013a, 2013b; Rigby, 2018).

Two aspects in the EEG have attracted considerable recent attention. The first is the notion of path dependence and how this shapes the economic trajectories of regions. The second is the role of institutions, and how these account for the evolution of the economic landscape. These two components of Evolutionary Economic Geography are central to this thesis and provide a better understanding of regional development in Indonesia. This chapter examines the conceptual foundations of Evolutionary Economic Geography. It begins by tracing the origins of the approach, and how it intersects with the evolutionary economics. The chapter then outlines the key concepts relevant to this, focusing on path dependence and the role of institutions.

2.2. Earlier Perspectives: Evolutionary Economics

Evolutionary economics can trace its origins to the end of the 19th century and a seminal article written by Veblen (1898) that suggested economic analysis may benefit from the incorporation of concepts from the natural sciences. While Veblen's work is widely cited, its immediate impact was somewhat limited, and it was the more recent work of Nelson and Winter (1982) that reinvigorated debates about the value of evolutionary thinking in understanding the nature of economies. In contrast to neoclassical economics, which claims

that firms are perfectly rational profit maximisers with complete knowledge, evolutionary theory suggests that firms do not have sufficient information with regards to the market environment in which they operate. The implication of this limited information is that firms engage in satisficing behaviour using routines that might be considered as "all regular and predictable behavioural patterns of firms" (Nelson & Winter, 1982, p.14), to test the market in a trial and error process. Under these conditions, it is entirely possible that the profit achieved by any firm is not an optimum one (Boschma & Frenken, 2006). Moreover, the evolutionary economists argue that the optimal market equilibrium state of neoclassical economics is not possible, given the diverse behaviour of firms reflected by the dynamic alteration of routines, behaviours and exogenous conditions (Nelson & Winter, 1982).

In prioritising the diversity and routinised behaviour of firms, evolutionary economics is often regarded as having opened a 'black box' of how organisations function (Boschma & Frenken, 2006). In particular, drawing explicitly on evolutionary biology, the concepts of gene inheritance and selection are applied to understand how a firm's organisational routines change over time (Nelson & Winter, 1982, 2002). The market in which firms operate provides the selection mechanism, which "is analogous to the natural selection of genotypes with differential net reproduction rates in biological evolutionary theory" (Nelson & Winter, 1982, p. 17). On the other hand, firms' organisational routines are analogous to the genes of living creatures. The most effective and efficient routines have passed by the time those firms can cope with the adversity of the market. Of particular note here is not simply the way in which evolutionary economics draws on concepts from the natural sciences, but the ways in which it provides explicit reference to time. Yet, for geographers, one of the ongoing criticisms of this work is its inability to adequately capture concerns about space, and in particular, the issue of uneven development (see, for example, Boschma & Frenken, 2006; Boschma & Martin, 2010; Essletzbichler & Rigby, 2010; Martin & Sunley, 2006).

2.3. Evolutionary Economic Geography

2.3.1. Early Origins

Geographers have long been interested in understanding the nature of spatially uneven development. It was central to the work of regional scientists from the 1950s and 1960s (Boyce, 2003; Isard, 1956) where there was a strong focus on quantifying the nature and causes of spatial inequality (Berry & Garrison, 1958; Chorley & Haggett, 1967; Haggett, Cliff, & Frey, 1977). Uneven development was also a major focus of the work of Marxian geographers from the early 1970s, where explicit attention was drawn to the interaction of

temporal and spatial processes (e.g. Harvey, 1982; Harvey, 2001, 2006; Massey, 1984, 2008; Smith, 1984). This body of work aimed to understand how capitalist accumulation, and periodic crises of capitalism, was reflected in the spatial organisation of economic activity. Importantly, embedded within this intellectual project was a recognition that economic, social and political processes operating across time were critical in shaping capitalist accumulation and patterns of uneven development. Yet, as Boschma and Martin (2007) point out, there were limitations in this approach, notably a limitation in explaining temporal change economic landscape beyond the focus on broad phases of capitalist accumulation. In particular, precisely how the recombination of the spatial structures across time creates particular spatial arrangements of economic activities was not clearly defined (see, for example, Massey, 1979, 1984, 2008).

Evolutionary approaches provide an alternative perspective in trying to understand the geography of uneven development (Boschma & Martin, 2007). According to Boschma and Martin (2010), the focus of EEG is on "the processes by which the economic landscape—the spatial organisation of economic production, circulation, exchange, distribution and consumption—is transformed from within over time" (p. 6). Two things are of importance here. First, that emphasis needs to be given to the transformation of the economic landscape 'from within', particularly at the level of firms and institutions. Boschma and Martin (2007) stress that such transformation even exists "in the absence of central coordination or direction" by the state (p. 540). Second, EEG brings place and space into evolutionary economics, exploring how economic change is being affected by the place in which the change is situated as well as through broader spatial relationships and interdependencies. This latter point is particularly important, in that it is not only the change in a given region that matters (i.e. where the firms are competing against each other), but also changes in other regions (Esselbitzchler & Rigby, 2007). Regions, or places, hence are "conceived as evolving bundles of attributes" (Esselbitzchler & Rigby, 2007, p. 565) reflecting the cumulative interaction between economic agents and their environments.

It is important to understand how EEG bridges the gap between simply understanding organisational routines and dynamics of firms and critical questions related to uneven development. Boschma and Frenken (2006) suggest a focus on three layers: the micro, meso and macro levels. The micro-level of analysis focuses on firms and their characteristics, routines and interactions. The meso-level comprises an understanding of both economic sectoral competition amongst firms and inter-firm cooperation in networks. At this level, firms gain in terms of profit and investment opportunities as a result of altering their routines, with

less profitable routines eliminated by competition and, in some cases, firms exiting the market. In terms of networks, firms within similar or related fields may exchange knowledge either through formal cooperation or labour mobility (Boschma & Frenken, 2010). Here, geographical proximity – social, cognitive, institutional, organisational and geographical – provide incentives for firms to cooperate (Essletzbichler, 2015; Lee, 2018). Indeed, Boschma & Frenken (2006) argue that the growth of firms will likely be influenced by their networks positions. Finally, at the macro-scale of analysis, regional development can be understood as an aggregate of firms, sectors and networks dynamics (Boschma & Frenken, 2006; Sorenson, Rivkin, & Fleming, 2006) whereby places that are capable of producing competitive sectors out-perform other regions.

Within this hierarchy of layers, EEG emphasises that innovation and the institutional structures in particular places are central to the success of firms (Boschma & Frenken, 2006). Indeed, it is held that it is the relationship between firms and their environment that dominates the theoretical development of EEG (Boschma & Frenken, 2009; Martin & Sunley, 2015; Pike, Birch, Cumbers, MacKinnon, & McMaster, 2009). There are two alternate views on how such routines might be influenced by the environment, both of which emphasise the role of institutions. One argument holds that institutions are responsive to the action taken by the creative agents (Boschma & Frenken, 2006; Boschma & Lambooy, 1999). Another line of thinking argues that institutions influence the decision taken by firms from the beginning, due to their embeddedness to their localities (Martin & Sunley, 2006, 2010).

2.3.2. Different Approaches in the Evolutionary Economic Geography

There are three main approaches to the study of evolutionary thinking in EEG: generalised Darwinism, complexity theory and path dependency (Boschma & Martin, 2010; Kogler, 2015). This section provides a brief overview of these approaches.

First, Generalised Darwinism translates the notions of biological evolution either directly or as an analogy to economic behaviour (Essletzbichler & Rigby, 2007, 2010). Here, the approach has been to select concepts from evolution theory and apply these directly to understanding economic geography, focusing on the role of firms (Boschma & Martin, 2010; Essletzbichler & Rigby, 2007, 2010). The basic idea is that the core principles of the Darwinian theory of evolution – variety, selection and retention – can be fruitfully employed in explaining the evolutionary change of the economy (Essletzbichler & Rigby, 2007). Firms possess unique and various organisational routines (variation) to be transmitted over time (retention) under market conditions (selection). Indeed, such an approach is similar to the

initial conceptualisation of evolutionary theory in evolutionary economics. As argued by Nelson & Winter (1982) the objective was, "… to exploit any idea from biology that seems helpful in the understanding of economic problems… to pass anything that seems awkward, or to modify accepted biological theories radically in the interest of getting better economic theory" (p. 11). From an EEG perspective, firms operate in regions, which in turn act as selection mechanisms (Esselbitzchler & Rigby, 2010). Regions, or places, are "conceived as evolving bundles of attributes" (Esselbitzchler & Rigby, 2007, p. 565), reflecting the cumulative interaction between economic agents and their environments.

The second approach commonly used in EEG is complexity theory. This approach considers economic landscape as a complex system that is dynamic and self-organised (Martin & Sunley, 2010). A key characteristic of complex systems is that they are open and "subject to constant interaction with their environments, that are dynamic, typically 'far-from-equilibrium', yet which display internal order and the emergence of structure (self-organisation)" (Boschma & Martin, 2010, p. 9). According to Boschma and Martin (2010), the space economy is considered a complex system because it is comprised of various interacting (sub)systems, such as households, firms, states and individual economic agents (Arthur, Durlauf, & Lane, 1997; Foster, 2005; Sorenson et al., 2006). The spatial organisation of economic activities is both the outcomes of interactions between (sub)systems and the feedback mechanisms through which externalities and spillovers emerge (Boschma & Martin, 2010). Space, therefore, links two important aspects of the economic dynamics: knowledge and adaptation of economic agents, with the spatial localisation, which enable the creation and the diffusion of the knowledge (Bathelt, Malmberg, & Maskell, 2004; Breschi & Lissoni, 2001; Martin & Sunley, 2010).

The third approach is the focus on path dependency, which assumes that the current development of particular phenomenon is determined in large part by its history. Put differently, past conditions play a critical role in shaping current and (potentially) future outcomes (Martin & Sunley, 2006). Arguably, the notion of path dependence has been the most widely adopted perspective within EEG, in large part because it resonates with the empirical experience of both firms and regions. Indeed, within geography there has been a longstanding recognition that capitalist development is deeply embedded within historical processes of accumulation, including regimes of economic expansion and periodic restructuring crises (Harvey, 1982; Massey, 1984; Tickell & Peck, 1992).

2.3.3. Current Development and Debates

In the context of the three different levels of analysis outlined earlier, Table 2.1 classifies substantive research in EEG into three research areas: (i) the dynamics of firms and clusters (micro level); (ii) the dynamics of agglomeration (meso level); and (iii) the role of the institutions and regional development in general (macro level) (Boschma & Frenken, 2011; Essletzbichler & Rigby, 2007; Kogler, 2015).

Table 2.1. Recapitulation of Research in Evolutionary Economic Geography
(Source: Author's summary)

Research Context	Research Areas		
	Firm and Cluster Dynamics	**Agglomeration Dynamics**	**The Role of Institutions and Regional Development**
Less Economically Developed Countries and/or Natural Resource Sectors	Zhang, 2011; Guo, Zhu & He, 2018; Hu, 2017; Yang, Fu & Li, 2017	Giuliani, 2007a, 2007b; Giuliani & Bell 2005 ; He, Guo, & Rigby, 2015; Zhou, He, & Zu, 2015; Hassink, Hu, Shin, Yamamura & Gong, 2018; Lee, 2017; Nel, Smart & Binns, 2017	Iizuka & Katz, 2015; Marin, Navas-Alemán, & Perez, 2015; Duysters, Cloodt, Schoenmakers, & Jacob, 2015; Montobbio, Primi, & Sterzi, 2015; Cassi, Morrison, & Rabellotti, 2015; Plummer & Tonts, 2013a, 2013b, 2015; Tonts, Plummer, & Argent, 2014; Guo & He, 2015; Hassink, 2010a
More Economically Developed Countries and/or High Technology Sectors	Wenting, 2008; De Vaan, Boschma, & Frenken, 2012; Boschma & Wenting, 2007 ; Buenstorf & Klepper, 2009; Klepper, 2010; Esslebitzhcler 2015; Castaldi, Frenken, & Los, 2015; Ostergaard & Park, 2015; Cho & Hassink, 2009; Isaksen, 2018	Breschi & Lissoni, 2001, 2009; Bishop & Gripaios, 2010; Shaver & Flyer, 2000; Breschi & Lenzi, 2014; Feldman, Kogler, & Rigby, 2015; Almeida & Kogut, 1999; Sorenson, Rivkin, & Fleming, 2006; Frenken, van Oort, & Verburg, 2007; Pellenbarg & van Steen, 2003; Ponds, Oort, & Frenken, 2010; Boschma & Iammarino, 2009; Boschma, Minondo, & Navarro, 2013; Duranton & Puga, 2001; Holl, 2004; Fitjar & Pose, 2015; Spencer, 2015; Desrochers & Leppa¨la, 2010; Cantwell & Santangelo, 2002; Maggioni, Nosvelli, & Uberti, 2007	Gertler, 2010; Schamp 2010; Maskell & Malberg 2007; Agrawal, Cockburn, & McHale, 2006; Iammarino & Marinelli, 2015; Spicer, McDermott, & Kogut, 2000; Strambach, 2010; Hassink 2010b; Coenen, Hansen, & Rekers, 2015; Murmann, 2003

Research on the dynamics of firms and clusters is dominated by the examination of innovation and technological change. Much of this research suggests that, if innovation and technological change are influenced by the diffusion of tacit knowledge, then geographical proximity becomes an important determinant of uneven development (Essletzbichler & Rigby, 2007).

Here, successful firms will have the potential to generate successful spin-offs, which in turn create additional economic activity (Klepper, 2007). Since spin-off firms are more likely to locate near to the parent firms, clusters of economic activity emerge (Boschma & Frenken, 2011).

The second area of concentration within EEG has been the focus on interactions between clusters of firms across sectors that ultimately leads to larger agglomerations. This builds on a considerable body of literature that emphasises the ways in which agglomerations of industries emerge due to the presence of knowledge spillovers (Boschma & Frenken, 2011). Conventionally, there have been two perspectives in regards to the importance of spillover effects: (i) thick and specialized labour markets that lead the localisation economies, which is generally referred as Marshall-Arrow-Romer (MAR) externalities; (ii) diversity of industries that promote cross-sectors spillovers, which is generally referred to as Jacobs externalities (Beaudry & Schiffauerova, 2009). As argued by Boschma and Frenken (2011), EEG research on agglomerations moves beyond this division by providing four explanations. First, a pool of firms may neither be too specialised nor too diverse, but knowledge transfers benefit firms in related varieties of technologies and industries (Frenken, Van Oort, & Verburg, 2007). Second, Potter and Watts (2011) suggest that the maturity of industries determines which environments suit them best. New start-ups, therefore, are most likely to benefit from Jacobs externalities. On the other hand, well-established firms may benefit from MAR externalities. Such notions lead to the third contribution, which is that different types of firms may gain differently from the agglomeration externalities (Cantwell & Santangelo, 2002). Knowledge-intensive firms, for example, may gain less from their less knowledge-intensive counterparts. Fourth, EEG also provides a detailed explanation on how knowledge spillovers are transferred among agents. Transfer of knowledge may take place as part of the mobility of labour, in which workers change jobs between firms (Boschma, Eriksson, & Lindgren, 2009). The transfer of knowledge may also occur due to social and professional connections between workers in different firms (Agrawal, Cockburn, & McHale, 2006). Further, simple or complex knowledge may also differ in the way it is transmitted (Boschma & Frenken, 2011).

The third research area focuses on the role of institutions in linking agglomerations to the changing geography of uneven development (Boschma & Frenken, 2006; Kogler, 2015). Here, institutions are conceptualised as co-evolving with other economic agents in influencing regional development (Essletzbichler & Rigby, 2007). In essence, firms co-evolve with other institutions because it is not only firms that induce the change to their environment, but the

environments themselves also provide feedbacks that may alter firms and institutions (Boschma & Frenken, 2009, 2011).

There are at least three critiques of this recent development in EEG. First, despite the claimed significance and prominence given to the role of institutions within in EEG, in reality its treatment remains limited (MacKinnon et al., 2009). This is particularly true in the case of empirical analyses, where the explicit focus on institutions in economic development remains a marginal concern (see Boschma & Frenken, 2011). Second, research on the role of the institutions has taken place mostly in the more economically developed countries and focused on the technology-intensive sectors. As such, its application in developing countries and those with less technology-intensive industries remains limited (see Hassink, 2017; Morrison & Cusmano, 2015). Third, research is still preoccupied with micro-level analysis, concentrating to the evolution of industrial geography and firms, rather than the evolution of broader regional economic structures that shape patters of uneven development (Martin & Sunley, 2015).

2.4. Path Dependence

2.4.1. The Origins of the Concept

As noted earlier, arguably one of the most significant concepts within EEG is the notion of path dependence. It has been widely used in interpreting the developmental trajectory of localities and regions within EEG, and has been applied across numerous geographical, sectoral and institutional contexts (Boschma 2007; David, 2005; Morgan, 2013; Strambach, 2010; Tonts, Plummer, & Argent, 2014). Path dependence was originally developed as a concept to explain how particular technologies emerge and assume market dominance (David, 2005). While the origins of the concept remain somewhat contested, most scholars draw attention to the seminal paper of David (1985) on the emergence and eventual widespread adoption of the QWERTY keyboard (see David, 1985). In this paper, David argues that, despite its inefficiency, the QWERTY keyboard managed to dominate the 20th century market as a result of at least three factors. The first was the technical interrelatedness between the QWERTY design and the availability of well-trained typists. Since the QWERTY keyboard came first to the market in the 1880s, more typists were familiar with the usage of it than other systems. Changing the style of typing for the sake of increasing efficiency or technological innovation was typically considered problematic. Moreover, the QWERTY keyboard was readily available, with more and more typists trained to use them. The second factor was a consequence of the first factor, that is, economies of scale. Since more typists were trained to

use the QWERTY keyboard, in turn, more and more QWERTY keyboards needed to be produced, therefore lowering the unit cost of production. The third factor is related to the quasi-irreversibility of investment. Company consumers decided that investing in new training for other keyboard designs would be too costly when compared to the benefit obtained from such other designs (David, 1985).

Drawing on 'QWERTY-Nomics', EEG has employed path dependence to explain the ways in which the spatial organisation of economic activities is the result of "largely contingent, yet path dependent, historical process" (Boschma and Franken, 2011, p. 297). Economic choices and opportunities are hypothesised, by and large, depend on past structural, institutional, social and technological developments (Drahokoupil, 2012; Martin, 2010). Accordingly, path dependence processes are conceived as irreversible, or as unable "to shake free of their history" (Martin & Sunley, 2006, p. 399). However, path dependence is not a deterministic process. Instead, past actions merely provide possibilities to be selected by the present condition to proceed to "possible future evolutionary trajectories (paths)" (Martin & Sunley, 2006, p. 402).

Within EEG, path dependence is typically regarded as a multi-scalar process (Boschma & Frenken, 2009). The current trajectory of a regional economy depends on the historical adjustment path, which, in turn can depend on place, or specific geographical locational factors (Martin & Sunley, 2006). Martin and Sunley (2006) suggest at least four possible sources of regional path dependence: (i) the availability of particular raw materials, or natural resources; (ii) the development of technology and industries that support the processing of such materials; (iii) particularly successful technological innovations that attract more and more firms to develop such technologies; (iv) region specific institutions, social forms and cultural traditions that provide a basis for industries and local entrepreneurs.

One of the central features of path dependence is the notion of 'lock in'. Lock-in refers to a set of conditions in which the combination of past actions and "the emergence of self-reinforcing effects" leads to a particular development trajectory (Martin, 2010, p. 3). This leads to "an emergent progressive 'fixity' or 'rigidification' in the patterns of economic activity" (Martin & Sunley, 2006, p. 406). Increasing returns may lead development trajectories to a positive lock-in; however, being trapped in old institutional structures or mature organisational routines that inhibit further innovations may lead to a negative lock-in (Hassink, 2010a; Martin & Sunley, 2010).

The notion of lock-in has also been applied to understanding regional development, and the particular ways in which economic development is either enhanced or constrained by its various positive or negative forms. As Martin and Sunley (2006, p. 395) point out, "… some regional economies become locked into development paths that lose dynamism, whilst other regional economies seem able to avoid this danger." However, it is also apparent that lock-in is not inevitable. External forces, such as major economic shocks, have the capacity to result in significant adjustments in regional performance. Moreover, institutions, it is argued, play a critical role in both helping avoid negative lock-in and providing a means of 'breaking free' of its constraints (see also, Gertler, 2010; Grabher, 2009; Rodríguez-Pose, 2013; Scharpf, 2018).

2.4.2. Path Dependence and Place Dependence

One issue in regards to the application of path dependence in EEG is how it relates to place. Martin and Sunley (2006) argue that specific place conditions and characteristics provide feedback to the economic activities of agents in shaping particular development paths. Although there is agreement that place is an important factor in explaining path dependence, there is disagreement regarding how significant place may be in influencing path dependence (Drahokoupil, 2012; Martin & Sunley, 2010).

Boschma and Lambooy (1999) argue that place plays only a minor role in the creation of the new developmental pathways. Their claim is that new firms have a high degree of freedom to select their locations among various options (Murmann, 2003). This is because new firms bring new routines and/or new technology. They go on to suggest that there is a gap between the supporting capacities of places with the requirements of the new firms (Boschma & Frenken, 2006). Place-specific features (e.g. general knowledge, skills, raw materials and existing firms) are merely 'generic resources', as compared to the 'specific resources' that firms need (e.g. specialised inputs), which are also often available somewhere else (Boschma & Lambooy, 1999; Boschma & Frenken, 2006). Moreover, one of the critical determinants of firm location under this model is the ability to maximise profits, which is often linked to underlying costs, including labour, land and other resources. In this sense, there is an argument that 'chance' plays a considerable role in determining where new firms reside. Following Boschma and Lambooy (1999) and Boschma (2007), chance events represent the interplay between (1) the supportive selection environment, which is the place, along with generic resources, (2) unpredictable triggers, "potential sources of major technological innovations" and consist of both challenges and opportunities (Boschma & Lambooy, 1999, p. 422), and

(3) the innovation performed by entrepreneurs or the human agency. Over time, the institutional structures of particular places adapt to and provide "specific resources" for new firms. Hence, a transformation of 'neutral space' to 'real space' occurs (Boschma & Frenken, 2006) and place becomes important in determining the path development of a region.

Martin and Sunley (2006) offer quite a different perspective, and argue that place is of critical importance, not only after the creation of the new path but also during the selection of location. They suggest that 'generic resources' embedded in particular places are not undermined or radically altered through the emergence of new firms. Indeed, they argue that the existing generic resources within a place are vital in understanding the development of economies within a locality. The availability of generic resources implies that it is possible for entrepreneurs to rework them "to form the basis of purposeful entrepreneurial deviations into new paths" (Martin & Sunley, 2010, p. 81). Generic resources are still unique and reflect the particular characteristics of localities, yet they are also omnipresent. In this sense, Martin and Sunley claim that path dependence itself is place-dependent. It is "inextricably bound up with geography", since the place that is being modified by the path dependence process is also determining the creation and development of new paths (Martin & Sunley, 2006, p. 410).

2.5. Institutions and Economic Geography

2.5.1. The Origins of the Concept

Institutions are generally defined as the 'rules of the game' that guide the actions taken by economic agents (Khalil, 1995; Tomaney, 2014). Acemoglu, Johnson, and Robinson (2005) divide institutions into two basic categories: formal and informal. Formal institutions are codified by rules that both protect citizens from any exploitation, and also guide contractual obligations between citizens. Formal institutions may take the form of economic institutions (e.g. property rights, markets and contract enforcement system) or political institutions (e.g. judicial system, form of governments). In contrast, informal institutions can be understood as "correlated and relatively stable social interactions between economic agents that develops upon rules and regulations in rather contingent way" (Bathelt & Glucker, 2014, p. 356). Examples of informal institutions include social norms, values, cultures and other intangible aspects that stabilise and reinforce social and economic conditions. They are also closely related to the development and maintenance of formal institutions (Acemoglu et al., 2005). In the context of this thesis, institutions might be conceived as "durable structures that are specific to territories" and that can transmit histories between agents (Boschma & Frenken, 2009, p. 152)

Economic geographers, in particular, those working in the field of institutional economic geography, have been interested in how 'institutional environments' and 'institutional arrangements' interact with each other across spaces and how they shape the evolution of the economic landscape (Hodgson, 2009; MacKinnon et al., 2009; Pike et al., 2009). Martin (2000) describes the 'institutional environment' as the system in which both formal and informal institutions take place. Such systems normally require 'institutional arrangements', which are specific organisational forms (e.g. labour unions, regional development bodies, city councils and regulatory agencies) that are governed by the 'institutional environment' (Martin, 2000).

2.5.2. Institutions in the Evolutionary Economic Geography

Within EEG, there is an increasing recognition that institutions are important in understanding the evolution of capitalist space economies (Gertler, 2010; Morrison & Cusmano, 2015; Tomaney, 2014). Institutions provide part of the guiding structure that can shape economic development, yet at the same time institutions are also products of local and regional economic, social and political histories. In this respect, institutions can also be conceptualised as embedded within path- and place-dependent processes, and also subject to phenomena such as 'lock-in'.

In explaining the relationship between institutions and firms, Boschma and Frenken (2009) argue that "territorial institutions are to be viewed as orthogonal to organisational routines" (p. 156). The influence of specific territorial institutions upon firms is not decisive, given that firms may "replicate their routines across different territorial contexts" (Boschma & Frenken, 2009, p. 153). Over time, it has been suggested that institutions become increasingly important to regional economies as they tend to co-evolve with firms (Essletzbichler & Rigby, 2007). In this respect, institutions become a critical part of regional path dependence. Moreover, the co-evolution process is used to help explain why firms in a given region tend to exhibit similar organisational routines (Essletzbichler, 1999). In essence, they are both reinforced by, and reinforcing, institutional environments.

One of the criticisms of the early work in EEG was that it tended to limit its engagement with non-firm variables in understanding path dependence, and that it was particularly neglectful of appreciating the role of institutions (Hodgson, 2009; MacKinnon et al., 2009). Yet, as the body of work in EEG has increased, one of the critical findings has been a recognition that institutions preserve history and information from the past (Martin & Sunley, 2015). Such history and information serve as important sources of ideas, which may be used by the firms,

or creative entrepreneurs, in their decision-making process (Essletzbichler, 2009). For example, MacKinnon et al. (2009) argue that the tendency to treat institutions as either a set of arrangements that constrain or co-evolve with the organisational routines of firms risks ignoring the significant impact of "deliberate intervention through public institutions such as the state in shaping the evolution of the economic landscape" (p.136). Also, Hassink, Klaerding, and Marques (2014) note that, in emphasising endogenous growth, EEG has often neglected the fact that institutions may also influence such processes by providing a supporting, or inhibiting, environment. By focusing on the technological relatedness of firms as the main source of path creation (Boschma & Wenting, 2007), there was a recognition that EEG needed a greater engagement with interpreting the role of non-firm actors, but also distribution of political and social agency (Binz, Truffer, & Coenen, 2016). These oversights mean that EEG has tended to struggle with connecting micro-level analysis to macro-level analysis of the geography of uneven geography development (Martin & Sunley, 2015; Kogler, 2015).

In their study of the regional innovation systems, Asheim, Bugge, Coenen, and Herstad (2013) found that, aside from industrial entrepreneurs, policy intervention and institutions were critical in path alteration and renewal within territorial economies. Moreover, by considering the context in which firms operate, Dawley (2013) argued that peripheral regions, where state-led development initiatives are pivotal, have been under-represented in EEG research. In particular, early stage entrepreneurialism in peripheral regions may benefit from policy intervention at the early stages of path creation, or in responding to major economic and social shocks. Morgan (2013) made similar observations in a study of old industrial regions, where there are often too few knowledge-intensive firms to stimulate new forms of economic development. In these contexts, the state is important in nurturing innovation and in guiding the transition phase to new developmental pathways (Morgan, 2013).

Collectively, this body of work points to the need for EEG to broaden its focus from firm-specific analysis to connect the organisational routines with broader institutional contexts, such as "capital-labour relations and national regulatory architectures, international trade regimes, and so forth" (Pike et al., 2009, p. 178). Some efforts in this direction have already been made. The notion of co-evolution between institutions and firms provide an example. Co-evolution refers to the process by which institutions are both being influenced by firms' organisational routines or technological advancements, and at the same time these institutions influence firms and the broader development of regional economies (Essletzbitchler, 2009; Boschma & Martin, 2010). Indeed, this notion of co-evolution focusing on the interplay of

firms and institutions in understanding regional development has become an increasingly important research thread within the EEG agenda.

However, the attempts to widen the focus of EEG by considering the notion of co-evolution may only address one of the perspective's key limitations. This is because co-evolution tends to focus on the role of the institutions over the course of time, not at the point of 'institutional genesis' or indeed the outset of new economic development trajectories. Moreover, there is still a tendency to employ the firm as the basic unit of analysis in explaining the changing regional economies. In following the aforementioned findings noted by Dawley (2014) and Morgan (2013), firms have quite different capabilities in different contextual settings. To date, research in EEG has been mainly undertaken in regions with the well-established institutional settings and where knowledge-intensive firms are abundantly available. Therefore, EEG provides little in the way of insight into economic landscapes outside of the 'core' regions, such as Europe and North America. Indeed, very few studies have drawn on EEG in more 'peripheral' regions, where knowledge-intensive firms are less common, and the state plays an important role in supporting innovation and economic development more generally (Morrison & Cusmano, 2015).

A recent study by Bauernschuster, Falck, Gold, and Heblich (2012) is instructive in this regard. In comparing entrepreneurship in Germany, the research considered areas that belonged to the former East and West Germany. This study found that while individuals living in Germany today did so in a similar economic and institutional environment, value systems and the organisational routines of businesses differed in their value system due to the earlier presence of different ideologies (i.e. Socialism in East Germany and Liberalism in West Germany). They argued that differences in value systems affect economic decisions, and in particular the decision to start a business, the risk-taking profile of the business, and the overall engagement with state institutions.

Drahokoupil (2012), in summarising his research on the evolution of industrial policies in Hungary and Czech Republic, also provided a useful framework in terms of different characteristics and capability of governments. With similar geographical locations, similar industrial bases and institutional settings, the two countries differ quite significantly in terms of their policies toward foreign investors. Such differences have led to different development paths as part of their economic evolution. In short, since the opening of their economies in the early 1990s, Hungary has advanced quickly in terms of industrial development when compared with the Czech Republic (Drahokoupil, 2012). This was mainly because Hungary

had a more welcoming set of institutional arrangements for foreign investors, and was therefore able to attract more international investment, technology, labour and skills than the Czech Republic. This made Hungary more competitive than the Czech Republic and contributed to an early economic advantage that has been maintained.

2.5.3. Policy and Institutions: The Role of Spatial Planning

A central focus of this thesis is how institutions have played a role in shaping the geography of uneven development in Indonesia by drawing on ideas from EEG. To be precise, this research explains how government, through the spatial planning policy, has attempted to influence the geography of economic activities in the country. The focus on spatial planning in Indonesia moves EEG (and its nascent institutional focus) beyond the economic 'core' of Europe and offers a 'stress test' of critical concepts in an environment quite distinctive from their historical origins. It is also important to acknowledge that spatial planning is significant both in the Indonesian context – a theme taken up later in this thesis – and that the particularities of public policies need to be placed in their institutional context within the EEG framework (Henry & Miller, 2008; Rafiqui, 2009; Rodríguez-Pose, 2013).

This thesis draws on Birkland (2014) interpretation of public policy (including spatial planning) as a set of choices taken by governments to address particular societal needs. In this context, it reflects the aspirations of government, and is constantly being interpreted and responded to by a range of interests, including firms. Abrams and Fish (2015) note that if (formal) institutions refer to regulations, a policy is an action to implement such regulations to address public needs and priorities. In the dichotomy of 'institutional environment' and 'institutional arrangement' discussed earlier (see Martin, 2000), the policy may be classified as the institutional arrangements in which government authorities and agencies implement the institutional environment. In this sense, policies tend to be more fluid and adaptive than more formal regulatory institutions, such as legal structures and statutes. However, in some cases, where policies become codified into law, these can then be interpreted as institutions themselves (Abrams & Fish, 2015).

In this sense, much spatial planning is best regarded as a set of policies that underpin a set of institutional arrangements. While some aspects of spatial planning are based on legal or regulatory requirements (e.g. land use planning), other components such as development inducements are better regarded as policies that reflect governmental (and societal) aspirations. The usage of spatial planning as a means of tackling regional inequality is common, since such uneven development is in large part the result of the difference in the

capacity of regions to "produce (and sell) goods and services", or the capacity of their population to generate income (Polese, 1999, p. 299). In particular, regional inequality is addressed through policies that attempt to guide the spatial development through the redistribution of economic growth to achieve national objectives (Friedmann, 1963; Galland, 2012; Polese, 1999).

According to Friedmann (1963), spatial planning at the regional level might best be regarded as "the process of formulating and clarifying social objectives in the ordering of activities in supra-urban space" (p. 171). Typically, spatial planning deals with the distribution of activities surrounding the centre of growths (nodes), which are arranged hierarchically by their functions (Friedmann, 1963). Thus, spatial planning attempts to address the issue of uneven development by linking institutional frameworks supporting economic development with the spatial arrangement of firms and economic activity (Matthew & Alden, 2006, p. 138). Given its complex and multi-sectoral agenda, spatial planning attempts to accommodates various interests from different policy sectors, industries and community groups (Adams, Alden, & Harris, 2006; Haughton & Counsell, 2004).

In the context of this research, spatial planning policy that is stipulated as a law is regarded as a critical component of the institutional environment in which the path dependent nature of the geography of uneven development in Indonesia might be interpreted. Through the place-based policies embedded within the spatial planning system, it is argued that the national government attempts to both distribute and concentrate growth in particular locations. In following Jones (1997), the state spatial selectivity strategy is undertaken by the government through 'geographical privileging', which consequently brings an accumulation of capital and state hegemonic projects to particular locations. The aim of this is to foster development growth in those locations. Such an initiative may originate for a number of economic, political or ideological reasons (Jones, 1997). In fact, such geographical privileging could also be "an unintended side effect" of development strategy, originating from the interaction between the government, private and public sectors (Jones, 1997, p. 854). It is also important to note that spatial planning is likely to be closely linked to notions of 'place dependence', as discussed earlier. The explicit focus of spatial planning on 'place' means that it forms part of the institutional environment that guides territorial development and is influential in shaping, and responding to, the routines and behaviours of firms and key economic actors.

2.6. Conclusion

As an emerging research perspective within economic geography, evolutionary economic geography (EEG) possesses powerful analytical potential to explain the changing economic landscape in capitalist economies. Inspired by evolutionary economics, EEG extends on this approach by focusing on questions related to space and place. EEG scrutinises how firms' organisational routines may impact the geography of economic activities across geographic space. Through a reworking of historical approaches evident in the work of earlier research traditions in economic geography, EEG also manages to provide a detailed account of how previous spatial arrangements of economic agents transmit their 'memory' over time through the organisational routines of firms, firms' networks and institutions (Boschma & Martin, 2010; Martin & Sunley, 2010). EEG does this by focusing on firms, as the initial agent that induced the change in the economy. From firms, EEG departs to explain the evolution of economy across network and sectors (the meso-level) as well as across geographical settings (the macro-level).

However, due to its stance, critiques have been made due to the tendency of EEG to limit the role of non-firm actors. Moreover, most research of EEG has been undertaken in a similar geographical context: economically developed countries with knowledge-intensive industries. In these countries, firms play a central role in economic development given the nature of the industries involved. The focus on firms also left EEG struggling to connect micro-reality facts with macro-level phenomena (Martin & Sunley, 2015). Such critiques are reflected in the usage of two important notions in EEG, namely path dependence and the role of the institutions.

This research follows the argument that by treating path dependence as place-dependent, it would yield an opportunity to expand the focus of EEG on aspects of regional development other than the organisational routines of firms. Various aspects may be responsible for the emergence of path dependence, such as formal institutional structures and place-specific socio-cultural characteristics. It is not only history that plays an important role in explaining the changing economic landscape, but the specific characters of places, or geography, is also important (Plummer & Tonts, 2013a). While at the same time, the notion of lock-in may help to explain the difference in regional dynamic capability in such path dependence process.

On the other hand, due to different contextual settings, the role of the institutions may not be quite so minor as argued by Boschma & Frenken (2006, 2011). Countries where dependency over state interventions is high and where the nature of entrepreneurship is low, for example,

may have to rely on institutions and public policies rather than firms' innovations solely in the creation of new development paths, or preserving the existing paths.

Indonesia is considered as a good example in providing a contribution in answering critiques over the EEG for two reasons. First, the geography of uneven development in Indonesia has been consistent for the last 30 years with some persistent sectoral strength in its major regions (Hill & Vidyattama, 2014). This thesis argues that such a pattern may be attributed to the presence of path dependence. By using EEG to explore this, this research aims to move the application of a theoretical framework from the evolution of industrial geography to the evolution of regional inequality. Second, this thesis assumes that as a less economically developed country (LEDC), Indonesia's economic development has been relying more on formal institutional settings rather than on the creative entrepreneurs. It is generally a common observable phenomenon in the lagging regions of economically developed countries (Dawley, 2014) as well as the emerging economies in the global south (Morrison & Cusmano, 2015). By focusing on Indonesia, this thesis may corroborate the efficacy of EEG to explain the geography of uneven development, which is occurring in many parts of the world.

Chapter Three
Research Methods

3.1. Introduction

Research on regional inequality in Indonesia has traditionally been based on quantitative analyses that have drawn on a number of standard measures, including gross regional product, export earnings, labour force change, poverty rates and a range of other socio-economic variables (e.g. Akita & Alisjahbana, 2002; Hill et al., 2008; Hill & Vidyattama, 2014; McCulloch & Sjahrir, 2008; van Leeuwen & Földvári, 2016; Vidyattama, 2010; Wibowo, 2011). In contrast, studies assessing the characteristics and success of spatial planning and regional development policy in Indonesia have typically been more qualitative in nature (e.g. Hudalah & Woltjer, 2007; Moeliono, 2011; Roosmalen, 2008). This work has tended to assess and critique spatial planning from an historical perspective, drawing largely on policy reviews, interviews and in some cases ethnographic approaches.

In contrast to this apparently dualistic set of approaches, this thesis utilises a mixed methods research design, combining quantitative and qualitative approaches, to assess the potential impacts of the spatial planning policies on the geography of uneven development in Indonesia. This chapter provides a rationale for employing a mixed methods research design. It also outlines the key data sources and variables, as well as the specific techniques used to analyse data. More detail on these data sources and analytical techniques is provided in the relevant chapters that follow.

3.2. An Overview of the Mixed Methods Research Design

A mixed methods research design refers to a set of approaches that combines techniques and data drawn from quantitative and qualitative methods. In many respects, this is a pragmatic approach that recognises that multiple methods are required to address different components of the research question. Yet, it also serves a broader purpose by offering a means of triangulating evidence from multiple sources in order to better understand different dimensions of a particular problem or question. Moreover, multiple methods provide data that can offer stronger support for a line of argument (Sayer, 2010). In the case of this thesis, Sayer's (2010) conceptualisation of 'intensive' and 'extensive' research design is helpful in

summarising the overall approach (Table 3.1). Extensive is often associated with quantitative research design, while intensive can be associated with qualitative research design.

Table 3.1. Intensive and Extensive Research Design
(Source: Adapted from Sawyer , 2010, p. 243)

Aspects	Intensive*	Extensive*
Focus of the research question	• Concerns processes in a particular case or small number of cases • Concerns socially complex relationships	• Concerns regularities and common patterns within a population • Concerns formal relations or similarity
Types of group studied	Causal groups (i.e. small number of groups) are studied in detail	Taxonomic groups are classified on the basis of their similarities/ differences
Typical methods/ techniques	Study of individual agents in their causal contexts through interactive interviews, ethnography etc. (qualitative analysis)	Large-scale analyses of a population or representative sample, formal questionnaires, standardized interviews, official data (statistical analysis)
Limitations	The problem of representativeness	Problems of ecological fallacy in making inferences about individuals
Appropriate tests	Corroboration	Replication

This thesis builds on previous research on regional inequality that would be regarded as 'extensive' in Sayer's (2010) classification. That is, it builds on research that has focused on understanding broad regularities and patterns in the nature of economic and social development over time and space. This includes analyses that draw on official data on regional economic, social and demographic change at a range of spatial scales and over different time periods. It also draws on approaches that can be classified as 'intensive' through their focus on the in-depth analysis of policies, plans or localities, usually through qualitative analysis. This qualitative analysis includes detailed policy reviews, interviews and archival research.

Creswell, Plano Clark, and Garrett (2008) provide a relatively simple means of classifying mixed methods approaches: (1) research that merges quantitative and qualitative data in a

parallel or *concurrent* manner; or (2) research that uses one type of data (i.e. quantitative or qualitative) to extend other types of data (i.e. quantitative or qualitative) in a *sequential* manner.

This thesis adopts a sequential schematic in which quantitative data and analysis forms the basis for describing patterns and regularities in regional inequality, while the qualitative data and analysis assists the interpretation of the quantitative analysis results. The schematic is outlined in Figure 3.1 and shows how the objectives of the thesis (see Chapter One) align with the analytical techniques and the data sources.

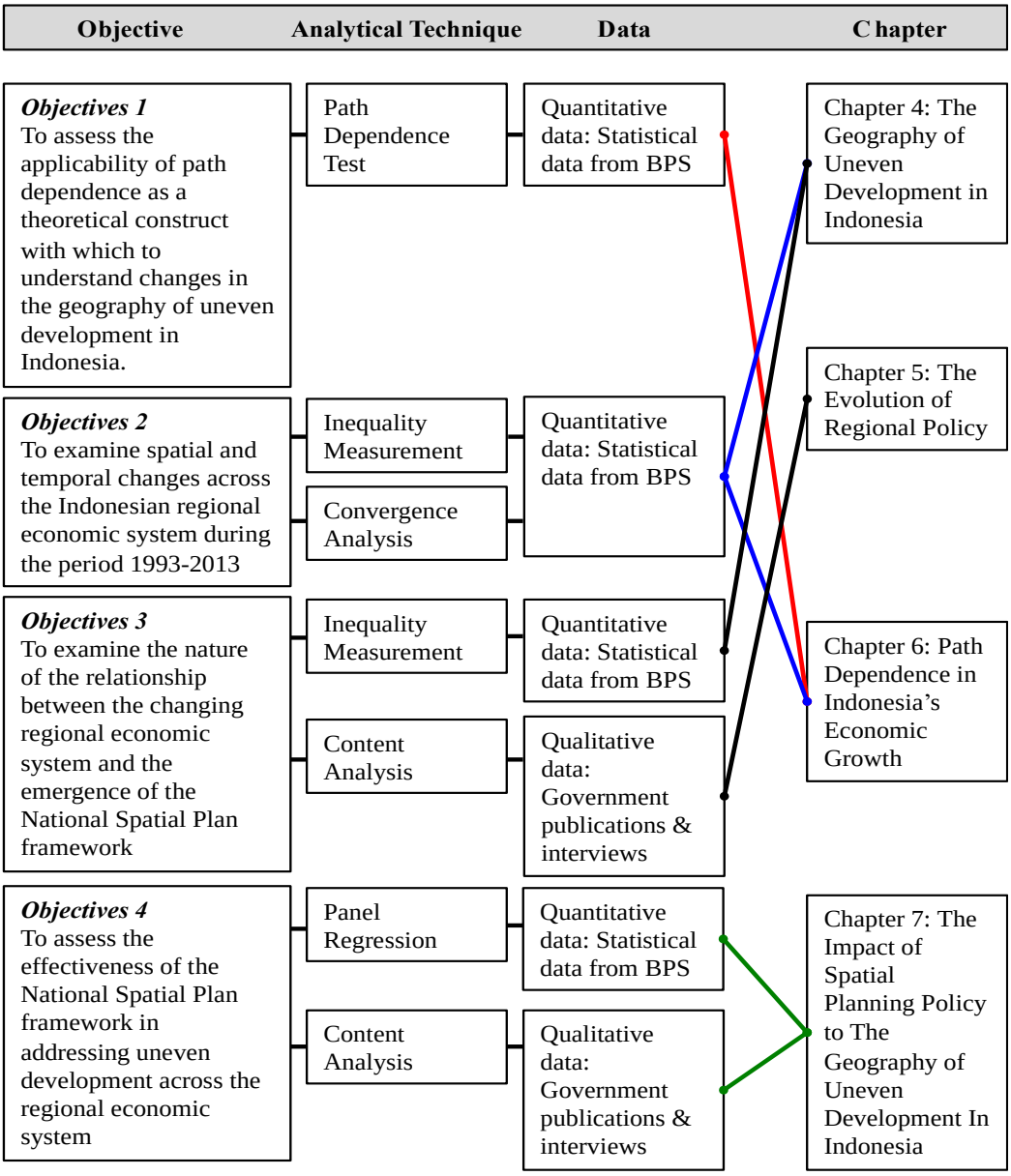

Figure 3.1. Data Analysis Integration Plan

3.3. Data

3.3.1. Quantitative Data

The bulk of the quantitative data was gathered from the National Statistics Agency (BPS). One of the critical sources that was used to provide an initial assessment of regional inequality was Gross Domestic Product (GDP) for districts in Indonesia for the period of 1993 to 2013. GDP, as defined by the National Statistics Agency, is the total added value of goods and services produced in a particular area (Bank Indonesia Statistic Department, 2014).

