PROVINCIAL TAX PERFORMANCE:
PRE-AND POST-INDONESIAN DECENTRALIZATION

TESIS

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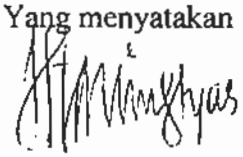

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ABSTRACT

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This study seeks to evaluate the effectiveness of decentralization by analyzing tax performance across the provinces of Indonesia. This study is based the Teera model, which measures tax performance in three dimensions. Past performance is measured by the tax ratio, current performance is measured by the potential tax base and tax effort index, and future performance is measured by the tax elasticity. This study modifies the Teera model for the provincial level by using the ratio of tax to expenditure as the dependent variable. This study also tries to compromise the Teera model and the real condition of provincial governments by using variables used in the Teera model and variables which affect provincial tax performance as the explanatory variables. Those variables reflect provincial capacities in augmenting provincial tax revenue.

The study shows that decentralization generally increases the tax ratio of the provincial government. The modified Teera model used in this study results in the conclusion that the increase of estimated potential tax base of some provincial governments less than the increase of tax ratio after decentralization, while some provinces are constant and the others are decreased in their potential tax base. The combination of such tax ratio and potential tax base results in the increase of provincial tax effort index. The effectiveness of decentralization was proven by the increase of the provincial tax response to the change in expenditure.

The modified Teera model shows us that the increase of income per capita, population density, and transportation sectors were found to increase the potential tax base. But the increase of grants, manufacture, and domestic trade sectors potentially reduced the potential tax base. In addition, a shadow economy will significantly affect the potential tax base of provincial governments.

The effort of augmenting provincial tax performance involves both central government and the provincial governments. On the one hand, provincial governments have to optimize their tax revenue by intensifying the current tax rate and tax base, reduce inefficiency in their expenditure, and utilize economic variables that significantly support the increase of the potential tax base. On the other hand, the central government has to transfer the taxing power on the sectors that affect the provincial tax base positively to the provincial governments. The taxing power transfer is conducted to support the sustainability of the provincial tax performance increase. Without transferring the taxing power from central government, provincial governments will face a limited effort in augmenting their tax performance.

ABSTRAKSI

Tesis ini bertujuan mengevaluasi efektivitas program desentralisasi di Indonesia melalui analisa atas kinerja pajak provinsi. Analisa didasarkan pada model dari Teera yang dimodifikasi sesuai kondisi Indonesia. Model tersebut mengukur kinerja pajak provinsi dari tiga dimensi, yaitu kinerja masa lalu yang diukur dari rasio pajak, kinerja actual yang diukur dari potensi dasar pajak dan indeks usaha pajak, serta kinerja mendatang yang diukur dari elastisitas pajak. Modifikasi dilakukan dengan cara menggunakan pengeluaran pemerintah sebagai *dependent variable* dalam regresi dan menambah variable yang dipakai dalam regresi dengan variabel yang berpengaruh pada pajak provinsi di Indonesia.

Hasil studi menunjukkan bahwa desentralisasi pada umumnya mampu meningkatkan rasio pajak provinsi. Akan tetapi eningkatan potensi dasar pajak yang diestimasi dari hasil regresi pada beberapa provinsi lebih kecil dari peningkatan rasio pajak. Kombinasi dari kedua kondisi tersebut menghasilkan peningkatan indeks usaha pajak yang signifikan. Efektivitas desentralisasi di Indonesia juga dibuktikan oleh peningkatan respon pajak provinsi terhadap perubahan pengeluaran pemerintah.

Model yang dipakai dalam tesis ini menunjukkan bahwa peningkatan pendapatan per kapita, kepadatan penduduk, dan sektor transportasi akan meningkatkan potensi dasar pajak. Sebaliknya, peningkatan bantuan pemerintah pusat, sektor industri, dan perdagangan domestik secara potensial mengurangi potensi dasar pajak oleh karena Pemerintah provinsi tidak berwenang mengenakan pajak atas sektor-sektor tersebut. Di lain pihak, *shadow economy* juga berpengaruh secara signifikan atas potensi dasar pajak provinsi.

Usaha untuk meningkatkan kinerja pajak provinsi melibatkan Pemerintah Provinsi dan Pusat. Di satu pihak, Pemerintah Provinsi harus mengoptimalkan penerimaan pajak mereka melalui intensifikasi tariff pajak dan dasar pajak yang ada/berlaku,minimalisasi ketidakefisiensienan, dan pemanfaatan variable ekonomi. Pemerintah Pusat, di lain pihak, harus mentransfer wewenang pajak atas sector-sektor yang mempengaruhi potensi pajak provinsi.

Table of Contents

	page
Halaman Judul	i
Halaman Pernyataan Orisinalitas	ii
Halaman Pengesahan	iii
Acknowledgement / Kata pengantar	iv
Halaman Pernyataan Persetujuan Publikasi karya ilmiah untuk kepentingan Akademis	v
Abstract	vi
Table of Contents	viii
List of Tables	x
List of Figure	Xi
List of Abbreviations	xii
Chapter 1: Introduction	1
1.1. Background	1
1.2. Research Problem	4
1.3. Research Objective	5
1.4. Data and Methodology	5
1.5. Organization of the Study	5
Chapter 2: Related Literature Review	7
2.1. Decentralization Issue	7
2.2. Fiscal Decentralization Effect in Regional Government	8
2.3. Tax Performance and the Importance of tax performance measure	12
2.4. Methods of Tax Performance Measure	14
2.5. Shadow Economy	17
2.6. Characteristic of Local Tax	22
Chapter 3: Overview of Decentralization in Indonesia	25
3.1 History and Effect of Decentralization in Indonesia	25
3.2 The Role of Provincial and Local Government	28
3.3 Revenue in Provincial Level	29
3.4 Characteristic of Provincial Tax in Indonesia	33

3.5 Descriptive Statistical Analysis 34
3.5.1. Trends of Provincial Finance at National Level 35
3.5.2. Trends of Provincial Finance at Provincial Level 38
Chapter 4: Data Analysis 51
4.1. Review of Teera Model 51
4.2. Assumptions and Data Sets 57
4.2.1. Assumptions 58
4.2.2. Data Sets 59
4.3. Data Solving 60
4.3.1. Measuring Tax Ratio 60
4.3.2. Measuring Potential Tax Base 66
4.3.3. Measuring the Effect of Decentralization on Provincial Tax Effort Index 84
4.3.4. Measuring Provincial Tax Elasticity to Expenditure over Period (Dynamic Approach) 85
4.4. Analysis of The Result and Policy Implication 86
Chapter 5: Concluding Remarks and Recommendations 96
5.1. Concluding Remarks 96
5.2. Recommendations 97
5.3. Limitation of the Study and Areas for Further Research 99
Bibliography 102
Appendix A : Variable Descriptions 106
Appendix B : Descriptive Statistics of Tax Ratio 107
Appendix C : Descriptive Statistics of GRDP per capita 108
Appendix D : Descriptive Statistics of Grants 109
Appendix E : Descriptive Statistics of Population Density 110
Appendix F : Descriptive Statistics of Shadow Economy 111
Appendix G : Descriptive Statistics of Transportation Sector 112
Appendix H : Descriptive Statistics of Manufacturing Sector 113
Appendix I : Descriptive Statistics of Agricultural Sector 114
Appendix J : Descriptive Statistics of Domestic Trade 115
Appendix K : Descriptive Statistics of Foreign Trade 116

List of Tables

				Page
Table	:	1	Classification of Activities	18
Table	:	2	Provincial Tax Ratio Pre-Decentralization	62
Table	:	3	Provincial Tax Ratio Post-Decentralization	63
Table	:	4	Performance of Low Tax Ratio Group Provinces	65
Table	:	5	Comparison of Tax Ratio to GRDP per capita	66
Table	:	6	Provincial Shadow Economy Pre-Decentralization	70
Table	:	7	Provincial Shadow Economy Post-Decentralization	71
Table	:	8	Regression Estimation Pre-Decentralization	74
Table	:	9	Regression Estimation Post-Decentralization	78
Table	:	10	Regression Estimation All Periods	81
Table	:	11	Potential Tax Base of Provinces for All Periods	82
Table	:	12	Growth of Potential Tax Base as the Effect of Decentralization	83
Table	:	13	Provincial Tax Effort Index for All Periods	84
Table	:	14	Average Growth of Provincial Tax Effort Index	85
Table	:	15	Provincial Tax Elasticity Pre-and Post-Decentralization	86
Table	:	16	Growth of Tax Performance as the Effect of Decentralization ...	88

LIST OF FIGURES

			Page
Figure	1 :	Comparison of Provincial Tax Revenue to Grants and Expenditure in Constant Value	35
Figure	2 :	Percentage of Provincial Tax Revenue to Grants and Expenditure in Constant Value	36
Figure	3 :	Comparison of Revealed Provincial Own Revenue to Expenditure in Constant Value	37
Figure	4 :	Provincial Tax Revenue in Nominal Value	38
Figure	5 :	Provincial Tax Revenue in Constant Value	41
Figure	6 :	Growth of Provincial Tax Revenue in Constant Value	42
Figure	7 :	Provincial Expenditure in Nominal Value	43
Figure	8 :	Provincial Expenditure in Constant Value	44
Figure	9 :	Growth of Provincial Expenditure in Constant Value	45
Figure	10 :	Ratio Provincial Tax Revenue to Expenditure in Constant Value	46
Figure	11 :	Provincial Revenue from Grants in Nominal Value	48
Figure	12 :	Provincial Grants in Constant Value	49
Figure	13 :	Growth of Provincial Grants in Constant Value	49
Figure	14 :	Tax Ratio and Potential Tax Base of NAD	89
Figure	15 :	Tax Ratio and Potential Tax Base of East Kalimantan	90
Figure	16 :	Tax Ratio and Potential Tax Base of Lampung	91
Figure	17 :	Tax Ratio and Potential Tax Base of East Java	91
Figure	18 :	Tax Ratio and Potential Tax Base of South Kalimantan	92
Figure	19 :	Tax Ratio and Potential Tax Base of South East Sulawesi	92
Figure	20 :	Tax Ratio and Potential Tax Base of Bali	93
Figure	21 :	Tax Ratio and Potential Tax Base of Maluku	93
Figure	22 :	Tax Ratio and Potential Tax Base of Papua	93

List of Abbreviations

APBD	Regional Budget (Anggaran Penerimaan dan Belanja Daerah)
BBNKB	Vehicle Ownership Transfer Tax
BHP	Tax Revenue Sharing (Bagi Hasil Pajak)
BHBP	Non Tax Revenue Sharing (Bagi Hasil Bukan Pajak)
DAU	General Purpose Grant (Dana Alokasi Umum)
DAK	Specific Purpose Grant (Dana Alokasi Khusus)
DBH	Revenue Sharing (Dana Bagi Hasil)
DJPKPD	Directorate General Fiscal Balance Regional Government (Direktorat Jenderal Perimbangan Keuangan Pemerintah Daerah)
ECM	Electricity Consumption Method
FEM	Fixed Effect Model
GDP	Gross Domestic Product
GRDP	Gross Regional Domestic Product
ICBS	Indonesia Central Bureau of Statistic
KEPMENDAGRI	Minister of Home Affairs Decree (Keputusan Menteri Dalam Negeri)
PABD	Revised APBD during fiscal year
OLS	Ordinary Least Square
PABT	Water Exploitation Tax
PAD	Provincial Own Revenue (Pendapatan Asli Daerah)
PAP	Surface Water Tax
PBBKB	Fuel Tax
PKB	Motor Vehicle Registration Tax
PT(PERSERO) PLN	Power State Company (Perusahaan Listrik Negara)
REM	Random Effect Model

CHAPTER 1

INTRODUCTION

1.1. Background

Regional autonomy began in Indonesia in 1999, when decentralization in authorities and responsibilities were transferred from the central government to the regional governments. According to Law 22/1999, regional autonomy is defined as the authority of autonomous region to govern and administer the interests of the local people according to its own initiatives based on the people's aspirations in accordance with the prevailing laws and regulations.

Regional autonomy was legalized by issuing Laws No. 22/1999 and No. 25/1999 and revised in Laws No. 32/2004 and No. 33/2004; the laws concern regional government and intergovernmental fiscal balance respectively. These laws divide regional governments into two tiers: provincial and district/municipal governments. The number of regional governments increased as a result of decentralization, caused by the aspirations of local communities to form new regional governments, both at the provincial and municipal/district level. In 2000, before the implementation of decentralization, there were 26 provinces, 69 districts, and 266 municipalities in Indonesia (Directorate General of Fiscal Balance, 2000). In 2005, after decentralization, there were 33 provinces, 349 districts, and 91 municipalities in Indonesia. Therefore, less than five years after the implementation of decentralization, there are new seven provinces and 105 new districts/municipalities (Directorate General of Fiscal Balance, 2005). This fact shows that regional governments support the implementation of decentralization.

Law 22/1999 and 32/2004 define decentralization as the transfer of the authority from the central government to the autonomous region to regulate and administer governmental affairs in that region under the Unitary State of the Republic of Indonesia. In general, the function of the regional governments is to carry out the authority and responsibilities as an autonomous region in all sectors, excluding the six responsibilities which remain with the central government, i.e. foreign affairs, defense affairs, monetary affairs, law, religion, and central fiscal affairs (such as income tax and property tax). In the economic point of view, decentralization empowers regional governments (provinces and districts/municipalities) to explore their capabilities in creating revenue and lessen their dependence on Central Government subsidies in serving the public. Therefore,

the purpose of decentralization is to empower the regions (province and district/municipality) to finance their needs/expenditures by themselves.

Regional government revenue comes from several sources. This includes regional own revenue, balancing funds, and regional loans. Regional own revenue comes from regional tax revenue, user charges, and regional owned companies. Before the implementation of decentralization, the amount of regional own revenue was not more than 40% of all regional revenue. In the period from 1996/1997 to 1999/2000, the average revenue that came purely from local resources (known as original revenue) amounted to only 34.41% of total local government revenues. Local taxes contributed about 81% (28.03% of total revenues) and the rest came from charges and fees. The major role in regional finance was played by the balance fund which consisted of the general purpose grant (DAU), specific grant (DAK) and revenue sharing of natural resources and taxes at about 58.05% of the total regional revenue for the same period (Alfirman, 2003).

The condition above implies that before decentralization, regional governments were not able to cover their expenditures by their own regional revenue. In other words, regional governments needed to be subsidized by the central government to finance their expenditures. Indonesia started to implement the decentralization on January 1st 2001 to change the financial structure by strengthening regional own revenue, especially tax revenue, to finance their expenditure. Therefore, the decentralization success was determined by the effort of the regional government to finance their expenditure through their tax revenue. In this study, the comparison of tax revenue to expenditure is called the tax ratio.

Tax ratios are different among the regions because of their behavioral factors. Teera (2004), who formulated the tax ratio as a comparison of tax revenue to output (GDP), proposed some economic development variables as behavioral factors among the countries. These behavioral factors include income per capita, the value of export and import, aid, population density, agriculture, manufacturing, debt, and tax evasion. The regression of such variables resulted in a function that expresses the average amount of tax obtainable from given determinants by which we can derive a tax potential. We can say that the tax potential is an estimated tax obtained from given determinants as an approach to the taxable capacity/tax base. When this information is collected, we can analyze the tax effort of the countries by comparing

the actual tax ratio to the tax potential ratio. Goode stated that tax performance expresses the effort of the countries to use their tax potential (1984). In addition to the opinion of Goode, Teera (2004) measures tax performance from three dimensions; tax ratio, tax potential, tax effort index, and tax elasticity.

There are two reasons why tax revenue is more interesting than the other sources of regional own revenue to finance regional expenditure. The first reason is that tax revenue is routinely received by the regional government and this certainty is guaranteed by the law. The certainty in acceptance makes it easy to be managed by regional government. The other reason is the flexibility in its use. In comparison with user charges, tax is more flexible in its use because the regional government can use tax revenue without direct compensation to the tax payer to finance public needs. On the other hand, user charges are only used to finance the related service in which user charges come. For example, revenue that comes from the health user charge is only used to increase the health services. The government cannot use the health user charges to finance the transportation sector.

The decentralization enables provinces and municipalities to have more power than before in managing their revenue as an autonomous region. According to Regional Government Laws 22/1999 and 32/2004, there is a distinction between provincial and local (district/municipal) governments. However, provincial governments have limited authority as the autonomous region. The roles of provincial governments cover authority inter-local affairs and provide a basic public service that cannot be served at the local level. Furthermore, the Law does not state clearly the real field of government belonging to the provincial authority. Provincial governments also carry out the role as the central government representative since de-concentration transfer. In this role, provincial governments conduct the duty as the representative of the central government. The budget for the activity is provided by the central government. In fact, such provincial multi-functions are not supported through Laws 22/1999 and 25/1999 as a fundamental regulation of decentralization. Provincial governments do not have authority to create greater tax revenue by tax base and tax rate, nor can they make policy in deconcentrated activities.

Regarding Law No.34/2000 on Local Tax and User Charges, the province is entitled to levy taxes, such as land and water vehicle taxes, ownership transfer fees of land and water vehicles, motor vehicle fuel tax, and a water levy tax. The first and

the second tax of the province must be transferred to the district/municipality of that province for at least 30% of the total tax, while other taxes must be transferred by at least 70% to the district/municipality of that province. On the other hand, the province has not been allowed to levy one or more determined taxes if they are not potential to create the revenue. On such limited authority, provincial governments have to fulfill their financial needs by themselves. Some debate emerges because provincial governments receive 10% of the total general purpose fund (Dana Alokasi Umum/DAU) regarding Law 22/1999. During the three years after implementation of decentralization, some surveys and observations indicated that such a proportion favored the provincial level (Brodjonegoro, 2004). The fact implied that provincial governments should receive the fund less than current amount. If this suggestion will be one of considerations in DAU allocation, provincial government revenue will decrease by a significant amount. The only way to strengthen the financial structure of provincial governments is through the provincial own revenue, especially the provincial tax revenue.

This study aims to evaluate the success of the decentralization in Indonesia by measuring the provincial tax performance. In order to accomplish this task, this study will analyze the provincial tax performance pre-and post-decentralization. The reason to measure tax performance at the provincial level is because provincial governments have less authority than before decentralization. Therefore, they have to optimize their own revenue, especially the tax revenue, to fulfill their needs. Another reason is that just a few analytical studies on the provincial roles of decentralization had been conducted. Finally, this is easy to analyze tax performance at the provincial level in Indonesia, because provincial taxes are restricted by the law. A similar kind of tax among the provinces facilitates this study in proposing the recommendation.

1.2. Research Problem

This study will analyze provincial tax performance from provincial tax ratio, potential tax share, tax effort index, and tax elasticity point of view. The issues of this study include:

a. The effect of Indonesian decentralization to provincial tax ratio, potential tax share, tax effort index, and tax elasticity.
b. The significance of potential tax share on provincial tax performance.

c. Factors that affect potential tax share of provinces after decentralization.

d. Review of Indonesian decentralization policy.

1.3. Research Objective

This study aims to evaluate the effectiveness of Indonesian decentralization by analyzing the provincial tax performance. To fulfill this objective, an analysis will be performed on the tax performance measure, comparison, and growth among the provinces. The recommendations also cover possibilities for the provinces to increase their tax revenue based on the tax potential obtained. The results of this study will be useful in evaluating Law 32/2004 and 33/2004, especially in reference to determining provincial governmental roles.

1.4. Data and Methodology

In order to analyze the relationship between tax revenue as a dependent variable and other explanatory variables, the regression will use some related data as regressors consist of the Gross Regional Domestic Product (GRDP) per capita, number of aid/grants from the central government, population density, the shadow economy, the income from the transportation sector, manufacturing sector, domestic trade and foreign trade (export plus import) sectors, and the agricultural sector. The data consists of 11 years data during the period of 1995 – 2005 for 26 provinces and seven variables. The data were published by The Indonesian Statistical Central Bureau (ICBS) which consisted of GRDP, population density, and the income of agricultural, transportation, manufacturing, and trade sectors. This study also used data from realization of regional budgets published by Directorate General Fiscal Balance, which consists of provincial tax revenue, expenditure, and grants/aid. In measuring the shadow economy, we use electricity consumption/sold energy data published by Power State Company of Indonesia (PT PLN Indonesia). The model will be run using panel regression.

1.5. Organization of the Study

The study is comprised of five chapters, with an introduction as the first chapter. The second chapter is the literature review which presents the results of previous studies, mainly on decentralization and its effect on regional governments.

The third chapter presents the history and effect of decentralization in Indonesia, the role of the provincial and local governments, regional revenue at the provincial level, characteristic of provincial tax in Indonesia and the problems which exist. The fourth chapter describes the Teera (2004) article as the basis of this study, data provided and used in this study, the assumptions to support the model, and methodology of data solving. This chapter also discusses the results of the data regression and relates this to the provinces' program in creating their revenue by generating the existing tax. In the last chapter, Chapter four, the author of this paper tries to summarize considerations for future research to improve the study. The fifth chapter as the last chapter in this paper will present a conclusion of the study and propose recommendations for province's tax structure.

CHAPTER 2

RELATED LITERATURE REVIEW

2.1. Decentralization Issue

Decentralization is an interesting phenomenon that affects many aspects of development, such as the social safety net, macroeconomic stability, and the efficiency and equity of service delivery. Decentralization is a world movement because most countries experience it. Decentralization is a way to improve the efficiency of the public sector and promote economic growth, enabling local governments to deliver public services directly to the society to fulfill local preferences and needs.

Decentralization can take a number of different forms (World Bank Institute, 1999):

a. *Political decentralization*: This normally refers to situations where political power and authority have been decentralized to sub-national levels. The aim of political decentralization is to give citizens and their elected representatives more power in public decision making, so that citizens better know the political representatives and elected officials and the needs of their constituents. *Devolution* is a form of political decentralization that refers to a full transfer of responsibility, decision-making, resources and revenue generation to a local level of public authority. In this form, the local government is autonomous and fully independent in its authority.
b. *Administrative decentralization* refers to transfers of decision-making authority, resources and responsibilities of a select number of public services from the central government to other lower levels of government, agencies, or offices of central government line agencies.
c. *Fiscal decentralization:* Financial responsibility is a core component of decentralization. To carry out financial responsibility effectively, local governments must have adequate revenue, which is generated locally or transferred from the central government, as well as the authority to make expenditure decisions. Fiscal decentralization can take many forms, including the expansion of local revenue through local taxes or user charges and intergovernmental transfers of general revenues from taxes and non-taxes

collected by the central government. Local governments have the authority to use these transfers for general and/or specific purposes.

According to this form of decentralization, local governments possess the legal authority to impose their local taxes. However, the tax base of local governments is usually very weak and their dependence on central government subsidies is very high. As a result, local governments make no attempt to use their authority. These conditions are often met in developing countries, including Indonesia.

d. *Divestment or market decentralization* is conducted in the case of nonpublic entities where the government transfers planning and administrative responsibility or other public functions to private or nongovernmental institutions transparently to the public. This kind of decentralization often involves deregulation or full privatization.

From the definitions above, we can conclude that the main characteristic of decentralization is to increase the role of local governments. Its purpose is to achieve the efficiency in transferring public service that supports economic growth. The scope of decentralization is different among the countries, which depends on the preferences and needs and also the situations of each country. Stein (1998) emphasizes the efficiency created through the process of decentralization. He stated that the efficiency resulted by delegating resource allocation decisions to local governments that can improve the match of services produced by the public sector and preferences of the local population.

2.2. Fiscal Decentralization effects in regional government

Regarding the definition of fiscal decentralization by the World Bank, a fiscal decentralization can be conceptualized as the empowerment of communities and citizens by fiscally empowering their local governments. In this context, fiscal decentralization is often more narrowly conceptualized as fiscal *devolution*. Fiscal decentralization is a condition where regional or lower levels of governments carry out their financial responsibility by generating revenue through fiscal policy. The issue of fiscal decentralization in regional governments is about the extent to which local governments are empowered and how much authority and control they exercise over the use and management of devolved financial resources, measured in terms of

their control over (i) the provision of local services for which regional governments are responsible; (ii) the level and kinds of local taxes and revenues (base, rates and collection); and also (iii) the grant resources that come from the central government with which they finance the delivery of local public services. Simply speaking, we are able to measure fiscal decentralization success by these three financial aspects. In addition, the success of fiscal decentralization is correlated with political and administrative decentralization by support for regional capacity development, for the strengthening of the system in local expenditure management, and for robust accountability mechanisms in regional governments.

Roy Bahl (1999) emphasizes an intra-province dimension to intergovernmental fiscal relations in fiscal decentralization implementation, so that fiscal decentralization must be carried through to the lower levels of government. The intra-province dimension consists of the policy among the provinces and other lower level governments in determining their authority and responsibility.

Two intra-province policies include:

a. Fiscal decentralization will cover all levels of government. Fiscal decentralization allows provincial autonomy in deciding on distribution among its local governments. This means that the provincial government determines and has control over the policy of other lower levels of governments. In effect, each province is thought to be in a better position to determine the proper distribution of resources within its boundaries.
b. Each province will be left to design its own internal program. The central government mandates some degree of uniformity in lower level government fiscal decentralization policy. In this policy, both provincial and other lower levels of governments have the same authority in determining their policy. In grants matter, provinces pass grants through to their lower level of governments in exactly the same way as grants are allocated to districts/municipalities.

Furthermore, Roy Bahl states that the design of fiscal decentralization should begin with the recognition of the benefits and costs of this policy, reflected by its advantages and disadvantages. The advantages of fiscal decentralization are:

a. The efficiency of gains from moving the government closer to the people. This means that the local government is able to provide better public services and

better accountability on the part of government officials so that there will be a higher willingness-to-pay for services from the public.

b. The improvement of overall revenue mobilization. This can be realized because local governments are assumed have better knowledge/understanding on public situations, so that they empower the local governments to broaden the tax net results in a large portion of the economy (tax paying power).

c. When decentralization is implemented, a better size distribution of cities would result. Based on the assumption that local governments have a better understanding about public preferences and needs, this is easy for local governments to force cities to raise their own taxes. As a result, the marginal cost of living in those cities would rise because urban residents would now pay the marginal cost of service provisions.

d. Fiscal decentralization is able to stabilize the economy. Because of financial responsibility, local governments will have a greater motivation to manage their finances, as well as their public demands. By the implementation of a hard budget constraint in the local financial management, budget deficits might be actually smaller in a decentralized setting.

Despite the advantages, there are many disadvantages from some risks created by fiscal decentralization:

a. There is no macroeconomic control. Each local government only controls its region, but does not have an intension if its government activity creates a financial gap to the other local governments. On the macroeconomic stability issue, the inability to use fiscal policy reduces central government control over aggregate revenues and expenditures nationally. Besides, central government deficits can be worse if local governments are unable to reduce expenditures or increase revenues to finance the cost of assuming new responsibilities. This will be worse when local governments increase their borrowing excessively, in the expectation that the central government will bail them out.

b. In the process of decentralization, especially in relation to political problems, there is a possibility for local elites to influence local administrations for particular interests. This is because the scope of the local government is very small; everyone has a chance to play a role in the political environment. The

greater the opportunity, the greater the influence is. The elite will utilize the opportunity for their interest.

c. The direction of infrastructure investment on social overheads will move towards the local benefit project. As a result, the central government has to expend additional investment on infrastructure. However, this additional expenditure needs to fall within the national scope.
d. In the area of service provisions, the small size of some communities may accentuate problems related to insufficient scale problems. If it does not, institutional weakness may result in low quality and inefficiently provided services.
e. Fiscal decentralization is very counter equalizing and leads to a much less equalizing system under a fiscal decentralized system. An abundantly natural resource region will become a rich region. Inversely, the limited natural resource region cannot change its destiny to become a poor region.

Principles of Fiscal Decentralization

Although fiscal decentralization covers a broad policy area, this can be looked at in terms of the four basic building blocks (Boex and Vazquez, 2005): (a) there is an assignment of functions and expenditure responsibilities for each level of government. Different levels have different functions and responsibilities. (b) There is an assignment of tax and revenue sources for the different government levels. Kinds and sources of taxes and revenues will be separated, according to the governmental level. The assignment is conducted to meet those responsibilities. (c) There are intergovernmental fiscal transfers to support the assignment of revenue sources from central governments through a system of intergovernmental fiscal transfers or grants. (d) There is an opportunity for local governments to borrow to finance their revenue shortfalls.

The principle of fiscal decentralization is basically a delegation of expenditure and revenue responsibilities from the central government to the lower level governments. The purpose of decentralization is that local governments are able to finance their expenditures by exploring both their own revenue resources and other resources (intergovernmental transfer or borrowing). In exploring regional/local own revenue resources, a region must have authority in managing taxes and/or user

charges as revenue resource. According to Bahl (1999), one of the 12 rules for implementation of fiscal decentralization determines that fiscal decentralization require significant local government taxing power, including the tax rate, tax base, and tax collection. This means that the performance of regional/local tax revenues reflects the effectiveness of fiscal decentralization.

2.3. Tax performance and the importance of tax performance measure

In reference to regional autonomy and fiscal decentralization, which enables the local government to carry out its functions, local governments have the power to managing revenue to finance their provisions of local services. Managing their revenue means generating local revenues, which consist of local tax revenue and user charge revenue. Regional governments often regard the proportion of local taxes and charges in their total budget as the main indicator of the degree of local autonomy they enjoy (Simandjuntak, 2002). The larger the taxing power, the larger the proportion of own-source revenue in the total budget.

