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DETERMINANTS OF TAX REVENUE IN EMERGING COUNTRIES

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ABSTRACT

Issuing tax is important for countries to increase the ability of the government to spend on citizens. Knowing and understanding the relationship between these determinants and tax revenue make all tax policymaker have a clear image about when to issue tax and with which percentage. This study focused on explaining the effect of the macroeconomic variables, namely, GDP growth, agriculture, employment, manufacturing and trade on tax revenue in seven emerging countries by adopting the ordinary least square (OLS) method. The outcome of the analysis deduced that each of these countries had different tax revenue determinants. India is positively affected by GDP growth; Pakistan is positively impacted by employment growth; Brazil is positively affected by trade growth; Mexico is positively impacted by employment growth but negatively impacted by trade growth; and Malaysia is negatively affected by agriculture growth. China and Turkey had four same significant determinant factors (agricultural growth, employment growth, manufacturing growth and trade growth). China is positively influenced by manufacturing growth but negatively affected by the other three determinants. On the other hand, the determinant for Turkey was negatively affected by manufacturing growth while the rest were positively. In conclusion, these determinants can influence tax revenue positively or negatively and each country has a specific sector from which they generate money, depending on these sectors governments decide how much tax they should issue.

INTRODUCTION

In the current era, the world is developing more than any other time. That has a great influence on the level of public expenditure. Countries need a huge amount of money, in order to improve and provide all citizens' essentials such as, health, education, housing and etc. In other words, it is important for any country to increase its gross domestic product (GDP) to be able to spend on public expenditure. Unfortunately, there are some countries, which suffer from budget deficit and it is difficult for them to meet all citizens' necessities [1]. To solve this problem, governments have several ways to reduce budget

deficit. One of these ways is tax collecting. Tax collecting is a way to gather an amount of money from people and businesses in a country in order to increase government spending. Collecting of taxes divided into two different kinds, direct taxes and indirect taxes. Direct taxes are collecting taxes from personal income, corporate income and property income. Indirect taxes are considered as goods and services taxes and international trade taxes. The determination of which kind of taxes will use depends on each country's tax policy and on the sector that generate the most income in the country[2]. Each country has a numerous determinants that influence tax revenue. These determinants have the power to increase or decrease the demand of taxes in a country, which also has an effect on the economic status.

The tax revenue determinants analysis conducted for Ethiopia revealed that in the long run, real GDP per capita income, foreign aid and industrial value added share of GDP positively and significantly affect tax revenue. However, inflation exerted a negative and significant influence. Whereas, in the short run real GDP per capita income and inflation have negative effect, whereas industrial value added share of GDP has positive effect on tax revenue in Ethiopia [3]. On the other note, Gobachew et al. [4] stated that in Ethiopia industry sector share to GDP, per capita income and trade openness as measured by share of export and import to GDP have significant positive effect on tax revenue. But agriculture sector share to GDP and annual rate of inflation have significant and negative effect on tax revenue as measured by share of tax revenue to GDP.

These findings were analogous with the study done by Anuar[5] on the tax revenue determinants in Malaysia which found that inflation rate, trade openness and exchange rate were found to be significantly influencing the tax revenue since inflation rate and exchange rate were positively related to the tax revenue while trade openness was negatively related. Among these three significant factors, exchange rate was the main impacting factor. Nevertheless, the value-added of agriculture sector was insignificant factor that can affect the tax revenue due to its negative relationship toward the tax revenue. Anh and Thinh [6] concluded that in Southeast Asian countries, the four vital factors influencing the tax revenues were GDP per capita, trade volume, agricultural sector, industry sector.

Applying Auto Regressive Distributed Lag Model (ARDL) approach, Ali and Audi [7] examined the determinants of tax revenue of Pakistan. They found that unemployment and money supply had positive and significant impact on the tax revenue of the country. Nonetheless, inflation has negative and significant relation with tax revenues. As for the oil exporting countries, Monjazeb and Asadian [8] reported that the GDP per capita and trade openness are the main factors affecting the ratio of tax revenue to GDP.

Based on the past researches done, it is evident that governments all over the world are continuously in search of policies and tools through which they can enhance tax revenues. The higher level of tax revenues ensures a higher degree of spending in developmental projects, thereby alleviating poverty in the country. Therefore, this research focused on determining the variables that

influence tax revenue in emerging economics. The emerging countries studied were China, Malaysia, Brazil, Mexico, Turkey, Pakistan and India.