There are two types of GDP dataset available from the BPS: (i) GDP including the oil and gas sector, and (ii) GDP without oil and gas. This research follows the approach taken by previous studies (see, for example, Aritenang & Sonn, 2018; Hill & Vidyattama, 2014) that draw on measures of GDP without the oil and gas sector. This is because the vast bulk of revenue gained from these two sectors flows mainly to the national government, rather than the local governments where the natural resources are located. Therefore, the presence of these natural resources has less impact on regional economic growth, and indeed their inclusion in the analysis has the potential to distort the 'on the ground' reality of regional inequality (see Hill & Vidyattama, 2014). The details of these revenue flows and arrangements are provided in Appendix 1.

The population data of all districts during the period of 1993 to 2013 was also gathered from the BPS to calculate districts' GDP per capita. 'Population' is defined by BPS as all individuals living in Indonesia for more than 6 months, or less than 6 months with the intention to stay in the country. It therefore excludes tourists and short-term temporary workers. The GDP per capita data represents the growth level of each district.

To assess the potential impacts of spatial planning policies in addressing uneven development in Indonesia other social and economic data gathered from the BPS are:

1. The number of people enrolled in school for the period of 1993 to 2013, collected from the National Socio-Economic Household Survey (*SUSENAS*);
2. The number of villages with asphalt roads for the period of 1993 to 2014, collected from the Village Potential Survey (*Potensi Desa*);
3. The number of households with the telephone connection for the period of 1993 to 2014, collected from the Village Potential Survey (*Potensi Desa*).

In addition to the BPS data, several other datasets were also collected. The amount of transfer funding from central to local governments for the period of 1993 to 2013 was collected from the Ministry of Finance's database. Foreign Direct Investment (FDI) and domestic investment data in each district were collected from the Indonesia's Investment Coordinating Board for the period of 1993 to 2013.

Additionally, the road length of each province during the period of 1996 to 2015 was collected from the Ministry of Public Works. This dataset in particular is used as a comparison to the number of villages with asphalt roads collected from BPS. The number of districts targeted for the spatial planning policy was also gathered from the National Spatial Plan (NSP) document.

All of these data have been used in previous research as variables that reflect determinants of regional growth (e.g. Akita & Alisjahbana, 2002; Aritenang & Sonn, 2018; McCulloch & Sjahrir, 2008; Vidyattama, 2010). This thesis uses these data as explanatory variables to predict the GDP per capita in the linear regression analysis undertaken in Chapter Six.

3.3.2. Qualitative Data

Qualitative data gathered for this thesis is from two sources: (i) policy documents (including regulatory documents) collected from government offices and (ii) semi-structured interviews with government officials. The list of the government publications collected is provided in Appendix 2.

For the semi-structured interviews, a total of 32 respondents were interviewed during the period of December 2015 to April 2017. The list of the respondents is provided in Table 3.2. The choice of national government institutions from which interviewees were drawn was on the basis of the importance of these organisations to the scope of work and the implementation of the National Spatial Plan (NSP).

In terms of local governments, interviews were conducted with representatives of local authorities, which are part of the *Jabodetabekpunjur* area, also known as the Jakarta Metropolitan Area (JMA). The JMA is a metropolitan area encompassing Jakarta, the capital city of Indonesia, and its surrounding neighbours: Bogor, Depok, Tangerang, Bekasi and Cianjur. The administrative boundary of the metropolitan area extends beyond the Province of Jakarta and includes both the Provinces of West Java and Banten (see Figure 3.1). The officials from the JMA were interviewed because the JMA itself is one of the earliest targeted areas designated by the national government through the National Spatial Plan (NSP) 1997.

The JMA also remains a priority in the newest version of the National Spatial Plan, which was released in 2008.

Table 3.2. Semi-Structured Interviews with Local and National Governments

Institution	National Government (NG)	Local Government (LG)
Jakarta Province (J)		5
West Java Province (WJ)		1
Bogor Regency (B)		2
Depok Municipality (D)		2
Bekasi Municipality (BM)		2
Bekasi Regency(BR)		1
Tangerang Municipality (T)		1
South Tangerang Municipality (ST)		2
Ministry of Land and Spatial Planning (LSP)	6	
Ministry of Finance (F)	1	
Ministry of Public Works (PW)	7	
National Development Planning Agency (PA)	2	
Sum	**16**	**16**
Total Interviews		**32**

The broad schedule and guide for the semi-structured interviews are provided in Appendix 3. These interviews were organised around three major themes:

1. The history of the National Spatial Plan;
2. The implementation and general problems faced in the implementation of the National Spatial Plan; and
3. The potential impacts of clustering policies adopted in the National Spatial Plan

To ensure anonymity, the respondents will be cited in the following sections in accordance to abbreviations in Table 3.2. For example, a local government official in Bekasi Municipality will be cited as LGBM and a national government official working in the Ministry of Finance will be cited as NGF. If several interviews were conducted in the same institution, the respective interviews will be numbered (e.g. NGLSP1, NGLSP2).

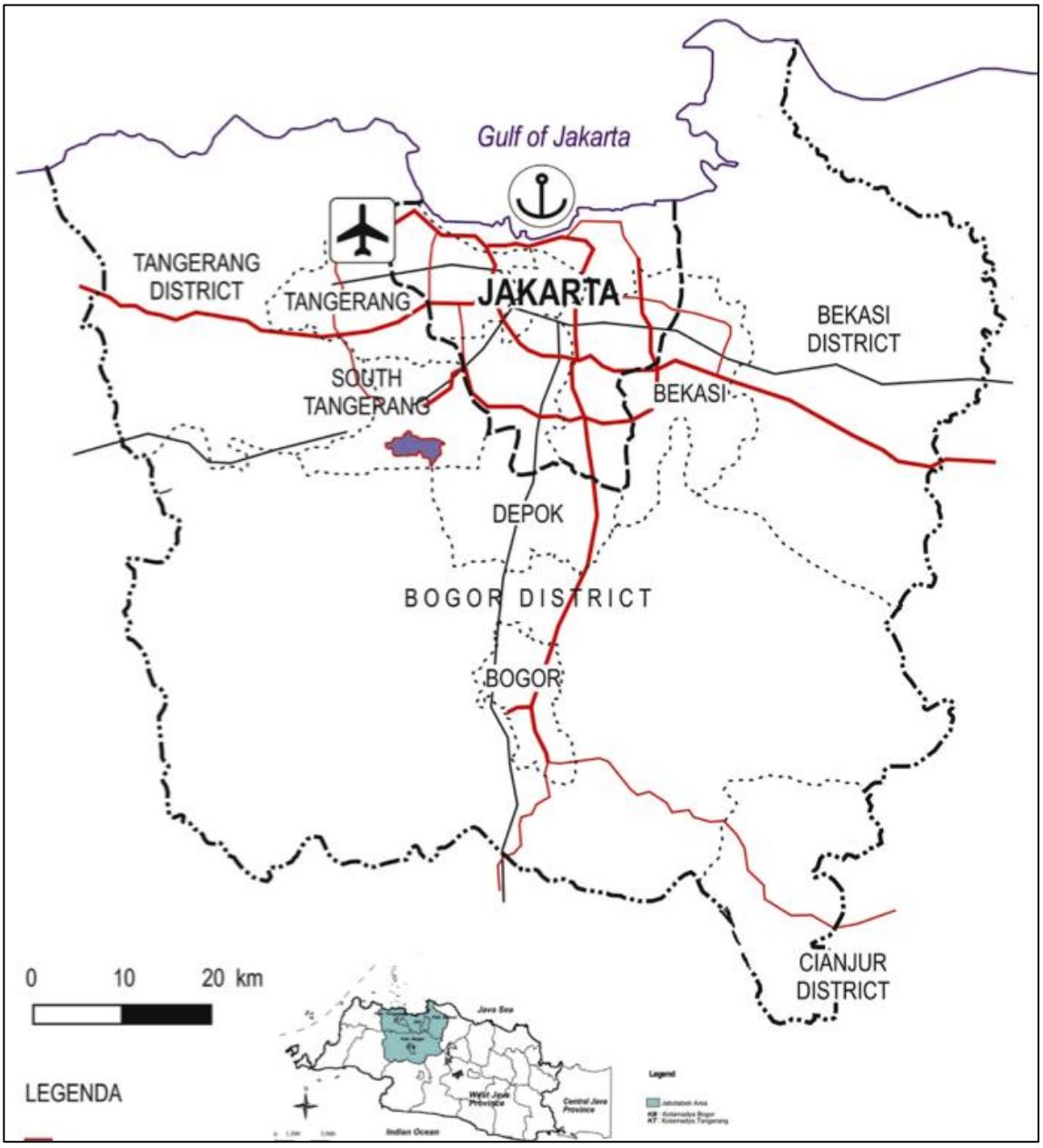

Figure 3.2. Orientation Map of the Jakarta Metropolitan Area
(Source: Adapted from Winarso, Hudalah, and Firman, 2015, p. 222)

3.4. Analytical Techniques

3.4.1. Quantitative Techniques

This section describes in broad terms the techniques used to analyse the quantitative data collected for this thesis. It focuses on a number of standard means of assessing regional inequality, including the Gini coefficient and Theil index, convergence analysis, path dependence tests, and panel regression.

3.4.1.1. Inequality Measurement: Gini Coefficient and Theil Index

The Gini coefficient can be best described by referring to the Lorenz Curve, which plots the cumulative population against the cumulative variable of interest, in this case GDP per capita (Dorfman, 1979). To illustrate a Lorenz curve, Figure 3.2. shows the GDP per capita of Indonesia in 1993 (black line) and 2013 (red line); the X axis is the cumulative of population in percentile and the Y axis is the cumulative income. The diagonal line represents the line of equality, where each region possesses exactly the same amount of income, which is not possible in reality. The Gini coefficient is defined as A/(A+B) (Haughton & Khandker, 2009). If A = 0, the Gini coefficient becomes 0, which is a perfect equality. While if B = 0, the Gini coefficient becomes 1, which reflects a complete inequality.

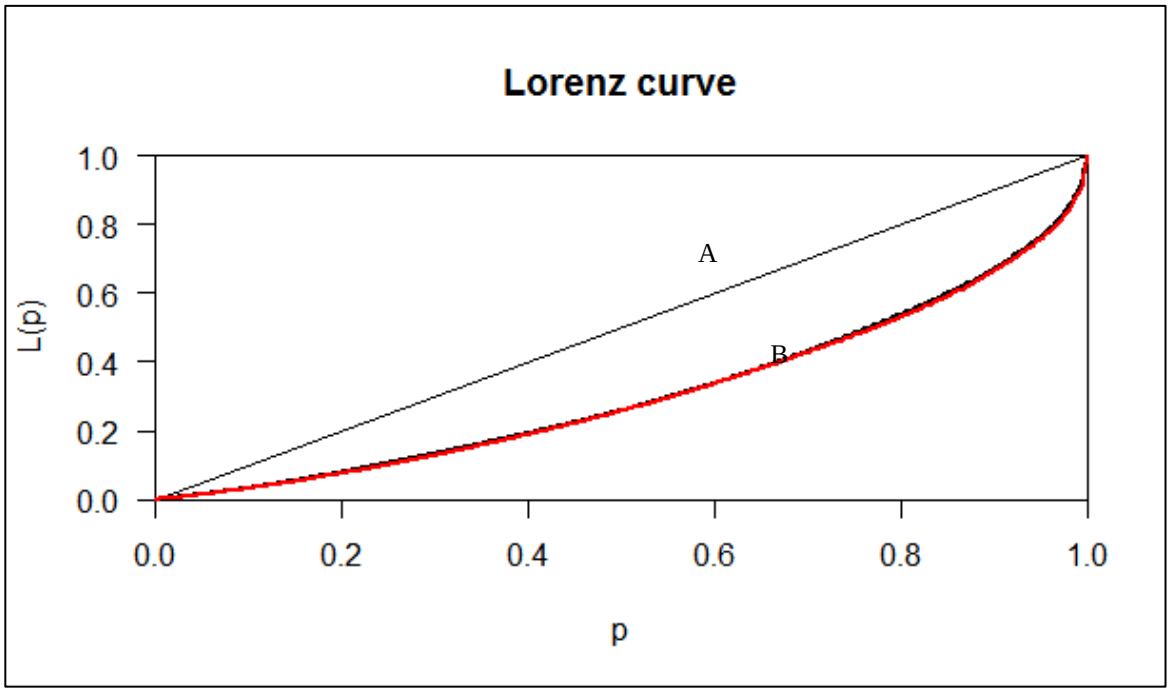

Figure 3.3. Lorenz Curve Indonesia GDP per Capita 1993 & 2013
(Source: Author's own calculation based on BPS data)

Mathematically, the Gini Coefficient can also be written as:

$$G = \frac{\sum_{i=1}^{n}(2i - n - 1)x'_i}{n^2\mu} \quad (1)$$

where i is the region's rank order number, n is the number of total regions, x'_i is the individual's variable value, and μ is the population average.

While the Gini coefficient is widely used as a measure of regional inequality, the coefficient itself is not easily decomposable in the sense that the coefficient of the country is not equal to the total Gini coefficient of all provinces in Indonesia (Haughton & Khandker, 2009).

Given that it is important to know, for example, how much inequality between provinces and inequality between districts contribute to the total inequality; the Theil Index is an appropriate alternative measure of regional inequality. In general, the Theil Index provides a value for each individual or group, by weighting each region, in terms of population share, and by measuring the proportional distance of each data point to its mean (Haughton & Khandker, 2009). If the individual data is available, the formula would be,

$$T = \frac{1}{N}\sum_{i=1}^{N}\frac{y_i}{\bar{y}}ln\left(\frac{y_i}{\bar{y}}\right) \quad (2)$$

where N is the total population, $\bar{y}$ is the mean income per person, y_i is income for region i. When the individual regional data can be grouped into mutually exclusive groups, the Theil Index can be decomposed to measure the inequality within and between groups. Following Akita and Alisjahbana (2002) and Haughton and Khandker (2009), the equation is,

$$T = \sum_{j}\frac{Y_j}{Y}T_j + \sum_{j}\frac{Y_j}{Y}ln\left(\frac{Y_j/Y}{N_j/Y}\right) \quad (3)$$

where Y is the total income of all N individuals in the sample, Y_j is the total income of a subgroup with N_j members, and T_j is the value of Theil Index for sub-group j. The first term in the equation above represents the within group inequality, while the second term represents the between group inequality (group refers to province). Since the Theil Index is sensitive to the number of the groups, it cannot be compared among groups with different sizes, a feature that is applicable for the Gini coefficient (Hale, n.d.).

3.4.1.2. Convergence Analysis

The degree of regional economic convergence is measured by β convergence, which identifies whether or not the poorer regions are growing faster than the richer regions (Barro & Sala-i-Martin, 1995; Young, Higgins, & Levy, 2008). Following Garcia Garcia and Soelistianingsih (1998) and McCulloch and Sjahrir (2008), β convergence is estimated with the following equation:

$$\ln(\frac{y_{it}}{y_{i0}})/t = a + \beta \ln y_{i0} + \mu_{it} \quad (4)$$

where *a* stands for the constant, β for the slope coefficient, which captures the convergence rate, *ln* stands for natural logarithm, y_{it} stands for the GDP per capita of district *i* at *t* time, y_{i0} for the GDP per capita of district *i* at the initial point, which is in 1993, and μ_{it} *t* stands for the error term which has mean zero, finite variance, and is independent over *t* and *i* (Garcia Garcia & Soelistianingsih, 1998; Young, Higgins, & Levy, 2008). Taking into account the time periods used in previous research (Akita & Alisjahbana, 2002; Aritenang, 2012; McCulloch & Sjahrir, 2008), the calculation of the *β convergence* is not only undertaken for the period of 1993 to 2013, but also for three other periods: 1993 to 1997, 1998 to 2001, and 2001 to 2013. These correspond to the period before the 1998 Asian financial crisis, the period during the crisis and the post-crisis period. Different periods are assumed to possess different economic characteristics, as observed by several studies (see, for example, Aritenang & Sonn, 2018; McCulloch & Sjahrir, 2008; Vidyattama, 2010).

3.4.1.3. Path Dependence Test

Following the research of Plummer and Tonts (2015) and Tonts et al. (2014), it is possible to test for path dependence across the districts in Indonesia during 1993 to 2013. Here the basic path dependent model is as follows:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_2 I_{(t)} + \varepsilon_t \qquad \varepsilon_t \sim N(0, \sigma^2) \quad (5)$$

y_t is the (log of) GDP per capita at year t, which depends upon the (log) GDP per capita of previous year, y_{t-1}, and the potential structural break, which shifts the long-run growth trajectory, $I_{(t)}$. Here, α_0 is the constant parameter, α_1 is a parameter which captures the out-of-equilibrium adjustment, α_2 is the location shift/structural break parameter. For this type of univariate process, path dependence is defined as a data generation process which is "both nonstationary and nonergodic" (Plummer & Tonts, 2015, p. 3). In this context, following Plummer and Tonts (2015), nonstationary means that the joint probability distribution of any pair of observations from y_t and y_s depends not only on *s*, the distance in time between the observations, but also on *t*, the time in the sample from which the pair is drawn. On the other hand, nonergodic means that the process of y_t generation displays changing statistical properties over time. The model assumes that for a nonstationary data generation process, if $\alpha_1 = 1$, then the data generation process of GDP per capita exhibits a path dependent stochastic

trend process that is persistence over time; if $\alpha_1 < 1$, then the data generation process of GDP per capita exhibits convergence to equilibrium, indicating path independence (Plummer & Tonts, 2015; Tonts et al., 2014). Whereas, if α_2 is significant, then this indicates that there is a shift in the long-run equilibrium. Finally, ϵ_t is a white noise process, or a series of random shock to the model, which is assumed to be normally distributed, with mean equal to 0 and constant variance of σ^2.

In estimating the *stochastic trend* (α_1), this research makes use of the ARIMA model, given its ability to capture the impact of the variable of interest's initial value over its succesive values. ARIMA is a tool to forecast time series data. Using ARIMA, if necessary, the data can be made 'stationary' for the purpose of forecasting by differencing the data (Nau, n.d.).

ARIMA captures three components for the time series data: *Auto Regressive, Integrated,* and *Moving Average* (Chard, 2012). ARIMA model denotes as ARIMA (p, d, q); where p stands for the Auto Regressive order; q for the Moving Average order; and d for the Integrated order. The Auto Regressive part indicates that the successive values of the variable of interest are regressed on its own prior values. The Moving Average part indicates the lags of the forecast error. The AR part indicates longer impact of the initial condition on the regression results, while the MA part indicates short-term impact (Chard, 2012; Coghlan, 2017). The Integrated part indicates the how frequently the time series data need to be differenced to be made stationary (Chard, 2012).

In estimating *the structural break* (α_2), this research utilises the family of generalised fluctuation tests. The generalised fluctuation tests, according to Zeileis, Leisch, Hornik, and Kleiber (2002), fit the model and determine the structural break using the fluctuation in either the residuals or estimates of the model. For the purpose of this research, the fluctuation of the residuals is captured using both *cumulative sums of standardised residuals* as well as *moving sums of residuals* (Zeileis et al., 2002). The test is able to pinpoint the years in which the structural breaks are observed.

The result of the estimation may exhibit the presence of both stochastic trend and structural break (Plummer & Tonts, 2015). The analysis is provided for different administrative levels: national, island and districts, to better understand the process of path dependence at different spatial scales.

3.4.1.4. Panel Regression

To assess the effectiveness of the National Spatial Plan framework in addressing uneven development across the regional economic system, this thesis applies growth regression given in Vidyattama (2010) and Caselli, Esquivel, and Lefort (1996):

$$\ln y_{it} = \alpha_0 + \alpha_1 \ln y_{it-1} + \alpha_z \ln(Z')_{it} + \alpha_d pol_{it} + dy_t + \eta_i + u_{it} \quad (6)$$

where y_{it} is the proxy for economic growth, which is GDP per capita district *i* at time *t*, α_0 is a constant, α_1 is the rate of convergence between t-1 and t, Z'_{it} contains the suite of explanatory variables for district *i* at time *t*, α_z is the parameter for each explanatory variable, pol_{it} is dummy variable for districts stipulated in particular spatial planning policies (it has binary values: 1 for districts included in the policy inititiave, 0 otherwise) dimensioned by *t*, α_d is the parameter of each policy dummy variable, dy_t is dummy variable for time *t*, η_i is the unobserved districts effect and μ_{it} is the error term which is assumed to be normally distributed, with mean equal to 0 and constant variance of σ^2.

Further discussion on the explanatory variables is provided in Chapter Seven; while the spatial planning policies observed are the National Strategic Area, the Regional Cluster, or the Urban Hierarchy, which are discussed in detail in Chapter Five.

3.4.2. Qualitative Techniques

Qualitative analysis was focused on detailed content analysis of policy documents (including formal regulatory documents) and interviews. A systematic, close reading of spatial planning policy documents and regulation was undertaken to interpret formal aims, objectives and strategies. In addition to this, a number of regulations were also examined to determine the context from which policies were stipulated.

Given that there is a likelihood of gaps between the formal aim of particular policies and their implementation, information gathered from the semi-structured interviews enabled the researcher to explore how both national and local governments developed and executed spatial planning policy. Field notes and interview records were transcribed and then codified into the three key themes: (i) the history of the National Spatial Plan; (ii) the implementation and challenges faced in the implementation of the National Spatial Plan; and (iii) the potential impacts of clustering policies adopted in the National Spatial Plan.

In most cases, additional information other than these three themes was raised by respondents. Therefore, additional codification was undertaken and linked to broader themes, and in particular on the role of other regional policies that have sought to address the geography of uneven development in Indonesia.

3.5. Conclusion

This chapter has summarised the research design and key methods used in this thesis. As outlined, the thesis uses a mixed methods research design to address its aim and objectives. This is in large part pragmatic, in that it addresses issues of data availability and scope. However, it also has an additional benefit in enabling research from different sources to be used to 'triangulate' information and therefore offers confidence in the evidence and strengthens the underlying argument of the thesis (Creswell et al., 2008).

Chapter Four
The Geography of Uneven Development in Indonesia

4.1. Introduction

Over the past three decades, Indonesia has been characterised by persistent regional inequality (Hill et al., 2008; Hill & Vidyattama, 2016). Despite the fact that the rate of economic growth in poorer regions has been higher than the richer regions, the pace of regional convergence has been slow (Garcia Garcia & Soelistianingsih, 1998; Hill & Vidyattama, 2014). Such inequality is problematic in social, political and economic terms (Firman, 2009; Hill, 2002; Miranti et al., 2014).

Socially, the evidence suggests that inequality correlates strongly with the poverty rate (Hill et al., 2008). In Indonesia, richer regions tend to have lower poverty incidence, while poorer regions and high poverty tend to coincide (Hill et al., 2008; Hill & Vidyattama, 2014). Economic activities remain concentrated in the western parts of the country (e.g. Jakarta, the capital city, Java and Sumatra), while poverty is concentrated mainly in the eastern parts (e.g. Papua, Nusa Tenggara) (Hill & Vidyattama, 2016).

Politically, there also appears to be a relationship between political unrest and inequality. This is particularly evident where the division of lagging and advanced regions coincides with either ethnic or religious divisions (Hill, 2002; Milankovic, 2005). Indeed, regional inequality is often cited as one of the main reasons for the emergence of political turmoil in Indonesia during 1998 (Booth, 2014). This ultimately led to the transfer of significant powers from central to local governments through decentralisation. During the implementation of decentralisation, dissolution of formal regions occurred frequently and resulted in a significant increase in the number of smaller districts. This was, in part, a response to the dissatisfaction felt by people living in lagging and impoverished regions with the way regional governments managed development budgets (Hadiz, 2004). The creation of smaller districts was thought to be a means of bringing decision-making closer to areas of need, improving local participation in regional governance, and enhancing accountability (Firman, 2009). As a result of the process of devolution, Indonesia now has more than 500 districts, which is an increase from the 291 districts that existed in 1999.

Economically, problems associated with regional inequality have required the Indonesian government to implement redistributive policies that drain resources from other productive

activities. These redistributive policies, coupled with the inability of lagging regions to use their resources optimally, have the potential to hamper national economic growth in the long run (Castells-Quintana & Royuela, 2014; Farole, 2013). In the context of Indonesia, Miranti et al. (2014) suggest that a high level of inequality is highly associated with increasing levels of poverty.

This chapter provides an examination of the geography of uneven development in Indonesia. It is set within the context of previous research (see, for example, Akita & Alisjahbana, 2002; Hill et al., 2008; McCulloch & Sjahrir, 2008) and demonstrates the depth and persistence of uneven development at multiple spatial scales. The chapter draws on a range of sources to explore the nature of uneven development and inequality, and helps to provide the context for the policy responses that are described in Chapter Five.

4.2. Previous Studies and the Data

Despite evidence that there has been insignificant change in the geography of economic activities across major island groups in Indonesia over the past three decades (Hill et al., 2008, Hill & Vidyattama, 2014), changes in levels of inequality have been quite dynamic at a more localised scale. This section provides a review of regional inequality in Indonesia at various spatial scales, from major island groups through to the district level. Formally, there are three administrative levels in Indonesia: national, province and district. For the purpose of regional analysis, researchers have typically considered an additional geographical unit in the major island groups (Akita & Alisjahbana, 2002; Garcia Garcia & Soelistianingsih, 1998; Hill & Vidyattama, 2014). The different administrative tiers in Indonesia are shown in Table 4.1 (for geographical orientation, see Figure 1.1).

A number of earlier studies on regional inequality across Indonesia are helpful in understanding longer-term trends. Three previous studies are particularly insightful. Hill et al. (2008) provide a thorough analysis of the changing economic geography of provinces in Indonesia, using data from the period of 1975-2002. According to this study, Indonesia demonstrated a high degree of persistence in regional inequality. More recent work by Hill and Vidyattama (2014, 2016) suggest that this pattern of inequality remains. Other research was undertaken by McCulloch and Sjahrir (2008) and offered one of the first attempts to explain the dynamic of regional economic growth at the district level by drawing on district-level data for the period of 1993-2005. This study also emphasised the entrenched nature of spatial inequality, but also suggested that there may be some evidence of regional convergence with poorer districts tending to grow faster than richer districts.

Table 4.1. Numbers of Administrative Tiers in Indonesia by Major Islands in 1993

No.	Major Islands	Number of Provinces	Number of Districts
1.	Sumatra	8	73
2.	Java-Bali	6	116
3.	Kalimantan	4	29
4.	Sulawesi	4	39
5.	Eastern Islands (Nusa Tenggara, Maluku, Papua)	4	34
Total		**26**	**291**

While these studies focus on inequality across Indonesia, Akita and Alisjahbana (2002) decomposed inequality between and within provinces, using district-level data from the period of 1993 to 1998. They found that within-province inequality was typically higher than between-province inequality. This suggests that a focus on larger spatial units may mask the significance of spatial inequality given the high degree of variability within provinces.

Building upon these three studies, and other relevant research, this chapter adds to the understanding of regional inequality in two ways. First, it combines the approaches taken from the aforementioned studies to build a more complete picture of the geography of uneven development in Indonesia. Second, this chapter extends existing research by including the latest available data at the district level, which is now available for the period 1993 to 2013.

As explained in Chapter Three, the data were sourced from the National Statistic Agency (BPS). Following the approaches used in previous research (Akita & Alisjahbana, 2002; Aritenang, 2012; Hill & Vidyattama, 2014), the data have been reorganised in order to regroup the districts in Indonesia to be consistent with those that existed in 1993. This resulted in an aggregation of the 511 districts in 2013 to 291 in 1993. This helped to ensure data comparability across time and to provide a means of ensuring comparability with previous research on regional inequality. The number of provinces was also amalgamated to mirror those that existed in 1993 (the full list of provinces is outlined in Appendix 4). The variables used as measures of economic performance (and/or wellbeing) are Gross Domestic Product (GDP) and GDP per capita.

This research focuses on regional inequality in so far as it is concerned with both regional development and the relevant regional policy objectives and strategies. A given region's capacity to develop, to some extent, reflects the overall economic performance of firms and inhabitants (Polese, 2007). The relationship between the region, or the place, and its inhabitants, or economic agents, is of particular importance in economic geography where

there is an increasing focus on what might be regarded as 'place-based' development (Peck & Sheppard, 2010). This perspective emphasises the pursuit of local and regional economic development by improving competitiveness, social wellbeing and enhancing political stability. Of particular importance here is the creation of "particular spatial formations that define access to land and water, energy and food supplies, and meaningful political voice" (Lawson, 2010, p. 255). This is not to imply a simplistic and naïve 'spatial fetishism' in understanding regional development (see Massey, 1984). Instead, as Peck and Sheppard (2010) emphasise, what is important is the relationship between place and economic agents, and that addressing regional inequality may increase opportunities to overcome individual inequality. Accordingly, it is critical to understand the local and regional economic conditions in understanding uneven development.

4.3. Trend and Share

Figure 4.1 shows a long-run increasing trend in real national GDP and real national GDP per capita from 1993 to 2013. A steep decrease of both the real national GDP and real national GDP/capita occurred between 1997 and 1998, due in large part to the Asian economic crisis. Indonesia was badly affected by this crisis, and indeed it took until 2006 for both real national GDP and national GDP per capita to return to their pre-crisis levels.

A similar trend can also be observed in the economies of the major islands (Figure 4.2). It is evident that the financial crisis hit Java-Bali particularly hard. The most severe impacts were felt in the highly urbanised areas of Java (Akita & Alisjahbana, 2002). The other region most severely affected was Kalimantan, while Sumatra, Sulawesi and the Eastern Islands were less affected. However, it is important to note a considerable differential exists in terms of levels of real GDP per capita.

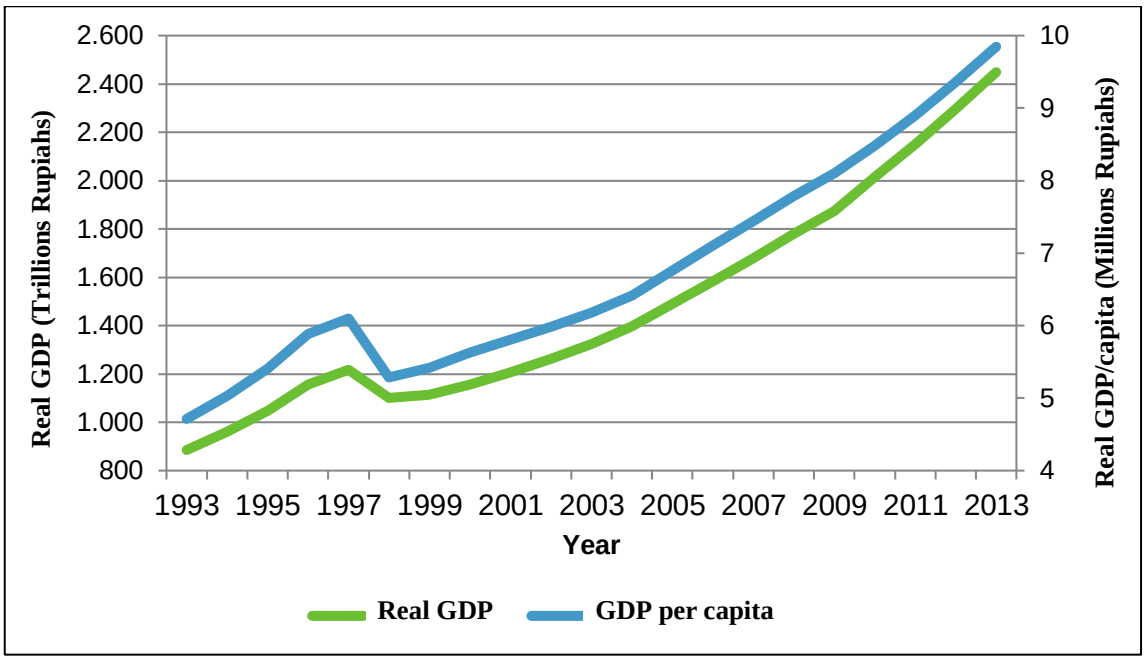

Figure 4.1. Real National GDP and National GDP per Capita Trend 1993-2013
(Source: Author's calculation based on BPS data)

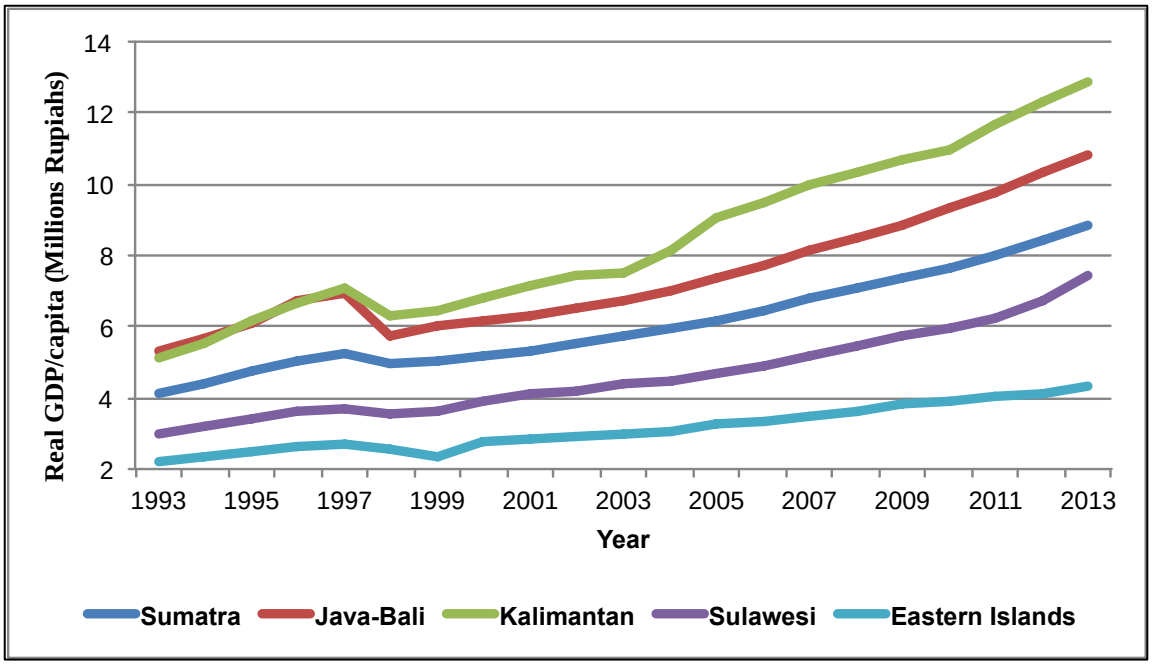

Figure 4.2. Major Islands Real GDP per Capita 1993-2013
(Source: Author's calculation based on BPS data)

Figure 4.3 shows that the share of Gross National Product for each major island was relatively constant during the 1993-2013 period. A slight decrease, however, can be seen in share of Java-Bali. Over the same period, a slight increase can be observed in share of both Kalimantan and Sulawesi. In general, at the major island level, Java-Bali has been the main contributor to the national GDP. However, when population size is taken into account, Kalimantan has been the most prosperous major island during this period (as can be seen in Figure 4.2). The Eastern

Islands, which consists of Nusa Tenggara, Maluku and Papua islands, have consistently been the poorest region through the study period.

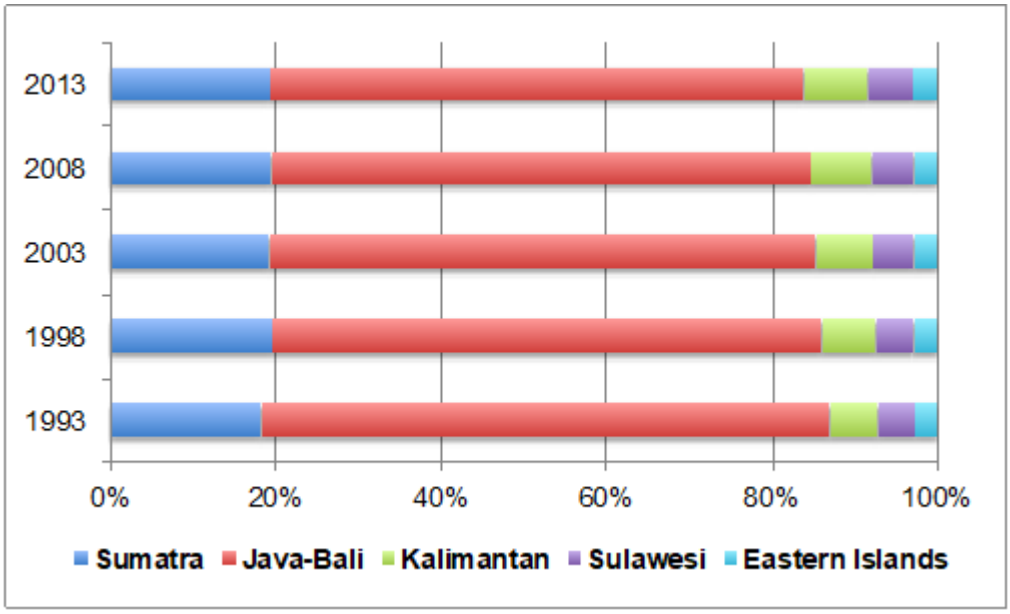

Figure 4.3. Major Island Share to National GDP
(Source: Author's calculations based on BPS data)

Table 4.2 shows that, at the provincial level, Jakarta, West Java, and East Java have consistently recorded the highest share of GDP to the National GDP. The fact that these three provinces are all located in Java-Bali explains the economic dominance of the island over the other islands in the nation. Jakarta's status as the nation's capital city has driven investment across a range of sectors, including finance, management, manufacturing and public sectors services (Tumenggung, 2013). In Java, economic activity has been generated as a result of an expanding manufacturing sector, which in part has been underpinned by a national policy that promoted foreign investments through deregulation (Booth, 2006; Tirtosuharto, 2009). Moreover, manufacturing has concentrated in West Java on the back of (i) lower land prices than in Jakarta, (ii) the presence of the largest port in the country, and (iii) its close proximity to the national capital. East Java, on the other hand, recorded a high share of the national GDP due to the presence of Surabaya, its capital city, which serves as the main economic and transport hub for eastern parts of Indonesia (i.e. Kalimantan, Sulawesi and Eastern Islands).

On Sumatra Island, the overall trends are somewhat mixed. The share has been stable for West Sumatra, Bengkulu, Lampung and Jambi. On the other hand, fluctuating trends are evident in Aceh and Riau, the two most resource rich provinces in Sumatra. Riau is particularly notable, because it recorded a quite significant improvement in its performance at the end of the period. It is likely due to the presence of Batam, a well-supported special economic zone that was

established to compete with the neighbouring country, Singapore. In both North and South Sumatra, the figure has been steadily increasing. These two provinces, together with Riau, contribute to the increasing share of Sumatra to the National GDP.

Table 4.2. Province Share to National Gross Domestic Product in %
(Source: Author's calculations based on BPS data)

Major Islands / Provinces	1993	1998	2003	2008	2013
Sumatra	**18.28**	**19.55**	**19.21**	**19.45**	**19.29**
Aceh	1.39	1.42	1.35	1.39	1.26
North Sumatra	5.44	5.67	5.88	5.79	5.66
West Sumatra	1.98	1.98	2.00	2.00	1.94
Riau	3.54	4.70	3.98	4.19	4.30
Jambi	0.73	0.74	0.72	0.73	0.76
South Sumatra	2.80	2.73	2.91	3.01	3.10
Bengkulu	0.43	0.42	0.42	0.41	0.39
Lampung	1.96	1.90	1.96	1.92	1.87
Java-Bali	**68.76**	**66.52**	**66.17**	**65.21**	**64.60**
Jakarta	21.50	19.25	19.26	19.67	19.23
West Java	18.29	18.06	19.09	19.29	19.01
Yogyakarta	1.28	1.18	1.16	1.08	1.00
Central Java	8.61	8.48	8.55	7.98	7.47
East Java	17.69	18.15	16.72	15.84	16.56
Bali	1.38	1.40	1.38	1.35	1.32
Kalimantan	**5.78**	**6.55**	**6.84**	**7.44**	**7.74**
West Kalimantan	1.34	1.56	1.45	1.54	1.47
Central Kalimantan	0.89	0.95	0.89	0.90	0.89
South Kalimantan	1.31	1.38	1.45	1.49	1.45
East Kalimantan	2.23	2.65	3.05	3.52	3.93
Sulawesi	**4.48**	**4.63**	**4.94**	**5.06**	**5.51**
North Sulawesi	0.84	0.95	1.00	1.02	1.07
Central Sulawesi	0.72	0.73	0.76	0.81	0.93
South Sulawesi	2.43	2.47	2.65	2.71	2.88
Southeast Sulawesi	0.50	0.49	0.53	0.52	0.63
Eastern Islands	**2.71**	**2.75**	**2.84**	**2.83**	**2.86**
West Nusa Tenggara	0.78	0.79	1.07	0.94	0.85
East Nusa Tenggara	0.65	0.66	0.67	0.64	0.63
Maluku	0.60	0.57	0.38	0.36	0.36
Papua	0.68	0.73	0.72	0.88	1.03

All provinces in both Kalimantan and Sulawesi have experienced increases in their share of National GDP. In Kalimantan, the performance of East Kalimantan has improved rapidly, largely as a result of its abundant natural resources. In Sulawesi, the province of South Sulawesi has the highest share of National GDP, largely because it is a major economic and

transport hub for eastern part of Indonesia. An increasing trend can also be observed in Eastern Islands, although Maluku remains an exception due to the social conflict that took place in the province during the financial crisis (Hill et al., 2008). In contrast, an opposing trend is observed in Java-Bali. Despite its superior economic performance, all of the provinces in the island have experienced a decline, with West Java as an exception.