The term tax performance is referred to by Teera (2004) as a tax ratio, tax effort index, and tax buoyancy, by taking the ratio of percentage change in tax revenue to the percentage change in national income. The tax ratio is the ratio of tax revenue to the output of a country. The tax effort index refers to the effort of a country to use their tax potential to increase tax revenue. This is derived from the comparison of the tax ratio of a country to the tax potential resulted if an economy uses all its resources and ability to collect all obtainable tax revenues in a given determinant characteristic. Another researcher defines tax effort (Alfirman, 2003) as the extent to which an economy uses its taxable capacity, and mathematically, this is just the ratio of actual tax collections to the estimated tax collection from the OLS regression. Estimated tax collection reflects the tax collection that should be obtained in a given determinant. The success of the authorities in exploiting the tax potential, and in attaining the taxation target, will depend on several economic factors. These factors include the general level of development, the administrative and political constraints on the fiscal system, social-political values, indigenous institutional arrangements, popular desires for government spending, plus other factors, which condition the overall willingness-to-pay for taxes (Teera, 2004, p.2). The estimated

tax collection or potential tax base is achieved by measuring the relationship between the tax revenue and the economic variables.

Some research on tax has measured the tax performance related to the need of the measurement. The tax performance measurement analyzes the effectiveness of the tax policy in a particular country to raise the tax revenue (Teera, 2004). So far, by comparing the tax performance among the regions based on a given proxy, we can evaluate which regions are able to achieve the expected level. However, the interpretation of the tax effort/tax performance has to be done very carefully. Bahl (1999) states that if one country has a tax effort lower than one, this can only be implied that this country's tax effort is relatively low compared to other countries. However, this would be incorrect to conclude that this country has to increase its tax ratio.

Stotsky and Mariam (1997) state that tax effort measures indicate the extent to which countries use their potential tax base to raise revenue. It can be used to provide guidance on the proper mix of fiscal policy in the budgetary imbalance. The measure is constructed as the ratio of the actual tax share to the predicted tax share. They noted that in the 46 Sub-Saharan African countries, the share of tax revenue in GDP was, on average, 15.7 percent in 1995. It was somewhat lower in Special Program of Assistance (SPA) countries, averaging 11.9 percent, and in Communaute Financiere de l'Afrique (CFA) franc zone countries, averaging11.9 percent in 1995. Recent evidence suggests that tax revenue shares are beginning to strengthen (Stotsky and Mariam, 1997, p.7).

In addition, Tanzi (1992) noted that the most recent data reveals that the tax level in major industrialized countries (members of the Organization for Economic Cooperation and Development or OECD) is approximately double the tax level in a representative sample of developing countries (38 percent of GDP compared with 18 percent). The reasons to those conditions are differences between the two country groups (developed and developing countries) in wage income, in the sophistication of the tax administration, and in the political power of the richest segment of the population. On the other hand, the revenue from trade taxes is significantly higher in developing countries than it is in industrial countries. We can see from the Tanzi observation that the tax power of each country is different. This depends on the tax

base, tax administration and tax policy. We can evaluate the effectiveness of government policy in taxes by measuring tax performance.

In Indonesia, between the years of 1990 and 1999, provinces and districts/municipalities contributed tax revenue to their regional budgets. The average contribution from the provinces was 20 percent while this was less than 10 percent for the districts/municipalities. These contributions went to the regional budgets of 27 provinces and 292 districts/municipalities (Simandjuntak, 2002). On the other hand, the role of local revenue was not significantly improved from the condition before the regional autonomy era. In 2001, the share of the local tax revenue of the districts/municipalities increased 2.57 percent to their regional budget. This implies that fiscal decentralization, as a part of regional autonomy, does not give a good enough chance to the local governments to increase their revenue, especially their local tax revenue. Most of the local governments still rely on the transfers from the central government, mainly from the general-purpose grant transfer (Dana Alokasi Umum/DAU).

2.4. Methods of tax performance measure

Teera (2004) introduced tax the performance measure by using static and/or dynamic method(s). In order to compare the tax performance among the countries at one point in time, Teera uses tax effort indices as a static indicator for tax performance measure. In this static method, he compares actual tax ratio to the tax ratio predicted by the regression equation. This is called the tax effort index. Teera also uses a dynamic method by utilizing tax elasticity as the approach. Furthermore, the dynamic method is used to analyze the tax effort of a country over the periods (1975-1998). The predicted tax ratio is achieved from the regression of some variables as determinants. The determinants are economic variables and consist of GDP per capita, the level of openness represented by the value of export import, aid from foreign countries, population density, the ratio of agricultural sectors, manufacturing sector, the ratio of total expenditures, total debt, and tax evasion shown by the shadow variable. The Teera model and its process in measuring tax performance will be discussed in more detail in Chapter 4.

Some studies have focused on the tax performance measurement using data from both developed and developing countries. These studies include Tanzi (1987),

Piancastelli (2001), and Bird et al. (1995). Musgrave (1964) argues that the lack of the availability of tax handles might limit revenue collection at low levels of income. This limitation should become less severe as the economy develops. Chelliah (1971) introduced two approaches of tax performance measures: static and dynamic. The static measure is used because this measures the tax potential at a given point in time. The static measure is good way to compare the tax performance across countries at one point in time. However, Teera postulates that tax effort should be considered in the dynamic sense of comparing changes in the tax ratio over time, so that the tax performance of a country can be analyzed to increase tax revenues. Teera viewed tax effort as a process of several forms, including the reform of existing taxes, improvement in administration, and introduction of new taxes, all of which require time to plan, legislate, and implement. For this reason, a country which started out with a low tax ratio, might have undertaken considerable effort to raise its tax ratio, but may not have reached the average level of taxes in developing countries. The income buoyancy of tax revenue, as an approach of the dynamic method, provides information on the past efforts made to increase tax revenues. Hence, the performance of a country, or its 'effort,' is defined in terms of how closely a given quantifiable indicator of performance approaches the standard.

Stotsky and Woldemariam (1997) investigated six explanatory variables in which exports and imports are used separately to measure a country degree of openness. The other determinants include income per capita, share of manufacture, share of mining, and share of agriculture. The income per capita is used as proxy for the overall level of development, while the last three variables were chosen because of the administrable ease in their tax collection.

Alfirman (2003) used three variables that affect the output of the provincial tax effort/performance in Indonesia: level of education, labor force participation rate, and level of openness shown by the value of exports and imports of the provinces. He used those variables for their ease in collecting provincial taxes. Using a stochastic frontier analysis maximum likelihood estimation and data from 1996-1999 (before decentralization) for 26 provinces, Alfirman found that since the tax rate tended to be the same across provinces, tax revenue differed among the provinces because the tax base varied considerably. Some rich provinces, which have an abundance of natural

resources, have a small tax potential. DKI Jakarta and Bali are the two provinces with the highest tax potential.

Comparing to Teera, the study of Alfirman is only conducting three of the four steps in the Teera model. Therefore, the analysis is not fixed enough, because the model requires an accurate specification which can not be guaranteed by the data. Despite the downsides of the model, the study does not classify the level of local tax that is discussed. Sometimes, the author discusses the provincial level, but sometimes the author discusses the district/municipalities level.

Lewis (2005) compared the local governments (districts and municipalities) behavior in expenditure, taxing and saving with total grants received by locals from the central government, government need, and personal income, before and after decentralization. According to Lewis, decentralization considers regional government expenditure responsibilities, but does not award new authority over any major tax bases. Evidence shows that public revenue remains heavily centralized in Indonesia. Its share to total national revenue is around 7 percent (Lewis, p. 294). However, the structure of local government revenue has changed, mainly from natural resources. Therefore, the intergovernmental grants and own source revenue have both become relatively less significant (Lewis, p. 297).

Furthermore, Lewis presents the behavior during pre-pre-decentralization, that with an increase of grants, the expenditure will increase, but it will not have an impact on local taxation or surplus. As personal income increased, the local government own source revenue increased marginally and the expenditure increased significantly. No significant savings were generated from the increase in local revenue. For the behavior during post-decentralization, Lewis distinguished between rich and non-rich local government. Non-rich local governments respond to the increase of poverty, by increasing the agricultural spending. On the one hand, a rich local government responds to such an increase by increasing spending in health and education. This means that both rich and non-rich will increase their expenditures when their needs increase. As a result, the tax revenue will decrease. Both rich and non-rich local governments will make up a slightly larger percentage of personal income when grants increase. Finally, when grants from the central government increase, the local government will increase savings because of the surplus budget.

The results of the Lewis study contain a doubtful analysis, because the time series data was only two years. Moreover, there was inconsistency, because Lewis did not classify the local government into rich and non-rich prior to decentralization, but he did after decentralization.

2.5. Shadow economy

According to the Teera model, tax evasion was the most important variable that affected the tax performance of countries. The implication of its existence is that some income goes untaxed and indirect taxes are also evaded. In other words, the existence of tax evasion will decrease tax revenue.

Tax evasion in the Teera model represents the shadow/hidden/underground economy in taxation. Although this is difficult to be measured, some researchers found that the role of the shadow economy is significant among the countries. One of the researchers is IMF. Using 84 samples, IMF found that during 1988 – 2000, the size of the shadow economy reached 35-44% in the developing countries, 21-30% in the transition countries, and 14-16% in the OECD.

Different authors give different definitions for the concept of the shadow economy. The shadow economy is defined as all economic activities that contribute to the officially calculated (or observed) gross national product, but are currently unregistered (Schneider, 2000). Another definition, according to Phillip Smith, explains a shadow economy as a market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP (Smith, 1994, p.84). More detailed definitions of shadow economy activities can be seen in table 1 (Schneider, 2000).

Table 1. Classification of Activities

	Monetary Transactions		Non-monetary Transactions	
Illegal Activities	Trade in stolen goods; drug dealing and manufacturing: prostitution; gambling; smuggling and fraud.		Barter: drugs, stolen goods, smuggling, etc. Produce or growing drugs for own use.	
Legal Activities	**Tax Evasion**	**Tax Avoidance**	**Tax Evasion**	**Tax Avoidance**
	Unreported income from self-employment; Wages, salaries and assets from unreported work related to legal services and goods	Employee discounts, fringe benefits	Barter of legal services and goods	All do-it-yourself work and neighbor help

Source : Rolf Mirus and Roger S. Smith (1997, p. 5). with additional remarks.

We can see from the table that tax evasion and tax avoidance include the shadow economy as a legal activity. This thesis will not distinguish between tax evasion and tax avoidance, but treats a shadow economy as a representation of tax evasion.

Generally, there are six main characteristics of the unofficial/shadow economy (Kaufmann & Kaliberda, 1996):

a. *Coexistence of state and non-state activities and enterprises.*

   Coexistence is created between state enterprises and non-state activities when there is opportunity to generate private income flows for state officials, state managers and their conduits, by utilizing state assets.

b. *Visibility and size.*

   The sizes of informal activities are not necessarily small and their existences are visible, although this is difficult to recognize them.

c. *Unofficial in an Economic Regulatory Sense.*

   In an economic regulatory sense, the informal economy is 'extra legal' and its purpose is to avoid the burden of administrative regulations on their economic activities and escape from high taxation rates.

d. *Continuum in the Official –Unofficial activity spectrum.*

   Depending on their incentives structure, the degree of formal/official activities within each activity or enterprise can vary along a continuum to become completely informal / unofficial.

e. *Social services and state subsidies are accessible to unofficial activities.*

This characteristic emphasizes that many unofficial activities are skilled ones in extracting resources from the state to grow and strengthen their existence.

f. *The unofficial economy is shallow.*

The unofficial economy is not difficult to be observed when they operate in very close proximity to official activities and when they respond to economic incentives largely driven by government policies.

There are three approaches of estimating the size and development of the Shadow Economy. Each approach has its own weakness and strength, and the result of the estimation differs widely. The approaches to measure the shadow economy are:

A. Direct approach

This method employs either surveys or samples based on voluntary replies or audits on tax. The advantage of this method is that this can provide detailed information about shadow economy activities, including its structure and composition. But results from these surveys are sensitive to the way the questionnaire is formulated and depends on the respondents' willingness to cooperate. Furthermore, the results of the survey only lead to point estimates, but are unable to provide an estimation of development and growth of the shadow economy over a longer period of time.

B. Indirect/indicator approach

This approach is mostly macroeconomic and uses economic indicators in estimating the shadow economy. Some indicators used in this approach are:

1) Discrepancy between national expenditure and income statistics

In this method, the income reported in GNP should be equal to the expenditure reported in GNP. The discrepancy between the expenditure and income measure is an indicator of the shadow economy. The discrepancy reflects all omissions and errors everywhere in the national accounting statistics, as well as the shadow economy activities. Therefore, this method becomes questionable for reliability.

2) Discrepancy between official and actual labor force

Using the assumption that total labor force is constant, ceteris paribus, a decline of labor participation in the official economy becomes an indicator of increased activity in the shadow economy. Actually, people are able to work

in both shadow and official economies. Therefore, the indication shown by the discrepancy between the official and actual labor force may be viewed as a weak indicator of the size of the shadow economy.

3) The transaction approach

This method assumes there is a relationship between the velocity of money (MV), the value of total transactions (pT) and the total nominal GNP that has a constant relationship over time. The GNP of the shadow economy is the discrepancy between nominal GNP and official GNP, where total nominal GNP consists of official and unofficial GNP. According this method:

MV = pT and *GNP shadow economy = GNP total nominal – GNP official.*

This method has some weaknesses in its application. For instance, there must be assumed a base year in which there is no shadow economy, and therefore, the ratio of pT to total nominal (official=total) GNP was normal. Some of these conditions t are difficult to fulfill, such that its application may lead to doubtful results. However, this is interesting theoretically.

4) The currency demand approach

This method assumes, at first, that underground economic transactions are undertaken in the form of cash payments. This is accomplished so as to leave no traces for authorities. The size and development of the shadow economy is calculated by comparing the development of currency when taxes and government regulations are at their lowest values, with the development of currency at the current levels of taxation and regulations.

The second assumption is the same income velocity for currency in the shadow economy and for money in the official economy. Therefore, the size of the shadow economy can be computed and compared to the official GDP.

There are some weaknesses with this method that make the size of the shadow economy underestimated:

a. Not all of the transactions in the shadow economy are paid in cash.
b. From the factors used in the regression, only the data of tax burden are considered as a cause of the shadow economy. Whereas the other factors, such as the impact of regulation, taxpayers' attitudes towards the state and tax morality, are not considered because of the unavailability of the data.

c. Increases in currency demand deposits are largely due to a slowdown in demand deposits, rather than to an increase in currency caused by activities in the shadow economy.
d. The assumption of a constant velocity of money in both types of economies is actually very difficult to be realized, because of the difficulty in estimating the velocity of money in the shadow economy.

5) The physical input (electricity consumption) method

The Electricity Consumption Method was introduced by Kaufmann and Kaliberda (2002) to measure the overall (official and unofficial) economic activity in an economy. Kaufmann and Kaliberda (1996) assumed that electric-power consumption is regarded as the single best physical indicator of overall economic activity. They derive an estimate of unofficial GDP by subtracting electricity consumption data as a proxy of the overall economy from estimates of official GDP. This means that Kaufmann and Kaliberda suggest that the growth of total electricity consumption is an indicator for representing the growth of official and unofficial GDP. Overall, (official and unofficial) economic activity and electricity consumption have been empirically observed throughout the world to move in lockstep with electricity consumption/GDP elasticity usually close to one.

There are some special features of economies in transition that determine possible upward and downward bias in utilizing electricity consumption as a proxy for official and unofficial GRDP. An upward bias could be caused by:

a. Higher overhead and fixed electricity use per unit of output, resulting from capacity underutilization during an economic downswing;
b. Some technological redress due to the lack of basic maintenance;
c. Substitution of electricity for other energy sources.

Conversely, downward bias could be caused by:

a. Efficiency in electricity use, given the very low efficiency starting base and subsequent energy saving reforms;
b. An increase in electricity prices;
c. A shift in output mix away from electricity intensive industries (within existing enterprises and start-up businesses);

d. Increased underreporting of electricity consumption.

Electricity Consumption Method (ECM) is very simple and appealing, however, this can also be criticized on various grounds (Schneider, 2002):

a. Not all shadow economy activities require a considerable amount of electricity (e.g. personal services). Other energy sources can be used (gas, oil, coal, etc.), so that only a part of the shadow economy will be captured.
b. Over time, there has been considerable technical progress. Both the production and use of electricity are more efficient than in the past, and that will apply in both official and unofficial uses.
c. There may be considerable differences or changes in the elasticity of electricity/GDP across countries and over time.

C. Model approach (DYMIMIC)

The model approach estimates a comprehensive dynamic multiple-indicator multiple-cause model to yield a time series index for the hidden/measured output. This approach then estimates a separate 'cash-demand model' to obtain a benchmark for converting the index into percentage units. The empirical method is based on the statistical theory of unobserved variables, which considers multiple causal variables and multiple indicators of the phenomenon. For the causal variable, this approach uses average and marginal tax rates, inflation, real income, and the degree of regulation in the economy. For the indicators, this approach uses data of changes in the (male) labor force participation rate and the cash/money supply ratio.

2.6. Characteristics of local tax

Fiscal decentralization, as a specific term of decentralization, gives two possibilities for the relationship between the central and local governments. One possibility is that the central government assigns revenue responsibilities to each lower level government to achieve efficiency. The other possibility is to centralize revenue responsibilities and finance the provision of decentralized services through the use of intergovernmental transfers.

In order to support the first possibility, some considerations are established on the criteria for appropriate revenue sources in local governments. These

considerations are introduced by Musgrave (1983) and Oates (1994) and are called the criteria of good tax. Guidelines for good tax sources in local governments are:

a. Taxes on mobile tax bases should be primarily left to the central government, because the central government is able to control the tax base. On the other hand, the mobility of the tax base will limit the ability of lower level governments to control such taxes, if such taxes are imposed by lower level governments. This is because lower level governments may be out of their jurisdiction where tax base or factor of production is most productive.
b. Redistributive taxes, such as progressive income taxes, should be reserved for the central government. This is related to the purpose of redistribution as a national purpose. If these taxes are assigned to the lower level governments, this will not only result in an inefficient jurisdictional allocation of the factors of production, but this will also render the distributive efforts of the government ineffective.
c. The centralization of taxes is levied on tax bases that are unevenly distributed (such as natural resources). The distribution of the revenue from the central government to the lower level governments will be carried through intergovernmental transfer. This may commonly occur in developing countries, where the tax bases are usually more unevenly distributed among lower level governments. The centralization aims to control national stability.
d. Centralization of taxes that are subject to important economies of scale, or that require information at the national level, such as corporate income tax, have a database provided at the national level.

From the list above, the conditions for a tax to be a good local tax are rather restrictive. As a result, the tax bases that can efficiently be exploited locally are more limited than the more abundant spending obligations that should be assigned to the local governments. Furthermore, a recent work in East Asia, including Indonesia, shows that the local government administrative capacity is often weak (White and Smoke, 2005). That weak administration is the binding constraint for improving revenue performance. The principal problems identified include: (1) the low capacity to perform the taxpayer registration function, which results in an opportunity to delay and even escape the payments; (2) infrequent exercise of audit and enforcement authority, which results in low compliance both for the tax payer and the tax officer; (3) poor administration, which results in limited services available for the taxpayer;

(4) the low professional qualifications of staff; and (5) inadequate support from, and coordination with, the national government. The governance support systems that one takes for granted in most countries may sometimes be so insufficient that they may cancel the tax autonomy.

CHAPTER 3

OVERVIEW OF DECENTRALIZATION IN INDONESIA

3.1 History and effect of decentralization to provincial government

The process of decentralization in Indonesia began when the central government issued Law 22/1999 on the Regional Government and 25/1999 on the Fiscal Balance between the central and regional government. The laws replaced Law 5/1974 and stipulated for a regional autonomy rather than a centralized government. Law 22/1999 was intended to restructure the political and organizational arrangements of the sub-national government system, which consisted of a provincial and local government, and their relationships to the central government. On the other part, Law 25/1999, associated with the establishment of a balance fund, introduced a share of revenues from natural resource exploitation and reorganized the transfer system from the central to the lower level of government. Under the law, central government delegates had all authorities over the regional government, except foreign policy, national defense and national security, the judicial system, monetary and fiscal issues, and religious issues. Regional governments played their new roles by implementing the laws on January 1st of 2001.

Regarding Law 22/1999, its general goals for Indonesia's fiscal decentralization program (Sidik and Kadjatmiko, 2002) are (1) increasing the efficiency of national allocation and the operational activity of the regional government (2) achieving regional aspirations, improving the overall fiscal structure, and mobilizing regional, and therefore, national revenues, (3) enhancing accountability, increasing transparency, and expanding constituent participation in decision-making at the regional level, (4) mitigating fiscal disparities among regional governments and assuring the delivery of basic public services to citizens across the country, ameliorating the social welfare of Indonesians, and (5) supporting macro-economic stability. So far, the objectives of fiscal decentralization in Indonesia include political, administrative, and economic regional governments, both in provincial and local governments, to support national economic stability.

Theoretically, the implementation of fiscal decentralization empowers the provincial and local government economy to accept broader authorities in managing their revenue and expenditure by themselves. Decentralization of revenue and expenditure management means that the regional government has a chance to

improve the local provision of public goods and gives better service (both in time and quality). Better service is main objective in decentralization on the assumption that the regional government has a better knowledge of the publics needs. Decentralization also facilitates that the public monitor and control regional government spending. This creates good competition among the regions and supports the regional government innovation.

It is not easy to achieve the aim of fiscal decentralization in Indonesia. Some problems follow the implementation of fiscal decentralization in Indonesia, such as a lack of revenue decentralization, unclear assignment of function between levels of government, and inadequate capacities in both central and regional governments for these new roles. The decentralization challenge is compounded by several factors (Ahmad & Ali, 2000):

a. The decentralization of Indonesia is phenomena in which provinces and local governments do not have control over rate structures and base of tax/user charges.

   Even though the central government decentralized the authorities to manage the finances of the regional governments, the source of revenue management is still handled by the central government. The central Government has determined the type of tax; tax rate and tax collection allowed to be levied at the provincial level by government regulation 34/2000. The authority of provincial governments is limited in their ability to decide which taxes are suitable to be levied in their regions, but they are not allowed to create a new kind of tax. However, this is contradictory to the aim of fiscal decentralization, which empowers the regional governments to manage their finances, both in the revenue and expenditure sides.

b. Provisions to safeguard public services face some limitations in some regional governments to build their local capacity and pool their skilled technical staff.

   While the central government transfers the authority to the lower level, some of the regional governments (both provinces and districts/municipalities) are not ready yet in human resources. They used to receive funds from the central government and wait for the central government policy in managing the existing problem; however, regional governments are scarce in skilled technical staff. Bambang Brodjonegoro (2004) stated that the relationship between local executives and the legislative government becomes one of the major obstacles in

promoting good governance and effective local administration after fiscal decentralization. Law 22/1999 implied that the local parliament/legislative (DPRD) is the most powerful body at the local level to hire the head of local executives, evaluate responsibility reports, and determine the local budget. On the other hand, the executive will do anything to make his/her position safe. Therefore, the local executive and legislative relationship is not a productive and conducive one from the local resident point of view. They could either create collaboration between them or fight continuously. The collusion between the local executives and the legislative government tends to promote the corrupt behavior.

c. Regional governments currently manage the transition economy with fiscal neutrality. Fiscal neutrality refers to the degree to which the resources available to regional governments vary with their regional fiscal capacity. In other words, regional governments will generate their revenue resources to finance their expenditures and/or will expend as much as their revenue. A consequence of this policy is that the regional expenditure might be out of control, in which case rendering the expenditure useless (not effective) and/or greater than needed (inefficient). The lack of skilled staffs exacerbates such a condition.

d. Regional budget and public expenditure management system is not effective. While a system should accommodate related economic conditions in each regional government, the regional economic management in Indonesia was still centralized by stipulating Government Regulation 105/2000 and PP 58/2005 on Management and Responsibility of Regional Finance. This system creates conditions where the system is not suitable when this is implemented in provinces, such as high administrative costs and limited revenue sources. The reason is that the central government policy is so general that this might not cover the social condition of a province.

In the end of 2004, these Laws were revised and replaced by Laws 32/2004 and 33/2004. The main differences between Law 22/1999 and Law 32/2004 is the scope of the central government authority. The former stated that the central government has the authority of six basic fields: foreign policy, national defense and national security, judicial system, monetary and fiscal issues, and religious issues. Moreover, the other fields under central government authority include the policy of

national planning and national development control, balance budget, system of country administration and country economy institution, human resources training and control, natural resources management, and technology that is strategic, conservative, and a nationalized standard. On the other hand, Law 32/2004 states that the central government authority is only over six basic fields. The second difference is the role of the provincial government. Law 22/1999 verse (9) states that the province has two authorities: the authority as an autonomous region, consisting of the authority in the governmental sector across district/municipal governments above the local government capability and a certain governmental authority, and authority as central government representative. But Law 32/2004 limits the province status as an autonomous region only.

3.2 Role of provincial and local government

The aim of regional autonomy in Indonesia is to empower the regional governments, both in the provincial and district/municipal level. Even though Indonesia's provincial governments do not play the role as much as municipalities, they do retain certain budgetary responsibilities. According to Law 22/1999 and the revised law, Law 33/2004, and its implementation regulations, most project implementation will be delegated to districts and municipalities. On the other hand, the role of the province might be reduced. Previously, the provincial government was the second most powerful level of government. Now, provincial governments serve only as the representatives of the central government in the region and will handle inter-district affairs, while the bulk of their spending authority is devolved to the local governments (Anwar Nasution, BIS paper no.20). The basic provincial role will be limited to coordinating and supervising activities in the local government, providing basic public services that cannot be served at the local level, and carrying out the authority across local governments. This means that the province functions as the central government representative in the area. The limitation of the province is also stated by Central government regulation (PP) 65/2001 in that the province cannot create a new tax, but may not levy a tax if the tax is inefficient.

However, the function and limitation at the province and local levels are not stated clearly in the regulation, so that they are still questionable. When a problem

exists as the consequences of the questionable condition, the central government will solve the problem by a new regulation, which is over the province and local government authority. One thing that can be recognized is that there are limitations to the provincial government to manage its finance, especially in generating its revenue. Does this influence the structure of provincial finances? This will be discussed in the effect of decentralization to the provincial government section.

The role of the province as an autonomous region (World Bank, 2003) was deliberately kept limited by the legislator. The restricted assignment of functions to the province does not ensure optimal economies of scale. Some functions, whose benefits spread across local governments, can best be performed at the provincial level, such as watershed management, control of communicable diseases, and parts of agricultural extension services. The law allows for provinces to perform cross-regional functions, as well as local functions, in case a local government cannot perform them. However, this authority seems too weak to be effective. As a result, economies of scale are left unexploited, and cross-regional functions are left under-performed.

3.3 Revenue in Provincial Level

Based on Law 22/1999 and Law 32/2004, the provincial revenue consists of the own revenue, balancing fund, provincial loan, and other revenue that is not included in previous classification. This also includes revenue sharing from the central government, which comes from taxes and non-taxes. Revenue sharing of non-taxes comes from the natural resources, as following:

A. Provincial own Revenue (PAD)

1. Provincial Tax Revenue

Vehicle registration tax (PKB)

Vehicle ownership transfer tax (BBNKB)

Fuel tax (PBB-KB)

Water exploitation tax (PABT/AP) [1]

1 This kind of tax is based on Law 34/2000, while three kinds of previous taxes were based on Law 18/1997. Before 1997, local taxes were regulated by Law 11 Drt 1957, but this law did not state clearly which taxes are allowed to be levied by the provincial government. While some provinces did not have districts/municipalities, they did levy some municipal

2. User Charges (depend on each provincial government policy)
3. Provincial owned company
4. Miscellaneous own revenue

B. Balancing Fund

1. General purposed grants (DAU)
2. Specific purposed grants (DAK)
3. Revenue Sharing
   a. Tax revenue sharing
      - Property tax (PBB)
      - Land rent (BPHTB)
      - Income Tax article 21, 25, and 29
   b. Natural resources

C. Provincial Loan

D. Other Incomes

Regarding Laws 22/1999 and 32/2004, PAD aims at providing authority to the regional government to finance regional autonomy. Provincial taxes are compulsory contributions imposed on individuals or corporations to provincial government without direct compensation used for public purposes. The regional own revenue components are different among the provinces, depending on their conditions. The provincial level receives relatively more lucrative taxes through PKB, BBNKB, PBBKB, and a water exploitation tax. Actually, not all of such taxes revenue belongs to the provincial government. A certain percentage of the revenue must be shared with the local government in the respective provinces. The shared revenue has been regulated with a maximum number in Law 34/2000 and central government regulation (Peraturan Pemerintah/PP) 65/2001.

Though the provincial government benefits by such a revenue, the province does not have the authority in managing the taxes, because the tax rate and the tax base is determined by the central government through Law 34/2000 and PP 65/2001. The province has authority in tax collecting only. While the percentage obtained has been regulated by the central government, the allocation formula or rule from the

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taxes for provincial revenue, until an agreement between the province and districts/municipalities was issued.

province to the local government will vary among the provinces. This is stated in the provincial government regulations.

User charges are charges imposed to individuals or corporations for providing current services in connection with general governmental activities. The kinds of user charges are different among the provinces, depending on their policy. The law does not state which kinds of user charges are allowed to be imposed, but in the implementation, the central government will analyze and decide whether or not the regional regulation (Peraturan Daerah) was allowed to be issued.

