Regional Government Budgets and Human Development Outcomes Across Indonesia's Provinces

(Study Case of Provinces in Indonesia)

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Table of Contents

List of Tables

List of Figures

List of Appendices

List of Acronyms

BPS	Badan Pusat Statistik
DAK	Dana Alokasi Khusus
DAU	Dana Alokasi Umum
DBH	Dana Bagi Hasil
HDI	Human Development Index
ISS	Institute of Social Studies
PAD	Pendapatan Asli Daerah
RPJP	Rencana Pembangunan Jangka Panjang
UNDP	United Nations Development Programme

Abstract

This research paper aims to examine the effect of government spending, particularly in education and healthcare, on human development outcomes in 33 provinces of Indonesia from 2002 until 2012. The Human Development Index (HDI) is used to indicate the level of human well-being, as it has been proposed by the United Nation Development Program (UNDP) to compare human capabilities across diverse localities. The model built in this paper employs panel regression, and shows a variety of expected and unexpected relationships between HDI and several dependent variables. Health, agriculture and household expenditures each had a positive effect on HDI, while education and infrastructure expenditure were not significantly related. On the revenue side of provincial budgets, this paper finds that original income (PAD) had a much more position impact of HDI as all three forms of central government transfer: general allocation funds (DAU), special allocation funds (DAK) and revenue sharing funds (DAK). The outcomes suggest that the significant variety of revenue sources and expenditure strategies among Indonesia's provincial governments also translated into strongly divergent human development outcomes.

Relevance to Development Study

A focus on human-centred development has become a recurring strain of argumentation among development scholars wishing to capture outcomes of development beyond the grasp of economic indicators such as growth, GDP and income. Furthermore, increasing public expenditures is widely proposed as a strategy to increase human capabilities through equal-access public services . In addition, this study also evaluates the relation between centralized and decentralized, conditional and unconditional revenue streams and HDI, and in this manner indicated a tentative measure of the impact of fiscal decentralization on human well-being from a macroeconomic perspective.

Keywords

Human Development Index (HDI), Public expenditures, Government income, Central Government Transfers, Decentralization, Capabilities approach

CHAPTER 1
INTRODUCTION

1.1 Background

The idea to designate human development outcomes as the central purpose of development policy has become more widely accepted in recent years. Its proponents argue that development should not only focus on economic indicators such as income and standard of living, but must also be more directly interpreted via social indicators. Stanton (2007) traces this philosophical consideration - that material belongings should count less than the actual 'humanity' we gain from (or without) them – back to Aristotle's idea of 'eudaimonia', a broad term translated as 'well-being', 'flourishing' and (individual) 'human development' (Stanton 2007):

> *Another belief which harmonizes with our account is that the happy man lives well and does well; for we have practically defined 'eudaimonia' as a sort of good life and good action. The characteristics that are looked for in eudaimonia seem also, all of them, to belong to what we have defined happiness as being. For some identify eudaimonia with virtue, some with practical wisdom, others with a kind of philosophic wisdom, others with these, or one of these, accompanied by pleasure or not without pleasure; while others include also external prosperity*. (1926: 8)

After the end of the Cold War, a modern version of this ideal found its way into critiques of mainstream development, and was slowly taken up into institutional discourses. According to Anand (2000), at the height of the Cold War, economists such as W. Arthur Lewis stressed the Gross National Product (GNP) as lighthouse and indicator of well-being, arguing that the higher the GNP, the more income can be distributed to public and private spending on education and health. Srinivasan (1994) states that this paradigm in favor of economic development (and what might be termed indirect indicators of well-being) reached its peak during the 1960s, but it was not until the 1990s that economists started to gather around alternative views such as those promoted

by ul-Haq and Sen (1990). Since then, more direct human development indicators have become partially-autonomous foci in development economics, existing besides, or even before, income and growth. Despite all the debates around when (and whether) mainstream development economics has effectively begun to privilege human-centered development, the view that increasing health, education and other individual capabilities also leads to more balanced and equitable economic development has become a part of the rationale of development studies. Scholars such as Nussbaum (2002), Narayan et al (2000), Cummins (1996), Schwartz (1994) & (Alikire 2002) all argue that 'development' should primarily be modelled on factors such as access to education, access to healthy food, being surrounding by a safe environment, equal justice (Rakowski, 1991), living a healthy life, the ability to hold property and freedom of choice and action. According to Sen, 'human development' theory engages "the relationship between our wealth and our ability to live as we would like" (1983: 6). After a decade of academic engagement, the United Nations Development Program (UNDP) included human development in its core documents, describing it as higher human capabilities to accomplished increasing levels of well-being. The main consideration is on improving health, education and the standard of living of the society (UNDP, 1990).

Recently, new emphasis has been put on the role of public spending in key areas such as health and education, its correlation with measurable human development outcomes. Furthermore, the capacity for these public efforts to act as 'seed investments' in human capital and stable basic services, which multiply private development efforts, has been judged more highly than in previous decades. Rodrik (2010) argues that developing country governments should increase intervention in the educational sector through policies like subsidies and providing remedial education, in order to enhance human capital stocks that, in the end, will benefit both production and quality of life Moreover, studies have revealed that revitalized fiscal policy has successfully increased not only measures of human development, but also economic growth. Wang (2002) revealed how, in China's economy, public investments in education and human capital makes a high contribution to increasing, and especially reproducing, growth. Hari (2003) shows that higher government expenditure in edu-

cation and health is leading to higher economic and human development outcomes also in India. Similarly, Gupta et al. (2002) argue that public accounts centred spending in education and health will lead to better achievement in school and lower mortality rates, leading to sustainable increases of workforce skills. Most developed countries have applied similar strategies of allocating high budget percentages to the education and health sectors as a boost to non-public investments. In a classical study, Mackenzie (1991) demonstrated that total expenditure on education in developed countries hovered around 4.5% to 7.5% of GDP before and during their growth periods, while developing countries at the time had a much lower proportion of around 2.5%, with a notable group of successful outliers. In 2002, Potoerba stated that most developed economies continued to spend high percentages of public budgets on education and health, though neoliberal policies have lowered some standards and 'broken' the post-1945 trajectory to ever better health and education services (Mooney, 2012).

The UNDP's Human Development Index (HDI) is one of the indicators that aim to measure the human outcomes of economic and policy changes. It tries to quantitatively capture the idea of human development as a state of having a healthy, educated and proper standard of living. Though many similar indicators have been developed to underline additional aspects, such as ecological footprint, the classical HDI is still the most-used 'alternative' indicator in development studies. It functions by giving equal weight to three components or 'dimensions of human development'. The health dimension is calculated using available data on life expectancy at birth, the education component is measured as a) average and b) expected years of school enrolment, while the standard of living is measured as GDP. The HDI was first proposed by Mahbub ul-Haq, who argued that the often passivized individual citizen/human should be the centre of development discourse and measurement, rather than focusing on increases in aggregate economic output and, thereby, the complete nation (ul-Haq, 1990).

Many scholars have debated several weakness of the HDI and particular paths of measurement. Ranis et al (2005) point to how the indicator only captures some aspects of human development and that by only including

health, education and income measures does not cover other important values such as democracy or human rights. Sagar & Najam (1998) critique that the HDI has not considered sustainability as a component of its index. Further critique was related to the income component and its simplistic use of GDP. The HDI theoretically is an index that puts humans at the centre of development, instead of economic value as proposed by mainstream economics. Nonetheless, the index still consists to one third of the same GDP measurement it was meant to oppose. McGillivray & White (1993) even argue that by including this income proxy, the HDI fails to capture the deeper ideal of capabilities theory, rendering it redundant or even 'dangerous' to a potential change in perception. Anand & Sen (2000) responded to the critique by stressing how the income component may fulfil the gaps left by other more direct, but unmeasurable variables. Both authors argued that GDP is merely used as a proxy to measure factors besides health and education, such as having enough money to buy adequate food or provide for adequate shelter. Despite the critiques from more alternative currents, ul-Haq retains that the HDI was intentionally formulated in order to change the mainstream paradigm of development from economic achievement to human centred purposes, and that compromises on what can be measured sensibly had to be made. In addition, by following a relatively simple procedure, the HDI was easy for a large variety of developing countries, which led to them setting their goals to achieve higher levels of human development (ibid).

In agreement with this argumentation, this paper uses the HDI as an available, but also a relatively meaningful proxy of human development in the Indonesian context. Since the Indonesian government built its long term development plan (twenty five years), medium development plan (five years) and yearly development plan (one year) around HDI measures, has expressed a strong commitment to achieve higher ranks of HDI, and regularly evaluates the result every year (noted in the annual report of the president on the national scope, the governor on the provincial scope and the major on the district area), we see it as a discursive tool that is widely known, but still also incomplete in its application. In the decentralization era, every municipality and province has mentioned HDI in their long term, intermediate and annual develop-

ment plans, but few use this tool to its full (albeit limited) potential, especially when evaluating policy alternatives and establishing causality in examples coming from other provinces. This paper seeks to fill some of this void, and give suggestions on using the HDI and its sub-components, as well as related (and potentially finer) variables, in policy deliberation on the sub-national level.

Indonesia is currently categorized as a 'medium' human development nation, ranked 121st out of 187 countries (UNDP, 2014). The government of Indonesia has committed to increasing human development in its long-term development program (Rencana Pembangunan Jangka Panjang or RPJP) stretching from 2005 until 2025, which was outlined in 2004 and written into Law number 17 in 2007. As mentioned earlier, as an indicator, the program uses the HDI as the main index to capture human capabilities in Indonesia. In order to increase all aspects of human development, especially in terms of health and education, the government created new policies allocating additional budgets to health and education, while maintaining income growth as the primary purpose of state development policy. In 2002, the parliament agreed to spend 20 per cent of the total budget on education, a commitment enshrined in Law number 20, 2003. Law 20 binds all levels of the state, including districts, provinces and the central government, to allocate 20% of its total expenditure to education. A similar law to increase expenditure for health component was created in 2009. Law number 39, 2009, states that central government must spend 5% of its budget for health, while for provinces and districts it stipulates 10% of the total expenditure. Both laws represent attempts by the Indonesian to manage its expenditures in ways that maximize the human development gains from its ongoing economic transition.

Meanwhile, the long shadow of the 1997 financial crisis and ensuing political turmoil triggered extensive decentralization policies, with which the Indonesian state granted more and more power and fiscal resources to regional governments. The provincial and municipal levels of government now hold more responsibility and flexibility than ever to manage their budget allocation. While the above-mentioned laws on budget allocation to health and education do regulate the percentage of expenditure to be spent on both sectors, the

strategies to achieve these goals are increasingly formulated on the respective level of government. Priyono (2007) showed that in the decentralization era, provincial and municipal government could formulate their own strategies in order to fulfil the development goals enshrined centrally, and that exclusive agency of the national government is more and more restricted to religious, military, monetary and diplomatic matters (as enshrined in law number 32, 2004).

Indonesia's decentralization emerged through what has been called a 'big bang', given that most policies were applied rather suddenly soon after the financial crisis led to political chaos and mass protests. In May 1998, former president Soeharto - who had been Indonesian president for almost 32 years, was forced to step down, marking the year of political decentralization in the country. The first democratic elections were held in June 1999, when, for the first time, leaders of provinces or districts were directly elected, as were regional representatives to Jakarta. At this stage, there had been little proper planning on how to apply a decentralizing agenda to the country (McCulloch & Suharnoko Sjahrir, 2008). The term 'big bang' also refers to the sudden power granted to regional and district governments in 2002, including administrative, political and fiscal authorities previously held by the authoritarian central state (Shah, A. and T.T. Chaudhry 2004).

This paper looks at the effects of decentralization and the emergence of different provincial policies on human development, as measured by the regional HDI of the 33 provinces. It will zoom in on the fiscal aspects of decentralization, covering budget allocation in expenditures aimed at increasing human capabilities, namely education and health. However, it also examines other expenditures' contribution to human development, including allocations to infrastructure and agriculture. The infrastructure budget is often seen as one of the keys to boosting both economic and human development. It consists of three interlinked components, namely construction (usually in support of other state policies), transportation, and networks (Globerman & Shapiro, 2002). Another expenditure investigated is state support for agriculture, which is also evaluated due to the fact that Indonesia's economy as a whole, and the poorer

sections of its population in particular, rely on agriculture, which contributes 14.4% to GDP (Ministry of Agriculture 2014). Furthermore, agricultural products provide the food supply to society, and will hence prevent hunger and malnutrition (Welch & Graham 1999).

In addition to public budget allocation, household-based expenditure on health and education will be examined in order to contrast the relationship between government and household expenditures to human development in the Indonesian context. The number of schools in primary, junior secondary and secondary education is also checked for effects, as are variables that are thought to have effects on health performance, namely number of hospitals & public health facilities, as well as number of doctors. In addition, the population and poverty rate in each province are used as controlling variables for the regressions. In terms of revenue side, this paper will also examine the role of local revenue and central government transfers on regional human development performance. In the statistics used, local revenue (collected on the province or municipal level) is represented by Local Income (PAD), while central government transfers consist of general allocation funds (DAU), revenue sharing funds (DBH) and special allocation funds (DAK). Besides the overall balance between these revenue sources, the DAK funds taken into account in this paper are special allocation funds for the health and education sectors.