Table 4.3 compares the GDP per capita with the National GDP per capita and presents further insight into the changing economic geography of Indonesia. At the major islands level, Java-Bali and Kalimantan are consistently above national GDP per capita. Sumatra comes third, with the figure slightly below the national GDP per capita. Sulawesi and Eastern Islands follow, with figures slightly above and below 50% of National GDP per capita respectively. All major islands recorded an increase in their relative GDP per capita to the national figure, except for Java-Bali and Eastern Islands. These data emphasise the considerable variability in GDP performance across Indonesia.

At the provincial level, there are only three provinces that were consistently above the national GDP per capita: Riau, Jakarta and East Kalimantan. These are likely to be performing well because of particular local conditions: the Batam special economic zone in Riau, the economic size and status of the nation's capital in Jakarta, and the presence of mineral deposits in East Kalimantan. While the trends of GDP per capita have been increasing for both Jakarta and East Kalimantan, in Riau a decreasing trend can be seen. This was largely due to the significant increase of population in Batam during the year of 2000. North Sumatra and East Java have recently joined these three provinces to surpass the national GDP per capita due to the performance of Medan, the capital of North Sumatra, and Surabaya, the capital of East Java. These two cities are particularly strong in the manufacturing industry as well as trade and services, owing to their strategic location. Medan has been the biggest city in Sumatra, while Surabaya, as mentioned before, is gaining more influence over cities in the eastern parts of Indonesia.

Table 4.3. Ratio of GDP per Capita to National GDP per Capita in %
(National GDP per Capita = 100%; Source: Author's calculations based on BPS data)

Major Islands / Provinces	1993	1998	2003	2008	2013
Sumatra	**85.84**	**90.82**	**93.08**	**91.07**	**89.59**
Aceh	69.39	69.51	70.26	74.17	65.34
North Sumatra	92.38	98.27	105.69	101.54	103.59
West Sumatra	86.46	88.40	97.11	95.82	95.28

Major Islands / Provinces	1993	1998	2003	2008	2013
Riau	184.55	230.06	161.99	144.24	135.53
Jambi	59.55	57.15	59.39	60.23	57.26
South Sumatra	74.74	70.74	82.69	83.55	84.30
Bengkulu	59.43	53.73	58.48	56.70	54.01
Lampung	56.14	54.19	61.20	59.22	58.62
Java-Bali	**110.14**	**105.39**	**108.73**	**109.27**	**110.00**
Jakarta	448.66	408.69	473.42	491.51	479.67
West Java	89.82	88.23	87.67	87.27	83.23
Yogyakarta	80.52	81.98	78.13	71.18	69.24
Central Java	54.02	47.45	56.76	55.88	55.87
East Java	97.32	105.79	99.02	97.58	107.35
Bali	88.76	95.23	87.83	87.56	81.12
Kalimantan	**106.50**	**115.73**	**121.79**	**132.37**	**130.48**
West Kalimantan	70.74	80.87	78.86	82.65	78.67
Central Kalimantan	105.60	107.52	89.37	99.77	92.70
South Kalimantan	86.67	90.56	96.90	98.81	93.84
East Kalimantan	191.08	202.21	236.54	259.69	252.38
Sulawesi	**62.01**	**64.31**	**70.80**	**70.01**	**75.17**
North Sulawesi	59.33	69.25	72.52	73.51	76.98
Central Sulawesi	71.92	69.91	77.84	75.94	82.95
South Sulawesi	60.66	62.77	71.07	70.19	74.72
Southeast Sulawesi	60.99	56.76	59.30	56.91	65.35
Eastern Islands	**45.87**	**46.41**	**48.08**	**46.36**	**44.17**
West Nusa Tenggara	40.56	41.91	56.78	49.49	44.62
East Nusa Tenggara	34.42	35.49	35.29	32.35	31.66
Maluku	54.92	51.36	38.54	36.20	33.05
Papua	67.95	68.31	63.22	72.57	67.97

Looking at the dynamic of each major island, in Sumatra it is evident that a steep decrease of the relative GDP per capita to national GDP per capita in Riau had been offsetting the significant increase in North Sumatra, South Sumatra and West Sumatra. This resulted in a slight increase in the island's performance. In Java-Bali, two notable patterns can be observed. First, Jakarta has been very dominant, recording a figure of more than four times the national GDP per capita throughout the period. Second, despite the increasing trend observed in Jakarta and East Java, other provinces in Java-Bali recorded a declining trend, contributing to the province's declining relative share. In Kalimantan, the rising trend has

been attributable to the significant increase of East Kalimantan. In Sulawesi, the increasing trend is shared relatively evenly among its provinces. In the Eastern Islands, the figure is decreasing, largely due to a significant fall in Maluku.

Taking 50% of national GDP per capita as the cut-off point, all provinces had been above this level, with the exception of West Nusa Tenggara, East Nusa Tenggara and Maluku. Located in the Eastern Islands, the performance of three provinces provide evidence that Eastern Islands consistently lagged behind when compared to other islands in the country. This phenomenon is relatively consistent with the findings of Hill et al. (2008) and Hill and Vidyattama (2014, 2016), which suggest that there are four groups of provinces in accordance with their relative GDP per capita to national GDP per capita:

1. First, the consistently wealthy provinces (GDP is significantly higher than national GDP): Jakarta, East Kalimantan, Papua and Riau.

2. Second, the consistently non-poor provinces (GDP is 25% above or below national GDP): Central Kalimantan, South Kalimantan, West Kalimantan, East Java, West Java, Bali, North Sumatra, West Sumatra, Jambi and South Sumatra.

3. Third, the moderately poor provinces (GDP is 50%-70% of national GDP): Central Java, Yogyakarta, Lampung and all provinces in Sulawesi.

4. Fourth, the slipping behind provinces (GDP is less than 50% of national GDP): West Nusa Tenggara, East Nusa Tenggara, Maluku and Bengkulu

The findings in this thesis are different in the sense that: i) Papua and Aceh are classified in the third group, and ii) North, Central and Southeast Sulawesi are classified in the second group. This is because Hill and Vidyattama (2014) used the current price version of the GDP and taking into account the oil and gas contribution to the GDP. This thesis, on the other hand, uses real GDP and removes the contribution of oil and gas.

Table 4.4 shows a more dynamic pattern at the district level. Most districts at the top of the list remain there throughout the period, with districts from Jakarta dominating the list. Other districts also come from Java, with Medan and Kutai as exceptions. These districts are those that exhibit strong performance in either industrial or services sectors. Kutai, on the other hand, is the centre of mining exploration in East Kalimantan (the most prosperous province in Kalimantan). In the lowest 10 districts in Table 4.4, the picture is quite dynamic. Despite coming from the same islands, the districts that were on the list in 1993 mostly did not appear

again in 2013. Sulawesi and Sumatra, surprisingly, dominate the list by contributing with three and four districts respectively.

Table 4.4. Top Ten and Lowest Ten Real GDP by Districts
(in Indonesian Rupiah; Source: Author's calculation based on BPS data)

1993 (in trillions Rupiahs)		2013 (in trillions Rupiahs)	
Top 10 Districts			
South Jakarta, DKI Jakarta	43.39	Central Jakarta, DKI Jakarta	124.99
Central Jakarta, DKI Jakarta	43.28	Surabaya, East Java	109.14
West Jakarta, DKI Jakarta	41.48	South Jakarta, DKI Jakarta	107.51
Surabaya, East Java	40.05	North Jakarta, DKI Jakarta	87.76
East Jakarta, DKI Jakarta	33.76	Bekasi (District), West Java	84.21
North Jakarta, DKI Jakarta	27.81	East Jakarta, DKI Jakarta	80.12
Bogor (District), West Java	18.78	West Jakarta, DKI Jakarta	70.53
Bandung (District), West Java	16.60	Bogor (District), West Java	46.70
Medan, North Sumatra	15.75	Kutai, East Kalimantan	45.43
Bekasi (District), West Java	14.20	Medan, North Sumatra	43.30
Lowest 10 Districts			
Pare Pare, South Sulawesi	0.28	Gorontalo (Municipality), North Sulawesi	0.75
North Central Timor, East Nusa Tenggara	0.27	Majene, South Sulawesi	0.74
Sibolga, North Sumatra	0.27	Solok (Municipality), West Sumatra	0.63
Yapen Waropen, Papua	0.26	Sawahlunto, West Sumatra	0.62
Solok (Municipality), West Sumatra	0.24	Yapen Waropen, Papua	0.62
Alor, East Nusa Tenggara	0.23	Selayar, South Sulawesi	0.60
Gorontalo (Municipality), North Sulawesi	0.21	North Central Timor, East Nusa Tenggara	0.56
Selayar, South Sulawesi	0.20	Padang Panjang, West Sumatra	0.50
Padang Panjang, West Sumatra	0.19	Alor, East Nusa Tenggara	0.50
Sabang, Aceh	0.08	Sabang, Aceh	0.28

When taking the population into account, the spatial patterns become more evident. Table 4.5 shows GDP per capita relative to national GDP per capita. All districts from Jakarta remain above the national benchmark throughout the period, albeit their ranks change slightly. Kediri (East Java, Java-Bali Island) and Batam (Riau, Sumatra Island) also perform above the national benchmark due to the presence of a major cigarette industry and a special economic zone, respectively. Two districts from East Kalimantan remain in the list in 1993-2013 for different reasons. While Kutai is rich in minerals, when population is accounted for, Berau ranks higher, albeit it has a relatively similar real GDP rate with major districts in East Kalimantan. The lowest ranking districts in Table 4.5 are from three poor provinces: Central Java, Papua and East Nusa Tenggara. To emphasise the extent of regional inequality, the

richest district in 1993 had relative GDP per capita more than 44 times that of the poorest district. In 2013, this figure significantly increased, with Central Jakarta having relative GDP per capita more than 70 times that of Manggarai. In general, Table 4.5 is consistent with the broader pattern of uneven development in Indonesia as described by Hill and Vidyattama (2014).

Table 4.5. Top Ten and Lowest Ten Relative GDP per Capita to National GDP per Capita by Districts

(National GDP per capita = 1; Source: Author's calculation based on BPS data)

1993		2013	
Top 10 Districts			
Central Jakarta, DKI Jakarta	9.75	Central Jakarta, DKI Jakarta	14.00
Kediri, East Java	8.55	Kediri, East Java	9.96
Batam, Riau	7.34	North Jakarta, DKI Jakarta	5.14
South Jakarta, DKI Jakarta	4.69	South Jakarta, DKI Jakarta	5.10
West Jakarta, DKI Jakarta	4.26	Surabaya, East Java	3.93
North Jakarta, DKI Jakarta	3.92	Kutai, East Kalimantan	3.54
Surabaya, East Java	3.26	Batam, Riau	3.16
East Jakarta, DKI Jakarta	3.12	West Jakarta, DKI Jakarta	2.99
Riau Islands, Riau	3.00	Berau, East Kalimantan	2.96
Berau, East Kalimantan	2.92	East Jakarta, DKI Jakarta	2.92
Lowest 10 Districts			
Tegal, Central Java	0.28	Wonosobo, Central Java	0.29
Grobogan, Central Java	0.28	Blora, Central Java	0.29
Manggarai, East Nusa Tenggara	0.27	Grobogan, Central Java	0.28
Pati, Central Java	0.27	Alor, East Nusa Tenggara	0.26
West Aceh, Aceh	0.27	East Flores, East Nusa Tenggara	0.25
West Sumba, East Nusa Tenggara	0.27	South Central Timor, East Nusa Tenggara	0.24
South Central Timor, East Nusa Tenggara	0.27	North Central Timor, East Nusa Tenggara	0.24
Jayawijaya, Papua	0.26	Jayawijaya, Papua	0.23
Jember, East Java	0.24	Central Maluku, Maluku	0.20
Magelang, Central Java	0.22	Manggarai, East Nusa Tenggara	0.20

4.4. Growth and Agglomeration

In broad terms, it is possible to classify Indonesian economic growth into three distinct periods: (1) 1993-1997, the pre-crisis era; (2) 1998-2001, the crisis period; (3) the post-crisis/post-decentralisation era (see Akita & Alisjahbana, 2002; Aritenang, 2012; McCulloch

& Sjahrir, 2008). Table 4.6 shows that the growth of real GDP in the post-decentralisation period at both island and provincial level has been relatively low when compared to the growth in the pre-crisis era. There are, however, four exceptions: Bengkulu, Central Sulawesi, Southeast Sulawesi and Papua. This pattern is also evident in Figure 4.2, where a deviation of the growth trajectory of islands is apparent after the financial crisis shock in 1997-1998. In the crisis period, four provinces recorded growth decline: Riau, Central Kalimantan, Maluku and Papua.

During the period 1993-2013, all islands and provinces recorded positive growth rates except for the Province of Riau. Figure 4.4 shows that all islands outperformed national growth rates, except for Java-Bali and Eastern Islands. This is consistent with earlier observations that Java-Bali had experienced a slowing of economic growth, while the Eastern Islands persistently lagged, largely due to the performance of Maluku Province. That almost all provinces in Sulawesi outperformed national growth, as well as West Nusa Tenggara and Papua, suggests that poorer provinces are catching up with their prosperous counterparts in Java-Bali and Sumatra. This is broadly consistent with the findings of (Aritenang, 2012; Hill & Vidyattama, 2016).

At the district level, the highest-ranking districts were dominated by those from Java-Bali, and in particular from East Java (Table 4.7). At the same time, however, districts from East Java also had some of the lost rankings. This accounts for the fact that East Java, despite having five high rankings districts in terms of GDP per capita growth, ranked only as the fourth highest province during 2001-2013 and the seventh during 1993-2013 in terms of GDP per capita growth (see Table 4.6). It is also noteworthy that, despite being grouped in ‘moderately poor provinces’ in the previous sub-chapter, Central Java had two districts ranked in the upper part of the list. This explains the relatively high overall growth of Central Java during the crisis period (Table 4.6). It is important to note though that the high growth rate was achieved from a rather low initial level of GDP.

Table 4.6. GDP per Capita Average Growth 1993-2013 by Major Islands and Provinces

(in %; Source: Author's calculation based on BPS data)

Major Islands / Provinces	1993-2013	1993-1997	1998-2001	2001-2013
Sumatra	**3.87**	**6.07**	**2.38**	**4.29**
Aceh	3.34	5.43	3.69	3.54
North Sumatra	4.25	7.30	4.00	4.46
West Sumatra	4.16	5.65	5.24	4.34
Riau	-0.44	6.37	-9.66	3.08
Jambi	3.45	4.07	3.91	4.04
South Sumatra	4.28	5.36	6.81	4.83
Bengkulu	3.16	1.46	2.23	4.49
Lampung	3.87	5.13	5.81	4.23
Java-Bali	**3.64**	**7.00**	**3.14**	**4.59**
Jakarta	4.00	6.31	6.76	4.71
West Java	3.26	7.34	2.12	3.97
Yogyakarta	2.87	6.83	0.01	3.55
Central Java	3.83	7.02	8.21	4.38
East Java	4.16	6.90	0.04	5.14
Bali	3.19	6.71	0.66	3.46
Kalimantan	**4.71**	**8.32**	**4.06**	**5.03**
West Kalimantan	4.20	6.45	1.88	4.30
Central Kalimantan	2.98	14.96	-2.88	4.49
South Kalimantan	4.06	6.87	5.71	3.88
East Kalimantan	5.10	6.39	7.40	5.09
Sulawesi	**4.65**	**5.63**	**5,13**	**5.07**
North Sulawesi	5.01	7.70	4.30	4.84
Central Sulawesi	4.39	4.49	3.80	5.54
South Sulawesi	4.74	5.73	6.38	4.92
Southeast Sulawesi	4.01	3.15	2.52	5.60
Eastern Islands	**3.46**	**5.39**	**3.62**	**3.67**
West Nusa Tenggara	4.15	5.65	13.52	2.28
East Nusa Tenggara	3.22	6.54	2.31	3.44
Maluku	1.05	3.50	-5.95	2.80
Papua	3.65	4.96	-1.00	5.24
National	**3.77**	**6.74**	**3.15**	**4.51**

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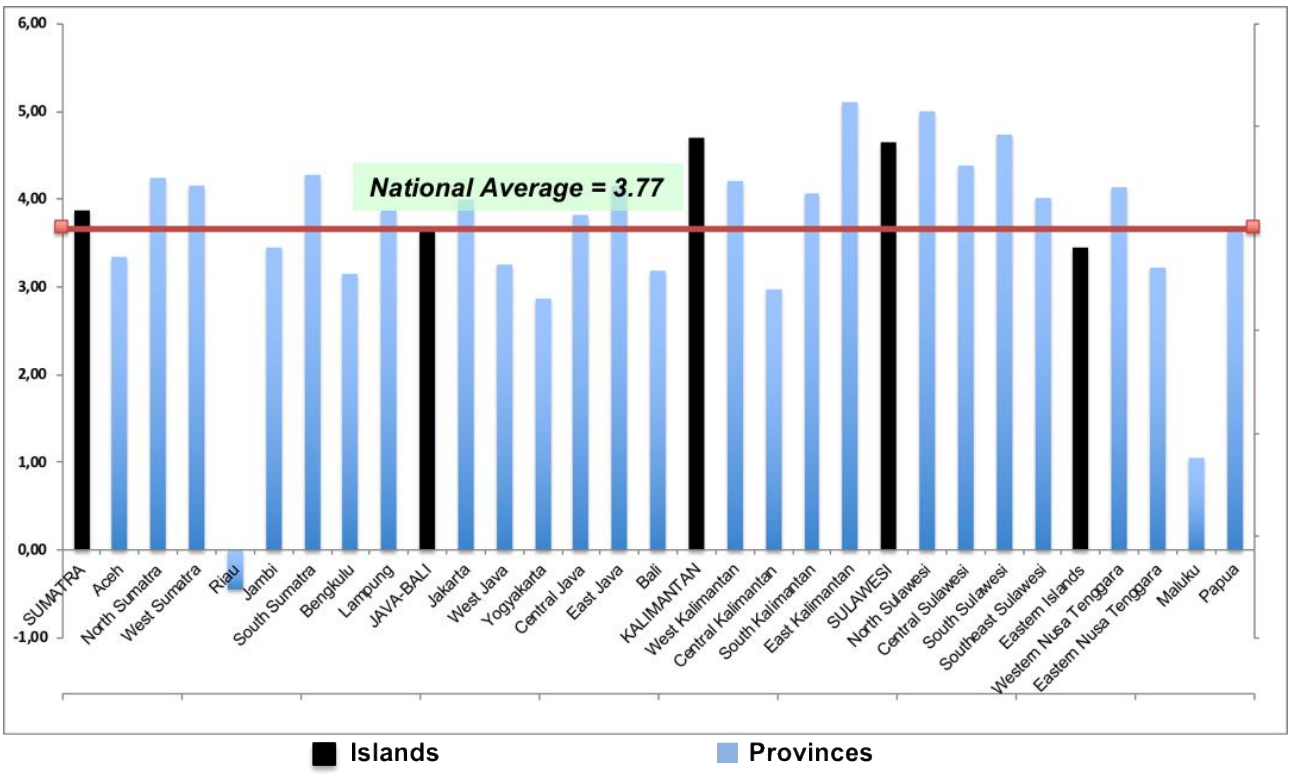


Figure 4.4. Real GDP per Capita Growth 1993-2013
(Source: Author's calculations based on BPS data)

Table 4.7. Top Ten and Lowest Ten Real GDP per Capita Growth by Districts 1993 – 2013
(in %; Source: Author's calculations based on BPS data)

Top 10 Districts		Lowest 10 Districts	
Tabalong, East Kalimantan	9.71	Riau Islands, Riau	0.06
Belu, East Nusa Tenggara	9.38	Bondowoso, East Java	-0.27
Kudus, Central Java	9.02	Batam, Riau	-0.52
Jember, East Java	8.78	Tabanan, Bali	-0.58
Madiun, East Java	8.02	Central Maluku, Maluku	-0.63
Tulungagung, East Java	7.76	Lumajang, East Java	-0.67
Malang, East Java	7.61	Kampar, Riau	-1.24
Banda Aceh, Aceh	7.36	Mojokerto, East Java	-1.41
Sidoarjo, East Java	6.96	Indramayu, West Java	-2.05
Magelang, Central Java	6.89	Jepara, Central Java	-3.35

Following the approach of McCulloch and Sjahrir (2008), Figure 4.5 and 4.6 plots the share of provincial GDP made up by the top 20% of districts within it against the provincial real GDP per capita in 2013. Figure 4.5 shows that there is a negative relationship. It implies that the top 20% of districts in richer provinces contributed to a smaller share of provincial GDP as compared to poorer provinces, thus indicating less concentrated economic activities. However, this figure displays one significant outlier: Jakarta. There are two reasons that

Jakarta stood out as an outlier. First, it had significantly higher GDP per capita as compared to other provinces (see Table 4.3). Second, all districts in Jakarta were also displaying significantly higher real GDP as compared to other districts in other provinces. On the other hand, Jakarta has only five districts. The top 20% of districts share of GDP, the Y-axis in Figure 4.5, was only capturing the share of one district, out of five districts in Jakarta. Therefore, it was relatively small as compared to the provincial real GDP.

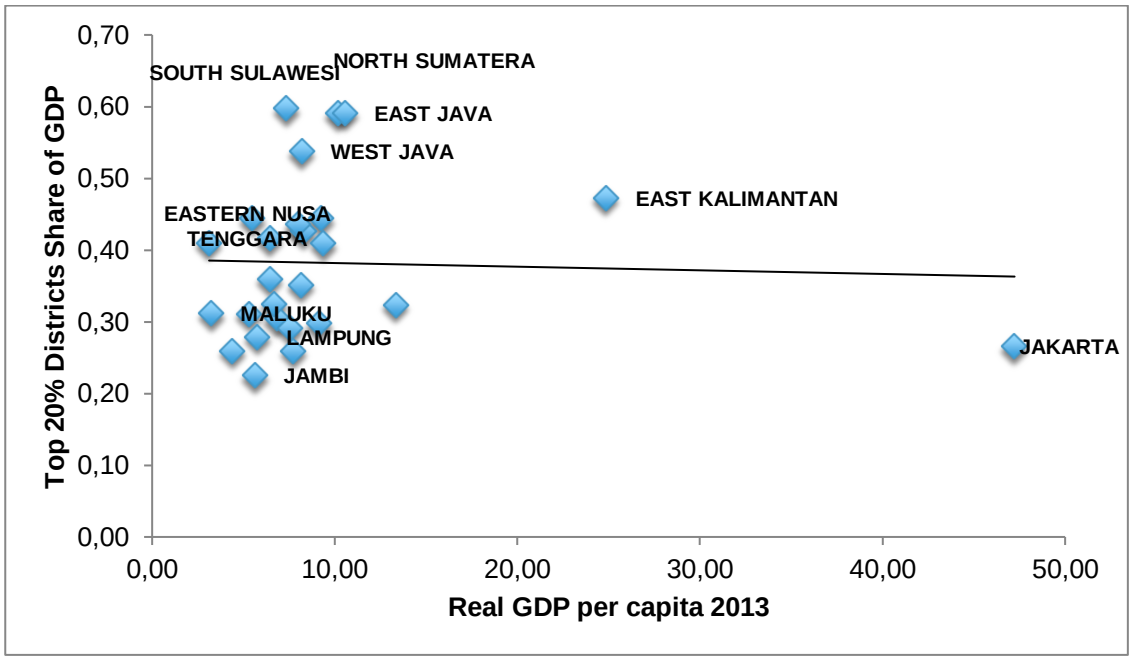


Figure 4.5. Concentration of Economic Activity by Province (with Jakarta)
(Source: Author's own calculation based on BPS data)

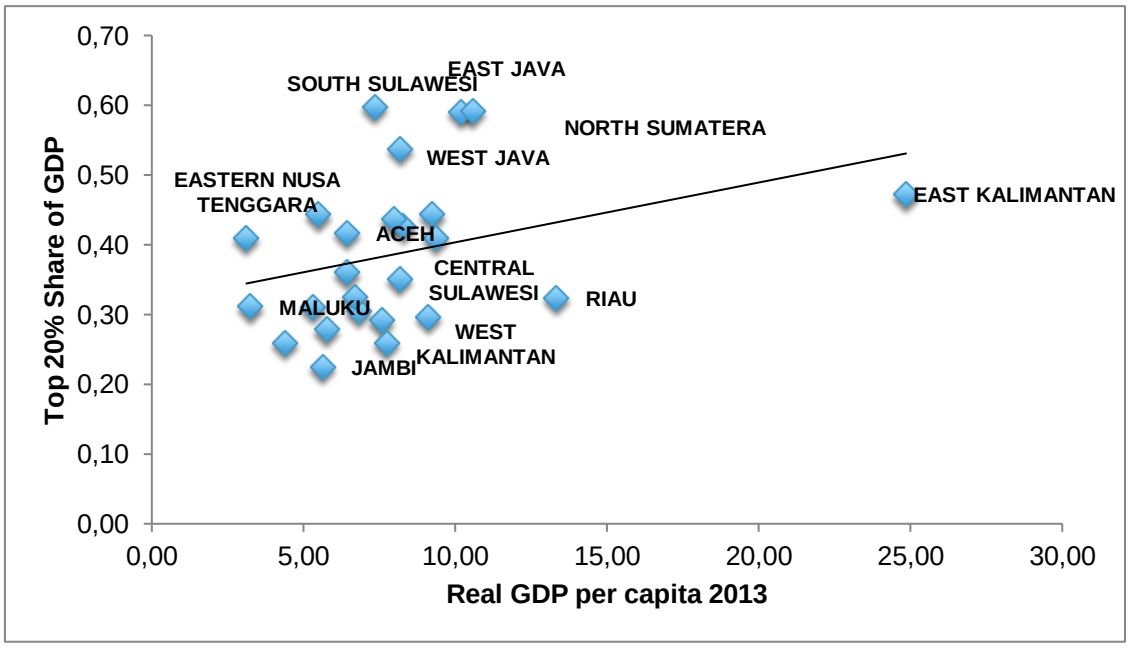


Figure 4.6. Concentration of Economic Activity by Province (without Jakarta)
(Source: Author's own calculation based on BPS data)

By removing Jakarta from the analysis (Figure 4.6), the pattern looks quite different. Consistent with the findings from McCulloch and Sjahrir (2008), this research found a positive relationship. It implies that, top 20% districts in richer provinces contributed to a bigger share of provincial GDP as compared to poorer provinces, thus indicating more concentrated economic activities. This is also consistent with previous discussion that the change in GDP per capita of particular islands and provinces had been determined, most of the time, by one or two prosperous districts.

By taking into account population size, Figure 4.8 shows that the growth in the top 20% districts (by GDP) is also related to population growth during 1993 to 2013. Figure 4.7 displays one outlier, Bengkulu that recorded the highest change in population (6.66%) as well as the lowest GDP growth (-7.52%) in its top 20% district. The reason for this is due to the transmigration program initiated since the colonial era to move some of the population from Java Island to outer Java islands. Bengkulu has been one of the main destinations for these transmigrants (Hardjono, 1986).

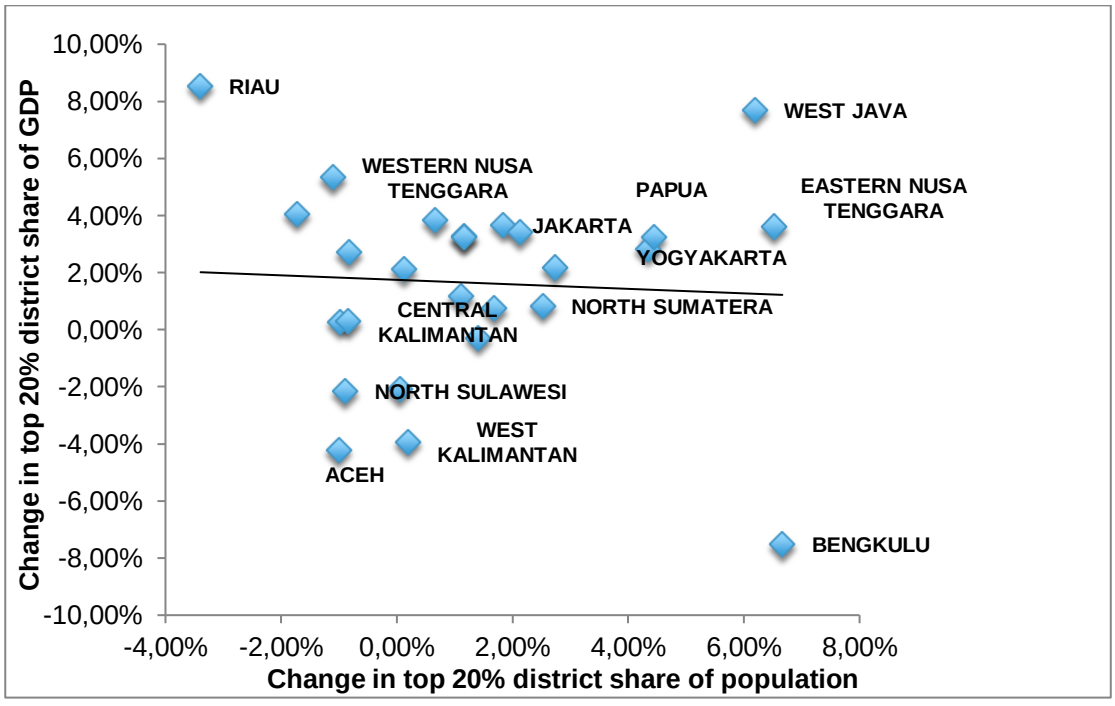


Figure 4.7. Change in Population Share and Real GDP Share in the Top 20% District by Province (with Bengkulu)
(Source: Author's own calculation based on BPS data)

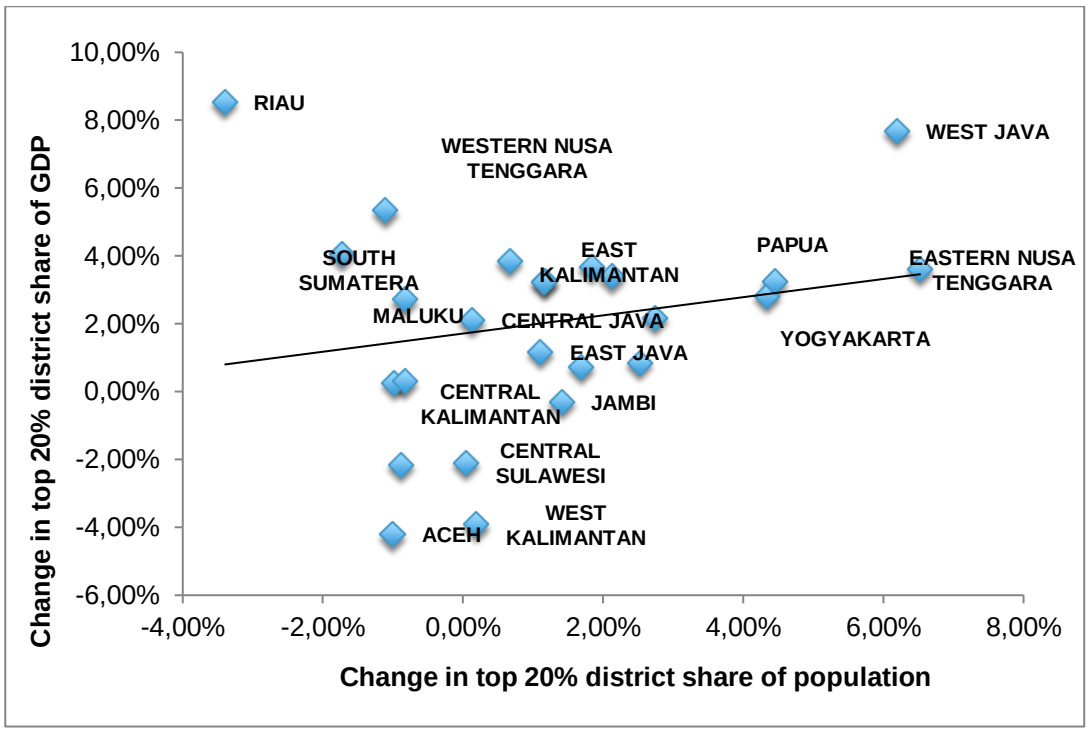


Figure 4.8. Change in Population Share and Real GDP Share in the Top 20% District by Province (without Bengkulu)
(Source: Author's own calculation based on BPS data)

4.5. Inequality and Social Indicators

This section draws on two measures of regional inequality: the Gini Coefficient and Theil Index. As elaborated in Chapter Three, the Gini Coefficient is a measure of differences in income distribution, ranging from 0 (equally distributed) and 1 (one individual own all income, and the rest owns nothing). While the Gini Coefficient is widely used as a measure of regional inequality, the coefficient itself is not easily decomposable (Haughton & Khandker, 2009). For example, the coefficient of Indonesia is not equal to the total Gini Coefficient of all provinces in Indonesia. In this thesis, the Theil Index is used to measure the share of inequality between provinces and inequality between districts to the total inequality rate.

Across Indonesia, inter-district inequality had always traditionally been higher than inter-province inequality (Figure 4.9). A trend of declining inequality can be observed during the period of 1999-2000, the period of crisis. In large part, this is due to prosperous districts, mostly urbanised areas, experiencing the most severe economic downturns as a result of the financial crisis (Akita & Alisjahbana, 2002). In contrast, poorer districts, the least impacted from the crisis, managed to maintain a relatively stable growth. Both the Gini and Theil indices recorded a persistent level of inequality after the financial crisis up to 2013.

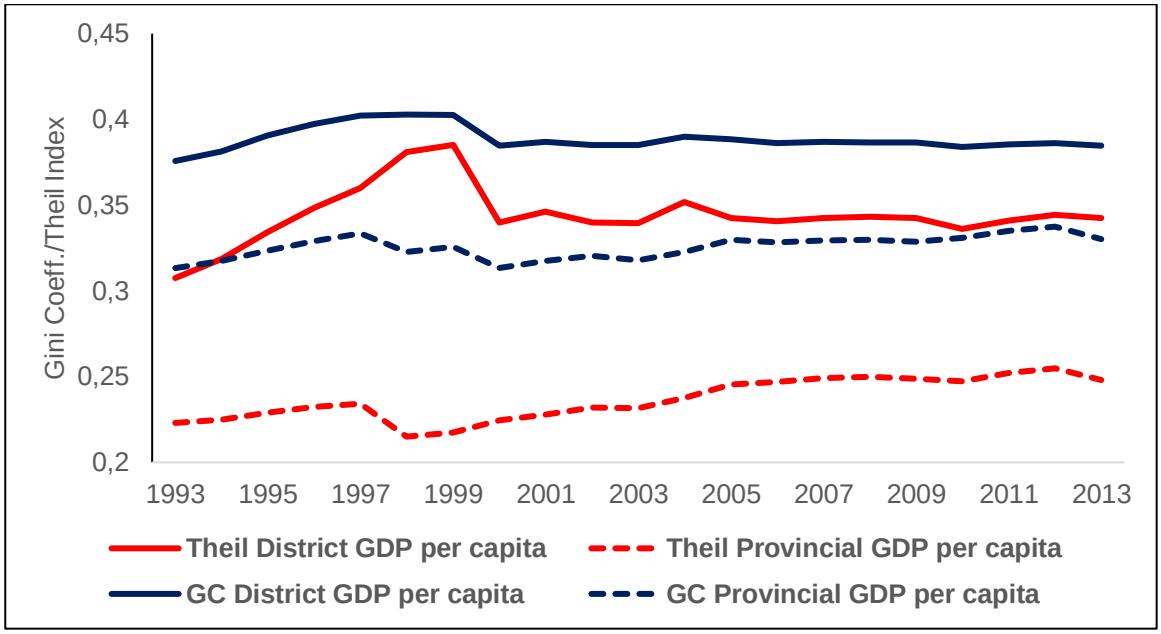


Figure 4.9. Inequality Between Districts and Between Provinces 1993-2013
(Source: Author's own calculation based on BPS data)

Table 4.8 provides detailed information on district inequality by major islands. It is apparent that the decline in the inequality after 1998 was largely due to decreasing levels of inequality across districts in Sumatra. The general trend observed was that inequality rose until 1998, before decreasing steadily from 1998 and remained stable until 2013 (Table 4.8, Figure 4.10. and Figure 4.11). This is confirmed by comparing the Lorenz Curves in 1993 and 2013 (Figure 3.2), indicating a persistence of inequality.

Table 4.8. Gini Coefficient and Theil Index (based on GDP per Capita) Across Districts by Major Islands
(Source: Author's own calculation based on BPS data)

	Sumatra (73)*	Java-Bali (116)*	Kalimantan (29)*	Sulawesi (39)*	Eastern Islands (34)*	NATIONAL
Year	**Gini Coefficient**					
1993	0.30	0.44	0.29	0.20	0.26	**0.38**
1997	0.34	0.47	0.31	0.20	0.26	**0.40**
1998	0.38	0.46	0.30	0.20	0.26	**0.40**
2003	0.24	0.48	0.30	0.23	0.28	**0.39**
2008	0.24	0.48	0.29	0.23	0.31	**0.39**
2013	0.23	0.48	0.31	0.24	0.32	**0.38**
Year	**Theil Index**					
1993	0.22	0.42	0.13	0.06	0.11	**0.31**
1997	0.30	0.47	0.16	0.07	0.11	**0.36**
1998	0.41	0.46	0.16	0.07	0.10	**0.38**
2003	0.13	0.53	0.14	0.08	0.14	**0.34**
2008	0.11	0.55	0.15	0.09	0.15	**0.34**
2013	0.10	0.54	0.16	0.10	0.17	**0.34**

**Numbers in parentheses indicate the numbers of districts*

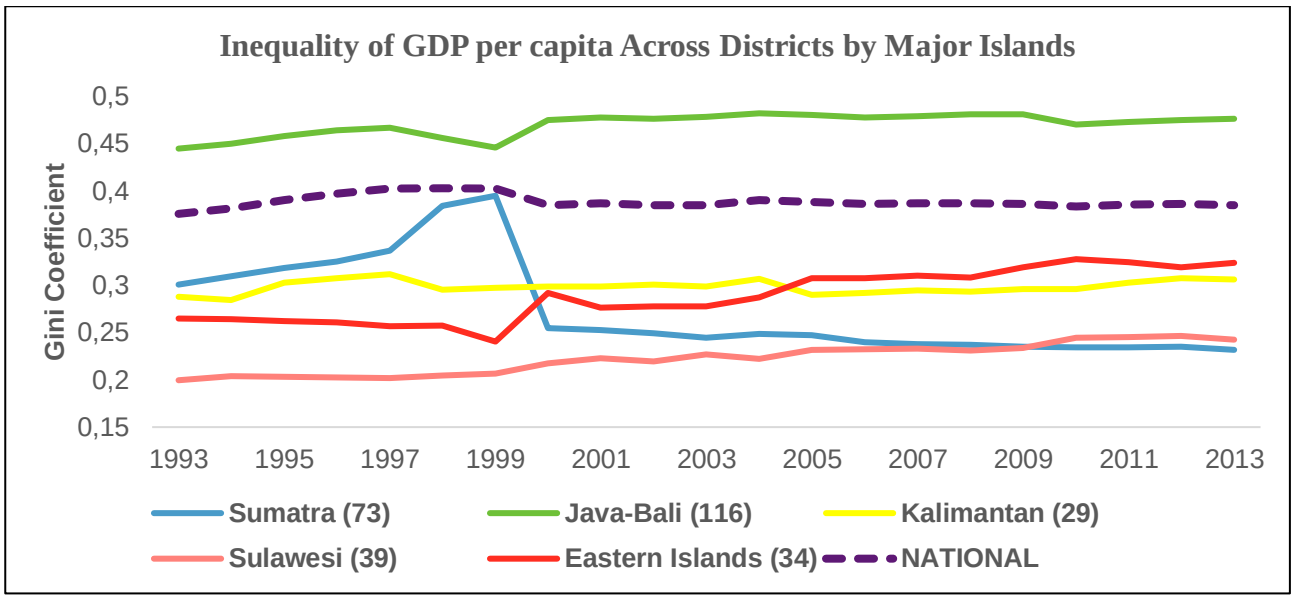


Figure 4.10. Inequality of GDP per Capita Across Districts by Major Islands (Gini Coefficient)
(Source: Author's own calculation based on BPS data)

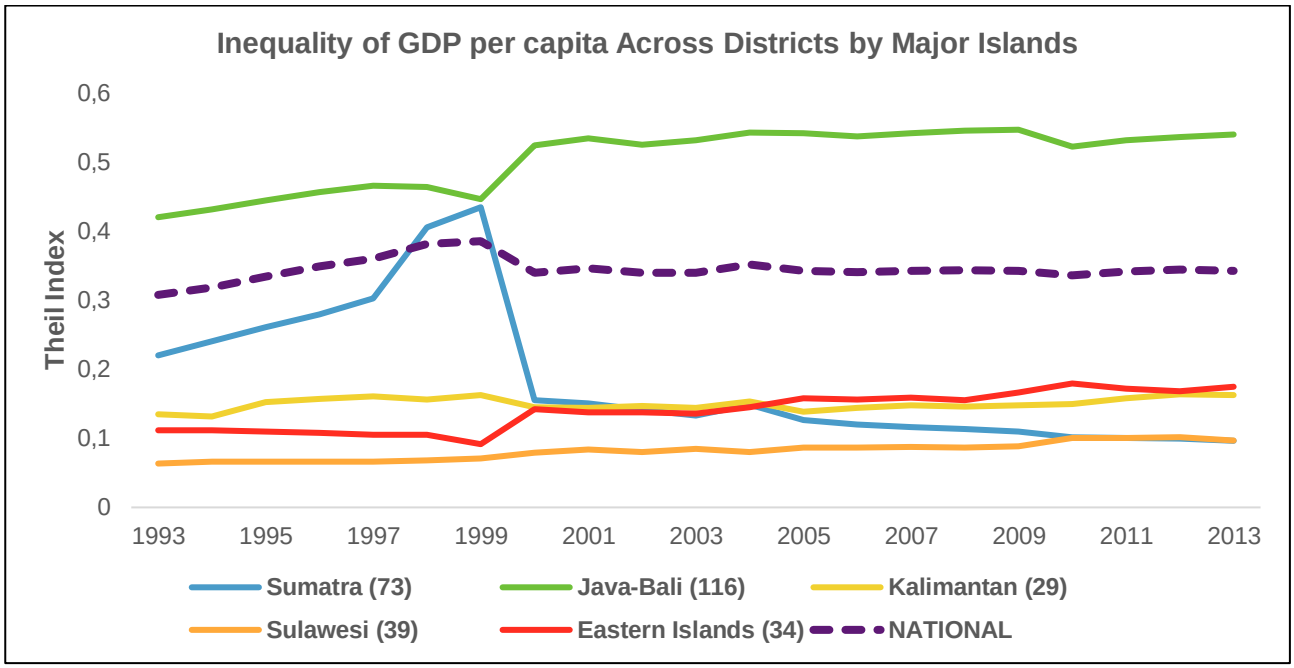


Figure 4.11. Inequality of GDP per Capita Across Districts by Major Islands (Theil Index)
(Source: Author's own calculation based on BPS data)

By utilising the decomposed Theil Index, Table 4.9 shows the proportion of inequality between province and within province to the total level of inequality. It can be seen that inequalities *between* and *within* province were higher in 2013 than 1993. In general, two trends can be observed. First, in the long run, both inequalities increased. This implies that poorer provinces and districts have grown slower than their richer counterparts. This is different with the pattern found in both Akita and Alisjahbana (2002), for the period of 1993-

1998, and McCulloch and Sjahrir (2008), for the period of 1998-2003. Akita and Alisjahbana (2002) found within province inequality increased from 1993-1997, before decreasing slightly in 1998. On the other hand, between province inequality was fairly stable for the period 1993-1997, before decreasing significantly in 1998. McCulloch and Sjahrir (2008), however, found that both inequalities were decreasing during 1998-2003.

