Tax Structures and Economic Growth: A Study of Asian Countries

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Abstract – This study aims to analyse the impact of total tax revenue and its structures on GDP per capita growth in 31 Asian countries. We estimate the results using the Static Panel Fixed Effects (within) regression with Driscoll and Kraay's Standard Errors. The results suggest that increases in total tax revenue, taxes on income, profit and capital gain (direct taxes), and taxes on goods and services (indirect taxes) are associated with lower GDP per capita growth in Asian countries. In contrast, this study finds a significant and positive impact of taxes on property (other taxes), while labour taxes show an insignificant but positive impact on growth. We conclude that property taxes have a positive potential to sustain and promote higher growth, and policymakers should consider reducing both taxes on income and goods and services to encourage productivity and generate more consumption, which can stimulate economic growth in Asian countries.

Keywords: "Economic Growth", "Tax Structures", "Asian Countries"

JEL Classification: H2, O1, O2

1. Introduction

Taxes play an essential role in a country as the most significant contributors in collecting revenue and one of the tools in fiscal policy for sustainability and promoting economic growth. Tax system refers to a collection of tax management practices and associated policies, in which developing an effective tax system is crucial for comprehensive economic growth strategies and the general management of the public sector (Martinez-Vazquez, 2014). Taxation can be considered as a fee charged to citizens by the government in exchange for supplying them with goods, services, and facilities. A study by Islam (2016) stressed that taxes are not voluntarily given to the government, where they are required payments that are essentially forced onto citizens. Taxes can be divided into two categories: direct and indirect. Direct taxes can be defined as taxes levied on income where the burden

of the taxes cannot be shifted to the other party. In this case, the taxpayers must pay taxes directly to the government of a country. Meanwhile, indirect taxes refer to taxes levied on goods and services where the burden of the taxes can be passed to the other party.

The traditional theory of economics holds that taxes lead to distortions and have a detrimental effect on economic expansion. According to the neoclassical growth theory (Solow,1956; Swan, 1956), increased taxes may deter people from saving, investing, and discouraging business activities, which obstructs economic progress over the long run. In contrast, a lower tax burden is anticipated to encourage business productivity and production, which may boost economic growth. The endogenous growth theory (Barro,1990; King and Rebello,1990; Jones et al., 1993) contends that taxes have a considerably more complex effect on growth. In this case, well-designed tax policies that focus on developing human capital, infrastructure, and public goods may encourage business productivity and innovation, stimulating economic growth in a country.

Many studies have been conducted to reveal the mixed and inconsistent impacts of taxes on economic growth. Recent studies by Korkmaz et al. (2019) and Hakim (2020) reveal the significant and negative correlation between direct taxes and economic growth, while indirect taxes have contributed to positive economic growth in a country. Additionally, a study of taxes on economic growth in 100 countries, including Asian countries, by Mcnabb (2018) finds that increased income taxes are associated with lower long-run economic growth. On the other hand, Xing (2012) suggested that shifts toward property taxes may generate higher long-term economic growth. Taxes on consumption, personal income taxes, and property taxes significantly and positively affect economic development (Stoilova, 2017).

Therefore, this paper's main objective is to investigate further the impact of total tax revenue and its structures (direct and indirect taxes) on economic growth by utilizing panel data regression analysis on Asian countries. The structure of this paper is as follows: Section 2 discusses the literature review on the impact of taxes on economic growth, and Section 3 explains the methodology and the data. Empirical results and discussion are presented in Section 4, and finally, section 5 provides the conclusion of this study.

2. Literature Review

In the past few decades, many empirical studies have been conducted to reveal and conclude the impact and relationship between tax policy and economic growth. Although this topic has been the subject of several research studies, the literature contains contradictory information regarding the connection between taxes and economic growth in general and fiscal policy in particular. Furthermore, depending on the state of the economy in a given country, the model's parameters, and estimating methods, there have been conflicting findings and much discussion regarding the effects of taxes and spending on growth.

