Empirical Test of Tax Ratio: (Empirical Studies in ASEAN 2011-2017)

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Abstract. *The purpose of this study is to show the effect of per capita income, and economic structure on tax ratios in ASEAN countries for the period 2011-2017. This study uses data sourced from the official website of the World Bank. The population of this study is data on the amount of tax revenue, GDP, GDP per sector, and economic structure. The sample is taken from time series data on the amount of tax revenue, GDP, GDP per sector, tax rates, and economic structure in ASEAN countries for 7 years from 2011-2017. The method used in determining the sample is a purposive sampling method that is sampling based on certain criteria that have been determined by researchers. The sample obtained in this study amounted to 8 countries in ASEAN. The data analysis method used in this study is panel data regression analysis.*

Based on the results of research conducted, the partial test results obtained indicate that income per capita, and economic structure affect the tax ratio. Simultaneous test results in this study also indicate per capita income, and economic structure have an influence on tax ratios in ASEAN countries 2011-2017.

Keywords. *Economic Structure; Per capita income; Tax Ratio.*

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INTRODUCTION

Association of Southeast Asian Nations, or more popularly known as the Association of Southeast Asian Nations (ASEAN) is an organization of geo-politics and the economy of the countries in Southeast Asia, which was established in Bangkok, August 8th, 1967 by the Bangkok Declaration by Indonesia, Malaysia, Philippines, Singapore, and Thailand. The organization aims to promote economic growth, social progress and cultural development of its member countries, promoting peace stability at regional level, as well as increasing the opportunity to discuss the differences between its members with peace. For governments in countries in the ASEAN region is a country with a majority of its members growing conditions, a source of income tax revenue the state relied upon by governments around the world, both the developed and developing countries. Tax revenue is a revenue source of the most dominant. According Sinaga (2010) since the early 1980s, the Indonesian government on tax revenues as a source of revenue for the state, because the state revenue from oil and gas sector can not be relied upon due to lower international oil prices.

With a variety of tax information that has been truly global, the term tax ratio is not something that is familiar to the people. According to(Way, 2014)The tax ratio is the ratio of tax revenue to gross domestic product (GDP). Tax rate is one indicator for assessing the performance of tax revenues. Although the actual tax rate is not the only indicator in assessing the performance of a state tax, but until now the ratio of tax to a size that is considered to give a general overview of a country's tax situation (Aeny, 2017), Some countries will raise the ratio of tax to gross domestic product to cover the shortfall in state revenue budget up to a few percent. When the tax revenue growth is lower than the growth in gross domestic product of a country then the tax rate will decrease. By dividing the national tax revenue to gross domestic product that is a

calculation of the tax ratio. In the calculation of time, the tax compared to only national tax only. Over time, many states add some factors in the formula numerator tax ratio. For example, taxes received in the area, royalties, as well as natural resources for results.

Some of the theories used in this study are as follows :

Theory Chenery

Pattern theory Analysis of Development (1975) describes the structural changes in the stages of the process changes in economic structure of developing countries experiencing the transformation of agriculture traditional switched to the industrial sector as the main engine of economic growth. Increasing the role of the industrial sector in the economy in line with the increase in per capita income strongly associated with the accumulation of capital and an increase in resources (Human Capital).

In general, countries that have a high population levels which basically describes the level of potential demand is high, tend to be set up import substitution industries. This means that they produce their own goods previously imported and then sold in the market in the country. Conversely countries with a relatively small number of people, tend to develop industry oriented to the international market.

The theory related to my research variable is economic structure. The economic structure of a country is a term used to denote an economic composition divided into economic sectors. Characteristics can be seen from the most reliable sectors in a country. There are those from the agricultural or industrial sector. In this study I took from the industrial sector, because countries in ASEAN are developing. Which began to change its financial structure into an industrial country.

Tax revenue

According to (Hutagol, 2007) Tax revenue is a source of revenue that can be obtained continuously and can be optimally developed according to the needs of government and community conditions.

Income per capita

Per capita income is the average income of the population of a country(Oentoro, 2010), Per capita income shows income levels in a country. Variables used to calculate income per capita is the gross national product and population. Mathematically, the formula for calculating per capita income is as follows:

Per capita income = Gross National Product (GNP) / Total Population

Economic Structure

The division of state structures can be classified into three categories, namely underdeveloped countries, developing countries, and developed countries. To find out for sure whether the country is in the category of developing countries or not is easy. Because many indicators may not be changed, a rich country is not necessarily a developed country. Because some conditions cannot be agreed upon. Such as progress in the economic, technological, and political conditions.

Economic structure is a term used to determine the economic composition which is divided into economic sectors. The financial characteristics of a country can be seen from the sector that can be trusted or arguably the sector that has the largest contribution from that country.