Table 4.9. Decomposition of Inter-District Inequality
(Source: Author's own calculation based on BPS data)

	1993	1997	1998	2003	2004	2005	2008	2013
Total Theil Index	0.307	0.360	0.381	0.340	0.352	0.343	0.343	0.342
Within Province	0.144	0.179	0.193	0.178	0.183	0.168	0.164	0.161
Between Province	0.163	0.181	0.188	0.161	0.169	0.174	0.179	0.181
%Within Province	46.85%	49.61%	50.54%	52.45%	52.01%	49.19%	47.81%	47.07%
%Between Province	53.15%	50.39%	49.46%	47.55%	47.99%	50.81%	52.19%	52.93%

Second, taking into account the classification periods, it is evident that the trend was for both forms of inequality to increase between 1993 and 1998, before decreasing significantly until 2003. Interestingly, within province inequality was always higher than between province inequality before 2005, a feature that was also highlighted by both Akita and Alisjahbana (2002) and McCulloch and Sjahrir (2008). From 2005 onwards, however, between province inequality was consistently higher. It is also noted that, from 2004, the trend was quite different for both types of inequality. Between province inequality increased steadily, meaning that districts in richer provinces were growing slightly faster than districts in poorer provinces during 2003-2013. Within province inequality continued to decline from 2003 onwards. The explanation for this can be traced back to Figure 4.8, where it is shown that growth is closely related to population increase. This feature acted as a balancing mechanism that produced a stable level of total inequality during 2005-2013.

To measure the impact of persisting inequality, Hill and Vidyattama (2014) compared the relative GDP per capita rank in Table 4.5 with the districts' rank on poverty incidence. They found that districts from poor provinces, such as Maluku, Papua and East Nusa Tenggara, dominate the top list on the poverty incidence. However, a rather mixed result can be found in the lowest list, with districts in Jakarta appearing frequently, and some unexpected districts from Bali and Aceh appearing on the list.

This dissertation extends the analysis by using the Human Development Index (HDI). Since it consists of three composite measures (on education, purchasing power and living expectancy), it is considered to be more precise in measuring social indicators. Most of the districts that were ranked highest in terms of HDI in 1996 were also ranked highest in 2013

(Table 4.10). Besides districts in Jakarta, the top list surprisingly includes districts from Yogyakarta (Yogyakarta City and Sleman), Central Kalimantan (Palangkaraya) and Maluku (Ambon). Yogyakarta, known for its reputation as the education city, managed to record the highest level of HDI in 2013, despite its modest relative GDP per capita. On the other hand, Palangkaraya and Ambon also recorded a low level of relative GDP per capita.

A similar pattern can be observed for the lowest ranked placed. Districts from the 1996 rank list of HDI remained in the 2013 list. These districts were observed to also possess low level of relative GDP per capita in 2013.

Table 4.10. Highest and Lowest Districts by Human Development Index 1996 & 2013
(Source: Author's own calculation based on BPS data)

Top 10 Districts				
Districts	**HDI 1996**	**Districts**	**HDI 2013**	**Relative GDP per Capita to National GDP per Capita 2013**
South Jakarta, Jakarta	77.20	Yogyakarta, Yogyakarta	80.51	1.64
Palangkaraya, Central Kalimantan	76.90	South Jakarta, Jakarta	80.47	5.10
East Jakarta, Jakarta	76.40	Makassar, South Sulawesi	80.17	1.54
Manado, North Sulawesi	76.20	East Jakarta, Jakarta	80.07	2.92
Bukittingi, West Sumatra	76.10	Sleman, Yogyakarta	79.97	0.66
West Jakarta, Jakarta	76.10	Balikpapan, East Kalimantan	79.87	2.43
Yogyakarta, Yogyakarta	76.10	West Jakarta, Jakarta	79.69	2.99
Central Jakarta, Jakarta	76.00	Ambon, Maluku	79.58	0.59
Pekanbaru, Riau	75.90	Palangkaraya, Central Kalimantan	79.52	0.81
Klungkung, Bali	75.80	Pekanbaru, Riau	79.47	1.23
Lowest 10 Districts				
Districts	**HDI 1996**	**Districts**	**HDI 2013**	**Relative GDP per Capita to National GDP per Capita 2013**
South Central Timor, East Nusa Tenggara	55.90	Situbondo, East Java	65.73	0.40
Nias, North Sumatra	55.50	West Sumba, East Nusa Tenggara	65.49	0.19
Bondowoso, East Java	55.40	Bondowoso, East Java	65.39	0.51
Bangkalan, East Java	55.00	Probolinggo, East Java	65.19	1.12
East Lombok, West Nusa Tenggara	54.40	West Lombok, West Nusa Tenggara	63.82	0.34

West Lombok, West Nusa Tenggara	51.60	East Sumba, East Nusa Tenggara	63.80	0.35
Central Lombok, West Nusa Tenggara	51.20	Central Lombok, West Nusa Tenggara	63.51	0.33
Paniai, Papua	48.90	Sampang, East Java	62.39	0.38
Sampang, East Java	48.20	Pania, Papua	60.81	0.39
Jayawijaya, Papua	43.90	Jayawijaya, Papua	57.55	0.23

4.6. Conclusions

In summary, this chapter provides evidence that there is a persistence of geography of uneven development across different administrative tiers in Indonesia during 1993-2013. However, the change had been relatively more dynamic at the district level. Districts inequality between provinces has been increasing since 2003. On the other hand, within province inequality has been slightly decreasing in the period of 2003-2013. The total level of inequality level, however, remained relatively stable, with a slight increase over the period 1993-2013. In broad terms, this confirms the findings from previous studies (Hill et al., 2008; Hill & Vidyattama, 2016). This persistence suggests a degree of path dependent development, whereby historical development trajectories and differentials tend to remain in place across time. This is a theme taken up in greater detail in Chapter Six.

This chapter also noted that districts possessing particular natural resource endowments (e.g. districts in Riau and East Kalimantan) seem to perform better that those that lack these attributed. This is also true for districts in economically strategic areas, such as Jakarta, Surabaya (East Java Province) as well as "the Free Trade Zone" Batam (Riau Province). In a number of the areas that are performing well, or where inequality has decreased, there have been active regional policy interventions. This suggests that institutional factors may also be shaping the pattern of uneven development, and in some cases possibly helping to tackle inequality. At the same time, however, ongoing persistence suggests that policy responses may not always be adequate or effective. Chapter Five turns to a more detailed assessment of the role of regional policy in responding to regional development.

Chapter Five
The Evolution of Regional Policy

5.1. Introduction

Given the persistence of regional inequality, as elaborated in Chapter Four, the Indonesian government has implemented a range of regional policy strategies to tackle problems associated with spatially uneven development (Kuncoro, 2005; Leitner & Sheppard, 1987; Tumenggung, 2013). Yet, to date, very little research has considered the regional policy responses adopted in the spatial planning to uneven development in Indonesia. Accordingly, this chapter provides an overview of the evolution of regional policies in Indonesia and the ways in which these have attempted to address spatial inequality. The chapter begins by providing a brief overview of the nature of the planning system in Indonesia. This is then situated within an historical context that considers the broader evolution of regional policy before turning to a more detailed assessment of the National Spatial Plan. The chapter draws on policy documents, government reports and interviews with key policy makers in Indonesia.

5.2. The Planning System in Indonesia

In simple terms, the planning system in Indonesia can be classified into two basic forms: development planning and spatial planning. Development plans typically begins with a focus on particular industrial sectors or mixtures of industries. Central to these are policy conditions related to macroeconomics, trade, labour and capital investment. These form the basis around which regional policies may also be formulated to support broader economic development objectives. On the other hand, spatial plans start with a more geographical perspective, focusing on the spatial organisation of industry, land use, demography and social conditions. There is a clear interaction here with development plans, which are critical in shaping spatial patterns of economic, social and demographic activity. While the development planning system was established in the 1960s, the spatial planning system was only formed in the 1990s[5].

Since the Suharto era, or the New Order era, the government has been using the *Repelita*, the five-year development plan to organise the country into distinctive periods of development (Hill, 1998). *Repelita* is a recapitulation of sectoral development programs with particular

[5] Before the 1990s, spatial plans had been implemented in a haphazard manner, mostly in urban areas (Moeliono, 2011; Roosmalen, 2008)

economic targets to be achieved. While these were mainly undertaken in a centralised or 'top-down' manner during the New Order Era, in 1982 the approach began to change with a greater participation by the lowest administrative units, the villages, as well as the people (Hill, 1998). The first *Repelita*, took place in the period of 1969-1974. Together with the second, third, fourth and fifth *Repelita*, they formed the first long-term development plan (25 years) in the New Order Era. The second long-term development plan began with *Repelita* VI (1994-1999), which also saw the demise of the New Order government, due to political and economic crisis (Booth, 1994).

After the implementation of decentralisation, much has been done to overhaul the planning system in order for it to be more democratic. Yet, despite this reform, the basis of the system remains in tact. Through the Law 25/2004, the five-year development plan is sustained and renamed the Mid-Term Development Plan (RPJM). Additionally, the national government also established the Long-Term Development Plan (RPJP), which is now revised to a 20-year development plan. The first RPJP is for the period of 2005-2025, while the first RPJM was during the period of 2005-2009. The composition of these plans involved citizens from the lowest level of administrative units. Proposals from people, mass organisation, and other stakeholders are discussed and compiled from the village level. The proposals are then filtered in accordance to the development objectives as well as the availability of budget from relevant administrative tiers: municipality, province and national. Programs that are deemed appropriate to be undertaken by the national government are then adopted by the national RPJM and the national RPJP. Otherwise, the programs are adopted by the local RPJM and the local RPJP. For the purpose of transparency, Law 25/2004 also requires both the national and local government to compose a yearly development plan, or the RKP. RKP translates programs in the Mid-Term Development Plan (RPJM) into a yearly action plan, with clear financial arrangements. The complete development planning system after the decentralisation is illustrated in Figure 5.1.

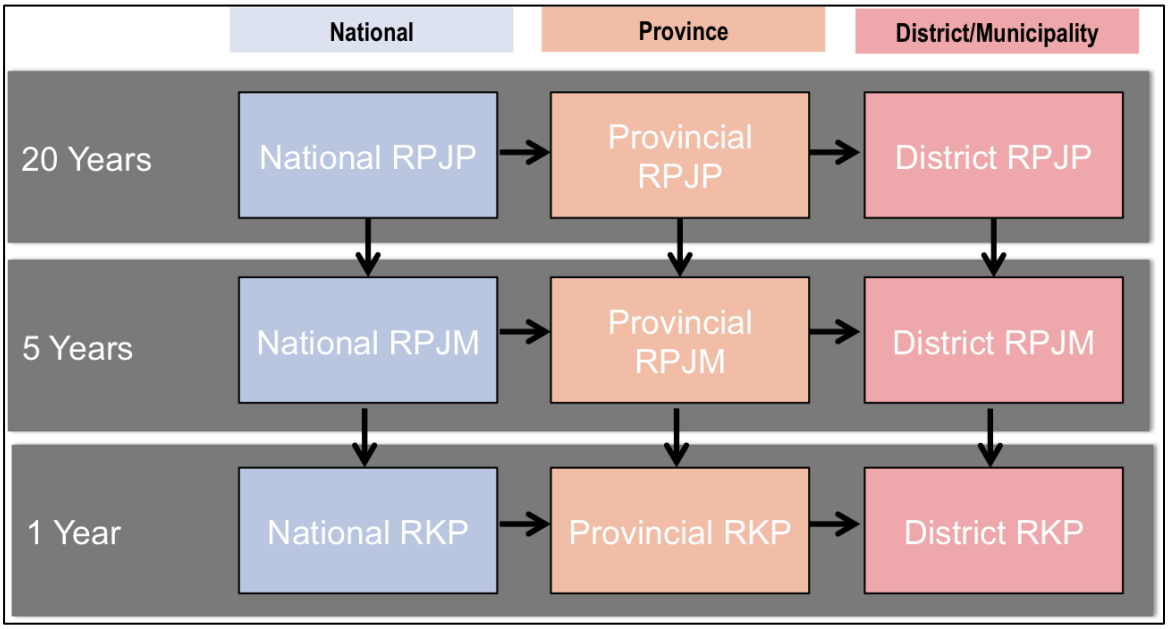


Figure 5.1. Development Planning System in Indonesia
(Source: Law 25/2004 on the Development Planning System)

While the modern spatial planning system was only established in 1992, in reality spatial planning in Indonesia was initiated during the Dutch colonial era. The changing spatial planning system in Indonesia is depicted in the Table 5.1.

Table 5.1. Changing Spatial Planning System in Indonesia
(Source: Elaborated from Hudalah, Firman, and Woltjer (2014), Hudalah and Woltjer (2007), Indonesian Ministry of Public Works (2006), Roosmalen (2008) and Rukmana (2015))

	1948-1970	1970-2007	2007-now
Regulation	Town Planning Ordinance/SVO (1948)	SVO, with some modifications, and the SPL 24/1992	SPL 26/2007
Characteristics	Urban & Java-centric, mixed top-down and bottom-up approach, sectoral approach	Regional approach, top-down approach, clientelist practice	Regional approach, people participation, devolution of power from central government, rule of law, promoting private sectors involvement

At the beginning of the 20th century, ordinances on the decentralisation and the creation of local government touched upon minor aspects of planning in local areas (Indonesian Ministry of Public Works, 2006). Following contributions by Dutch scholars who studied town planning (e.g. Thomas Karsten), a more comprehensive framework of urban and regional planning was proposed in 1922 (Roosmalen, 2008). Such consideration had not been implemented until the issuance of the Stadvorming Ordonantie (Town Planning Ordinance)

in 1948, which was prepared by the Centraal Planologisch Bureau (Central Planning Buereau) in 1946 (Hudalah & Woltjer, 2007; Indonesian Ministry of Public Works, 2006). Planning during this era focused on cities, especially the rebuilding of cities in the post-war era, and on Java Island, where the capital city is located and the most populated island. The activity focus of planning in this era was on urban housing, as rapid urbanisation resulted in many problems in issues related to overcrowding, slum housing and a range of related health and social issues (Hudalah & Woltjer, 2007). It is also noteworthy that the focus of planning during that time was Java-centric, largely because the central government was located in Batavia (now Jakarta), in the western part of Java Island, with poor levels of transportation and communications for bureaucrats in Batavia to interact with other parts of the country (Roosmalen, 2008).

In the post-colonial era, the application of the Stadvorming Ordonantie (SVO) was extended to islands other than Java (Hudalah & Woltjer, 2007). However, the planning focus was still on urban areas. It was only from the 1970s onwards that a regional approach was initiated, mainly because the problems posed by rural-urban disparity (Indonesian Ministry of Public Works, 2006). Following growth pole theory, several regional units of development were prioritised, including metropolitan areas and other rapid economic growth areas (Indonesian Ministry of Public Works, 2006). In the late 1980s, the need for a new legal framework for spatial planning became more urgent, since the SVO was considered as out-dated and Java-centric biased (Hudalah & Woltjer, 2007). Moreover, urban and regional planning was undertaken in a rather sectoral manner, due in large part to inter-departmental rivalry (Hudalah & Woltjer, 2007). The new law on Spatial Planning, Law 24/1992 (SPL 24/1992) was then stipulated, reflecting the shifting focus of planning in Indonesia, from urban and Java-centric to a wider regional focus.

The SPL 24/1992 is different from its predecessor, the SVO, as it provided a comprehensive regulatory framework. This is carried on by setting up a hierarchy for the planning documents for both national and local governments. Each administrative tier had to formulate its own spatial plan documents. The spatial plan documents in the lower administrative hierarchies must adhere to the higher ones. The hierarchy enables the spatial planning to cover all regions in Indonesia, as the SVO was considered overly preoccupied with urban areas, particularly in Java (Roosmalen, 2008). The SVO was also unable to overcome inter-sectoral rivalry in spatial management. Accordingly, the hierarchy set-up aimed to clarify the duty of relevant sectoral authorities in the making and implementation of spatial planning documents (Hudalah & Woltjer, 2007). However, The SPL 24/1992 reduced the authority of local governments, as

compared to the SVO. Local governments could not stipulate any spatial plan documents without the approval of the national government, however within the SVO the autonomy of local governments was acknowledged (Moeliono, 2011). This is understandable as the autocratic New Order regime was in power during that period. Moreover, as observed by Poppe (1998), the absence of necessary power to authorise and to execute the spatial plan prevented local governments from creating their own planning policies. Such an approach extended the fragmented implementation of planning undertaken by various sectors of development.

The SPL 24/1992 was then translated to the National Spatial Plan (NSP), stipulated through the Government Regulation 47/1997 (hence it is NSP 1997). The NSP 1997 was a spatial arrangement of all regions in Indonesia through a binary division of land use, the conservation area and the built area. The conservation area is the area where development activities are prohibited or limited. This area includes conservation forests, agricultural lands and hazard-prone areas. On the other hand, the built area is the area where development is promoted. The built area consists of the area in which the national government has strategic interests and the area in which the development is devolved to the local governments. To ensure that the NSP 1997 is implemented, local government spatial plans are obligated to follow this binary division of land use and translate it to more detailed maps in accordance to the hierarchy set-up in the SPL 24/1992.

Due to the political and economic turmoil in Indonesia during the year of 1998, there was an interruption to the implementation of the Spatial Planning Law (SPL) 24/1992. The top-down approach adopted in the SPL 24/1992 was incompatible with the decentralisation that was implemented in 2001. However, it took some time before the new Spatial Planning Law 26/2007 was stipulated to replace the SPL 24/1992. The Spatial Planning Law (SPL) 26/2007 adopts a more bottom-up approach by acknowledging the authority of the local governments and allowing greater participation from citizens in the plan-making process (Hudalah & Woltjer, 2007). The SPL 26/2007 also applies the rule of law in a stricter manner as compared to the SPL 24/1992, by introducing a detailed plan in the form of zoning regulation. However, despite all these changes brought by the SPL 26/2007, some prominent features of the SPL 24/1992 remain. The hierarchy of spatial plan documents and the binary division of land use is still adopted by the SPL 26/2007. It is evident in the new National Spatial Plan, stipulated through the Government Regulation 26/2008 (hence it is NSP 2008). In particular, the regional approach associated with the development of the built area in the NSP 1997 is retained in the NSP 2008, which will be discussed in detail in sub-chapter 5.4.

5.3. The Evolution of Regional Policy

To overcome the negative impacts of the regional inequality in Indonesia, the government has implemented a number of regional policies under the umbrella of the National Development Planning System.

In general, two phases of regional policies can be observed, as outlined in Table 5.2. First, rather *ad hoc* types of policies, on the basis of geographical division (i.e. Java and outside Java), were initiated in 1967 (Salih, Pakkasem, Prantilla, & Soegijoko, 1978). From 1990, however, more advanced types of policies have been implemented in an organised manner (Tumenggung, 2013). This not only considers geographical division as the criteria to define lagging regions, but also takes into account other aspects, such as the potential sectoral developments available in particular regions.

The first phase of regional policies in Indonesia was initiated in 1967, in the beginning of the New Order era[6]. Along with the instalment of the first *Repelita* (five year development plan), 1969-1974, the government aimed to attract foreign capital to the country. It was then the law on foreign investment (Law 1/1967) stipulated, followed by Law 6/1968 on domestic investment. Since the government also recognised that major economic activities prefer to locate in Java rather than islands outside Java[7], the government provided additional incentives for businesses that located outside Java in the laws.

Aside from the investment policy, the government also designed an industrial zone in Batam, an island that is a part of the Sumatra Island and neighbouring to Singapore. Through the Presidential Decree 71/1971, Batam was set up as a competitor to -- or to tap the spillover from -- the fast-growing Singapore (Hadi, 2009; Kam & Kee, 2009). Various fiscal incentives were applied in Batam, such as the exemption of custom tax, income tax and luxury goods tax for goods imported and exported through selected ports and airports, after it was declared as the bonded zone through the Presidential Decree 41/1973 (Kam & Kee, 2009). This was in

[6] New Order era extends from 1967 until 1999.

[7] As observed by Dick (2002), the "superiority" of Java over other islands in Indonesia reflects the long history of economic activities of the nation. Chosen as the core region by the East India Company (Vereenigde Oost Indische Compagnie) during the Dutch colonial era in 1700s, Java has been developed relatively more rapidly than other islands ever since due to the presence of plantations and labours. Such pattern remained unchanged until the 1970s, where the inter-island trade had begun to involve eastern Islands (i.e. Sulawesi, Nusa Tenggara and Maluku) intensely. This was due to the industrial revolution that took place in Java, which demanded more raw materials supply from other islands (Dick, 2002).

fact the only policy addressing a particular region with significant incentives during the period of the first *Repelita* (1969-1974).

Table 5.2. Regional Policies in Indonesia
(Sources: Elaborated from Tumenggung (2013), Kuncoro (2005), Leittner & Sheppard (1987), Salih et.al, (1978))

	First Phase		Second Phase		
	1967-1974	**1974-1990**	**1990-1995**	**1995-2001**	**2002-now**
Stages of Regional Policies	No specific policies on lagging regions, rather investments were promoted for the country in general.	Regional balanced growth was recognised in the policy documents (*Repelita*)	Clearer definition of lagging regions	The initiation of various regional policies aiming to promote growth and to achieve economic equity among regions	Advanced initiatives to promote regional economic growth and equity; the era of decentralisation
Example of Policies	Incentives, albeit insignificant, were given to investments outside Java Island; the initiation of bonded zone in Batam	Dispersion of population through transmigration, incentives for investments outside Java Island and the stipulation of hierarchical development regions	Incentives for 13 provinces in eastern part of Indonesia, the creation of the Development Council of the Eastern Part of Indonesia	The stipulation of Integrated Economic Developme nt Zone (KAPET)	The stipulation of Special Economic Zone and the Master Plan of Economic Corridors

The imperative to achieve balanced economic growth among regions was heightening during the period of 1978 to 1984. This was due to the fact that the rapid national economic growth in the 1960s to 1970s was achieved by promoting industrialisation, located in developed regions (mostly in Java island), that was financed by the export of raw materials, extracted from the less-developed regions (Salih, et.al, 1978). Political pressure from the lagging regions resulted in the government setting balanced economic growth as one of the main goals in its five-year development plans. In particular, the 2nd *Repelita* (1974-1979) was the first plan to consider balanced economic growth as one of the main goals (Leitner & Shepperd, 1987). One important policy taken by the government to distribute growth was the transmigration, in the 1970s. The government promoted transmigration to disperse the population to islands other than Java. This policy was also supported by the creation of hierarchical development regions, a cluster of regions with their designated growth centres,

while at the same time maintaining incentives for investments outside Java (Salih, et al, 1978; Tumenggung, 2013).

Before this, however, since the first *Repelita* (1969-1974), the national government had regularly allocated regional transfer funds in the form of the *Inpres* grant (Azis, 1990). The grant aimed to reduce interregional disparity and funds were transferred in the form of block and non-block grants. However, due to the decline of the oil price in the 1980s, the constraints over the national budget were heightened (Hill, 1998). To relieve the pressure on the national budget, the national government formulated specific regional policies to enable districts and municipalities to identify their own sources of income. At the same time, the national government was also significantly reforming the regional financial arrangement (Hill, 1998)

Since the regional policies undertaken in the first phase were only on the basis of Java and non-Java division without specific definition on what is considered as lagging regions (Tumenggung, 2013), some drawbacks were apparent. As noted by Leitner and Sheppard (1987), such policies missed provinces in Java that were considered as lagging regions (i.e. Central and East Java), as indicated by their share of population below the poverty line. Moreover, the investment incentives for locating outside Java were also not significant as compared to the obstacles faced by the investors (e.g. lack of public infrastructures) (Tumenggung, 2013). This resulted in the majority of investments being located in the economically advanced provinces (Leitner & Sheppard, 1987). All of this has contributed to the reinforcement of regional inequality, since economically advanced provinces are getting more benefit from investments as compared to the economically lagging provinces. On the other hand, the creation of development regions, with their growth centres, was also not followed up by any supporting policies from the national government. The stagnation of such policy cannot be separated from the fact that during the 1980s there was a financial crisis in Indonesia[8], thus reducing the financial capacity of the national government.

The second phase of the development of regional policies in Indonesia began in 1990. In response to the persistent inequality observed in Chapter Four, the second phase adopted a different approach when compared to the first phase. What differentiates this phase with the previous one was that the lagging regions were defined not only on the basis of Java and non-Java division, but also on the basis of sectoral development that are potentials (Tumenggung, 2013). Moreover, efforts in promoting growth centres and cluster areas were more

[8] The crisis was triggered by the decreasing oil price and the decreasing demand of the raw material produced by Indonesia (Leitner & Shepperd, 1987, Widodo, 2013)

coordinated. In 1990, special incentives for investments in various sectors (e.g. agriculture, farming, fisheries) were implemented for 13 provinces in eastern part of Indonesia[9], part of the country that is considered as lagging regions[10] (Tumenggung, 2013). Further effort was carried on through the creation of the Development Council of the Eastern Part of Indonesia (DP-KTI). The DP-KTI, stipulated through the Presidential Decree 120/1993 and comprised of relevant Ministries, was established to ensure that growth acceleration of those 13 provinces continued.

The DP-KTI then proposed the creation of the Integrated Economic Development Zone (KAPET) in 1996, an initiative that was first mooted in 1990 (Hill, 1998). KAPET, according to the Presidential Decree 89/1996, are economically prospective clusters that have a particular prominent economic base (e.g. agriculture) as feasible for both domestic and private investments. During 1996-1998, 14 KAPET were stipulated, 13 of which were located in the eastern parts of Indonesia. Various incentives were implemented by the national government in KAPET, such as the exemption of income tax for imported goods, provision of net loss compensation for up to 10 years and the exemption of luxury goods tax[11]. KAPET, in particular, is relatively different with the bonded zone, as applied in Batam. They both are different not only for the fiscal incentives applied, but also for the size of the area. While KAPET encompasses larger areas with its focus on attracting investments, the bonded zone only applies incentives for selected enclaves and ports/airports with a focus on international trade.

After the decentralisation era in 2001, most of the aforementioned policies remain, albeit with slight modifications. The bonded zone status of Batam, for example, has been extended to incorporate its neighbouring islands, Bintan and Karimun (through the stipulation of Law 44/2007). While some of the incentives were abolished in 2004 (such as luxury goods tax on cars, cigarette and alcohol), they were reinstalled in 2007 along with the extension of the area (Kam & Kee, 2009).

In addition, the government also introduced the development of the Special Economic Zone (SEZ) and the Economic Corridors (Tumenggung, 2013), which is stipulated through the

[9] East Kalimantan, West Kalimantan, South Kalimantan, Central Kalimantan, North Sulawesi, South Sulawesi, Central Sulawesi, Southeast Sulawesi, East Nusa Tenggara, West Nusa Tenggara, Timor-Leste, Maluku, and Irian Jaya.

[10] Lagging regions, as depicted in the Government Regulation No. 45 of 1996 on Income Tax for Business Units in Certain Industries, are regions with "feasible economic potential, but lacking in economic facility and cannot be reached by public transportation" (Tumenggung, 2013, p. 211).

[11] Presidential Decree 9/1998 on the Change of the Presidential Decree 89/1996 on KAPET

Presidential Decree 32/2011 on the Master Plan for Acceleration and Expansion of Indonesia's Economic Development. The law on SEZ was stipulated in 2009, and after that 10 SEZs were stipulated across Indonesia (Figure 5.2. and Table 5.3). While also focusing on international trade, in SEZ, being different to KAPET, the government will build integrated service facilities to support any industrial, export-import and other prominent economic activities in the selected SEZs.

Figure 5.2. The Location of the Special Economic Zones
(Source: kek.go.id, accessed 25 July 2018)

Table 5.3. Sectoral Potentials of the Special Economic Zones
(Source: kek.go.id, accessed 25 July 2018)

No.	SEZs	Province	Sectoral Potentials
1.	Sei Mangkei	North Sumatra	Palm oil, rubber, fertiliser, logistic, tourism
2.	Arun Lhokseumawe	Aceh	Oil and gas industry, petrochemical industry, logistic
3.	Tanjung Api-api	South Sumatra	Rubber, oil, and petrochemical
4.	Galang Batang	Riau	Bauxite and alumina industry, stem powered electric generator, logistic
5.	Tanjung Kelayang	Bangka Belitung	Tourism
6.	Tanjung Lesung	Banten	Tourism
7.	Maloy Batuta Trans Kalimantan (MBTK)	East Kalimantan	Palm oil, logistic
8.	Mandailika	West Nusa Tenggara	Tourism
9.	Palu	Central Sulawesi	Manufacturing, agriculture, mining industry, logistic
10.	Bitung	North Sulawesi	Fisheries, coconut plantation, logistic
11.	Morotai	North Maluku	Tourism, fisheries, logistic
12.	Sorong	West Papua	Shipyard, agriculture, mining, logistic

On the other hand, the Master Plan of Economic Corridors was stipulated through the Presidential Decree in 2011, aiming to develop economically prospective corridors in six

major islands in Indonesia on the basis of their economic base (Figure 5.3). The development of these ambitious corridors is subject to the investment contribution of the private sectors, since the government only provides small contributions. However, the implementation continuity of the Master Plan of Economic Corridors remains uncertain given that in 2014 a new president has replaced the previous president, who stipulated the Presidential Decree as the basis for the corridors development.

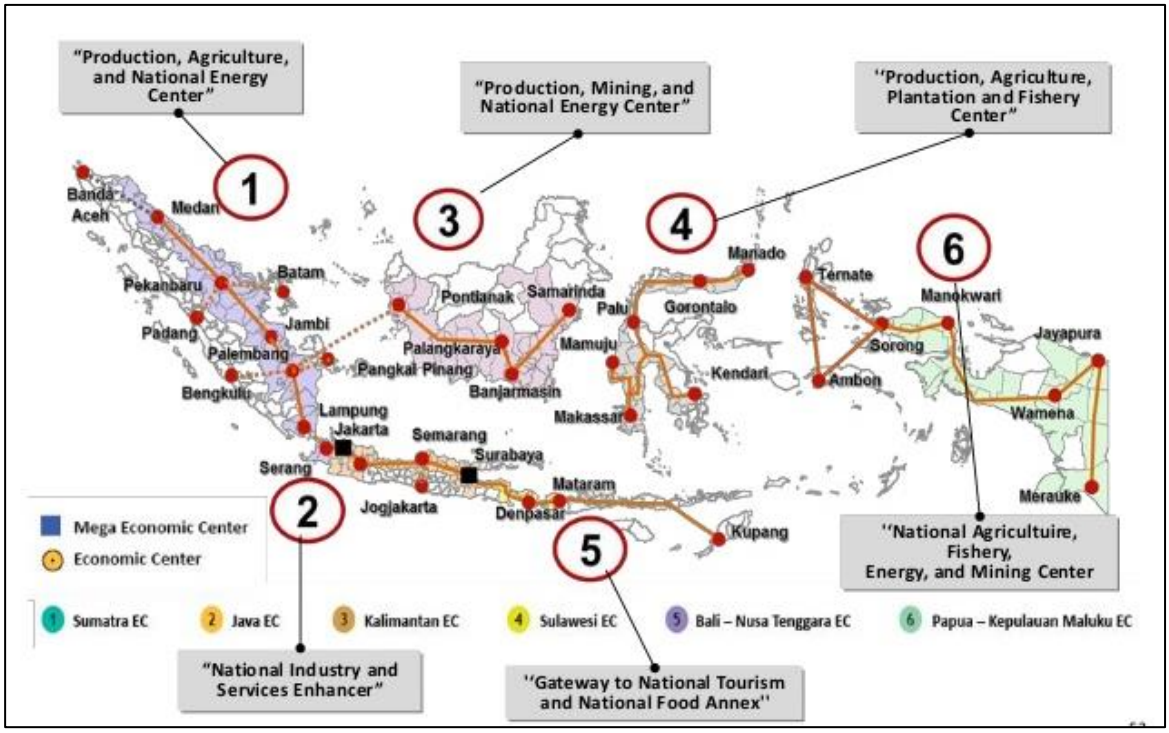


Figure 5.3. Six Economic Corridors of Indonesia
(Source: Susantono, 2012)

Regional policies in the second phases, in particular since 1995, were undertaken at the same time with the emergence of the regional approach in the spatial planning system as mentioned previously. Collectively, these two sets of policies have been influencing the regional development in Indonesia. The relationship between some prominent policies with the National Spatial Plan, and which will be discussed in detail in the next sub-chapter, is outlined in Table 5.4.

Table 5.4. Summary of Some Prominent Regional Policies in Indonesia
(Source: Author's analysis)

No.	Policy	Definition	Facilities	Relation with the National Spatial Plan
1.	KAPET (Integrated Economic Development Zone)	Economically prospective clusters that have particular prominent economic base as feasible for both domestic and private investments	Incentives for investment from the national government: the exemption of income tax for imported goods, loss compensation for up to 10 years and the exemption of luxury goods tax	Included in the National Spatial Plan. KAPET and the bonded zone are parts of the National Strategic Areas: areas considered having national strategic values, in which the national government may be able to support the infrastructures development.
2.	Bonded zone/Free trade zone	Selected enclaves and ports/airports that are internationally competitive	The exemption of custom tax, income tax and luxury goods tax for goods imported and exported through selected ports and airports	
3.	Regional Clusters	Areas with economic abilities and potencies to support the economic development of their surrounding areas	No specific incentives from the national government. The development of the clusters are under the authorities of relevant local governments	
4.	Special Economic Zone	Selected areas that are internationally competitive in terms of geo-economic and geo-strategic	The national government builds integrated service facilities to support any industrial, export-import and other prominent economic activities	Not included in the National Spatial Plan
5.	Master Plan of Economic Corridors	Selected corridors in 6 major islands in Indonesia	The national government will support private investments in these corridors through limited co-funding.	

5.4. The Regional Policies in the National Spatial Plan

The regional approach here is defined as features, or policies, adopted by the National Spatial Plan (NSP) as a means to redistribute the economic growth across Indonesia. Three major policies can be observed. The first is the stipulation of the Urban Hierarchy, in which urban areas are assigned a different status in accordance to their roles and prospects in supporting the economic growth of their surrounding areas. The hierarchy corresponds to the development of necessary infrastructures, such as roads and electricity, built by the national

government. The higher the status of particular urban areas, the higher the capacity of infrastructures built in these areas.

The second policy is the stipulation of the National Strategic Areas (NSA). The NSA is the area of main concern of the national government for having strategic values due to its characteristics. The NSA may include areas with high economic growth, such as metropolitan areas and free trade zone areas, areas with critical environment, such as volcanic and conservation areas, as well as areas with a high security level, such as bordering areas. Overall, there are 23 NSAs in the NSP 1997 and 78 NSAs in the NSP 2008. In the NSA, the national government may finance the provision of selected infrastructures, in order to secure the national interests.

The third policy is the designation of the Regional Clusters (RC). The RC is the area with economic abilities and potencies to support the economic development of their surrounding areas. Sectoral priorities, such as fisheries, mining and agriculture, are assigned to the RC in the National Spatial Plan (NSP) on the basis of pre-determined criteria. Overall, there are 149 RCs in the NSP 1997 and 157 RCs in the NSP 2008. The development of the RC is solely the responsibility of the local governments, which is different to the National Strategic Area (NSA).

While the Urban Hierarchy consists of cities, the National Strategic Area (NSA) and the Regional Cluster (RC) may take form in either multiple districts/cities in the same province, or multiple districts/cities in multiple provinces. The Regional Cluster (RC) may also be located within the NSA. An illustration of these three policies is depicted in Figure 5.4. A detailed explanation of each policy is provided in the following sections.

In relation to the persistent regional inequality explained in Chapter Four, these three regional policies adopted in the NSP were aimed to alleviate the problem. First, the distribution of Urban Hierarchy, as will be explained later, was undertaken on the basis of consistent criteria. Urban areas in the eastern of the country were given lower criteria to be carried on in the policy. Second, Regional Clusters (RC) were also distributed evenly across the country. Districts, or the smallest spatial unit, with potential sectors were identified nationwide to ensure that lagging regions may catch their richer counterparts up.

To assess the aim and the implementation of the three policies aforementioned, this research makes use of secondary data gathered from government's publications as well as information collected from a series of semi-structured interviews with both local and national

governments. Following approach taken by Dawley (2013), to ensure anonymity, interviewees will be cited in the following sections according to abbreviation in Table 5.5. Multiple interviewees from the same institution are numbered. It is expected that the result of this study may provide insight on the implementation of National Spatial Plan (NSP) in Indonesia. Since to the best of the author's knowledge, research in this direction is quite rare.

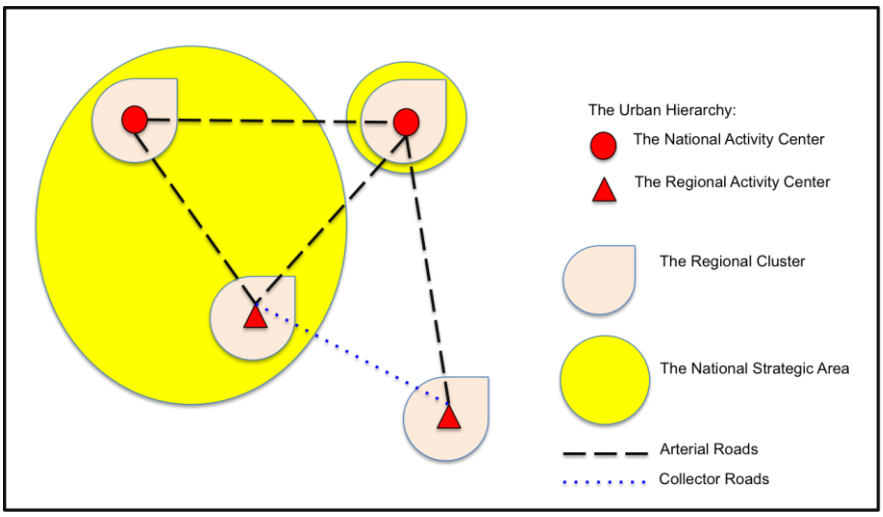


Figure 5.4. The Regional Approach in the National Spatial Plan
(Source: Author's illustration based on Indonesian National Development Planning Agency (1996))

Table 5.5. Interviewee's Abbreviation
(Multiple interviewees from the same group are numbered)

Institution	National Government (NG)	Local Government (LG)
Jakarta Province (J)	-	LGJ 1-5
West Java Province (WJ)	-	LGWJ
Bogor Regency (B)	-	LGB 1-2
Depok Municipality (D)	-	LGD 1-2
Bekasi Municipality (BM)	-	LGBM 1-2
Bekasi Regency (BR)	-	LGBR
Tangerang Municipality (T)	-	LGT
South Tangerang Municipality (ST)	-	LGT 1-2
Ministry of Land and Spatial Planning (LSP)	NGLSP 1-6	-
Ministry of Finance (F)	NGF	-
Ministry of Public Works (PW)	NGPW 1-7	-
National Development Planning Agency (PA)	NGPA 1-2	-
Total Respondents	***16***	***16***

5.4.1. The Urban Hierarchy

The Urban Hierarchy is assigned to cities in order to define their role in the economic development of their surrounding areas. It began as an effort to support the transmigration

program (NGPW5), a program that aimed to move people permanently from Java to other islands. This program was undertaken to promote the development throughout the country (Hardjono, 1986; MacAndrews, 1978; Rigg, 1991). The Urban Hierarchy was stipulated to distribute the settlement areas in accordance to the destination of the people that was transmigrated. In addition to this, the Urban Hierarchy also acknowledges the existing roles of major Indonesian cities as stated in the National Spatial Plan (NSP) 2008.

Being defined as the major settlement areas, within this hierarchy, Indonesian cities are classified into three divisions:

1. The National Activity Centre (NAC): cities assigned this status are deemed to be (a) the main hub, or the nation's gate, for the international trade and (b) the hub for the inter-provincial transportation networks and economic activities.

2. The Regional Activity Centre (RAC): cities assigned this status are deemed to be the (a) secondary hub for the international trade, which support the NAC and (b) the hub for inter-districts/municipalities transportation networks and economic activities.

3. The Local Activity Centre (LAC): cities assigned this status are deemed to be the hub for inter-sub-districts transportation networks and economic activities.

The criteria used to assign cities into these divisions correspond to the roles they are expected to fulfil. Three main criteria are used (NGLSP5, NGLSP1):

1. In identifying the potential of cities to be the hub for international trade, the volume of export-import, either through airports or seaports, is used;

2. In identifying the potential of cities to be the hub for economic activities, the share and growth rate of Gross Domestic Product (GDP) is used;

3. In identifying the potential of cities to be the hub for transportation networks, the interconnectedness of the city is measured.

The aforementioned criteria are adjusted depending on whether respective cities belong to the western part or eastern part of Indonesia. Lower thresholds are applied for cities in the eastern part of Indonesia, as the aim of the policy is to redistribute the economic growth, which has been mainly concentrated in the western part of the country (in particular Java and Sumatra).

While the Urban Hierarchy remains similar in the concept both between the National Spatial Plan (NSP) 1997 and the NSP 2008, few differences can be discerned. In the NSP 2008, the stipulation of the RAC requires the city to have the potential to be the secondary hub for international trade, while in the previous NSP it was not a pre-requisite. The NSP 2008 also adds another division, the National Strategic Activity Centre (NASC). The NASC is being stipulated to promote the development of the border areas. In addition to the criteria used to assign cities to their relevant hierarchy, an NASC city must also be the city where the border areas inspection is taking place. The National Spatial Plan (NSP) 26/2008 also does not stipulate Local Activity Centre (LAC), as the task now is being delegated to the provincial government, by taking into account recommendations made by the district/municipality. Therefore, the focus of this research is the National Activity Centres (NAC) and Regional Activity Centres (RAC), due to its dependence on the national budget. The NASCs are also not discussed here, since these centres are relatively new.

In total, there were 14 NACs and 55 RACs in the NSP 1997, far less than the 36 NACs and 176 RACs in the NSP 2008. The reason for this is because some cities that were previously assigned as RACs are now being promoted as NACs. Another reason is because of the massive proliferation of municipalities and districts in Indonesia from 2001 onwards, due to the decentralisation. The number of local governments has been increasing, from 27 provinces and 291 municipalities/districts to 34 provinces and more than 500 municipalities/districts.

The Urban Hierarchy influences the spatial economic development of the country because the infrastructure, in particular the roads and the railways, is provisioned in accordance to the hierarchy, as illustrated in Figure 5.5.