A study of tax structure and economic growth in 20 middle-income Asian countries by Nazir et al. (2020) employed the two-step system GMM estimation technique to reveal the inconsistent impact of both direct and indirect taxes on economic growth. Their study found that taxes on goods and services (indirect taxes) significantly and positively impact growth. At the same time, a negative correlation exists between corporate, property, and international trade taxes (direct taxes) and GDP growth rate. Similar findings for the case of Nigeria conducted by Ogundana et al. (2017) reveal the positive and significant relationship between indirect taxes and economic growth. On the other hand, they found a positive but insignificant impact of direct taxes on Nigeria's growth. Rehman et al. (2020) studied the relationship between indirect taxation and economic growth in 12 Asian countries by employing the Pooled Mean Group (PMG) estimation from 1996 to 2018. The results showed that indirect taxation positively and significantly impacts Asia's economic growth. They concluded that the impact of indirect taxes varied greatly from nation to nation due to the country's economic condition and political stability, which can play an important role in contributing to the positive impact on growth. A recent study of indirect taxes and economic growth covering 14 Middle East and North Africa (MENA) countries by Sayari et al. (2023) proved that the value-added tax (VAT) leads to an increase in economic growth and generates more revenue in the region.

In contrast to those findings, Ahmad et al. (2018) examined the impact of indirect tax on economic growth in Pakistan and revealed the negative relationship among these variables. Their findings suggested that an increase of 1 percentage point in indirect tax will lead to a fall in economic growth by 1.68 percentage points. The negative impact of indirect taxes on growth is also supported by Bansal and Alfardan (2020), which investigated the role of VAT in the economic development of Bahrain using both primary and secondary sources. They concluded that implementing VAT had increased the inflation rate and discouraged the production of Small and Medium Enterprises (SMEs), contributing to a fall in Bahrain's economy. Yanikkaya and Turan (2020) analysed the effect of tax structure on economic growth by dividing more than 100 countries into low, middle, and high income. They generated an interesting finding where the GMM estimation showed that shifting from income to consumption taxes has positively impacted growth in middle and high-income countries but negatively correlated in low-income countries. Neog and Gaur (2020) employed the ARDL approach to examine the relationship between taxes and economic growth in India from 1980 - 2016. They found that income and excise taxes do not contribute to long-term economic growth, whereas corporate taxes harm short and long-run growth.

Several studies have been conducted to reveal the possible impacts of direct taxes on economic growth. Ferede and Dahlby (2019), Bakari (2018), and Ojong et al. (2016) concluded that corporate income taxes had adverse effects on economic growth. Additionally, a study of taxation and economic growth in the case of Kenya by Owino (2018) argued that direct tax negatively impacted growth. For the case of OECD countries, Macek (2014) revealed that personal and corporate income taxes have significantly and negatively impacted economic growth. Ojeda and Yamarik (2012) relate tax policies and economic growth in 48 states in the United States by employing the PMG approach, and they found no

significant relationship between income taxes and economic growth in the short and long run. This finding was supported by Iswahyudi (2018), who examined the impact of tax structures on economic growth in Indonesia. He stressed that income taxes could not have a statistically significant impact on long-run growth.

Nonetheless, some studies revealed that the implementation of direct taxes may give an improvement in a country's economy. A recent study by Halim and Rahman (2022) found that the corporate tax rate is positively and significantly associated with emerging countries' sustainable development goals (SDG). It's indicated that a higher corporate tax rate led to achieving the SDG and stimulating growth in those countries. Data from 23 OECD countries covering the period of 1970 to 2000 was utilized in an endogenous growth model by Angelopoulos et al. (2007), proving the positive effect of corporate income taxes on economic growth. Higher corporate taxes may promote growth in technologically advanced industrialized countries by encouraging private innovation and supplying funds for beneficial state investment (Kate and Milionis, 2019). Hoang et al. (2021) studied the impact of taxation on economic growth by applying the dynamic panel Generalized Method of Moments (GMM) in 63 countries revealing that property taxes have contributed to the economic growth in low-income countries, while significantly negative in rich countries.

3. Methodology and The Data

3.1. Methodology

This study employs the Static Panel Fixed Effects (within) regression with Driscoll and Kraay's (1998) Standard Errors to reveal the significant impacts of tax structures on economic growth in all model estimations. According to a study conducted by Hoechle (2007), the standard errors produced by the ordinary least square (OLS) and cluster standard errors are assumed invalid and tend to be biased for the presence of cross-sectional dependence and heteroscedasticity in the panel data regression. Thus, the Static Panel Fixed Effects (within) regression with Driscoll and Kraay's Standard Errors is believed able to produce unbiased and more efficient results in dealing with cross-sectional dependence and heteroscedasticity, which usually occurs in many static panel datasets. In this case, two important tests were conducted, namely the Hausman test and the cross-sectional dependence (CD) test. An econometrics study by Wooldridge (2002) suggested applying the Hausman test to choose between the random effects (RE) and fixed effects (FE) regression for all the empirical models involved in this study. A test for cross-sectional dependence by Pesaran (2004) is selected to identify the presence of spatial dependence, as suggested by DeHoyos and Sarafidis (2006). In this case, rejecting the null hypothesis of this test will indicate that the element of cross-sectional dependence (CD) is present in the model estimation, and ignoring it will tend to produce biased and invalid results.