The balancing fund is a financial transfer from the central to the regional government which aims at closing the fiscal gap between central government and regional government. The balancing fund consists of DAU, DAK, and revenue sharing. The aim of DAU is to equalize the revenue among the regions by covering the fiscal gap. The fiscal gap exists when the fiscal capacity of a region is not able to cover its fiscal needs. The equity among the regions will minimize, or even eliminate, the gap between the rich region (that is the region with natural resources abundance) and the poor region. Based on Laws 25/1999 and 33/2004 on the fiscal balance between the central government and local government, the provincial level receives 10% of the total amount of DAU, and the rest (90%) has to be transferred to the districts/municipalities. Among Indonesian provinces, the balancing fund plays the biggest role in the provincial finance structure. During the fiscal years of 2001 to 2003, the transfers from the central government through the balancing fund were around 92.62% of the total regional government revenue (World Bank, 2003). The transfers came from the DAU (± 64%), Contingency fund (± 3.93%), revenue sharing from natural resources (± 23.9%), special autonomy grants (± 1.23%), and DAK (± 3.44%). This means that the regional own revenue/PAD was only 7.38% of the total revenue. Revenue sharing between the central government and the regional governments means a fair, proportional, democratic, transparent and efficient sharing of revenues in the financing of decentralization, de-concentration and co-administered *Tasks,* with due regard to the potential, condition and need of the regions.

DAK, as part of balancing fund, shall be allocated to certain regions to finance special activities being the affairs of the region in accordance with the function, as established in APBN. The central government establishes criteria for

DAK, including general, special, and technical criteria. General criteria is established with due regard to the financial capacity of the region in APBD. Special criteria is established with due regard to the prevailing laws and regulations and the characteristics of the region. Technical criteria are established by the state ministry/technical department.

The Revenue Sharing Fund (Dana Bagi Hasil/DBH) is sourced from taxes and natural resources. The natural resource aspect of revenue sharing consists of the following industries:

a. Forestry
b. General mining
c. Fisheries
d. Oil mining
e. Natural gas mining and
f. Geothermal mining

Provincial governments are allowed to borrow to cover their financial deficiency under the Law. Regional loan aims at securing sources of funding regional government affairs. But in the implementation, central government has the control and decides whether or not a regional government might borrow. Other incomes aim at providing an opportunity to the region to secure incomes, other than those stated before. The income might come from the sale of regional assets. But usually, the income is not significant in provincial finance, because this is not routine revenue.

The role of tax revenue in provincial finance is low compared to the role of other sources of provincial revenue. According to LPEM-UI research (LPEM, 2001), the reasons for such conditions are:

a. The tax base and tax rate is still low. In fact, this is difficult for regions to change the tax rate and tax base. Based on Law 34/2000, the central government determined the regional tax base. Specifically for provincial taxes, there is no chance for the provincial government to determine the tax rate.
b. Most of regional finances are covered by a central government transfer, such as revenue sharing, DAU and/or DAK.
c. Regional administration is poor. This is stimulated by the system of the regional financial budget, which is based on the target. This means the tax revenue is not

based on the tax base. Some weaknesses will be created, both in planning and controlling, when the budget is based on the target.

3.4. Characteristics of Provincial Tax in Indonesia

Provincial tax revenue consists of a motor vehicle registration tax (Pajak Kendaraan Bermotor/PKB), vehicle ownership transfer tax (Bea Balik Nama Kendaraan Bermotor/BBNKB), fuel tax (Pajak Bahan Bakar Kendaraan Bermotor/PBBKB), and water exploitation tax (Pajak Air Bawah Tanah-Air Permukaan/PABT-AP). Law 18/1997 and 34/2000 has stipulated the rate of the taxes, which are 5% for PKB, 5% for BBNKB[2], and PBBKB, 20% for ground water exploration tax (PABT) and 10% for surface water tax (PAP)[3]. Regarding the Law, at least 70% for PKB and BBNKB, and 30% for PBBKB and the water exploitation tax of total revenue will be kept by the province and the rest are shared by the local government.

The problems of decentralization view are that provincial governments don't play their role as a fully authorized institution in managing provincial taxes, especially in determining the tax rate, tax base, and tax collecting, even though this has been guaranteed by the law. In the case of the PKB (motor vehicle tax) and the BBNKB (motor vehicle ownership transfer tax), the tax rate has been determined by the law, by as much as 5%. But provincial governments have the control of the tax payer. The quantity of the tax payer and the motor vehicle imposed by the PKB and the BBNKB refers to the tax base. But the tax revenue depends on the capability of the provincial government to "catch" them, as the tax payer in their regions and the system of administration of each region. The amount of the tax to be paid by the tax payer is the rate of the vehicles real value[4] (5% x vehicle real value for PKB and 5% x vehicle real value for BBN-KB). Each provincial government imposes a different classification in determining a vehicles real value regarding the provincial

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2 The tax rate is regarding Law 18/1997, but it was changed to become 10%, regarding Law 34/2000.

3 This tax was eliminated by Law 34/2000.

4 The real value is a basic value to be imposed by the tax. In the case of PKB and BBNKB, a real value is the estimated market value determined by some classifications, such as type and age of the motor vehicle.

government regulation, because the estimated market price/value is different in different regions. A provincial government could increase the revenue of PKB by increasing the vehicles real value. This condition is favorable to a provincial government. But from the tax payer's point of view, such a condition is not an interesting one and the tax payers will administer their PKB in the other provinces. This could happen because the administrations of populations among the regions are not integrated. A resident could have identity cards in several provinces. Regional governments also have control over tax collection for a percentage of the tax revenue. To cover the operational/administration cost, regional governments are allowed to deduct this directly from tax revenue.

In the case of PABT/AP (Water exploitation tax), regional governments have control over the number of tax payers (tax base) and the collection method of the tax payment. The tax payment is the rate of water used (20% x water used for ground water tax/PABT and 10% x water used for surface water tax/PAP). But there is no authority for regional governments to control the tax rate, because the central government had already set this.

On the other hand, provincial governments do not have control in the case of PBB-KB, either in tax rate, tax base, or tax collection. Tax rate has also been determined by the law by as much as 5% of the fuel sold in each province. Pertamina, a state owned company, has the control over the amount of sold fuel data (tax base) and also over the tax collection. Fuel data sold by both Pertamina and private companies are handled by Pertamina. This will be reported to the provincial government, together with the cash transferred by Pertamina. Usually, the process of cash receipts by Pertamina, up to transferring to the provincial government takes a long time. As a result, the provincial government cannot use the revenue in time. Briefly speaking, the regional governments don't have any control over PBB-KB.

3.5. Descriptive Statistical Analysis

In order to achieve the thesis purpose of evaluating the effectiveness of decentralization, this study analyzes the performance of the provincial governments from the central governments point of view. As a comparison to that analysis, we also analyze the performance of each province from the provincial government point of view. It is difficult to analyze national economic development by differentiating

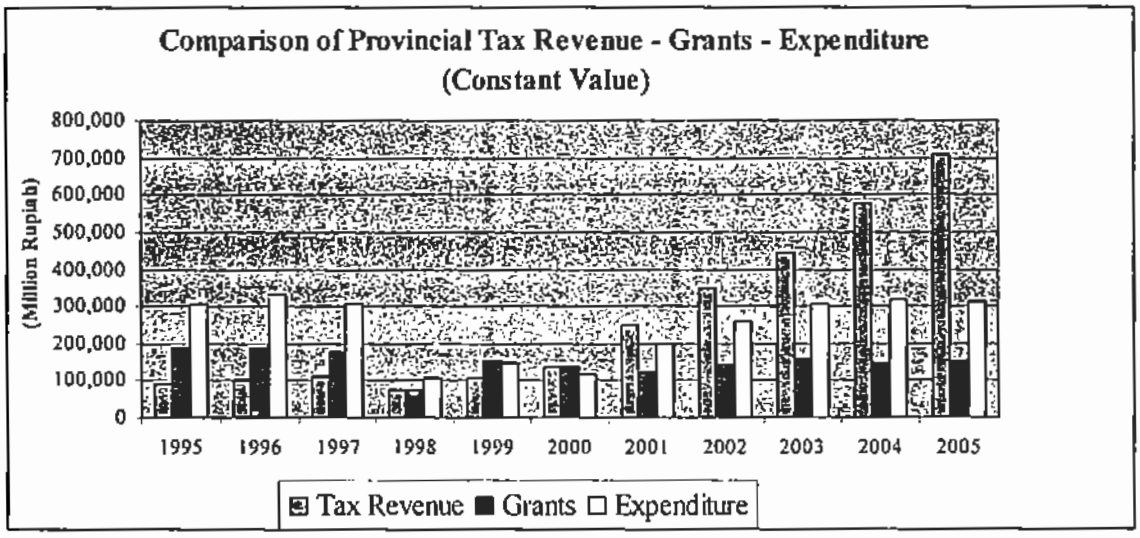
the effect of fiscal decentralization to other effects, such as economic crisis. As we know it, the process of fiscal decentralization is applied during the process of economic crisis recovery. This thesis tries to differentiate and analyze the effects of inflation by stabilizing the economy. Therefore, this study will analyze data using both nominal values and constant values, where nominal values are divided by GDP deflator.

3.5.1. Trends of Provincial Finance at National Level

From the trend of provincial finance at national level, decentralization had empowered the provincial governments in their effort to generate revenue. This means that decentralization had succeeded in supporting the provinces to finance their expenditures by themselves. Two variables on the provinces' financial statement show a significant increase in the period of decentralization, which are tax revenue and expenditure. This fact is supported by the analysis of the financial growth in constant value.

For the first statistical analysis, we will use the comparison of provincial revenue, which comes from tax revenue and grants, to provincial expenditures. Figure 1 shows that before decentralization, the tax revenue of provinces could not finance all of their expenditures. Such a condition also happened after the implementation of fiscal decentralization. Therefore, provinces still need central government support through the transfer of grants and grants become the main revenue of provincial finance.

Figure 1. Comparison of provincial tax revenue to grants and expenditure

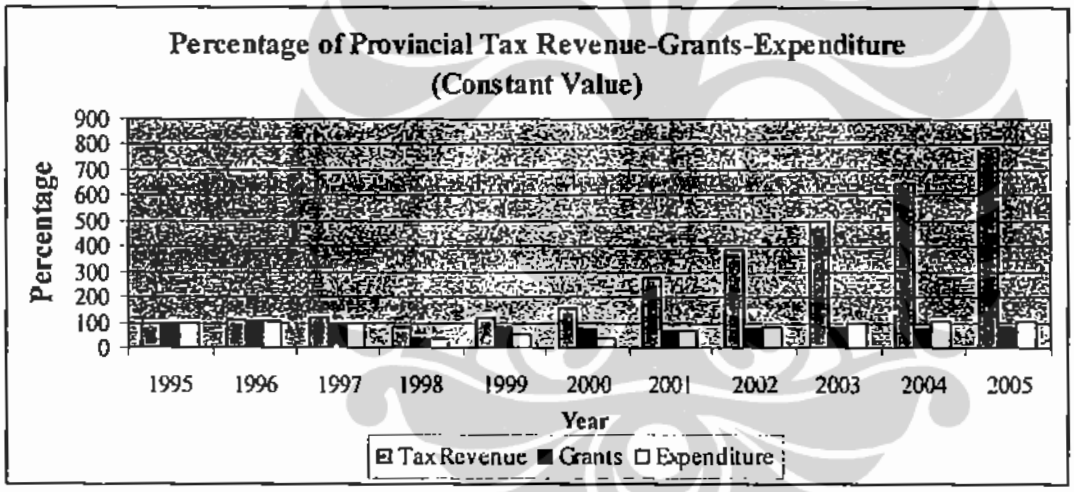


Source data : Directorate General Fiscal Balance Regional Government (DJPKPD)

Figure 1 shows that the increase of grants is less than the increase of tax revenue after the implementation of decentralization. The number of total grants and total provincial tax revenues are close to each other in the nominal value in 2004 and 2005. Provinces tended to become autonomous regions, which are able to finance the increasing expenditures by increasing their revenue and decreasing their dependence on grants.

For the second statistical analysis, we use the growth of provincial tax revenues, grants, and expenditures in constant value. We use a constant value, because we want to separate the inflation effect of the observation. In order to measure the percentage of the increase, we use the year 1995 as a base year.

Figure 2. Trends of provincial tax revenue to grants and expenditure (in constant value)



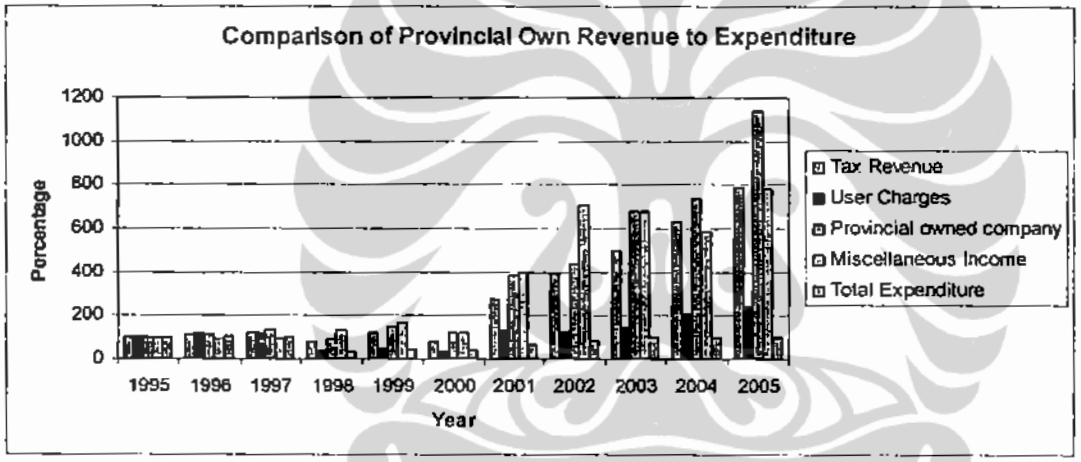
Source data : Directorate General Fiscal Balance Regional Government (DJPKPD)

Between 1995 and 1997, provincial tax revenue, grants, and expenditures tended to be constant. In 1998, after the economic crisis, expenditures decreased significantly by 50-60% from the previous year. To recover the provincial government, in 1999, the central government transferred by grants as much as 40% more than the previous year, while tax revenues and expenditures increased by less than 20%. Since 2000, the expenditure moved to different trends. Starting in 2001, when decentralization was implemented for the first time, the provincial tax revenue increase was faster than the expenditure. On the other hand, the expenditure tended to

be constant in its percentage in 2003, while grant tended to decrease slightly. This means that at a certain point in the future, tax revenue will be able to finance the expenditure without grants if the tax revenue keeps increasing in this way. This point reveals a condition where the effectiveness of decentralization is achieved.

For the next analysis, we try to reveal provincial own revenue and compare this to the expenditure that is a constant value. Based on the value in 1995, provincial own revenue, which consists of tax revenue, user charges, provincial owned companies, and miscellaneous income, increased faster than expenditures. Whereas, provincial owned companies showed the fastest increase in provincial finance, user charges failed to become the main revenue because of the difficulties in operations.

Figure 3. Comparison of revealed provincial own revenue to expenditure in constant value



Source : Directorate General Fiscal Balance Regional Government

Although in the last two years, provincial owned companies contributed the greatest proportion to provincial finance, the revenue comes from provincial owned companies are not as flexible as tax revenues in financing the provincial expenditure. The contribution that comes from a company's profit will be used for the company itself, while the rest is for the provincial expenditure. Tax revenue, on the contrary, does not have a limitation in its use, so the revenue of a tax can be used to finance the expenditures of other sectors.

An interesting phenomenon is shown by provincial expenditures. Provincial expenditures decreased for the first time in 1998, because of political disputes and the economic crisis, so that there were not conducive situations for development

programs. A slight increase was performed in 1999, when all of the provinces in Indonesia had recovery programs. But this decreased again in 2000, because of the transition of regional government policy from the centralized to the decentralized policy. In the year 2000, the government had not yet implemented the decentralization, but notice took the regional governments' attention. They preserved their finances, while they were waiting for the central government decision.

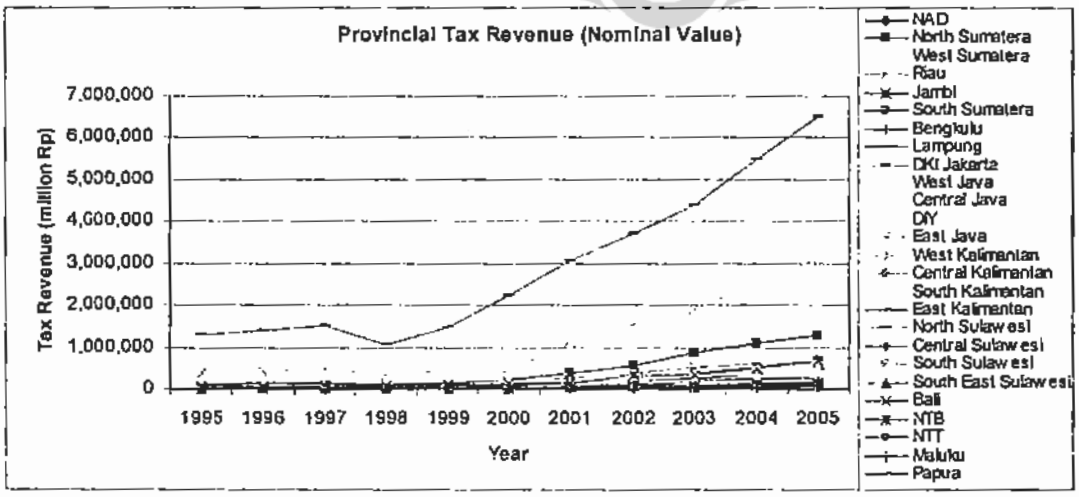
3.5.2. Trends of Provincial Finance at Provincial Level

Comparing provincial finance at national level, we will analyze the trends of provincial finance. One trend includes the effect of decentralization into provincial finances. In this statistical analysis, we use some of the accounts of financial statements of the provinces. They include tax revenue, expenditure, ratio of tax revenue to expenditure, and aid/grant coming from the central government. As the data is used for the central governments point of view, we use the data from the directorate of the General of Fiscal Balance for the analysis. Performance in each province is reflected by the following graphs, both in nominal and constant values. We use the GDP deflator to get a constant value for each account.

The purpose of this analysis is to understand the financial performance of each province. The performance refers to the response of the provincial government to the effectiveness of decentralization.

A. Provincial Tax Revenue

Figure 4. Provincial tax revenue in nominal value



Source Data: Directorate General Fiscal Balance Regional Government

DKI Jakarta is a successful region. It has achieved the highest tax revenue among the provinces in Indonesia. In 1998, when the crisis happened, its revenue was decreasing. However, today, the tax revenue of DKI Jakarta province leads the other provinces. The other regions that have increasing tax revenues are mostly the provinces of Java Island, which are West Java, East Java, Central Java, and North Sumatra, and one province outside the Java islands which is capable of augmenting its revenue from provincial tax significantly.

As the capital city of Indonesia, DKI Jakarta has special treatment in its financial accounting. Consisting of six districts: Central Jakarta, North Jakarta, South Jakarta, East Jakarta, West Jakarta, and Kepulauan Seribu, DKI Jakarta centralizes its financial accounting. Provincial tax revenue involves all kinds of taxes, which come from province itself (i.e., PKB, BBNKB, PBBKB, and PABT-AP) and from districts (such as hotel tax, restaurant tax, advertising tax, parking tax, mining tax, and street lighting tax). On the other hand, the other provinces have to report their own financial accounting and the financial statements of those provinces are separated from their district/municipal financial accounting. For example, the tax revenue account of the province just has to report the provincial tax revenue and this does not include the district/municipal tax revenue. Because of the system, DKI Jakarta province financial accounting seems to be doing better than the other provinces.

In 1998, the economic crisis hit Indonesia. The crisis also affected the economy of the provinces and districts/municipalities in Indonesia. DKI Jakarta, as a central player in the Indonesia economy, where most of their economy is stimulated by private sectors, lost some of its revenue sources. In addition, the year 1998 was a transition period of Regional Tax implementation from Law 11/1957 on Regional Tax to the new one, Law 18/1997. While Law 18/1997 emphasizes its aim to decrease the high cost economy caused by many kinds of taxes implementation, in fact, Law 18/1997 actually diminished the provincial tax revenue significantly, at around 28.60%, compared to the year before. According to the new regulation, the provincial tax revenue was cut to three kinds of taxes only. They were PKB, BBNKB and PBB-KB. Before the implementation of Law 18/1997, provinces imposed different types of taxes. Law 10/1968 allowed provincial governments to impose

municipal tax(es) as provincial revenue while districts/municipalities had not been formed under those provinces. Most of the provinces lost their tax revenues from the mining tax and water exploitation tax/PABT-AP. For DKI Jakarta, the implementation of Law 18/1997 makes this province lose 15 billion Rupiahs from foreign people tax/Pajak Bangsa Asing and 4 billion Rupiahs from radio tax (Tambunan, 2000)5. Both of the tax losses significantly affected the provincial economies and reduced their performance.

Since 1999, the provinces have overcome the economic crisis and some regions were able to increase their tax revenue successfully from 2000. We can see from the table that all of the provinces succeeded in increasing their revenues at different rates. In 1999, DKI Jakarta succeeded in increasing its tax revenue by as much as 38.70%, or 413,358.48 million Rupiahs, from previous year 1998 and the number increased again in 2000 by 36.51% or 817,463.12 million Rupiahs. This was amazing, because fiscal year 2000 is only nine months. The Indonesia economy, including the regional government, had changed the economic system since fiscal year 2000. In the previous year, the fiscal year started on April 1st and attended at March 31st. But since fiscal year 2000, the fiscal year started on April 1st and ended at December 31st. Since 2001, the fiscal year has started on January 1st and ended on December 31st.

This condition was supported by the government policy to implement the new Law 34/2000 and revise Law 18/1997. This new law returns water exploitation to the provincial level. In 2000, most of DKI Jakarta revenue came from PKB and BBNKB, which were 66.25% of the total budget as much as 1,490 billion Rupiahs (Kompas, 2002). At that time, local own revenue was a major revenue (55% of total revenue) greater than the aid/grant from the central government which was only 45% of total revenue (RPJM DKI Jakarta, 2007). But unfortunately, not all of the provinces can increase their tax revenue like this. One reason is that not all of the provinces implement the water exploitation tax depending on each province condition. According to Law 34/2000, this is permitted for a region not to levy some kind of taxes whether the condition of the province doesn't support the tax implementation.

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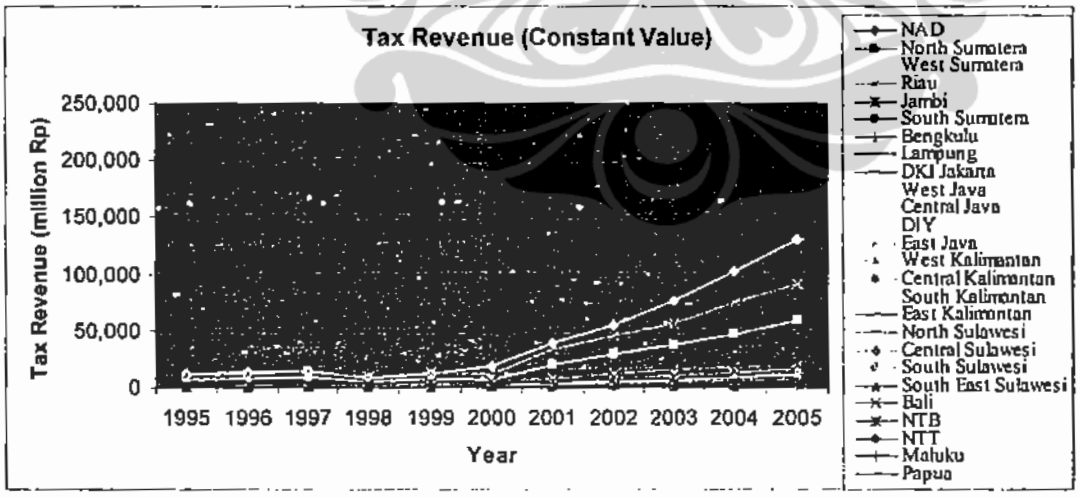
5 Tulus Tambunan is a Indonesia economic researcher from LP3E – Industrial and Trade Organization of Indonesia.

During 2001, tax revenue decreased a little more than the previous year; however, DKI Jakarta still succeeded in increasing its tax revenue. On average, DKI Jakarta succeed in increasing its regional own revenue by as much as 49.03% or 1,195,891 million Rupiahs or 5% higher than the previous years growth. Although no research explained such phenomenon, there was a possibility that it happened because of the Law 22/1999 effect. After Law 22/1999 was implemented, the provincial government would have a fiscal neutrality policy in their budget, where the tax revenue would be matched to their expenditure, and vice versa. Another possibility is that the regional governments had limited their revenue up to certain amount to get the bigger percentage of revenue sharing from the central government through DAU, DAK and/or natural resources revenue sharing. Such a condition was triggered by the implementation of a policy where a province/district/municipality will always receive revenue sharing, especially DAU, at least in the same amount as the previous year.

We take a different result if we graph the tax revenue in the constant value. The tax revenue of all provinces in Indonesia sharply declined in 1998, as a result of the economic crisis, but has increased since 1999. In 2005, even though the oil prices sharply raised and a global monetary tightening cycle, tax revenue is not influenced significantly. Generally, the position of the provinces in the constant value graph has not changed, compared to the nominal value graph.

Figure 5. Provincial Tax Revenue (Constant Value)

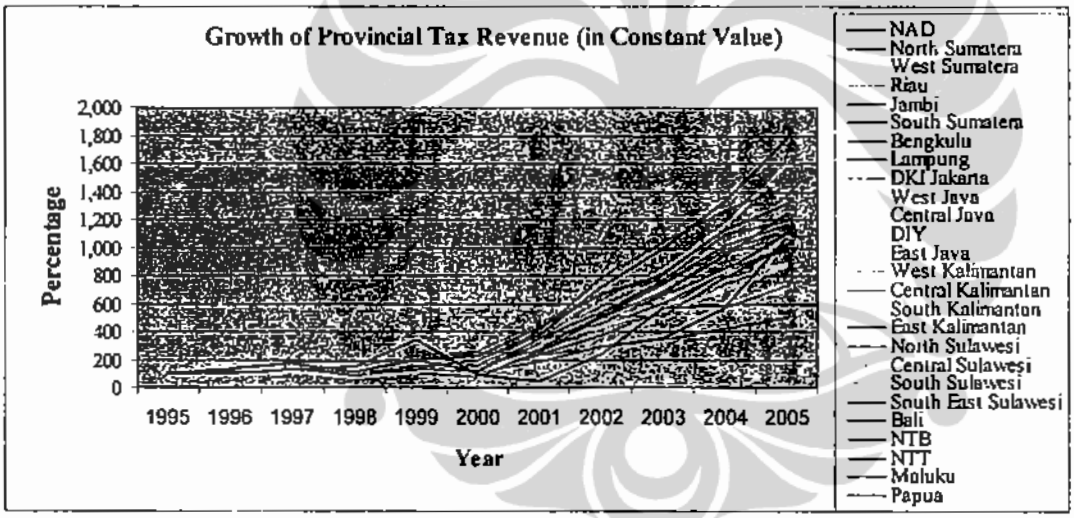


Source Data: Directorate General Fiscal Balance Regional Government
Source of inflation data: International Financial Statistic

Five provinces which generate their tax revenue greater than the other provinces averaged are: DKI Jakarta, West Java, East Java, Central Java, and North

Sumatra. These areas are the industrial regions. One characteristic of the industrial region is that the manufacturing sector supports its economy dominantly. The other sectors influenced by the condition are the trade and transportation sectors, where the workers of the manufacturing sector make transactions to fulfill their need and where they commute from their living to their work places. If the manufacturing sector increases, the trade and the transportation sectors also increase. The effect to the province revenue is the increasing of the provincial tax revenue. The tax base for the three kinds of provincial taxes is number of vehicles and fuel consumed. The number of manufacturers also determines the provincial tax revenue and this comes from the water exploitation tax. The greater the number of manufacturers, the more the water consumed, which increases the water exploitation tax revenue.

Figure 6. Growth of Provincial Tax Revenue (Constant Value)

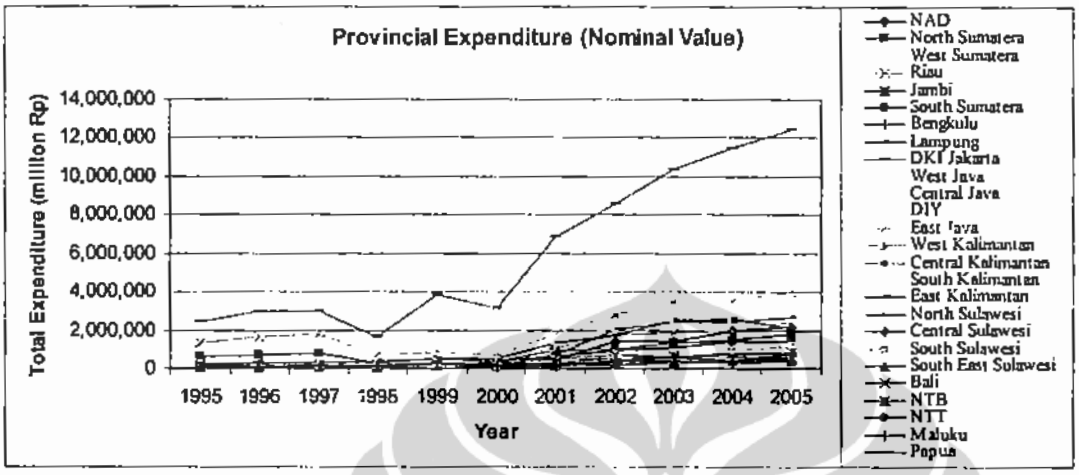


Source data : Directorate General Fiscal Balance Regional Government (DJPKPD)
Source of inflation data: International Financial Statistic

Between 1996 and 1997, the tax revenue of Papua and NTB grew around 50%. These were the highest growth rates among the provinces. Since 2000, the tax revenue of all the provinces increased significantly. The highest growth was found to be by East Kalimantan, followed by South Kalimantan, South East Sulawesi, and Central Kalimantan.