METHODOLOGY

This research employed Ordinary Least Square (OLS) method to empirically study the factors that influence tax revenues in emerging economies. Namely, India, China, Pakistan, Brazil, Turkey, Mexico, Malaysia.

The dependent variable is tax revenue, while the independent variables are GDP growth, agriculture growth, employment growth, manufacturing growth and trade growth.
All data of the model were obtained from World Development Indicators (WDI). This study examined the data during the year 1986 until the year 2015.

Model of this study:

$\log TR = \log GDP + \log AGR + \log EMP + \log MNU + \log TRD$

Where

GDP :	Gross Domestic Product
AGR :	Agriculture
EMP :	Employment
MNU :	Manufacture
TRD :	Trade
TR :	Tax Revenue

Result And Discussion

India

Table 1 presented the coefficient and p-values for each determinant. Employing OLS estimation reveals that the coefficient values indicate the positive or negative relationship between the determinants and tax revenue. For example, GDP growth, employment and trade have a positive impact on tax revenue, which indicate a 1-percentage increase in these factors will result an increase in tax revenue by 1.17 percentage of GDP growth, 0.55 percentage of employment and 0.04 percentage of trades. Conversely, agriculture and manufacturing have a negative impact on tax revenue, which make a 1-percentage increase, will result a decrease in tax revenue by 0.67 percentage of agriculture and 0.14 percentage of manufacturing. The third column of the table shows the P-value of each variable that show which variable has a significant relation with tax revenue and which variable has an insignificant relation. The variable with P-value less than 10% is significant. GDP growth is statistically significant, implying that GDP growth strongly affect tax revenue in India. The R-square indicates that 17 percent of the variation in tax revenue

is explained by GDP growth, agriculture, employment, manufacturing and trade.

Table 1. Determinants for India tax revenue

Determinants	Coefficient	p-value	R-square
GDP Growth	1.17827	0.083726	0.17289
Agricultural Growth	-0.67076	0.14400	
Employment Growth	0.55505	0.75001	
Manufacturing Growth	-0.14672	0.65452	
Trade Growth	0.044136	0.83261	

In order to estimate the variables' influence on tax revenue in India, the following model is offered:

TR=1.17 GDP−0.67AGR+0.55 EMP−0.14 MNU+0.04TRD

Pakistan

The coefficient, p-values and R-square of the determinants are tabulated in Table 2. Employing OLS estimation reveals that the coefficient values indicate the positive or negative relationship between the determinants and tax revenue. Manufacturing, employment and trade have a positive impact on tax revenue, which indicate a 1-percentage increase will result an increase in tax revenue by 0.82 percentage of manufacturing, 0.12 percentage of employment and 0.13 percentage of trades. However, GDP growth and agriculture have a negative impact on tax revenue, which make a 1-percentage increase will result a decrease in tax revenue by 0.59 percentage of GDP growth and 0.49 percentage of agriculture. The P-value of each variable indicate which variable has a significant relation with tax revenue and which variable has an insignificant relation whereby the variable with P-value less than 10%, is significant. Trade is statistically significant, implying that trade is the most indicator that strongly affect tax revenue in Pakistan. The R-square indicates that 60 percent of the variation in tax revenue is explained by GDP growth, agriculture, employment, manufacturing and trade.

Table 2. Determinants for Pakistan tax revenue

Determinants	Coefficient	p-value	R-square
GDP Growth	- 0.59204	0.14603	0.60151
Agricultural Growth	- 0.49498	0.14657	
Employment Growth	0.12535	0.00087	
Manufacturing Growth	0.82871	0.14777	
Trade Growth	0.13001	0.62194	

In order to estimate the variables' influence on tax revenue in Pakistan, the following model is suggested:

$TR = -0.59\ GDP - 0.49AGR + 0.12\ EMP + 0.82\ MNU + 0.13\ TRD$

Brazil

With reference to Table 3, it is found that employment and trade have a positive impact on tax revenue, which indicate a 1-percentage increase will result an increase in tax revenue by 0.07 percentage of employment and 0.46 percentage of trades. As for GDP growth, agriculture and manufacturing, these factors have a negative impact on tax revenue, which make a 1-percentage increase will result a decrease in tax revenue by 0.21 percentage of GDP growth, 0.95 percentage of agriculture and 0.10 percentage of manufacturing. The P-value of each variable indicates which variable has a significant relation with tax revenue ($p < 0.010$). Trade is statistically significant, implying that trade is the most indicator that strongly affect tax revenue in Brazil. The R-square value implies that 44 percent of the variation in tax revenue is explained by GDP growth, agriculture, employment, manufacturing and trade.