This study aims to investigate the effect of direct and indirect taxes on economic growth, focusing on Asian countries. The basic model of this study can be written as follows:

$$y_{it} = \alpha + \beta_0 \lambda_{it} + \beta_1 \chi_{it} + \varepsilon_{it} \quad (1)$$

Where y is the dependent variable (GDP per capita growth), α intercepts, β_0 and β_1 are the slopes of both direct and indirect taxes as the explanatory variables, ε_{it} is the error term, i represents the country (i = 1, 2, 3…., n), and t represents time (t = 1, 2, 3…., n). The empirical model of this study is based on studies conducted by Mdanat et al. (2018), Gashi et al. (2018), and Nguyen (2019), which studied the impact of tax structure on economic growth. The control variables are also included in the model regressions derived from the appropriate growth literature consisting of some important economic indicators. Thus, the empirical model of equation (1) can be specified as follows:

$$GDPPC_{it} = \alpha + \beta_0 INCOMET_{it} + \beta_1 LABORT_{it} + \beta_2 PROT_{it} + \beta_3 GST_{it} + \beta_4 TRADET_{it} + \beta_5 TAXES_{it} + \beta_6 EXP_{it} + \beta_7 CONS_{it} + \beta_8 POP_{it} + \beta_9 TRADE_{it} + \varepsilon_{it} \quad (2)$$

Where *GDPPC* is the dependent variable (GDP per capita growth), and explanatory variables consist of taxes on income, profits and capital gains (INCOMET), labour tax (LABORT), taxes on goods and services (GST), taxes on international trade (TRADET) and property taxes (PROT). The set of control variables are gross national expenditure/GDP (EXP), consumption expenditure/GDP (CONS), total tax revenue/GDP (TAXES), trade openness/GDP (TRADE), and population growth (POP) are assumed to relate with the dependent variable and components of tax as similar studies by Mdanat et al. (2018) and McNabb (2018). Involving direct and indirect taxes in a single equation (2) can lead to a problem of high collinearity (multicollinearity) among independent variables. To avoid that problem, we specify equation (2) by including only one tax component for each model estimation. Furthermore, the variance inflation factor (VIF) is adopted to confirm that no collinearity problem occurs in each model estimation (Shrestha, 2020). Therefore, the equation (2) can be extended to the following equations:

$$GDPPC_{it} = \partial_0 + \partial_1 TAXES_{it} + \partial_2 EXP_{it} + \partial_3 CONS_{it} + \partial_4 POP_{it} + \partial_5 TRADE_{it} + \varepsilon_{it} \quad (3)$$

$$GDPPC_{it} = \alpha_0 + \alpha_1 INCOMET_{it} + \alpha_2 TAXES_{it} + \alpha_3 EXP_{it} + \alpha_4 CONS_{it} + \alpha_5 POP_{it} + \alpha_6 TRADE_{it} + \varepsilon_{it} \quad (4)$$

$$GDPPC_{it} = \gamma_0 + \gamma_1 LABORT_{it} + \gamma_2 TAXES_{it} + \gamma_3 EXP_{it} + \gamma_4 CONS_{it} + \gamma_5 POP_{it} + \gamma_6 TRADE_{it} + \varepsilon_{it} \quad (5)$$

$$GDPPC_{it} = \eta_0 + \eta_1 GST_{it} + \eta_2 TAXES_{it} + \eta_3 EXP_{it} + \eta_4 CONS_{it} + \eta_5 POP_{it} + \eta_6 TRADE_{it} + \varepsilon_{it} \quad (6)$$

$$GDPPC_{it} = \beta_0 + \beta_1 TRADET_{it} + \beta_2 TAXES_{it} + \beta_3 EXP_{it} + \beta_4 CONS_{it} + \beta_5 POP_{it} + \beta_6 TRADE_{it} + \varepsilon_{it} \quad (7)$$

$$GDPPC_{it} = \beta_0 + \beta_1 PROT_{it} + \beta_2 TAXES_{it} + \beta_3 EXP_{it} + \beta_4 CONS_{it} + \beta_5 POP_{it} + \beta_6 TRADE_{it} + \varepsilon_{it} \quad (8)$$