Tax Ratio

According to (Sakti, 2014) The tax ratio is tax revenue to gross domestic product (GDP). The tax ratio is one indicator to determine tax revenue. Because the tax ratio is not the only indicator in the assessment of state taxes, but now the tax ratio is an option that provides a general assessment of taxes in a country (Aeny, 2017). Some countries will increase the tax ratio to domestic products to increase the budget in the receiving country by a few percent. When tax revenue growth is lower than the growth of a country's gross domestic product, the tax ratio will increase. The biggest proportion in the State Tax is the Tax Required by Personal and Corporate Taxes.

$$Tax\ Ratio = \frac{\Sigma Tax\ Revenue}{\text{GDP}}$$

ASEAN

Raising Nations Southeast Asia, or more popularly known as the Association of Southeast Asian Nations (ASEAN) is an organization of geo-politics and the economy of the countries in Southeast Asia which was founded in Bangkok on August 8, 1967 by the Bangkok Declaration by Indonesia, Malaysia, the Philippines, Singapore, and Thailand. The organization aims to promote economic growth, social progress and cultural development of its member countries, to promote peace and stability at regional level, as well as increasing opportunities to discuss differences peacefully among its members. The member countries are Brunei, the Philippines, Indonesia, Cambodia, Laos, Malaysia, Myanmar, Singapore, Thailand, and Vietnam.

Framework of thinking

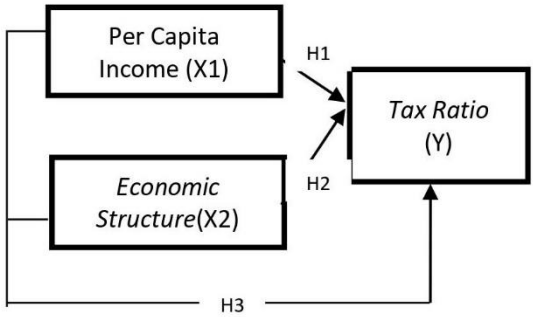


Image 1. Framework of thinking

hypothesis development

Per Capita Income Tax Influence on Ratio

According to (Way, 2014)The tax ratio is the ratio of tax revenue to gross domestic product (GDP). Tax rate is one indicator for assessing the performance of tax revenues. Although the actual tax rate is not the only indicator in assessing the performance of a state tax, but until now the ratio of tax to a size that is considered to give a general overview of a country's tax situation (Aeny, 2017), In a previous study, researchers found N. Sitinjak (2016) which states that the income per capita effect on tax revenues.

H1: per capita income, affect the tax ratio in ASEAN countries.

Influence of Economic Structure on Tax Ratio

According to Chenery's theory explains the process step changes in the structure of the economic structure changes from developing countries experiencing the transformation of agriculture traditional switched to the industrial sector as the main engine of economic growth increase the role of the industrial sector in the economy in line with the increase in per capita income strongly associated with the accumulation. capital and increased resources (Human Capital). In previous research, Sri Utami (2015) mentions that the economic structure has a significant impact on the tax ratio.

H2: Economic structure affect the tax ratio in ASEAN countries

Effect of Per Capita Income, and Economic Structure of the Tax Ratio in ASEAN countries

From the explanation of per capita income above, and economic structure can affect tax ratios in ASEAN countries. Then the hypothesis proposed is:

H3: Per capita income, and economic structure simultaneously influence the tax ratio in ASEAN countries.

RESEARCH METHOD

This type of research is a quantitative research data used is secondary data obtained from the website: World Bank (*http://data.worldbank.org/*) And the IMF (International Money Funds) (*http://www.asean.org/*)

Operational Variables

The research variables are all things that any form defined by the researchers to study in order to obtain information about the result, then drawn conclusions (Sugiyono, 2017), The following table variable Operational:

Table 1. Operating Table Variables

No	variables	variable concept	Measurement	Scale
1.	*tax Ratio* (Way, 2014)	This figure is obtained by dividing the country's tax revenue to GDP.	$tax\ Ratio = \frac{\Sigma Tax\ Revenue}{\text{GDP}}$	ratios
2.	Income per capita (Oentoro, 2010)	Obtained from the amount of GDP in x divided by the population of x.	$\text{GDP} = \frac{\text{GDP tahun x}}{\text{Jumlah Penduduk tahun x}}$	ratios
3.	Economic Structure (Sri Utami, 2011)	sector's contribution - a country's economic sector to GDP formation.	The term used to indicate the composition of an economy that is divided into sectors of the economy. The hallmark of a country's economy can be seen from the most reliable sector or sectors that have arguably the greatest contribution of the country's economy.	ratios

Source: Data are processed, 2019

Population and Sample

The population in this study is the overall income per capita, economic structure, and the tax ratio in the countries in the region in the years 2011-2017 as many as 10 countries. In this study, samples are taken using purposive sampling so get eight countries included in the criteria included in the ASEAN countries in a period of 7 years, so we get a sample of 56 samples of data. Here's a sample selection process and results of the sample countries.