B. Provincial Government Expenditure

Figure 7. Provincial expenditure in nominal value



Source data : Directorate General Fiscal Balance Regional Government (DJPKPD)

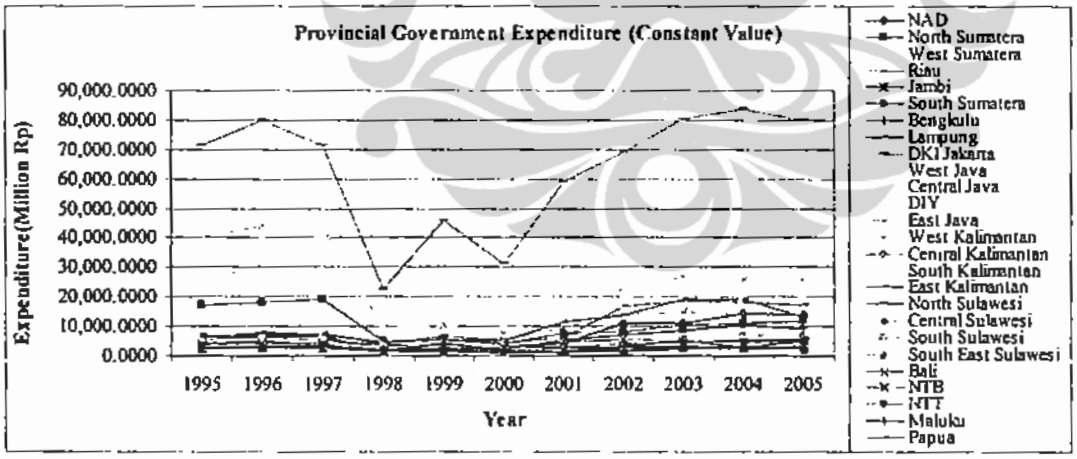
The provincial expenditure is the expenses used by the provincial government to finance its public provisions. Before 2003, according to the Manual of the Local Finance Administration, the expenditure in the provincial government financial statement had been classified into two groups: routine and development expenditures. The routine expenditure was used for operational expenses. The development expenditure is to finance activities in all sectors. The routine expenditure means that the expenditure is for daily expenditures, such as employee's salary, commodities, and loan payments. Since 2003, the Regional Government has implemented the Home Affair Ministry Regulation (Kepmendagri) 29/2002, which classified the expenditure according to the functions. Although the classifications before and after 2003 are different, they exhibit similarities in meaning one another. Both methods classify the expenditure according to their function, but the former method emphasizes the objective/user of the expenditure. On the other side, the development expenditure is used to finance public provisions, such as education, health, and the development of the economic sectors.

DKI Jakarta, as a unique province in its economic characteristics, especially in presenting the financial statements, finances its provision more than other provinces. For 11 years, the expenditure of DKI Jakarta was more than the other provinces and the trend shows this will always increase. In the years 1997 and 1998, the political upheaval and economic crisis hit its economic performance. Political and

economic chaos has obstructed the implementation of provincial government programs. As a result, government expenditure decreased by 44.73%. In 1999, DKI Jakarta started to recover its economy through all of the economic sectors by rebuilding the infrastructure that was damaged. The expenditure of DKI Jakarta increased sharply by 133.62%, especially in development expenditures, which reflected the development of the sector. As much as 82.30% came from the expenditure in 1998. In 2000, even though its tax revenue increased, the expenditure decreased again to 119.25% and did not follow the trend of the tax revenue. In the year 2000, there were issues of fiscal decentralization. The issues did not affect DKI Jakarta very much. This was because the structure of DKI Jakarta finance was influenced by its own revenue and not its revenue sharing.

The other provinces, which have large expenditures among the Indonesia provinces, are West Java, East Java, Central Java, Papua and East Kalimantan. The political disturbance and economic crisis exists all over the Indonesian provinces, but it mostly affects the politics and economics of the Java provinces. The difference is that the process of economic recovery in these provinces is slower than in DKI Jakarta.

Figure 8. Provincial expenditure in constant value



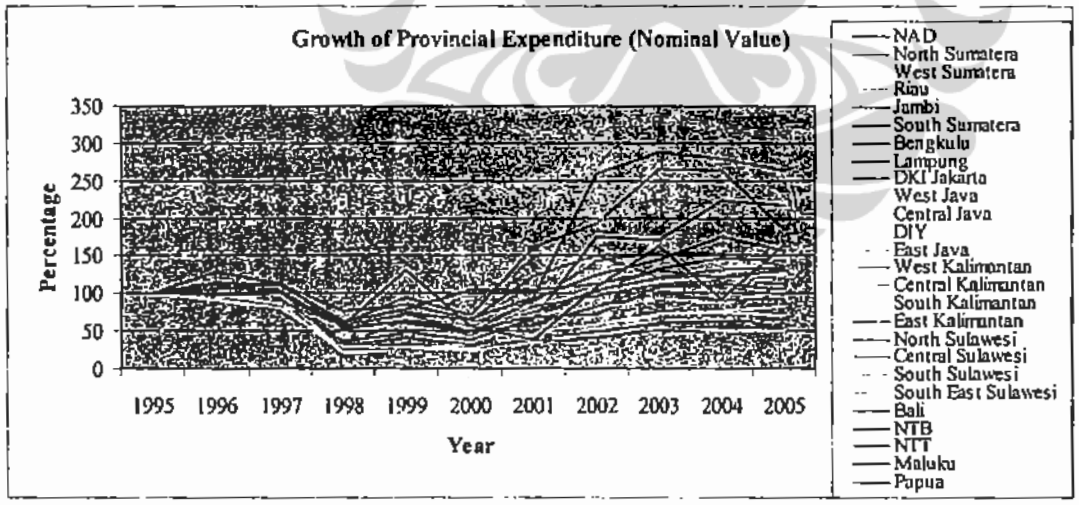
Source data: Directorate General Fiscal Balance Regional Government (DJPKPD)
Source of inflation data: International Financial Statistic

As in tax revenue, we get a different result from the graph when we draw the expenditures of the provinces at a constant price. In 2005, the expenditure of all provinces declined more than in the previous year. DKI Jakarta had a great inflation

affect its finances, especially in its expenditure. In 1999, the expenditure of DKI Jakarta increased as a result of economic recovery after the crisis by as much as 104.64%, and it decreased again in 2000 by as much as 32.22%. The trend of DKI's expenditure has increased since 2001. This may have occurred because the economic structure of DKI Jakarta is dependent on the private sector, which is very elastic in responding to the economic situation. In 2005, the expenditure of DKI Jakarta declined again, but it was an insignificant decline. The Central Bank of Indonesia stated that the consumption in 2005 declined because of the weakened public purchasing power and the new upward movement in interest rates.

If we compare the tax revenue to government expenditure in the provincial level by constant price, we can see that from 2001 to 2005, the provincial expenditure in all provinces in Indonesia have exceeded their tax revenue. The expenditure reached the peak in 2003, when new provincial governments split from their existing provinces, and financed their formation of a new government structure. This condition might support the other phenomenon stated before that provincial finance still depends on aid/grants or income sharing from the central government, distributed by the balancing fund account and other user charges.

Table 9. Growth of Provincial Expenditure (Constant Value)



Source data : Directorate General Fiscal Balance Regional Government (DJPKPD)
Source of inflation data: International Financial Statistic

In 1999, Maluku increased its expenditure by 73% more than the previous year but this decreased again in the next year. After decentralization, all provinces tend to increase their expenditures. Four provinces are in the highest growth of

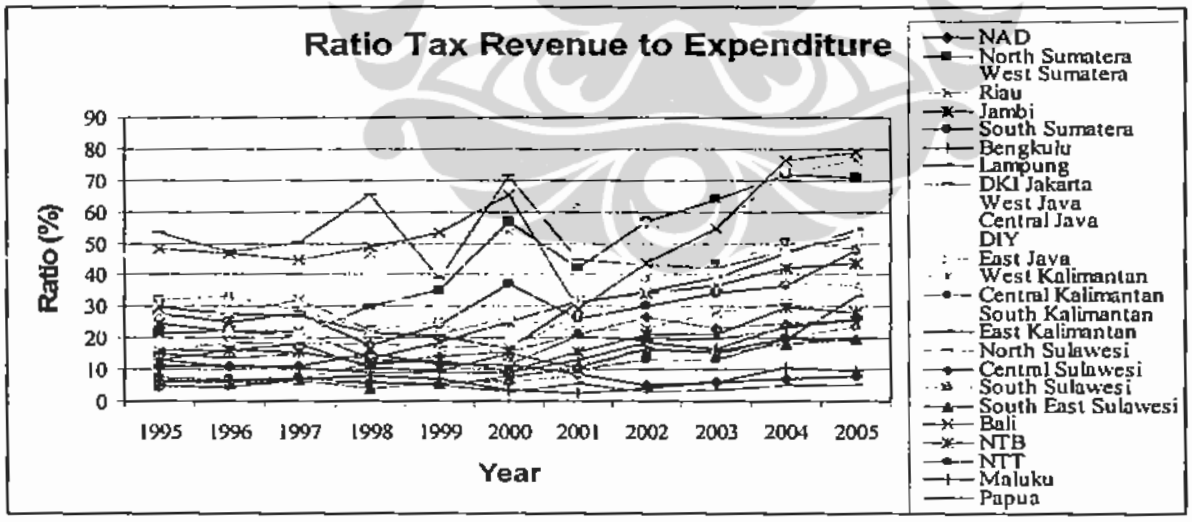
expenditure, which are Papua, East Kalimantan, Riau, and NAD. Their expenditures increase continuously at 30-50% a year. However, the increase of expenditure is determined by the economic policy of each province in spending its revenue. Regarding the purpose of decentralization, each province has the authority to determine its priority of development and finance it by its revenue. The central government will support the development of the province by transferring the fund to cover the fiscal gap of the province.

The higher the expenditure, the faster is the development of the province. This means that the level of expenditure directly represents the level of development of a province. Instead, a high expenditure shows the inefficiency of the province. This might happen because the personnel quality of the province is low.

C. Ratio of Tax Revenue to Expenditure

The purpose of decentralization is that the regions are able to finance their expenditures by their own revenue. While the regions can not cover all their expenditures by their own revenue, the central government will cover that fiscal gap by transferring grants.

Figure 10. Ratio provincial tax revenue to expenditure in constant value



Source data : Directorate General Fiscal Balance Regional Government (DJPKPD)

We can see from the graph that the ratio of tax revenue to expenditures tends to increase in some provinces. Before decentralization, there were only four provinces over 50% in their ratio, but after decentralization, more provinces increased the ratio of tax revenue to expenditure. In 2005, there were nine provinces

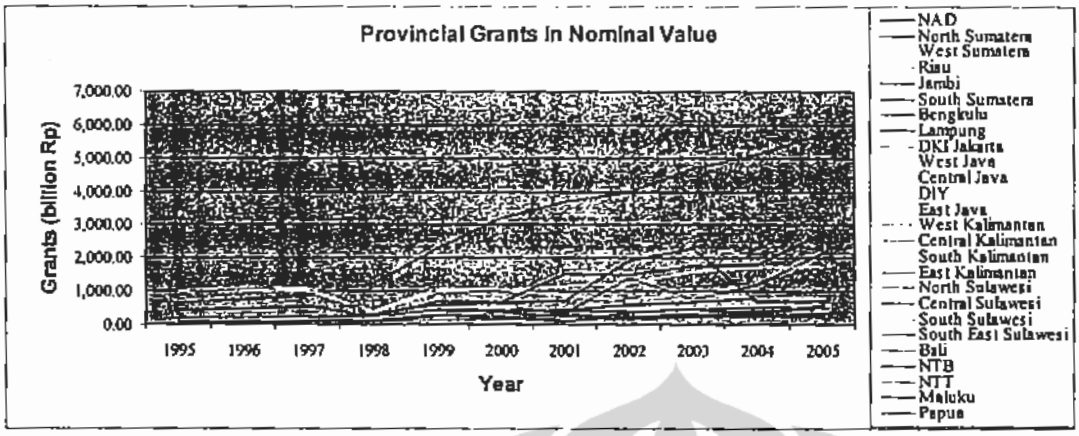
that achieved the ratio over 50%, in which Bali was the highest. Two provinces at the lowest level are NAD (8.18%) and Papua (5.12).

D. Number of Aid/Grants transferred from central government to provinces

Grants are designed to address the horizontal fiscal imbalance Riyadi Suparno (2004). Unlike tax or revenue sharing, block grants are decided totally at the behest of the central government. Two kinds of grants are block grant and specific grants. *Block (unconditional) grants* are grants extended by central governments to local governments without any strings attached (Suparno, 2004, p.9). After decentralization, the term block grants became known as DAU. *Specific grants* are extended by the center to local governments with strings attached, such as to finance only certain sectors, or even specified projects. This is known as the DAK and/or the contingency fund.

The central government of Indonesia transfers the grants to the regional government by the Balancing Fund (Dana Perimbangan) account. Regarding Law 25/1999 and 33/2004, the Balancing Fund consists of general purpose grants (DAU), specific grants (Dana Alokasi Khusus/DAK), and revenue sharing grants, whereby the sources came from tax and non-tax sharing. BHBP came from the natural resources income. DAU is a block grant transfer to cover the horizontal fiscal imbalance. The central government, i.e. Ministry of Finance (MOF), determines the formula for each grant by law, based on the fiscal gap (discrepancy between fiscal capacity and need). The fiscal gap computation is measured by the number of people, GRDP, and hold harmless factor. Suparno (2004) stated in his paper that there is a political component in the DAU formula. DAK is a transfer to address a regional and/or national special need. While DAU is for covering the horizontal fiscal imbalance, revenue sharing is to address the vertical fiscal imbalance. Before the implementation of Law 25/1999, there was also an account to record the aid and donations (Bantuan/Sumbangan).

Figure 11. Provincial revenue from grants in nominal value

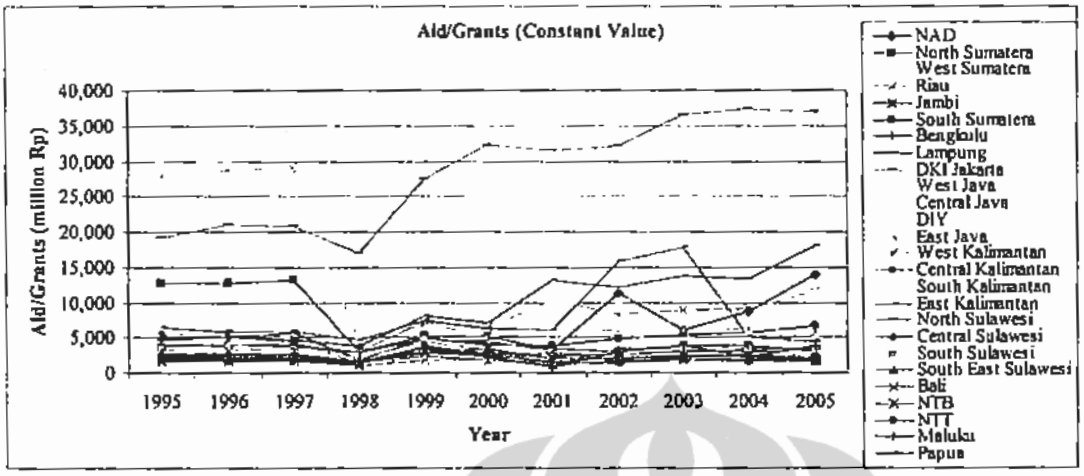


Source data : Directorate General Fiscal Balance Regional Government (DJPKPD)

The amount of aid/grants from the central to the provincial government by DAU, DAK and revenue sharing, are increasing from year to year among the provinces. Some interesting phenomena exist in the trend of the grants. The first province which takes the greatest percentage of grants is DKI Jakarta. The other provinces are East Kalimantan, Papua, and NAD. Those four provinces are abundant in natural resources. Despite Papua, which is abundant in mining, the three other provinces are abundant in oil. This means that revenue sharing has the most important role in provincial finance structure. In other words, the richer a province is in natural resources, the more grants are received.

Another phenomenon is that 20 provinces received more than 100% of the grants and six provinces received about 90% in the year 1999, compared to 1998. One reason is that the central government transferred more grants to recover the regional economy after the political and economic reformation in 1997-1998.

Figure 12. Provincial grants in constant value

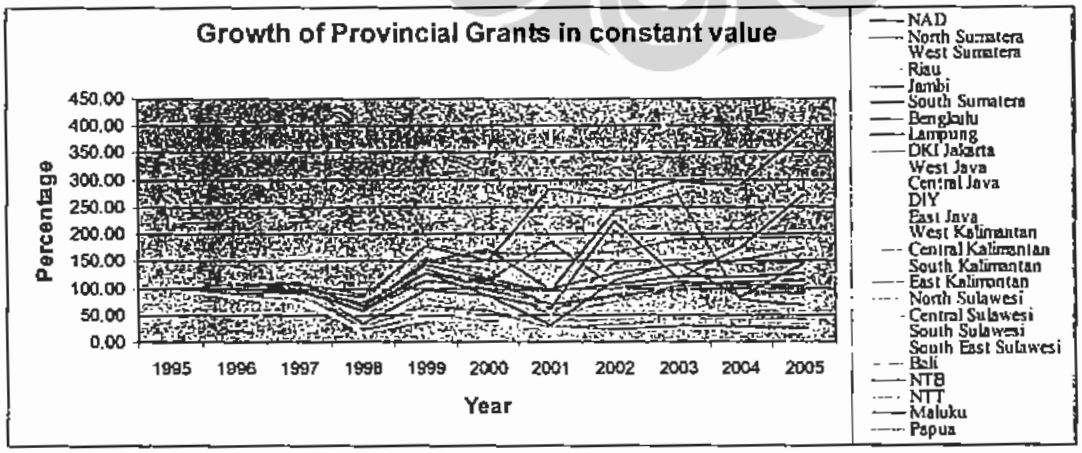


Source data : Directorate General Fiscal Balance Regional Government (DJPKPD)

Source of inflation data: International Financial Statistic

Using a constant value, the growth of the provincial grants significantly increased in some provinces after decentralization. In 2002, the central government transferred grants through revenue sharing to NAD and Papua. This was 140% higher than in the previous year. This was because of the special autonomy given to both provinces by which they receive a higher percentage of revenue sharing than the other provinces. The other provinces that have an advantage from grants are East Kalimantan, Riau, and DKI Jakarta. The amount of their grants always increases because of hold harmless policy.

Table 13. Growth of Provincial Grants (in Constant Value)



Source data : Directorate General Fiscal Balance Regional Government (DJPKPD)

Source of inflation data: International Financial Statistic

If we compare total provincial income, consisting of tax revenue and aid/grants, to the provincial expenditure, their amount had started to be equal since 1995 up to 2001. But after 2001, the total expenditure exceeded total income. When total expenditure was greater than total income, the provincial government financed activities by provincial user charges and/or provincial debt.

We can conclude from the descriptive statistical analysis that:

a. Because of its certainty in acceptance and flexibility in its use, tax revenue becomes the main revenue of provincial finances by its increasing trend at a national level.
b. Provincial Own Revenue, which are consisting of the revenue of provincial tax, user charges, provincial owned company, and miscellaneous income tend to increase significantly, whereas grants from the central government tend to decrease at a constant value.
c. Generally, decentralization in Indonesia succeeds in strengthening provincial finances compared to the expenditures in a constant value from the viewpoint of percentage trends. But the ratio of tax revenue to expenditures shows the volatility at each province, and since 2001, the ratio (effect of decentralization) increased insignificantly.

The conclusion, based on the trend analysis, contains some deficiencies. The conclusions are built only on actual revenue. We can not analyze the efforts of the provincial government in using the potential revenue, because the analysis does not talk about the tax potential. The trend analysis can not be used to estimate the tax capacity of each provincial government. In order to overcome such deficiencies, we will use the Teera model, which enriches our analysis. This is such because we need a model as a quantitative method to estimate and measure the potential tax base. The potential tax is estimated tax revenue that can be received based on a given set of variables and tax potential is measured as an approach to the tax base (that is difficult to define in the provinces).

CHAPTER 4

DATA ANALYSIS

4.1. Review of Teera Model

In this chapter, we will discuss the Teera Model (Teera, 2004) as a tax performance measure. On the whole, the Teera method consists of four stages in measuring a countries tax performance. At first, the Teera model measures the tax ratio by using GDP as the denominator of actual tax revenue. Teera found that GDP per capita refers to the capability of society to pay the tax and does not relate to the tax ratio.

In the second step, Teera uses a regression analysis to see the relationship between the variables using pooled cross sectional and time series data. The purpose of this step is to achieve the estimated potential tax base of each country. As discussed in the previous chapter, it is difficult to measure the tax base in developing countries. Therefore, Teera proposed a model to get a proxy of the tax base (called potential tax base) using variables as determinants. The variables include GDP per capita as a proxy to the level of development, trade, expenditure, public debt, the amount of aid, demographics, economic structure of a country, and tax evasion. These variables are considered in determining the possibility of tax levies, either on the tax potential of the individual countries, taxation targets set by the authorities, or the ability of governments, in practice, to collect taxes.

Income per capita refers to the level of development, as a proxy to indicate the capacity of the society to pay the tax. The increase of economic development will result in the increase of income per capita. Under the assumption that the country is in the developing stage, the increase of income per capita will increase the capacity of the society to pay the tax. In other words, this will increase the tax base.

Teera use export plus imports as a variable that affects the tax revenue because exports and imports give an administration ease to tax. The transaction can be monitored easily because it takes place in specified location. This is because the entrance and exit to the country takes place in a specified location so that this can be easily monitored. If the trade (foreign trade) increases, the tax capacity also increases. In addition, export and import indicates the degree of openness which

significantly affects tax ratio in developing countries. This is because foreign trade in developing countries is typically the most monetized sector of the economy.

Government expenditure and public debt are variables that influence the tax capacity of a country. The growth of the government by public spending is leading to the increase in the share of public debt, relative to GDP. A large share of debt comparing to GDP induces the government to raise the revenue, so it can pay the debt and interest. By the assumption that a country won't be collapsed, the increasing of government expenditure and public debt would tend to raise the tax level, ceteris paribus.

Whereas aid and grants play an important role in the economic structure of developing countries, empirical literature results in the conclusion that aid and grants might have a negative impact on some indicators, especially taxation revenue. Therefore, when the aid and grants increase, the tax revenue may decrease.

Demographic characteristics are variables that influence the process and pattern of development. In the case of tax performance, population density, as a characteristic of demography, influences the effort of the government in increasing the tax revenue by raising the taxable sources. This is because the increase of population density will increase public expenditure. The increase of public expenditure is an indicator for the government to intensify their efforts to raise revenue. Therefore, tax revenue, as a source of government revenue, will be intensified either in its tax rate, tax base, or tax collection. On the contrary, population density may affect the tax performance negatively, because of its high administrative cost. In this case, the tax cost will be higher than the tax revenue. Therefore, Teera believes that population density affects the tax performance in either a positive or negative way.

The economic structure is one of the factors expected to influence the level of taxation. The share of the agricultural sector is considered to be an important feature of economic structure compared to the other sectors. On the supply side, a large share of the agricultural sector does not generate large taxable surpluses, as many countries are unwilling to tax the main foods used for subsistence. On the demand side, the increase of agricultural share may lessen the government expenditure. The decreasing of government expenditure will decrease the effort to raise the tax revenue. This means that the tax ratio, in term of tax revenue compared to GDP, will decrease.

Therefore, the higher the shares of the agricultural sector in a country, the smaller the expected tax ratio.

The Teera model includes the time trend as the independent variable. The purpose is to know the effect of the time trend to the potential tax base through the regression.

The last variable of the Teera Model to get the potential tax base is tax evasion, which reflects the existence of the underground economy of a country. Tax evasion is a factor that will affect the economy by reducing the tax revenue. To measure the tax evasion of a country, Teera takes the indirect/indicator approach, or currency approach, mentioned in Chapter 2. Teera uses some 'shadow' variables. One variable, the money supply (M1), refers to the sum of the currency outside banks and demand deposits except from the central government, GDP, and GDP per capita. The regression uses the log form for each variable, where $LM1 = \beta_0 + \beta_1 LGDP + \beta_2 LGDPP + \beta_3 Trend + Z_T$. In this regression, Teera uses Z as an error term to explain the unexplained part of the regression, with respect to money supply holdings, or the hidden economy. When the error is negative, there is a large hidden economy, and vice versa. The expected result for tax evasion as a variable is significantly negative, to show the contradictory relationship between tax performance and the hidden economy.

Therefore, the estimation methodology of the relationship between tax revenue and explanatory variables above is:

$$T = f(Y, XM, A, P, Ag, Mf, E, D, \phi, t)$$

Where: T is Tax to GDP ratio, Y is GDP per capita, XM is the ratio of exports plus imports to GDP, A is the ratio of aid/grants to GNP, P is population density, Ag is the ratio of agriculture to GDP, Mf is the ratio of manufacturing to GDP, E is the ratio of total expenditure to GDP, D is the ratio of total debt to GDP, Φ is the shadow variable, indicating tax evasion/hidden economy, and t is the time trend.

The formulation for the regression is a linear function:

$$LnT_{it} = \alpha + a_1 LnY_{it} + a_2 LnXM_{it} + a_3 A_{it} + a_4 LnP_{it} + a_5 LnAg_{it} + a_6 LnMf_{it} + a_7 LnE_{it} + a_8 D_{it} + a_9 \phi_{it} + a_{10} t_{it} + \varepsilon_{it}$$

In this model, Teera wants to capture the effect of time by measuring the time trends in the regression. Therefore, Teera includes the time trend as an explanatory

variable. Teera uses a one way error component regression model, which is $\varepsilon_{it} = \mu_{it} + v_{it}$, where μ_i is the unobservable country specific effect and is time invariant. V_{it} is the remainder of usual disturbance in the regression and varies at random with countries (i) and time (t).

The expectations regarding the theoretical framework are:

$a_1 > 0, a_2 > 0, a_3 < 0, a_4 > 0 > a_4, a_5 < 0, a_6 > 0, a_7 > 0, a_8 > 0, a_9 > 0 > a_9$

The expectation of population density might be either positive or negative, and depends on the characteristic of each country. So does the expectation of the shadow economy, which depends on the effect on both tax revenue and GDP per capita. If the impact on tax revenue is greater than on GDP per capita, then the shadow variable will be negative, and vice versa (Teera, 2004, p.11).

The result of the Teera regression shows that the factors of specific countries are important determinants in the tax performance of those countries. All variables used in the regression generally yield a significant influence on the potential tax base. The sign of the estimated regression coefficients also support the expectation. This means that all variables generally affect the potential tax base of all countries positively, while the variables aid/grants, share of agricultural sector, and tax evasion affect the potential tax base negatively.

In the third step, Teera compares the tax effort index among the countries. The purpose of this step is to evaluate the effectiveness of a particular country in raising tax revenue. Tax effort is tax revenue obtained by the government in a given tax capacity/base. The relationship between tax effort and tax performance is that the tax effort reflects the extent of tax performance to which a country uses its taxable capacity. The tax effort index is calculated by taking the relationship between the actual tax ratio and the potential tax ratio. Teera found that the lower the index, the higher is the income group. This fact implies that the effort of the higher income group to increase revenue in a given tax capacity is more than the lower income groups. Nonetheless, the potency of the countries to increase their revenue from the tax is limited. The implication of this finding to higher income groups in fiscal policy is that they have to decrease the expenditure, rather than increase their tax revenue with an imbalanced budget.

In the final step, Teera analyzes the countries efforts to increase tax revenue over the period using the income tax elasticity/tax buoyancy. According to Teera, tax elasticity measures the effect of some factors, such as the progressive elements in the tax system, distribution of income, and composition of bases. The value of tax elasticity/tax buoyancy is greater than unity, while GDP per capita is growing and shows that such a country must have a rising tax ratio over time. This result implies that the higher income groups make use of their tax bases to increase their tax revenues more than the lower income groups, and the potential for further tax increases for higher income countries would be limited.

In order to support the conclusion of tax performance among the countries and its correlation to the policies that will be taken, Teera uses Spearman's Rank Correlation Coefficient. The result shows that there is a little correlation between the ranking of tax effort and tax elasticity, except for the upper income group. Furthermore, this means that a low effort index does not necessarily indicate that the countries have not made an effort to increase tax revenue over the years (Teera, 2004, p. 29).