3.2. Data

This study uses balanced panel data from 31 Asian countries from 2000 to 2020 (see Appendix 1). The datasets were collected from World Development Indicators (WDI), World Bank. Throughout the panel data analysis, Table 1 reveals the descriptive statistics for the variables considered in this study. The descriptive statistics for the selected Asian countries include the mean (X), standard deviation (σ), minimum (MIN), maximum (MAX), and observations (N). The dependent variable for 31 Asian countries is the GDP per capita growth (annual %). An analysis reported that the mean GDP per capita growth for 31 Asian countries is lower, 3.52%. The minimum value of an average GDP per capita growth of -54.64% in 2020 (Macao SAR, China) and 49.48% in 2004 (Iraq). This study also revealed that the average tax revenue as a percentage of GDP is 12.64% for the selected 31 Asian countries. Timor-Leste recorded the lowest tax revenue as a percentage of GDP in 2000 (-142.99 %) and the highest in 2012 (147.66%) among all selected Asian countries. The negative tax revenue of a percentage of GDP is concerning, as explained by the excess withdrawals from the petroleum funds leading to a deficit in federal spending. The negative government revenue is likely to cause higher borrowing. For example, Timor-Leste's general government borrowing as a percentage of GDP rose to 3.2% in 2002 (IMF, 2023).

Table 1: Descriptive statistics of the of the variables for 31 selected Asian countries

Variable	Unit of Measurement	$\underline{X}$	σ	Min	Max	N
GDPP	GDP per capita growth (annual %)	3.52	6.63	-54.64	49.48	651
EXP	Gross national expenditure (% of GDP)	102.09	28.99	-48.51	264.77	651
CONS	Final consumption expenditure (% of GDP)	74.84	25.55	3.47	236.86	651
POP	Population growth (annual %)	1.60	1.59	-1.94	15.18	651
TRADE	Trade (% of GDP)	97.83	69.09	11.86	437.33	651
TAXES	Tax revenue (% of GDP)	12.64	15.44	-142.99	147.66	651
INCOMET	Taxes on income, profits and capital gains (% of revenue)	21.18	13.74	-14.13	61.31	651
LABORT	Labour tax and contributions (% of commercial profits)	15.07	12.84	0	97.00	630
PROT	Property taxes (% of revenue)	2.59	4.77	-4.02	46.05	651
GST	Taxes on goods and services (% of revenue)	29.35	20.64	-28.67	182.18	651
TRADET	Taxes on international trade (% of revenue)	7.31	12.63	-120.21	64.11	651

Source: World Bank and Authors' calculation

The 21 years of historical data from 2000 to 2020 also depicted that the average of the taxes on income, profits and capital gains as a percentage of revenue is 21.18%. Iraq recorded the minimum value in 2000, equivalent to -14.13%. In 2020, Iran recorded a maximum value of 61.31%, indicating that this tax structure contributes more than 50% of Iran's total revenue. Moreover, the taxes on goods and services as a percentage of GDP is an average of 29.35%. China recorded 182.18% as the highest GST percentage of GDP in 2000. The lowest contributors among the tax structures in Asian countries are recorded by property taxes, followed by taxes on international trade, which contribute an average of 2.59% and 7.31% of total revenue, respectively.

Table 2: Correlation matrix of the variables for 31 selected Asian countries

	GDPP	EXP	CONS	POP	TRADE	TAXES	INCOMET	LABORT	OTHERT	GST	TRADET
GDPP	**1.00**										
EXP	**0.07**	1.00									
CONS	**0.04**	0.90	1.00								
POP	**-0.30**	-0.11	-0.06	1.00							
TRADE	**-0.05**	-0.34	-0.24	0.20	1.00						
TAXES	**-0.01**	0.09	0.03	-0.15	-0.01	1.00					
INCOMET	**0.09**	0.17	0.11	-0.32	-0.01	0.20	1.00				
LABORT	**0.07**	-0.06	-0.16	-0.13	-0.17	0.04	0.06	1.00			
PROT	**0.03**	0.03	0.05	-0.10	0.25	0.05	0.05	0.06	1.00		
GST	**0.09**	0.12	0.10	-0.30	-0.19	0.10	0.14	0.25	0.05	1.00	
TRADET	**-0.06**	-0.06	0.04	0.03	0.02	0.04	-0.08	-0.26	-0.04	-0.23	1.00

Source: World Bank and Authors' calculation.