1.2 Research Question

The objective of this study is to evaluate the relationship between government expenditures and human development among Indonesia's 33 provinces, using statistical analysis. Health & education budgets will be the indicators for government expenditure on human development. Regression is against an indicator for human development outcomes, the HDI. Moreover, this paper will add public budgets in agriculture & infrastructure, as well as household expenditures on health and education as additional variables. Schools, hospitals, doctors and public health facilities will also be examined, given that all of the variables hold important roles in public capacities to provide educational

and healthcare services and add a longer-term feature to the annual measures of (primarily operational) budgets. Population and poverty rate were chosen as controlling variables. As a way to interpret the results of the statistical model, a discussion of several provinces that showed significant differences will follow.

Key questions raised are:

a) Most broadly: What is the relationship between differences in government expenditures, household expenditures, long-term assets such as schools, hospitals, doctors & public health facilities, and differences in the Human Development Index among the 33 provinces of Indonesia?

b) Have the different fiscal strategies taken by provincial governments since 2002 been responsible for differences in human development among provinces today?

c) What is the effect of different balances between local revenue and central government transfer on human development outcomes?

d) How is the trend of the relationships between the variables and HDI over the first fifteen years of increasingly structured decentralization and evolving relationships between levels of government, and how does it differ between provinces when using one of them as the baseline?

1.3 Limitations of the study

As in many studies, this research process had to struggle with the limited availability (public as well as internal) of data. At first, the research aimed to evaluate data from the 1990s until 2012. However, several indicators (such as provincial human development index) have only been compiled since 2000. Given that there are also new provinces in Indonesia, the data of these prov-

inces remained partially incomplete1. A similar limitation also occurs in the data on numbers of hospital, schools and doctors. The availability of the data for this indicator is limited to some of the study years, often following planned or even haphazard intervals of 3-4 years. Only some of the desired variables could in the end be included in the model. To counteract these limitations, the research focuses on the period between 2002 until 2012, thereby also avoiding the short-term effects of political and economic events (rather than processes) unfolding in 1997-2000 (such as high inflation and riots). Nevertheless, some available data from the 1990's was used in the wider analysis of results and trajectories. In assessing the impact on my model, I assume that while the HDI's GDP component may be more strongly impacted by events and policies more than 10 years prior, healthcare and education outcomes have generally been seen as more responsive to short- and medium-term policies.

1.4 Organization of the thesis

The main body is organized as follows: Chapter two discusses the literatures regarding the impact and accuracy of the human development index, and its relation with government expenditure in health and education. Afterwards, the discussion will evaluate the role of infrastructure, agriculture and household expenditures. Chapter three describes the particular situation in Indonesia, focusing on broad developments in education, health, agriculture and infrastructure. This chapter also highlights the transformations in the budgeting system of the Indonesian state, along with the regulations aiming to allocate more funds into the health and education sectors. Furthermore, as this research also aims to see the revenue side, a subsection will discuss the components of provincial government revenue from own income or central government transfers, as well as the strings attached with each. Chapter four presents the data and outlines the methods used to analyze it systematically. The

[1] Before 2000, Indonesia was divided into 27 provinces. As part of decentralization policies, 7 new provinces were created, and today Indonesia consists of 34 provinces. One of them, North Kalimantan, was only created in 2012 and is excluded from this model.

resulting model is given and evaluated in chapter five, before chapter six provides interpretations and a conclusion of the research.

CHAPTER 2
REVIEW OF THE LITERATURE

2.1 The Human Development Index

> '*HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. The HDI can also be used to question national policy choices, asking how two countries with the same level of GNI per capita can end up with different human development outcomes*' (UNDP, 2014)

The Human Development Index is the most used indicator to measure human well being. Mahbub ul-Haq, who first proposed it in 1990, argues that development is not always associated with economic indicators such as income or growth. In contrast, it is also related with an increasing portfolio of choices, such as having access to education, health and a decent living (ul-Haq, 1990). Amartya Sen, known for his capabilities theory of development, quickly joined this research agenda, and formulated an index that aims to be a standard between all countries in the world, including developed, transitioning and least-developed nations. Ul-Haq urged that one single indicator would be enough to change the paradigm of development into what a growing academic community was calling 'human-centered development'. Sen proposed that this alternative paradigm should primarily be interpreted as enlarging people's capabilities, presupposing an ideal of increased agency, not merely increased (passive) incomes. Moreover, he added that having a proper 'end' for development (like a decent standard of living expressed in direct variables) is more important than considering the means by which to achieve it (McGillivray & White, 1993). The HDI is one outcome of this period of debate, and seeks to formulate a simplified, combined measurement of three essential features of development, namely access to health, education, and goods and services. Soon gaining popularity, the HDI has become one important indicator in development policy-making, particularly since the index was adopted by the UNDP and its flagship Human Development Report.

The indicators of each component have changed over time, in accordance with new interpretations as well as organizational exigencies in seeking to make the index implementable by national and sub-national statistical agencies with limited capacity. At first, in 1990, the health indicator was represented by life expectancy/longevity. Education was represented by the adult literacy rate as well as school enrollment, while standard of living was represented by GDP per capita. After various less intrusive changes, since 2010 the education sub-index is calculated as years of schooling of the current population and expected years of schooling of new-born children, and standard of living was geared towards Gross National Income (GNI) per capita, which the UNDP judged to be more adequate. Besides the change in indicators, the 2010 HDI began using geometric means in order to give space for imperfect substitutability between the three indicators of HDI. Before, the UNDP used the additive aggregation function, also known as arithmetic means, of the three indicators. The decision to implement such drastic changes to a widely used indicator has caused criticism among scholars. Despite the fact that the HDI was accused as too simple to describe human development and negligent of other important issues such as gender, human and political rights, and environmental sustainability, the last changes were seen as problematic, _since it cause trades off across core dimensions (Ravallion, 2012). The UNDP responded that the arithmetic means will give more equal results for all indicators, thereby increasing comparability. Moreover, the changes have only resulted in minor differences to ranked country scores when compared to the previous measurement (UNDP, 2014). On the question of why the HDI does not cover more issues and expressions of people's capability, the UNDP mentions that its statistics unit has also created indexes and indicators for the issues in question: a gender inequality index, gender development index, and multi-dimensional poverty index are all advanced by the organization, and its adjusted human development index (AHDI) combines the classical HDI equation with an inequality indicator (ibid).

There are three steps in measuring HDI. Firstly is setting the minimum and maximum value in all indicators. The aim is to transform the indicators into indices between 0 and 1. The table below describes the indicators with the

minimum and maximum values for each component in the 2014 Human Development Report:

Dimension	Indicator	Min. value	Max. value
Health	Life expectancy	20	86
Education	1. Expected years of schooling &	0	18
	2. Mean Years of Schooling	0	15
(Material) Standard of living	GNI per capita	100	75,000

Table 2.1: Indicators used in calculating the HDI. Source: UNDP (2014)

In the 2014 UNDP report, detailed justification is given on why these values and scores were chosen. The minimum of the life expectancy value was set at 20 years because all countries surpass it. In terms of expected years of schooling and mean years of schooling, the minimum value is zero since everybody should attain formal education. The maximum measurement of expected years of schooling - 18 - is equal to years spend in obtaining a master's degree. The maximum for mean years of schooling, 15, is the projected maximum of this indicator for 2025. In terms of standard of living, the maximum values of income is 75,000. As shown in research by Kahneman and Deaton (2010) there is a tendency for human development to be untouched by annual incomes beyond $75,000. Moreover, assuming an annual growth rate of 5 percent, only three countries are projected to exceed the $75,000 in the next five years (ibid.)

In the second step, the three dimensions or sub-indicators are calculated using the following equation:

Dimension Index = actual value – minimum value / maximum value – minimum value

For the standard of living index, ln(x) is applied to all variables. Finally, the three indices are aggregated in order to obtain the final value HDI value. The calculation is as follows2:

$$\mathbf{HDI = (I_{health} \cdot I_{Education} \cdot I_{Income})^{1/3}}$$

While the classification of HDI is between one and zero, actual country scores have tended to range between 0.300 and 0.950. Countries with a an HDI above 0.700 are summarily included in a 'high human development' column, while 'medium human development' is valued as 0.699 to 0.500 and a 'low human development' index is taken to be equal to or below 0.499. In the 2014 UNDP report, the highest HDI was held by Norway (0.944), followed by Australia with 0.933 and Switzerland, which was measured at 0.917 HDI. The statistical median was given by the Maldives, Mongolia and Turkmenistan, with a value of 0.698 each. The countries with the lowest HDI in 2013 were Niger, Congo and the Central African Republic, who were measured at only 0.037, 0,038 and 0.0341, respectively.

Several studies have been realized to evaluate the impact of various other indicators and measurable aspects of reality on HDI. Marucii et al. (2007) argue that the prevalence of infectious diseases such as Human Immunodeficiency Virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) is much higher in countries that have low HDI. The study shows that these three viruses, which have become increasingly central issues in underdeveloped countries where awareness is still low, are highly correlated with the outcome of HDI, and should be understood as one of the primary determinants of cross-country differences despite equal levels of income. In studying the state of human development among indigenous peoples, Cooke et al. (2007) examine indigenous people living in Australia, the United States and Canada and reveal that differences and fluctuations in their HDI are mostly contained to the health sub-indicator. The authors suggest that the government in all three

[2] Before 2010, a different equation was used, limiting comparability between some different HDI datasets produced before and after. This paper uses only data that follows the new HDI, or NHDI, equation displayed above.

countries take more consideration of indigenous people, since their health condition primarily relies on government programs. The study also highlights that the availability of doctors or public health facilities in the areas where they live are crucial determinants of life expectancy as measured within HDI. In response to criticism of the HDI, Lee et al. (1997) evaluated 78 countries and found that the overall HDI, albeit often seen as oversimplified, was able to closely predict the infant and maternal mortality rate in all of them. Their study also discusses the critiques that the index is not broadly representative of human capabilities, and the authors argue that the index could indeed predict some of the exempted conditions in a diverse sample of 78 countries, and could hence be used as a suggestive indicator on a variety of issues.

Agostini & Richardson (1997) studied several cities in the United States and found that the predominance of one or another class of labor left a strong mark on HDI. In their case, cities such as Seattle, which has more white collar workers, showed markedly higher HDI when compared to Detroit, where the proportion of blue collar workers and un(der)employed is higher. Their study shows that a decent material standard of living, represented by the income component of HDI, has the primary role in HDI differences within large countries with relatively homogenous health and education policies among its states or provinces. Gomanee et al. (2005) evaluate 39 international aid receiving countries and measure the relationship between aid and human development index. The authors argue that most aid that had been effectively allocated to public expenditures did significantly increase the level of HDI. Their study has many similarities with this thesis, since it values and seeks to quantify the role of (different kinds of) government expenditures on human development index. Though they focused primarily on aid to least-developed countries, their results nonetheless serve to underline how public expenditures, especially on health and education, are the primary strategy to raising the level of HDI.

2.2 Debates on government spending and different sectors of public activity

The state and its expenditure accounts are across development theories seen as having important role in development, given that government has the authority to create policies that will have wide effects on it citizens and the shape of the national, provincial and local economy, human well-being, political dynamics and even the country's degree of openness to dynamics taking place in or spilling over from outside of its frontiers. Since this paper will be focus on government expenditures and government revenues, fiscal policy will be the main 'phase' of public agency considered here. Debates on how much the state can and should interfere in the economy, how much money it should spend and on what, how high the taxes imposed on its citizens should be, and which sectors of economic activity and sections of the population should be prioritized, are of course perennial subjects of discussion among scholars.

According to Tanzi & Schuknecht (1997), there are two main currents of thought on the degree and purpose of government interference with the market and, hence, on the purpose and size of its expenditures. The first, known as classical economics, suggests that the government should only engage in minimum intervention with the economy; therefore, this school of thought does not suggest high government spending. On the contrary, Keynesian economics is the primary (mainstream) theory associated with high government expenditures, based on the argument that high spending will be beneficial for the economy. However, there are two different assumptions on what was the cause that created government spending. Long before Keynes, Wagner (1890) published a theory related to government expenditures, in which he argued that high government expenditure was itself dependent on economic performance, which means that the higher the economic outcome, the higher amount of money the government can and will spend (the remaining question being on what). Keynes turned the argument around, and proposed that government expenditure can and should be used to induce growth in the economy, especially by increasing aggregate demand. A recent 'update' of this theory is proposed by Poot (2002), who categorizes several ways by which govern-

ment actions can positively affect economic activity and human well-being. First of all, the government can provide public goods and increase its spending in order to increase aggregate demand. Second, the state can form and invest in state-owned enterprises, both for-profit and non-profit, to obtain the fulfillment of public and strategic needs. Third, the government can create policies to protect property and just exchange and, when externalities occur, the government has a variety of policies in hand to facilitate efficiency. Fourth, the government may impose taxes and redistribute the additional revenue in order to support more equal income distribution. Lastly, government can interfere when there is asymmetric information in the market. These five points can serve as a first suggestion on how government policies can further economic activity in market societies such as Indonesia. Moreover, the author highlights that allocations of funds to human development such as health and education have strongly increased over time, especially in industrial countries (the main subjects in Poot's research). The following sections of the chapter will discuss the relation between government expenditures, economic performance and human well-being.