Table 3 Determinants for Brazil tax revenue

Determinants	Coefficient	p-value	R-square
GDP Growth	-0.21196	0.62844	0.44569
Agricultural Growth	-0.09559	0.90066	
Employment Growth	0.07836	0.15491	
Manufacturing Growth	-0.10608	0.57164	
Trade Growth	0.46994	0.03233	

In order to estimate the variables' influence on tax revenue in Brazil, the following model is proposed:

$$TR = -0.21\ GDP - 0.095\ AGR + 0.07\ EMP - 0.10\ MNU + 0.46\ TRD$$

Mexico

The coefficients, p-values and R-square results are shown in Table 4. Based on that, GDP growth, agriculture, employment and manufacturing have a positive impact on tax revenue. Thus, a 1-percentage increase will cause an increase in tax revenue by 0.34 percentage of GDP growth, 0.73 percentage of agriculture, 0.10 percentage of employment and 0.08 percentage of manufacturing. Nonetheless, trade growth has a negative impact on tax revenue, which make a 1-percentage increase will result a decrease in tax revenue by 0.14 percentages of trades. The third column of the table shows the P-value of each variable that indicate trade and employment are statistically significant, implying that these are the indicators that strongly affect tax revenue in Mexico. The R-square designates that 42 percent of the variation in tax revenue is explained by GDP growth, agriculture, employment, manufacturing and trade.

Table 4 Determinants for Mexico tax revenue

Determinants	Coefficient	p-value	R-square

GDP Growth	0.34990	0.12602	0.42022
Agricultural Growth	0.73454	0.44547	
Employment Growth	0.10263	0.02021	
Manufacturing Growth	0.08483	0.84361	
Trade Growth	-0.14441	0.07301	

In order to estimate the variables' influence on tax revenue in Mexico, the following model is suggested:

$$TR = 0.34\ GDP + 0.73\ AGR + 0.10\ EMP + 0.08\ MNU - 0.14\ TRD$$

China

Employing OLS estimation reveals that the coefficient values indicate the positive or negative relationship between the determinants and tax revenue as shown in Table 5. The GDP growth and manufacturing have a positive impact on tax revenue, which indicate a 1-percentage increase, will result an increase in tax revenue by 0.28 percentage of GDP growth and 0.17 percentage of manufacturing. Nevertheless, agriculture, employment and trade have a negative impact on tax revenue, which make a 1-percentage increase will result a decrease in tax revenue by 0.34 percentage of agriculture, 0.04 percentage of employment and 0.09 percentage of trades. In terms of significance (variable with p-value less than 10%), trade, agriculture, employment and manufacturing are statistically significant, implying that they are the most indicators that strongly affect tax revenue in China. The R-square indicates that 52 percent of the variation in tax revenue is explained by GDP growth, agriculture, employment, manufacturing and trade.

Table 5 Determinants for China tax revenue

Determinants	Coefficient	p-value	R-square
GDP Growth	0.28354	0.22339	0.52709
Agricultural Growth	-0.34155	0.010311	
Employment Growth	-0.04853	0.042897	
Manufacturing Growth	0.17345	0.039440	
Trade Growth	0.099255	0.053236	

In order to estimate the variables' influence on tax revenue in China, the following model is offered:

$$TR = 0.28\ GDP - 0.34\ AGR - 0.04\ EMP + 0.17\ MNU - 0.09\ TRD$$

Malaysia

Based on the tabulation in Table 6, it is revealed that GDP growth has a positive impact on tax revenue, which indicates a 1-percentage increase in it will result an increase in tax revenue by 0.80 percentage of GDP growth. On the contrary, agriculture growth, employment growth, manufacturing growth and trade growth have a negative impact on tax revenue, which make a 1-percentage increase, will result in a decrease in tax revenue by 0.48 percentage

of agriculture growth, 0.58 percentage of employment growth, 0.004 percentage of manufacturing growth and 0.14 percentage of trade growth. The p-value column showed that agriculture is statistically significant, implying that it is the indicator that strongly affect tax revenue in Malaysia compared to the other four determinants. The R-square indicates that 61 percent of the variation in tax revenue is explained by GDP growth, agriculture growth, employment growth, manufacturing growth and trade growth.