Table 2 shows the correlation matrix of the variable for 31 selected Asian countries. The correlation analysis is important as it helps the study visualise the coefficient of relationship among each variable in the preliminary analysis. The study employed ten independent variables with one dependent variable of GDP per capita growth, whereby the result depicted criteria that are positive and negative correlations. It is confirmed that four of the independent variables are negatively correlated to GDP per capita growth. Specifically, the population growth, trade, tax revenue, and taxes on international trade depicted a weak negative relationship with the GDP per capita growth in the selected 31 Asian countries. Meanwhile, the selected from 31 Asian countries revealed that the gross national expenditure, final consumption expenditure, taxes on income, profits and capital gains, labour tax and contribution, goods and services tax, and property taxes have a weak positive relationship with the GDP per capita growth, (<0.10). Confirming an analysis of Field (2005), all specified variables of less than 0.80 indicate that the multicollinearity problem is not an issue in this result.

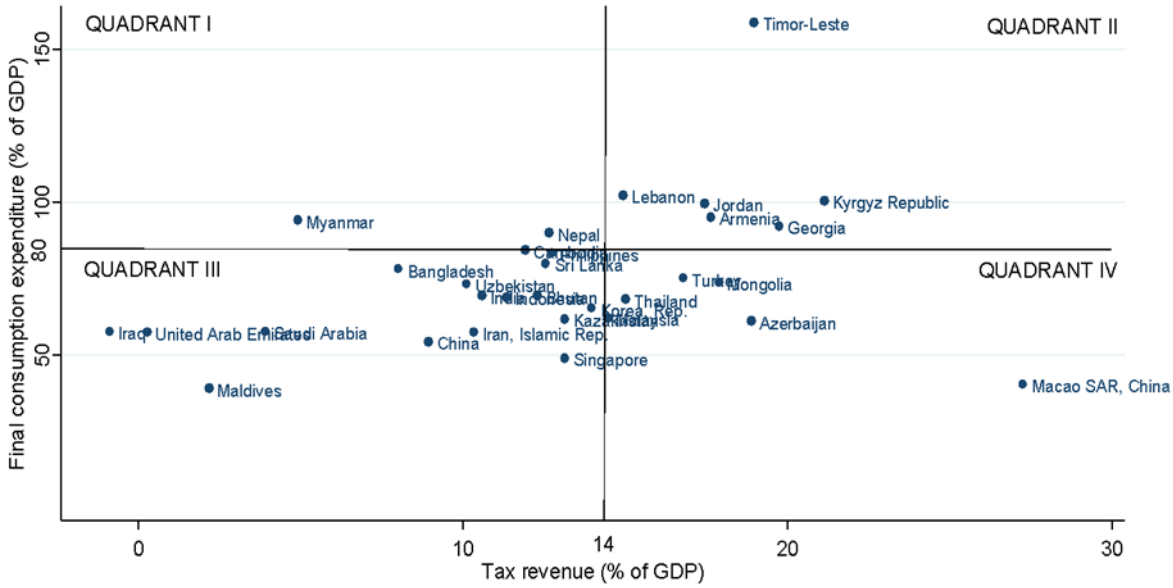

Figure 1: Quadrant matrix of average tax revenue and final consumption expenditure

The study extends the analysis with the Quadrant depicted in Figure 1. It shows an average relationship between tax revenue and final expenditure of selected Asian countries. The quadrant analysis is segregated into four quadrants, giving us a picture of the relationship for each of the selected Asian countries. Whereby Quadrant I (QI) has above-average final consumption expenditure with below-average tax revenue; Quadrant II (QII) has average final consumption expenditure and tax revenue; Quadrant III (QIII) has average final consumption expenditure and tax revenue; Quadrant IV (QIV), below average final consumption expenditure with above average tax revenue. There are two Asian countries categorized in Quadrant I, Myanmar and Nepal, indicating deficit spending, and these two countries are running with high final expenditure and low tax revenue. Smaller countries

categorized in Quadrant I are exposed to the risk of foreign direct investment and foreign ownership of external debt. This study categorized Timor-Leste, Lebanon, Jordan, Armenia, Georgia, and Kyrgyz Republic as Quadrant II, indicating above-average final consumption expenditure and government revenue.