2.2.1 Government Expenditures and Economic Performance

Before human centered development become a household name, studies of state budgets were usually related with economic outcomes. This section presents studies relating both aspects in different ways. Both empirical and theoretical research about the relationship between government expenditures and economic performance has come up with variety of results. Landau (1983) found a negative relationship between total government expenditure as part of GDP and economic growth rates in a sample of 104 countries (all with a population of one million or more), which contained eight major oil exporters and 96 non-communist countries. This study was heavily publicized by proponents of 'small government' and limited public intervention in the market, and, in line with the predominant 'modernization theory' of the 1960s to early 1980s, the study stated that big government has a tendency to harm the economy. Devarajan (1996), argues that government expenditure is essential to the de-

velopment process in poorer countries, while richer, well-structured economies may cease to require big expenditures. Moreover, the government in developing countries should spend high amounts of money in sectors that contribute to economic growth. Lozides et al (2005), using annual data drawn from the UK, Greece and Ireland, evaluate the causality between government spending and economic growth. While not in all countries growth leads to higher government expenditure, the study reveals that increases in spending caused higher economic growth across the board. Nurudeen (2010) evaluates government expenditure in Nigeria and shows that not all types government expenditure are beneficial for growth. Government expenditures in transportation, telecommunication and health increased growth while capital expenditure had a negative effect. Interestingly, education spending was also correlated negatively in this Nigerian case study. Irmen (2009) argues that productive government expenditure has a positive relation with sustained economic growth, particularly in the infrastructure sectors that create beneficial conditions for long-run economic growth. Based on these previous studies that suggested a relation between infrastructure spending and HDI, we decided to also include infrastructure spending and stocks in our model.

Other studies have examined the impact of fiscal policy instruments, namely taxation, expenditures and overall government budget, on HDI. Easterly and Robello (1993) argue that both taxation and expenditures will at first (in the development transition) increase growth, but at some point growth will tend to be hindered rather than furthered by them. Bose (2007) studied government expenditure accounts in 30 countries over the course of the 1970's and 1980's, and found that, at the time, state budget growth – especially in capital expenditure - had a positive correlation with economic growth, which has slowly dwindled into an insignificant relation in the 2000s.

All of the studies presented above show how several types of government expenditures affect economic growth, and how academic currents have debated different perspectives on their exact relation and causality, which objectively changed over time, position on the development transition, and country. While some studies found that, within their specific parameters, increased

government expenditures were not clearly beneficial to growth, other stated that they supported the economy/ies in question measurably. Some of the studies also discuss the main issues of this thesis, which is the relation between health & education achievements and expenditure. Here, though the scales are more clearly tilted toward an affirmation of a positive relation, various debates remain important, and need to be taken into account when interpreting quantitative empirical results such as those presented in chapter 5. The next section of this chapter will focus some of them.

2.2.2 Effectiveness of Government Spending in Education and Health

As human well-being has been seen as an essential factor in public administration studies from the treatises of Aristotle and Platon, Adam Smith, Immanuel Kant and many others up to the point where Amartya Sen and Mahbub ul-Haq first built it into an indicator, normative, teleological, philosophical and political theories on whether and how to increase government agency and action on individual well-being are too abundant to be mentioned here in any conclusive fashion. We will thus limit this section to studies presenting ample empirical data. Neoclassical economist R.J. Barro (1990) examined statistics on 98 countries between 1960-1988 and found that economic growth had a strongly positive impact on human capital, measured by variables such as school enrolment ratio. On the other hand, government expenditure in other public sectors had a negative impact on economic growth. Furthermore, private investment contributed more positively to the economy than public investment. Barro's research has become an important reference, both followed and disputed, for subsequent studies related to government expenditure. Sylwester (2002) studied the relationship between human capital and economic growth, and revealed that countries that allocate high percentages of their budget to human capital formation tend to achieve higher growth and lower income inequality. Rappaport (1999) evaluated US government data for various cities during the period from 1970 until 1990, and found that there was a positive relation between government expenditure in the human capital sectors (schools, hospitals, medical education etc.) and economic performance, largely explained by the increasing attractiveness to high-end employers and employ-

ees. Donald & Shuangling (1993) studied 47 countries for ten years and 58 countries for eleven years, and revealed that government expenditure in education had a positive impact on economic growth in all cases. Welfare expenditure and economic growth showed a negative correlation in only one case, but was insignificant in most others. The result for military expenditure was mixed, and some countries gave strongly positive results while others exhibited a negative relation. Mauro (1998), in a study of 100 countries between 1982 and 1995, was able to present statistical evidence of a negative relationship between corruption and government expenditure in education.

Public health expenditures have often been shown to increase life expectancy and other health indicators. Glom et al. (1997) state that higher allocation for health expenditure increases life expectancy, which in turn may have a significant stabilizing impact on private capital accumulation decisions, and hence on growth and material living standards. Robert Lucas (1988) argues that investment in education increases the level of human capital, and should thus be seen as the main source of long-run economic growth. Lucas's work remains one of the most important references for arguments stressing human capital and capabilities. Van de Walle (1998) studied public expenditure in health sector in 1985-86, 1991-92 and 1996-97, respectively, covering six major states in India. His analysis of budgetary spending and subsidies on health is based on the conviction that the level of spending or subsidies from government does not have any direct bearing on the level of health. Unlike other studies that mostly show a positive relationship, van de Walle could not find a significant correlation. Karras (1993) added that government spending in education, represented, for example, by the construction of additional schools, can also lower the unemployment level much more effectively when compared to expenditure in military projects. All of the research above presented various studies that evaluated government expenditure in human capital. While few show an insignificant result, most of them have resulted in positive correlations with economic indicators.

2.2.3 Human Development effects of non-directly related public expenditures and derived variables

In this section we present literature covering the supplementary variables in the model: public expenditure on infrastructure and agriculture, household expenditure on health and education, education and health facilities (existing infrastructure), population and poverty rates.

First of all, infrastructure has become an essential issue in enhancing development indicators over the long term. As the main indicator to measure development achievement was through economic achievement, studies regarding infrastructure are mostly evaluating its relation with growth and income. One important study, however, that examined the relation between infrastructure and human development was presented by Jimenez (1994), who tested it against infant mortality and literacy as indicators of human well-being. The author concluded that, overall, infrastructure is beneficial for those indicators but there was a need to differentiate between public and private infrastructure. Although it conceded that different methodologies could lead to different results, Jimenez' study urges that infrastructure spending can be seen to have an impact on human well-being. Ranis & Stewart (2005) show several aspects of how infrastructure spending can have a positive impact on human development, and some of them (length of asphalted roads, public health infrastructure) are also variables measured in this paper.

On the relationship between agriculture and HDI, a number of authors argue that higher agriculture expenditure will lead to higher human development. The causality hypothesized for enhancing HDI through agriculture expenditure is by providing education and training for farmers, which results in their increased capabilities to increase their incomes through better skill and market knowledge. Average household expenditure as the other big determinant of health outcomes also shows a positive correlation with human development outcomes. Various studies show that the higher financial effort by households will increase the level of human development, and that, in general, households tend to prioritize allocation of their budget to health services. Last-

ly, Ranis & Stewart (2005) also revealed that the human development level has a negative relation with the poverty rate, meaning that the lower the poverty, then higher the human development outcome can be hypothesized to be.

Education and health are two factors that have been direct determinants in human capability theory from the beginning (Sen, 1990). Therefore, in order to increase the aspect of human well being, government and society needs to improve both health and education. This thesis thus includes measurements of the relative impact of the number of schools, hospitals, doctors and public health facilities built in each province of Indonesia, since all of the variables mentioned above have been theorized to have a big role in enhancing health and education levels. Grosse & Auffrey (1989) argue that the role of education and health facilities in developing countries as very essential. The authors assess that public facilities have a significant effect on both literacy and longevity, two out of three sub-indicators in the original HDI. The effect of population growth, however, has always been subject to debate in development studies. While some scholars argue that higher economic growth will limit population growth decrease, others in turn state that population decrease will cause high economic performance. Kelley & Schmidt (1995) divided the then existing evidence into two periods. In the 1960s and 1970s, population increases showed only insignificant correlation with growth, while from the 1980s on the relation between population is strongly negative. In terms of population size, Schumacher (1985) argues that economist should re think the determinants of achievement in development. Rather than focusing on growth as a definition of success, policymakers and scholars should consider direct values, such as living in a responsive social group and development of the community. Rethinking is also necessary since humans are highly dependent on unrenewable energy sources.

CHAPTER 3
THE SITUATION IN INDONESIA

3.1 Fiscal Decentralization and the Government Budget

According to Seda (2009), the organization of government accounts in Indonesia was originally rooted in the Dutch budgetary system in the colonialial era, called Indische Comptabiliteitswet (ICW) and instituted in 1867. After gaining independence, Indonesian politics began 'the old order era' marked by the rule of its first president, Soekarno. During this time, the new state adapted the Dutch budget system, which was highly centralized and consisted of two simplified groups - income and expenditure, without a system of checks and balances by level or part of government. The expenditures side included routine expenditure and capital expenditure and the central government held complete authority to allocate the budget and formulate a development program. The law Number 5 Year 1974 regulated the basic principles of local government, however, the state system in practice was still centralized in all manners (Smoke & Lewis, 1996). The second president, Soeharto, also ran the government in a centralistic, authoritarian style, therefore the budgetary system remained both formulated and decided upon by the central government. This only changed in the aftermath of the financial crisis in 1999.

With the passing of Law Number 22, 1999, Indonesia started the decentralization era. Due to the new legal provisions, local government (which in the country's terms consist of both provincial and district levels) could for the first time formulate their own revenue and expenditure programs, using the mechanism of an in theory participatory citizen's forum named Musrenbang (National Development Agency, 2005). Through this new mechanism (a bottom-up system that involves local government and, to a varying degree, the local population in formulating development strategy), regional government was fundamentally empowered. Besides this change in money flows, direct elections for governors and majors were for the first time held throughout the country. Fiscal decentralization was legislated on the height of crisis in 1999; however the implementation of this law only started after political turmoil had set in 2001. According to the classical theory by Tiebout (1956), the fundamen-

tal rationale for decentralization is that it enables local government to fund policies that can be more beneficial and suitable to local citizens than for central government. Eckardt (2008) states that the empowerment of local government is essential, since it has more direct contact with citizens, giving it the potential to enhance efficiency and responsiveness of public services. Helmsing (2002) argues that decentralization should be seen as a 'spirit' of giving local government the ability to do what the central government could not fulfil over decades of central-state led development policy. In addition, decentralization is seen by some to reduce corruption (Fisman & Gatti, 2002).

In spite of the broad advantages of decentralization, several weaknesses have more recently been pointed out or hypothesized. Treisman argues that decentralization could reduce efficiency and quality of public services, especially in the absence of a regulative assignment of responsibilities between central and regional government (Treisman, 2000). Eckardt criticizes that the bulk of the resources re-arranged during fiscal decentralization has done little more than increase the percentage of local government expenditure reserved for civil servant salaries (Eckardt, 2008). Prud'Homme (1995) adds that decentralization could increase disparity, reduce efficiency and may indeed increase corruption.

Fiscal decentralization in Indonesia – known as 'big bang' decentralization for the lack of preparation before instituting massive decentralization, has resulted in more power for regional government both to impose local taxes and to manage its budgets. This thesis, which is focused on government expenditure, has a strong connection with decentralization, given that the source of the expenditures I am investigating is the regional budget, consisting of local revenue and central government transfers. However, beside expenditures, this paper will also analyse the income side of the budget, in order to gain a broader perspective on the new causalities around human development caused by fiscal decentralization. In the following paragraphs, a classification of local and regional government budgets is presented.

The local government budget or APBD is managed through a legislative mechanism that involves extensive back-and-forth discussion between

government and parliament. Citizen participation through Musrenbang forums should be accommodated in this process, which finally leads to the publication of the government's annual plan (RKPD). The regional budget consists of two parts, namely revenue derived from own income (PAD) and central government transfers. PAD is obtained from local taxes and local revenue, while the central government transfers consist of four items. The first and most important is the DAU (General Allocation Fund), a fund aimed at providing a stable budget source for regional governments in order to finance its development programs. There is no regulation on how local government should spend the DAU, however some studies show that most regional governments use this particular fund primarily for the salaries of long-term employed government officials and workers (Sidik, 2002). The second is the DAK (Special Allocation Fund), a fund allocated based on the central government's priorities. Unlike DAU, DAK is further broken down and classified based on its purpose, such as DAK education, DAK infrastructure or DAK health. The third, the Revenue Sharing Fund (DBH) is a transfer from central government to provinces and municipalities in accordance with their contribution to the central state. Several regions that have natural or other resources that generate revenue for central state agencies and companies take part in the revenue sharing fund DBH. Their share, however, depends on the actual contributions by the respective region. DBH also includes a separate mechanism that redistributes back to the provinces based on the share of central government taxes, such as income tax, gained by central government in the respective province. Lastly, the fourth fund has the purpose to fund emergency situations, and the resources allocated through it are relatively small.

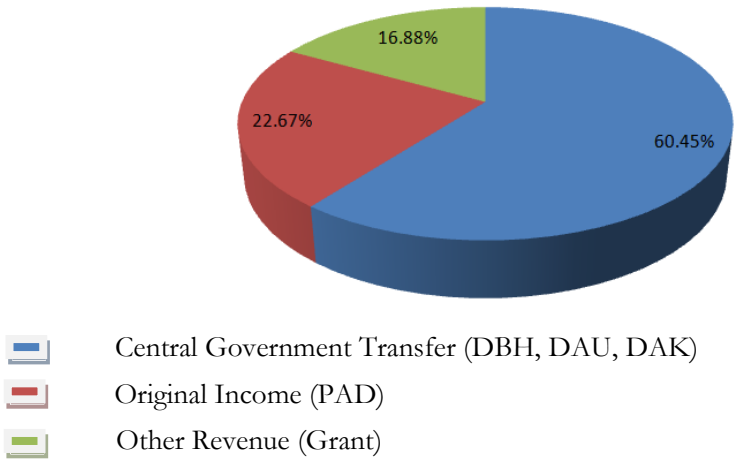

Figure 3.1: Main revenue sources of provincial governments in Indonesia. *Source:* Ministry of Finance, 2014.