The Advantage and Deficiency of the Teera Model

We have discussed the comprehensive steps of the Teera method in measuring the tax performance of countries. Compared to the other methods, Teera's method is unique because it enables us to measure the tax performance from three dimensions; past, current, and future. Teera measures the last tax performance from the actual tax revenue that had already been collected by the countries. She uses the tax ratio to show the past performance. Currently, Teera measures the performance by the potential tax base that resulted from the regression using various economic variables. Based on the regression model, we may measure how much tax revenue could be realized in a given determinant. As mentioned previously, this step solves the difficulty in measuring the tax base, which is usually dealt with by developing countries, including Indonesia. Combining those two steps, Teera signifies tax performance by tax effort, which reflects the degree to which a country makes use of its available tax capacity. For the future, Teera estimates the income tax elasticity, which shows the sensitivity and response of the tax system to the changes that take

place in the composition. All of these steps are being conducted to support the purpose of measuring the tax performance of the countries.

Despite the power of the method, we are also able to see some weaknesses in the Teera model. The Teera model tries to compare tax performance among the countries. But Teera had never explained the characteristics of tax in each country. As a result, the choice of explanatory variables in measuring tax performance is too general. The model does not use specific variables that affect directly tax performance of the countries.

We also know that in her regression Teera uses GDP as the denominator in both the dependent and independent variables. She also uses GDP itself as the numerator in terms of GDP per capita as the explanatory variable. The effect resulted from such a model is that the disturbances contain individual invariant effects (the μ_i) which are unobserved and may be correlated with the X_{it} (Badi, 2001). Econometrically, this violates the assumption in the error component regression model $E(\mu_{it} / X_{it}) = 0$ where μ_{it} is the error component regression which denotes that unobservable ability of the country will also be affected by X_{it} as the explanatory variable. This means that the estimate from the regression using Ordinary Least Squares is not the best linear unbiased estimator (BLUE).

The model also brings the possibility of multicollinearity to the model, in which two or more predictor variables in the regression model are highly correlated. The consequences of the multicollinearity are that the variances and standard errors of the estimates will increase. The condition will give a higher probability of obtaining an estimated regression coefficient (β) different from the true sign that creates the difficulty in estimating the result. The computed t-scores will fall, which means that the variable(s) is/are not significant and estimates will become very sensitive to changes in specification. But the overall fit of the equation, and the estimation of the coefficients of non-multicollinear variables, will be largely unaffected and the estimates will remain unbiased, or still be centered on the true population, βs, if all the classical assumptions are met for a correctly specified equation (Studenmund, 2006).

Based on such an analysis, this thesis will use and apply the Teera model as a method to measure tax performance and make a comparison before and after decentralization in Indonesia, with some modifications. The modifications are:

a. We use tax revenue divided by expenditure to get the tax ratio as the dependent variable in the regression. The purpose of this modification is to emphasize the effectiveness of decentralization, which is measured by financial responsibility. The financial responsibility of provincial governments is represented by the ability to finance their expenditures. As a consequence, we remove expenditures as the explanatory variable to eliminate the violation of the critical assumption of CLS, which is $E(\mu_{it} / X_{it}) = 0$.
b. The regression drops GDP as the denominator for the explanatory variables, except the shadow economy. Instead, we use the real value to minimize multicollinearity among the independent variables. For instance, while the Teera model uses grants over GNP, we use grants themselves to be regressed. We also modify the share of some sectors, including exports plus imports to GDP, by using their real number without GDP as a denominator.
c. The effect of decentralization on the tax effort index will be measured by the same potential tax base. Therefore, the explanatory variables will be regressed in time (11 years). But in analyzing the capacity of each province we will segregate the data into two periods; before and after decentralization.

4.2. Assumptions and Data Sets

As we know, there are four factors that influence tax revenue: tax rate, tax base, tax collection, and tax ratio (Alfirman, 2003). This thesis wants to analyze the performance of the provincial tax from those four factors. Overall, this thesis will follow Teera steps to analyze tax performance, since determining the tax ratio prior to measuring the tax elasticity. Since it is difficult to measure the provincial tax base, this thesis will use the Teera model to measure the potential tax base in each province. Tax collection is affected however, by some factors such as the shadow economy. Teera stated that the shadow economy is the most important variable that affects both tax base and tax collection. Therefore, this study will also measure the shadow economy using the electric consumption method (ECM).

There are some different frameworks of this study comparing the Teera analysis. At first, Teera interpreted the tax performance from all the factors of taxes in revenue. In this way, Teera measures tax performance by tax ratio, tax effort, and tax elasticity. The purpose of the Teera paper is to analyze statistically the underlying

factors such as the economic structure, level of development, the administrative and political constraints on the fiscal system, and the willingness-to-pay taxes. Teera considered that those factors interacted in a different way, at different times and in different countries, so that the effects vary among countries and bring the disparity in tax revenues between countries (Teera, 2004, p.3). In order to achieve her purpose, Teera had classified the countries according their economic structure. These structures include: Sub Saharan Africa, low, lower middle, upper middle, and high income groups.

This thesis, on the other hand, will focus on measuring the effectiveness of decentralization. Therefore, this thesis follows Teera's steps in measuring tax performance by tax ratio, tax effort index, and tax elasticity and classifies the data into two periods, before and after decentralization, rather than provincial economic structure.

Secondly, the Teera model uses time trend as the explanatory variable in order to measure the effect of time trend to tax performance of the countries. The regression of this thesis does not use time trend because the purpose of this thesis is to compare the provincial tax performance between two periods.

Thirdly, Teera used an indirect approach. More specifically, she uses the currency demand approach with some modifications to measure tax evasion using the monetary method. In her model, tax evasion was the unexplained part of the regression, with respect to money supply holdings, which were reflected by the error term as an indicator of the hidden economy. In this thesis, we will use the electricity consumption method to measure tax evasion, represented by the shadow economy. We use this method because of the limitation of provincial data, except for the electricity consumption, which is published by PT (Persero) PLN Indonesia.

4.2.1. Assumptions

This study has built some assumptions as a base in interpreting the results:

a. This thesis aims to statistically analyze the effect of chosen variables to provincial tax share, before and after decentralization. To fulfill the purpose, new provinces created after implementation of decentralization (2001) are compiled with the old provinces, from which they are split. In this way, the number of

provinces after decentralization is assumed to be the same as before decentralization, which are 26 provinces.

b. To measure the government effort in tax potential, we use some variables as determinants that affect the success in exploiting the tax potential of provinces and ability to collect the taxes in practice. We assume the given variables that affect the provincial tax base are grants from the central government, GRDP per capita, population density, transportation, manufacturing, agriculture, both domestic trade and export import, and the shadow economy as a percentage of GRDP.

c. We use the national GDP Deflator to make the financial data of provinces a constant value. We assume that the differences among the provinces' inflation are not significant. This assumption is made because of the lack of suitable data.

d. To support the electricity consumption method (ECM), we maintain an assumption of unitary elasticity, which is consistent with international estimates. In this assumption, the effect of upward bias will cancel out downward bias. We use the shadow economy of Indonesia, calculated by Wibowo and Sharma (2005), as the first year/base year of the provincial shadow economy. Wibowo measured the Indonesian shadow economy between 1985 -1999 and found it was 22% of reported GDP. This approach is taken because there is no research for the Indonesia shadow economy at the provincial level.

4.2.2. Data Set

All data are in the provincial level. The data includes information from 26 provinces between the years of 1995 and 2000 (before decentralization) and 33 provinces between the years of 2001 and 2005 (after decentralization). The data were published by the Indonesia Statistical Central Bureau (ISCB) which consisted of:

a) Provincial Gross Regional Domestic Product (GRDP)
b) Number of population and province area to measure population density
c) Agricultural sector
d) Manufacturing sector
e) Trade sector consists of domestic trade and foreign trade (export plus import)
f) Transportation sector

This study also used data from the Realization of Regional Budgets (Perhitungan APBD), published by the Directorate General Fiscal Balance (DJPKPD), which consists of provincial tax revenue, provincial expenditure, and grant/aid from central to provincial governments.

To measure the shadow economy, we use electricity consumption data/sold energy data from PT (Persero) Perusahaan Listrik Negara/PLN (Power State Company). The data covers all Indonesian provinces over an 11 year period (1995 – 2005).

4.3 Data Solving

To analyze the effect of decentralization by analyzing the provincial tax performance, we will conduct four steps, or stages, in this thesis. The steps include measuring the tax ratio, measuring the tax potential, measuring the tax performance and making a comparison of such tax performance among the provinces (static approach), and finally, analyzing the effect of decentralization on the provincial tax performance over the periods using a dynamic approach.

4.3.1. Measuring Tax Ratio

In measuring the provincial tax ratio, the time is divided into two periods: pre-and post-decentralization. The tax ratio is measured by comparing the tax revenue to the expenditure, which refers to the effectiveness of decentralization. Based on the analysis of the tax ratio, we statistically analyze the underlying factors that could account for the differences among the provinces tax ratio.

In this study, specifically for the tax ratio analysis, we classify the tax ratio into three groups: low, middle and high[6]. This classification will facilitate us to analyze the movement of a province from one group to the other between pre-and post-decentralization. The low group consists of the provinces that have an average ratio of 0.24411 or less $(X \leq 0.2441)$. The middle group consists of the provinces that

6 Ratio tax is classified by dividing the difference between the highest and the lowest number in both periods into three groups. The lowest is 0.0450 and the highest is 0.4431, so the difference is 0.1991. For instance, the low group is determined by 0.0450 + 0.1991 = 0.2441.

have an average ratio between 0.2441 and 0.4431 $(0.2441 < X < 0.4431)$. The high group consists of the provinces that have an average ratio of 0.4431 or more $(X \geq 0.4431)$.

Before decentralization, the number of provinces in the low tax ratio group was 16, eight provinces were in the middle group, and two provinces were in the high group. Five provinces in the Java islands were spread into three groups. DIY was in the low group, while Central, West and East Java were in the middle group. DKI Jakarta was in the high tax ratio group. This phenomenon shows us that the tax ratio is not determined by the location of the province.

The highest ratio of pre-decentralization was performed by DKI Jakarta followed by Bali. This is logically true because, as mentioned in Chapter 3, DKI has a special structure in its finance system where the provincial finance includes the district finance. In other words, the amount of provincial tax revenue for DKI Jakarta is the total amount of the districts' tax revenue. Bali is a small province outside the Java islands whose economy is supported by trade and tourism/service sectors. With a high degree of openness, this province succeeds in increasing its provincial tax.

Table 2. Provincial Tax Ratio Pre-Decentralization

	1995	1996	1997	1998	1999	2000	Average
Low Tax Ratio Group							
Central Kalimantan	0.0420	0.0464	0.0581	0.0530	0.0581	0.0614	0.0532
South East Sulawesi	0.0619	0.0574	0.0664	0.0420	0.0535	0.0696	0.0585
Maluku	0.0666	0.0674	0.0700	0.0784	0.0709	0.0357	0.0648
NTT	0.0736	0.0685	0.0737	0.0545	0.0526	0.0804	0.0672
Papua	0.0525	0.0470	0.2765	0.0596	0.0486	0.0310	0.0859
Central Sulawesi	0.0581	0.0589	0.0727	0.1203	0.1409	0.1570	0.1013
Bengkulu	0.1285	0.1111	0.1057	0.0896	0.0903	0.0903	0.1026
NAD	0.1122	0.1130	0.1087	0.1524	0.1150	0.1160	0.1196
NTB	0.1289	0.1588	0.1582	0.1149	0.1308	0.0973	0.1315
North Sulawesi	0.1498	0.1352	0.1502	0.1341	0.1185	0.1159	0.1339
East Kalimantan	0.1586	0.1621	0.1801	0.1044	0.0959	0.1494	0.1417
South Kalimantan	0.1699	0.1866	0.2219	0.1330	0.1322	0.1983	0.1737
West Kalimantan	0.1580	0.1840	0.1835	0.1805	0.1725	0.1725	0.1751
Jambi	0.2478	0.2201	0.2195	0.1378	0.1876	0.2531	0.2110
Lampung	0.2985	0.2782	0.2698	0.2179	0.2067	0.1639	0.2392
DIY	0.1903	0.2253	0.2496	0.2745	0.3096	0.1955	0.2408
Middle Tax Ratio Group							
Central Java	0.1816	0.1833	0.1993	0.3241	0.3204	0.2636	0.2454
South Sulawesi	0.3210	0.3305	0.2874	0.2246	0.2536	0.1261	0.2572
West Sumatera	0.3298	0.2761	0.2593	0.2191	0.2370	0.2370	0.2597
South Sumatera	0.2758	0.2499	0.2783	0.1782	0.2406	0.3701	0.2655
Riau	0.3019	0.2764	0.3221	0.2279	0.2127	0.2649	0.2676
North Sumatera	0.2183	0.2204	0.2080	0.3014	0.3518	0.5669	0.3111
West Java	0.2734	0.2827	0.3045	0.4010	0.4143	0.4566	0.3554
East Java	0.2749	0.2649	0.2683	0.4663	0.5396	0.5396	0.3922
High Tax Ratio Group							
Bali	0.4818	0.4671	0.4465	0.4885	0.5341	0.6555	0.5122
DKI Jakarta	0.5328	0.4709	0.5042	0.6513	0.3867	0.7160	0.5436

Source: Author's calculation

Using the same classification of groups, the number of provinces after decentralization becomes 10 in the low tax ratio group, nine provinces in the middle and seven provinces in high tax ratio group. After decentralization, all provinces in the Java Islands were in the high ratio. Two provinces outside the Java islands in high ratio were Bali and North Sumatra.

Table 3. Provincial Tax Ratio Post-Decentralization

	2001	2002	2003	2004	2005	Average
Low Tax Ratio Group						
Papua	0.0566	0.0296	0.0367	0.0509	0.0512	0.0450
Maluku	0.0253	0.0401	0.0610	0.1034	0.0950	0.0650
NAD	0.0876	0.0525	0.0612	0.0704	0.0818	0.0707
NTT	0.1011	0.1282	0.1307	0.1971	0.1923	0.1499
South East Sulawesi	0.1163	0.1610	0.1523	0.1791	0.1984	0.1614
Central Kalimantan	0.0812	0.1804	0.1627	0.2029	0.2381	0.1730
East Kalimantan	0.1059	0.1634	0.1558	0.1981	0.3319	0.1910
Bengkulu	0.1303	0.1874	0.1681	0.2351	0.2598	0.1961
North Sulawesi	0.2083	0.1918	0.1975	0.2334	0.2575	0.2177
NTB	0.1552	0.2089	0.2119	0.2987	0.2838	0.2317
Middle Tax Ratio Group						
Central Sulawesi	0.2135	0.2683	0.2310	0.2467	0.2622	0.2443
Riau	0.2222	0.2300	0.2814	0.3096	0.2691	0.2624
West Kalimantan	0.2739	0.3469	0.3524	0.3784	0.3694	0.3442
South Sumatera	0.2596	0.3036	0.3428	0.3661	0.4754	0.3495
Jambi	0.3166	0.3406	0.3690	0.4234	0.4383	0.3776
West Sumatera	0.2806	0.3689	0.3840	0.4707	0.5043	0.4017
Lampung	0.3093	0.3490	0.3944	0.4670	0.5413	0.4122
South Kalimantan	0.2298	0.3496	0.4043	0.5655	0.5704	0.4239
South Sulawesi	0.3135	0.3864	0.4348	0.5011	0.4849	0.4241
High Tax Ratio Group						
DIY	0.3751	0.4407	0.3931	0.4805	0.5326	0.4444
DKI Jakarta	0.4458	0.4329	0.4240	0.4783	0.5233	0.4609
Central Java	0.4611	0.4801	0.4840	0.6314	0.6798	0.5473
Bali	0.2899	0.4395	0.5486	0.7657	0.7886	0.5665
North Sumatera	0.4235	0.5690	0.6375	0.7202	0.7108	0.6122
West Java	0.5185	0.5611	0.6123	0.7319	0.7630	0.6374
East Java	0.6233	0.5519	0.5499	0.7224	0.7636	0.6422

Source: Author's calculation

Some interesting phenomena appeared in this measure. The number of provinces that are in the low tax ratio group decreased from 16 to 10, while the middle and high tax ratio groups increased from eight and two to nine and seven. Another interesting phenomenon is that all provinces in the Java Islands are in high group. DIY, a province whose economy is also supported by the trade and tourism/service sector, jumped from the low group before decentralization to the high group after decentralization.

The classification shows us that before and after decentralization, all provinces in the low ratio group are the rich provinces, which have abundant natural resources. East Kalimantan is the richest province among Kalimantan provinces and

relied on oil, gas, forest, and coal in its revenue. Papua is a province in the Irian Islands rich in mining (gold), forest, and agriculture. Nanggroe Aceh Darussalam (NAD) is a small province in the Sumatera Islands. This province is rich in oil, natural gas, mining (especially gold), forests, and plantations such as coffee and spices. However, there was tsunami at the end of 2004 that destroyed this province.

Although those provinces have abundant natural resources, the revenue from the natural resources did not come to them before decentralization. Because of the financial policy between the central and lower level government before decentralization that gave the priority to the central government, those natural resource revenues that were extracted to Jakarta and the generating provinces only received a very limited part of the revenues as grants from the central government. After decentralization, the central government changed the system of intergovernmental finance, where the central government transfers the revenue from natural resources to provincial governments through revenue sharing. In the case of Papua, the exploration of gold in Papua is held by Freeport McMoran, a US corporation. The agreement was signed in 1961 and the corporation had an exclusive mining license for 30 years. The agreement was between Freeport and the central government. In 1991, when the first agreement was over, the central government renewed it for the next 30 years with provisions for two 10-year extensions to 2041. While the agreement currently works, Freeport McMoran pays its responsibility to the central government, but not to the Papua province. On the other hand, the central government transfers the grants to Papua to finance the activities that had been determined by the central government. After decentralization, when the financial policy between the central and lower level government has changed, Papua received special autonomy grants based on Law 21/2001. By comparing the tax ratio before and after decentralization, we can say that decentralization can not improve the effort of these four provinces to generate their tax revenue.

Two factors that determine tax ratio are tax revenue and expenditure. When tax revenue exceeds expenditure, tax ratio will increase, and vice versa. The analysis of both tax revenue and expenditures among the provinces shows that a province is able to move to the higher level group of tax ratio when tax revenue growth exceeds expenditure growth. This analysis gives a reason for DKI Jakarta that moved to the middle tax ratio group post-decentralization. This is because the average growth of

expenditure in eleven years exceeded the average growth of the tax revenue by 256.68% (0.1268/0.0494). An interesting phenomenon is made by eight provinces whose tax revenue growth exceeds expenditure growth, but they are still in the low tax ratio group after decentralization. The only reason for this condition is that the initial value of tax revenue and its growth can not cover the value of expenditure and its growth.

Table 4. Performance of low tax ratio group provinces

Provinces	Average Growth		Percentage of b to a
	Tax Revenue (a)	Expenditure (b)	
Maluku	135.38	67.64	200.15
NTT	34.22	13.23	258.65
South East Sulawesi	31.21	13.59	229.65
Central Kalimantan	39.82	6.67	597.00
East Kalimantan	39.80	6.46	616.10
Bengkulu	33.54	13.36	251.05
North Sulawesi	18.69	14.29	130.79
NTB	23.65	5.86	403.58

Source: Author's calculation

Comparison of the tax ratio and GRDP per capita, which refers to the ability of society to pay tax among the provinces make us aware that GRDP per capita is not the reason for the condition shown by table 3. East Kalimantan is a province that has the highest GRDP per capita post-decentralization, but its tax ratio is the third lowest among the provinces. Therefore, a province which has a higher GRDP per capita does not mean the province has a higher tax ratio than the others.

Table 5. Comparison of Tax Ratio to GRDP per capita

Provinces	Average Post-Decentralization		Rank of	
	Tax Ratio (%)	GRDP (million Rp)	Tax ratio	GRDP
NAD	0.0707	9.900	26	5
North Sumatera	0.6122	6.624	6	7
West Sumatera	0.4017	6.026	14	11
Riau	0.2624	18.034	23	3
Jambi	0.3776	4.485	3	18
South Sumatera	0.3495	6.832	17	6
Bengkulu	0.1961	3.617	10	23
Lampung	0.4122	3.714	9	21
DKI Jakarta	0.4609	30.517	2	2
West Java	0.6374	5.872	11	13
Central Java	0.5473	4.150	8	20
DIY	0.4444	4.875	4	15
East Java	0.6422	6.585	13	8
West Kalimantan	0.3442	5.262	15	14
Central Kalimantan	0.1730	6.479	22	9
South Kalimantan	0.4239	6.316	5	10
East Kalimantan	0.1910	34.229	24	1
North Sulawesi	0.2177	4.666	12	16
Central Sulawesi	0.2443	4.600	16	17
South Sulawesi	0.4241	4.331	7	19
South East Sulawesi	0.1614	3.672	18	22
Bali	0.5665	5.994	1	12
NTB	0.2317	3.463	19	24
NTT	0.1499	2.267	21	26
Maluku	0.0650	2.418	20	25
Papua	0.0450	10.000	25	4

Notes:
- Tax revenue, GRDP Per capita in constant price 2000
- Tax Ratio is the average of tax ratio post-decentralization (2001 – 2005)
- GRDP per capita is the average of GRDP per capita post-decentralization (2001 – 2005)
- Source: DJPKPD and ICBS 1995 – 2005

4.3.2. Measuring Potential Tax Base

In the second step, we use all data as determinants for the regression of the model. Some determinants will be derived from the Teera model, which is GRDP per capita as a proxy of GDP per capita at the provincial level, population density, and aid/grants, share of agricultural sector, trade sector, and the share from the manufacturing sector.

Income per capita as a proxy of level of development indicates the capacity of the society to pay the tax. The increase of income per capita will increase tax capacity.

Aid/grants actually play an important role in the economic structure of provincial governments. As mentioned by Teera, empirical literature results in the conclusion that aid and grants might have a negative impact on some indicators, especially taxation revenue. Therefore, when the aid and/or grants increase, the tax revenue may decrease. This reciprocal relationship between tax revenue and aid/grants actually supports the purpose of decentralization. As we know it, the purpose of decentralization is empowering the provincial government to finance their expenditures by themselves. Therefore, provincial governments in Indonesia can not rely on the aid or grants from the central government anymore after the implementation of decentralization. In other words, to generate tax revenue, provincial governments have to reduce their dependence on aid/grants from the central government.

Population density is a characteristic of demography which influences the effort of the government in increasing tax revenue by raising the taxable sources. The increase of population density will be followed by the increase of the provincial tax base. This is because the increase of population density will increase the possibility of trade transactions and ownership of vehicles, which is the object of the provincial tax.

The economic structure is one of the factors expected to influence the level of taxation. The agricultural sector is considered to be an important feature of the economic structure comparing the other sectors. However, the role of the agricultural sector is not to support the provincial government effort in generating tax revenue. This is because the government cannot politically levy the tax on the agricultural products. Therefore, the larger the role of the agricultural sector, the less is the tax revenue. Alfirman (2003) stated that the agricultural sector affects the tax performance by its difficulties to be levied on the tax. The important characteristic of the agricultural sector is that both the tax object and the subject (tax payer) are geographically very spread out, while the potential revenue is not very promising. Therefore, the agricultural sector is estimated to have an inverse relationship to tax revenue.

The trade sector consists of both domestic trade and export imports, which are considered to affect the provincial tax base, especially PKB and PBBKB. PKB and PBBKB are kinds of tax in which their tax base results by trading vehicles and fuel.

The increasing role of trade in development will be followed by the increase of PKB and PBBKB.

The manufacturing sector is estimated to have a positive relationship with the provincial government effort in generating tax revenue. Although there is no research that states a direct relationship between the manufacturing sector and tax revenue, the increase of the manufacturing sector will increase the provincial tax base. In this case, the manufacturing sector becomes a tax subject (tax payer) for PKB, PBBKB and PABT.

We also use another variable, not used in Teera model, but considered to affect the provincial tax performance, the transportation sector. The transportation sector is estimated to influence the provincial tax performance especially PKB, BBNKB and PBBKB. The growth of the transportation sector increases public demand for vehicles, which means the increasing possibility for the provincial government to collect PKB, BBNKB and PBBKB. Unfortunately, this thesis can not explore the role of provincial debt, because of the lack of data.

The last and the most important variable regarding the Teera model is tax evasion, which reflects the existence of an underground/shadow economy. As mentioned in Chapter 2, tax evasion, a form of legal activities of the shadow economy in both monetary and non-monetary transactions, will affect the economy by reducing the tax revenue. Sometimes, the term shadow economy is also used to refer to the informal sector of a country (Hanousek and Palda, 2004). Regarding the Head of ICBS (Heriawan, 2004), the concepts and definition of the informal sector in Indonesia are not adequate. Many borderline cases around the informal sector are still being discussed. The statistics of Indonesia collects the data relating to the informal sector only, but the statistics can not measure the number of informal sectors. In other words, the shadow economy of Indonesia has never been formally measured by ICBS.

In measuring the shadow economy that refers to tax evasion, this study uses the Electricity Consumption Method introduced by Kaufmann and Kaliberda (Kaufmann and Kaliberda, 1996). By having a proxy measurement for the overall economy and subtracting this from the estimates of official GDP, Kaufmann and Kaliberda derive an estimation of unofficial GDP. In this case, Kaufmann and Kaliberda suggested that the growth of total electricity consumption is an indicator

for representing the growth of official and unofficial GDP. According to this approach, the difference between the growth rate of registered (official) GDP and the growth rate of total electricity consumption can be attributed to the growth of the shadow economy. Kaufmann and Kaliberda argued that overall (official and unofficial), economic activity and electricity consumption have been empirically observed throughout the world to move in lockstep with electricity consumption/GDP elasticity, and is usually close to one. Briefly speaking, ECM is used to measure the growth of the shadow economy and not the number of shadow economies, by the difference between growth of the overall economy and official GDP, based on electricity consumption. Again, this thesis will use GRDP as provincial GDP.

Despite being suitable for the available data, we use ECM because it is useful in estimating the change of the unofficial economic size for given dynamics in measured output and electricity consumption (Alexeev and Pyle, 2003). This method is able to provide the change of the Indonesian provinces' shadow measure year to year, at which there is no empirical study on the subject. By using this number, we can follow the growth of the shadow economy at each province and compare it among the provinces. Regarding the research of Schneider (Schneider, 2000), the ECM measure shows an average result compared to the other methods. This means that by using ECM, we had minimized the risk of over and/or under-estimated measures of the shadow economy.

As mentioned in the assumption of this study, in using ECM, we maintain an assumption of unitary elasticity which is consistent with international estimates. In this assumption, the effect of upward bias will cancel out downward bias. The effect of upward and downward bias has already been explained in Chapter 2.

Using the ECM, we need to calculate the initial number of shadow economies for the Indonesian provinces. To overcome the difficulty that there is no shadow economy measure by ICBS, we use the research of Wibowo and Sharma (2005) that states the average size of the underground economy in Indonesia was 22 percent of the GDP during the period of 1976-1999. Starting from this point, we assume that the shadow economy for each province in 1995 is 22 percent. This assumption is

important to facilitate us in analyzing the growth of the shadow economy in a province and in comparing it among the provinces over the periods.

The shadow economy measure of the provinces in Indonesia shows the increase trend before the implementation of decentralization. Since 1995, the growth significantly increased until 10%, although some provinces had a declined in growth, such as Jambi (-8.34%) and West Kalimantan (-3.05%). Generally, all provinces had an increasing shadow economy, compared to their initial number.

Table 6. Provincial Shadow Economy Pre-Decentralization

Provinces	1995	1996	1997	1998	1999	2000
NAD	22.00%	30.21%	39.30%	48.75%	46.75%	51.26%
North Sumatra	22.00%	23.40%	35.00%	48.86%	42.53%	44.08%
West Sumatra	22.00%	32.68%	46.49%	56.72%	56.45%	58.53%
Riau	22.00%	35.07%	47.75%	54.78%	55.72%	58.46%
Jambi	22.00%	13.66%	36.31%	45.43%	45.09%	47.69%
South Sumatra	22.00%	24.45%	35.26%	44.25%	41.69%	43.81%
Bengkulu	22.00%	31.11%	39.89%	50.31%	49.05%	51.25%
Lampung	22.00%	32.32%	45.67%	54.25%	53.65%	56.95%
DKI	22.00%	22.00%	30.72%	38.80%	32.22%	35.17%
West Java	22.00%	27.44%	32.06%	45.57%	48.56%	43.03%
Central Java	22.00%	22.00%	29.99%	38.35%	39.41%	44.14%
DIY	22.00%	23.92%	29.77%	37.31%	43.12%	44.66%
East Java	22.00%	24.50%	27.55%	39.79%	44.45%	46.89%
West Kalimantan	22.00%	18.95%	23.11%	34.37%	35.78%	38.26%
Central Kalimantan	22.00%	27.13%	34.28%	44.41%	47.11%	50.96%
South Kalimantan	22.00%	22.07%	19.83%	27.63%	28.18%	32.24%
East Kalimantan	22.00%	22.18%	29.04%	33.80%	34.12%	37.40%
North Sulawesi	22.00%	24.79%	30.43%	35.17%	35.51%	38.06%
Central Sulawesi	22.00%	25.24%	32.73%	41.07%	41.31%	42.07%
South Sulawesi	22.00%	30.84%	34.91%	42.41%	44.85%	46.25%
South East Sulawesi	22.00%	30.29%	40.42%	48.48%	50.58%	53.41%
Bali	22.00%	25.78%	30.37%	40.73%	42.68%	45.87%
NTB	22.00%	26.72%	35.08%	42.88%	43.93%	30.15%
NTT	22.00%	25.37%	30.24%	34.09%	34.72%	40.26%
Maluku	22.00%	24.50%	29.66%	38.53%	46.03%	24.89%
Papua	22.00%	21.55%	28.57%	23.73%	28.83%	31.61%

Source: Author's calculation

After decentralization, shadow economy of some provinces tended to decrease, such as West and East Java, all Kalimantan except East Kalimantan, all Sulawesi, Bali, and all Nusa Tenggara (NTB and NTT). Jambi reveals an interesting

phenomenon, because at the second year its shadow economy was declining but since the third year its number increased significantly.