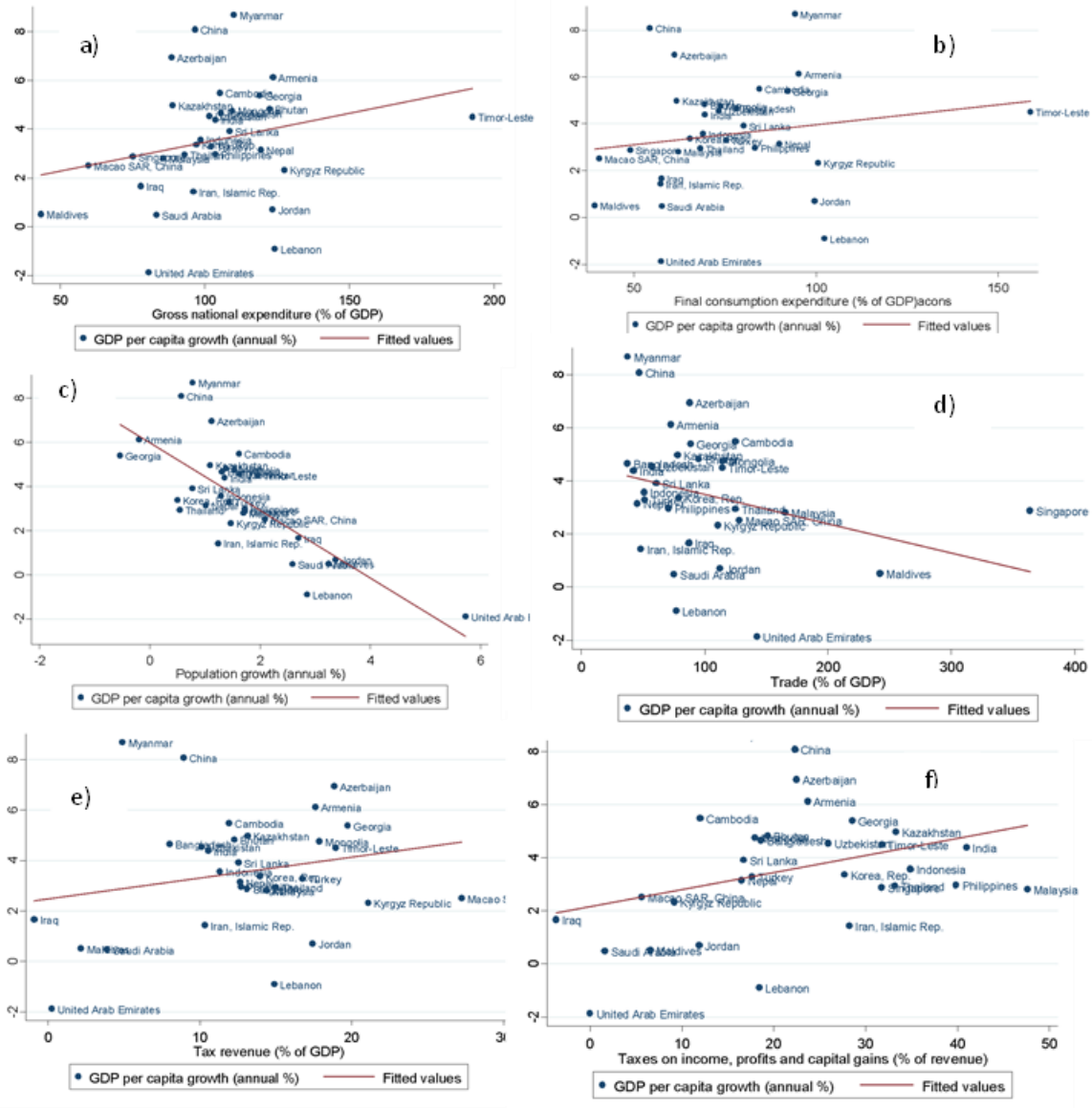

Figure 2a: Plot of the average GDP per capita growth (annual %) against average (a) Gross national expenditure (% of GDP); (b) Final consumption expenditure (% of GDP); (c) Population growth (annual %); (d) Trade (% of GDP); (e) Tax revenue (% of GDP); (f) Taxes on income, profits and capital gains (% of revenue)

Meanwhile, Turkey, Mongolia, Thailand, Malaysia, Azerbaijan, and China show an average final consumption expenditure below average and tax revenue above average, indicating

surplus government spending (QIV). Running a country with a surplus budget does not always promise to be beneficial. As such, it can sometimes come with its problems. The risks of a surplus budget are the decline in investment revenue, public goods, and infrastructure, as the government is not spending and investing as much as other regions. Another risk that may concern the country is that budget surpluses slow down the economy by reducing aggregate demand, leading to high unemployment and decreased consumer spending.