From the chart above we can see that the biggest proportion of provincial government revenue is from the various transfer funds. A similar situation also occurs on the district level. Central government controls more than half of the budget source, though not all of it is earmarked for specific policies. This captures that local government is still highly dependent on the central state after around fourteen years of decentralization.

In terms of expenditures, there are two categories of government expenditures in Indonesia, based on ministry regulation number 29, 2006.

1. Direct expenditures

Direct spending are all government expenditures that have direct relations with government development programs. Direct expenditures extend to three classifications, namely:

a. **Salaries**: covers all personal payments for government officials who participate in certain programs.

b. **Goods and Services** covers payments for all goods with benefit value of less than twelve months, as well as payments for services that assist in implementing the policies, programs and other activities of the government. Some examples are office services, disposable office materials such as printers, insurance premiums & vehicle maintenance.
c. **Capital expenditures** includes payments for tangible fixed assets that have a benefit value of more than twelve months, such as land, equipment and machinery, buildings, roads, irrigation, networks and other fixed assets.

2. Indirect Expenditures

Indirect expenditure is government spending that has no direct relation with specific government development programs. Examples of indirect expenditures are monthly salaries for government officials employed irrespective of a specific program, interest payments, payment of subsidies, social assistance expenditures, financial aid and unexpected costs. With regards to its function, the regional budget consists of public services, health, education, security, environment, public facilities, social security and economic assistance. Another widely used mode of classifying government expenditure is based on whether it is obligatory or optional. Obligatory are all expenditures that have to be allocated by the government in order to succeed its development program, while optional expenditures can be requested by specific agencies depending on need.

Health and education expenditures, the main focus in this paper, are a mixture of resources from the general allocation fund (DAU), special allocation funds (DAK) in health and education and local government revenue (PAD). Other variables such as infrastructure expenditure and agriculture expenditure are, in this regard, similar to health and education resources. In order to evaluate their effect from the revenue side, in the next chapter we examine the history and potential determinants of the relationship between each government revenue stream and human development index on the province level.

3.2 Mechanisms of education spending in Indonesia

As this paper discusses human development through HDI with health and education as the two main indicators, this section will present the government mechanisms used to manage education and health in the specific case of Indonesia.

Education is a right for every citizen, as written in the Basic Law formulated after Indonesia gained independence from the Netherlands in 1945. The education system and curriculum, however, have been changing over time.

Before decentralization (pre-1999)

Indonesia was a colony of the Netherlands since the 1600s, but it was not until the 1920s that Indonesian people gained the right to enter formal schools provided by the colonial administration, and even then only few were admitted. Indonesians lagged behind European and Chinese people who lived in the same country. In 1930, only 6.4 per cent of native Indonesians were literate, as compared to 75.2 per cent of the European and 28.9 per cent of the Chinese populations, respectively (Van der Kroef, 1957). These students were mainly from wealthy families in the native Indonesian elite. Many other Indonesian children, however, studied in informal schools, mostly in the form of traditional or Islamic schools. One of the famous informal schools was called Taman Siswa ('students' garden') founded by Ki Hajar Dewantara, a nationalist figure who struggled to provide education for Indonesian children. The Dutch also founded several universities during this time, such as the University of Indonesia, Bandung Institute of Technology and Gajah Mada University.

In 1945, the increasingly powerful native elite wrestled power from the Dutch. The first president of independent Indonesia, Soekarno, formed his new cabinet and instituted Ki Hajar Dewantara as minister of education. His

government also formulated the Undang Undang Dasar (equivalent to the constitution) which affirms education as a human right and establishes an obligation for the state to provide education for the people resident in its boundaries. The first curriculum was named SR 1947 and consisted of 15 subjects. Besides thousands of schools, mostly concentrated in cities and towns, the new government also established a number of additional universities and teachers' schools.

After the fall of the old order 'Guided Democracy' regime in 1965-6, what was subsequently termed the 'new order' was initiated by the new president, Soeharto. As part of its complex restructuring of society, the new regime also set up a new curriculum for all levels of education, using its centralized fiscal powers to implement centralization also in the content of education. In the 1970s, Indonesia gained massively from the oil sector, and was able to allocate a part of the profit to building a comprehensive school system in the countryside. This 'big push' was organized in a government program called INPRES (President's Instruction). 68,000 INPRES schools were built in rural areas between 1973 and 1982, and the fact the central government provided the complete budget for the program also allowed it to increase its ideological reach into the diverse provinces and districts. In addition, the central government also provided the budget for student's school uniforms, books, tuition fees and teachers' salaries. With this infrastructure in place, nine years of schooling were formally made mandatory in the mid-1990s. In this era, the literacy rate increased significantly. Gross enrolment in primary schools thus rose from 62% in 1973 until universal primary education was achieved in the mid-1980s" (Bahreman et al, 2002).

1999 to today (changes during the study period)

Indonesia started to apply decentralization after the 1997 financial crisis, which led to political chaos. During the first years of the economic crisis, enrolment in junior high schools decreased to 69% (Kristiansen 2006). To regain the stable rate of increase, in 2004, the new president Soesilo Bambang

Yudhoyono formulated a program aimed at giving education and increasing the literacy rate for people who were not able to enrol in school before, which was called KEJAR. Since then, the quality of education in Indonesia has increased every year. A study by Widyanti and Suryahadi (2008) found that 76% of respondents considered that education services were generally better in 2006 than ever before.

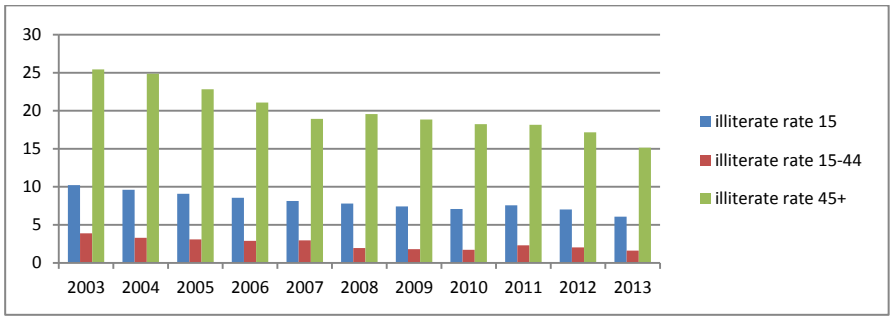

Figure 3.2: The Illiteracy Rate in Indonesia during the study period. *Source*: Author on calculation based on Indonesian Statistic 2015

The graph above shows the behaviour of the illiteracy rate (in percentage points) over the last decade. It can be seen that the highest proportion of illiteracy is in the population aged 45 and above, followed by those aged 15 and below. The lowest rates are in observed in the group of 15-45, known as the productive age. In general, there is a decrease every year in illiteracy, and the current historical low point was reached in 2013.

3.2 Health care in Indonesia

The Indonesian Constitution of 1945 states that living a healthy life and being able to turn to healthcare facilities when need arises are basic rights for every human being. Their actual implementation, however, has kept changing throughout every phase and style of government capacity and agency, beginning with the presence of traditional medication, high mortality and short life expectancy, before slowly achieving better conditions. This section seeks to establish a basic historical overview in order to understand the situation during our study period.

Health and healthcare before 1999

In pre-modern times, the Indonesian people relied on traditional medications and traditional practitioners to cure and prevent their illnesses. Baby deliveries were done with the help of traditional practitioners. In this time the mortality rate was very high, especially due to high infant mortality. In the colonial era, the Dutch, through their trading company VOC, brought the first modern doctors to the country, and Indonesians, especially elite families, started to know modern medication. During the process the VOC also built the first hospital in 1625, though it was limited to serving members of their military only. Until the late 1800s, several hospitals had been built and a medical education program called Pendidikan Doker Jawa (Java Medical Education) was in place, even though the availability was limited to elite families and the lecturers were from the Netherlands. In 1922 there were already 61 military hospitals, 181 national hospitals (Burgelijke Centrale), and 91 government hospitals. After gaining independence, Indonesia struggled with its economic condition, yet in 1951 the Duo Plan was created as a service concept that combines curative and preventive services. In the new order era, Soeharto's cabinet introduced public health facilities (PUSKESMAS) which operated on the subdistrict level and provided health services such as vaccination and nutrition consultancy. The health condition of the Indonesian people increased significantly in this era. In addition, the period also marked the success of a large-scale family planning program. During the 1970s, population growth reached a rate of 2.3% annually, while inn the early 1990s this figure had been lowered to around 1.6% each year. If in the early 1970s the Indonesian population had an average life expectancy of about 50 years, in the 1990s it had risen to more than 61 years.

1999-Recent

After taking the hit of the financial crisis, Indonesia began a path of improving its health quality. More PUSKESMAS (Public Health Centre) and hospitals were built. Health system performance has shown improvement, as indicated by several health status indicators such as infant mortality as presented in the graph below

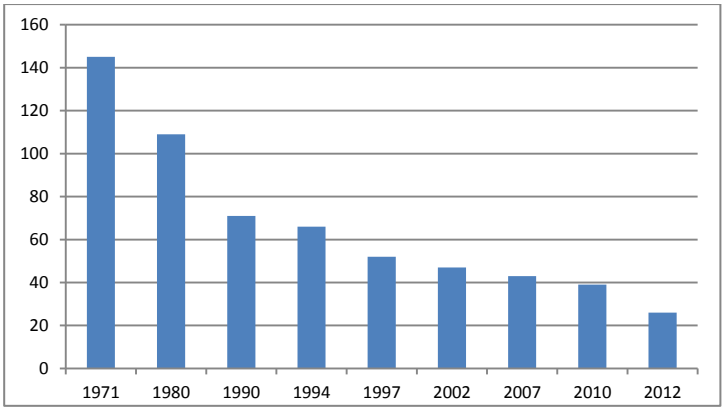

Figure 3.3 The development of the infant mortality rate in Indonesia. Source: Author's illlustration based on Central Bureau of Statistics (BPS) 2015

Infant mortality is counted as very high if the number reported is 125 and above. 75 until 125 are grouped as high infant mortality, medium infant mortality covers 35 to 75 while an index below 35 is classified as low. In 1971, infant mortality in Indonesia was very high, totalling 145 of all causes. There was a significant decrease over the 1980s. The number again fell dramatically when the country entered the 1990s and after that the trend shows a more gradual decline until 2012. It can be interpreted from the graph the government of Indonesia has been relatively successful in fighting the primary causes ofinfant mortality.

3.3 Provincial Government Expenditures in Health and Education Sectors in Indonesia

After the financial crisis in 1999, Indonesia reformed its government system, applied decentralization and a commitment to increase human-centred development (which is stated in Law Number 20, 2003). RP 23.1 trillion in

2005, RP 84.9 Trillion in 2009 and RP 103.9 Trillion in 2012 allocated from the national government budget for education expenditures, respectively. The average increase in education expenditure was around 22% each year. The largest share of education spending has been devoted to primary education (52%), followed by 18 and 13 percent for junior and senior secondary. However, government spending on the educational sector reached its heights in the mid-1980s with 17–18% of central government expenditures. In 1997, the figure was reduced to 14% (Kristiansen, 2006).

The government expenditure on healthcare was re-regulated in Law Number 39, 2009, which states that 5% of the national budget should be allocated to health expenditure, as well as 10% of the regional budget. Several studies have evaluated the impact of education expenditure in Indonesia. Anjouw (2001) studied the role of government expenditures in health and education and the relation with poverty, revealing that people who live in poverty can drastically increase their health and education level through health subsidies. Kristiansen (2006) stated that government transfers from central to regional authorities can bring positive effects to human well-being and economic outcomes.

3.5 Indonesia's Human Development Index

Indonesia's HDI was 0.684 points in 2013, thus the country was categorized in the medium human development category. Indonesia's HDI increases slightly every year as shown from the graph below that shows the trend of HDI in Indonesia on the national level. We can see that during the financial crisis HDI decreased significantly. However, even excluding the rebound effects after the crisis, the trend presents a significant increase until 2013

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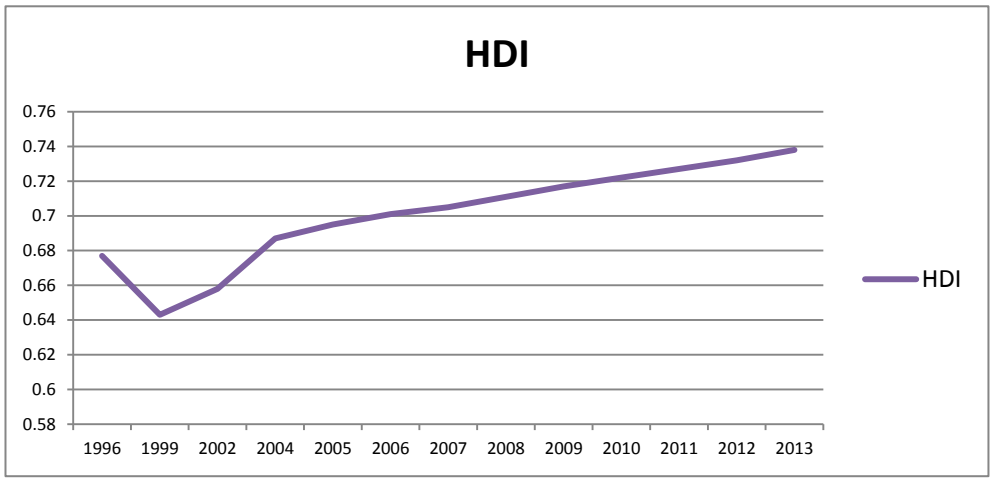

Figure 3.4: HDI trend for Indonesia. *Source:* Author's illustration based on UNDP (2014)

The government of Indonesia has written its commitment to increase human development into its long term development plan (RPJP) that stretches from 2005 until 2025 as written in Law number 17 Year 2007. Furthermore, the government also began to extensively use the HDI as an indicator of human development. In the decentralization era, all local government units on the provincial and district level have begun to use HDI as an indicator, partly because the development plan of all regional government should be similar with the national one even though every local government sets different ways to achieve the goals. Since Indonesia applied decentralization, local government has more responsibility to induce human development in its region. The graph below presents the differentiated achievement of human development as measured by HDI on the province level.