Table 2. Sample Selection Process

No.	criteria sample	Not Meet Criteria	Accumulation
1.	The countries included in the ASEAN region.	-	10
2.	The countries in the ASEAN region that includes the variable data is needed on the website.	-	10
3.	ASEAN countries that include fully variable data required in the study period 2011-2017.	2	8
Total Country or Number of Samples			8
Study observation period (2011 - 2017)			7 years
Total Processed Data			56

Source: *www.data.worldbank.org*

Table 3. Country Selection Sample

No.	Country code	Country name
1.	IDN	Indonesia
2.	KHM	Cambodia
3.	LAO	Lao PDR
4.	MMR	Myanmar
5.	MYS	Malaysia
6.	PHL	Philippines
7.	SGP	Singapore
8.	THA	Thailand

Source: *www.data.worldbank.org* (Processed by the author)

Data analysis method

Data analysis techniques in this study using panel data (pooled data) which is a combination of time series data (time series) and data cross (cross section). Then the hypothesis testing was done with panel data regression model.

RESULT AND DISCUSSION

Descriptive Statistics Analysis

The results of the analysis of the statistical description in the table shows that the overall number of samples 56 samples of the observed data.

Table 4 Descriptive Statistics Variable Research

	TAX RATIO	INCOME PER CAPITA	*ECONOMIC STRUCTURE*
mean	12.51234	10460.95	32.72042
median	13.55576	3156.815	31.49301
maximum	17.01196	60297.79	43.91342
Minimum	2.127100	882.2755	22.14181
Std. Dev.	3.253895	17876.98	6.051636
Observations	56	56	56

Source: E-views output 10.0

In the variable tax ratio showed a mean value of 12.51234, the median of 13.55576, 17.01196 maximum value of a tax ratio value of Thailand in 2013, a minimum value of 2.127100 is the value of the tax ratio in the country Myanmar in 2011, and the standard deviation value of 3.253895 shows the variation contained in the variable tax ratio.

On a per capita income variables showed a mean value of 10460.95, the median of 3156.815, the maximum value of 60297.79 which is a Singapore state per capita income in 2017, a minimum value of 882.2755 is the value of per capita income countries Cambodia in 2011 and the value of 17876.98 shows the variation contained in the variable income per capita.

In the structure of economic variables showed a mean value of 32.72042, the median of 31.49301, 43.91342 maximum value of which is the economic value of the Indonesian state structure in 2011, the minimum value of 22.14181 an economic value on the structure of the country Cambodia in 2011, and the standard deviation value of 6.051636 shows the variation contained in the structure of economic variables.

Panel Data Regression Analysis

Based on the results shown in Table 5 for testing three models of panel data it can be concluded that the model used is a model of random effect because of the test results Chow, Hausman test, and test Lagrange Multiplier

indicates that the model random effect most appropriate for further use in factor estimating the factors that affect the tax ratio.

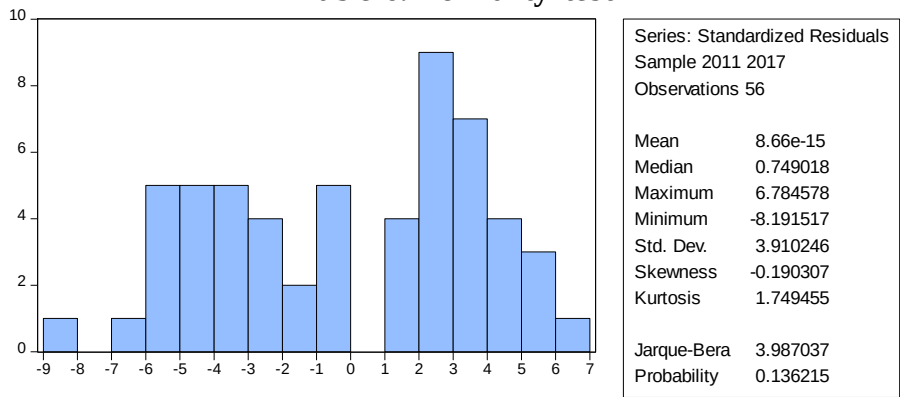
Table 5. Model Testing Results

No.	Method	examination	result
1.	Chow test	*CEM vs FEM*	*FEM*
2.	Hausman test	*FEM vs REM*	*BRAKE*
3.	Lagrange Multiplier test	*CEM vs REM*	*BRAKE*

Source: Data were processes in 2019

Classic assumption test
Normality Results

Table 6. Normality test



Source: Eviews Output 10.0

From the picture above can be seen that the probability of normality test results amounted to 0.136215 or greater than 0.05, it can be concluded that the H0 is rejected and Ha accepted then a distributed residual normal.