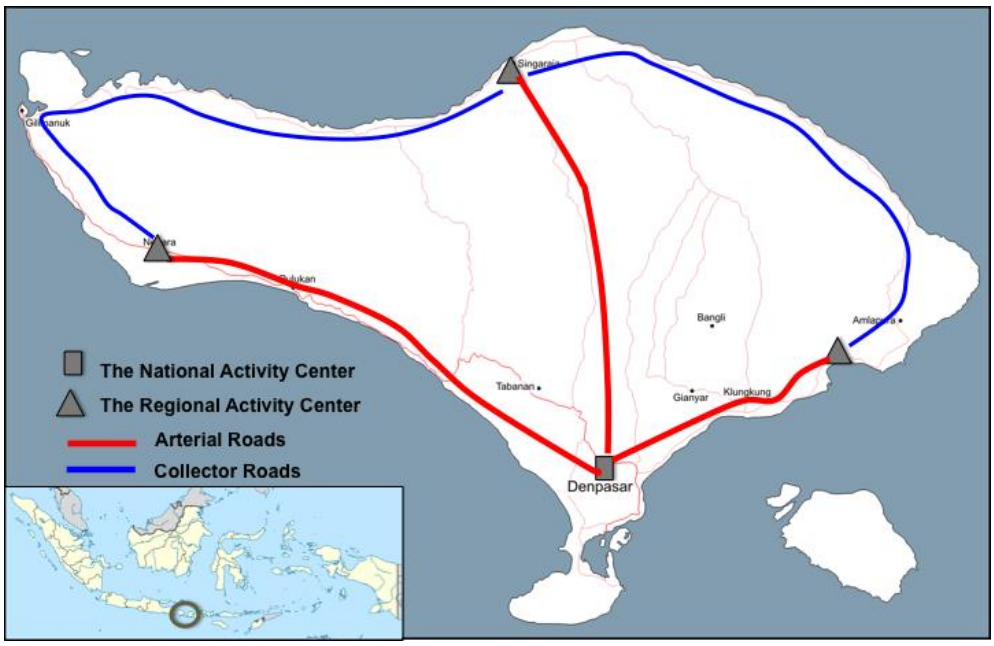


Figure 5.5. The Illustration of Urban Hierarchy in the Island of Bali
(Source: Author's illustration based on the National Spatial Plan 1997 and 2008)

Main roads, the arterial roads, are built to provide connection between NACs, connection between NACs to RACs and between (National Strategic Activity Centres) NASCs to cities in bordering countries. The collector roads are built to provide connection between RACs and between RACs to Local Activity Centres (LACs). At the lowest level, LACs are connected to each other with the local roads. On the other hand, railways are built to connect NASCs to cities in bordering countries, NACs to NACs, NACs to RACs, and RACs to RACs.

5.4.2. The Regional Cluster

Similar to the urban hierarchy, the regional cluster (RC) was initially stipulated to support the transmigration program (NGPW5). The aim of the policy is to broaden the economic growth, which was concentrated in the western part of Indonesia during the 1990s (NGLSP1). Mainly being influenced by growth pole theory (see Polenske, 2017) and Marshallian industrial district (see Castree, Rogers & Kitchin, 2013), a cluster of regions was then defined along with its sectoral potential (NGPW5). The main districts are identified on the basis of their potential to be the engines of economic growth, in accordance to their potential. In relation to the urban hierarchy, most of main districts in the RCs correspond to the list of cities in the urban hierarchy. Along with these main districts, a number of their hinterlands are also identified on the basis of their interconnectedness (see Figure 5.6).

The Regional Cluster (RC) is differentiated into two types:

1. The developed RC, which already has sectoral strength and deemed to have economic performance above average as compared to other regions;

2. The prospective RC, which has potential sectoral strength to be developed and expected to have economic performance above average in the future.

Several criteria were used to define the prospective and developed Regional Clusters (NGLSP5, NGLSP1):

1. The amount of urban areas located within the RCs;

2. The share of RCs' GDP to the national GDP;

3. The share of RCs' population to their respective provinces' population;

4. The availability of infrastructure; and

5. The identified sectoral potentials for economic growth.

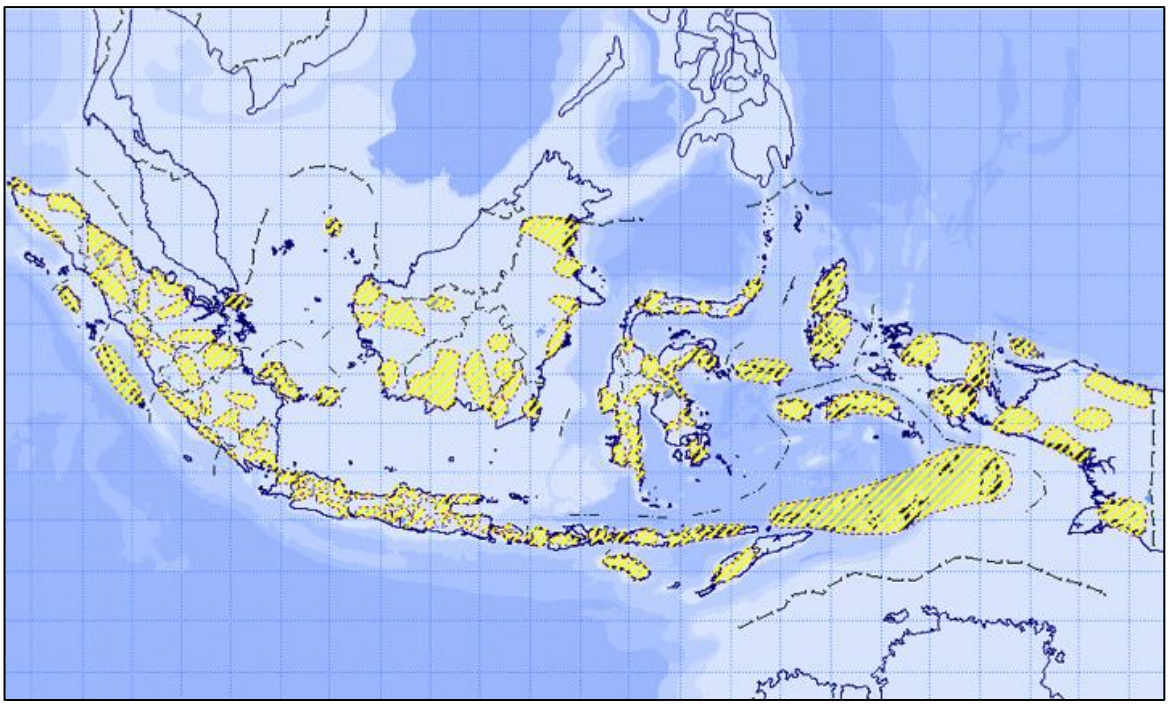


Figure 5.6. The Regional Cluster
(Source: National Spatial Plan 2008)

Again, as in the urban hierarchy, the criteria are being adjusted to the condition as to whether relevant Regional Clusters (RC) are located in the western or eastern part of the country. Generally, the prospective RC is designed to accommodate emerging economies in the eastern part of the country. Therefore, an additional criterion, which is the GDP growth rate, is being

defined for the prospective RC. This is to offset their shortcomings in the share of their GDP to the total national GDP.

As mentioned before, the number of RCs remains similar in the National Spatial Plan (NSP) 2008 as compared to the NSP 1997. Both NSPs also acknowledges Regional Clusters that are located in land area and sea, given the nature of Indonesia as an archipelagic country. There are 111 land RCs and 38 sea RCs in the NSP 1997 and 112 land RCs and 45 sea RCs in the NSP 2008. In both NSPs, the RCs are also only indicatively stipulated and need to be detailed in the local governments' spatial planning. The development of these RCs is also to be followed by the provision of relevant infrastructure, such as roads and electricity networks.

5.4.3. The National Strategic Area

The aim of the National Strategic Area (NSA) is to secure the interest of the national government over particular areas, which is different to the two policies discussed previously (NGLSP1). Such areas are deemed to have strategic values, which are: the cultural value (i.e. heritage areas), security value (i.e. bordering areas), environment value (i.e. critical or hazardous areas), technological value (i.e. rocket launch site areas) and economic value (i.e. metropolitan areas and free trade zone areas). Given the objectives of this research, focus will be given to the NSA with strategically economic value. Therefore, in the remainder of the sections, the NSA refers to the strategically economic NSAs.

The NSAs are stipulated on the basis of several criteria:

1. Areas that are deemed to have GDP growth above the national average;
2. Areas that are considered to have sectoral strength as measured with the locational quotient;
3. Areas that are considered to have export rate above the national average;
4. Areas that are supported by well-established infrastructure; and
5. Areas that are deemed to have high-technological basis of economic activities, as measured by the GDP rate in the manufacturing industry as compared to the national GDP.

In relation to the Regional Cluster (RC), since the economic value is also the basis of the stipulation of RCs, most of the NSA is also located in the defined RCs.

The main aim is to selectively promote development in the areas that attract national interest, however, the stipulation of the NSAs is subject to be negotiated (NGLSP2). Due to equality and political reason, some areas that do not meet the aforementioned criteria still can be included in the list of NSAs (NGLSP1). This is evident in the National Spatial Plan (NSP) 2008, where an additional criterion is added: the potential to be the engine of growth for the less prosperous regions.

In total there are 17 NSAs that were stipulated in the NSP 1997. While in the NSP 2008 there are 22 NSAs, where 8 of them are the same NSAs that were stipulated in the NSP 47/1997 (see Figure 5.7). The list of the NSAs is outlined in Appendix 5.

Figure 5.7. The National Strategic Area
(Source: Author's illustration based on National Spatial Plan 1997 and 2008; map of Indonesia from: http://www.mapsofworld.com/indonesia/)

The stipulation of the NSAs requires immediate follow-up actions by the national government, as stated in the SPL 24/1992 and SPL 26/2007. In the NSAs, the national government is expected to contribute to the development of the area beyond the provision of infrastructure associated with the RCs. While the development of RCs is being delegated to the local governments, in the NSAs, the national government may have a significantly greater role than the local governments.

5.5. Conclusion

Indonesia has a long history of engaging in regional policies that aim to tackle the issue of spatial inequality. In large part this is been about addressing the problem of uneven development outlined in Chapter Four. Indonesian regional policy has evolved in line with the changing political and economic circumstances facing Indonesia, along with an increasing recognition that uneven development has significant social and political implications. The focus of recent policy has been on promoting economic development through various forms of 'cluster' approaches that aim to stimulate economic development according to particular spatial and other criteria. This targeted approach has become an important and enduring characteristic of spatial policy. Among these policies, spatial planning policy stood out as one of the most durable approaches, having been in space for nearly 20 years. One of the recent major economic policies, the Economic Corridor Master Plan, was also outlined using the National Spatial Plan as its basis.

While there is a commitment to spatial policy interventions to address regional inequality, there has been relatively little research that has evaluated its efficacy. One of the latest areas of research undertaken by Rothenberg, Bazzi, Nataraj & Chari (2017) indicated that despite tax incentives provided for the Integrated Economic Development Zone (KAPET) no agglomeration followed the stipulation of the policy over 12 regions in the eastern part of Indonesia. Rothenberg et al., pointed out that this may be because the incentives that were provided were not large enough to overcome difficulties faced by firms in these lagging regions (i.e. limited infrastructure and access to the market). They also suggested that given the KAPET policy was initiated in 1998, immediately after the Asian Financial Crisis, firms may be dissuaded to use the incentives because of the political instability.

However, in contrast to KAPET, the spatial planning policy does not provide any tax incentives. The policy looks beyond firms and its aim is to provide infrastructure and amenities across targeted areas. The extent to which this policy has been able to change development trajectories is an important question. Additionally, the way in which path dependent patterns of development are altered or otherwise by regional policy in Indonesia is also poorly understood. We use the spatial planning policy as a case study to dig more in this direction. Chapter Seven takes up these themes and begins to consider the observable relationships between institutional frameworks and development.

Chapter Six
Path Dependence in Indonesia's Economic Growth

6.1. Introduction

As elaborated previously in Chapter Four, the persistence of economic growth differentials across districts in Indonesia potentially provides an example of regional path dependence. Providing evidence for the existence of path dependence is considered important for at least two reasons. First, given most examples of path dependence come from industrial clusters or firms, the presence of path dependence across districts in Indonesia potentially expands the horizon for the use of an evolutionary economic geography (Boschma & Frenken, 2011; Martin & Sunley, 2006). Second, empirical research on path dependence has been mostly undertaken in countries, which are classified as mature capitalist economies. Different contextual settings may provide comparative insights into the role of path dependence in explaining the evolution of regional economies (Plummer & Tonts, 2013a). That is, Indonesia may serve as a stress test for the theory of path dependence in a context in which it was not developed.

Typically, research undertaken to explain Indonesia's economic growth has focused on both the overall dynamics of regional inequality and the underlying causes of these dynamics (see, for example, Akita & Szeto, 2000; Aritenang, 2012; Garcia Garcia & Soelistianingsih, 1998; Hill et al., 2008; Hill & Vidyattama, 2014; Resosudarmo & Vidyattama, 2006; Wibowo, 2011; Yusuf et al., 2014). However, there has been little research to explain how significant the history of development has been in impacting on economic growth across individual economies in Indonesia. An exception is the work of Yusuf et al. (2014), which acknowledges that a particular event, the commodity boom, may have had a long-term impact on regional inequality across Indonesia: "The recent commodity boom may influence urban and rural inequality, but this is not clear" (p. 253). van Leeuwen and Földvári (2016) provide an extensive account of the history of inequality dynamic in Indonesia, but at the household level.

This chapter moves beyond this literature, modelling the impact of history on economic growth across districts in Indonesia using GDP per capita as a measure of economic performance. Following a brief explanation and statistical summary of Indonesia's growth dynamics, a test of convergence is undertaken to test for the persistence of regional inequality.

Finally, a general time series model is estimated and used to test for the presence of path dependence across the Indonesian space economy.

6.2. The Data and Descriptive Statistics

This chapter utilises annual data on GDP per capita for districts across Indonesia during the 21-year period, 1993 to 2013. For each year, a total of 291 districts is recorded. For the purpose of analysis, districts are grouped by islands (See Figure 1.1 and Table 4.1 for the geographical orientation and details of administrative tiers in Indonesia). Additionally, analysis is undertaken for aggregated data at three levels of administrative tiers (national, islands, provinces).

From the descriptive statistics of the data in Table 6.1 below, the gap between the richest district and the poorest was widening from 1993 to 2013, with a threefold increase of the *maximum* figure of GDP per capita, while at the same time the *minimum* figure remained similar. On average the GDP per capita has increased more than two times from 1993 to 2013. Furthermore, both the mean and median GDP per capita of districts has approximately doubled from 1993 to 2013. By using Welsch's *t*-test, it is known that the GDP per capita in 1993 and 2013 are significantly different at the 5% level (t = -6.6141; df = 387.46; p-value = 1.244e-10, thus rejecting H_0 assumption of data being homogenous).

Table 6.1. Descriptive Statistic of Indonesia GDP per Capita by Districts 1993 & 2013
(Source: Author's calculation based on BPS data)

Descriptive Statistic	GDP per capita (in million Rupiahs)		Growth
	1993	2013	
Number of observation	291		
Minimum	1.035694	1.898812	-3.348571
Maximum	45.802816	137.876122	9.705786
1st Quartile (Q1)	2.344250	4.683818	2.815235
3rd Quartile (Q3)	4.545441	9.203022	4.487988
Mean	4.278481	8.977118	3.710063
Median	3.156433	6.685631	3.784202
Sum	1245.037898	2612.341242	1079.628189
Standard Error Mean	0.272870	0.655906	0.100554
Lower Control Limit (LCL) Mean	3.741424	7.686179	3.512153
Upper Control Limit (UCL) Mean	4.815538	10.268057	3.907972
Variance	21.667322	125.191786	2.942361
Std. Deviation	4.654817	11.188914	1.715331
Skewness	5.553589	7.540257	-0.155198
Kurtosis	38.945666	73.135261	2.348900

An indication of the possible presence of outliers can be seen from the spread of data by looking at the *quartile* division. For example, in 1993 the *interquartile range* (IQR) of GDP per capita is 2.2 (Q3-Q1). While the maximum GDP per capita in 1993 is 45.8 million Rupiahs. Recall that outliers are data points more than 1.5 IQR above the 3rd quartile (or below the 1st quartile). Therefore, any GDP per capita above 7.8 million Rupiahs are considered as outliers. In the case of this dataset, four districts in the capital city of Jakarta as well as several districts endowed with natural resources (e.g. oil, coals) in Sumatra and Kalimantan are the outliers due to their significantly higher GDP per capita compared to other districts. A similar phenomenon can also be observed in the 2013 dataset. This is also confirmed by the large figures of *variance* and *standard deviation* indicating the data is widespread, for both GDP per capita 1993 and 2013. The increasing IQR between 1993 and 2013 (from 2.2 to 4.52) and the increasing standard deviation between the two years also indicate that the data is slightly more dispersed in 2013 rather than in 1993. Looking at the data, it reflects that more districts identified as outliers, which had significantly higher GDP per capita than the rest of their counterparts. These additional districts are including newly emerging major cities in the island of Sulawesi and Papua.

The normality test, by using the Shapiro-Wilk test (Table 6.2), shows that the distribution of GDP per capita of all districts in both 1993 and 2013 were not coming from a normal distribution (p-value < 2.2e-16, thus rejecting the H_0 assumption of the normality of data). In addition, the *skewness* indicates that the data is being concentrated on the lower value of X-axis, therefore it skews left, implying that districts are concentrated on low to medium GDP per capita level.

Table 6.2. Normality Test
(Source: Author's calculation based on BPS data)

Shapiro-Wilk Normality Test		
GDP per capita 1993	**GDP per capita 2013**	**GDP per capita growth 1993-2013**
W = 0.47913	W = 0.40101	W = 0.95972
p value < 2.2e-16	p value < 2.2e-16	p value = 3.262e-07

The density plot, and its relevant quantile-to-quantile plot[12] (Figure 6.1.) confirm the result of Shapiro-Wilk that the distribution of the data is not forming a bell-shape, likely due to the presence of few outlying values. In particular, GDP per capita of four districts located in the capital city, Jakarta, are significantly higher than the rest of the districts. For example, the

[12] Density plot maps the spread of the data points. Quantile-to-quantile plot (QQ plot) is plotting the dataset on the basis of quantiles to a theoretical dataset with a normal distribution.

GDP per capita of Central Jakarta in 1993 was 45.8 million rupiahs, ten times higher than the mean. On the other hand, while the normality test of the GDP per capita growth 1993 to 2013 rejects the assumption of data being normal, the density plot and QQ plot display a closer approximation to the normal distribution. This may suggest that majority of districts in Indonesia had been experiencing a rather similar growth rate of GDP per capita.

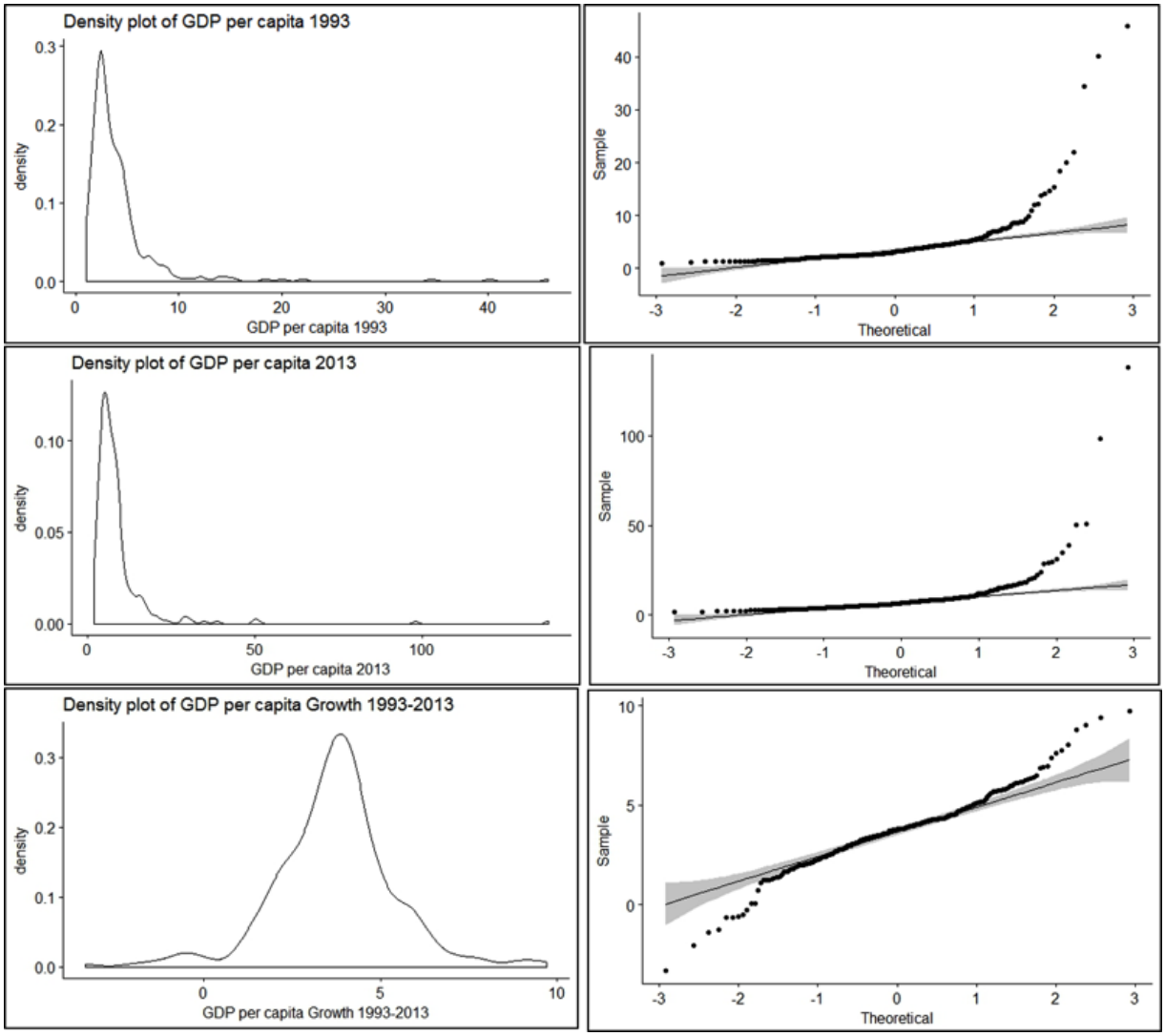


Figure 6.1. Density and QQ Plot of GDP per Capita (Districts) 1993 & 2013
(Source: Author's calculation based on BPS data)

The picture becomes clearer when all districts are grouped by islands and the normality test is considered along with data plots. Sumatra and Java-Bali, for example (Figure 6.2.), have their own "super-rich" districts that influence the skewness of the distribution curve. In Sumatra, these districts are Riau Islands, Kampar, Medan, Padang and Batam. The first two districts are known for their natural resources endowment (i.e. oil and gas), while the other three districts are major cities that serve as national hubs for both transportation and economic activities. In Java-Bali, four districts located in Jakarta, the capital city, together with Kudus (major cigarette producer) and Surabaya (the capital city of East Java Province) stand out as

outliers due to their high GDP per capita. The Shapiro-Wilk normality test also rejects the assumption of a normal distribution at the 5% level.

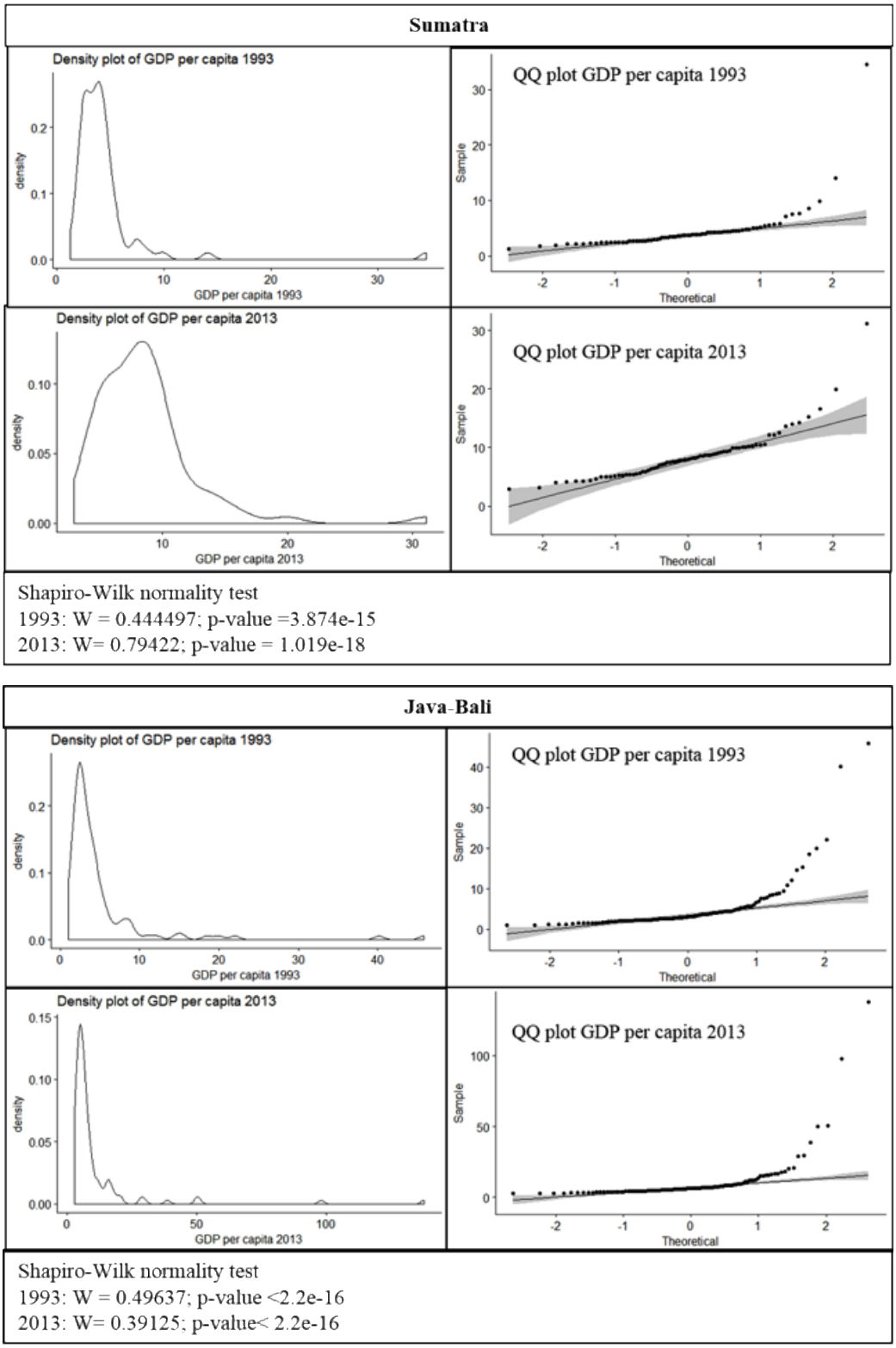


Figure 6.2. Normality Test and Plots GDP per Capita (Districts) for Sumatra and Java-Bali 1993 & 2013
(Source: Author's calculation based on BPS data)

Figures 6.3 and 6.4 show both normality tests and plots for the other three major islands: Kalimantan, Sulawesi and Eastern Islands. Although they are not as skewed as Sumatra and Java-Bali, Sulawesi and Kalimantan have several significant outlying districts (Figure 6.4). In Kalimantan, four districts that possess natural resources (e.g. coal, palm oil, oil), namely Pasir, Berau, Kutai and Balikpapan are significantly higher in terms of GDP per capita than other districts in Kalimantan. On the other hand, Bitung, Manado and Makassar – major cities in Sulawesi – also have significantly high GDP per capita. The Eastern Island is the only island that displays normal distribution over the GDP per capita data (Figure 6.3).

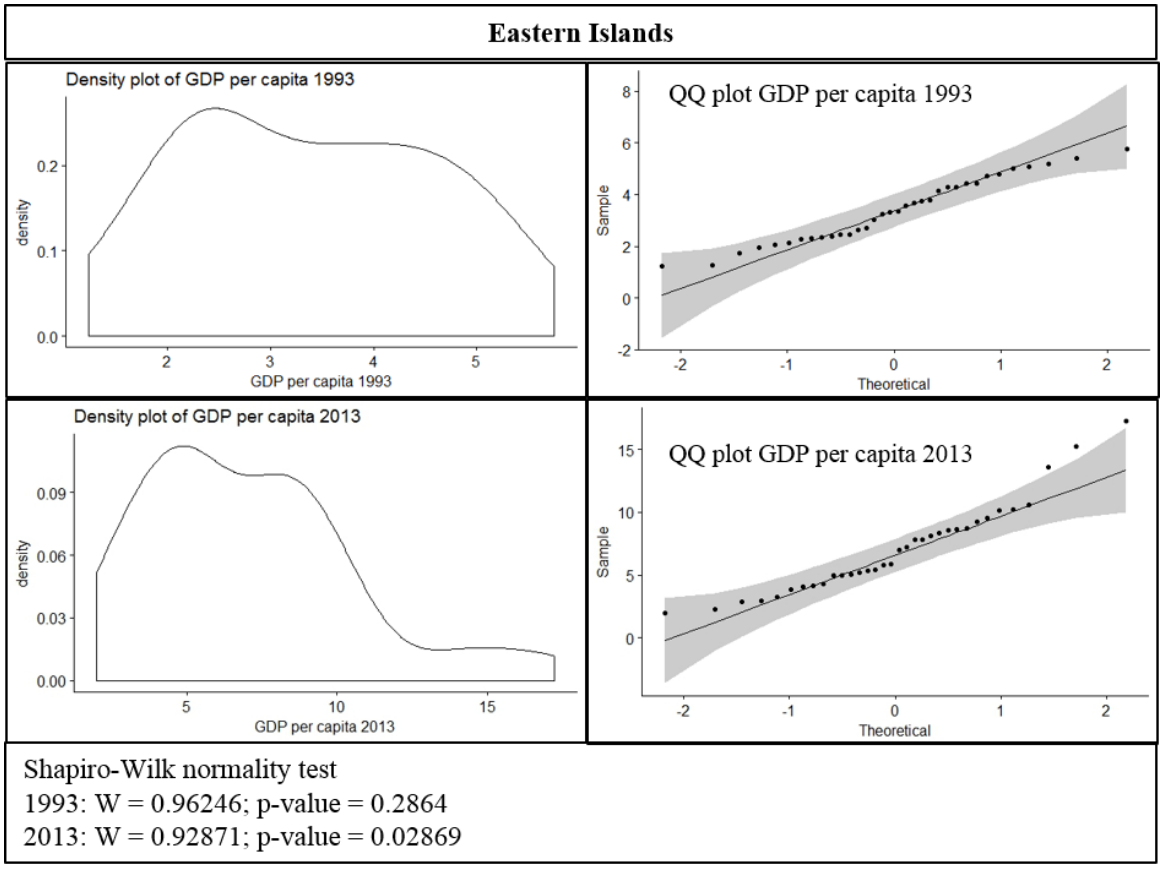
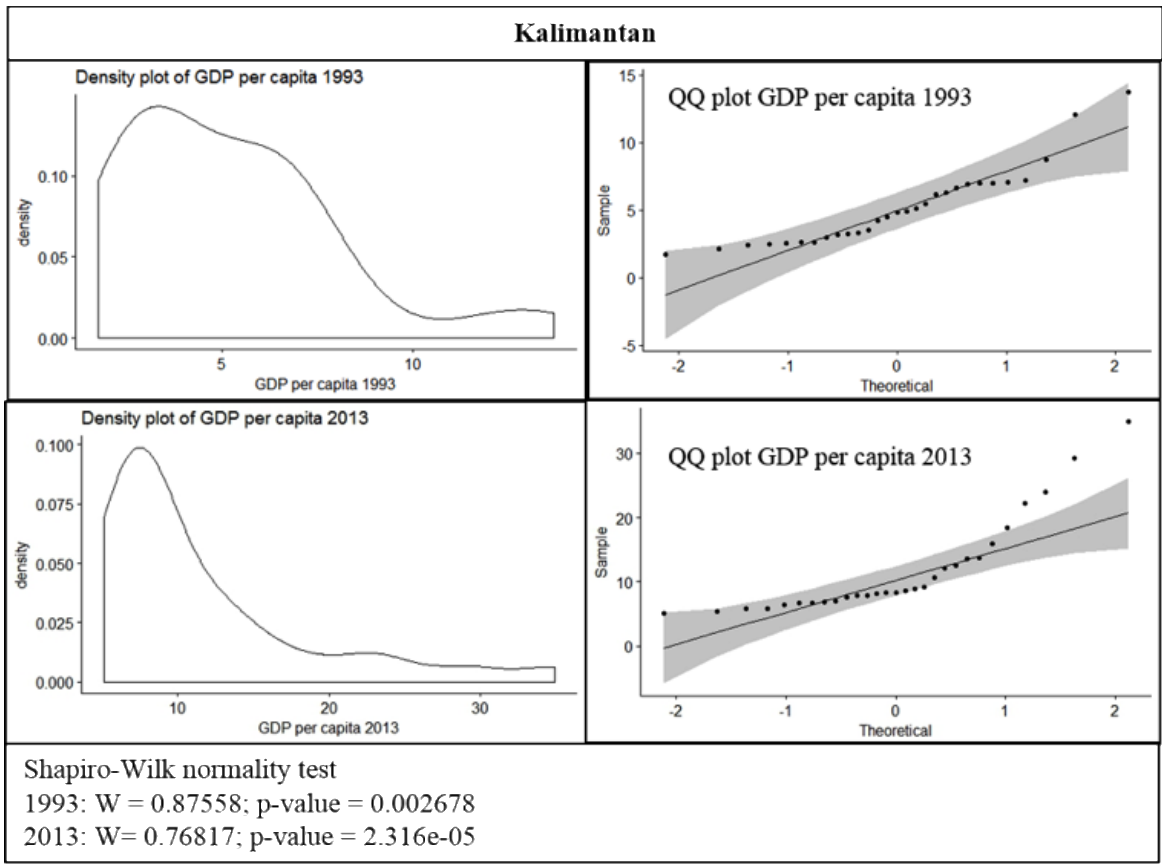


Figure 6.3. Normality Test and Plots GDP per Capita (Districts) for Eastern Islands 1993 & 2013
(Source: Author's calculation based on BPS data)



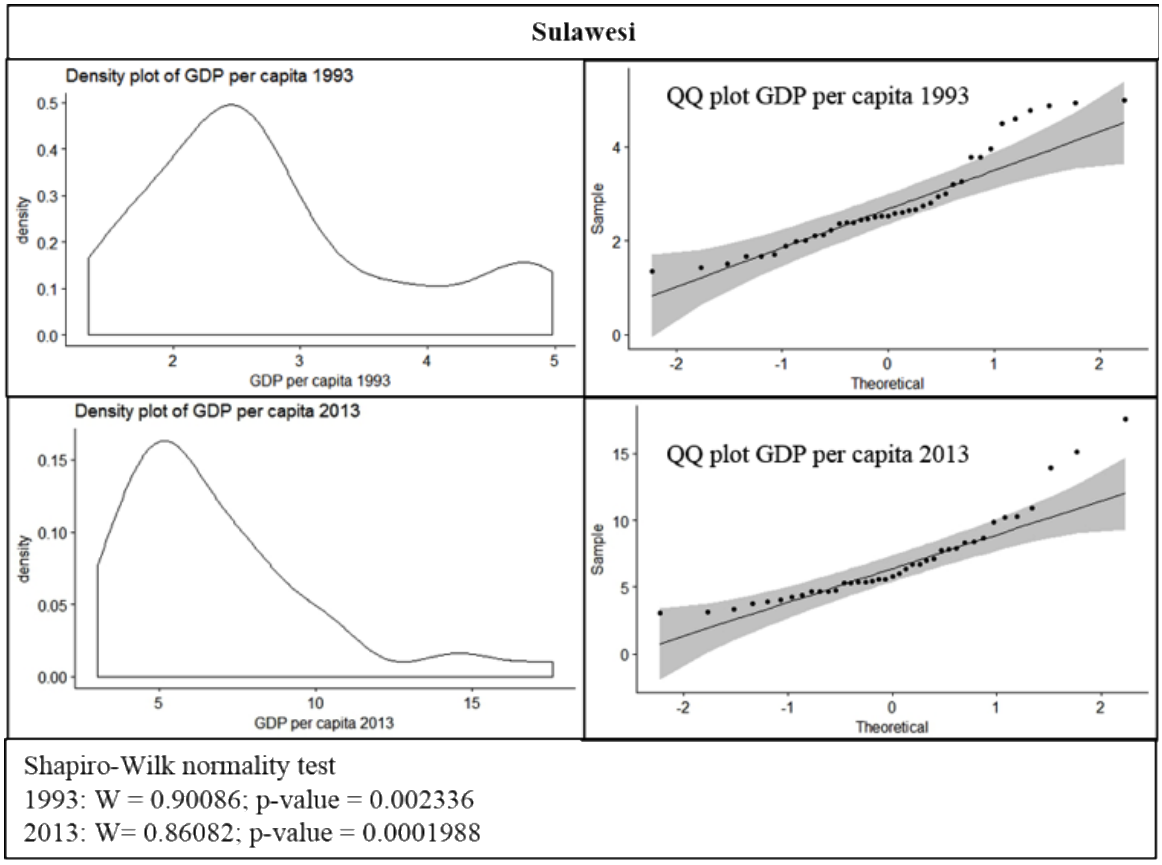


Figure 6.4. Normality Test and Plots GDP per Capita (Districts) for Kalimantan and Sulawesi 1993 & 2013

(Source: Author's calculation based on BPS data)

6.3. Convergence Analysis

Chapter Four indicated that the total inequality both "between" and "within" provinces remained stable during 1993-2013 and that the "within" province inequality slightly decreased during the period of 2003 to 2013. Exploring this trend in more detail, this section follows the methods used by previous researchers (see, for example, Aritenang, 2012; Garcia Garcia & Soelistianingsih, 1998; McCulloch & Sjahrir, 2008) to ascertain whether there has been regional convergence in economic growth rates at the district level in Indonesia.

As mentioned by Barro and Sala-i-Martin (1995), there are two ways to measure the convergence of economic growth. The first is known as *σ convergence*, which measures the dispersion of GDP per capita among districts in terms of changes in the standard deviation between time periods; *σ convergence* occurs if there is a decline in the dispersion of GDP per capita over time. The second is known as *β convergence*, the extent to which poorer regions catch up with richer regions and is estimated by the following equation (4) (Garcia Garcia & Soelistianingsih, 1998; McCulloch & Sjahrir, 2008), which is discussed previously in Chapter Three:

$$\ln(\frac{y_{it}}{y_{i0}})/t = a + \beta \ln y_{i0} + \mu_{it} \quad (4)$$

where *a* stands for the constant, β for the slope coefficient, which captures the convergence rate, *ln* stands for natural logarithm, y_{it} stands for the GDP per capita of district *i* at *t* time, y_{i0} for the GDP per capita of district *i* at the initial point, which is in 1993, and μ_{itt} stands for the error term which has mean zero, finite variance, and is independent over *t* and *i* (Garcia Garcia & Soelistianingsih, 1998; Young et al., 2008). The convergence hypothesis is that β should have a negative coefficient, reflecting a negative relationship between growth and initial log income. Summarising the convergence literature, Dey and Neogi (2015) show that the presence of β convergence is consistent with σ convergence, unless counterbalanced by high variance in random shocks. Accordingly, β convergence is necessary but not a sufficient condition for σ convergence (Young et al., 2008).

Taking into account the classification of time periods used in Chapter Four, it is possible to identify three distinct regimes: (1) 1993 to 1997, the pre-crisis era; (2) 1998 to 2001, the crisis period; (3) 2001 to 2013, the post-crisis/post-decentralization era. Accordingly, the β convergence model is estimated for the period of 1993 to 2013, but also for the three different regimes: 1993 to 1997, 1998 to 2001 and 2001 to 2013.

Overall, Figure 6.5 indicates that the dispersion of GDP per capita among districts during the period 1993 and 2013 was relatively stable, suggesting the absence of *σ convergence* across districts over this period. However, there is evidence that the degree of dispersion increased steadily from 1993 to 1998, before decreasing slightly from 1998 to 2000, and from 2000 until 2013 the degree of dispersion remained relatively stable. The increase during 1993 to 1998 might have been due to economic growth of Indonesia that began in the 1970s. It might be conjectured that districts with sectoral strength (e.g. oil and mining, manufacturing industry, tourism) grew faster than other districts, contributing to the increase of inequality. The downturn from 1998 to 2000 was most likely due to the financial crisis, which began at the end of 1997. Akita and Alisjahbana (2002) have argued that urbanised and well-developed districts were severely impacted by the crisis.

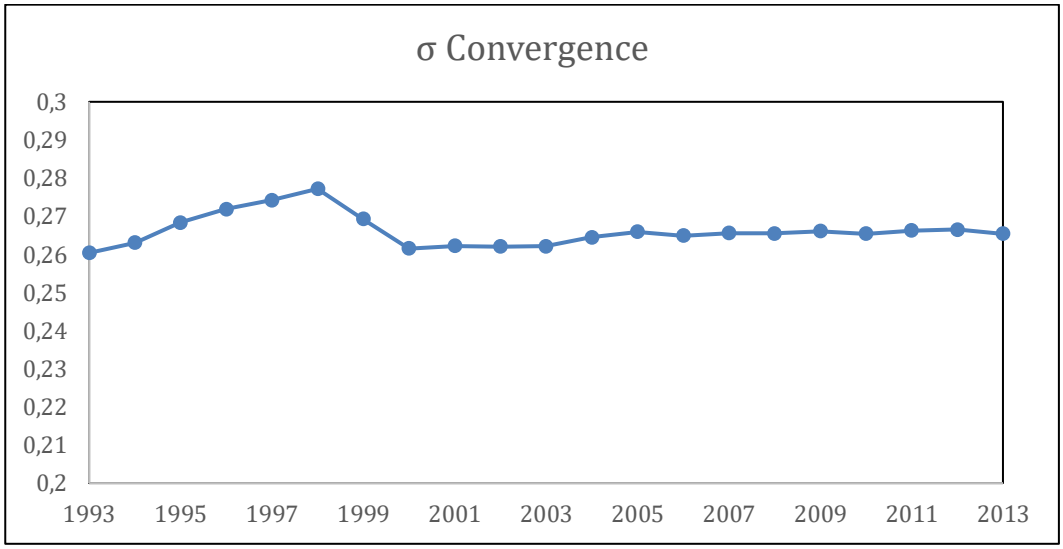


Figure 6.5. Dispersion of Districts GDP per Capita (*σ convergence*, 1993-2013)
(Source: Author's calculation based on BPS data)

A descriptive statistic over the natural logarithm of GDP per capita in 1993 and 2013, provided in Table 6.3 and Figure 6.6 below, confirms the result displayed in Figure 6.5. First, the steady value of Gini Coeffient and Theil Index, other measurements of income distribution, supports the fact that there had been no change in the dispersion of income among districts during 1993 to 2013. Second, the relatively small change in both skewness and kurtosis of the data distribution also provides evidence that the *σ* convergence had not been present (see Figure 6.6; blue graph is for 1993 data, red graph is for 2013 data).