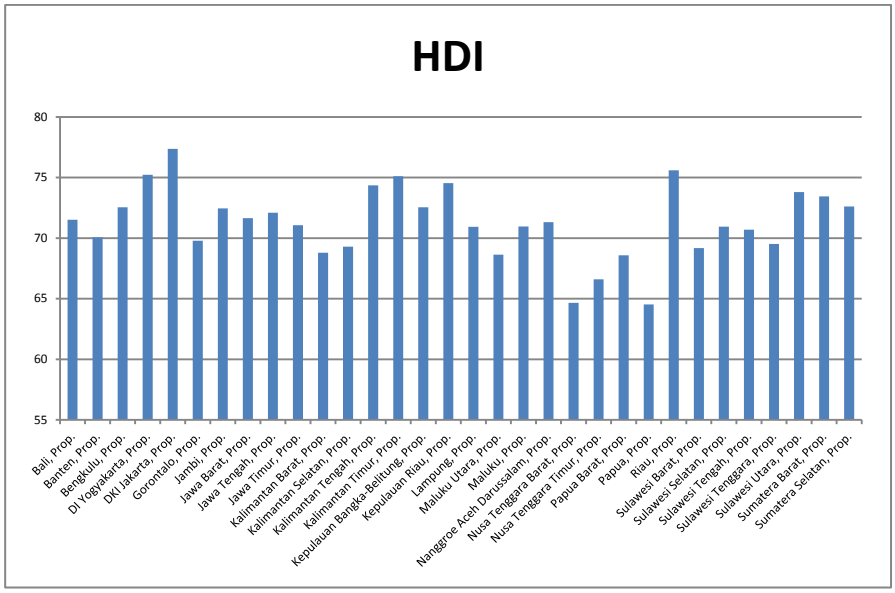

Figure 3.5: Province-level HDI average between 2002 and 2012. *Source:* Author's elaboration based on annual Central Bureau of Statistics (BPS)

The graph shows trends in HDI among provinces in Indonesia. The graph has covered the average of HDI between 2002 and 2012 among all provinces except North Kalimantan, which is a new province established in 2012. It can be seen that Jakarta (the capital), Riau Province and East Kalimantan were the top three of the highest HDI in Indonesia. Meanwhile, Papua, West Nusa Tenggara and East Nusa Tenggara were the bottom three. The graph also illustrates the fact that HDI in Indonesia is relatively varied. However, most of the provinces were classified in the (albeit broad) medium HDI group.

CHAPTER 4
Data and Methodology

4.1 Data

Data used for HDI and population are secondary data from Central Bureau of Statistics (BPS). Data for education and health are taken from the Ministry of Finance. Data for agriculture, infrastructure, and household expenditure are from the World Bank INDO-DAPOER (Indonesia Database for Policy and Economic Research). The same source was used for data on the number of schools, number of hospitals, number of public health facilities, number of doctors and poverty rate. Data for the revenue side, which consists of Original Income (PAD), General Allocation Fund (DAU), Revenue Sharing Fund (DBH) and Special Allocation Fund (DAK) was taken from the Ministry of Finance. All of the data covers 33 provinces in Indonesia and the study period from 2002 until 2012.

4.2 Variables

The variables used in this paper are based on the most widely associated causalities on human development in Indonesia. Table 2 contains a description of all variables.

Variables	Definition	Source
Health Expenditure (HealthExp)	Amount of provincial government expenditure in the health sector per year in USD	Ministry of Finance
Education Expenditure (EducExp)	Amount of provincial government expenditure in the education sector per year in USD	Ministry of Finance

Agriculture Expenditure (AgriExp)	Amount of provincial government expenditure in the agriculture sector per year in USD	The World Bank Indo-dapoer
Infrastructure Expenditure (InfraExp)	Amount of provincial government expenditure in infrastructure per year in USD	The World Bank Indo-dapoer
Household Expenditure (HH Exp)	Amount of household expenditure in education and health per month in USD	The World Bank Indo-dapoer
Population (Pop)	Total number of people who live in the province	The World Bank Indo-dapoer
Hospitals (NumOfHosp)	Number of hospitals (public and private) in each province	The World Bank Indo-dapoer
Schools (NumOfSchools)	Number of schools (primary, junior secondary and secondary) in each province	Central Bureau of Statistics (BPS)
Public Health Facilities	Number of public health facilities (PUSKESMAS) in each province	The World Bank Indo-dapoer
Doctors	Number of doctors (general practitioners and specialists) in each province	The World Bank Indo-dapoer
Poverty	Percentage of people who live under the poverty threshold among the population in each province	The World Bank Indo-dapoer

Table 4.1 Variables Definition and Sources

On the revenue side, Original Income (PAD), General Allocation Fund (DAU), Special Allocation Fund (DAK), Revenue Sharing Fund (DBH) each define the amount of revenue in USD that received by the respective province.

The expected regression results for the health and education expenditure variables are positive, since the purpose of health and education expenditure is to increase human capability and, albeit potentially in an inefficient way, it is sure to impact two out of three HDI sub-indexes positively to some degree. Agriculture expenditure is expected to show a positive relation as well, since agriculture is one of the biggest sectors that contribute to GDP, showing 14.4% in 2014 (Ministry of Agriculture 2014). Furthermore, a study by Ranis (2005) shows that expenditure in the agriculture sector, especially in the form of education and training for farmers tends to increase their well-being comprehensively, from income to pride. Infrastructure expenditure is expected to show a positive relation as predicted by Jiminez (1994), who argues that infrastructure such as roads are crucial in providing better access to health and education facilities. Schools, hospitals, public health facilities and doctors are expected to show positive correlations because all of the variables represent facilities or services to the citizen in order to obtain better health and education. Ranis (2005) also evaluated the impact of poverty and household expenditure, and as the study shows that poverty has negative correlation with human development since people who live under the poverty threshold may not be able to afford proper education and health, the hypothesis is for the poverty rate to be correlated negatively to HDI. In terms of household expenditure in education and health, the relation is expected to be positive because the more the average household earns, the more it can, in principle, allocate to maintaining the health and increase the education of its members.

However, it is difficult to find study that examines the relationship between total population of a governed unit and HDI. Generally, developed countries that organize the best health and education for all of their inhabitants tend to have a lower population when compared with larger countries of equivalent wealth (Kohr, 2001). For developing countries, however, this relationship has not been tested conclusively. Kohr (ibid.) offers a convincing ex-

planation when he expects a causality between the closeness between a government and its citizens (he calls this 'translucency) and the equality and effectiveness of its policies. In taking this lead, we expect that the correlation between population and HDI could be negative.

4.3 Methodology

This investigation uses quantitative analysis in order to examine the impact of health expenditure, education expenditure, infrastructure expenditure, agriculture expenditure, household expenditure, population, number of schools, number of hospitals, number of public health facilities, number of doctors and poverty rate on HDI in 33 provinces of Indonesia between 2002 and 2012. The model is built using panel data regression. Panel data is a combination of time series and cross section regression that will give the model dimensions of time and space and enables researchers to increase the quality and quantity of the data in ways that could not be achieved when using only time series or cross section data (Gaskari, 2011). Furthermore, besides evaluating the expenditure side of regional fiscal policy, a second model correlates the revenue side and its' variables' impact on HDI. In order to check the relationships' changes over time, the model includes a dummy time measure, using 2012 as the basic value. To evaluate the effect among provinces, DKI Jakarta is used as the base value for a dummy province variable.

The following equation is estimated to examine the impact of all variables on HDI.

Model 1:

The first model measures the relationship between government expenditures and a number of derived variables with HDI:

$$\mathbf{HDI}_{it} = \lambda_i + \theta_t + \beta_0 + \beta_1 \mathbf{lnEducExp}_{it} + \beta_2 \mathbf{lnHealthExp}_{it} + \beta_3 \mathbf{lnAgriExp}_{it} + \beta_4 \mathbf{lnInfraExp}_{it} \beta_5 \mathbf{lnHHExp}_{it} + \beta_6 \mathbf{lnPop}_{it} + + \beta_7 \mathbf{numofhosp}_{it} + \beta_8 \mathbf{numofschool}_{it} + \beta_9 \mathbf{numofdoc}_{7it} + \beta_{10} \mathbf{numofpubfac}_{it} + \beta_{11} \mathbf{pov}_{it}$$

HDI is the dependent variable, EducExp stands for Education Expenditure, HealthExp for Health Expenditure, AgriExp for agriculture expenditure, InfaExp for infrastructure expenditure, HHExp for household expenditure, pop for total population, numofhosp for the number of hospitals, numofschool for the number of schools, numofdoc for the number of doctors, numofpubfac for the number of public health facilities, pov for the poverty while, while i represents entity (the province) and t the time dimension.

Model 2

The second model examines impacts from the revenue side of the provincial government budget, both from Original Income as well as central government transfers, with HDI.

$$\mathbf{HDI}_{it} = \lambda_i + \theta_t + \beta_0 + \beta_1 \mathbf{lnPAD}_{it} + \beta 2\mathbf{lnDAU}_{it} + \beta 3\mathbf{lnDAK}_{it} + \beta 4\mathbf{lnDBH}_{it}$$

HDI is the dependent variable. The independent variables consist of PAD for Original Income (Pendapatan Asli Daerah), DAU for General Allocation Fund (Dana Alokasi Umum), DAK for Special Allocation Fund (Dana Alokasi Khusus), DBH for Revenue Sharing Fund (Dana Bagi Hasil), while i stands for entity (province) and t for time.

The thesis uses three techniques to estimate the effects of this panel data model: Pooled Least Square, Fixed Effect, and Random Effect. According to Nachrowi & Usman (2002), they are distinguished by the following. Pooled or ordinary least square are used when the intercept and slope are not changing among entity or time. Fixed effect is used when the intercept is not constant and the changes among entity and time are accommodated through the intercept. The last technique utilized is Random Effect measurement, which is generally used when there is a discrepancy or error between entity and time and the difference in entity and time is accommodated through the error. After that, in order to determine the best results between fixed effect and random effect measures, the panel will be tested via the Hausman Test.

Chapter 5
Findings and Interpretations

This chapter will discuss the results of the two models, the first of which regresses HDI against expenditures and derived variables, and the second, which regresses HDI against revenue streams. Since the Hausman test found a Chi Square value of 70.50 with a probability of 0.0000 (or less than the threshold $\alpha = 10\%$), we will use the fixed effect model to determine effects.

5.1. Findings and Interpretation of Model 1

The table below shows the results of the regression between HDI and expenditures and derived variables, using OLS, fixed effect and random effect.

Variables	OLS	FIXED EFFECT	RANDOM EFFFECT
Education Expenditure	0.0056*** (0.0013)	0.0004 (0.0007)	0.0030 (0.0008)
Health Expenditure	-0.0011 (0.0013)	0.0050*** (0.0008)	0.0051*** (0.0009)
Agriculture Expenditure	0.0036* (0.0020)	0.0026* (0.0013)	0.0059*** (0.0013)
Infrastructure Expenditure	0.8878*** (0.0221)	0.0027 (0.0196)	0.0350* (0.0203)
Number of Doctors	0.118e-06 (0.369e-06)	7.23e-06 (0.527e-06)	0.126e-04* (0.4e-0670)
Number of Hospitals	0.0003*** (0.646e-04)	0.0004*** (0.775e-04)	0.0001** (0.604e-04)
Poverty rate	-0.0019*** (0.0013)	-0.0020*** (0.0003)	-0.0023*** (0.0002)
Number of schools	-0.339e-06*** (-0.607e-07)	-9.60e-07 (0.794e-07)	-0.295e-06*** (0.674e-07)
Number of Public Health Facilities	0.286e-04*** (0.517e-06)	0.392e-04*** (0.906e-06)	0.146e-04** (0.652e-06)
Household Expenditure	0.0009*** (0.0001)	0.0002** (0.760e-04)	0.0005** (0.721e-04)
Population	-0.0216*** (0.0025)	0.0516*** (0.0113)	-0.0192*** (0.0056)
Constant	0.0537	-5.2276**	0.4281***

	(0.2029)	(0.2449)	(0.2015)
Observations	363	363	363
R-squared	0.754	0.8610	0.6942

Table 5.1: Results of Model 1. Source: own computation
Note: Standard errors are shown in parentheses
Level of significance is indicated by ***, **, and * for 1, 5, 10% significance level, respectively

From table 5.1 it can be seen that the R-squared in the fixed effect shows 0.8610, meaning that 86.10% of HDI could be explained by the model. Furthermore, the main indicators (health and education expenditures) show positive correlations, albeit below the significance level in the case of education expenditure. The result of health expenditure can be interpreted as such that a 1% increase in government health spending is, based on this model, expected to increase HDI by 0.005 points. Other expenditure variables that returned significant positive results were agriculture and household expenditures. If the government expenditure in agriculture increases by 10%, or 5% for household expenditure, HDI would be expected to rise by 0.002 points. Meanwhile, for the derived variables related to healthcare - number of doctors, number of hospitals and number of public health facilities, results vary. While number of hospitals and number of public health facilities show a significant positive correlation, with a 1% increase corresponding to a 0.004 or 0.003 point increase of HDI, respectively, number of doctors is positive but not significant. Number of schools is negative, but also not significantly. Furthermore, the poverty rate was significantly negatively correlated, with each 1% rise in poverty expected to decrease HDI by 0.002 points. The last variable, which is population, shows the strongest significant positive result, suggesting that each 1% difference in a provinces total population will change the expected HDI by 0.051 points.