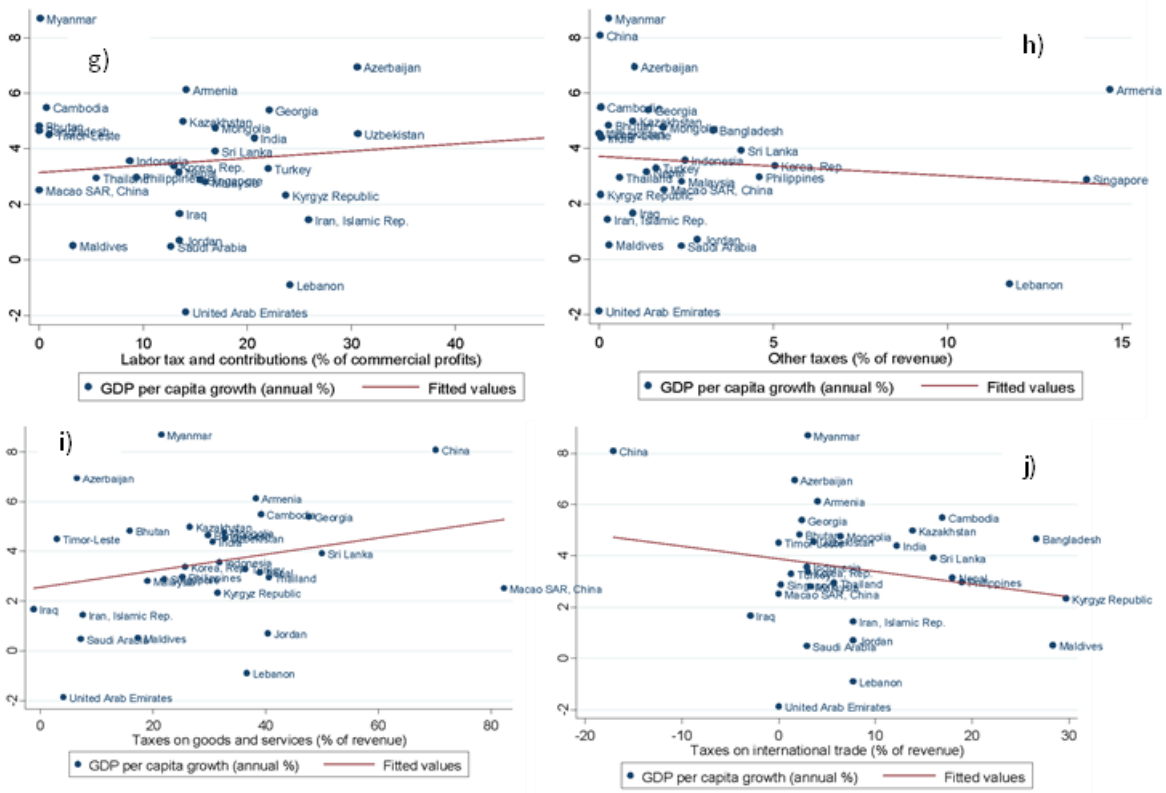

Figure 2b: Plot of the average GDP per capita growth (annual %) against average (g) Labor tax and contributions (% of commercial profits) (h) Other taxes (% of revenue); (i) Taxes on goods and services (% of revenue) (j) Taxes on international trade (% of revenue).

Figure 2 shows scatter plots of an average GDP per capita growth (annual %) against all average independent variables from 2000 to 2020. The scatter plots analysis results are consistent with the correlation matrix analysis results (Table 2). However, the scatter plots figure opposing the correlation matrix results for an average GDP per capita growth against tax revenue show a direct relationship. The scatter plots analysis predicts that an increase in tax revenue will increase the GDP per capita growth in the selected 31 Asian countries. Meanwhile, scatter plots also illustrate that other taxes will have an inverse relationship with the GDP growth per capita. An increase in other taxes in the selected 31 countries is expected to reduce GDP per capita growth.

4. Findings and Discussion

The regression results of equations (3) Model 1, (4) Model 2, (5) Model 3, (6) Model 4, (7) Model 5 and (8) Model 6 are presented in Table 3. There is no problem of high collinearity in each model estimation where the value of VIF is less than 5. The null hypothesis of the Breusch and Pagan (BP) LM test is rejected for all models except for Model 6, showing that the models can be pooled by using random effects (RE) or fixed effects (FE). In this case, applying the panel ordinary least squares (POLS) is considered biased and invalid. However, for the case of Model 6, POLS with robust standard errors is applied due to failure in rejecting the null hypothesis of the BP LM test. The results of the Hausman test for choosing between RE and FE estimations show that FE is the most suitable estimation for all five models. The Pesaran CD test indicates that rejecting the null hypothesis of cross-sectional dependence is absent in the model regressions. Therefore, applying the fixed effects (FE) estimation with Driscoll and Kraay's (1998) standard errors is assumed to be unbiased and valid, as suggested by Hoeche (2007).