Table 6.3. Summary Statistics of Log GDP per Capita 1993 and 2013
(Source: Author's calculation based on BPS data)

Statistic	1993 Log GDP per capita	2013 Log GDP per capita
Standard Deviation	0.260	0.265
Gini Coefficient*	0.38	0.38
Theil Index*	0.31	0.34
Skewness	1.11	1.073
Kurtosis	2.43	2.90

***** *Gini Coefficient and Theil Index were measured on the basis of real GDP per capita figures*

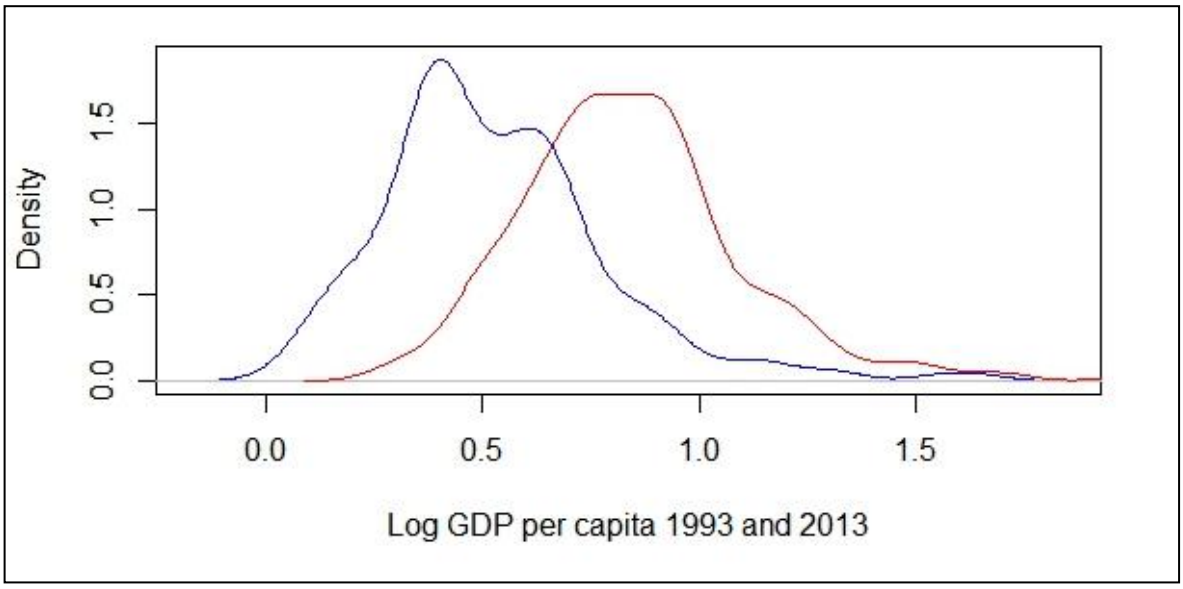


Figure 6.6. Density Plot of Log GDP per Capita 1993 and 2013
(Source: Author's calculation based on BPS data)

The calculation of *β convergence*, following the equation (4) can be seen in Table 6.4 and Figure 6.7. The results in all sub-periods indicate that there is evidence that poorer districts were catching up with their rich counterparts as shown by the minus figure of the slope of the regression line (β). The regression results of the convergence coefficient are statistically significant at the 5% level for all sub periods. The highest rate of convergence took place during 1993-1997 with the rate of 4%, with the slowest rate between 2001-2013 with the rate of 1.6%. Overall, the speed of convergence rate was quite slow, for only 0.6% throughout the period of 1993-2013, indicating a weak convergence.

The results suggest that the convergence rate during the pre-crisis era had never been achieved again after the financial crisis that took place in 1998. Convergence speed had been gradually decreasing over the sub-periods. One possible explanation is the implementation of the decentralisation system of government in 2001, which had provided districts governments with more authorities. Therefore, richer districts had been able to channel all their resources to gain more prosperity. On the other hand, given that the national government's ability to

redistribute the wealth among regions had been reduced, poor regions might have received less assistance in accelerating their economic growth. As observed by Firman (2009), it is true that decentralisation had reduced vertical imbalance between the central and district governments, however interregional inequality tended to increase.

Table 6.4. β Convergence of 291 Districts
(Source: Author's calculation based on BPS data)

Explanatory Variables	Dependent Variable (Annual Growth Rate of GDP per capita)**			
	1993-1997	***1998-2001***	***2001-2013***	***1993-2013***
Constant Parameter (*a*)	0.045 (19.4)*	0.0288 (7.313)*	0.0223 (36.22)*	0.0193 (20.729)*
ln GDP per capita 1993 (β)	-0.0408 (-10.37)*			
ln GDP per capita 1998 (β)		-0.0336 (-5.573)*		
ln GDP per capita 2001 (β)			-0.0156 (-17.53)*	
ln GDP per capita 1993 (β)				-0.0067 (-4.222)*
Adjusted R-squared	0.269	0.094	0.514	0.055

Figure in parentheses is t-test value
**Significant at the 5% level*
*** The annual growth rate is measured as $(\ln(y_{it}/y_{i0}))/t$, where t represents the number of years*

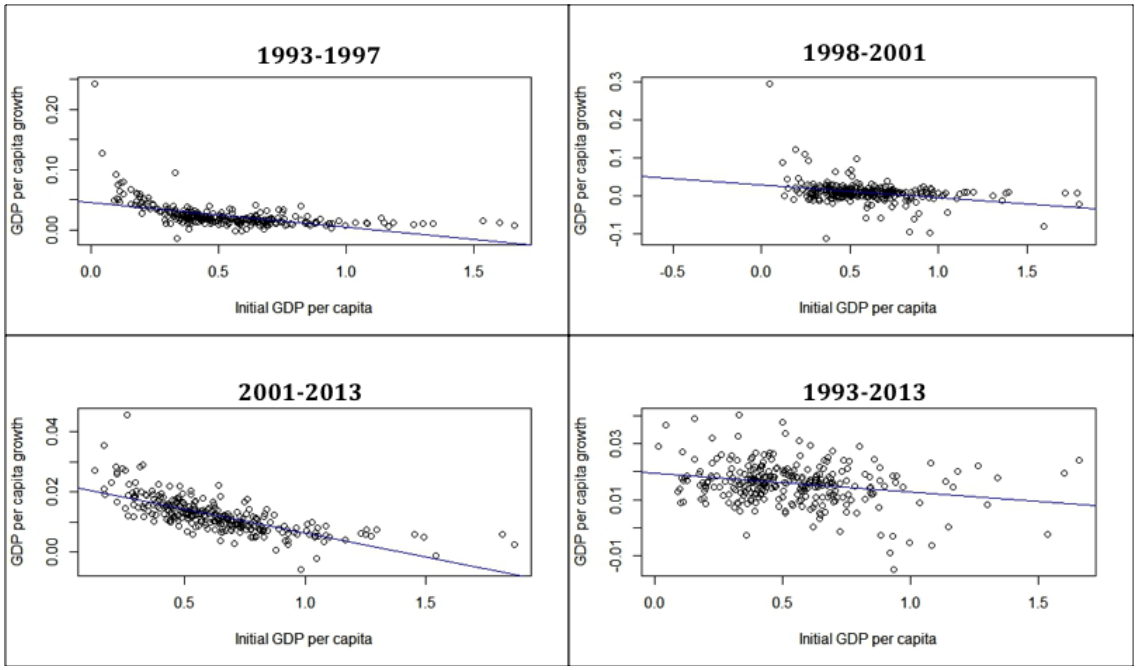


Figure 6.7. β Convergence Regression
(Source: Author's calculation based on BPS data)

6.4. Path Dependence Analysis

To test whether the economic growth path of districts in Indonesia during 1993-2013 display "path dependence" in the sense that is identified by Evolutionary Economic Geography, this research builds on and adapts the empirical model specification developed by Plummer and Tonts (2015), which is equation (5) as discussed before in Chapter Three. For simplicity of exposition, this model is limited to a first order autoregressive process with the possibility of a single structural break:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_2 I_{(t)} + \varepsilon_t \qquad \varepsilon_t \sim N(0, \sigma^2) \qquad (5)$$

y_t is the (log of) GDP per capita at year t, which depends upon the (log) GDP per capita of previous year, y_{t-1}, and the potential structural break, which shifts the long-run growth trajectory, $I_{(t)}$. Here, α_0 is the constant parameter, α_1 is a parameter which captures the out-of-equilibrium adjustment, α_2 is the location shift/structural break parameter. For this type of univariate process, path dependence is defined as a data generation process which is "both nonstationary and nonergodic" (Plummer & Tonts, 2015, p. 3). In this context, following Plummer and Tonts (2015), nonstationary means that the joint probability distribution of any pair of observations from y_t and y_s depends not only on *s*, the distance in time between the observations, but also on *t*, the time in the sample from which the pair is drawn. On the other hand, nonergodic means that the process of y_t generation displays changing statistical properties over time. The model in equation (2) assumes that for a nonstationary data generation process, if $\alpha_1 = 1$, then the data generation process of GDP per capita exhibits a path dependent stochastic trend process that is persistence over time; if $\alpha_1 < 1$, then the data generation process of GDP per capita exhibits convergence to equilibrium, indicating path independence (Plummer & Tonts, 2015; Tonts et al., 2014). Whereas, if α_2 is significant, then this indicates that there is a shift in the long-run equilibrium. Finally, ϵ_t is a white noise process, or a series of random shock to the model, which is assumed to be normally distributed, with mean equal to 0 and constant variance of σ^2.

To account for the possibility of a *stochastic trend*, equation (5) can be respecified and estimated as a time series ARIMA model. Conventionally, ARIMA models decompose the variability in a time series into three components: *Auto Regressive, Integrated,* and *Moving Average* (Chard, 2012). Here, an ARIMA model is denoted as ARIMA (p, d, q); where p stands for the Auto Regressive order; q for the Moving Average order; and d for the Integrated order. Following Box-Steffensmeir, Freeman, Hitt, and Pevehouse (2014), ARIMA can be

used to detect path dependence through a simple univariate linear time series model below, which is rewritten from the aforementioned equation (5):

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \epsilon_t \quad (7)$$

Equation (7) above resembles the first order of autoregressive model with constant coefficients. Following Freeman (2010) the solution is:

$$y_t = \alpha_0 \sum_{i=0}^{t-1} \alpha_1^i + \alpha_1^t y_0 + \sum_{i=0}^{t-1} a_1^i \epsilon_{t-1} \quad (8)$$

In this sense, path dependence can be observed not only from the impact of the initial condition to y_t , but also from the sequence of shocks, weighted by α_1 raised to different powers of *t* (Freeman, 2010).

In the application of ARIMA (p, d, q) model using equation (7) and (8), the 'p' order indicates the number of immediately preceeding values of y_t in the time series that are used to predict the current value of y_t. This is the same explanation for the "q" order in the model, with reference to the current regression result of the error. The Auto Regressive part indicates that the successive values of the variable of interest are regressed on its own prior values. For example, ARIMA (2, 0, 0), means that the value of y_{t-2} and y_{t-1} are used to predict y_t. The model is named as a second order auto-regressive (AR) model, given the value of p being 2. The AR model indicates path dependence due to the dependence on the *order* of past events. As for the ARIMA (0, 0, 1), the error terms ϵ_{t-1} is used to predict ϵ_t. This model, then, is named as a first-order of moving average (MA) model, given the value of q is 1. The Moving Average part indicates the lags of the forecast error. The AR model longer impact of the initial condition on the regression results, while the MA model indicates short-term impact (Chard, 2012; Coghlan, 2017).

The Integrated part of the ARIMA model indicates how many times the series needs to be differenced to achieve stationary (Chard, 2012). In other words, the order of integration identifies the degree of non-stationarity and, hence, whether a time series displays path dependence. Specifically, ARIMA (0, 1, 0) is a unit root process meaning that the data generation process displays path dependence in the sense that the long-run trajecotry depends on the degree of persistence, or memory, with respect to random "shocks". Again, following Freeman (2010), the unit root , or random walk model (Figure 6.8), can be written as:

$$y_t = y_{t-1} + \epsilon_t \tag{9}$$

, the solution is:

$$y_t = y_0 + \sum_{i=1}^{t} \epsilon_{t-1} \tag{10}$$

The solution is different to equation (8) as the initial condition, or the y_0 has lasting impacts over the y_t, but without the influence of the successive preceeding values of y_t. This also indicates path dependence on the *set* of previous events.

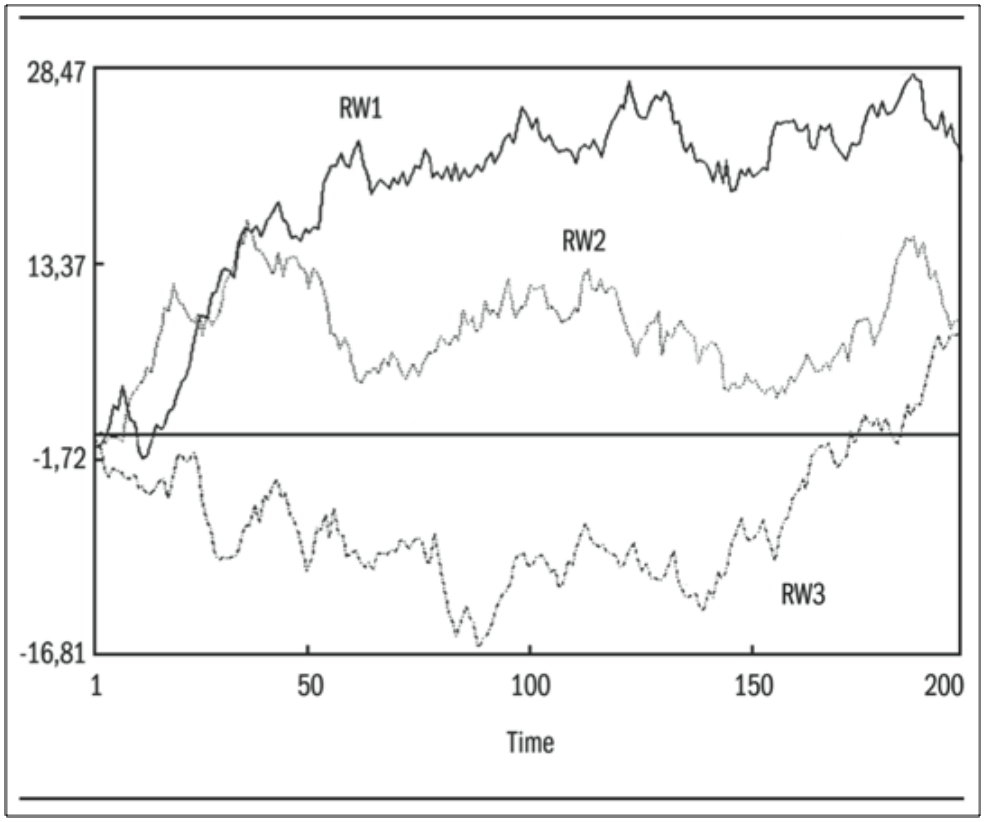


Figure 6.8. Three Realizations of Random Walk Process (RW1, RW2, RW3)
(Source: Adapted from Thome (2014, p. 201))

While estimating *the structural break* in equation (5), this research utilises the family of generalised fluctuation tests. The generalised fluctuation tests, according to Zeileis, Leisch, Hornik, and Kleiber (2002), fit the model and determine the structural break using the fluctuation in either the residuals or estimates of the model. For the purpose of this research, the fluctuation of the residuals is captured using both *cumulative sums of standardised residuals* as well as *moving sums of residuals* (Zeileis et al., 2002). These tests identify residuals that are outliers in the sense that they are significantly different from the other

residuals in the series. These tests are able to pinpoint the years in which the structural breaks are observed.

The analysis is provided for different administrative levels: national, island and districts, to better understand the process of path dependence at different spatial scales.

6.4.1. National and Island Levels

At the national level, the ARIMA (p, d, q) model displays an ARIMA (0, 1, 0), a unit root model, with drift. This means that the current y_t, or GDP per capita, at the national level depends on the y_0, the initial GDP per capita, with some deterministic trend, as reflected in the drift. It suggests that at the national level there is both an underlying (deterministic) growth trend and a path dependent process superimposed on that trend.

Table 6.5. Path Dependence at the National and Island Levels
(Source: Author's calculation based on BPS data)

Level	ARIMA	Structural Break(s)[13]
National Level	(0, 1, 0) with drift	1995, 2003, 2006, 2010
Island Level		
Sumatra	(1,1,0) with drift	1995, 2001, 2004, 2007, 2010
Java-Bali	(0,1,0) with drift	1995, 2004, 2007, 2010
Kalimantan	(0,1,0) with drift	1995, 2001, 2004, 2007, 2010
Sulawesi	(0,2,0)	1999, 2004, 2007, 2010
Eastern Islands (Maluku, Nusa Tenggara, Papua)	(0,1,0) with drift	1999, 2004, 2008

All results are significant at the confidence level of 95%

The similar pattern of a path dependent evolution of GDP per capita superimposed on an underlying long-run growth trend is also characteristic of the other four islands, namely Java-Bali, Kalimantan, Sulawesi and Eastern Island (see Figure 1.1. for map orienation). However, a different evolutionary trajectory is observed for the Sumatra Island, which displays a first-order of Auto Regressive model even after accounting for path dependence and a lon-run growth trend. The data generation process of y_t not only depends on the initial GDP per capita, but also the immediate previous year of the GDP per capita, which is y_{t-1} . This indicates that the evolution of GDP per capita in Sumatra displays a path dependence process both on the *set* and *order* of the previous events.

[13] The estimation provides a range of confidence interval for each break year. The analysis provided, therefore, not only uses the break year as the point of reference, but also the confidence interval range of the estimation.

Considering the structural breaks that are identified as significant there are four breaks that are significant at the national level: 1995, 2003, 2006 and 2010. These breaks can be interpreted in terms of some milestones in the economic growth of the country over this period. First, it is widely known that the Asian financial crisis hit most of the Southeast Asian countries during the period of 1997-1999. During the crisis, political turmoil was also taking place in Indonesia. Second, from 2001 until late 2012, there had been a "commodity boom" period for Indonesia, raising the price of both coal and palm oil (Henstridge, Chiappe, & Crawfurd, 2013; Wihardja, 2016). In particular, there were two points in which the price had risen significantly, as observed by Wihardja (2016), between 2003-2007 and 2009-2010 (see Figure 6.9). Third, there was also the global financial crisis which occurred in 2008-2009, which impacted the country export rate in 2009 (The World Bank, 2015).

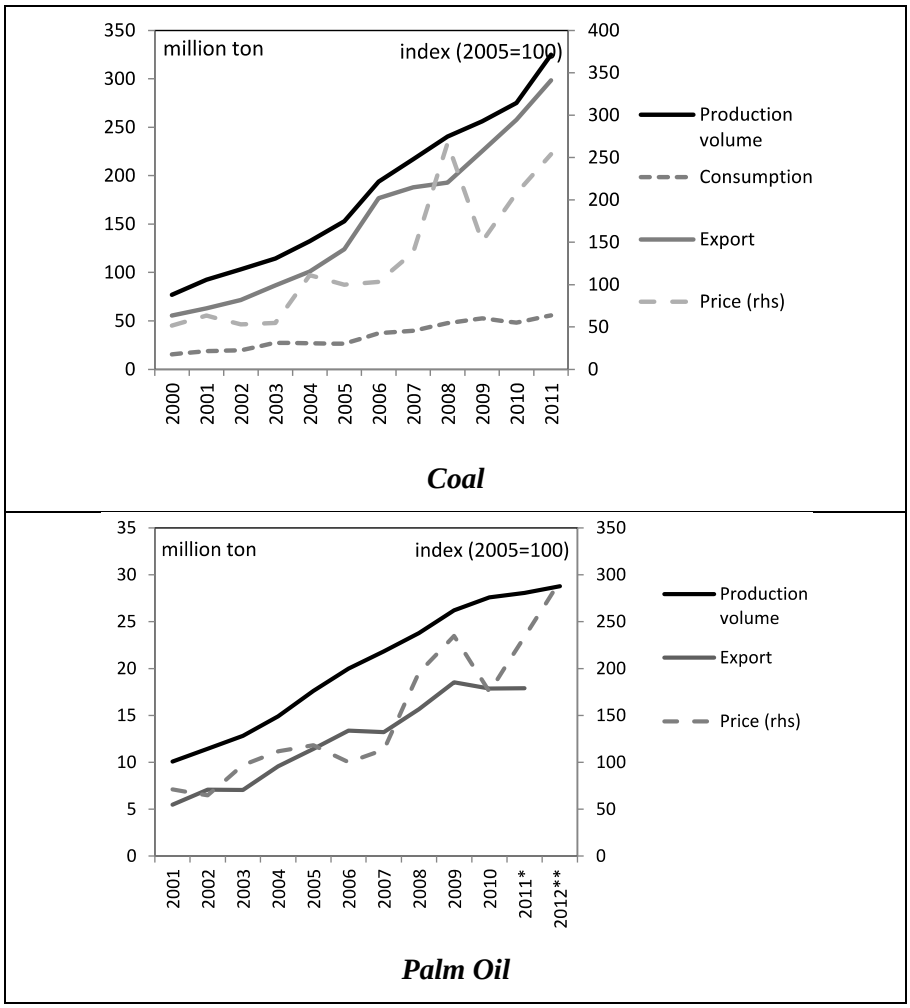


Figure 6.9. Coal and Palm Oil Trend 2000-2012
(Source: Adapted from Henstridge et al. (2013, pp.2-3))

Putting the breaks observed in Table 6.5. in such context explains that the break which happened in 1995 was likely due to the Asian financial crisis. It was true that the crisis severely hit Indonesia in 1997. However, the exchange rate of Rupiah, the country's currency, had started to appreciate from 1995, which led to the slowing down of manufactured export

growth as well as the deterioration of current acount defisit due to rising imports value (Stern, 2003). The breaks in 2003 and 2006 were due to the rising price of both coal and palm oil, boosting the economic growth of the country. Lastly, the break observed in 2010 was likely due to the slowing down of the export rate as a consequence of the global financial crisis in 2008 to 2009.

At the island level, the pattern of the breaks are slightly different from that of the national level. This partly reflects a time lag, as these "shocks" diffused through the Indonesian regional economic system. On the other hand, the breaks were still consistent with the aforementioned milestones. While the breaks observed in Java-Bali, Sulawesi and Eastern Island are similar to the national breaks, the pattern of structural breaks is different for Sumatra and Kalimantan, which have exactly the same break years: 1995, 2001, 2004, 2007 and 2010. The breaks in 1995, 2004, 2007 and 2010 can be linked to the explanation at the national level. Accordingly, those years were related to the Asian financial crisis, the peaks of commodity boom period (2004 and 2007) and the global financial crisis. The additional break in 2001, which marked the beginning of the commodity price boom, was interesting, since it was not recorded at the national level. Sumatra and Kalimantan have been known as the major contributors of coal and palm oil, two commodities that were on the rise during the boom of the country. It is likely that in 2001, the rising price of these two commodities caused a significant deviation to both Sumatra's and Kalimantan's development path.

6.4.2. District Levels

The analysis of the district level path dependence is undertaken with the reference to Appendix 6, which displays the result of the equation (5) estimation for all relevant districts.

Districts in Sumatra Island mostly display different dynamic characteristics from the island's ARIMA model. Recall that the Sumatra Island displays a path dependence first-order autoregressive ARIMA (1,1,0) model. However, across Sumatra Island, 60 out of 73 districts were displaying a path dependent (unit root) model (ARIMA (0,1,0)), without any short-run auto-regressive component (Table 6.6.). This indicates that in most districts in Sumatra, the current GDP per capita displays persistence, or memory, in the sense that it is influenced by y_0, the initial GDP per capita in 1993. Furthermore, there were only 4 districts that exhibit a significant auto-regressive component at the 5% level. Interestingly, one out of these 4 districts, namely Tanah Datar district, displays a second order auto-regressive model, an ARIMA (2,0,0). This indicates that two immediate past values of GDP per capita, which are y_{t-1} *and* y_{t-2}, have been impacting the current GDP per capita (y_t). This means that the evolution

of GDP per capita of the district displays path dependence on the *order* of the previous events. More interesting, 9 out of the total 73 districts exhibit moving-average components (all of them are first-order moving average models), along with the presence of unit root. This means that, despite the short-term influence of immediate past error term, the ε_{t-1}, over the current GDP per capita, it is still under the influence of y_0 over the long-term. Therefore, the evolution of GDP per capita of these districts exhibit path dependence with short-run adjustment over the out-of-equilibrium movement.

In regards to the presence of structural breaks, all districts display the structural breaks, despite different numbers of breaks and years (see Appendix 6). While five points of break can be found at the island level: 1995, 2001, 2004, 2007, 2010 (see Table 6.5.), breaks at the district level range from one up to five. All break years can also be explained by referring to the aforementioned Sumatra Island's structural breaks explanation.

Table 6.6. Estimation of Equation (5) for Districts in Sumatra Island
(Source: Author's calculation based on BPS data)

#	ARIMA (p,d,q)	# of Districts	Definition
1.	ARIMA (0,1,0)	60	y_t is influenced by y_0 over the long-run
2.	ARIMA (1,1,0)	2	y_t is influenced by y_{t-1} and y_0 over the long-run
3.	ARIMA (1,0,0)	1	y_t is influenced by y_{t-1} over the long-run
4.	ARIMA (2,0,0)	1	y_t is influenced by y_{t-1} and y_{t-2} over the long-run
5.	ARIMA (0,1,1)	9	ε_t is influenced by ε_{t-1} over the short-run; but, y_t is still influenced by y_0 over the long-run
Total Districts		**73**	

Similar with Sumatra, districts in Java-Bali island exhibit a different ARIMA model with the island spatial scale (Table 6.7.). While Java-Bali island displays a unit root, which is also true for 103 districts, 13 districts exhibit a first-order auto-regressive model indicating path dependence on the *order* of previous events. On the other hand, all districts also exhibit significant structural breaks, ranging from one to five points of break. Recall that Java-Bali only displays four points of break, which are 1995, 2004, 2007 and 2010 (see Table 6.5).

Table 6.7. Estimation of Equation (5) for Districts in Java-Bali Island
(Source: Author's calculation based on BPS data)

#	ARIMA (p,d,q)	# of Districts	Definition
1.	ARIMA (0,1,0)	76	y_t is influenced by y_0 over the long-run
2.	ARIMA (1,1,0)	9	y_t is influenced by y_{t-1} and y_0 over the long-run
3.	ARIMA (1,0,0)	13	y_t is influenced by y_{t-1} over the long-run
4.	ARIMA (0,1,1)	18	ε_t is influenced by ε_{t-1} over the short-run; but, y_t is still influenced by y_0 over the long-run
Total Districts		**116**	

The majority of districts in Kalimantan follow the ARIMA model displayed at the island level (Table 6.8.), an ARIMA (0,1,0), indicating path dependence on the evolution of their GDP per capita. Interestingly, out of 4 districts without the presence of unit root, one district shows an ARIMA (2,0,0) model, which is the District of Barito Kuala, indicating path dependence on the *order* of previous events. Again, structural breaks are also observed significantly in all districts, and the maximum points of break are five points. These points are mostly similar with the breaks at the island level: 1995, 1999, 2004, 2007, and 2010.

Table 6.8. Estimation of Equation (5) for Districts in Kalimantan Island
(Source: Author's calculation based on BPS data)

#	ARIMA (p,d,q)	# of Districts	Definition
1.	ARIMA (0,1,0)	23	y_t is influenced by y_0 over the long-run
2.	ARIMA (1,0,0)	2	y_t is influenced by y_{t-1} over the long-run
3.	ARIMA (2,0,0)	1	y_t is influenced by y_{t-1} and y_{t-2} over the long-run
4.	ARIMA (0,1,1)	2	ε_t is influenced by ε_{t-1} over the short-run; but, y_t is still influenced by y_0 over the long-run
5.	ARIMA (0,0,1)	1	ε_t is influenced by ε_{t-1} over the short-run
Total Districts		**29**	

While Sulawesi displays a similar pattern to the three aforementioned islands, there are two notable phenomena which can be observed (Table 6.9*)*. *First*, a significant number of districts (14 districts) display a first-order moving-average model, while at the same time they also exhibit unit root, indicating path dependence with a short-run adjustment over the out-of-equilibrium movement. *Second*, there is one district that exhibits an unusual ARIMA (0,0,0) model. This suggests that the evolution of GDP per capita of this district exhibits path independence. The district is Kolaka, which also does not display any structural breaks. Other districts, however, display significant structural breaks, which are similar to the break points

at the island level (i.e. 1999, 2004, 2007 and 2010). These two phenomena indicate that, as previously also noted in Sumatra, different spatial levels may exhibit quite different path dependence models.

Table 6.9. Estimation of Equation (5) for Districts in Sulawesi Island
(Source: Author's calculation based on BPS data)

#	ARIMA (p,d,q)	# of Districts	Definition
1.	ARIMA (0,1,0)	22	y_t is influenced by y_0 over the long-run
2.	ARIMA (1,1,0)	2	y_t is influenced by y_{t-1} and y_0 over the long-run
3.	ARIMA (0,0,0)	1	The model exhibits uncorrelated error
4.	ARIMA (0,1,1)	14	ε_t is influenced by ε_{t-1} over the short-run; but, y_t is still influenced by y_0 over the long-run
Total Districts		**39**	

The majority of districts follow the path dependence model at the island level in the Eastern Islands (ARIMA (0,1,0)), indicating the presence of path dependence over the evolution of GDP per capita. There were only a handful of districts that did not display unit root (Table 6.10). All districts also exhibit significant structural breaks, ranging from one to five points. The numbers of the breaks observed at the district level are quite varying, from one up to five break points. This is interesting given the breaks observed at the island level were only three points: 1999, 2004 and 2008.

Table 6.10. Estimation of Equation (5) for Districts in Eastern Islands
(Source: Author's calculation based on BPS data)

#	ARIMA (p,d,q)	# of Districts	Definition
1.	ARIMA (0,1,0)	26	y_t is influenced by y_0 over the long-run
2.	ARIMA (1,1,0)	1	y_t is influenced by y_{t-1} and y_0 over the long-run
3.	ARIMA (1,0,0)	2	y_t is influenced by y_{t-1} over the long-run
4.	ARIMA (2,0,0)	1	y_t is influenced by y_{t-1} and y_{t-2} over the long-run
5.	ARIMA (0,1,1)	4	ε_t is influenced by ε_{t-1} over the short-run; but, y_t is still influenced by y_0 over the long-run
Total Districts		**34**	

6.5. Conclusion

Summarising the analysis undertaken in this chapter :

First, at the district level, there has been a weak convergence, indicating that poor districts are slowly catching up to their richer counterparts in terms of GDP per capita growth (beta convergence). This weak convergence contributes to the unchanged dispersion of GDP per capita during the period of 1993 and 2013 (sigma convergence). This is consistent with the persistence of inequality levels (measured by Theil Index and Gini Coefficient) as discussed in Chapter Four. This finding also provides a new insight on the regional inequality in Indonesia if compared to previous reserch. At the provincial level, Garcia Garcia and Soelistianingsih (1998) found both beta and sigma convergence during the period of 1975 to 1993. On the other hand, McCulloch and Sjahrir (2008) and Aritenang (2012) observed the beta convergence among districts during 1993 and 2005; however, they did not calculate for the sigma convergence.

Second, by using a simple ARIMA model specification, there is evidence of the significant impact of history, represented by the past values of GDP per capita, on the economic growth of the country. This is true since figures at the national and island levels exhibit unit root model, or path dependence on the *set* of events. On the other hand, at the district level, a majority of the districts exhibit either unit root or auto-regressive models (path dependence on the *order* of events).

Third, while the evidence of path dependence at the national level is consistent with that observed at the island level, there are significantly different evolutionary trajectories observed at the district level. For example, Sumatra exhibits a first-order auto-regressive (AR) structure, whereas the AR component was missing in most districts in Sumatra. Another example is Sulawesi. While a majority of districts exhibit significant structural breaks, as observed at the island level, a single district manages to be different by exhibit no structural break. This is also true, albeit in a lesser extent, for other islands. The message is clear that different evolutionary trajectories may be present at the different spatial scales and there exists a degree of heterogeneity within spatial scales.

Finally, as observed by Tonts et al. (2014) and Plummer and Tonts (2015), the stochastic trend (α_1) may present simultaneously with the structural break (α_4). This indicates that both the impact of past values GDP per capita as well as shocks influence the emergence of current GDP per capita and shape the development path of each district.

The subsequent chapter is devoted to resolving the cause of the path dependency in order to meet the fourth objective of this research (see Chapter One). This is achieved by focusing upon the role of institutions, in the form of government policy, as previously discussed in Chapter Two.

Chapter Seven
The Impact of Spatial Planning Policy to the Geography of Uneven Development In Indonesia

7.1. Introduction

Chapter Six identified that the economic growth of districts in Indonesia displayed path dependence. This chapter focuses upon the underlying determinants of the economic growth of these districts. In particular, this chapter tests how spatial planning policy, one of the forms of institution, has impacted on the economic growth of districts, and thus, influenced the geography of uneven development in Indonesia.

Previous research exploring regional growth determinants across Indonesia is somewhat limited. At the provincial level, Garcia Garcia and Soelistianingsih (1998) conducted research over the period of 1976 to 1994 with Vidyattama (2010) updating the results for the period of 1985 to 2005. They identified four possible growth determinants, namely public investment, population growth, education and infrastructure provision. These variables were selected not only because they were available for the time of observation, but also because studies have found that these are appropriate measures of economic growth (Durlauf & Quah, 1999). Public investment was measured as the ratio of the amount of capital expenditure to GDP in each province; population growth was measured by the percentage change in the number of persons; education was measured by the average of years schooling; and infrastructure was measured by the ratio of road length to the size of the population. They have found that the education and infrastructure provision contributed positively to the economic growth of provinces in Indonesia. On the other hand, public investment contributed negatively to the economic growth. Interestingly, population growth was observed to have negative impact on the economic growth in the Garcia Garcia and Soelistianingsih's (1998) study, but was not significant in the Vidyattama's (2010) study.

At the district level, studies by Aritenang (2012), Aritenang and Sonn (2018) and McCulloch and Sjahrir (2008) that covered the period of 1993-2005 chose three potential growth determinants: national government transfer fund, population, education and infrastructure provision. The selection of variables was not only driven by the data availability, but also because these variables had been found as appropriate growth determinants in cross-country

analysis (Barro & Sala-i-Martin, 1995; Durlauf & Quah, 1999). Each of these variables are measured by, respectively, transfer fund per capita, share of people in urban area, share of people in primary/secondary school, share of villages with asphalt roads and numbers of households with telephone connection. Their findings are mixed. In McCulloch and Sjahrir's (2008) study, population was found to contribute positively to the economic growth of the districts, along with education. These two variables, however, were found to be insignificant in Aritenang's (2012) and Aritenang and Sonn's (2018) studies. Infrastructure and transfer fund from the national government to districts were found to contribute positively to the economic growth in Aritenang's (2012) and Aritenang and Sonn's (2018) studies. On the other hand, infrastructure provision was found to be insignificant in McCulloch and Sjahrir's (2008) study. Another study by de Silva and Sumarto (2014) confirmed the positive contribution of both education and national government transfer fund to the economic growth of districts in Indonesia.

In addition to those factors that were identified as growth determinants across Indonesia, this research considers the potential impact of spatial planning policies on the geography of uneven development at the district level. It is assumed that districts in Indonesia that are included in the spatial planning policies, namely the National Strategic Area, the Urban Hierarchy and the Regional Cluster (as elaborated in Chapter Five), have a better chance to achieve higher GDP per capita growth. To explore the significance of these variables at the district level a panel data regression is estimated that includes the aforementioned growth determinant variables with additional dummy variables representing each of the spatial planning policies. These dummy variables are categorical variables consisting of 1 for the districts included in the policy, 0 otherwise. Given that there are no precise measurements of the ways in which these policies have been implemented, this thesis provides additional qualitative information based on a series of interviews with government officials[14] as well as governments' publications. Interpretation of this qualitative information is used to triangulate the empirical evidence generated by the panel data analysis and gain insights into the role of institutions in determining the evolving geography of economic development across Indonesia.

[14] In citing interviewees' opinions, this chapter refers to abbreviations provided in Table 5.5 (Chapter Five).

7.2. Overview of the Districts and the Spatial Planning Policies

Each of the three spatial planning policies under consideration - the Regional Cluster (RC), the Urban Hierarchy (UH) and the National Strategic Area (NSA) - have different aims. RC and UH aim to redistribute growth, by supporting the transmigration program implemented by the national government (NGPW5). This transmigration program, which began during the 1970s, redistributed people from Java to other islands outside Java (Hardjono, 1986; Rigg, 1991). This is because the national government considered that economic and population growth were too concentrated in Java (MacAndrews, 1978). On the other hand, the National Strategic Area (NSA) was designed to secure the interest of the national government in areas that were identified as being economically strategically significant. According to the National Spatial Plan 47/1997 and 26/2008, the development of the Urban Hierarchy (UH) and the National Strategic Area (NSA) is supported by the national government through the provision of basic infrastructure, such as roads and electricity. On the other hand, the responsibility for developing RC was given to the local governments, with no or minimum assistance from the national government. Local governments, however, were obliged to prioritise those RCs in their local budgets. It is therefore expected that regions stipulated in these three policies performed better in terms of economic development in comparison to those that were not included in the policy initiatives.

Chapter Four discusses the dynamics of economic growth across districts in Indonesia. This chapter elaborates on this discussion, providing an overview of the economic growth across districts in terms of the aforementioned spatial planning policy initiatives. The period of coverage is 1998 to 2013, given that the Government Regulation 47/1997 on the National Spatial Plan in was stipulated in December 1997, and thus expected to take effect in 1998. The measurement of economic performance is real GDP per capita (without oil and gas). The top 20 districts with GDP per capita in 5-year intervals during 1998 to 2013 with their relevant policies in 2013 are presented in Table 7.1.

From Table 7.1, it can be seen that those districts that were in the list of the top 20 were consistent across years of observation, with the addition of only 7 districts (in italic fonts). It is also the case that all of the districts on the list in 2013 are stipulated in at least one policy, with the exception Kutai and Pasir Districts. These two districts are located in East Kalimantan and have been well known for their abundant natural resources endowment, such as oil and coal. The geographical distribution of these 20 top districts for the years 1998 to 2013 is depicted in Figures 7.1 and 7.2.

Table 7.1. Top 20 Districts by GDP per Capita
(Source: Author's analysis)

#	Years				Policies**		
	1998	**2003**	**2008**	**2013**	**National Strategic Area**	**Regional Cluster**	**Urban Hierarchy**
1	Batam (city)	Kediri (city)	Central Jakarta	Central Jakarta	X	X	X
2	Kediri (city)	Central Jakarta	Kediri (city)	Kediri (city)	-	X	X
3	Central Jakarta	North Jakarta	North Jakarta	North Jakarta	X	X	X
4	Riau Islands	Batam (city)	South Jakarta	South Jakarta	X	X	X
5	North Jakarta	South Jakarta	Batam (city)	Surabaya (city)	X	X	X
6	South Jakarta	Surabaya (city)	Kutai	Kutai	-	-	-
7	Berau	West Jakarta	Surabaya (city)	Batam (city)	X	X	X
8	Surabaya (city)	Kutai	East Jakarta	West Jakarta	X	X	X
9	West Jakarta	East Jakarta	West Jakarta	Berau	-	-	-
10	Kutai	Berau	Balikpapan (city)	East Jakarta	X	X	X
11	East Jakarta	Cirebon (city)	Berau	Balikpapan (city)	-	X	-
12	Cirebon (city)	*Samarinda* (city)*	*Pasir*	Pasir	-	-	-
13	Gresik	Tangerang (city)	Samarinda (city)	Malang (city)	-	X	X
14	Kampar	*Balikpapan (city)*	Cirebon (city)	Cirebon (city)	-	X	X
15	Tangerang (city)	*Bekasi*	Tangerang (city)	Medan (city)	X	X	X
16	Kudus	Gresik	*Medan (city)*	Samarinda (city)	-	X	X
17	Sidoarjo	Malang (city)	Kudus	Tangerang (city)	-	X	-
18	Malang (city)	Semarang (city)	Malang (city)	Kudus	-	X	X
19	North Barito	*Kotabaru*	Kotabaru	*Manado (city)*	X	X	X
20	Tabanan	Kudus	Bekasi	*Jayapura (city)*	-	X	X

**Italic means new districts that were not in the list in previous years*
***Policies refer to districts in 2013 only*

Figure 7.1. Top 20 Districts by GDP per Capita in 1998

Figure 7.2. Top 20 Districts by GDP per Capita in 2013

The geographical distribution of the top 20 districts was mainly located in two major islands, Java and Kalimantan. West and East Java, in particular, are known for their strength in service and manufacturing industries, whereas East Kalimantan is a rich province with oil, gas and coal. It can also be observed that a few districts in the eastern part of the country (i.e. Manado in Sulawesi Island and Jayapura in Papua Island) managed to join their richer counterparts in 2013.

In terms of the bottom 20 districts, (Table 7.2.) the picture was relatively more dynamic. Fourteen districts (in italic fonts) were added to the list across the years of observation. All districts, however, were excluded from the National Strategic Area (NSA) policy. A handful of districts, however, had been stipulated as either Urban Hierarchy (UH) or Regional Cluster (RC) districts.

Table 7.2. Bottom 20 Districts by GDP per Capita
(Source: Author's analysis)

#	Years				Policies**		
	1998	2003	2008	2013	National Strategic Area	Regional Cluster	Urban Hierarchy
1	Temanggung	West Sumba	West Sumba	West Sumba	-	-	-
2	North Tapanuli	*Central Maluku*	Manggarai	Manggarai	-	-	-
3	Jayawijaya	Manggarai	Central Maluku	Central Maluku	-	-	-
4	West Sumba	Grobogan	Belu	Jayawijaya	-	-	-
5	South Central Timor	South Central Timor	North Central Timor	North Central Timor	-	-	-
6	Manggarai	West Aceh	East Flores	South Central Timor	-	-	-
7	Grobogan	Jayawijaya	South Central Timor	East Flores	-	-	-
8	West Aceh	Kebumen	Alor	Alor	-	-	-
9	Maros	Tegal	Jayawijaya	Grobogan	-	-	-
10	Tegal	Purbalingga	Grobogan	Blora	-	-	-
11	Alor	*North Central Timor**	Kebumen	Wonosobo	-	-	X
12	Kebumen	*Wonosobo*	*Pamekasan*	*Ngada*	-	-	-
13	Jeneponto	Banyumas	Pemalang	Kebumen	-	X	X
14	Belu	Central Lombok	*Blora*	*West Aceh*	-	-	-
15	Ogan Komering Ilir (OKI)	*East Flores*	Wonosobo	*South East Maluku*	-	-	-
16	Central Lombok	Belu	Tegal	Tegal	-	-	-
17	Banyumas	Jeneponto	Central Lombok	Gorontalo	-	X	-
18	Brebes	*East Timor*	Jeneponto	*East Lombok*	-	-	-
19	Tegal (city)	Alor	*Gorontalo*	Jeneponto	-	X	X
20	Purbalingga	*Pemalang*	*Pacitan*	Pemalang	-	X	-

**Italic means new districts that were not in the list in previous years*
***Policies refer to districts in 2013 only*

The geographical distribution of these 20 bottom districts for the years 1998 and 2013 (Figures 7.3. and 7.4.) reveals that most districts are located in Central Java and South East Nusa islands (located east of Bali). Despite being located in the prosperous island, the Province of Central Java had been known for its poverty due to the lack of resources and the dense population. On the other hand, South East Nusa had been known as an infertile region, with lack of rain. A shifting of geographical distribution towards the east of the country can be observed in 2013, with the emergence of several districts in Papua and Maluku, islands located west of Papua.

Figure 7.3. Bottom 20 Districts by GDP per Capita in 1998

Figure 7.4. Bottom 20 Districts by GDP per Capita in 2013

On the basis of the description above, two observations can be made. First, indicatively, National Strategic Area (NSA) appeared to be associated with economic development of districts. This is shown by the fact that almost all districts at the top 20 GDP per capita rank are included in the NSA, and none of the bottom 20 districts were included in the NSA. Second, Urban Hierarchy (UH) and Regional Cluster (RC) policies, on the other hand, had

been found to be associated with the top 20 districts, but at the same time were also found in a few bottom 20 districts.

An initial explanation to these observations can be proposed. The responsibility for developing RC districts is decentralised to the local government. This is in contrast with the NSA districts, which are fully supported by the national government. This factor may hamper the development of some RC districts, given the limited budget of some regencies or municipalities. This reason, however, does not apply for the UH, which also has full support from the national government. To further explore this contradiction, a panel data analysis is undertaken, controlling districts that had not been stipulated in one of these policies.

7.3. Panel Data Analysis

Panel data analysis is undertaken to gain more insight into the impact of spatial planning policies in the economic growth of districts. Panel data analysis is appropriate because of the spatial-temporal data coverage, combining time-series (multi years, expanding from 1993 to 2013) and cross-sectional data (various districts). The following section elaborates the model specification, choice and measurement of explanatory variables, and the empirical results.