The following table presents the results of using a dummy time variable to examine the changes between 2002 and 2012. Since the model being used is a fixed effect model, the dummy is run in a fixed effect regression.

Dummy 2003	-0.0025*** (0.0014)
Dummy 2004	0.0185*** (0.0016)
Dummy 2005	0.0294*** (0.0017)
Dummy 2006	0.0372*** (0.0022)
Dummy 2007	0.0394*** (0.0023)
Dummy 2008	0.0461*** (0.0029)
Dummy 2009	0.0495*** (0.0032)
Dummy 2010	0.0553*** (0.0034)
Dummy 2011	0.0614*** (0.0040)
Dummy 2012	0.0671*** (0.0043)

Table 5.2: Results of the Year Dummy Test

From the table, we can see that the responsiveness of HDI against the regressed variables increased every year when comparing it to 2002, the reference category. As the results are almost all positive and significant, with a growing coefficient for every year after 2003, it can be concluded that there was a stable growth of HDI responsiveness over time in the study period.

The next table captures the responsiveness of HDI to all regressed variables in each respective province. The reference province is Aceh. Again, the dummy province was run through a fixed effect regression.

Province 2 (North Sumatra)	0.1089*** (0.1529)
Province 3 (West Sumatra)	0.41738*** (0.0127)
Province 4 (Riau)	0.0586*** (0.0126)
Province 5 (Jambi)	0.0884*** (0.0148)
Province 6 (South Sumatra)	0.0253* (0.0140)

Province 7 (Bengkulu)	0.1490*** (0.0187)
Province 8 (Lampung)	0.0278 * (0.0146)
Province 9 (Bangka Belitung)	0.1685*** (0.0219)
Province 10 (Kepulauan Riau)	0.1685*** (0.0197)
Province 11 (DKI Jakarta)	0.0487*** (0.0151)
Province 12 (West Java)	-0.2386*** (0.0354)
Province 13 (Central Java)	-0.2251*** (0.0369)
Province 14 (Jawa Tengah)	0.1122*** (0.0120)
Province 15 (Jogjakarta)	-0.27939*** (0.0428)
Province 16 (East Java)	-0.0059 (0.0107)
Province 17 (Banten)	0.0478*** (0.0108)
Province 18 (Bali)	0.0220 (0.0137)
Province 19 (Nusa Tenggara Barat)	0.0150 (0.0165)
Province 20 (Nusa Tenggara Timur)	0.0232 (0.0145)
Province 21 (West Kalimantan)	0.1163*** (0.0183)
Province 22 (Central Kalimantan)	0.0356** (0.0141)
Province 23 (East Kalimantan)	0.0780*** (0.0145)
Province 24 (North Sulawesi)	-0.0933*** (0.0281)
Province 25 (Central Sulawesi)	0.0980*** (0.0169)
Province 26 (South Sulawesi)	-0.0252 (0.0159)
Province 27 (South East Sulawesi)	0.1047*** (0.0171)
Province 28 (Gorontalo)	0.1805*** (0.0227)
Province 29 (West Sulawesi)	0.1687*** (0.0220)
Province 30 (Maluku)	0.1686*** (0.0208)
Province 31 (North Maluku)	0.1487*** (0.0236)

Province 32 (West Papua)	0.1965*** (0.0271)
Province 33 (Papua)	0.0622** 0.0195

Table 5.3: Results of the Province Dummy Test

Based on the table above, it can be seen that the impact of all expenditure variables taken together on HDI is highly divergent among provinces. Several provinces show no significant difference to the dummy (Aceh): East Java, Bali, Nusa Tenggara Timur, Nusa Tenggara Barat and South Sulawesi. Most of the provinces (21 in total) show a positive significant result when compared to Aceh. Only five provinces are significantly less responsive to the dependent variables: West Java, Central Java, Jogjakarta and North Sulawesi. The only two provinces that show negative but insignificant results are East Java and South Sulawesi.

Based on these results, the following interpretations are admissible. Health expenditure gave a positive result, which corresponds to most of the studies presented in the literature review, such as Mauro (1998). Education expenditure, however, showed no significant result. A World Bank study on local government performance on the municipal level showed that provincial government only gives a small amount of the overall funding for education - around 6 per cent in 2009. Even though the trend showed a gradual increase, the percentage spent by provincial government is still very low as opposed to district and central government, who carried most of the funding for schools and universities. Furthermore, provincial government also did not spend the regulated minimum 20% of its budget for education expenditure (World Bank, 2013). Hence, since most responsibility for public education was placed away from provincial governments, their different approaches will have mattered relatively little, as represented by the inconclusive regressions.

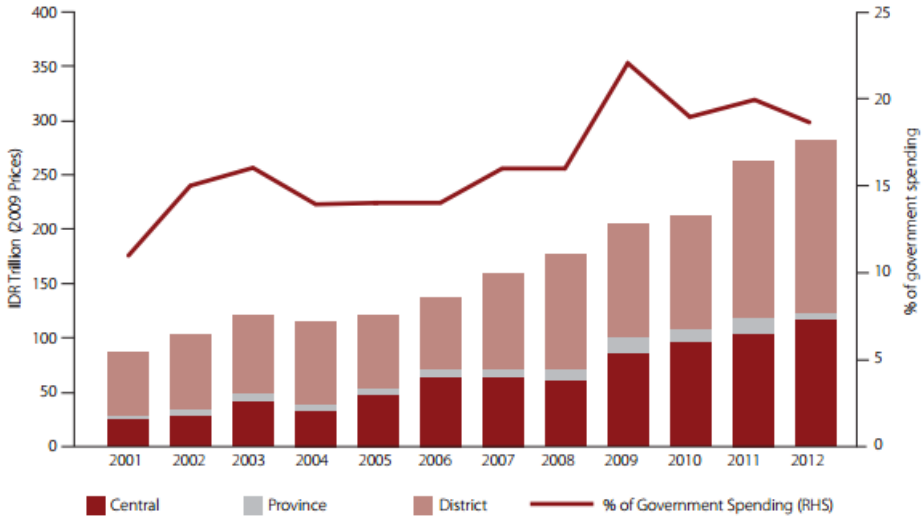

Figure 5.4: Changes in Government Spending in Education

Source: http://www.worldbank.org/en/news/feature/2013/11/26/local-governance-and-education-performance-in-indonesia

As for the other variables that showed a positive significant result - agriculture and household health and education expenditure, a study by Ranis & Stewart (2005) gave a very similar result. Higher household expenditure on health and education is likely to increase the health and education capabilities of every family. The channel through which agriculture expenditure by the provincial government could lead to higher HDI is via farmer's growing incomes, likely resulting in higher household income and hence higher spending on education and healthcare. During the study period, Indonesia's government issued Law Number 16, 2006, to increase the number of extension workers that provide information about technology and skills to farmers.

Number of schools was negative but insignificant which on first inspection differs from most of the literature, beginning with Sen (1990). One explanation that could explain this situation is a report from the Ministry of Education which shows that while the number of schools in Indonesia is not sufficient to cover all students adequately, no students are rejected either way, and provinces with more schools might have better quality and more comfortable education, but not necessarily more years of schooling, leading to the inconclusive relationship in the model (Ministry of Education, 2014). The poverty rate showed the expected result: increases in the poverty rate, even if GDP

remains constant, will decrease HDI, as argued by Ranis & Stewart (2005). The last variable that exhibited a positive relation was total population. There is no previous study evaluating the connection, however this outcome may occur due to the fact that one of the HDI sub-indicators is longevity, and more populated provinces might be expected to have advanced further on the demographic transition. Indonesia's provinces are currently in various stages of the demographic dividend phase, a situation where the relation between productive population and those in an unproductive age changes swiftly (Lee & Mason, 2006).

Lastly, the bulk of regional government expenditure is used for (often administrative) salaries, which could be an explanation for why the coefficients were all relatively small. Civil servant salaries make up around half of the regional budget, as presented in the chart below. This situation means that only around 50% of the total expenditure was spent for productive expenditure - projects that have direct correlation with development.

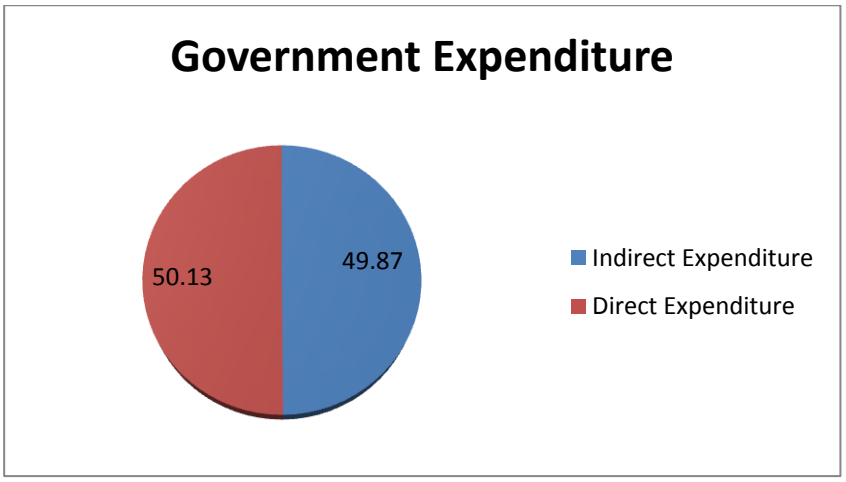

Figure 5.5: Proportion of Government Expenditure Uses of Indonesian Provinces. *Source*: Ministry of Home Affair, 2014 http://keuda.kemendagri.go.id/datin/index/1/2014

The result for dummy time shows that for the years after 2003 (the reference is 2002) the result of HDI grew steadily, as expected. The province dummy test, however, reveals a variety of results. Aceh, which lies on the north tip of Indonesia, is the region that suffered from a devastating Tsunami in 2006, which caused an enormous impact in this region. Therefore, most other

provinces had a higher HDI responsiveness in the study period. Provinces that showed an even lower responsiveness were located in Java, with the exception of North Sulawesi, which could be explained by already above-average HDI levels there.

5.2. Findings and Interpretation of Model 2

Model 2 aimed to analyze the relationship between HDI and government revenue streams, differentiating between original income and four types of central government transfer. The table below presents the results of the OLS, Fixed Effect, and Random Effect regressions. However, since the Hausman Test favours the Fixed Effect model, the results will be measured by this specific method. We also ran a regression against dummy year and province variables, however since the main focus of the paper is the expenditure side, the discussion will only evaluate the dependent variables. The result for both of the dummies is presented in the appendix.

Variables	OLS	FIXED EFFECT	RANDOM EFFFECT
General Allocation Fund (DAU)	0.0034 (0.0028)	0.0111*** (0.0017)	0.0109*** (0.0016)
Revenue Sharing Fund (DBH)	-0.0005 (0.0006)	0.0020*** (0.0006)	0.0019*** (0.0005)
Original Income (PAD)	0.0135*** (0.0012)	0.0150*** (0.0013)	0.0148*** (0.0012)
Special Allocation Fund (DAK)	0.0027*** (0.0014)	0.0030*** (0.0007)	0.0030*** (0.0007)
Constant	-0.2924 * (0.0771)	-0.2595*** (0.0380)	-0.2427*** (0.0389)
Observations	363	363	363
R Squared	0.3367	0.7263	0.0303

Table 5.4: Statistical results of Model 2

Source: own computation

Note: Standard errors are showed in parentheses

Level of significance is indicated by ***, **, and *, which represent 1, 5, and 10% significance levels, respectively

From the statistical results, we can see that the R-squared in the fixed effect model is 0.7283, which means that 72.83% of the variation in HDI could be explained by the model. All of the dependent variables show significant positive correlations with HDI. Every 1% increase in DAU will increase HDI by 0.011 points. 1% increases in DBH and PAD and DAK will lead to an enhancement in the level of HDI by 0.0020, 0.0150, and 0.0030 points, respectively. When comparing government transfer funds and original income (PAD), the regression shows clearly that original income has a bigger positive impact than unconditional transfers, which, again, had almost four times higher impact than conditional transfers. Revenue sharing transfer funds had the lowest impact overall. These results would lead us to underline the arguments of proponents of decentralisation (Eckardt, 2008), with a suitable explanation being that the more unconditional and self-controlled the funds are, the more they enable regional governments to formulate their own strategy according to local preferences and dynamics. Decentralization also gives more authority to regional governments to increase their original income through taxes or other sources. Eckardt states that the empowerment of local government is essential since they have more direct contact with their citizens which, as argued by Helmsing (2002), leads to enhanced efficiency and responsiveness of public services. The fact that the least HDI contribution was achieved by funds transfered in exchange for primary production such as oil, gas and forestry, suggests a tendency for resource-curse type aberrations of government-citizen interaction and codependency in the respective provinces. Each dollar of original income had the same impact as 7,5 dollars of revenue sharing transfer income.