Table 6 Determinants for Malaysia tax revenue

Determinants	Coefficient	p-value	R-square
GDP Growth	0.80354	0.86975	0.61682
Agricultural Growth	-0.48866	0.08182	
Employment Growth	-0.58889	0.10254	
Manufacturing Growth	-0.00412	0.949806	
Trade Growth	-0.14869	0.8648	

In order to estimate the variables' influence on tax revenue in Malaysia, the following model is proposed:

$$TR = 0.80\ GDP - 0.48\ AGR - 0.58\ EMP - 0.004\ MNU - 0.14\ TRD$$

Turkey

Table 7 displayed the coefficients, p-value and R-square value of the determinants for tax revenue in Turkey. Employing OLS estimation reveals that the coefficient values indicate the positive or negative relationship between the determinants and tax revenue. For the country of Turkey, agriculture, employment and trade have a positive impact on tax revenue, which indicate a 1-percentage increase, will result an increase in tax revenue by 3.11 percentage of agriculture, 0.13 percentage of employment and 0.47 percentage of trades. Whereas GDP growth and manufacturing have a negative impact on tax revenue, which make a 1-percentage increase, will result a decrease in tax revenue by 0.41 percentage of GDP growth and 2.80 percentage of manufacturing. The P-value column specifies which variable has a significant relation with tax revenue and which variable has an insignificant relation. The variable with P-value less than 10% is significant. Trade, agriculture, employment and manufacturing are statistically significant, implying that these are the indicators that strongly affect tax revenue in turkey. The R-square indicates that 48 percent of the variation in tax revenue is explained by GDP growth, agriculture, employment, manufacturing and trade.

Table 7.Determinants for Turkey tax revenue

Determinants	Coefficient	p-value	R-square
GDP Growth	-0.41223	0.14682	0.48929
Agricultural Growth	3.11013	0.00010	
Employment Growth	0.13424	0.072772	
Manufacturing Growth	-2.80569	0.00029	
Trade Growth	0.47040	0.00189	

In order to estimate the variables' influence on tax revenue in Turkey, the following model is suggested:

$$TR = -0.41\ GDP + 3.11\ AGR + 0.13\ EMP - 2.80\ MNU + 0.47\ TRD$$

Overall Discussion

Comparing the findings from this study with other researches, there are some countries that show the same results as other researches. On other hand, some countries have different results from other researches. Most of the countries (four out of seven) have a positive relationship between GDP Growth and tax revenue. This shows that this finding corresponds with Nezhad, Ansari, and Moradi [9] study, which explained that GDP growth has a positive relationship with tax revenue. These authors also showed that agriculture has a negative impact on tax revenue, because countries that depend on agriculture as a source of money, government cannot impose taxes on them due to low income. In addition, these findings also indicate that in most countries, agriculture has a negative influence similar to what Nezhad, Ansari, and Moradi [9] had explained.

However, countries, such as, Mexico and Turkey, agriculture has a positive impact on tax revenue. This is in line with Karagoz [10] study, which stated that in some countries, agriculture affect positively on tax revenue due to the huge amount of agricultural exports, which leads to high generation of income. Nevertheless, from the discovered showed that most countries also have a positive impact between employment and tax revenue. According to Mihokova et al.[11], high employment rate led to positive influence on tax revenue. The other variable (trade growth) has a positive impact on tax revenue for most countries as agreed to Karagoz [10] study. The author indicated that the more the country import or export their goods, the more trade taxes it has to pay. Manufacturing growth has a negative effect on tax revenue for most of the countries. This results is different than the study of Karagoz [10], which elaborated that manufacturing should have a positive impact on tax revenue because businesses generate a huge amount of money for a country that make it amenable to tax.

CONCLUSION

Ultimately, the variables which affect tax revenue positively or negatively in emerging countries indicate different results for each country. Besides each country has a specific variable that affect tax revenue the most and with the highest level of strength. GDP growth was significant for India; agriculture growth was significant for China, Malaysia and Turkey; employment growth was insignificant for India, Brazil and Malaysia; manufacturing growth was significant for China and Turkey; and trade growth was insignificant for India, Pakistan and Malaysia. Employment and trade growth were the two determinants that had the most impact on the tax revenue since it appeared to be significant in four out of seven countries.

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