7.3.1. Model Specification and the Data

This research employs an extension of the growth regression model given in Vidyattama (2010) and Caselli et al. (1996), or the aforementioned equation (6) in Chapter Three:

$$\ln y_{it} = \alpha_0 + \alpha_1 \ln y_{it-1} + \alpha_z \ln(Z')_{it} + \alpha_d pol_{it} + dy_t + \eta_i + u_{it} \qquad (6)$$

where y_{it} is the proxy for economic growth, which is GDP per capita district *i* at time *t*, α_0 is a constant, $\alpha_1 = 1 + \beta$, which is the rate of convergence between t-1 and t, Z'_{it} contains the suite of explanatory variables for district *i* at time *t*, α_z is the parameter for each explanatory variable, pol_{it} is dummy variable for districts stipulated in particular spatial planning policies (it has binary values: 1 for districts included in the policy inititiave, 0 otherwise) dimensioned by *t*, α_d is the parameter of each policy dummy variable, dy_t is dummy variable for time *t*, η_i is the unobserved districts effect and μ_{it} is the error term which is assumed to be normally distributed, with mean equal to 0 and constant variance of σ^2.

Common explanatory variables used in growth study in Indonesia are as follow:

1. *Transfer funds from the national government to local goverments ($tf.pc_{it}$)*. Following the implementation of power decentralisation in Indonesia, fiscal decentralisation has been applied since 2001. As observed by Oates (1993), transfer funds may accelerate economic growth at the local level. It is because transfer funds are spent for development by local governments, which have more ability than the national government to respond to local characteristics and differences. It is, thus, expected that transfer funds have significantly impacted on economic growth. However, Martinez-Vazquez and McNab (2003) argue that the results were mixed between countries. They found that transfer funds were not even significant, and even negatively contributed to economic growth for some countries. This is particularly the case for Indonesia, as de Silva and Sumarto (2014) found that transfer funds negatively contributed to the growth of the country. On the other hand, Aritenang and Sonn (2018) found that transfer funds were a significant determinant of growth in Indonesia. Following de Silva and Sumarto (2014), this thesis uses transfer funds per capita as one of the economic growth predictors. It is expected to have a *positive* impact on the economic growth of districts. In Indonesia, the transfer funds is known as the *Dana Alokasi Umum* (General Allocation Fund) which is available from the website of the Ministry of Finance for the period of observation.

2. *Infrastructure ($asph_{it}$* and *$telp.hh.pc_{it}$)*. According to Esfahani and Ramírez (2003), the provision of infrastructure was a significant growth determinant and it contributed positively to economic growth. In previous studies on Indonesia, however, mixed results were found. While Vidyattama (2010) found significant positive contribution of the length of road to the economic growth, McCulloch and Sjahrir (2008) and Aritenang (2012) found no significant contribution. As proxies for the infrastructure provision, this thesis makes use of the *Potensi Desa* (Village Survey) data published by the National Statistic Agency (BPS). In particular, length of asphalt road and households with telephone connection are used. The data is available on a three years interval from 1993 to 2014. These variables measure both investment and accessibility. It is expected that both variables will have a *positive* impact on the economic growth of districts.

3. *Education ($es.pc_{it}$*). Barro (2013) observed that economic growth is positively related to the average years of school enrolment, particularly since workers with better educational background would be more adaptable to the development of technologies. The majority of studies on Indonesia found that education contributed positively to economic growth (see, for example, de Silva & Sumarto, 2014; Garcia Garcia & Soelistianingsih, 1998; McCulloch & Sjahrir, 2008; Vidyattama, 2010). However, Garcia Garcia and

Soelistianingsih (1998) also found that after 1983 the contribution had decreased. This is perhaps due to the level of education becoming more uniform (Jones, 2003). Education is measured by the districts' elementary enrolment per capita in this thesis. The data is collected from the *Survey Sosial Ekonomi Nasional – SUSENAS* (National Socio Economic Survey) which is available on a three year interval from 1993 to 2014. *SUSENAS* is published by the National Statistic Agency. It is expected that elementary enrolment per capita will have a *positive* impact on the economic growth of districts.

4. *Foreign Direct Investment (fdi.gdp$_{it}$).* Hansen and Rand (2006) found that in the long run, FDI contributed positively to economic growth. In the context of Indonesia, there has been research on how both public and foreign direct investments contributed to economic growth. As for public investment, the results were mixed. In their study, de Silva and Sumarto (2014) found that the capital expenditure ratio to GDP contributed positively to economic growth, whereas Vidyattama (2010) found it was insignificant. On the other hand, for the impact of FDI on the economic growth, Khaliq and Noy (2007) found that FDI had a positive impact on the aggregate economic growth. This thesis opts to use the FDI as one of these explanatory variables. To measure FDI, this thesis follows Carkovic and Levine (2005), which made use of the ratio of total FDI inflow to the real GDP. The data is available from the Investment Coordinating Board (BKPM), covering the period of observation. It is expected that the ratio of FDI and the real GDP will have a *positive* impact on the economic growth of districts.

Descriptive statistics of all the growth determinants above are depicted in the table 7.3.

In addition to these growth determinants, three dummy variables, with binary values (1 for districts included in the policy, 0 for no policies), representing the spatial planning policies are also considered. These variables are *pol.uh$_{it}$*, *pol.rc$_{it}$* and *pol.nsa$_{it}$* , which are the Urban Hierarchy, Regional Cluster and the National Strategic Area respectively. Incorporating all of these variables, the equation (6) can be rewritten as follow:

$$\begin{aligned} \ln y_{it} = {} & \alpha_0 + \alpha_1 \ln y_{it-1} + \alpha_2 \ln(tf.pc)_{it} \\ & + \alpha_3 \ln(telp.hhpc)_{it} + \alpha_4 \ln(asph)_{it} + \alpha_5 \ln(es.pc)_{it} \\ & + \alpha_6 \ln(fdi.gdp)_{it} + \alpha_7 pol.uh_{it} + \alpha_8 pol.rc_{it} \\ & + \alpha_9 pol.nsa_{it} + dy_t + \eta_i + u_{it} \end{aligned} \qquad (11)$$

Table 7.3. Regression's Variables and the Descriptive Statistic
(Source: Author's calculation)

Variable	Mean	Standard Deviation	Minimum	Maximum	Median
y_{it} ; GDP per capita (million Rupiahs)	6.201	7.86	0.263	137.876	4.436
$tf.pc_{it}$; transfer fund per capita (thousand Rupiahs)	959.334	924.934	17.561	9466.243	659.059
$telp.hh.pc_{it}$; Household with telephone connection per capita	0.018	0.026	0.00008	0.413	0.007875
$asph_{it}$; Length of asphalt road (%)	68.629	25.162	18.315	100	70.9
$es.pc_{it}$; Elementary school enrolment per capita	0.405	0.111	0.0347	1.376	0.415
$fdi.gdp_{it}$; FDI (ratio to real GDP)	0.000268	0.00303	0	0.094	0.000013

Currently, it is possible to estimate panel data models using three different estimation techniques. First, the standard Ordinary Least Square (OLS) estimation, which obtains estimation by randomly sampling from a large population at different points of time (Wooldridge, 2015). Therefore, OLS, or the pooling method, ignores the fact that population may have different distribution in different time periods (Kennedy, 2008). The second and third estimation methods, namely random effect (RE) and fixed effect (FE), introduce both individual and time effect to the panel data analysis (Wooldridge, 2015). Therefore, these two estimation methods consider individual heterogeneity across time, and are better suited to analyse panel data (Vidyattama, 2010). RE and FE estimation methods differ in so far as FE is more appropriate if one considers that there is a correlation between explanatory variables and the unobserved individual effect. In doing this, FE excludes any time-invariant data used in the panel analysis (Wooldridge, 2015).

In this thesis, observations, or districts, are not independently distributed across time. In fact, same districts are observed repeatedly across time, and the change experienced by districts is important in terms of the potential for path dependence and for determining growth determinants for each district. Accordingly, either fixed or random effect estimations are more appropriate than the OLS estimation. To distinguish between these model specifications, a Hausman-test is employed to test whether random effect or fixed effect estimation is the most appropriate model specification (Wooldridge, 2015). The test checks whether there is a significant difference in the coefficients on the time varying variable (which in this case study, is the growth determinants, except the dummy variabels that represent the policy), between random effect (RE) and fixed effect (FE) estimation. The null hypothesis (H_0) is that there is no significant difference between RE and FE, therefore one does not need to use FE (Kennedy, 2008). The test result, showing that the p-value is less than 0.05, implies that FE is better than RE.

Nevertheless, given that FE estimation allows for arbitrary correlation between η_i, the unobserved individual effect, and the explanatory variables in any time period, it will exclude all explanatory variables that are time invariant (Wooldridge, 2015). This thesis will not be able to estimate the dummy variables with FE. Therefore, in its estimation results, this research still use both RE and OLS.

7.3.2. Results

Results of the aforementioned three estimations are displayed in Table 7.4. below.

Table 7.4. District's Growth Regression 1998-2013
(Source: Author's calculation)

	Ordinary Least Square		**Panel - Random Effect**		**Panel - Fixed Effect**	
	Coeff.	**Std. Error**	**Coeff.**	**Std. Error**	**Coeff.**	**Std. Error**
Intercept	0.077	0.068	0.177*	0.085		
Ln y_{it-1}	0.991***	0.004	0.988***	0.005	0.723***	0.019
Ln $tf.pc_{it}$	0.008**	0.003	0.004	0.003	0.018**.**	0.01
Ln $telp.hhpc_{it}$	-0.001	0.002	0.002	0.003	-0.009*	0.004
Ln $asph_{it}$	-0.0002	0.004	-0.005	0.005	0.009	0.013
Ln $es.pc_{it}$	0.011	0.009	0.012	0.009	0.052**	0.018
Ln $fdi.gdp_{it}$	-0.001**.**	0.001	-0.001	0.001	0.0002	0.001
$pol.nsa_{it}$	0.003	0.007	0.002	0.007		
$pol.rc_{it}$	0.0001	0.005	-0.001	0.005		
$pol.uh_{it}$	0.015**	0.005	0.014**	0.005		
Adj. R^2	0.985		0.984		0.878	
n	280					
T	3-5					
N	1,319					

*Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'*
Coeff.= Coefficient; Std.Error = Standard Error; Adj. = Adjusted

The total observation (N) is 1,319 from 280 individuals/districts (n). The panel is unbalanced, meaning that data on some individuals are not available for a number of years; or some years are missing from the data. This is because the data available for some variables are not on a yearly basis, but on a three year interval (i.e Village Survey and National Socio-Economic Survey). Moreover, variables are also missing for some districts, in some years, from the publication released from the National Statistic Agency. Imputation, or replacing missing data with substituted values, was not undertaken to maintain the originality of the data.

Looking at the results from all estimations, convergence is confirmed during the period of 1998 to 2013. Interestingly, α_1 (remember that $\alpha_1 = 1 + \beta$) is the lowest in the Fixed Effect (FE) model as compared to other models. This indicates that β, or the convergence rate, in the FE model is the highest.

From the FE estimation result, the evidence suggests that three variables had significant impact over the economic growth: transfer fund per capita ($tf.pc_{it}$), number of households with telephone connection per capita ($telp.hhpc_{it}$) and elementary school enrolment per capita ($es.pc_{it}$). The significant impact of $telp.hhpc_{it}$ contradicts the previous study conducted by McCulloch and Sjahrir (2008), which found this variable to be insignificant. All have the expected sign of impact, except for the $telp.hhpc_{it}$. The reason for the negative sign is perhaps due to the significant decrease of households with telephone connections from 2010, due to the popularity of mobile phones in Indonesia.

In both Ordinary Least Square (OLS) and Random Effect (RE) estimations, it can also be found that there is evidence that the Urban Hierarchy (UH) policy significantly (positively) contributed to economic growth. This seems to contradict observation in the previous section (sub-chapter 7.2), which suggested that UH was not clearly associated with richer districts. On the other hand, National Strategic Area (NSA) and Regional Cluster (RC) were not found to be significant determinants of economic growth. According to the National Spatial Plan, the development of both NSA and UH are to be fully supported by the national government. Therefore, it is expected that both NSA and UH to have a significant impact on economic growth. Given their importance to Indonesian government policy, there is a need to explore why these empirical results are not consistent with the expectation. The next section provides qualitative analysis to investigate the way in which these policies were implemented as part of the National Spatial Plan.

7.4. The Implementation of the National Spatial Plan

As elaborated in Chapter Five, despite being firstly stipulated in 1997, the implementation of the National Spatial Plan (NSP) was interrupted during the period of 1998 to 2001 due to the Asian financial crisis. However, there was no significant improvement in the policy implementation from 2001 until 2008 (NGPW1). For example, out of eighteen National Strategic Areas (NSA), according to the interview results, the national government could only manage to produce one master plan of the NSA (NGPW1, NGLSP2) in this period. The master plan is required by law in order for the NSA to remain in effect. The only NSA was the Jakarta Metropolitan Area (see Figure 3.1. for geographical orientation).

The reason for this is partly due to the dualism of the planning system adopted by Indonesia. As elaborated in Chapter Five, there is both a spatial planning and development planning system in the country. While the spatial plan documents arrange development on the basis of geographical location, the development plan documents are the ones that coordinate sectoral developments (NGPW5). Most of the time, budget allocations also followed the development plan rather than the spatial plan. Another reason was that the agency responsible for the spatial planning implementation was the Directorate General of Spatial Planning (DGSP), under the Ministry of Public Works (MoPW). On the other hand, development planning implementation was coordinated by the Ministry of National Development Planning (MoNDP). Given that the MoNDP was higher than the DGSP within the hierarchy most of the time, spatial planning implementation had to follow what was decided by the MoNDP in the development plans, as observed by the respondents (NGLSP1, NGLSP2).

The stipulation of the new NSP in 2008 attempted to change this. Four years before that, the Law 25/2004 on the Law of National Development Planning System was also stipulated. Policymakers managed to synchronise the dual planning systems adopted in Indonesia through this law and the NSP 2008. To compromise, each of the planning documents must refer to each other. This is also intended to provide more concise and clearer development guides to local governments (NGLSP1). After this attempt, starting from 2010 the speed of implementation of the National Strategic Area (NSA) had been increased. As per 2015, an additional five NSA master plans, all located in metropolitan areas, have been stipulated. Despite this, some local governments still found that the NSA was not clear enough. This is because there are no detailed plans on what needs to be done by local governments, as mentioned by the respondents, in the master plan of the NSA (LGBR, LGWJ). This resulted

in the ineffectiveness of some regional policies outlined in the National Spatial Plan (NSP), as elaborated in the following sub-sections.

7.4.1. The Implementation of the National Strategic Area

As written in Chapter Five, the main objective of the National Strategic Area (NSA) is to secure national interest (NGLSP1, NGPW5). In particular, regions with high economic growth are stipulated as NSAs. In this sense, the national government is willing to assist the development of those regions.

Looking at the National Spatial Plan (NSP) 1997 and NSP 2008, in total 32 NSAs had been stipulated. Some of the NSAs were only available in the NSP 1997, and some were only available in the NSP 2008. This thesis only include 9 (nine) NSAs that are both stipulated in NSP 1997 and 2008, as depicted in the following table.

Table 7.5. National Strategic Areas
(Source: NSP 1997 and NSP 2008)

#	National Strategic Areas	Province
1.	Metropolitan of Jabodetabek	West Java-Banten-Jakarta
2.	Metropolitan of Mebidangro	North Sumatra
3.	Free Trade Zone Batam Bintan Karimun	Riau
4.	Metropolitan of Sarbagita	Bali
5.	Metropolitan of Gerbangkertasusila	East Java
6.	KAPET Kakab Catchment Area	Central Kalimantan
7.	KAPET Manado-Bitung	North Sulawesi
8.	KAPET Biak	Papua
9.	Lhokseumawe Industrial Zone	Aceh

In relation to the evolution of regional policy explained in Chapter Five, it can be seen that aside from the metropolitan areas, some other economic zones are included in the NSP. These are, in particular, the Integrated Economic Development Zone (KAPET), which was created in 1996, and the Free Trade Zone (FTZ), which was initiated in 1971. While the KAPET aims to promote growth in the eastern part of the country, the FTZ was specifically designed for Batam, a neighboring island to Singapore, to compete with Singapore in attracting foreign investments (Hadi, 2009; Kam & Kee, 2009). Currrently, all the metropolitan areas and the FTZ that are stipulated as National Strategic Areas (NSAs) have their own master plan. On the other hand, none of the KAPET that have been adopted as NSA had master plan until it was abolished by the President in 2016. One of the obstacles in designing the master plan for the KAPET was that it was oversized and there was a lack of infrastructure support from the

sectoral ministries (NGPW1). For example, a couple of KAPETs may be as big as half the province, and thus made them difficult to develop.

On the other hand, the implementation of metropolitan National Strategic Areas (NSAs) were also not too successful. At least three problems can be observed.

First, as a policy covering multiple districts and municipalities, metropolitan NSAs need to provide a platform for inter-sectoral coordination. This was not achieved during the implementation of the policy, given that the hierarchy level of the Directoate General of Spatial Planning (DGSP) is lower than sectoral ministries. Since 2008 the spatial plan has been synchronised with the development plan, however, on a practical level, it is still the agency that needs to campaign for the success of the policy. Given that DGSP is not a ministry, it was never easy to gain commitments from sectoral ministries, as acknowledged by the respondent (NGLSP2). In fact, inside the Ministry of Public Works (MoPW), where the DGSP is attached, other directorate generals may not willingly follow the plan outlined in the metropolitan NSAs. For example, road development provided by the Directorate General of Road in MoPW was not primarily referring to the NSAs (NGPW6). Settlements development and the water provision system undertaken by other directorate generals in the MoPW also follow maps and priorities created by each of them (NGPA1, NGPW4). This resulted in the lack of government support in developing NSA, which is demanded by the National Spatial Plan (NSP).

Second, there had been some complaints from the local governments that the metropolitan National Strategic Areas (NSAs) did not provide guidance for implementation. The master plan did outline the spatial arrangement of the NSA, however, it provided no step-by-step development indicating how to achieve it (LGB2). In fact, most of the local government officials interviewed were not sure which projects endorsed by the national government represented support for their districts as NSA according to the interview results (LGD1, LGD2, LGB1, LGBR). For districts stipulated in the Jakarta Metropolitan Area (JMA), for example, coordination among them was undertaken without the assistance of the national government. Most of the time, Jakarta, as the richest region in the JMA, initiated the coordination. This is because Jakarta needs to secure their interests over various problems, such as traffic congestion, high inflow of migration and flood. Regular coordination with its neighboring districts appeared to address this. This coordination also involved the transfer of some funding from Jakarta to their neighboring districts to help them alleviate the problems (LGJ4, LGT).

Through the examination of the spatial plan documents of each of the regions covered in the fieldwork, it is found that only few detailed plans were available for National Strategic Areas (NSAs) that are mentioned in these documents. For example, in the Jakarta Spatial Plan 2030, the provincial government did mention the presence of NSAs in their region, however, the plans on what they intended to do in these NSAs were quite general, indicating no specific roles for each of the sectoral authorities (Provincial Government of Jakarta, 2012). This is also true for spatial plan documents stipulated by the Regency of Bekasi, the Municipality of Depok, the Municipality of Tangerang and the Municipality of South Tangerang (Municipality of Depok, 2015; Municipality of South Tangerang, 2011; Municipality of Tangerang, 2012; Regency of Bekasi, 2011). Even in the spatial plan document created by the Municipality of Bogor, nothing is mentioned about the presence of NSA (Regency of Bogor, 2009). The only spatial plan document outlining detailed plans for NSA is the Spatial Plan of Bekasi Municipality (Municipality of Bekasi, 2009). However, when referring to relevant authorities to undertake these detailed plans, the document does not refer to any institutions from the national government. This implies that the creation of those detailed plans was not under the supervision of the national government.

Third, as a national policy requiring attention from sectoral ministries, local governments may use the NSA status as a bargain to negotiate more transfer funds from sectoral ministries. In particular, this negotiation may take place during the annual budget consultation between national and local governments. However, the effectivenes of NSA to attract such an allocated fund had been in doubt (LGB2, NGPW1). This is because the biggest part of transfer funds, which is the General Allocation Fund, is calculated on the basis of a rigid formula, as revealed by the interview results (NGF). This formula does not include NSA as part of its consideration. A minor part of the transfer fund, the Special Allocation Fund, is indeed allocated on the basis of a yearly review on the development progress of districts. However, this Special Allocation Fund was designated for lagged regions, small islands and bordering districts. These three types of regions are definitely non-NSA regions. The only transfer fund received by the regions for the NSA development is the transfer fund given by the Directorate General of Spatial Planning (DGSP), under the Ministry of Public Works (MoPW), which was not very substantial. For the years 2011 to 2015 (when it ceased) the total amount to be distributed among 32 provinces were respectively: 170 billion Rupiahs (US$ 7.4 million), 402 billion Rupiahs (US$ 27.9 million), 354 billion Rupiahs (US$ 24.6 million), 257 billion Rupiahs (US$ 17.8 million) and 149 billion Rupiahs (US$ 27.9 million). Given the minuscule amount of the fund given by the national government through DGSP, local governments could only

use the fund for composing local spatial plan and master plan documents (LGWK, LGTS1, LGTS2, LGD1, LGD2). These documents are prioritised in cities/districts that are included in the NSA.

7.4.2. The Implementation of the Urban Hierarchy

The aim of the Urban Hierarchy (UH), which is different to the National Strategic Area (NSA), is to promote development throughout the country, together with the transmigration program as explained in Chapter Five. Therefore, this policy has a longer historical background than the NSA. During the1980s, the national government had undertaken road provision on the basis of the hierarchical status of cities (NGPW7). Law 13/1980 on Road, in particular, assigns different levels of road to different orders of cities. The levels of road consist of national, provincial and district roads. Each road is assigned to serve a particular transportation hub, depending on the load and the status of the city. Capital cities, for example, are served and linked with each other with national or provincial roads. On the other hand, small sized cities are only served by provincial or district roads.

This concept was then adopted by the recent National Spatial Plan (NSP) 1997. As elaborated in Chapter Five, Urban Hierarchy (UH) consists of the National Activity Centres (NACs), Regional Activity Centres (RACs) and Local Activity Centres (LACs). The NACs are the main hub, RACs are the secondary hub, and the LACs are the inter-districts hub. In 2004, the Law 13/1980 on Road was also changed by the Law 38/2004 on Road. The new law on road was also in turn adopted by the UH and applied by the NSP 1997.

This historical sequence enabled UH to be effectively implemented throughout the period of NSP 1997 and NSP 2008 (NGPW5). The total amount of road provision on the basis of provincial area is provided in Table 7.6.

The significant achievement of Urban Hierarchy (UH) as a redistributive growth policy can be seen in some of the eastern provinces (i.e. Maluku, Papua, and South East Sulawesi) which lag behind their western counterparts. In these provinces the growth of road provision reached more than 100%. The reason for this is because the development of roads in the eastern part of the country had been treated differently (NGPW5). The different level of economic activities is a matter of fact between western and eastern parts of Indonesia and therefore, the quality of roads provided can also be differentiated. Roads built in Papua for example, may not need to be similar in terms of quality with roads provided in Jakarta. In this way, the road

provider may optimise the available budget in order to meet their goal in promoting growth in the eastern part Indonesia through road provision (NGPW5).

Table 7.6. Provincial Length of Road (in KMs) 1996-2015
(Source: Ministry of Public Works)

#	Province	1996	2004	2009	2015	Growth (1996-2015)
1	Aceh	1,144.02	1,782.78	1,803.35	2,102.07	84%
2	North Sumatra	1,305.96	2,098.05	2,249.64	2,632.22	102%
3	West Sumatra	871.95	1,200.09	1,212.89	1,448.81	66%
4	Riau	838.56	1,126.11	1,134.47	1,336.61	129%
5	Riau Islands*	NA	NA	334	586.83	NA
6	Jambi	853.28	820.4	936.48	1,317.93	54%
7	Bengkulu	750.43	736.44	783.87	792.61	6%
8	South Sumatra	1,006.95	1,290.24	1,444.26	1,600.16	119%
9	Bangka Belitung Islands*	NA	530.65	509.59	600.40	NA
10	Lampung	851.25	1,004.16	1,159.57	1,292.21	52%
11	Jakarta	153.5	122.38	142.65	53.31	-65%
12	Banten*	NA	490.4	476.49	564.89	NA
13	West Java	1,062.22	1,140.69	1,351.13	1,789.20	122%
14	Central Java	1,215.46	1,297.63	1,390.57	1,518.09	25%
15	Yogyakarta	158.34	168.81	223.16	247.91	57%
16	East Java	1,783.49	1,899.21	2,109.31	2,361.23	32%
17	West Kalimantan	1,006.62	1,575.32	1,664.55	2,117.57	110%
18	Central Kalimantan	1,707.53	1,714.95	1,714.83	2,002.08	17%
19	East Kalimantan	1,226.21	1,539.70	2,118.17	1,710.90	87%
20	North Kalimantan	NA	NA	NA	585.16	NA
21	South Kalimantan	864.07	876	866.09	1,204.30	39%
22	Bali	405.93	501.64	535.23	629.39	55%
23	West South East Nusa	541.22	601.83	632.17	934.55	73%
24	East South East Nusa	1,121.85	1,273.02	1,406.68	1,857.91	66%
25	East Timor**	582.45	NA	NA	NA	NA
26	North Sulawesi	1,360.39	1,267.39	1,319.23	1,663.92	80%
27	Gorontalo*	NA	616.24	606.7	784.6	NA
28	Central Sulawesi	1,592.99	1,806.46	2,181.95	2,373.40	49%
29	West Sulawesi	NA	NA	571.98	763.17	NA
30	South Sulawesi	1,669.57	2,107.54	1,722.86	1,745.92	50%
31	South East Sulawesi	621.6	1,293.87	1,397.05	1,497.82	141%
32	Maluku	464.8	985.46	1,066.65	1,771.67	540%
33	North Maluku*	NA	458.21	511.89	1,203.34	NA
34	Papua*	NA	2,303.16	2,111.44	2,636.73	133%
35	West Papua*	NA	NA	963.24	1,326.38	NA
36	Irian Jaya	1,701.96	NA	NA	NA	NA

**New Provinces, established after the reform in 2001*
***Separated from Indonesia in 2002*

The provision of other services, such as settlements and water system, also rigidly follow the location of Natioanl Activity Centres (NACs) and Regional Activity Centres (RACs), as observed by the respondent (NGPA1). As a consequence of this, many local governments were relatively satistified with the implementation of Urban Hierarchy (LGD1, LGD2). One of the obstacles found in the interview was only the need for the assistance from the national government in buying private lands for the road development (LGWJ, LGWD2). As for the road provision, the national government mostly only funds for the road construction, but not for the land buying. Therefore, in general, it can be said that the implementation of Urban Hierarchy had been fully supported by the sectoral ministries.

7.4.3. The Implementation of the Regional Cluster

The aim of the Regional Cluster (RC), which is similar with the Urban Hierarchy (UH), is also to alleviate regional inequality by promoting growth across the country. Mainly being influenced by growth pole theory, a cluster of regions is then defined along with its sectoral potential (NGPW5). The main districts are identified on the basis of their potential to be the engines of economic growth, in accordance to their potential. Along with these main districts, a number of their hinterlands are also identified on the basis of their interconnectedness (see Figure 5.4. in Chapter Five).

However, it was found that during the interview with both national and local government officials that this policy has failed for two main reasons.

First, the stipulation of the Regional Cluster (RC) was not followed by the active campaign from the national government (NGLSP1, NGLSP2, and NGPW5). The lists of 149 RCs in the NSP 1997 and 157 RCs in the NSP 2008 were merely information for both provincial and district governments to follow up. In addition to this, the national budget had been refrained from assisting the development of RCs. Because of this, RC, as a status, can be flexibly distributed across the country on the basis of rigid criteria (NGPW5). This is different with the case of National Strategic Area (NSA), for example. Given that the national budget is required to assist the NSA, most of the time the stipulation of NSA required a lengthy negotiation between the national and local governments (NGLSP1, NGLSP2). In the development of RCs, local governments had been left with their own fiscal capabilities. Therefore, the result of RCs development had been varied; prosperous districts were enabled to fulfil the RC status, whereas other poorer districts were not affected by the RC status (NGLSP5).

Second, as a policy that had been stipulated for more than 15 years, it was surprising to find that most government officials in the interview were not aware of the presence of Regional Cluster (RC) (LGBR, LGBC1, and LGT). In fact, in the spatial planning documents of districts in the Jakarta Metropolitan Area, it was very rare that RC was mentioned, some not at all. The lack of information provided by the national government for this important policy may be the main reason behind this. It is one of the major drawbacks in the implementation of NSP. This is because robust criteria have been employed in selecting RCs across Indonesia (NGLSP5), with the expectation that these clusters may drive the economic growth of their hinterlands. In this way, the national government expects to balance the development between richer and poorer regions, thus, addressing regional inequality.

7.5.Conclusion

Despite the fact that the prosperous districts (by measurement of GDP per capita) had the status as the National Strategic Area, the Regional Cluster or the Urban Hierarchy, it was found that the only regional policy that impacted the economic growth of districts was the Urban Hierarchy (UH). Through the panel data analysis, it was revealed that the significant impact of the UH is confirmed both with the OLS and random error estimations, after controlling several prospective growth determinants.

The reason for the success of the Urban Hierarchy (UH) was because it has been closely connected with the infrastructure provision system since the very beginning of the policy. In addition to this, the presence of regulation to ensure the budget disbursement towards the development of various infrastructure connections had assisted the development of UH. This is because those regulations had constantly referred to the UH as a selection criterion. This supports the findings of Patunru & Rahman (2014) who emphasised not only reductions in transaction costs and improved financial management, but also that infrastructure development is an important indicator that contributes positively to the development outcomes.

On the other hand, this kind of support was completely missing in the development of National Strategic Area (NSA) and Regional Cluster (RC). Moreover, given the absence of influence of the national government, the RC was not fully understood by the local governments. The nature of both NSA and RC required active innovation and cooperation among local governments. This, unfortunately, has been missing during the implementation of decentralisation. As argued by Firman (2009) and Patunru & Rahman (2014), the uncontrolled

subdivision of regions (*pemekaran*), has been increasing fragmentation among local governments and hindered economic growth.

Another important point is that the economic growth of districts is proved to be influenced by institutions, in the form of government policy. As previously observed in Chapter Six, economic growth, proxied by the GDP per capita, of Indonesia is a path-dependent process. This chapter provides evidence that institutions may play a significant role in the path creation through the provision of infrastructure and the establishment of connected cities. This, to some extent, supports Martin and Sunley's (2006) observation that specific place conditions and characteristics (including norms, regulations and policies) provide feedback to the economic activities of agents in shaping particular development paths.

Chapter Eight
Conclusion

8.1. Introduction

This study is an inquiry into the geography of uneven development in Indonesia. In this context, most research that has been undertaken to understand the geography of uneven development can be classified into two themes. First, there have been attempts to unravel the dynamics of regional inequality along with its possible sources of inequality for the last 20 to 30 years (see, for example, Akita & Alisjahbana, 2002; Garcia Garcia & Soelistianingsih, 1998; Hill et al., 2008; Hill & Vidyattama, 2016; McCulloch & Sjahrir, 2008; Vidyattama, 2010; Yusuf et al., 2014). Second, there have been some attempts to understand the regional inequality in Indonesia in the light of decentralisation (see, for example, Akita & Szeto, 2000; Aritenang, 2008; Aritenang, 2012; Aritenang & Sonn, 2018; Firman, 2009; Wibowo, 2011). This thesis offers new insights in understanding the country's regional inequality by introducing the role of spatial planning policy. Although it has been in effect for more than fifteen years, there has been little research which attempts to evaluate the impact of this policy.

In addition, this study draws on recent debate in the development of the Evolutionary Economic Geography (EEG) as a potential framework to understand the aforementioned problems. While it is true that as a theoretical perspective EEG has been gaining popularity in the field of economic geography (see Boschma & Frenken, 2006, 2011), there remain important questions about its application in understanding uneven development. As noted by MacKinnon et al. (2009), despite claims that EEG incorporates an appreciation of the role of institutions in shaping development, in practice this has received only modest attention. Most research in EEG has tended to underplay the role of institutions, instead tending to focus on firms and creative entrepreneurs (Boschma & Frenken, 2011; Martin & Sunley, 2010). Moreover, research in EEG has mostly also been carried out in the context of the more economically developed countries and focused on the technology-intensive sectors (Morrison & Cusmano, 2015). As such, its application in developing countries and those with less technology-intensive industries remains limited (Morrison & Cusmano, 2015). Finally, research in EEG also had been preoccupied with micro-level analysis, concentrating on the development of firms, clusters, and networks. This has meant that EEG's role in understanding the evolution of broader regional economic structures that shape patterns of uneven development is somewhat limited (Martin & Sunley, 2015).

In this study, it is found that recent developments in EEG offer a new insight into the geography of uneven development in Indonesia. First, the geography of uneven development across the country has been consistent for the last 30 years with some persistent sectoral strength in its major regions (see also Hill & Vidyattama, 2014). This research demonstrates that such a pattern may be attributed to the presence of path dependence. Second, this thesis considers that as a less economically developed country (LEDC), Indonesia's economic development has been relying more on formal institutional settings rather than on creative entrepreneurs. More generally, this is an observable phenomenon in the lagging regions of economically developed countries (Dawley, 2014) as well as the emerging economies in the global south (Morrison & Cusmano, 2015). By focusing on Indonesia, this thesis affirms the efficacy of employing concepts drawn from EEG to explain the geography of uneven development. Specifically, the thesis focused on the potential impact of policies adopted in the National Spatial Plan. Four objectives were addressed:

1. Assess the applicability of path dependence as a theoretical construct with which to understand changes in the geography of uneven development in Indonesia.
2. Examine spatial and temporal changes across the Indonesian regional economic system during the period 1993 to 2013.
3. Examine the nature of the relationship between the changing regional economic system and the emergence of the National Spatial Plan framework.
4. Assess the effectiveness of the National Spatial Plan framework in addressing uneven development across the regional economic system.

The remainder of this chapter reflects on the key themes to emerge from the thesis corresponding to the objectives outlined above. Additionally, the policy relevance and further research suggestions are outlined.

8.2. Persistence Regional Inequality and Weak Convergence

To examine spatial and temporal change of economic geography of Indonesia, this thesis builds upon the findings of previous research. At the provincial level, the thesis extended the analysis provided by Hill et al. (2008) and Hill and Vidyattama (2014, 2016), which was conducted for the period of 1975 to 2010. At the district level, the thesis updated research undertaken by Aritenang (2012) and McCulloch and Sjahrir (2008), which was carried out for the period of 1993 to 2006. Additionally, the research also provided a new insight on the regional inequality as compared to findings obtained by McCulloch and Sjahrir (2008), during

1998 to 2005, and Akita and Alisjahbana (2002), during the era of the financial crisis 1999 to 2001.

First, as outlined in Chapter Four, the thesis explored the distribution of GDP per capita. In general, at the provincial level the research confirmed that the four classifications of provinces on the basis of their wealth provided by Hill et al. (2008) are still applicable. Hill et al. (2008) created the classifications on the basis of a ratio between provinces' GDP and the national GDP. Findings of this thesis were consistent with this classification for the wealthiest and poorest groups of provinces with the one from Hill and Vidyattama (2014), although it is also found a different configuration of provinces in the middle group. Broadly, provinces that are associated with having a strong service sector (e.g. Jakarta) and are abundant with natural resources (e.g. Riau and East Kalimantan) remained at the top of the grouping. On the other hand, provinces that are slipping behind are those that are traditionally known to lack natural resources and which have poor agricultural potential (e.g. Eastern and West Nusa Tenggara) and those which experienced lengthy social-horizontal conflict (i.e. Maluku). Aceh, once a resource-rich region, is now classified in the lowest part of the group. It is not only because its natural gas reserves have been declining sharply, but also because the devastating tsunami in 2004 severely impacted the province (Hill & Vidyattama, 2014). The same consistency in the distribution of GDP per capita at the district level is also observed. The top 10 districts remained similar during the period of 1993 to 2013; however, the bottom 10 districts were relatively more dynamic. These findings are also similar with the ones observed by Hill and Vidyattama (2014, 2016). It is apparent that there is a persistence of regional inequality during the period of 1993 to 2013.

Second, the thesis analysed the growth of GDP per capita. At the provincial level, the general trend that can be observed is that the growth after the financial crisis period (2001 to 2013) was lower than before the crisis (1993 to 1997). This however, was not applicable for some provinces: Papua, Maluku, Riau and Central Kalimantan. This is interesting given that Maluku is classified as a 'slipping behind' province and Papua as a moderately poor province. In fact, Papua had the second highest GDP per capita growth during 2001 to 2013. At the district level, some districts from poor provinces are also on the top 10 districts with the highest growth of GDP per capita. These districts are: Banda Aceh (Aceh Province), Belu (East Nusa Tenggara Province), Kudus and Magelang (Central Java). Overall, the thesis argues that there had been an indication of economic convergence between poor and richer regions during 1993 to 2013.

Third, the research confirms the thesis' argument on the persistence of regional inequality by considering at the extent of inequality. By employing the Theil Index and Gini Coefficient the thesis found that inequality between districts was always higher than inequality between provinces. This echoes findings from McCulloch and Sjahrir (2008) and Aritenang (2012). Both inequalities were also relatively persistent during the period of 1993 to 2013. Further, by disaggregating the Theil Index, the research managed to assess district inequality level as both between and within provinces inequality. Two arguments can be made. First, in the long run, both inequalities increased slightly. This is contrary with the pattern found in both Akita and Alisjahbana (2002), for the period of 1993 to 1998, and McCulloch and Sjahrir (2008), for the period of 1998 to 2003. They both found that both inequalities tend to decrease. Second, between provinces inequality was consistently higher from 2005 onwards. This is an update of the trend as compared to both Akita and Alisjahbana (2002) and McCulloch and Sjahrir (2008), who found that *within* provinces inequality was always higher. These two arguments indicate that richer provinces were growing faster than their poorer counterparts. However, interestingly, total inequalities as depicted by the Gini Coefficient remained persistent over the period of observation. One explanation of this phenomenon is that growth in richer districts in richer provinces was also associated with growth in population. This feature is considered as an act of balancing mechanism that produced a stable level of total inequality.

Fourth, to confirm economic convergence, the thesis estimated the convergence rate using both σ (sigma) and β (beta) convergence. The research found the absence of σ convergence throughout the observation period, meaning that there was no decline of dispersion of GDP per capita across districts. On the other hand, the research also found that β convergence, the extent of which poorer regions catch up with richer regions, was present. However, the convergence rate during the pre-crisis era (1993 to 1997) had never been achieved again after the financial crisis that took place in 1998. Indeed, the convergence rate during the period 1993 to 2013 was only 0.6%, compared to the convergence rate during 1993 to 1997, which was 4%. This thesis argues that the decentralisation system, which took effect from 2001, has been the main cause of this. Richer districts had been able to optimise their resources, given the decentralised authorities, as compared to poorer districts, which received less assistance from the national government due to the decentralisation. This finding provides a new insight on the economic convergence in Indonesia. At the provincial level, Garcia Garcia and Soelistianingsih (1998) found both σ and β convergence during the period of 1975 to 1993. On the other hand, McCulloch and Sjahrir (2008) and Aritenang (2012) observed the beta

convergence among districts during 1993 and 2005; however, they did not calculate for the sigma convergence. In conclusion, this study found that a relatively weak β convergence rate contributed to the unchanged dispersion of GDP per capita (or, the absence of σ convergence) during the period of 1993 and 2013.

8.3. Regional Path Dependence and Structural Breaks

As elaborated in Chapter Two, path dependence has been used as a concept within Evolutionary Economic Geography (EEG) to explain the ways in which the spatial organisation of economic activities is the result of "largely contingent, yet path dependent, historical process" (Boschma and Franken, 2011, p. 297). By and large, path dependence can be conceived as the outcome of past structural, institutional, social and technological developments (Drahokoupil, 2012; Martin, 2010). Within EEG, path dependence is typically regarded as a multi-scalar process (Boschma & Frenken, 2009). The current trajectory of a regional economy depends on the historical adjustment path, which in turn, can depend on place, or specific geographical locational factors (Martin & Sunley, 2006).

Within the context of an EEG framework, this thesis argues that the persistence of regional inequality across districts in Indonesia during 1993 to 2013 was largely due to the presence of path dependence. In Chapter Six, this thesis elaborates on an empirical model specification developed by Plummer and Tonts (2015), incorporating the presence of both path-dependent stochastic trend and structural break in the generation process of GDP per capita in each region, to confirm the presence of path dependence across Indonesia.

On the basis of the results, the research found that, at the national level, there is both an underlying (deterministic) growth trend and a stochastic path-dependent process superimposed on that trend. In other words, the data generation process of the national Gross Domestic Product (GDP) depends on the initial value of national GDP, a deterministic growth trend and the history of the process. The research also found similar results for the generation process of GDP per capita at the island level, implying the presence of both path dependence and deterministic trend. On the other hand, the estimation yielded slightly different results at the district level. It is true that most districts displayed a path-dependent process, in the way that the GDP per capita generation process depends upon the initial value of GDP per capita (y_0), or path dependence on the *set* of events. On the other hand, some districts also exhibit processes in which their GDP per capita depend upon lagged value of GDP per capita (i.e. y_{t-1}, y_{t-2}), or path dependence on the *order* of events. These findings show that different

evolutionary trajectories may be present at the different spatial scales and there exists a degree of heterogeneity within spatial scales.

Estimating structural breaks, the thesis found that in each spatial scale (i.e. national, province, and district) there are multiple structural breaks, with consistency in the timing of those breaks across Indonesian regions. The major points of structural break were 1995, 2003, 2006 and 2010. The thesis argues that these years correspond to, respectively, the initial tide of the Asian financial crisis in 1995, the rising price of both coal and palm oil in 2003 to 2007 and 2009 to 2010, and the slowing down of the export rate as a consequence of the global financial crisis in 2008 to 2009. Slightly different timing of structural breaks that were observed in both island and district levels may reflect a time lag, as these 'shocks' diffused through the Indonesian regional economic system. Having observed this, the argument is that the path-dependent stochastic trend may be present simultaneously with structural breaks. This indicates that both the impact of past values of GDP per capita as well as shocks influence the emergence of current GDP per capita and shape the development path of each district.

8.4. Evolving Regional Policy

Indonesia has adopted two planning systems, namely, development planning and spatial planning. In order to overcome the persistence of inequality across regions in Indonesia, the national government implemented a number of regional policies under the umbrella of the National Development Planning System. In Chapter Five, it is argued that, in general, there were two phases in which those policies can be differentiated. The first phase took place in the period of 1967 to 1990. This phase was indicated by ad hoc policies initiated in 1967 and a relatively simple geographical division between the rich Java Island and poor non-Java islands. This period also saw the initiation of the transmigration policy as a means to redistribute people from Java to non-Java islands.

The second phase of the development of regional policies in Indonesia began in 1990. What differentiates this phase with the previous one was that the lagging regions were defined not only on the basis of Java and non-Java division, but also on the basis of sectoral development that are potentials (Tumenggung, 2013). In this period, the central government initiated cluster-based regional policies, such as Integrated Economic Development Zone (KAPET), Special Economic Zone (SEZ) as well as Master Plan of Economic Corridors.

At the same time there was the emergence of the second phase regional policies under the development planning and the modernised spatial planning also emerged in 1992 through the

stipulation of Law 24/1992 (on the Spatial Planning) and the first National Spatial Plan (NSP) in 1997. On the basis of the fieldwork and interviews, this thesis elaborated on the historical perspective of the National Spatial Plan (NSP).