Table 7. Provincial Shadow Economy Post-Decentralization

Provinces	2001	2002	2003	2004	2005
NAD	52.94%	35.24%	46.70%	63.09%	63.00%
North Sumatra	46.32%	46.20%	48.77%	50.49%	51.74%
West Sumatra	60.66%	60.57%	60.85%	61.70%	62.94%
Riau	69.46%	64.69%	59.93%	67.31%	68.04%
Jambi	51.63%	52.22%	54.84%	57.55%	59.63%
South Sumatra	48.12%	48.67%	49.21%	52.63%	56.01%
Bengkulu	52.85%	53.52%	54.77%	57.80%	59.91%
Lampung	60.78%	61.11%	61.76%	63.52%	65.61%
DKI	40.46%	44.76%	42.14%	46.53%	49.73%
West Java	43.32%	42.58%	39.85%	40.56%	39.22%
Central Java	50.52%	44.51%	53.76%	52.35%	53.69%
DIY	43.16%	45.52%	44.02%	48.35%	44.50%
East Java	47.11%	45.98%	43.59%	45.34%	44.74%
West Kalimantan	39.33%	38.47%	38.82%	38.41%	37.53%
Central Kalimantan	50.86%	48.44%	47.50%	52.79%	46.95%
South Kalimantan	30.64%	25.96%	32.74%	24.90%	29.36%
East Kalimantan	34.41%	32.91%	36.88%	45.25%	44.49%
North Sulawesi	40.95%	40.06%	37.19%	38.60%	37.53%
Central Sulawesi	43.32%	40.69%	41.13%	41.49%	39.91%
South Sulawesi	47.95%	45.90%	45.20%	44.48%	42.68%
South East Sulawesi	53.59%	52.80%	50.71%	49.89%	47.69%
Bali	48.32%	47.18%	45.60%	47.04%	46.97%
NTB	30.43%	27.36%	29.08%	27.59%	29.36%
NTT	40.03%	36.76%	37.38%	36.99%	39.38%
Maluku	51.10%	52.97%	52.93%	58.84%	60.46%
Papua	30.89%	40.93%	32.24%	46.50%	33.44%

Source: Author's calculation

A. Model

The purpose of this study is to estimate the effect of economic variables on the tax ratio by calculating the unobserved province specific effect. The estimation methodology of the relationship is:

$$T = f(Y, G, P, A, M, DT, XM, T, S)$$

The formulation of the regression is a linear function:

$$lnTx_{it} = \beta_0 + \beta_1 lnY_{it} - \beta_2 lnG_{it} + \beta_3 lnP_{it} - \beta_4 lnA_{it} + \beta_5 lnM_{it} + \beta_6 lnDT_{it} + \beta_7 lnXM_{it} + \beta_8 lnT_{it} - \beta_9 lnS_{it} + \alpha_{it} + \mu_{it}$$

Where: Tx_{it} is the ratio of provincial tax revenue to the expenditure of province i at time period t (to reflect the effectiveness of decentralization), Y_{it} *is* GRDP per capita of province i at time period t, G_{it} is grants/aid received by provincial government i at

time period t (that comes from the central government), P_{it} is the population density of province i at time period t, A_{it} is the agricultural sector of province i at time period t, M_{it} is the manufacturing sector of province i at time period t, DT_{it} is domestic trade sector of province i at time period t, XM_{it} is the Rupiahs value of export and import of province i at time period t, T_{it} is the transportation sector of province i at time period t, S_{it} is the shadow economy (that refers to tax evasion as percentage of GRDP of province i at time period t), u_i is the province specific unobserved heterogeneity affects of the tax ratio, and μ_{it} is the idiosyncratic error that refers to the remainder usual disturbance unobserved factors in the regression which varies at random with provinces and time. β_0 is the estimated regression coefficient of the overall parameters, while β_1 up to β_9 is the estimated regression coefficient of each parameter.

B. Hypotheses

The hypotheses to be tested in this thesis are:

a. There is a positive relationship between the growth of per capita income and growth of tax share.
b. The increase of grants from the central to provincial governments through DAU and DAK will be weakening the ability of provincial governments to generate tax revenue. The decrease of tax revenue will cause a decrease of tax share.
c. A positive relationship will result from the population density to provincial tax share.
d. The growth of the trade sector, by both domestic trade and transactions of export imports, will support the provincial governments' efforts to increase the tax share.
e. There is a positive relationship between the transportation sector and the possibility to increase the tax share.
f. An increase in the size of the manufacturing sector will increase the provincial tax share.
g. The increase in the agriculture sector is negatively related to the provincial governments' effort in generating tax share.
h. The increase in growth of the shadow economy will negatively affect tax revenue collection.

The model is estimated by applying fixed effects estimation, but for comparison purposes, the OLS and random effects estimation are also presented. OLS relies on the restrictive exogeneity assumption that the compound of error term(ε_{it}) and province specific unobserved heterogeneity (α_i) are not correlated with other explanatory variables or $E[\alpha_i + \varepsilon_{it} | G_{it}, Y_{it}, P_{it}, S_{it}, T_{it}, DT_{it}, XM_{it}, M_{it}, A_{it}] = 0$. The alternative method is to use the fixed effects model to control for province specific unobserved heterogeneity. The fixed effects estimation assumes that the error term (ε_{it}) is not correlated with other explanatory variables and the province specific unobserved heterogeneity (α_i), which is $E[\varepsilon_{it} | G_{it}, Y_{it}, P_{it}, S_{it}, T_{it}, DT_{it}, XM_{it}, M_{it}, A_{it}, \alpha_i] = 0$. The other model is a random effects model in which the unobserved province specific effect (α_i) is independent of the remainder of usual disturbances in the regression (μ_i). In addition, the explanatory variables (X_{it}) are independent of the α_i and μ_i. α_i in this model can be assumed to be random so that it can avoid too many parameters and the loss of the degrees of freedom, such as in the fixed effects model. The random effects model is the appropriate specification to use if we are drawing N individuals randomly from a large population.

C. Estimate the Result

C.1. Provincial Tax Base Pre-and Post-Decentralization

In this regression we will segregate the data in two periods: pre-decentralization (1995 – 2000) and post-decentralization (2001-2005). In order to measure tax effort index of each provinces we regress all period to get the same potential tax base

In this topic we will analyze the estimation of the regression. As comparison, the study will present three kinds of estimation by GLS cross-section weights[7], FEM

7 Eviews provides estimated generalized least squares (EGLS) when OLS is no longer efficient when the element of dependent variable have unequal variance and/or are correlated. Wooldridge (2006, p.278) stated that GLS estimators are used to account for heteroskedasticity in the errors. This study uses weighted least squares (WLS estimators) which is GLS estimators for correcting heteroskedasticity.

using EGLS cross-section weights, and REM. The estimated regression coefficient and standard error (number in the parentheses) of explanatory variables show us the relationship between independent and dependent variables.

C.1.1. Pre-Decentralization (1995 – 2000)

The result of the regression before decentralization is presented in table 8.

Table 8. Regression Estimation Pre-Decentralization

Dependent Variable (Tax Revenue/Expenditure)			
Independent Variable	**EGLS**	**FEM**	**REM**
Proxy for level of development GRDP per capita (ln Y)	0.0456 (0.0546)	-0.0676 (0.1929)	0.2330** (0.1006)
Shadow Economy/GRDP (ln S)	-0.1568** (0.0729)	-0.0064 (0.0600)	-0.0518 (0.0685)
Population density (ln P)	0.2212* (0.0270)	-0.0855 (0.0170)	0.2691* (0.0565)
Financial component of Provincial government			
Grants (ln G)	-0.5372* (0.0410)	-0.2682* (0.0292)	-0.3444* (0.0461)
Economic Sectors:			
Trade sector (ln DT)	0.3040* (0.0824)	-0.6407* (0.2323)	0.1835 (0.1390)
Export Import (ln XM)	0.0539* (0.0154)	0.0376*** (0.0215)	0.0278 (0.0203)
Manufacture sector (ln M)	0.1660* (0.0379)	0.1086** (0.0547)	0.0479 (0.0658)
Transportation sector (ln T)	-0.1954* (0.0723)	0.2076*** (0.1058)	-0.0878 (0.1074)
Agriculture sector (ln A)	-0.0247 (0.0362)	0.5278** (0.2272)	0.1302 (0.0836)
R2	0.8319	0.9518	0.5447
SE	0.3188	0.2080	0.2249
DW	1.4489	2.0423	1.5393

Note:
* Significant at level 1%
** Significant at level 5%
*** Significant at level 10%

Based on the result of Hausman test provided by E-views, the valid model is FEM. Hausman test shows that Chi square statistic of this regression is 25.7462, chi square degree of freedom is nine and p-value is significant at 1% level, which means that null hypothesis (Ho=$Cov(a_i;X_{it})=0$) can be rejected. While the null hypothesis of Hausman test is that FEM is consistent inefficient and REM is consistent efficient, we can say that FEM is better used than REM for the regression estimation pre-decentralization.

Using cross section weights that estimates a feasible GLS specification assuming the presence of cross section heteroskedasticity, the fixed effects model for the pre-decentralization regression show us that the estimated regression equation explains the variation of the tax ratio as the dependent variable well, by the goodness of fit (R^2)=0.95. All independent variables together significantly affect the tax ratio shown by the F-statistic 70.24. The regression does not have a serial correlation proven by the number of DW 2.04, that do not reject the null hypothesis that there is no positive serial correlation.

Individually, the explanatory variables significantly affect the tax ratio, except GRDP per capita, population density and the shadow economy. Grants significantly affect the tax base reciprocally at the 1% significance level, so that the increase in grants from the central government will significantly reduce the tax base by 26.82%. This condition is supporting the theory that state that the increase of grants will reduce the provincial government effort to generate tax revenue.

The transportation sector significantly affects the potential tax base at the 10% significance level, and its sign is supporting the expectation. The result shows that the increase of 1% of the transportation sector will increase the tax base by 20.76%. Domestic trade significantly affects the tax ratio at the significance level of 1% as much as 0.6407, but the sign is not supporting the expectation. This means when domestic trade in a province increases 1%, it will reduce 64.07% of its tax base. Regarding the result, export and import also affect tax base at the 10% significance level with its sign being what we expected. The theory said that with the increase of trade, both domestic trade and foreign trade (export plus import) will increase tax revenue.

Agriculture positively affects the tax ratio at 5% significance level. This means if the agricultural sector of the provinces increased, the possibility for the provincial government to receive a higher tax would be increased by 52.78%. In other words, the existence of the agricultural sector in the Indonesia province supports the provincial government in augmenting the tax revenue. Although the theory states that the increase of the agricultural sector will reduce the tax base because of its difficulty to be imposed the tax, the facts reveal that the agricultural sector supports the increase of the provincial tax base. Another sector that affects the tax base is the manufacturing sector. The manufacturing sector affects the tax base

significantly at a degree of 5% by 0.1086 and its sign is supporting the expectation. This condition supports the theory that the improvement of the strategic sectors, such as the manufacturing sector will increase the possibility of receiving higher revenue for the government.

During the pre-decentralization period, when the central government increased the number of grants, the provincial tax ratio will decrease. The increase of grants will increase the expenditure, but cannot increase the tax revenue proportionally. Therefore, the tax ratio will decrease. Lewis (2005, p.305) shows that the system of intergovernmental fiscal relations that existed before decentralization stimulated the local governments to spend as much on grants as they received. Before decentralization, local governments were under central government control. Grants were transferred to finance an activity(s) at the local government level. The budget of the activities was determined by the central government. If the local government could not spend the grants, they did not conduct the activity(s) or could not achieve the effectiveness of the grants. As a result, local governments tended to spend the budget surplus they had at the end of the fiscal year. This was true even if they will change the project or activity to the simpler project to spend the fund through ABT (Anggaran Biaya Tambahan). ABT is usually included in the revised APBD (is called Perubahan APBD/PAPBD), which is allowed to be issued three months before the end of the budget year. This contains the revising of the activity's budget (increase or decrease) and the details of the activity(s) that changed.

The other information is that the increase of all sectors in explanatory variables will increase the potential tax base. This means that the increase of transportation, manufacturing, agricultural, domestic trade, and foreign trade are able to stimulate the increase of tax revenue that exceeds the expenditure, but the influence varies among the sectors. An interesting phenomenon is presented by the result where the agricultural sector makes a positive effect in increasing the potential tax base. This result shows us that the agricultural sector was still playing an important role in the provincial economy during pre-decentralization.

On the other hand, domestic trade potentially reduced the tax base in its significant influence. The reason is that domestic trade affects expenditures more significantly than tax revenue. The trade might not relate to the provincial tax base, such as motor vehicles, fuel and water, therefore, the increase of the trade sector

cannot increase the provincial tax revenue. In addition, the increase of domestic trade might push the provincial government to spend their funds to build the infrastructure. But that expenditure cannot stimulate the increase of tax revenue, because the provincial government cannot make use of domestic trade through the provincial tax. However, we can conclude that during pre-decentralization, the provincial government was able to make use of some independent variables, such as the supporting variables, to their effort in generating tax revenue.

There are two reasons why GRDP per capita, population density and the shadow economy does not affect the potential tax base significantly. At first, those variables might not affect tax share directly. Another reason is that the specification of the fixed effect model causes the correlation between these three variables. In this way, the tax base is not significant. Compared to EGLS, these variables have positively significant effects to the tax base at the 1% significance level by 0.2212 for population density while the shadow economy negatively affects the potential tax base at the significance level of 5% by 0.1568. Estimation by EGLS means that the increase of population density of one person will increase the provincial tax base as much as 22.12%. On the other hand, the increase of the shadow economy by 1% of GRDP will decrease the provincial tax base as much as 15.68%. Such a condition is caused by the assumption that is built for FEM, which accounted for correlation between the tax base and provincial specific unobserved heterogeneity, and the correlation between them might occur by generating an inconsistent estimate.

C.1.2. Post-Decentralization (2001 – 2005)

The result of regression after decentralization is presented in table 9.

Table 9. Regression Estimation Post-decentralization

Dependent Variable (Tax Revenue/Expenditure)			
Independent Variable	**EGLS**	**FEM**	**REM**
Proxy for level of development GRDP per capita (ln Y)	0.1859* (0.0673)	2.0792* (0.2676)	0.4360* (0.1696)
Shadow Economy/GRDP (ln S)	0.2621* (0.1080)	0.4585* (0.1759)	0.3903** (0.1875)
Population density (ln P)	0.2731* (0.0389)	2.1128* (0.2993)	0.3853* (0.0773)
Financial component of Provincial government			
Grants (ln G)	-0.6661* (0.0555)	-0.1220* (0.0438)	-0.1730* (0.0705)
Economic Sectors:			
Trade sector (ln DT)	-0.2243** (0.1165)	-0.6177** (0.2835)	-0.5888* (0.2468)
Export Import (ln XM)	0.0823* (0.0160)	0.0144 (0.0323)	0.0508 (0.0350)
Manufacture sector (ln M)	0.0919* (0.0339)	-0.2076** (0.0964)	-0.3174* (0.0922)
Transportation sector (ln T)	0.5155* (0.0950)	0.6407* (0.2551)	0.9447* (0.1969)
Agriculture sector (ln A)	0.0966* (0.0349)	0.1429 (0.1177)	0.4272* (0.1056)
R2	0.8132	0.9763	0.4102
SE	0.4245	0.1770	0.2335
DW	0.6737	1.9005	0.8756

Note:
* Significant at level 1%
** Significant at level 5%
*** Significant at level 10%

The result of Hausman test presents the validity of FEM as better model than REM in this estimation. Hausman test shows that Chi square statistic of this regression is 77.9737, chi square degree of freedom is nine and p-value is significant at 1% level, which means that null hypothesis ($Ho=Cov(a_i;X_{it})=0$) can be rejected. While the null hypothesis of Hausman test is that FEM is consistent inefficient and REM is consistent efficient, we can say that FEM is better used than REM for the regression estimation post-decentralization.

Regarding the fixed effects model for the post-decentralization regression, the estimated regression equation explained the variation of the tax ratio as the dependent variable well, by the goodness of fit (R^2)=0.98. All independent variables together significantly affected the tax ratio shown by the F-statistic, 114.89. The regression does not have serial correlation proven by the number of DW 1.90 that does not reject the null hypothesis that there is no positive serial correlation (d>

du(1.65). This regression assumes the presence of cross-section heteroskedasticity by using cross-section weights in estimating GLS specification.

Individually, the explanatory variables significantly affect the tax ratio, except for the agricultural sector and foreign trade. GRDP per capita positively affected the potential tax ratio at 1% level of statistically significance, so that the increasing GRDP per capita will significantly increase the tax base by 2.0792. This condition supported the expectation that the increase of GRDP per capita, that reflects the ability of society to pay taxes, will increase the effort of the provincial government to generate tax revenue.

Grants significantly affected the tax ratio reciprocally at the 1% significance level by 0.1220, so that the increasing grants from the central government will significantly reduce the tax base. This condition supports the theory that the increase of grants will reduce the effort of the provincial government in generating tax revenue.

Population density significantly affect tax ratio in the positive relationship at the 1% significance level. The increase in number population density will increase the possibility for provincial government to receive higher tax by 2.1128. This result strengthens the theory that increasing in population density can be used to support the effort of provincial government in augmenting tax revenue.

Although the sign of shadow economy does not support the expectation, this significantly affect potential tax ratio at 1% significance level by 0.4585. This means that when shadow economy increase 1%, potential ratio of provincial tax revenue to expenditure will increase as much as 45.85%.

All sectors except agricultural sector and foreign trade (export plus import) affect provincial tax base significantly. As in pre-decentralization, transportation sector still becomes a mainstay sector for provincial government. After decentralization transportation sector affects tax base at 1% significance level. When we increase transportation sector 1%, potential tax base will increase 64.07%. Surprisingly, manufacturing and domestic trade sectors reciprocally affects potential tax base at 5% level. This means that the increase of manufacturing and domestic trade sectors as much as 5% potentially reduce expected tax base by 0.2076 and 0.6177. If we compare to the result of OLS, generally manufacturing sector affects provincial tax base insignificantly but this will be significant if the specific effect of

each province is including in the consideration. On the other hand, agricultural and foreign trade sectors do not affect potential tax base significantly after decentralization.

With goodness of fit (R^2) of over 98% and a significance of each regressor of the model, we can see that after the implementation of decentralization, provincial governments are possible to make use of more economic variables to support their effort in generating potential tax base, which include GRDP per capita and population density. But we also see that decentralization limits provincial government efforts in utilizing the sectors. The results show that after decentralization, agriculture and foreign trade does not support the provincial government effort in increasing potential tax base. In fact, before decentralization, those sectors significantly increased their provincial effort in augmenting the potential tax base. In the meantime, the provincial governments have to care about the increase of the shadow economy that affects the provincial tax base significantly at 1% level. On the other hand, the manufacturing sector reciprocally affected the potential tax base after decentralization.

C.2. The Effect of Decentralization on Provincial Tax Base

In order to evaluate the effectiveness of decentralization by comparing the provincial tax effort index before and after decentralization, this thesis will use the same potential tax base for both periods. In this matter, variables are regressed for all periods (11 years). This thesis will analyze the improvement of the tax effort index as the effect of decentralization by using the same potential tax base. The result of regression is presented in table 10.

Table 10. Regression Estimation All Periods

Dependent Variable (Tax Revenue/Expenditure)			
Independent Variable	**EGLS**	**FEM**	**REM**
Proxy for level of development GRDP per capita (ln Y)	0.2204* (0.0589)	1.0323* (0.1491)	0.6666* (0.0817)
Shadow Economy/GRDP (ln S)	-5.7705* (0.5776)	-3.6053** (1.8399)	1.4764 (1.6607)
Population density (ln P)	0.1536* (0.0184)	0.9226* (0.1473)	0.4890* (0.0528)
Financial component of Provincial government			
Grants (ln G)	-0.4993* (0.0297)	-0.5542* (0.0302)	-0.5356* (0.0393)
Economic Sectors:			
Trade sector (ln DT)	0.5342* (0.0579)	-0.2922* (0.1068)	-0.0313 (0.0961)
Export Import (ln XM)	0.0168 (0.0125)	-0.0002 (0.0203)	0.0466* (0.0176)
Manufacture sector (ln M)	-0.0183 (0.0340)	-0.0437 (0.0421)	-0.0392 (0.0455)
Transportation sector (ln T)	0.0890 (0.0542)	-0.1554** (0.0759)	-0.2744* (0.0721)
Agriculture sector (ln A)	0.0472 (0.0324)	0.4235* (0.0849)	0.4064* (0.0686)
R2	0.8234	0.9226	0.5264
SE	0.3870	0.2293	0.2445
DW	0.9010	1.8060	1.3084

Note:
* Significant at level 1%
** Significant at level 5%
*** Significant at level 10%

To select the best method in estimation this study uses Hausman test provided by Eviews. Hausman test shows that Chi square statistic of regression for all periods is 40.2692, chi square degree of freedom is nine and p-value is significant at 1% level, which means that null hypothesis ($Ho=Cov(a_i;X_{it})=0$) can be rejected. While the null hypothesis of Hausman test is that FEM is consistent inefficient and REM is consistent efficient, we can say that FEM is better used than REM for the regression estimation all periods.

In addition, FEM assumes that the expectancy of the error is not correlated with the explanatory variables and the province specific unobserved heterogeneity. This assumption enables us to capture the characteristics of each province in measuring their potential tax base. Utilizing the variables GRDP per capita, grants, population density, shadow economy, transportation, manufacture, and agriculture,

that significantly affect the provincial tax base, we get a provincial tax base as presented in table 11.

Table 11. Potential Tax Base of Provinces for All Periods

Provinces	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
NAD	0.2087	0.2065	0.1857	0.2170	0.1752	0.1759	0.1568	0.0878	0.1350	0.1035	0.0782
North Sumatera	0.3842	0.4065	0.4009	0.5752	0.6370	0.6035	0.6566	0.7241	0.7061	0.6791	0.7406
West Sumatera	0.5629	0.5407	0.5331	0.4071	0.3831	0.4518	0.4451	0.5348	0.5185	0.5036	0.5602
Riau	0.5412	0.5491	0.5348	0.3991	0.3572	0.3624	0.2803	0.3252	0.3369	0.3165	0.2838
Jambi	0.5126	0.5175	0.5031	0.4086	0.3904	0.4139	0.5162	0.5013	0.4841	0.4400	0.4454
South Sumatera	0.5565	0.5612	0.5462	0.4078	0.4353	0.4975	0.5091	0.4621	0.4692	0.4522	0.4278
Bengkulu	0.2531	0.2438	0.2285	0.1767	0.1760	0.2160	0.2254	0.2329	0.2108	0.2134	0.2266
Lampung	0.4844	0.4854	0.4628	0.3693	0.3473	0.3779	0.3930	0.4160	0.4148	0.4026	0.4006
DKI Jakarta	0.3522	0.3355	0.3307	0.2353	0.2307	0.1991	0.1952	0.2216	0.2164	0.2087	0.2188
West Java	0.4207	0.4216	0.4121	0.4591	0.4448	0.6763	0.6561	0.9425	0.5845	0.5609	0.5655
Central Java	0.2333	0.2451	0.2530	0.3737	0.3592	0.3338	0.4124	0.4862	0.4473	0.5248	0.5776
DIY	0.2757	0.3039	0.3209	0.3560	0.3369	0.3591	0.4758	0.3822	0.4162	0.3746	0.4239
East Java	0.3174	0.3503	0.3479	0.5688	0.6438	0.6479	0.5856	0.5513	0.6070	0.5870	0.6130
West Kalimantan	0.4967	0.4914	0.4931	0.3900	0.3665	0.4266	0.4737	0.4890	0.4715	0.4457	0.4740
Central Kalimantan	0.1493	0.1471	0.1498	0.1434	0.1437	0.1787	0.2111	0.2303	0.2286	0.2116	0.2291
South Kalimantan	0.4175	0.4021	0.4957	0.3413	0.3585	0.3378	0.4412	0.4706	0.5214	0.4938	0.4825
East Kalimantan	0.4372	0.4267	0.4377	0.2984	0.2941	0.3109	0.2207	0.2503	0.2442	0.2329	0.2041
North Sulawesi	0.3502	0.3356	0.3373	0.2626	0.2515	0.2421	0.3436	0.2105	0.2169	0.2156	0.2207
Central Sulawesi	0.2107	0.2081	0.2207	0.2487	0.2322	0.2523	0.3607	0.3332	0.3134	0.2998	0.3166
South Sulawesi	0.5360	0.5368	0.5182	0.3537	0.3882	0.3656	0.4827	0.5269	0.5029	0.4768	0.5867
South East Sulawesi	0.1832	0.1721	0.1691	0.1307	0.1220	0.1251	0.2016	0.1715	0.1605	0.1576	0.1655
Bali	0.7541	0.7612	0.7553	0.5937	0.6088	0.5889	0.4326	0.6572	0.6704	0.6639	0.7010
NTB	0.2885	0.2822	0.2617	0.2144	0.2007	0.1826	0.2362	0.2530	0.2494	0.2444	0.2562
NTT	0.1784	0.1731	0.1674	0.1346	0.1165	0.1312	0.1830	0.1586	0.1580	0.1506	0.1636
Maluku	0.1314	0.1320	0.1304	0.1149	0.1039	0.1293	0.1841	0.0978	0.0908	0.1167	0.0895
Papua	0.1386	0.1476	0.1437	0.1026	0.1136	0.1196	0.1119	0.0636	0.0639	0.1189	0.1332

Source: Author's calculation

The potential tax base refers to the theoretically estimated tax ratio that can be averagely achieved when provinces make use of their capacity. In this study, the potential tax base above unity refers to the condition where provincial governments are able to increase their provincial tax by exceeding their expenditure. By this model, provincial capacity is estimated by the variables that we use as determinants, which are GRDP per capita, grants, population density, the shadow economy, transportation, manufacture, trade, and the agricultural sector.

Further, there are 16 provinces which are increased and 10 provinces which are decreased in their potential tax base after decentralization. The growth of

potential tax base of each province as the effect of decentralization is shown by table 12.[8]

Table 12. Growth of Potential Tax Base as the Effect of Decentralization

	Average Growth of Pre-Decentralization	Average Growth of Post-Decentralization	Increase
NAD	-0.0263	-0.0951	-0.0689
North Sumatera	0.1068	0.0326	-0.0742
West Sumatera	-0.0339	0.0636	0.0975
Riau	-0.0711	0.0080	0.0791
Jambi	-0.0381	-0.0355	0.0026
South Sumatera	-0.0123	-0.0418	-0.0295
Bengkulu	-0.0206	0.0031	0.0236
Lampung	-0.0436	0.0053	0.0489
DKI Jakarta	-0.1014	0.0311	0.1325
West Java	0.1166	0.0061	-0.1105
Central Java	0.0901	0.0932	0.0031
DIY	0.0560	-0.0190	-0.0750
East Java	0.1740	0.0134	-0.1606
West Kalimantan	-0.0225	0.0013	0.0238
Central Kalimantan	0.0413	0.0229	-0.0184
South Kalimantan	-0.0250	0.0247	0.0497
East Kalimantan	-0.0548	-0.0150	0.0398
North Sulawesi	-0.0676	-0.0848	-0.0173
Central Sulawesi	0.0391	-0.0307	-0.0699
South Sulawesi	-0.0623	0.0562	0.1185
South East Sulawesi	-0.0694	-0.0454	0.0240
Bali	-0.0439	0.1463	0.1902
NTB	-0.0858	0.0213	0.1071
NTT	-0.0534	-0.0244	0.0290
Maluku	0.0045	-0.1220	-0.1265
Papua	-0.0176	0.1385	0.1561

Source: Author's calculation

The highest increase is performed by Bali (19.02%). It is followed by Papua (15.61%) and DKI Jakarta (13.25%). The lowest increase is performed by Jambi (0.26%) and Central Java is the second lowest in its increase by 0.31%. This means that when provinces utilize their capacity after decentralization, they will be able to increase their potential tax base. Another phenomenon is only two of five provinces in Java islands succeed in increasing their potential tax base, which are DKI Jakarta and Central Java. Three provinces are decreased in their potential tax base, which are West Java, DIY, and East Java. East Java is also the province with the largest

8 The average growth is calculated by summing up the potential tax base growth divided by 5 years for pre-decentralization and by 4 years for post-decentralization.

decrease in its potential tax base (16.06%) and it is followed by Maluku (12.65%), West Java (11.05%), and DIY (7.50%).

4.3.3. Measuring the Effect of Decentralization on Provincial Tax Effort Index

Using the potential tax base as the effect of decentralization, we measure the effect of decentralization that has been implemented since 2001, on the provincial tax effort in Indonesia. The provincial tax effort can be calculated by comparing the provincial tax ratio to potential tax base. Provincial tax effort index for all periods is presented in table 13.