Chapter 6
Conclusions

The human-centred capabilities approach to development has become a capable alternative for measuring development outcomes in the last decades. One possibility to measuring achievement in human development is through the Human Development Index (HDI), which consists of sub-indicators capturing education, health and a decent living. The goal to increase human development has been the object of various legal and discursive commitments by the government of Indonesia, most importantly in its 2005-2025 long term development plan (RPJP). The government also uses the HDI as an indicator of human development, since this approach has become intrinsic to many development programs on all levels. In order to boost human development, these programs seek to increase the education and health status of citizens in a variety of ways. One of them is by increasing the expenditures in education and health, as well as re-allocating them to regional and district-level government and its agencies. National law stipulates that 20% of government expenditure must be allocated to education and 10% for healthcare expenditure. These two expenditures were also the main focus of this thesis. Other expenditures, such as agriculture, infrastructure and household health and education spending have also been examined in the model. Public health facilities, number of doctors, number of hospitals and number of schools - as proxies for access to health and education, were evaluated as additional dependent variables. Total population and the poverty rate were added to the model as further indicators. Besides measuring the coefficients for each variable, this study also correlated against a dummy year and a dummy province variable. Indonesia applied decentralization since 2002, therefore local government has gained both flexibility and responsibility to manage their region's development over the study period. A second model was constructed to estimate the relationship between original income (PAD) and central government transfers (DBH, DAK and DAU) on HDI. All of the independent variables and dependent variable were estimated using panel data regression, and covered the period between 2002 and 2012.

The first obvious result is that different kinds of government expenditure increased the level of HDI in different ways. Education expenditure showed a positive but insignificant result, which may have appeared due to provincial governments spending only around 3 to 6 per cent of their total expenditure on education. Among three derived indicators of healthcare assets, only the number of doctors showed no significant relation with HDI, while the other two contributed positively to it. As expected, a decrease in the poverty rate increased HDI, while population works in reverse, with increases in population leading to higher HDI. When applying year dummy variables, the result shows that since 2004, HDI was statistically higher when compared to the reference year 2002. The magnitude also became bigger over the years, reflecting the steady increase in HDI across all provinces. In terms of dummy province, most of the provinces showed higher HDI responsiveness when compared to Aceh as the base province. Of the few provinces with lower responsiveness, all were located in Java except one in Kalimantan. It is important to note that Aceh is the region highly damaged by a tsunami in 2006.

On the revenue side, it can be seen that all broad types of government revenue were positively related with HDI. The highest coefficient was shown by original income, the lowest (7,5 times lower) by revenue sharing transfers. From this data, we conclude that fiscal decentralisation brought benefits for human development. On the expenditure side, however, regional government needs to carefully consider how to allocate its spending productively, especially since slightly more than half of regional-level budgets are used in monthly government salaries.

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Appendix 1

Panel Data result of Expenditure Side

OLS

```
. reg hdi ln_educ ln_health ln_agri ln_infra doctor hospital povrate school public_health hh_exp ln_pop

      Source |       SS       df       MS              Number of obs =     363
-------------+------------------------------           F( 11,   351) =   98.01
       Model |  .401566313    11  .036506028            Prob > F      =  0.0000
    Residual |  .130742338   351  .000372485            R-squared     =  0.7544
-------------+------------------------------           Adj R-squared =  0.7467
       Total |  .532308651   362  .001470466            Root MSE      =   .0193

------------------------------------------------------------------------------
         hdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     ln_educ |   .0056108   .0013985     4.01   0.000     .0028603    .0083612
   ln_health |  -.0011663    .001365    -0.85   0.393     -.003851    .0015183
     ln_agri |   .0036838   .0020901     1.76   0.079     -.000427    .0077945
    ln_infra |   .0887825    .022133     4.01   0.000     .0452524    .1323125
      doctor |   1.18e-06   3.69e-06     0.32   0.748    -6.07e-06    8.44e-06
    hospital |   .0003268   .0000646     5.06   0.000     .0001997    .0004538
     povrate |  -.0019052   .0001348   -14.13   0.000    -.0021704     -.00164
      school |  -3.39e-06   6.07e-07    -5.60   0.000    -4.59e-06   -2.20e-06
public_health |   .0000286   5.17e-06     5.53   0.000     .0000184    .0000388
      hh_exp |   .0009109    .000114     7.99   0.000     .0006867    .001135
      ln_pop |  -.0216424   .0025061    -8.64   0.000    -.0265713   -.0167134
       _cons |   .0537251   .2029146     0.26   0.791    -.3453563    .4528066
------------------------------------------------------------------------------

.
```

Fixed Effect

```
. xtreg hdi ln_educ ln_health ln_agri ln_infra doctor hospital povrate school public_health hh_exp ln_pop, fe

Fixed-effects (within) regression               Number of obs      =       363
Group variable: province                        Number of groups   =        33

R-sq:  within  = 0.8610                         Obs per group: min =        11
       between = 0.0911                                        avg =      11.0
       overall = 0.1114                                        max =        11

                                                F(11,319)          =    179.69
corr(u_i, Xb)  = -0.9522                        Prob > F           =    0.0000

------------------------------------------------------------------------------
         hdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     ln_educ |   .0004626   .0007886     0.59   0.558    -.0010888     .002014
   ln_health |   .0050092   .0008719     5.75   0.000     .0032939    .0067246
     ln_agri |    .002644    .001342     1.97   0.050     3.74e-06    .0052842
    ln_infra |   .0270056   .0196154     1.38   0.170    -.0115862    .0655974
      doctor |   7.23e-06   5.27e-06     1.37   0.171    -3.15e-06    .0000176
    hospital |   .0004643   .0000775     5.99   0.000     .0003117    .0006168
     povrate |   -.002004   .0003483    -5.75   0.000    -.0026892   -.0013187
      school |  -9.60e-07   7.94e-07    -1.21   0.228    -2.52e-06    6.02e-07
public_health |   .0000392   9.06e-06     4.33   0.000     .0000214    .0000571
      hh_exp |   .0002619    .000076     3.45   0.001     .0001124    .0004114
      ln_pop |   .0516515    .011328     4.56   0.000     .0293645    .0739384
       _cons |  -.5227698   .2449912    -2.13   0.034    -1.004772   -.0407672
-------------+----------------------------------------------------------------
     sigma_u |  .11674489
     sigma_e |  .00894321
         rho |  .99416595   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(32, 319) =    41.11             Prob > F = 0.0000
```

Random Effect

```
. xtreg hdi ln_educ ln_health ln_agri ln_infra doctor hospital povrate school public_health hh_exp ln_pop, re

Random-effects GLS regression                   Number of obs      =       363
Group variable: province                        Number of groups   =        33

R-sq:  within  = 0.8323                         Obs per group: min =        11
       between = 0.6304                                        avg =      11.0
       overall = 0.6942                                        max =        11

                                                Wald chi2(11)      =   1613.84
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         hdi |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      ln_educ |   .0003023   .0008618     0.35   0.726    -.0013868    .0019914
    ln_health |   .0051921   .0009271     5.60   0.000     .0033751    .0070092
      ln_agri |   .0059462   .0013532     4.39   0.000     .0032939    .0085984
     ln_infra |   .0350583   .0203606     1.72   0.085    -.0048478    .0749644
       doctor |   .0000126   4.70e-06     2.68   0.007     3.37e-06    .0000218
     hospital |   .0001888   .0000604     3.13   0.002     .0000705    .0003071
      povrate |   -.002387    .000273    -8.74   0.000    -.0029221    -.001852
       school |  -2.95e-06   6.74e-07    -4.38   0.000    -4.27e-06   -1.63e-06
public_health |   .0000146   6.52e-06     2.24   0.025     1.84e-06    .0000274
       hh_exp |   .0005856   .0000721     8.12   0.000     .0004442     .000727
       ln_pop |   -.019268    .005633    -3.42   0.001    -.0303084   -.0082276
        _cons |   .4281294   .2015361     2.12   0.034     .0331259     .823133
-------------+----------------------------------------------------------------
      sigma_u |  .01631058
      sigma_e |  .00894321
          rho |  .76885167   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Hausman Test

```
. hausman fixed random

Note: the rank of the differenced variance matrix (10) does not equal the number of coefficients being tested (11); be
        sure this is what you expect, or there may be problems computing the test.  Examine the output of your estimators
        for anything unexpected and possibly consider scaling your variables so that the coefficients are on a similar
        scale.

                 ---- Coefficients ----
              |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
              |    fixed        random       Difference          S.E.
--------------+----------------------------------------------------------------
     ln_educ  |   .0004626     .0003023        .0001603             .
   ln_health  |   .0050092     .0051921       -.0001829             .
     ln_agri  |    .002644     .0059462       -.0033022             .
    ln_infra  |   .0270056     .0350583       -.0080527             .
      doctor  |   7.23e-06     .0000126       -5.35e-06        2.40e-06
    hospital  |   .0004643     .0001888        .0002755        .0000487
     povrate  |   -.002004     -.002387        .0003831        .0002163
      school  |  -9.60e-07    -2.95e-06        1.99e-06        4.18e-07
public_hea~h  |   .0000392     .0000146        .0000246        6.29e-06
      hh_exp  |   .0002619     .0005856       -.0003237        .0000238
      ln_pop  |   .0516515     -.019268        .0709195        .0098281
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                           =       70.50
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)

.
```

Dummy Year

```
. xtreg hdi ln_educ ln_health ln_agri ln_infra doctor hospital povrate school public_health hh_exp ln_pop d_2003 d_2004 d
> _2005 d_2006 d_2007 d_2008 d_2009 d_2010 d_2011 d_2012 , fe

Fixed-effects (within) regression               Number of obs      =       363
Group variable: province                        Number of groups   =        33

R-sq:  within  = 0.9548                         Obs per group: min =        11
       between = 0.0002                                        avg =      11.0
       overall = 0.2134                                        max =        11

                                                F(21,309)          =    310.66
corr(u_i, Xb)  = -0.2633                        Prob > F           =    0.0000
```

hdi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ln_educ	-.000473	.0004815	-0.98	0.327	-.0014203	.0004744
ln_health	.0021133	.0005845	3.62	0.000	.0009632	.0032633
ln_agri	-.001159	.0008659	-1.34	0.182	-.0028628	.0005449
ln_infra	-.0380057	.0125801	-3.02	0.003	-.0627591	-.0132522
doctor	-4.99e-06	3.12e-06	-1.60	0.110	-.0000111	1.14e-06
hospital	.0001491	.0000484	3.08	0.002	.0000539	.0002444
povrate	-.0009967	.0002817	-3.54	0.000	-.0015509	-.0004425
school	8.50e-07	5.08e-07	1.67	0.095	-1.49e-07	1.85e-06
public_health	5.95e-06	5.63e-06	1.06	0.291	-5.12e-06	.000017
hh_exp	-.0001801	.0000725	-2.48	0.014	-.0003227	-.0000374
ln_pop	-.0252709	.0075228	-3.36	0.001	-.0400734	-.0104685
d_2003	-.002512	.0014823	-1.69	0.091	-.0054285	.0004046
d_2004	.0185927	.0016352	11.37	0.000	.0153752	.0218102
d_2005	.0294922	.0017491	16.86	0.000	.0260506	.0329339
d_2006	.0372251	.0022326	16.67	0.000	.0328321	.0416181
d_2007	.0394204	.002381	16.56	0.000	.0347353	.0441055
d_2008	.0461783	.0029278	15.77	0.000	.0404173	.0519393
d_2009	.049564	.003288	15.07	0.000	.0430943	.0560337
d_2010	.0553243	.0034432	16.07	0.000	.0485493	.0620993
d_2011	.0614002	.0040661	15.10	0.000	.0533995	.0694009
d_2012	.0671528	.0043819	15.33	0.000	.0585307	.0757748
_cons	1.396007	.1739872	8.02	0.000	1.053658	1.738357
sigma_u	.0353945					
sigma_e	.00518361					
rho	.97900203	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(32, 309) =   121.12              Prob > F = 0.0000
```