Despite having undergone a significant change in terms of its approach and implementation (Hudalah & Woltjer, 2007), NSP has maintained three unique regional policies. The first policy is the Urban Hierarchy (UH), in which urban areas are assigned a different status according to their roles and prospects in supporting economic growth of their surrounding areas. The hierarchy corresponds to the development of necessary infrastructures, such as roads and electricity, built by the national government. The higher the status of particular urban areas, the higher the capacity of infrastructures built in these areas. The second policy is the National Strategic Areas (NSA), which is the main priority of the national government due to its strategic values (i.e. economic, environment, security) for the country. This thesis focuses upon NSA with high economic growth, such as metropolitan areas and free trade zone areas. Interestingly, some of regional policies implemented in the development planning (i.e. Integrated Economic Development Zone, or KAPET), had also been stipulated as NSAs. The third policy is the Regional Cluster (RC), which is considered to have economic abilities and potencies to support the economic development of their surrounding areas. Sectoral priorities, such as fisheries, mining and agriculture, are assigned to the Regional Cluster on the basis of pre-determined criteria. While the National Strategic Area (NSA) and the Urban Hierarchy (UH) were to be implemented with the full support of the national government budget, the development of Regional Cluster (RC) was to be decentralised to the local governments. According to the National Spatial Plan (NSP), the aim of NSA is to secure national interest over areas with strategic economic value. On the other hand, the aim of both Regional Cluster and Urban Hierarchy is to redistribute economic growth throughout the country.

To conclude, two sets of policies, under both development and spatial planning system, have emerged since the 1990s. While initially the National Spatial Plan (NSP) was created to provide a single umbrella for all of those regional policies, the attempt was only partly successful. This was because the most recent regional policies under the development planning system were not fully integrated to the NSP. This, in turn, hampered the effectiveness of three regional policies under the NSP, as elaborated in the next section.

8.5. Institutions and Economic Growth

The thesis employs the notion of institution derived from Evolutionary Economic of Geography (EEG) in assessing the impact of spatial planning on economic growth of districts

across Indonesia. As elaborated in Chapter Two, it is understood that region-specific institutions may be one of the sources of regional path dependence (Martin & Sunley, 2006). While early works of EEG emphasised the important role of firms/creative entrepreneurs in regional economies, over time, it has been suggested that institutions become increasingly important to regional economies, as they tend to co-evolve with firms (Essletzbichler & Rigby, 2007). This is because institutions preserve history and information from the past (Martin & Sunley, 2015), which serve as important sources of ideas to be used by the firms in their decision-making process (Essletzbichler, 2009).

Several studies had also shown that policy intervention, which is a form of institution, was critical in path alteration and renewal within territorial economies (see, for example, Coenen, Asheim, Bugge, & Herstad, 2017; Dawley, 2013; Morgan, 2013). In particular, early stage entrepreneurialism in peripheral regions may benefit from policy intervention at the early stages of path creation, or in responding to major economic and social shocks (Morgan, 2013). This research considers that spatial planning policy, which is stipulated as a series of regulation, is regarded as a critical component of the institutional environment in which the path dependent nature of the geography of uneven development in Indonesia might be interpreted.

In Chapter Seven, the thesis employed a growth regression model to test for the impact of three regional policies adopted in the National Spatial Plan (NSP): the Urban Hierarchy (UH), the National Strategic Area (NSA) and the Regional Cluster (RC). In the model, the thesis also considered common growth determinants used in previous research (see, for example, Aritenang, 2012; Garcia Garcia & Soelistianingsih, 1998; McCulloch & Sjahrir, 2008; Vidyattama, 2010). It found five variables to be significant in accounting for economic growth of districts: the status of being the Urban Hierarchy, the lagged value of GDP per capita, the amount of transfer fund per capita given by the central government, the ratio of household with telephone connection per capita (as a measure for infrastructure provision) and the ratio of elementary school enrolment per capita (as a measure of education).

It is particularly interesting to note that while the Urban Hierarchy (UH) and the National Spatial Plan (NSA) should have been implemented with the support of the national government's budget, only NSA was insignificant in the final model. Given the limitation of data available as a proxy for the policy implementation, the research included a series of interviews and analysis on the government's publication to gain more insight into these findings. Based upon these interviews, there is evidence that the process behind the success

of the UH was closely connected with the infrastructure provision system since the implementation of the policy. In addition, the presence of regulation to ensure the budget disbursement towards the development of various infrastructure connections had assisted the development of UH. This is because those regulations had been prioritising districts with Urban Hierarchy (UH) status for infrastructure developments. On the other hand, this kind of support was completely missing in the development of NSA and the Regional Cluster (RC). The campaign undertaken by the Directorate General of Spatial Planning (DGSP), the champion of these policies, has also rarely resulted in commitments given by sectoral ministries. This was not only because the DGSP has a lower hierarchical status than sectoral ministries, but also because inside the Ministry of Public Works (MoPW), where the DGSP is attached, other directorate generals were not willingly follow the plan outlined in NSA and RC. Given this condition, it is not surprising that local governments were not aware of the presence of RC. Overall, the thesis demonstrated that regional policy does have an impact over the economic growth, insofar as it provides a platform for inter-sectoral coordination.

8.6. Policy Implications

In 2015, there was a major restructuring in both the Ministry of Public Works (MoPW) and the National Land Agency (NLA). The main tasks of the MoPW were to coordinate the provision of roads, infrastructure and water provision on the basis of the spatial planning framework. In contrast, the main task of the NLA was to deal mainly with the land affairs. The restructuring in 2015 merged the spatial planning task of the MoPW with the NLA. For the first time Indonesia now has a Ministry of Agrarian and Spatial Planning.

It is argued in Chapter Five that one of the reasons for the ineffectiveness of the National Spatial Plan (NSP) was due to the low hierarchical status of the Directorate General of Spatial Plan (DGSP) as compared to sectoral ministry. The restructuring in 2015 addressed this problem. However, other parts of the implementation of regional policies adopted in the NSP remained unchanged by the restructuring. First, there has been no stipulation of regulations to ensure the financial support from sectoral ministries in the development of the National Strategic Area (NSA). Second, there has also been no issuance of clear guidance on the implementation of the Regional Cluster (RC), which aimed to redistribute economic growth across the country and to confront regional inequality. Third, importantly, there have been no attempts made to harmonise all regional policies under a development system and a spatial planning system. The thesis argues that these three factors are important in relation to the implementation of the NSP for the regional policy effectiveness.

In particular, the research suggests that RC is an important regional policy with which to address the persistence of uneven geography in Indonesia. Given the unique characteristics of RC in addressing sectoral strength for each region in Indonesia, this policy is considered as pivotal in changing the economic geography of the country. The Urban Hierarchy (UH) was also created to redistribute economic growth. However, it was specifically aimed at urban areas, through the provision of infrastructure networks connecting various cities. Consequently, UH was not created to induce economic growth in non-urban areas. Development of the Regional Cluster (RC) by local governments is expected to have a significant impact on these hinterland areas. Therefore, in the future, this research proposes active campaigning by the newly established Ministry of Agrarian and Spatial Planning in promoting RC, as well as stipulation of regulations that further clarify the role of local governments in developing RC.

8.7. Suggestions for Further Research

Several regional policies, under the development planning system, were relatively new as compared to regional policies adopted by the National Spatial Plan (NSP). The three most important policies, those that were cited repeatedly by the interviewees, are the Special Economic Zone (SEZ), the Industrial Zone and the National Strategic Tourism Area (NSTA). They were stipulated in, respectively, 2009, 2015 and 2011. This thesis did not include these policies in its analysis because there was not sufficient data to represent the implementation of these policies. Moreover, districts stipulated in these policies have been dynamic, in which additional districts kept being added until very recently. While it is true that these policies are not adopted in the NSP, it would be interesting to account for these policies, given their sheer magnitude, in the future, as revealed from the interview results.

This thesis presents an analysis of path dependence by using islands as the framework of analysis. The explanations for structural breaks observed at the district level are also on the basis of the structural breaks pattern that is observed at the island and national levels. Further research is needed to closely examine the provincial and district levels. This can be done by selecting particular provinces or districts as case studies. Further investigations in the form of, for example, interviews with local government officials and analysis of relevant local statistical data may also be carried out to unravel the cause of path trajectory that is unique for each province and district. In particular, this direction of research may further explain the cause of different evolutionary trajectories at the different spatial scales, as well as heterogeneity observed within spatial scales.

Finally, the thesis use GDP per capita as the measurement of economic growth. As observed by Monni and Spaventa (2013), the usage of GDP as an indicator has been based on an assumption that economic growth is closely related to well being. As people become more prosperous they can do more to improve their life. This assumption is not without dispute, given the limitation of GDP per capita to capture all relevant aspects of development and well-being (Jones & Klenow, 2016). Various alternative indicators have been proposed, such as the Gross National Happiness (GNH) and the Human Development Index (HDI) (Natoli & Zuhair, 2011). In Indonesia, HDI has been measured by the National Statistic Agency for only a relatively short period of time at the district level (i.e., 1996 and then 2002 to 2013). Further research may benefit from the usage of HDI when the dataset are available for a longer period of time.

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Appendices

Appendix 1. Revenue Sharing Scheme

Resource Types	Pre-Decentralisation			Law 25/1999					Law 33//2004				
	CG	PG	LG	CG	PG	Originating LG	Other LG in the same province	All LGs in Indonesia	CG	PG	Originating LG	Other LG in the same province	All LGs in Indonesia
Income Tax (PPh)	100	-	-	80	8	12	-	-	80	8	8	4	-
Land and Building Tax (PBB)	10	16	65	9	16	65	-	10	9 [a]	16	65	-	10 [b]
Duties on Land and Building Transfer (BPHTB)	20	16	64	-	16	64	-	20	-	16	64	-	20
Forest Concession Licence Fee (IHPH)	55	30	15	20	16	64	-	-	20	16	64	-	-
Forest Resource Rent Provision (PSDH)	55	30	15	20	16	32	32	-	20	16	32	32	-
Forestry: Reforestation	-	-	-	60	-	40	-	-	60	-	40	-	-
Fishery	100	-	-	20	-	-	-	80	20	-	-	-	80
Mining: Land Rent	20	16	64	20	16	64	-	-	20	16	64	-	-
Mining: Royalty	20	16	64	20	16	32	32	-	20	16	32	32	-
Oil	100	-	-	85	3	6	6	-	85 [c]	3	6	6	-
Gas	100	-	-	70	6	12	12	-	70 [c]	6	12	12	-
Geothermal	-	-	-	-	-	-	-	-	20	16	32	32	-

Source: Adapted from Wibowo (2011)

Notes:

- *CG stands for Central Government; LG for Local Government; PG for Provincial Government*
- *[a] to cover collection expenses*
- *[b] based on the current revenuie, 6.5% is equally distributed to all local governments and 3.5% is incentive for local governments that successfully achieve or exceed the target*
- *[c] 0.5% of this figure is allocated for basic education: 0.1% for the province, 0.2% for the originating region, 0.2% for other regions in the same province.*

Appendix 2. Government Publications Collected

No.	Document(s)	Institution(s)	Year
1.	District/Municipality Spatial Planning	Bekasi District	2011-2031
2.		Depok Municipality	2000-2010; 2012-2032
3.		Bekasi Municipality	2009-2029
4.		Bogor District	2005-2025
5.		Tangerang Municipality	2012-2032
6.		Jakarta Province	2010-2030
7.		South Tangerang Municipality	2011-2031
8.	Districts in Numbers (Regional Statistic Book)	Bekasi Municipality	2009-2013
9.		Bekasi District	2011-2014
10.		Bogor District	2008-2014
11.		South Tangerang Municipality	2012-2015
12.	Road Development at the Provincial Level	Directorate General of Road, Ministry of Public Works	1996-2015
13.	Spatial Planning Assistance Fund for Districts	Directorate General of Spatial Planning, Ministry of Public Works	2011-2015
14.	The National Spatial Plan	Ministry of Public Works	1997; 2008
15.	Background Study of the National Spatial Plan	Ministry of Public Works	-

Appendix 3. Interview Instruments

Interview Script for National Government Officials	
Topics	**Questions**
The Clustering Policy in the National Spatial Plan (NSP) (National Strategic Area/ Regional Cluster/ Urban Hierarchy)	What is the objective of the National Strategic Area/ Regional Cluster/ Urban Hierarchy?
	How is the National Strategic Area/ Regional Cluster/ Urban Hierarchy implemented? Have there been any detailed regulations on the cluster policies beside the National Spatial Plan NSP?
	It is known that there are many types of NSA in the NSP in accordance to its strategic values (economic, culture, environment, and security) What are the criteria in selecting the location of the economic NSA? What are the criteria in selecting Regional Clusters and Urban Hierarchy?
	What kind of support given by the National Government to the development of the economic National Strategic Area/ Regional Cluster/ Urban Hierarchy? Had there been any obstacles in developing the clusters?
	Indonesia is known for being geographically uneven in terms of economic development (i.e. Java and outside Java, Eastern and Western parts of Indonesia). Did the location selection of the cluster policy taking such phenomena into account?
	What is the expected support from the local governments in the development of the clusters?
	Apart from the decentralisation fund that is regulated under the Decentralisation Law, are there any other financial supports given by the National Government in the development of the clusters?
The National Spatial Plan (NSP)	The NSP has been modified in 2008 since it was first stipulated in 1997. Has there been any difference in terms of regional approach in the new NSP?
	Has the NSP been the reference for regional policies taken by sectoral institutions and local governments? If it has not been adhered properly, what are the obstacles?

Interview Script for Local Government Officials	
Topics	**Questions**
The Clustering Policy in the National Spatial Plan (NSP) (National Strategic Area/ Regional Cluster/ Urban Hierarchy)	What is the objective of the National Strategic Area/ Regional Cluster/ Urban Hierarchy?
	How is the National Strategic Area/ Regional Cluster/ Urban Hierarchy implemented? Have there been any detailed regulations on the cluster policies beside the National Spatial Plan NSP?
	What kind of support given by the National Government to the development of the economic National Strategic Area/ Regional Cluster/ Urban Hierarchy? Had there been any obstacles in developing the clusters?
	What is the expected support from the National Government in the development of the clusters?
	What is the impact of being stipulated as one of the clusters to the local economic growth? To the surrounding areas? Which one really significantly impacts the economic growth of the municipality (or district): being stipulated as the cluster as the basis of support from the national government *OR* the development of local economic base through the stimulation of both local and national policies without consideration of the cluster status?
	Apart from the decentralisation fund that is regulated under the Decentralisation Law, are there any other financial supports given by the National Government in the development of the cluster?
	What kind of obstacles faced by the local governments in the development of the cluster?
Local Economic Growth	What is the economic base of the district (or municipality) from 1997-now? Has there been any change in terms of economic structure?
	Have there been any supports from other stakeholders (i.e. entrepreneurs) in developing the economic base?
The NSP	The NSP has been modified in 2008 since it was first stipulated in 1997. Has there been any difference in terms of regional approach in the new NSP?
	Has the NSP been the reference for regional policies taken by sectoral institutions and local governments? If it has not been adhered properly, what are the obstacles?

Appendix 4. List of Provinces in Indonesia

#	Province	Island
1.	Aceh	Sumatra
2.	North Sumatra	
3.	Riau	
4.	West Sumatra	
5.	Jambi	
6.	Bengkulu	
7.	South Sumatra	
8.	Lampung	
9.	Jakarta	Java – Bali
10.	West Java	
11.	Central Java	
12.	Yogyakarta	
13.	East Java	
14.	Bali	
15.	West Nusa Tenggara	Eastern Islands
16.	East Nusa Tenggara	
17.	West Kalimantan	Kalimantan
18.	Central Kalimantan	
19.	South Kalimantan	
20.	East Kalimantan	
21.	North Sulawesi	Sulawesi
22.	Central Sulawesi	
23.	South Sulawesi	
24.	Southeast Sulawesi	
25.	Maluku	Eastern Islands
26.	Papua	

Appendix 5. List of National Strategic Areas

#	NSAs	Province
Stipulated both in NSP 47/1997 and NSP 26/2008		
1.	Metropolitan of Jabodetabek	West Java-Banten-Jakarta
2.	Metropolitan of Mebidangro	North Sumatra
3.	Free Trade Zone Batam Bintan Karimun	Riau
4.	Metropolitan of Sarbagita	Bali
5.	Metropolitan of Gerbangkertasusila	East Java
6.	KAPET Kakab Catchment Area	Central Kalimantan
7.	KAPET Manado-Bitung	North Sulawesi
8.	KAPET Biak	Papua
9.	Lhokseumawe Industrial Zone	Aceh
Stipulated in NSP 47/1997		
10.	Natuna Island	Riau
11.	Palembang Region	South Sumatra
12.	Ratai Gulf Region	South Sumatra
13.	Borobudur Area	Yogyakarta
14.	Bontang Region	East Kalimantan
15.	Nunukan Region	West Kalimantan
16.	Soroako Region	South Sulawesi
17.	Toraja Region	South Sulawesi
18.	Timika Area	West Papua
Stipulated in NSP 26/2008		
19.	Free Trade Zone Sabang	Aceh
20.	KAPET Banda Aceh	Aceh
21.	Sunda Gulf	West Java
22.	Metropolitan of Kedungsepur	Central Java
23.	KAPET Bima	West Nusa Tenggara
24.	KAPET Mbay	East Nusa Tenggara
25.	KAPET Khatulistiwa	West Kalimantan
26.	KAPET Batulicin	South Kalimantan
27.	KAPET Sasamba	East Kalimantan
28.	KAPET Batui	Central Sulawesi
29.	Metropolitan of Mamminasata	South Sulawesi
30.	KAPET Pare-Pare	South Sulawesi
31.	KAPET Buton Kolaka Kendari	Southeast Sulawesi
32.	KAPET Seram	Maluku

Number corresponds to numbers in Figure 5.7

Appendix 6. ARIMA and Structural Break Tests Result at District Level

1. Sumatra Island

#	Island/Districts	ARIMA	Structural Break(s)
Sumatra Island		**(1,1,0) with drift**	**1995, 2001, 2004, 2007, 2010**
1	District Aceh Barat	(0,1,1) with drift	1999 2003
2	District Aceh Besar	(0,1,0)	1995 2005 2009
3	District Aceh Selatan	(0,1,0) with drift	1995 2003 2006 2010
4	District Aceh Tengah	(0,1,0) with drift	1995 2005 2008
5	District Aceh Tenggara	(0,1,1)	2004
6	District Aceh Timur	(0,1,0)	1995 2004 2009
7	District Aceh Utara	(0,1,0) with drift	1995 2005 2008
8	District Agam	(0,1,1) with drift	1995 2002 2006 2010
9	District Asahan	(0,1,0) with drift	1995 1999 2004 2009
10	District Bangka	(0,1,0) with drift	1995 2001 2004 2007 2010
11	District Batanghari	(0,1,0) with drift	1999 2004 2007 2010
12	District Belitung	(0,1,0) with drift	1995 2000 2004 2007

#	Island/Districts	ARIMA	Structural Break(s)
Sumatra Island		**(1,1,0) with drift**	**1995, 2001, 2004, 2007, 2010**
13	District Bengkalis	(0,1,0) with drift	1995 1999 2006 2009
14	District Bengkulu Selatan	(0,1,0) with drift	2005 2009
15	District Bengkulu Utara	(0,1,1) with drift	2002 2008
16	District Bungo Tebo	(0,1,0) with drift	1999 2004 2007
17	District Dairi	(0,1,0) with drift	1995 1999 2003 2007 2010
18	District Deli Serdang	(0,1,0) with drift	1995 2003 2009
19	District Indragiri Hilir	(0,1,0) with drift	2005 2009
20	District Indragiri Hulu	(0,1,0) with drift	2002 2007 2010
21	District Kampar	(0,1,0) with drift	1995 1999 2004 2007
22	District Karo	(0,1,0) with drift	1995 1999 2004 2009
23	District Kerinci	(0,2,0)	1999 2004 2007 2010
24	District Labuhan Batu	(0,1,0) with drift	1995 1999 2002 2006 2009

#	Island/Districts	ARIMA	Structural Break(s)
Sumatra Island		**(1,1,0) with drift**	**1995, 2001, 2004, 2007, 2010**
25	District Lahat	(0,1,0) with drift	1995 2001 2004 2007 2010
26	District Lampung Barat	(0,1,0) with drift	1999 2010
27	District Lampung Selatan	(0,1,0) with drift	1995 2001 2005 2009
28	District Lampung Tengah	(0,1,0) with drift	1999 2002 2006 2009
29	District Lampung Utara	(0,1,0) with drift	1999 2005 2008
30	District Langkat	(0,1,0) with drift	1995 2002 2006 2009
31	District Limapuluh Kota	(0,1,0) with drift	1995 2001 2004 2007 2010
32	District Muara Enim	(0,1,0) with drift	1995 2002 2006 2010
33	District Musi Banyuasin	(0,1,0) with drift	1999 2003 2009
34	District Musi Rawas	(0,2,1)	1999 2003 2007 2010
35	District Nias	(0,1,0) with drift	1995 2001 2006 2010

#	Island/Districts	ARIMA	Structural Break(s)
Sumatra Island		**(1,1,0) with drift**	**1995, 2001, 2004, 2007, 2010**
36	District Ogan Komering Ilir	(0,1,0)	1997 2000 2006 2010
37	District Ogan Komering Ulu	(0,1,1) with drift	1999 2003 2006 2010
38	District Padang Pariaman	(0,1,0) with drift	1999 2005 2010
39	District Pasaman	(0,1,0) with drift	1999 2004 2007 2010
40	District Pesisir Selatan	(0,1,0) with drift	1999 2005 2009
41	District Pidie	(0,1,0) with drift	2005 2008
42	District Rejang Lebong	(0,1,0) with drift	2003 2006 2009
43	District Sarolangun Bangko	(0,1,0) with drift	1999 2004 2007 2010
44	District Sijunjung	(0,1,0) with drift	1999 2004 2009
45	District Simalungun	(0,1,0) with drift	1995 2000 2006 2009
46	District Solok	(0,1,0) with drift	1999 2003 2007 2010
47	District Tanah Datar	(0,2,2)	1995 1999 2004 2007 2010

#	Island/Districts	ARIMA	Structural Break(s)
Sumatra Island		**(1,1,0) with drift**	**1995, 2001, 2004, 2007, 2010**
48	District Tanjung Jabung	(1,1,0) with drift	1995 2004 2007 2010
49	District Tapanuli Selatan	(1,1,0) with drift	1995 2000 2004 2010
50	District Tapanuli Tengah	(2,0,0) with non-zero mean	1997 2000
51	District Tapanuli Utara	(0,1,0)	2000 2007
52	Kepulauan Riau	(0,0,1) with non-zero mean	1996 1999
53	Municipality of Banda Aceh	(0,1,0) with drift	1999 2005 2008
54	Municipality of Bandar Lampung	(0,1,0) with drift	1999 2002 2006 2010
55	Municipality of Batam	(0,1,0)	1995 1999
56	Municipality of Bengkulu	(0,1,0) with drift	1996 1999 2002 2005 2008
57	Municipality of Binjai	(0,1,0) with drift	2001 2006 2009
58	Municipality of Bukit Tinggi	(0,1,1) with drift	1995 2000 2004 2007 2010
59	Municipality of Jambi	(0,1,0) with drift	2001 2005 2010
60	Municipality of Medan	(0,1,0) with drift	2002 2006 2009
61	Municipality of Padang	(0,1,0) with drift	1999 2005 2009

#	Island/Districts	ARIMA	Structural Break(s)
Sumatra Island		**(1,1,0) with drift**	**1995, 2001, 2004, 2007, 2010**
62	Municipality of Padang Panjang	(0,1,0) with drift	1995 2001 2009
63	Municipality of Palembang	(0,1,0) with drift	1999 2004 2007 2010
64	Municipality of Pangkal Pinang	(0,1,0) with drift	1995 1999 2002 2005 2010
65	Municipality of Payakumbuh	(0,1,0) with drift	1995 2001 2004 2007 2010
66	Municipality of Pekanbaru	(0,1,0) with drift	1999 2004 2007 2010
67	Municipality of Pematang Siantar	(0,1,0) with drift	1995 2000 2006 2009
68	Municipality of Sabang	(0,1,0) with drift	1995 1999 2005 2008
69	Municipality of Sawahlunto	(1,0,0) with non-zero mean	2000
70	Municipality of Sibolga	(0,1,0) with drift	1995 2002 2006 2009
71	Municipality of Solok	(0,1,0) with drift	1999 2005 2009
72	Municipality of Tanjung Balai	(0,1,0) with drift	1995 1999 2003 2009
73	Municipality of Tebing Tinggi	(0,1,0) with drift	2001 2006 2010

2. Java-Bali Island

#	Island/Districts	ARIMA	Structural Break(s)
Java-Bali Island		**(0,1,0) with drift**	**1995, 2004, 2007, 2010**
1	District Badung	(0,1,0)	1995 2004 2007 2010
2	District Bandung	(0,1,0)	2000 2007
3	District Bangkalan	(0,2,1)	1995 1999 2009
4	District Bangli	(1,1,0) with drift	1995 2004 2007 2010
5	District Banjarnegara	(0,1,0) with drift	1997 2004 2007 2010
6	District Bantul	(0,1,0) with drift	1997 2006
7	District Banyumas	(1,1,0) with drift	1998 2001 2007 2010
8	District Banyuvvangi	(0,1,0) with drift	1997 2004 2007 2010
9	District Batang	(0,1,0) with drift	1995 2004 2009
10	District Bekasi	(0,1,0) with drift	2004 2007 2010
11	District Blitar	(1,2,0)	1997 2002 2007 2010
12	District Blora	(0,1,0) with drift	2004 2009
13	District Bogor	(0,1,0)	1995 1999 2007

#	Island/Districts	ARIMA	Structural Break(s)
Java-Bali Island		**(0,1,0) with drift**	**1995, 2004, 2007, 2010**
14	District Bojonegoro	(0,2,1)	1995 2004 2007 2010
15	District Bondowoso	(1,0,0) with non-zero mean	2004 2007 2010
16	District Boyolali	(0,1,0) with drift	1997 2002 2006 2010
17	District Brebes	(0,2,1)	1995 2002 2005 2009
18	District Buleleng	(0,1,0) with drift	1995 2004 2007 2010
19	District Ciamis	(0,1,0) with drift	1995 2004 2007 2010
20	District Cianjur	(0,1,0) with drift	2004
21	District Cilacap	(0,1,0) with drift	1995 2001 2009
22	District Cirebon	(0,1,0) with drift	1995 2004 2009
23	District Demak	(0,1,0) with drift	1997 2007
24	District Garut	(0,1,0) with drift	1995 2004 2007 2010
25	District Gianyar	(0,1,0) with drift	1995 2004 2007 2010
26	District Gresik	(1,0,0) with non-zero mean	2005 2009
27	District Grobogan	(1,1,0) with drift	1997 2006 2009

#	Island/Districts	ARIMA	Structural Break(s)
Java-Bali Island		**(0,1,0) with drift**	**1995, 2004, 2007, 2010**
28	District Gunungkidul	(0,1,0) with drift	2003 2009
29	District Indramayu	(0,1,0)	2004 2008
30	District Jember	(0,1,0) with drift	1997 2004 2009
31	District Jembrana	(1,1,0) with drift	1995 2005 2009
32	District Jepara	(0,1,0)	1997 2004 2009
33	District Jombang	(0,1,0) with drift	1997 2009
34	District Karanganyar	(0,1,0) with drift	1997 2005 2009
35	District Karangasem	(1,1,0) with drift	1995 2004 2007 2010
36	District Karawang	(0,2,1)	1999 2004 2007 2010
37	District Kebumen	(0,1,0) with drift	1997 2005 2009
38	District Kediri	(0,1,0) with drift	1995 2003 2006 2010
39	District Kendal	(0,1,0) with drift	1998
40	District Klaten	(0,1,1) with drift	2005 2009
41	District Klungkung	(1,1,0) with drift	1995 2000 2004 2007 2010
42	District Kudus	(0,1,0) with drift	1997 2005 2009

#	Island/Districts	ARIMA	Structural Break(s)
Java-Bali Island		**(0,1,0) with drift**	**1995, 2004, 2007, 2010**
43	District Kulonprogo	(1,0,0) with non-zero mean	1995 2005
44	District Kuningan	(1,1,0) with drift	1995 2004 2007 2010
45	District Lamongan	(0,2,1)	2004 2009
46	District Lebak	(0,1,0) with drift	1995 1999 2003 2006 2010
47	District Lumajang	(1,0,0) with non-zero mean	1997 2003 2007 2010
48	District Madiun	(1,0,0) with non-zero mean	2003 2006 2009
49	District Magelang	(0,1,0) with drift	1997 2005 2009
50	District Magetan	(0,2,0)	1997 2005 2009
51	District Majalengka	(0,1,0) with drift	2005 2009
52	District Malang	(0,1,0) with drift	1997 2005 2009
53	District Mojokerto	(1,0,0) with non-zero mean	1997 2004 2007 2010
54	District Nganjuk	(0,2,1)	2006 2009
55	District Ngawi	(0,2,0)	1999 2004 2007 2010
56	District Pacitan	(1,1,0) with drift	1999 2004 2007 2010

#	Island/Districts	ARIMA	Structural Break(s)
Java-Bali Island		**(0,1,0) with drift**	**1995, 2004, 2007, 2010**
57	District Pamekasan	(1,1,0)	2004 2009
58	District Pandeglang	(1,0,0) with non-zero mean	1997 2002 2008
59	District Pasuruan	(0,2,1)	1997 2002 2006 2010
60	District Pat	(0,1,0) with drift	1997 2001 2004 2007 2010
61	District Pekalongan	(0,1,0) with drift	2005 2010
62	District Pemalang	(0,1,0) with drift	1995 2005 2009
63	District Ponorogo	(0,2,1)	1995 2004 2007 2010
64	District Probolinggo	(0,1,0) with drift	1997 2004 2007 2010
65	District Purbalingga	(0,1,0)	1995 2004 2007 2010
66	District Purwakarta	(0,1,0) with drift	1995 2001 2004 2007 2010
67	District Purworejo	(0,1,0)	1995 2004 2009
68	District Rembang	(0,1,0)	1995 2000 2005 2008

#	Island/Districts	ARIMA	Structural Break(s)
Java-Bali Island		**(0,1,0) with drift**	**1995, 2004, 2007, 2010**
69	District Sampang	(0,1,0) with drift	1995 2004 2009
70	District Semarang	(0,1,0) with drift	2006 2010
71	District Serang	(0,1,0) with drift	2004 2007
72	District Sidoarjo	(0,1,0) with drift	1995 2003 2007 2010
73	District Situbondo	(0,1,0) with drift	1997 2005 2009
74	District Sleman	(0,1,0) with drift	1995 2001 2005 2009
75	District Sragen	(1,0,0) with non-zero mean	1997 2004 2007 2010
76	District Subang	(0,1,0) with drift	1995 1999 2009
77	District Sukabumi	(0,1,0) with drift	2000 2009
78	District Sukoharjo	(0,1,0) with drift	1996 2003 2006 2010
79	District Sumedang	(0,1,0) with drift	1995 2001 2004 2007 2010
80	District Sumenep	(0,2,1)	1995 2006 2009
81	District Tabanan	(0,1,0)	1995 2004 2007 2010

#	Island/Districts	ARIMA	Structural Break(s)
Java-Bali Island		**(0,1,0) with drift**	**1995, 2004, 2007, 2010**
82	District Tangerang	(0,1,0) with drift	1995 1999 2005
83	District Tasikmalaya	(0,1,0) with drift	2006 2010
84	District Tegal	(0,2,1)	1995 2001 2006 2009
85	District Temanggung	(0,1,1)	1995 2004 2009
86	District Trenggalek	(0,2,1)	1995 2005 2009
87	District Tuban	(0,2,1)	2003 2007 2010
88	District Tulungagung	(0,1,0) with drift	2004 2009
89	District Wonogiri	(1,0,0) with non-zero mean	1997 2004 2007 2010
90	District Wonosobo	(1,0,0) with non-zero mean	1997 2003 2006 2009
91	Municipality of Bandung	(0,2,1)	1995 1999 2009
92	Municipality of Blitar	(0,1,0) with drift	1995 1999 2007 2010
93	Municipality of Bogor	(1,0,0) with non-zero mean	2005 2009
94	Municipality of Cirebon	(0,1,0) with drift	1999 2003 2007 2010
95	Municipality of Denpasar	(0,1,0)	2002

#	Island/Districts	ARIMA	Structural Break(s)
Java-Bali Island		**(0,1,0) with drift**	**1995, 2004, 2007, 2010**
96	Municipality of Jakarta Barat	(0,1,0)	2001 2005 2010
97	Municipality of Jakarta Pusat	(0,2,1)	1995 2003 2009
98	Municipality of Jakarta Selatan	(0,1,0) with drift	2004
99	Municipality of Jakarta Timur	(0,1,0) with drift	2006
100	Municipality of Jakarta Utara	(0,1,0) with drift	1999 2004 2007 2010
101	Municipality of Kediri	(0,1,0) with drift	2006 2010
102	Municipality of Madiun	(0,1,0) with drift	1995 2001 2007 2010
103	Municipality of Magelang	(0,1,0) with drift	1995 1999 2005 2009
104	Municipality of Malang	(0,2,1)	1995 2001 2006 2009
105	Municipality of Mojokerto	(0,1,0) with drift	1995 2002 2006 2010
106	Municipality of Pasuruan	(0,1,0) with drift	1995 2004 2009
107	Municipality of Pekalongan	(0,1,0) with drift	1995 2001 2007 2010
108	Municipality of Probolinggo	(0,2,1)	1999 2003 2007 2010

#	Island/Districts	ARIMA	Structural Break(s)
Java-Bali Island		**(0,1,0) with drift**	**1995, 2004, 2007, 2010**
109	Municipality of Salatiga	(1,0,0) with non-zero mean	1995 2001 2005 2009
110	Municipality of Semarang	(0,1,0) with drift	1995 1999 2009
111	Municipality of Sukabumi	(1,0,0) with non-zero mean	1995 1999 2009
112	Municipality of Surabaya	(0,1,0) with drift	2002 2009
113	Municipality of Surakarta	(0,1,0) with drift	1995 1999 2006 2009
114	Municipality of Tangerang	(0,1,0) with drift	1997 2001 2006 2010
115	Municipality of Tegal	(0,1,0) with drift	1999 2004 2007 2010
116	Municipality of Yogyakarta	(0,1,0) with drift	1995 2003 2007 2010

3. Kalimantan Island

#	Island/Districts	ARIMA	Structural Break(s)
Kalimantan Island		**(0,1,0) with drift**	**1995, 2001, 2004, 2007, 2010**
1	District Sambas	(0,1,0) with drift	1995 1999 2004 2007 2010
	District Pontianak	(0,1,0) with drift	1995 2004 2007 2010
3	District Sanggau	(0,1,0) with drift	1995 1999 2004 2007 2010
4	District Ketapang	(0,1,0) with drift	1995 2004 2007 2010
5	District Sintang	(0,1,0)	1997 2000 2004 2009
6	District Kapuas Hulu	(0,1,0) with drift	1995 1999 2004 2009
7	Municipality of Pontianak	(0,1,0) with drift	1995 1999 2003 2007 2010
8	District Kotawaringin Barat	(0,1,0)	1997 2004
9	District Kotawaringin Timur	(0,0,1) with non-zero mean	0
10	District Kapuas	(0,1,0)	1999 2003 2009
11	District Barito Selatan	(0,1,0)	2008
12	District Barito Utara	(1,0,0) with non-zero mean	1995 1998
13	Municipality of Palangka Raya	(0,1,0)	2004

#	Island/Districts	ARIMA	Structural Break(s)
Kalimantan Island		**(0,1,0) with drift**	**1995, 2001, 2004, 2007, 2010**
14	District Tanah Laut	(0,1,0) with drift	1999 2004 2007 2010
15	District Kotabaru	(0,1,0) with drift	1995 1999 2004 2007 2010
16	District Banjar	(0,1,0) with drift	1995 1999 2004 2007 2010
17	District Barito Kuala	(2,0,0) with non-zero mean	1999 2005 2010
18	District Tapin	(0,1,0) with drift	1995 2000 2005 2010
19	District Hulu Sungai Selatan	(0,1,1) with drift	1995 2000 2004 2007 2010
20	District Hulu Sungai Tengah	(0,1,0) with drift	2000 2004 2007 2010
21	District Hulu Sungai Utara	(0,1,0) with drift	1995 1999 2003 2007 2010
22	District Tabalong	(0,1,1) with drift	1996 2000 2004 2007 2010
23	Municipality of Banjarmasin	(0,1,0) with drift	1995 2004 2009

#	Island/Districts	ARIMA	Structural Break(s)
Kalimantan Island		**(0,1,0) with drift**	**1995, 2001, 2004, 2007, 2010**
24	District Pasir	(0,1,0) with drift	1999 2004 2007 2010
25	District Kutai	(0,1,0) with drift	1995 2001 2005 2010
26	District Berau	(1,0,0) with non-zero mean	1995 1999 2009
27	District Bulungan	(0,1,0) with drift	1995 2001 2006 2010
28	Municipality of Balikpapan	(0,1,0) with drift	1995 1999 2003 2007 2010
29	Municipality of Samarinda	(0,1,0) with drift	1999 2002 2005

4. Sulawesi Island

#	Island/Districts	ARIMA	Structural Break(s)
Sulawesi Island		**(0,2,0)**	**1999, 2004, 2007, 2010**
1	District Gorontalo	(0,1,0) with drift	1995 2001 2007 2010
2	District Bolaang Mongondow	(0,1,0) with drift	1999 2004 2007 2010
13	District Minahasa	(1,1,0) with drift	1995 1998 2006 2009
4	Sangihe-Talaud	(0,1,0) with drift	1999 2004
5	Municipality of Gorontalo	(0,1,0) with drift	1995 1999 2003 2007 2010
6	Municipality of Manado	(0,2,1)	1999 2004 2007 2010
7	Municipality of Bitung	(0,1,0) with drift	1995 1999 2004 2007 2010
8	District Banggai	(0,2,0)	2001 2006 2010
9	District Poso	(0,1,0) with drift	2002 2010
10	District Donggala	(0,2,1)	1999 2004 2007 2010
11	District Buol Toli-Toli	(0,2,1)	2000 2004 2007 2010

#	Island/Districts	ARIMA	Structural Break(s)
Sulawesi Island		**(0,2,0)**	**1999, 2004, 2007, 2010**
12	Municipality of Palu	(0,2,0)	2002 2006 2010
13	District Selayar	(0,2,0)	1995 2003 2007 2010
14	District Bulukurnba	(0,2,0)	1999 2004 2007 2010
15	District Bantaeng	(0,2,1)	1999 2004 2007 2010
16	District Jeneponto	(0,1,0) with drift	1995 2001 2007 2010
17	District Takalar	(0,2,1)	1995 2001 2006 2010
18	District Gowa	(0,1,0) with drift	1995 2000 2004 2007 2010
19	District Sinjai	(0,2,0)	1995 2000 2004 2007 2010
20	District Maros	(0,1,0) with drift	1999 2006 2010
21	District Pangkajene Kepulauan	(0,1,0) with drift	1996 2000 2004 2007 2010

#	Island/Districts	ARIMA	Structural Break(s)
Sulawesi Island		**(0,2,0)**	**1999, 2004, 2007, 2010**
22	District Barru	(0,2,1)	1995 2001 2004 2007 2010
23	District Bone	(1,2,0)	1995 2004 2007 2010
24	District Soppeng	(0,2,1)	1995 1999 2003 2007 2010
25	District Wajo	(0,2,1)	1998 2004 2007 2010
26	District Sidenreng Rappang	(0,1,0) with drift	1995 2000 2004 2007 2010
27	District Pinrang	(0,2,0)	1995 2000 2004 2007 2010
28	District Enrekang	(1,2,0)	1995 2001 2004 2007 2010
29	District Luwu	(0,1,0) with drift	1999 2009
30	District Tana Toraja	(0,2,1)	1995 2001 2007 2010
31	District Majene	(0,1,0) with drift	1995 2004 2007 2010

#	Island/Districts	ARIMA	Structural Break(s)
Sulawesi Island		**(0,2,0)**	**1999, 2004, 2007, 2010**
32	District Polewali Mandar	(0,2,1)	1995 2004 2007 2010
33	District Mamuju	(0,2,1)	1995 2004 2007 2010
34	Municipality of Makassar	(0,2,1)	1999 2003 2007 2010
35	Municipality of Pare Pare	(0,1,0) with drift	1995 1999 2004 2007 2010
36	District Buton	(0,1,0) with drift	2009
37	District Muna	(0,2,1)	2000 2004 2007 2010
38	District Konawe	(0,2,1)	2000 2003 2007 2010
39	District Kolaka	(0,0,0) with non-zero mean	0

5. Eastern Islands

#	Island/Districts	ARIMA	Structural Break(s)
Eastern Islands		**(0,1,0) with drift**	**1999, 2004, 2008**
1	District Alor	(0,1,0)	1995 2004 2009
2	District Lombok Barat	(0,1,0) with drift	1995 2005 2008
3	District Lombok Tengah	(0,1,1)	1999 2011
4	District Lombok Timur	(0,1,0)	1995 2005 2009
5	District Sumbawa	(0,1,0) with drift	1995 2003 2006 2010
6	District Dompu	(0,1,1) with drift	2004
7	District Bima	(0,1,0)	2005 2008
8	Municipality of Mataram	(0,1,0) with drift	1999 2005 2008
9	District Sumba Barat	(0,1,0) with drift	1995 1999 2005 2008
10	District Sumba Timur	(0,1,0) with drift	1995 2001 2004 2007 2010
11	District Kupang	(0,1,0) with drift	1995 2001 2006 2010
12	District Timor Tengah Selatan	(0,1,0) with drift	1995 2001 2006 2010
13	District Timor Tengah Utara	(1,1,0) with drift	1997 2000

#	Island/Districts	ARIMA	Structural Break(s)
Eastern Islands		**(0,1,0) with drift**	**1999, 2004, 2008**
14	District Belu	(2,0,0) with non-zero mean	2000 2007
15	District Flores Timur	(0,1,0) with drift	1995 1999 2002 2006 2009
16	District Sikka	(0,1,0) with drift	1995 1999 2004 2009
17	District Ende	(0,1,0) with drift	1995 2000 2006 2009
18	District Ngada	(0,1,0) with drift	1995 1999 2003 2007 2010
19	District Manggarai	(0,1,0) with drift	1995 1999 2004 2009
20	District Maluku Tenggara	(0,1,0) with drift	2003 2007
21	District Maluku Tengah	(1,0,0) with non-zero mean	1998 2003 2007
22	Maluku Utara	(1,0,0) with non-zero mean	1998 2006 2009
23	District Halmahera Tengah	(0,1,0)	2007
24	Municipality of Ambon	(0,1,0)	2003
25	District Merauke	(0,1,0) with drift	1995 2001 2004 2007
26	District Jayawijaya	(0,1,0)	1999 2006
27	District Jayapura	(0,2,0)	1997 2003 2006 2010

#	Island/Districts	ARIMA	Structural Break(s)
Eastern Islands		**(0,1,0) with drift**	**1999, 2004, 2008**
28	District Kepulauan Yapen	(0,1,0)	2000 2004 2007
29	District Biak Numfor	(0,1,0)	2004 2007
30	District Paniai	(0,1,0)	1996 2004
31	District FakFak	(0,1,0) with drift	2000 2004 2007 2010
32	District Sorong	(0,1,1) with drift	1996 2004 2009
33	District Manokwari	(0,2,1)	1997 2004 2007 2010
34	Municipality of Jayapura	(0,2,1)	2004 2007 2010