Table 13. Provincial Tax Effort Index for All Periods

Provinces	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
NAD	0.5377	0.5470	0.5854	0.7020	0.6564	0.6597	0.5588	0.5982	0.4532	0.6802	1.0458
North Sumatera	0.5683	0.5421	0.5188	0.5240	0.5523	0.9393	0.6450	0.7858	0.9029	1.0604	0.9597
West Sumatera	0.5860	0.5107	0.4865	0.5382	0.6186	0.5246	0.6305	0.6899	0.7407	0.9346	0.9002
Riau	0.5578	0.5033	0.6023	0.5710	0.5955	0.7310	0.7925	0.7071	0.8352	0.9783	0.9481
Jambi	0.4834	0.4253	0.4363	0.3372	0.4806	0.6115	0.6133	0.6794	0.7623	0.9622	0.9839
South Sumatera	0.4956	0.4453	0.5095	0.4371	0.5527	0.7439	0.5100	0.6571	0.7305	0.8097	1.1112
Bengkulu	0.5078	0.4557	0.4624	0.5070	0.5131	0.4181	0.5780	0.8047	0.7977	1.1020	1.1466
Lampung	0.6163	0.5733	0.5829	0.5900	0.5950	0.4338	0.7871	0.8390	0.9509	1.1601	1.3514
DKI Jakarta	1.5129	1.4036	1.5245	2.7675	1.6761	3.5966	2.2840	1.9532	1.9589	2.2921	2.3922
West Java	0.6498	0.6706	0.7390	0.8734	0.9315	0.6751	0.7903	0.5953	1.0476	1.3048	1.3494
Central Java	0.7784	0.7477	0.7878	0.8672	0.8919	0.7895	1.1181	0.9875	1.0818	1.2030	1.1769
DIY	0.6901	0.7415	0.7778	0.7712	0.9188	0.5446	0.7884	1.1530	0.9445	1.2827	1.2564
East Java	0.8659	0.7560	0.7711	0.8198	0.8381	0.8329	1.0643	1.0012	0.9060	1.2308	1.2458
West Kalimantan	0.3181	0.3744	0.3722	0.4629	0.4705	0.4042	0.5782	0.7096	0.7473	0.8490	0.7795
Central Kalimantan	0.2810	0.3158	0.3882	0.3700	0.4041	0.3435	0.3847	0.7831	0.7116	0.9589	1.0393
South Kalimantan	0.4070	0.4641	0.4496	0.3898	0.3687	0.5869	0.5207	0.7429	0.7753	1.1453	1.1822
East Kalimantan	0.3626	0.3800	0.4116	0.3498	0.3260	0.4806	0.4797	0.6530	0.6379	0.8507	1.6260
North Sulawesi	0.4276	0.4028	0.4454	0.5106	0.4711	0.4786	0.6063	0.9113	0.9106	1.0829	1.1668
Central Sulawesi	0.2756	0.2832	0.3292	0.4838	0.6067	0.6221	0.5919	0.8053	0.7370	0.8227	0.8283
South Sulawesi	0.5988	0.6157	0.5545	0.6350	0.6532	0.3449	0.6494	0.7334	0.8646	1.0511	0.8265
South East Sulawesi	0.3380	0.3332	0.3929	0.3216	0.4383	0.5561	0.5771	0.9387	0.9492	1.1369	1.1987
Bali	0.6389	0.6136	0.5911	0.8228	0.8772	1.1130	0.6700	0.6688	0.8183	1.1533	1.1250
NTB	0.4468	0.5628	0.6047	0.5360	0.6519	0.5325	0.6573	0.8256	0.8496	1.2218	1.1079
NTT	0.4128	0.3961	0.4401	0.4046	0.4521	0.6130	0.5524	0.8089	0.8273	1.3092	1.1749
Maluku	0.5065	0.5104	0.5366	0.6824	0.6829	0.2758	0.1372	0.4099	0.6718	0.8862	1.0615
Papua	0.3785	0.3185	1.9235	0.5812	0.4282	0.2590	0.5055	0.4657	0.5738	0.4283	0.3845

Source: Author's calculation

Comparing the average tax effort index before decentralization (1995-2000) to the tax effort index after decentralization (2001-2005), we can see the effect of decentralization on the provincial tax effort index. After decentralization, the tax effort index of 21 provinces increased, while five provinces decreased in their tax effort index. Provincial tax effort index is presented in table 14.

Table 14. Average Growth of Provincial Tax Effort Index

	Average Growth of Pre-Decentralization	Average Growth of Post-Decentralization	Increase
NAD	0.0453	0.2166	0.1713
North Sumatera	0.1352	0.1117	-0.0234
West Sumatera	-0.0144	0.0982	0.1127
Riau	0.0635	0.0535	-0.0100
Jambi	0.0752	0.1287	0.0535
South Sumatera	0.1022	0.2203	0.1181
Bengkulu	-0.0329	0.2013	0.2343
Lampung	-0.0607	0.1461	0.2067
DKI Jakarta	0.3161	0.0180	-0.2982
West Java	0.0214	0.1982	0.1768
Central Java	0.0057	0.0173	0.0115
DIY	-0.0202	0.1548	0.1750
East Java	-0.0055	0.0541	0.0596
West Kalimantan	0.0581	0.0837	0.0256
Central Kalimantan	0.0497	0.3440	0.2943
South Kalimantan	0.1028	0.2449	0.1422
East Kalimantan	0.0774	0.3958	0.3184
North Sulawesi	0.0265	0.1922	0.1657
Central Sulawesi	0.1879	0.0997	-0.0882
South Sulawesi	-0.0739	0.0776	0.1514
South East Sulawesi	0.1230	0.2225	0.0995
Bali	0.1301	0.1517	0.0215
NTB	0.0507	0.1575	0.1068
NTT	0.0927	0.2417	0.1491
Maluku	-0.0530	0.7859	0.8389
Papua	0.7048	-0.0506	-0.7555

Source: Author's calculation

Decentralization succeeds in increasing the tax effort of 21 provinces in which Maluku receives the highest effect of 83.89% in its averaged growth. On the other hand, the effect of decentralization decreased the tax effort of five provinces. Papua is the province with the worst effect of decentralization (75.55% in averaged growth).

4.3.4. Measuring Provincial Tax Elasticity to Expenditure over the Period (Dynamic Approach).

The dynamic approach is used to evaluate the tax effort of the provinces over several periods. To achieve this, we compare the percentage change of tax revenue to the percentage change of the expenditure. This refers to the sensitivity and response of the tax system to the changes of the expenditure. The higher the tax elasticity, the faster the tax system responds to the change of expenditure.

Table 15. Provincial Tax Elasticity Pre-and Post-Decentralization

Provinces	Pre-Decentralization	Post-Decentralization
Nangroe Aceh Darusalam	0.85	-2.01
North Sumatera	0.54	2.95
West Sumatera	-3.49	5.82
Riau	-0.38	0.76
Jambi	1.25	1.15
South Sumatera	-1.60	0.92
Bengkulu	1.41	5.38
Lampung	1.48	4.21
DKI Jakarta	0.14	1.20
West Java	0.30	2.09
Central Java	1.58	1.28
DIY	1.44	2.14
East Java	0.97	0.65
West Kalimantan	0.31	1.12
Central Kalimantan	1.05	-8.22
South Kalimantan	1.09	1.15
East Kalimantan	2.70	-5.78
North Sulawesi	0.53	-1.17
Central Sulawesi	1.51	1.18
South Sulawesi	31.94	1.77
South East Sulawesi	9.10	-0.05
Bali	0.22	4.80
NTB	48.71	0.95
NTT	0.80	-0.97
Maluku	1.26	1.28
Papua	-3.95	-0.95

Source: Author's calculation

It is possible for the tax elasticity to be a negative number, because there were some periods in which either tax revenue or the expenditure of all provinces in Indonesia declined. Rather, when both tax revenue and expenditure declined, the tax elasticity is a positive number. Some provinces outside the Java islands showed high tax elasticity. These islands included West Sumatra (5.82), Bengkulu (5.38), and Bali (4.80). On the other hand, some provinces show low tax elasticity: Central Kalimantan (-8.22) and East Kalimantan (-5.78).

4.4 Analysis of the Result and Policy Implication

By analyzing the three stages, we can see that there are two effects of decentralization on the provincial tax performance: positive and negative effects. Decentralization affects positively the provincial tax performance if it succeeds in increasing the provincial tax performance which consists of tax ratio, potential tax base, tax effort index, and tax elasticity. On the other hand decentralization affects

the provincial tax performance negatively if it decreases tax ratio, potential tax base, tax effort index, and/or tax elasticity. After decentralization there are eight provinces which are increased in their tax ratio, potential tax base, tax effort index, and tax elasticity while 18 provinces are decreased at least in a kind of tax performances. But there is no province decreased in all tax performance.

Decentralization affects the provincial tax performance of Indonesia by four conditions. The effects are measured by average growth of each kind of tax performance. Firstly, while some provinces are increased in their tax ratio because of decentralization, the other provinces are decreased which are NAD, North Sumatra, DKI Jakarta, West Java, East Java, Central Sulawesi, and Papua. Secondly, decentralization is successful in increasing the potential tax base of provinces, except for 10 provinces. They are NAD, North Sumatra, South Sumatra, West Java, DIY, East Java, North Sulawesi, Central Sulawesi, and Maluku. Thirdly, decentralization decreases the tax effort index of five provinces, which are North Sumatra, Riau, DKI Jakarta, Central Sulawesi, and Papua. Finally, decentralization decreases tax elasticity of nine provinces, which are NAD, East Java, Central Kalimantan, East Kalimantan, North Sulawesi, South Sulawesi, South East Sulawesi, NTB, and NTT. The effects of decentralization are shown by table 16.

Table 16. Growth of Tax Performance as the Effect of Decentralization

Provinces	Growth			
	Tax Ratio	Potential Tax Base	Tax Effort Index	Tax Elasticity
NAD	-0.0077	-0.0689	0.1713	-3.6953
North Sumatera	-0.0910	-0.0742	-0.0234	2.8886
West Sumatera	0.2225	0.0975	0.1127	11.4900
Riau	0.0635	0.0791	-0.0100	1.2854
Jambi	0.0407	0.0026	0.0535	0.1727
South Sumatera	0.0566	-0.0295	0.1181	2.8994
Bengkulu	0.2754	0.0236	0.2343	5.3008
Lampung	0.2602	0.0489	0.2067	3.9591
DKI Jakarta	-0.0952	0.1325	-0.2982	1.1203
West Java	-0.0098	-0.1105	0.1768	2.2829
Central Java	0.0009	0.0031	0.0115	0.1903
DIY	0.0692	-0.0750	0.1750	1.3365
East Java	-0.1112	-0.1606	0.0596	-0.3484
West Kalimantan	0.0630	0.0238	0.0256	1.3392
Central Kalimantan	0.3013	-0.0184	0.2943	-11.3914
South Kalimantan	0.1953	0.0497	0.1422	0.2073
East Kalimantan	0.3230	0.0398	0.3184	-10.6159
North Sulawesi	0.1052	-0.0173	0.1657	-1.7987
Central Sulawesi	-0.1757	-0.0699	-0.0882	0.5531
South Sulawesi	0.2581	0.1185	0.1514	-34.3516
South East Sulawesi	0.0954	0.0240	0.0995	-14.4991
Bali	0.2295	0.1902	0.0215	5.4526
NTB	0.2127	0.1071	0.1068	-0.9026
NTT	0.1449	0.0290	0.1491	-1.8362
Maluku	0.5150	-0.1265	0.8389	0.1684
Papua	-0.6496	0.1561	-0.7555	4.0580

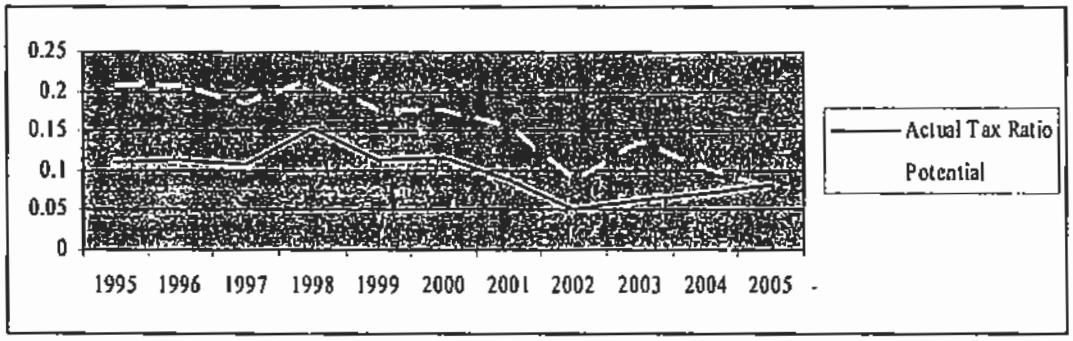
Source: Author's calculation

The tax ratios of provinces decreased after decentralization because the increase of tax revenue can not cover the increase of expenditure. They can not augment their tax effort after decentralization because of many factors: the policy of the provincial governments that does not generate tax as the source of their revenue, and/or inefficiency of the provincial government in expenditure. The provincial government might have a different policy in determining their main revenue sources other than tax, such as user charges, provincially owned companies or balancing funds. On the other hand, inefficiency often occurs during the effort to increase the provincial tax revenue. The expenditure that has to be spent in their effort in augmenting the tax revenue is more than the revenue they receive. Provincial governments conduct such an effort/activity because of their function which is not profit orientation. In this case, provincial governments can not control their expenditure.

The potential tax base of provinces is decreased after decentralization because of the limitations in utilizing their capacity. Provincial governments don't have the taxing power over the capacity in their territory and the taxing power is still under central government control. As we know, after decentralization central government transfers PABT-AP (water exploitation tax) as the new source of provincial revenue, but actually it gives insignificant revenue to the provincial government. Decentralization also provides a possibility for provinces to increase the tax rate of PKB, PBBKB, and PABT-AP by 5%, 10%, and 20%. As we know it, Law 18/1997 stated that the maximum tax rate of PKB, BBNKB, PBBKB, and PABT-AP are 5%, 10%, 5%, and 20%. Therefore, before decentralization, some provinces levied the tax rate less than stated in the Law. Law 34/2000 stated that all provinces have to levy the same rate for all provincial taxes except BBNKB. This means those provinces might increase their tax rate, and this will increase their tax revenue after implementation of Law 34/2000.

The effectiveness of decentralization in increasing the potential tax base of the provinces depends upon the financial policy or economic structure of the province. The wealthy provinces might have low potential tax base because their economic structure depends on the balancing fund, and especially the revenue sharing that comes from natural resources. The provinces will finance their expenditures by revenue sharing and not by tax revenues. As a result, the effort to utilize their capacity in order to increase the potential tax base is weak. The graphs of tax ratio and potential tax base of two provinces abundant in natural resources are presented in figure 14 and figure 15.

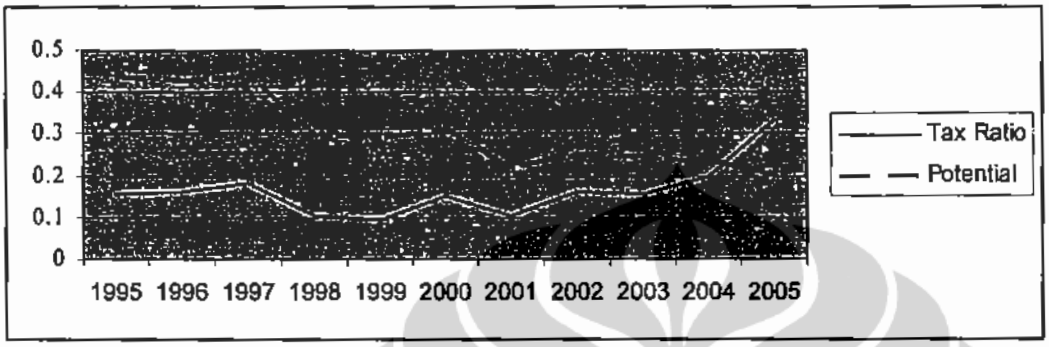
Figure 14. Tax Ratio and Potential Tax Base of NAD



Source : Author's calculation

Before 2002, the trend of potential tax base of NAD is similar to the trend of tax ratio. Since 2003 potential tax base of NAD tends to decrease while tax ratio tends to increase. But the decrease of potential tax base is greater than the increase of tax ratio.

Figure 15. Tax Ratio and Potential Tax Base of East Kalimantan



Source : Author's calculation

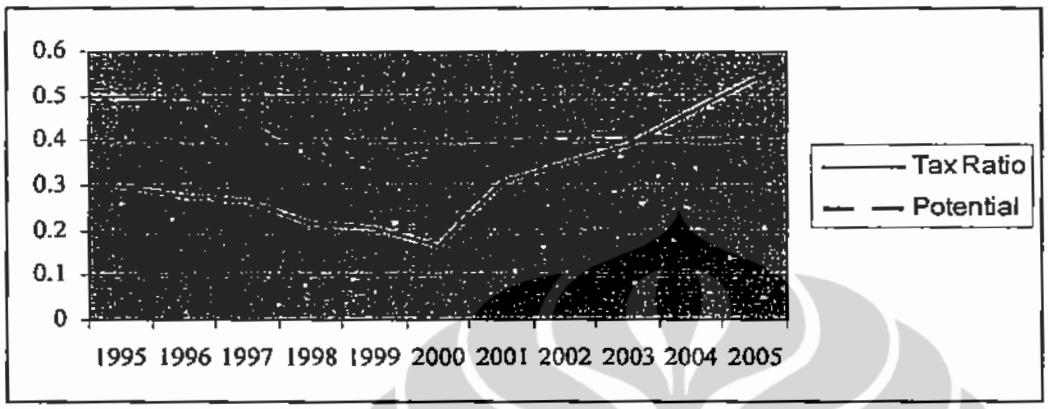
After the implementation of decentralization in 2001, potential tax base of East Kalimantan tends to be constant and slightly decreases after 2004. The trend is contrary to tax ratio which tends to increase after 2001.

The other provinces tend to rely on DAU in its financial structure. The allocation of DAU itself is still fully influenced by political factors. For instance, the use of the hold-harmless provision in DAU allocation guarantees that every local government receives grants not less than the previous year allocation. Brodjonegoro and Vazquez (2002) revealed a negative effect of the hold harmless provision that could not only work against the objective of equalization, but also introduce an incentive for local governments (provinces and districts/municipalities) to hire more employees and spend more on wages and salaries.

In both periods (pre-and post-decentralization), grants are significantly affected the potential tax base. In some provinces, grants are transferred because of historic reasons. With hold harmless provisions, they rely on the balancing fund to finance their expenditure. As a result, their efforts to augment tax revenue become less, while the expenditure increases. Another reason is that some provinces tend to spend their revenue more than in the previous year to get greater grants from the central government. To overcome those effects central government needs to reduce the amount of grants gradually.

The graphs of tax ratio and potential tax base of some provinces of different islands which are not abundant in natural resources and have different financial policy are presented in figure 16 - 23.

Figure 16. Tax Ratio and Potential Tax Base Lampung

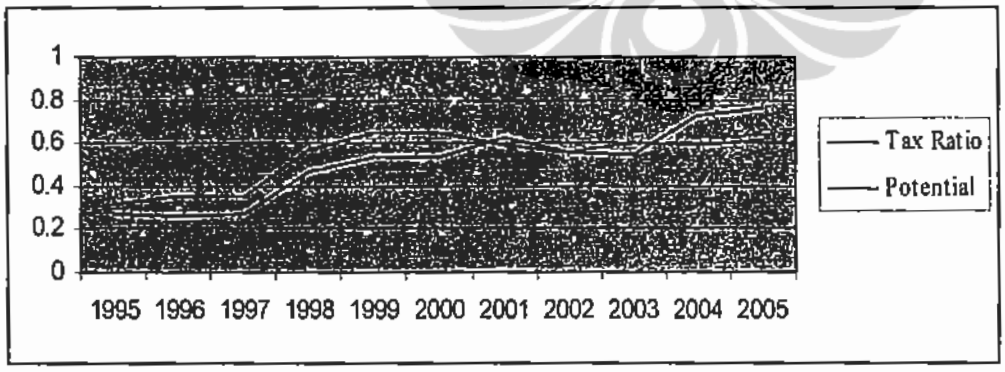


Source : Author's calculation

Potential tax base of Lampung tends to be constant after decentralization but the tax ratio tends to increase significantly. The condition of Lampung represents the conditions of other provinces in Sumatra Islands, except for North Sumatra and West Sumatra which are increased in their potential tax base.

The constancy of potential tax base also happens to East Java, DKI Jakarta, and West Java, while potential tax base of Central Java and DIY tends to increase. The graph of potential tax base of East Java is presented in figure 17.

Figure 17. Tax Ratio and Potential Tax Base East Java

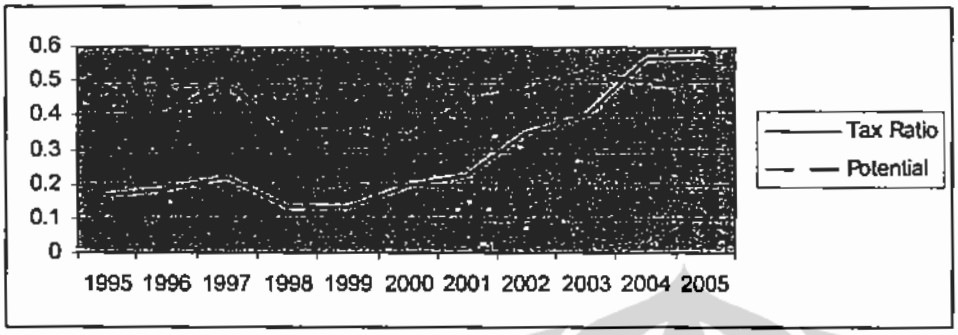


Source : Author's calculation

Figure 18 shows us that after decentralization potential tax base of South Kalimantan increase for three years and after 2003 it tends to be constant. Such

condition also happens in West Kalimantan. In Central Kalimantan potential tax base tends to increase along with the trend of tax ratio.

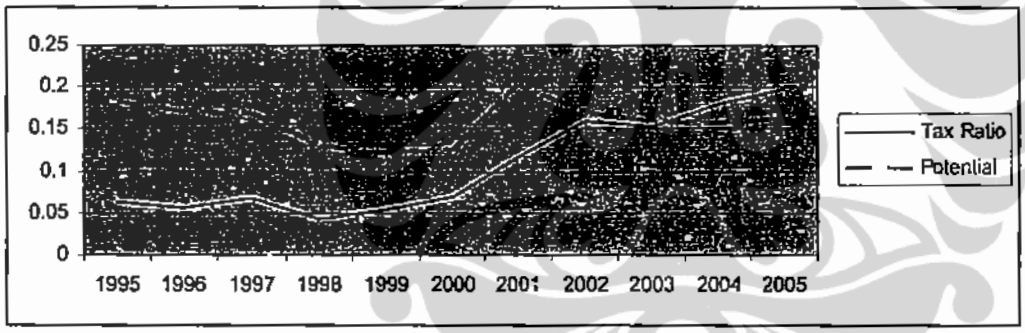
Figure 18. Tax Ratio and Potential Tax Base South Kalimantan



Source : Author's calculation

Potential tax base of three provinces in Sulawesi Islands tends to decrease after decentralization and to be constant after 2003. On the other hand, the trend of tax ratio of South East Sulawesi tends to increase.

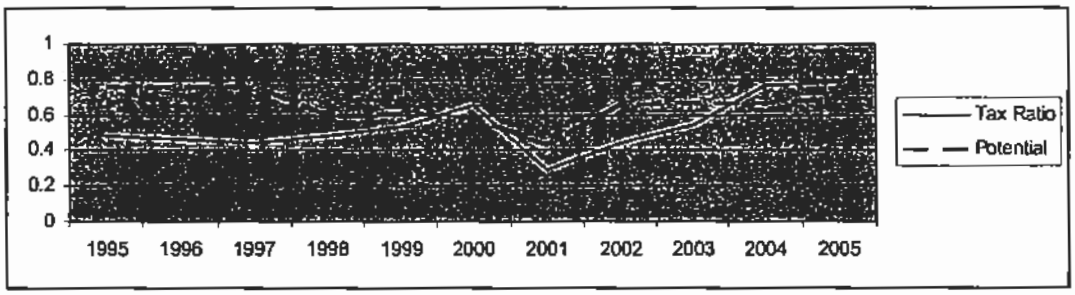
Figure 19. Tax Ratio and Potential Tax Base South East Sulawesi



Source : Author's calculation

Potential tax base of Bali, NTB, and NTT slightly increases after decentralization. The trend of tax ratio of Bali and NTT tends to be constant while the trend of tax ratio of NTB tends to decrease. The graph of potential tax base of Bali is presented in figure 20.

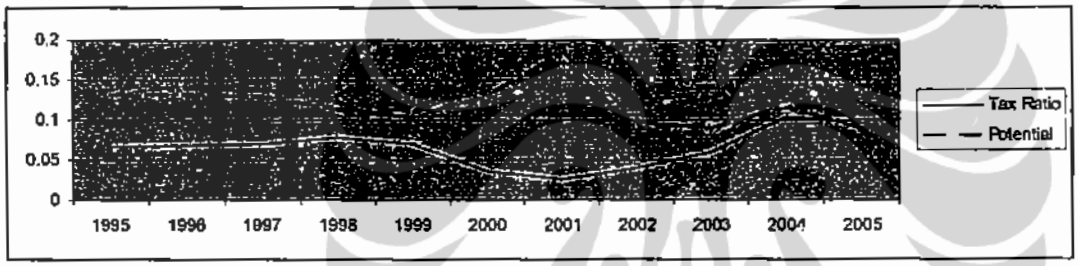
Figure 20. Tax Ratio and Potential Tax Base Bali



Source : Author's calculation

Potential tax base of Maluku tends to increase in 2003 to 2004 but tends to decrease starts from 2004. Meanwhile, its tax ratio tends to be constant after 2004. Before 2004, its tax ratio tends to increase.

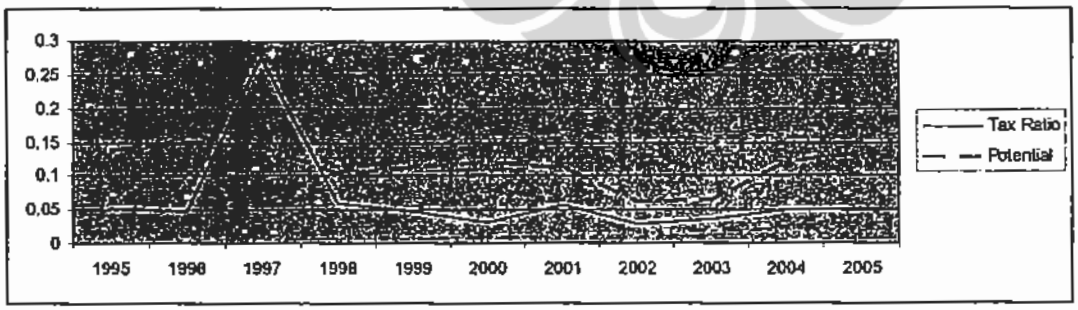
Figure 21. Tax Ratio and Potential Tax Base Maluku



Source : Author's calculation

On the contrary, in 2001 potential tax base of Papua decrease but start from 2003 it slightly increases. Meanwhile, its tax ratio tends to be constant in 2004.

Figure 22. Tax Ratio and Potential Tax Base Papua



Source : Author's calculation

Graphically, we can see that after decentralization the potential tax base of provinces in Indonesia increase slightly, constant, or even decrease. The taxing power that is not transferred to the provincial governments and the financial policy of provincial governments are the reasons for those phenomena. On the other hand,

provinces generally try to generate their tax revenue. Those conditions affect the provincial tax effort index in the short term and long term in different ways.

As we know, there are three conditions for potential tax base and tax ratio; increase, constant, and decrease. The combinations of those three conditions between potential tax base and tax ratio will affect the tax effort index of each province. The tax effort index will increase if the tax ratio and the potential tax base increase but the increase of potential tax base is less than the increase of tax ratio, if the tax ratio increases but the potential tax base is constant, or if the tax ratio increases but the potential tax base decreases. On the contrary, the tax effort index will decrease if the tax ratio and the potential tax base increase but the increase of potential tax base is more than the increase of tax ratio, if the tax ratio is constant but the potential tax base increases, or if the tax ratio decreases but the potential tax base increases.

The measure of averagely growth of the tax effort index shows us that provincial governments, except North Sumatra, Riau, DKI Jakarta, Central Sulawesi, and Papua, increased their tax effort index after decentralization. But the increases averaged below unity, which means that the tax effort index of provinces are still below the average performance. The decreased or constant potential tax base of provinces will limit the effort of provincial governments in augmenting their tax revenue while the expenditure still increases. This is because they may face the maximum point where they cannot make use of their tax base anymore. As a result, their tax effort index in the long term will decrease and the effectiveness of decentralization cannot be achieved.

After decentralization, the tax elasticity of all provincial governments increases, except for nine provinces. The increase of tax elasticity means that after decentralization, the tax policy is more responsive to the change in expenditure. The irresponsiveness of some provinces to the change of the expenditure is affected by following factors. Despite the policy of the provincial government not to use taxes as a source of their revenue, these provinces are not responsive to the changes of expenditures because they are not able to control their expenditures. One possibility to support this fact is the lack of skilled personal systems in the provinces. Another possibility is the poor budget arrangement system or no control over budget arrangement system. As a result, the next year budget of the province is arranged by adding a certain amount of Rupiahs to the current budget. For example, if the current

budget for activity A is Rp 25 million and it is decided that the increase of the budget is 10%, next year budget for activity A is Rp 27.5 million. The decision to decide on the budget increase usually is based on the routine.