Test Results Multicollinearity

Table 7. Multicollinearity Test

	INCOME PER CAPITA	ECONOMIC_STRUCTURE
INCOME PER CAPITA	1.000000	-0.457134
ECONOMIC_STRUCTURE	-0.457134	1.000000

Source: Eviews Output 10.0

Based on the table, the correlation between per capita income with the economic structure of -0.457134 it indicates that there is no correlation between the variables independently more than 0.80 and it can be concluded that H0 is accepted, it means that there is no problem of multicollinearity between independent variables.

Autocorrelation Test Results

Table 8. Autocorrelation Test

R-squared	0.920205	Mean dependent var	8.998908
Adjusted R-squared	0.914765	SD dependent var	2.266012
SE of regression	0.661564	Sum squared resid	19.25735
F-statistic	69.1384	Durbin-Watson stat	2.178207
Prob (F-statistic)	0.000000		

Source: Eviews Output 10.0

Autocorrelation test results showed that the value of Durbin Watson stat 2.178207. With a sample size = n = 56 and the number of independent variables = k = 2 then dL = 1.4954, dU = 1.6430, 4-dU = 2.3570, 4-dL = 2.5046, indicating 1.4954 <1, 6430 <2.178207 <2.3570 <2.5046 so we can conclude that H0 is accepted or not there is a problem of autocorrelation.

Coefficient of Determination

Table 9. R-squared Test Results

R-squared	0.456651	Mean dependent var	0.953757
Adjusted R-squared	0.436148	SD dependent var	1.047819
SE of regression	0.786809	Sum squared resid	32.81059
F-statistic	22.27164	Durbin-Watson stat	0.971805
Prob (F-statistic)	0.000000		

Source: Eviews output 10.0

It can be seen that the per capita income variable, and Economic Structure together have an influence on the contribution of Tax Ratio of 0.44 or 44%. While the remaining 46% (100% - 44%) is explained by other variables not examined in this study.

Hypothesis testing
t Test

Table 10. t Test Results

variable	coefficient	Std. Error	t-Statistic	Prob.
C	-3.435766	2.670388	-1.286617	0.2038
INCOME PER CAPITA	0.000170	6.72E-05	2.523462	0.0147
ECONOMIC_STRUCTURE	0.433179	0.064336	6.733096	0.0000

Source: Eviews output 10.0

Per capita income has a .0147 probability value of less than 0.05. This translates into a per capita income affect the tax ratio. It can be concluded that H1 is accepted. Assuming the results of which can be taken corresponding author of this study is that there are several factors that affect the level of the tax ratio, which is a factor that is macro and microeconomic. Income per capita is one of the macro factors affecting the level of a country's tax rate. Because, the higher the per capita income, the capacity to pay and collect tax revenue will be greater and will increase the tax ratio. The results support the research of N. Sitinjak (2016) which states that the income per capita effect on tax revenues.

Economic Structure has a probability value of 0.000 is less than 0.05. This translates into a per capita income affect the tax ratio. It can be concluded H2 acceptable. Assuming the results of which can be taken writers associated with the present invention is: according to according to Chenery (1975), in line with the increase in income per capita, the country's economy will shift from the original rely on the agricultural sector to the industrial sector. Picture of the economic structure of a country can be seen through the contribution of each economic sector to the GDP formation. And the higher contribution of the industrial sector, it can indicate the progress of the country's development. This result can be the same as the results of the study of Sri Utami (2015) which states that the structure of economic variables affect the tax ratio.

Test F

It can be seen that the probability value (F-statistic) 0,000 less than 0.05 this means that the income per capita, and the economic impact structure together (simultaneously) to the tax ratio. It can be concluded H3 acceptable. Of the coefficient of determination (R-Squared) it can be seen that the per capita income variable, and Economic Structure together have an influence on the contribution of Tax Ratio of 0.44 or 44%. While the remaining 46% (100% - 44%) is explained by other variables not examined in this study.

CONCLUSION

Per Capita Income and Economic Structure partially and simultaneously influence the Tax Ratio in ASEAN countries in the period 2011-2017. While the limited number of samples of only 8 countries in ASEAN.

This limitation is because not all countries in ASEAN to include the data required in this empirically on the website of the World Bank (data.worldbank.org). The ASEAN countries are mostly developing countries, but not all countries can be compared, for example, the Singapore state which is a tax haven, as well as the 7-year period is not enough to see the changes in the economy of a country.

Suggestions for further research, could add indicators that may affect the tax ratio for example such as the employment rate of the total population, economic and political stability, and the corruption perception index, as well as state-based classification structure. As for the government, suggested to pay more attention to macroeconomic aspects such as the fluctuating inflation affecting tax revenues, such as economic growth in order to achieve an increase in tax revenues in his country.

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