Dummy Province

```
. xi: regress hdi ln_educ ln_health ln_agri ln_infra doctor hospital povrate school public_health hh_exp ln_pop i.pr
> ovince
i.province        _Iprovince_1-33     (naturally coded; _Iprovince_1 omitted)

      Source |       SS       df       MS              Number of obs =     363
-------------+------------------------------           F( 43,   319) =  147.36
       Model |  .506794709    43  .011785923           Prob > F      =  0.0000
    Residual |  .025513942   319  .000079981           R-squared     =  0.9521
-------------+------------------------------           Adj R-squared =  0.9456
       Total |  .532308651   362  .001470466           Root MSE      =  .00894

------------------------------------------------------------------------------
         hdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     ln_educ |   .0004626   .0007886     0.59   0.558    -.0010888     .002014
   ln_health |   .0050092   .0008719     5.75   0.000     .0032939    .0067246
     ln_agri |    .002644    .001342     1.97   0.050     3.74e-06    .0052842
    ln_infra |   .0270056   .0196154     1.38   0.170    -.0115862    .0655974
      doctor |   7.23e-06   5.27e-06     1.37   0.171    -3.15e-06    .0000176
    hospital |   .0004643   .0000775     5.99   0.000     .0003117    .0006168
     povrate |   -.002004   .0003483    -5.75   0.000    -.0026892   -.0013187
      school |  -9.60e-07   7.94e-07    -1.21   0.228    -2.52e-06    6.02e-07
public_health |   .0000392   9.06e-06     4.33   0.000     .0000214    .0000571
      hh_exp |   .0002619    .000076     3.45   0.001     .0001124    .0004114
      ln_pop |   .0516515    .011328     4.56   0.000     .0293645    .0739384
 _Iprovince_2 |    .108995   .0152947     7.13   0.000     .0789037    .1390863
 _Iprovince_3 |   .0417388   .0127427     3.28   0.001     .0166684    .0668092
 _Iprovince_4 |   .0586397   .0126479     4.64   0.000     .0337559    .0835234
 _Iprovince_5 |    .088457   .0148864     5.94   0.000     .0591691     .117745
 _Iprovince_6 |   .0253757   .0140303     1.81   0.071    -.0022279    .0529793
 _Iprovince_7 |   .1490492   .0187099     7.97   0.000     .1122389    .1858595
 _Iprovince_8 |   .0278116   .0146837     1.89   0.059    -.0010774    .0567006
 _Iprovince_9 |   .1685263    .021928     7.69   0.000     .1253846     .211668
_Iprovince_10 |   .1636207   .0197703     8.28   0.000      .124724    .2025174
_Iprovince_11 |   .0484706   .0151986     3.19   0.002     .0185685    .0783728
_Iprovince_12 |  -.2386405    .035494    -6.72   0.000    -.3084724   -.1688085
_Iprovince_13 |  -.2251385   .0369663    -6.09   0.000    -.2978669    -.15241
_Iprovince_14 |   .1122164   .0120034     9.35   0.000     .0886005    .1358323
_Iprovince_15 |  -.2793936   .0428459    -6.52   0.000    -.3636897   -.1950974
_Iprovince_16 |  -.0059579   .0107533    -0.55   0.580    -.0271142    .0151984
_Iprovince_17 |   .0478236   .0108624     4.40   0.000     .0264525    .0691947
_Iprovince_18 |   .0220898   .0137966     1.60   0.110    -.0050054    .0492336
_Iprovince_19 |   .0150022   .0165176     0.91   0.364    -.0174951    .0474995
_Iprovince_20 |   .0232011   .0145464     1.59   0.112    -.0054178      .05182
_Iprovince_21 |   .1163893   .0183348     6.35   0.000     .0803169    .1524618
_Iprovince_22 |   .0356824    .014114     2.53   0.012      .007914    .0634508
_Iprovince_23 |   .0780931   .0145781     5.36   0.000     .0494117    .1067745
_Iprovince_24 |  -.0933536   .0281893    -3.31   0.001    -.1488139   -.0378932
_Iprovince_25 |   .0980104    .016952     5.78   0.000     .0646585    .1313624
_Iprovince_26 |  -.0252467   .0159277    -1.59   0.114    -.0565833     .00609
_Iprovince_27 |   .1047258   .0171489     6.11   0.000     .0709865    .1384651
_Iprovince_28 |   .1805287   .0227965     7.92   0.000     .1356782    .2253792
_Iprovince_29 |   .1687079   .0220285     7.66   0.000     .1253683    .2120475
_Iprovince_30 |   .1686945   .0208447     8.09   0.000     .1276841    .2097049
_Iprovince_31 |    .148795   .0236002     6.30   0.000     .1023633    .1952266
_Iprovince_32 |   .1965732   .0271838     7.23   0.000     .1430911    .2500553
_Iprovince_33 |   .0622903   .0195803     3.18   0.002     .0237674    .1008132
        _cons |  -.5710055   .2511301    -2.27   0.024    -1.065086   -.0769251
------------------------------------------------------------------------------
```

Appendix 2 Panel Data Result of the Revenue Side

OLS

```
. reg hdi ln_dau ln_dbh ln_pad ln_dak
```

Source	SS	df	MS	Number of obs =	362
				F(4, 357) =	45.31
Model	.178584936	4	.044646234	Prob > F =	0.0000
Residual	.351750634	357	.000985296	R-squared =	0.3367
				Adj R-squared =	0.3293
Total	.53033557	361	.001469074	Root MSE =	.03139

hdi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ln_dau	-.0034769	.0028324	-1.23	0.220	-.0090472	.0020933
ln_dbh	.0005925	.0006075	0.98	0.330	-.0006021	.0017872
ln_pad	.0135239	.0012037	11.24	0.000	.0111567	.0158911
ln_dak	.0027574	.0014962	1.84	0.066	-.000185	.0056997
_cons	.2924083	.0771955	3.79	0.000	.1405933	.4442233

Fixed Effect

```
Fixed-effects (within) regression               Number of obs      =       362
Group variable: province                        Number of groups   =        33

R-sq:  within  = 0.7283                         Obs per group: min =        10
       between = 0.1459                                        avg =      11.0
       overall = 0.3034                                        max =        11

                                                F(4,325)           =    217.80
corr(u_i, Xb)  = -0.3249                        Prob > F           =    0.0000
```

hdi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ln_dau	.0111879	.001704	6.57	0.000	.0078357	.0145401
ln_dbh	.0020511	.0006022	3.41	0.001	.0008664	.0032358
ln_pad	.015092	.0013162	11.47	0.000	.0125026	.0176813
ln_dak	.0030364	.0007563	4.01	0.000	.0015485	.0045243
_cons	-.2595289	.0380657	-6.82	0.000	-.3344151	-.1846426
sigma_u	.03188306					
sigma_e	.0123889					
rho	.86881805	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(32, 325) =    61.46                 Prob > F = 0.0000
```

Random Effect

```
. xtreg hdi ln_dau ln_dbh ln_pad ln_dak , re

Random-effects GLS regression                   Number of obs      =       362
Group variable: province                        Number of groups   =        33

R-sq:  within  = 0.7283                         Obs per group: min =        10
       between = 0.1459                                        avg =      11.0
       overall = 0.3035                                        max =        11

                                                Wald chi2(4)       =    832.71
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

hdi	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ln_dau	.0109391	.0016879	6.48	0.000	.0076308	.0142474
ln_dbh	.001973	.0005824	3.39	0.001	.0008316	.0031145
ln_pad	.0148422	.0012584	11.79	0.000	.0123757	.0173087
ln_dak	.0030691	.0007631	4.02	0.000	.0015735	.0045646
_cons	-.2427141	.0389356	-6.23	0.000	-.3190264	-.1664017
sigma_u	.02565613					
sigma_e	.0123889					
rho	.81091461	(fraction of variance due to u_i)				

Hausman Test

```
. hausman fe re
```

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
ln_dau	.0111879	.0109391	.0002488	.0002331
ln_dbh	.0020511	.001973	.0000781	.0001531
ln_pad	.015092	.0148422	.0002497	.0003856
ln_dak	.0030364	.0030691	-.0000326	.

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= -5.86 chi2<0 ==> model fitted on these data fails to meet the asymptotic assumptions of the Hausman test; see suest for a generalized test

Dummy Year

```
. xtreg hdi ln_dau ln_dbh ln_pad ln_dak d_2003 d_2004 d_2005 d_2006 d_2007 d_2008 d_2009 d_2010 d_2011 d_2012 , re

Random-effects GLS regression                   Number of obs      =       362
Group variable: province                        Number of groups   =        33

R-sq:  within  = 0.9440                         Obs per group: min =        10
       between = 0.0007                                        avg =      11.0
       overall = 0.3237                                        max =        11

                                                Wald chi2(14)      =   5055.07
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

hdi	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ln_dau	.0029525	.0008807	3.35	0.001	.0012263	.0046786
ln_dbh	.0002007	.0003032	0.66	0.508	-.0003936	.0007949
ln_pad	.0003094	.0007655	0.40	0.686	-.001191	.0018099
ln_dak	-.0001973	.0003746	-0.53	0.598	-.0009314	.0005369
d_2003	-.0004468	.001459	-0.31	0.759	-.0033065	.0024129
d_2004	.0211255	.0015076	14.01	0.000	.0181707	.0240803
d_2005	.0305083	.0015913	19.17	0.000	.0273893	.0336272
d_2006	.0343672	.0016922	20.31	0.000	.0310507	.0376838
d_2007	.038256	.0017841	21.44	0.000	.0347592	.0417527
d_2008	.0438531	.0019046	23.03	0.000	.0401202	.047586
d_2009	.0486837	.0019244	25.30	0.000	.044912	.0524554
d_2010	.0537128	.0020124	26.69	0.000	.0497686	.057657
d_2011	.0582053	.002225	26.16	0.000	.0538443	.0625662
d_2012	.0626713	.0023211	27.00	0.000	.058122	.0672206
_cons	.5625748	.0330683	17.01	0.000	.4977622	.6273874
sigma_u	.02526272					
sigma_e	.00570588					
rho	.95146257	(fraction of variance due to u_i)				

Dummy Province

```
. xi: regres hdi ln_dau ln_dbh ln_pad ln_dak i.province
i.province        _Iprovince_1-33     (naturally coded; _Iprovince_1 omitted)
```

Source	SS	df	MS		
Model	.480453025	36	.013345917	Number of obs	= 362
Residual	.049882544	325	.000153485	F(36, 325)	= 86.95
				Prob > F	= 0.0000
				R-squared	= 0.9059
				Adj R-squared	= 0.8955
Total	.53033557	361	.001469074	Root MSE	= .01239

hdi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ln_dau	.0111879	.001704	6.57	0.000	.0078357	.0145401
ln_dbh	.0020511	.0006022	3.41	0.001	.0008664	.0032358
ln_pad	.015092	.0013162	11.47	0.000	.0125026	.0176813
ln_dak	.0030364	.0007563	4.01	0.000	.0015485	.0045243
_Iprovince_2	.0216138	.0070915	3.05	0.002	.0076629	.0355648
_Iprovince_3	-.0012914	.0064446	-0.20	0.841	-.0139698	.0113871
_Iprovince_4	.0102539	.0061504	1.67	0.096	-.0018457	.0223534
_Iprovince_5	-.0078136	.0065186	-1.20	0.232	-.0206376	.0050103
_Iprovince_6	-.024177	.0062835	-3.85	0.000	-.0365384	-.0118156
_Iprovince_7	.0134846	.0071101	1.90	0.059	-.000503	.0274723
_Iprovince_8	-.0324832	.0063421	-5.12	0.000	-.04496	-.0200065
_Iprovince_9	.004548	.0069378	0.66	0.513	-.0091007	.0181967
_Iprovince_10	.0197705	.0066154	2.99	0.003	.0067561	.032785
_Iprovince_11	-.0233148	.0067473	-3.46	0.001	-.0365887	-.010041
_Iprovince_12	-.0624801	.0056588	-11.04	0.000	-.0736126	-.0513476
_Iprovince_13	-.0464812	.0060238	-7.72	0.000	-.0583317	-.0346308
_Iprovince_14	.0366297	.0075495	4.85	0.000	.0217777	.0514818
_Iprovince_15	-.0732756	.005762	-12.72	0.000	-.084611	-.0619401
_Iprovince_16	-.0301553	.0061424	-4.91	0.000	-.0422391	-.0180715
_Iprovince_17	-.0161341	.0058309	-2.77	0.006	-.0276051	-.0046631
_Iprovince_18	-.0769573	.0066955	-11.49	0.000	-.0901293	-.0637852
_Iprovince_19	-.0489347	.0077913	-6.28	0.000	-.0642625	-.0336069
_Iprovince_20	-.0497297	.0067291	-7.39	0.000	-.0629678	-.0364915
_Iprovince_21	.0164464	.0071223	2.31	0.022	.0024347	.0304581
_Iprovince_22	-.0473295	.0061884	-7.65	0.000	-.0595038	-.0351552
_Iprovince_23	.0096372	.0060731	1.59	0.114	-.0023104	.0215849
_Iprovince_24	.0067913	.0060811	1.12	0.265	-.005172	.0187546
_Iprovince_25	-.0142602	.007235	-1.97	0.050	-.0284934	-.0000269
_Iprovince_26	-.0373506	.0061973	-6.03	0.000	-.0495426	-.0251586
_Iprovince_27	-.0201867	.0073281	-2.75	0.006	-.0346033	-.0057701
_Iprovince_28	.0015467	.0079471	0.19	0.846	-.0140875	.0171809
_Iprovince_29	-.0006138	.0082085	-0.07	0.940	-.0167623	.0155348
_Iprovince_30	.0074279	.0078785	0.94	0.346	-.0080715	.0229273
_Iprovince_31	-.0027354	.0084988	-0.32	0.748	-.0194551	.0139842
_Iprovince_32	.0038183	.0100058	0.38	0.703	-.015866	.0235025
_Iprovince_33	-.0955228	.0079996	-11.94	0.000	-.1112604	-.0797853
_cons	-.2425161	.0383206	-6.33	0.000	-.3179038	-.1671283