CHAPTER 5
CONCLUDING REMARKS AND RECOMMENDATIONS

5.1. Concluding Remarks

From the analysis carried out in this paper, it is clear that Indonesia is making attempts to meet the effectiveness of decentralization. The effectiveness of decentralization was determined by the effort of provincial government to finance their expenditure through their tax revenue. In this study decentralization is effective when the tax performance of provincial government increase.

This study has proven that the average ratio of provincial tax to expenditures increases after the implementation of decentralization. This means that the effort of provincial governments to finance their expenditures using tax revenue increases.

This study used a modified Teera model to measure estimated potential tax base of provinces. The modified Teera model revealed to us that decentralization increases the potential tax base in some provinces, but the increase is less than the increase of tax ratio. Some other provinces have constant potential tax base while the tax ratio increases. The modified Teera model also revealed that potential tax base of some provinces decreased while their tax ratio is constant or increasing. The estimated potential tax base of provinces decreases, constant, or slightly increases because the provincial government do not have the taxing power to make use of their capacity. The taxing power is still controlled by the central government. For instance, provincial governments do not have the taxing power on manufacturing sector while they have to develop the infrastructure of the sector. In this case, manufacturing sector is the source for the central government tax revenue such as corporate and personal income taxes.

This study also has proven that all provinces were able to improve their tax effort index after decentralization. The tax effort indexes of some provinces are above the unity. It means that the effort of the provincial government in augmenting its tax revenue above the average performance. On the other hand, this also means that the provincial government may face the limitation in utilizing its tax.

In the future tax performance, the tax elasticity analysis shows that after decentralization provinces is more elastic in their tax revenue to anticipate the change of expenditure. The higher the tax elasticity of a province, the faster is the province to increase its tax ratio.

However, we also learn from this study that policy through decentralization is not necessarily successful in all provinces. There are seven provinces that did not increase their averagely growth of tax ratio: NAD, North Sumatra, DKI Jakarta, West Java, East Java, Central Sulawesi, and Papua. This study measured the estimated potential tax base by using the model in a given capacity that refer to the economic structure, social politics, and other factors of provincial specific conditions. The potential tax base of the provinces is not significantly increased after decentralization. Ten provinces are decreased in their average growth of potential tax base, which are NAD, North Sumatra, South Sumatra, West Java, DIY, East Java, Central Kalimantan, North Sulawesi, Central Sulawesi, and Maluku. Five provinces cannot increase their tax effort index, North Sumatra, Riau, DKI Jakarta, Central Sulawesi, and Papua. Tax elasticity of 12 provinces decreased after decentralization which reflected their irresponsiveness to the change of expenditure and social and political structure.

However, the effectiveness of decentralization is determined by the tax policy of each provincial government. Decentralization will be successful if the provincial government policy reflected by their financial structure focused on taxes as the main source of their revenue. Otherwise, the provincial governments could not support the purpose of the decentralization.

Some hindrances or obstacles to realize the effectiveness of decentralization include that each province has different conditions in their economy and its supporting factors, such as GRDP per capita, population density (including its quality and quantity), culture, and natural resources. Those factors affect the provincial government policy in augmenting their revenue and managing their expenditures.

5.2. Recommendations

Reviewing the theory and considering the features of decentralization in Indonesia, the author considers the better way to augment the provincial tax performance involved in both the central government and the provincial

governments. However, the central government must be aware of the conditions of each province so as to implement a new policy related to decentralization.

Provincial governments must utilize the existing tax rate and tax base, and also optimize tax collection. Using a modified Teera model, this study has proven that the short term problem of some of the provinces in the tax performance are not on the limited potential tax base, but on the limited effort to increase the tax revenue over the increase of the expenditure. In the case of the five provinces which are decreased in their tax effort index after decentralization, we find that their tax ratio cannot increase as much as the increase of their potential tax base.

Secondly, the provincial governments have to minimize inefficiency in their expenditures. The composition of the tax ratio consists of tax revenue and expenditures. In order to increase the tax ratio, the provincial governments might reduce their expenditure through the efficiency or the schedule of priority.

Thirdly, provincial governments must utilize their capacities that potentially support their efforts in increasing tax performance. The capacities are income per capita, transportation sector, and population density. The provincial governments also have to minimize the deficiency of using capacities which potentially reduce their effort in increasing tax revenue, which come from grants, the manufacturing sector, and domestic trade. Meanwhile, the provincial government should care about the shadow economy, which significantly affects the potential tax share after decentralization.

On the other hand, the central government needs to evaluate the existing, and/or establish a better system of, intergovernmental finance, which is now conducted through the balancing fund. By the improvement in the system of intergovernmental finance, provincial governments will not depend on the balancing fund from the central government. Therefore, the provincial governments accomplish the purpose of decentralization in financial responsibility.

Secondly, the central government in the long term has to transfer a greater taxing power to the provincial governments by increasing the tax base and/or increasing the tax rate. The central government might increase the provincial tax base by transferring the taxing power on sectors which are potentially increasing the tax revenue according to the model of this study, such as the manufacturing and domestic trade sectors. Such taxes should ideally generate sufficient revenues,

largely burden local beneficiaries, be sufficiently stable over time, and have a base that is not too unequally distributed across the provinces. The increase of the provincial tax base will support the sustainability of the provincial tax performance. On the other hand, the limitation on potential tax base will limit the provincial government effort to generate the tax revenue.

5.3 Limitation of the Study and Areas for Further Research

Even after the analysis of the tax performance was applied on the real situation, there would be some questions left. Some consequences might arise because of the assumptions we built for this study to simplify the phenomena among the provinces in Indonesia. Some critical points must be made aware of before applying the result of the analysis and policy implications.

The model specification contains some deficiencies especially in choice of dependent and independent variables. The modified Teera model used in this study tries to compromise between the Teera model and the real condition of provincial tax. While Teera model tried to capture the effect of some variables to the tax performance of the countries, this study tries to capture the effect of factors that affect provincial tax performance. The different level of the implementation of the model will result in different effect.

The modified Teera model used in this thesis is sensitive in its estimation, but still unbiased, for the possibility of multicollinearity in the regression. The model is also sensitive for the possibility of heteroskedasticity because of the pattern of the data. Some effort had been performed to minimize its effect, including the use of the logarithm form for the dependent and explanatory variables, modification of the explanatory variables (for instance, we use the real Rupiah value of transportation instead of transportation share), and using fixed effects as the best method in analyzing the results of the regression, based on the Hausman test,. The analysis of the regression assumes the presence of cross-section heteroskedasticity by using cross section weights.

Because of limitation in collecting provincial GDP deflator data, we use the GDP deflator for Indonesia (national level) to get the constant value. This number is created by assuming that inflation among the provinces in Indonesia is similar or even in the same level of inflation. The measure will be more accurate for future

studies to use the provincial GDP Deflator, because the data will exclude the effect of inflation for each province.

The number of provinces in Indonesia pre-and post-decentralization is not the same. Some new provinces are established by splitting from their existing provinces. We treat that condition by adding the variables from the new province to the province which they split from.

There are some issues in implementing the Teera model for the regional level. In order to evaluate the effectiveness of decentralization, we use expenditures as the denominator of tax revenue for the dependent variable. Therefore, we eliminate expenditures from the explanatory variables. In this study, we don't use debt data, as in the Teera model, because of the lack of provincial debt data. Instead, we use the transportation and domestic trade sectors. We suggested they will affect the provincial tax performance.

This thesis also modifies the Teera model by using a different method in the resulting shadow economy. We don't use the monetary method because of the absence of the provincial data in the money supply. The reason is that the monetary policy in Indonesia is still centralized. We use the electricity consumption method (ECM), which was introduced by Kauffman and Kaliberda for measuring the shadow economy variable. Despite the availability of the data, this method is used because it fulfills the purpose of this study, to capture the growth of Indonesia shadow economy especially at provincial level. In measuring shadow economy, we use the research of Wibowo and Sharma (2005) as the initial size of shadow economy of all provinces to solve the unavailability of provincial shadow economy. However, we are not able to compare the measurements using ECM, so we are also not able to assess the validity of the measurements in the real situation.

This would be worthwhile for further research to improve this study by gathering a larger dataset and valid variables in longer periods which enables us to make a better modification of the original Teera model. This is necessary for further examination of the significance of each variable by adding the kinds of variables and the data. This is also necessary to try a case study for a selected province to study the implication of this model further and to improve upon it. A better model might produce a better result. It is also better for future research studies to evaluate the effectiveness of decentralization at the district/municipal level, because the

district/municipal level is the real goal of Indonesia decentralization. Finally, we hope that the findings of this study assist policy makers and enrich the literature on efforts to increase the provincial tax performance in Indonesia.

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Appendix A : Variables Descriptions

Tax Revenue	Logarithm form of annually provincial tax revenue Tax revenue consists of provincial revenue that comes from PKB, BBNKB, PBBKB, and PABT-AP (in million Rupiah).
Expenditure	Logarithm form of annually provincial expenditure Expenditure consists of routine/belanja rutin and project expenditure/belanja pembangunan (in million Rupiah)
GRDP Per Capita	Logarithm form of annually provincial GRDP per number population
Grants	Logarithm form of annually provincial grants per population Grants consist of provincial revenue that comes from central government through revenue sharing/*Bagian bagi hasil pajak dan bukan pajak*, *pos Subsidi Daerah Otonom*/SDO and *sumbangan dan bantuan* (in million Rupiah). The terms of revenue sharing are changed into Balancing Fund/*Dana Perimbangan* in 2001.
Population Density	Logarithm form of annually population per area annually
Shadow Economy	Logarithm form percentage of unofficial activities to GRDP annually
Transportation Sector	Logarithm form of rupiah value of transportation sector annually
Manufacturing Sector	Logarithm form of rupiah value of manufacturing sector annually
Agricultural Sector	Logarithm form of rupiah value of agricultural sector annually
Domestic Trade Sector	Logarithm form of rupiah value of annually domestic trade
Export and Import	Logarithm form of rupiah value of annually provincial export to foreign countries and import from foreign countries

Appendix B : Descriptive Statistics of Tax Ratio (Tax Revenue/Expenditure)

Provinces	Mean	Standard Deviation	Maximum	Minimum
Bali	0.3846	0.2316	0.5914	-0.2340
Bengkulu	-0.9590	0.2784	-0.6455	-1.4829
DIY	-0.1156	0.2634	0.1893	-0.7106
DKI Jakarta	0.3446	0.2429	0.6727	0.0506
West Java	0.2567	0.1997	0.4795	-0.0643
Jambi	-0.2640	0.2508	-0.0269	-0.8805
Central Java	-0.0212	0.3333	0.3282	-0.4733
East Java	0.2970	0.2462	0.6017	-0.0819
West Kalimantan	-0.3969	0.2455	-0.0499	-0.8363
East Kalimantan	-0.8236	0.2881	-0.4004	-1.2413
South Kalimantan	-0.3376	0.3916	0.2181	-0.9156
Central Kalimantan	-1.3881	0.5046	-0.7041	-1.9385
Lampung	-0.1617	0.2920	0.0887	-0.8870
Maluku	-1.7679	0.4553	-1.4193	-2.6742
NAD	-1.3324	0.4511	-0.7801	-1.9375
NTB	-0.7500	0.2861	-0.4203	-1.4090
NTT	-1.3150	0.3177	-0.8360	-1.8087
Papua	-2.0140	0.3737	-1.4120	-2.5533
Riau	-0.2945	0.2336	0.1009	-0.6104
South East Sulawesi	-1.3502	0.4231	-0.8176	-2.0679
South Sulawesi	-0.1205	0.3787	0.1711	-1.1496
Central Sulawesi	-0.8938	0.4486	-0.3068	-1.6138
North Sulawesi	-0.7534	0.1932	-0.5642	-1.2340
West Sumatra	-0.1224	0.2068	0.1234	-0.5183
South Sumatra	-0.1816	0.1736	-0.0411	-0.6233
North Sumatra	0.1365	0.3229	0.5199	-0.3363

Appendix C : Descriptive Statistics of GRDP per Capita

Provinces	Mean	Standard Deviation	Maximum	Minimum
Bali	-0.2017	0.0441	-0.1276	-0.2593
Bengkulu	-0.7541	0.0569	-0.6397	-0.8245
DIY	-0.4092	0.0254	-0.3560	-0.4438
DKI Jakarta	1.5004	0.1587	1.9373	1.3084
West Java	-0.2154	0.0525	-0.1383	-0.3071
Jambi	-0.5771	0.0945	-0.4652	-0.6998
Central Java	-0.5864	0.0256	-0.5414	-0.6190
East Java	-0.1156	0.0225	-0.0806	-0.1542
West Kalimantan	-0.3487	0.0531	-0.2561	-0.4283
East Kalimantan	1.5084	0.0719	1.6159	1.4047
South Kalimantan	0.0565	0.2365	0.3532	-0.1612
Central Kalimantan	-0.3661	0.2828	-0.0409	-0.7077
Lampung	-0.7187	0.0774	-0.6284	-0.8601
Maluku	-0.8053	0.7406	1.4036	-1.1580
NAD	0.4139	0.1512	0.6165	0.1017
NTB	-0.9041	0.1772	-0.6966	-1.1303
NTT	-1.2107	0.0582	-1.1436	-1.3038
Papua	0.3225	0.1081	0.4754	0.1437
Riau	1.0038	0.1118	1.1391	0.8315
South East Sulawesi	-0.7292	0.0438	-0.6479	-0.7880
South Sulawesi	-0.5730	0.0557	-0.5112	-0.6544
Central Sulawesi	-0.5115	0.0536	-0.4332	-0.5853
North Sulawesi	-0.4974	0.0756	-0.4100	-0.6236
West Sumatra	-0.2593	0.0738	-0.1656	-0.3560
South Sumatra	-0.1176	0.0566	-0.0289	-0.1935
North Sumatra	-0.1320	0.0351	-0.0894	-0.1860

Appendix D : Descriptive Statistics of Grants

Provinces	Mean	Standard Deviation	Maximum	Minimum
Bali	-4.4296	0.3017	-3.6759	-4.7620
Bengkulu	-4.4738	0.1869	-4.1397	-4.6691
DIY	-4.1754	0.2962	-3.6621	-4.6837
DKI Jakarta	-1.6736	0.3611	-1.3583	-2.2791
West Java	-2.3904	0.2949	-1.8843	-2.6561
Jambi	-4.2413	0.1904	-3.9908	-4.4844
Central Java	-2.6477	0.5641	-1.8503	-3.4022
East Java	-2.8036	0.6064	-1.8247	-3.3064
West Kalimantan	-4.0691	0.1891	-3.6795	-4.2409
East Kalimantan	-2.8731	0.5876	-2.1610	-3.7099
South Kalimantan	-3.9585	0.2716	-3.5520	-4.2915
Central Kalimantan	-3.8280	0.3001	-3.5230	-4.2057
Lampung	-4.0078	0.2117	-3.7422	-4.3445
Maluku	-4.1013	0.3817	-3.6925	-5.0317
NAD	-3.2789	0.4726	-2.4136	-3.7883
NTB	-4.2094	0.2568	-3.6707	-4.5366
NTT	-4.1476	0.2361	-3.6839	-4.4458
Papua	-3.0446	0.4784	-2.1873	-3.5672
Riau	-3.1281	0.5001	-2.4804	-3.8485
South East Sulawesi	-4.3349	0.2840	-3.8918	-4.8004
South Sulawesi	-3.7909	0.2712	-3.3240	-4.0807
Central Sulawesi	-4.0647	0.3493	-3.6373	-4.6024
North Sulawesi	-4.0522	0.3133	-3.7428	-4.6402
West Sumatra	-4.1730	0.2306	-3.7598	-4.4533
South Sumatra	-3.5007	0.2670	-3.1546	-3.8973
North Sumatra	-3.3253	0.4648	-2.6187	-3.8449

Appendix E : Descriptive Statistics of Population Density

Provinces	Mean	Standard Deviation	Maximum	Minimum
Bali	6.3049	0.0533	6.3967	6.2446
Bengkulu	4.3516	0.0535	4.4174	4.2624
DIY	6.8611	0.0472	6.9365	6.8145
DKI Jakarta	9.3815	0.1761	9.5732	8.8927
West Java	6.8690	0.1078	7.0115	6.6836
Jambi	3.9091	0.0427	3.9743	3.8521
Central Java	6.8416	0.0257	6.8777	6.8051
East Java	6.6082	0.0149	6.6319	6.5827
West Kalimantan	3.2804	0.0605	3.3856	3.2006
East Kalimantan	2.4935	0.0595	2.5839	2.3966
South Kalimantan	4.1125	0.3026	4.4239	3.7413
Central Kalimantan	2.7321	0.2440	3.0185	2.4261
Lampung	5.2936	0.0656	5.4676	5.2350
Maluku	2.9972	0.6619	3.2789	1.0082
NAD	4.2828	0.0229	4.3259	4.2417
NTB	5.2712	0.0581	5.3748	5.1993
NTT	4.3925	0.0438	4.4672	4.3258
Papua	1.6824	0.0887	1.8288	1.5520
Riau	3.8204	0.1449	4.0812	3.6721
South East Sulawesi	3.8513	0.0842	4.0017	3.7327
South Sulawesi	4.8526	0.0362	4.9129	4.7988
Central Sulawesi	3.4492	0.0667	3.5649	3.3543
North Sulawesi	4.6185	0.0405	4.6889	4.5611
West Sumatra	4.6038	0.0264	4.6438	4.5656
South Sumatra	4.2176	0.0308	4.2670	4.1560
North Sumatra	5.0995	0.0333	5.1613	5.0504

Appendix F: Descriptive Statistics of Shadow Economy

Provinces	Mean	Standard Deviation	Maximum	Minimum
Bali	0.0126	0.0007	0.0135	0.0114
Bengkulu	0.0042	0.0003	0.0046	0.0035
DIY	0.0097	0.0005	0.0103	0.0090
DKI Jakarta	0.1615	0.0173	0.1832	0.1300
West Java	0.1665	0.0111	0.1813	0.1462
Jambi	0.0076	0.0016	0.0092	0.0035
Central Java	0.0862	0.0084	0.1002	0.0746
East Java	0.1507	0.0088	0.1613	0.1376
West Kalimantan	0.0116	0.0011	0.0128	0.0096
East Kalimantan	0.0493	0.0031	0.0536	0.0443
South Kalimantan	0.0086	0.0014	0.0116	0.0066
Central Kalimantan	0.0087	0.0005	0.0094	0.0077
Lampung	0.0222	0.0021	0.0240	0.0164
Maluku	0.0040	0.0008	0.0048	0.0019
NAD	0.0345	0.0066	0.0433	0.0229
NTB	0.0063	0.0007	0.0074	0.0054
NTT	0.0049	0.0003	0.0053	0.0045
Papua	0.0119	0.0009	0.0132	0.0101
Riau	0.0866	0.0081	0.0933	0.0652
South East Sulawesi	0.0049	0.0003	0.0052	0.0040
South Sulawesi	0.0230	0.0015	0.0257	0.0207
Central Sulawesi	0.0060	0.0002	0.0063	0.0057
North Sulawesi	0.0074	0.0004	0.0080	0.0068
West Sumatra	0.0220	0.0020	0.0234	0.0162
South Sumatra	0.0358	0.0025	0.0397	0.0313
North Sumatra	0.0530	0.0034	0.0591	0.0462

Appendix G : Descriptive Statistics of Transportation Sector

Provinces	Mean	Standard Deviation	Maximum	Minimum
Bali	-3.9590	0.1262	-3.8030	-4.1443
Bengkulu	-5.3054	0.5053	-4.8525	-6.5552
DIY	-4.2755	0.1195	-4.0934	-4.4130
DKI Jakarta	-1.7026	0.1529	-1.4922	-1.8830
West Java	-1.6329	0.4280	-1.1882	-2.1405
Jambi	-4.7789	0.0935	-4.6491	-4.9060
Central Java	-2.9729	0.0906	-2.8351	-3.1217
East Java	-2.0440	0.1534	-1.8418	-2.2531
West Kalimantan	-4.1659	0.2049	-3.8961	-4.4569
East Kalimantan	-2.9416	0.5498	-2.1012	-3.5223
South Kalimantan	-4.1473	0.0793	-4.0161	-4.2566
Central Kalimantan	-4.5635	0.2406	-4.2070	-4.8874
Lampung	-4.1346	0.2222	-3.6081	-4.3713
Maluku	-5.2869	0.2971	-4.9443	-5.6638
NAD	-3.7438	0.5472	-2.8611	-4.4172
NTB	-4.6986	0.1112	-4.5095	-4.8265
NTT	-5.0886	0.2292	-4.7996	-5.3594
Papua	-4.6008	0.5239	-3.8633	-5.0969
Riau	-3.4475	0.3802	-2.8997	-3.8359
South East Sulawesi	-5.3725	0.1171	-5.1629	-5.4765
South Sulawesi	-3.8570	0.1343	-3.5314	-4.0745
Central Sulawesi	-5.0333	0.1247	-4.8512	-5.1780
North Sulawesi	-3.9482	0.2902	-3.5717	-4.4398
West Sumatra	-3.6231	0.0780	-3.5413	-3.8072
South Sumatra	-3.5518	0.2595	-2.9590	-3.8259
North Sumatra	-2.9309	0.0889	-2.7865	-3.1098

Appendix H : Descriptive Statistics of Manufacturing Sector

Provinces	Mean	Standard Deviation	Maximum	Minimum
Bali	-5.6286	0.1652	-5.3897	-5.8099
Bengkulu	-7.4774	0.5169	-6.0896	-7.8715
DIY	-5.3704	0.1956	-5.1316	-5.6061
DKI Jakarta	-2.2024	0.3417	-1.7961	-2.5834
West Java	-1.0927	0.3488	-0.7246	-1.4793
Jambi	-5.5917	0.2978	-5.2580	-5.9376
Central Java	-2.4519	0.2135	-2.2098	-2.6912
East Java	-1.9667	0.2597	-1.6442	-2.2522
West Kalimantan	-4.7080	0.1932	-4.4677	-4.9891
East Kalimantan	-2.7660	0.1934	-2.4753	-3.1210
South Kalimantan	-4.9456	0.3669	-4.5205	-5.4305
Central Kalimantan	-5.9887	0.3060	-5.5042	-6.2969
Lampung	-4.9502	0.4483	-4.4575	-6.0480
Maluku	-6.1975	0.5650	-5.5931	-7.5651
NAD	-3.8388	0.5433	-3.1822	-4.7353
NTB	-6.7811	0.1312	-6.5768	-6.9295
NTT	-7.8911	0.3954	-7.4329	-8.3486
Papua	-5.8430	0.6112	-5.0165	-6.8409
Riau	-2.9928	0.8158	-2.0683	-4.3795
South East Sulawesi	-6.7813	0.1994	-6.5459	-7.0537
South Sulawesi	-4.6503	0.1991	-4.3665	-4.9123
Central Sulawesi	-6.4635	0.2357	-6.1709	-6.7582
North Sulawesi	-5.6037	0.2193	-5.2754	-5.9031
West Sumatra	-4.8181	0.2982	-4.4787	-5.1711
South Sumatra	-3.4370	0.1808	-3.1948	-3.7234
North Sumatra	-3.2393	0.2049	-2.9613	-3.4531

Appendix I : Descriptive Statistics of Agricultural Sector

Provinces	Mean	Standard Deviation	Maximum	Minimum
Bali	-4.2440	0.0962	-4.0931	-4.3700
Bengkulu	-4.9758	0.0636	-4.9088	-5.0893
DIY	-4.6302	0.0711	-4.5255	-4.7119
DKI Jakarta	-6.5076	0.4058	-6.0589	-7.0853
West Java	-1.7052	0.2429	-1.2371	-2.0071
Jambi	-4.4831	0.0613	-4.3996	-4.5729
Central Java	-2.3160	0.1173	-2.1447	-2.4591
East Java	-1.8860	0.1395	-1.7018	-2.0652
West Kalimantan	-3.9719	0.1075	-3.8187	-4.1035
East Kalimantan	-3.6577	0.3385	-2.9153	-4.0027
South Kalimantan	-4.1132	0.0674	-4.0399	-4.2337
Central Kalimantan	-3.9926	0.0814	-3.8658	-4.1006
Lampung	-3.3145	0.0693	-3.2113	-3.4099
Maluku	-4.6823	0.2216	-4.4098	-5.0997
NAD	-3.2846	0.4554	-2.4870	-3.8705
NTB	-4.3188	0.1416	-4.1299	-4.5102
NTT	-4.3675	0.0894	-4.2474	-4.4881
Papua	-3.8718	0.3926	-3.2556	-4.2519
Riau	-3.1368	0.3717	-2.6593	-3.5381
South East Sulawesi	-4.7999	0.0802	-4.7037	-4.9424
South Sulawesi	-3.0346	0.2618	-2.3334	-3.2705
Central Sulawesi	-4.2076	0.0912	-4.0933	-4.4005
North Sulawesi	-3.9824	0.2837	-3.6302	-4.4332
West Sumatra	-3.8607	0.0789	-3.7708	-3.9832
South Sumatra	-2.8371	0.2961	-2.4754	-3.1786
North Sumatra	-2.5485	0.1809	-2.3044	-2.7765

Appendix J : Descriptive Statistics of Domestic Trade

Provinces	Mean	Standard Deviation	Maximum	Minimum
Bali	-3.9678	0.1243	-3.7750	-4.1218
Bengkulu	-5.7959	0.1238	-5.6968	-6.0230
DIY	-4.7559	0.0664	-4.6988	-4.9226
DKI Jakarta	-1.6683	0.1758	-1.4477	-1.8453
West Java	-1.4932	0.2629	-1.2332	-1.7836
Jambi	-5.1331	0.1018	-4.9968	-5.2328
Central Java	-2.3928	0.1404	-2.2255	-2.5765
East Java	-1.7241	0.0743	-1.6553	-1.9286
West Kalimantan	-4.2403	0.0579	-4.1557	-4.3490
East Kalimantan	-3.7639	0.3503	-3.0747	-4.1203
South Kalimantan	-4.6998	0.1326	-4.5152	-4.8903
Central Kalimantan	-4.9348	0.1192	-4.7421	-5.0781
Lampung	-4.3302	0.1000	-4.1515	-4.4607
Maluku	-5.2058	0.2480	-4.9271	-5.6802
NAD	-4.3059	0.2076	-3.8592	-4.6364
NTB	-5.1994	0.0800	-5.0658	-5.2828
NTT	-5.5373	0.0872	-5.3867	-5.7160
Papua	-5.3097	0.5018	-4.6042	-5.7407
Riau	-3.4711	0.3624	-2.7902	-3.9690
South East Sulawesi	-5.8370	0.1068	-5.7428	-6.0752
South Sulawesi	-4.0189	0.1964	-3.6000	-4.2248
Central Sulawesi	-5.5782	0.0567	-5.5005	-5.7092
North Sulawesi	-4.8291	0.4128	-4.4104	-5.4076
West Sumatra	-4.2525	0.0636	-4.1501	-4.3371
South Sumatra	-3.2320	0.1653	-2.8799	-3.4259
North Sumatra	-3.0950	0.1018	-2.9470	-3.2215

Appendix K : Descriptive Statistics of Foreign Trade

Provinces	Mean	Standard Deviation	Maximum	Minimum
Bali	-5.7381	0.2448	-5.2948	-6.1263
Bengkulu	-7.4912	1.4327	-4.4807	-8.9753
DIY	-9.9675	1.6809	-5.8809	-11.3374
DKI Jakarta	-0.8926	0.0779	-0.7761	-1.0440
West Java	-3.4047	0.2693	-3.0411	-4.0021
Jambi	-5.1290	0.2504	-4.8007	-5.5909
Central Java	-3.0296	0.2321	-2.8117	-3.4313
East Java	-2.1815	0.0525	-2.1067	-2.2802
West Kalimantan	-5.1289	0.3154	-4.6959	-5.6742
East Kalimantan	-2.3556	0.2449	-2.0778	-2.7193
South Kalimantan	-4.2924	0.1015	-4.1539	-4.4884
Central Kalimantan	-6.6662	0.3991	-6.0917	-7.1377
Lampung	-3.9491	0.2264	-3.4486	-4.2217
Maluku	-5.7919	0.9047	-4.0434	-6.8765
NAD	-3.8884	0.3824	-3.4851	-4.7085
NTB	-6.7312	2.8413	-4.8204	-12.1681
NTT	-8.0322	0.8321	-6.3145	-9.4079
Papua	-3.9054	0.4587	-3.5101	-5.1009
Riau	-2.1834	0.1119	-1.9729	-2.3364
South East Sulawesi	-6.9604	0.1729	-6.7423	-7.2822
South Sulawesi	-4.6470	0.2242	-4.3665	-5.0062
Central Sulawesi	-6.8860	0.4670	-6.3937	-8.0125
North Sulawesi	-6.2560	0.4911	-5.9053	-7.5159
West Sumatra	-5.4150	0.2196	-5.0839	-5.8524
South Sumatra	-4.1381	0.1634	-3.8096	-4.4029
North Sumatra	-3.1856	0.1173	-3.0387	-3.3933