Table 3 shows that total tax revenue (TAXES) significantly and negatively affects economic growth in all models. This finding is consistent with many past studies which conclude that taxes have burdened the economic growth in many countries (Widmalm, 2001; Schwellnus and Arnold, 2008; Acosta-Ormaechea and Yoo, 2012; Petru-Ovidiu, 2015; McNabb, 2018; Neog and Gaur, 2020). It implies that a percentage point increase in total tax revenue reduces growth rates by 0.02 to 0.04 percentage points in Asian countries. The control variables show a significant and mixed impact on economic growth. Government expenditure (EXP) and trade openness (TRADE) are found to be positive and highly significant on GDP per capita growth. The coefficient estimate suggests that for a percentage point increase in EXP, the growth rate rises from 0.02 to 0.06 percentage points, while an increase in TRADE leads to boosting the growth rates by 0.003 to 0.05 percentage points, respectively.

The positive relationship between these control variables and economic growth supports studies by Nguyen et al. (2022) and Waweru (2021). In the case of government expenditure, Wameru (2021) suggests that the productive government expenditure conducted by a country can lead to a positive input on the private production function. Nguyen et al. (2022) reveal that international trade has boosted economic restructuring, contributing to the revenue and economic growth in Southeast Asian countries. However, an opposite finding is generated for the relationship between consumption expenditure (CONS) and economic growth in all model estimations. Implying that a percentage point increase in CONS reduces growth rates by 0.02 to 0.09 percentage points, respectively. This contrasting finding follows studies by Barro (1991) and Mose (2021), which relate that the ineffectiveness of consumption was due to the "crowding out effect" on investment that led to an increase in the interest rate and discouraged private investments and output growth.

Turning to the effects of tax structure on economic growth, total tax revenue/GDP (TAXES) shows a significant and negative effect on growth. The results suggest that for a percentage point increase in TAXES, the GDP per capita growth decreases by 0.03 to 0.04 percentage

points. The coefficient on taxes on income, profit, and capital gain (INCOMET) and goods and services tax (GST) are showing negative and highly significant towards growth. A percentage point increase in both types of taxes leads to a fall in GDP per capita growth rates of around 0.05 and 0.02 percentage points, respectively. This is following several studies done by McNabb (2018), Macek (2014), and Ahmad et al. (2018), which studied the impact of both direct and indirect taxes on economic growth. In this case, the negative effect of INCOMET is slightly stronger than GST on growth in Asian countries.

Table 3: Results of regression

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
EXP_{it}	0.0513***	0.0537***	0.0621***	0.0492***	0.0510***	0.0228
	(0.0115)	(0.0110)	(0.0139)	(0.0121)	(0.0117)	(0.0281)
$CONS_{it}$	-0.0849*	-0.0809*	-0.0675**	-0.0855**	-0.0833*	-0.0204
	(0.0431)	(0.0416)	(0.0287)	(0.0394)	(0.0433)	(0.0287)
POP_{it}	-0.5870	-0.5940	-0.6490	-0.5410	-0.5900	-1.131***
	(0.4040)	(0.4010)	(0.3780)	(0.4180)	(0.4000)	(0.1250)
$TRADE_{it}$	0.0514***	0.0517***	0.0543***	0.0508***	0.0509***	0.0027
	(0.0157)	(0.0155)	(0.0187)	(0.0153)	(0.0155)	(0.0041)
$TAXES_{it}$	-0.0372*	-0.0335*	-0.0286*	-0.0364*	-0.0370*	-0.0245
	(0.018)	(0.0178)	(0.0154)	(0.0181)	(0.0179)	(0.0365)
Tax components						
$INCOMET_{it}$		-0.0482***				
		(0.0146)				
$LABORT_{it}$			0.0678			
			(0.043)			
$PROT_{it}$				0.242***		
				(0.0647)		
GST_{it}					-0.0225**	
					(0.0097)	
$TRADET_{it}$						-0.0183
						(0.0182)
BP LM test	2.07*	2.09*	7.77***	2.18*	2.02*	1.53
	(0.0750)	(0.0740)	(0.0027)	(0.0697)	(0.0778)	(0.1083
Hausman test	33.12***	34.37***	32.86***	44.99***	36.20***	35.70***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Pesaran CD test	33.560***	32.688***	31.172***	31.814***	32.734***	33.292***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
M.Wald test	16830.35***	13991.36***	11068.73***	16889.04***	16171.82***	16407.94***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Mean VIF	3.07	2.83	2.72	2.77	2.76	2.83
No. of country	31	31	31	31	31	31
Observations	651	651	630	651	651	651

*Notes: All models are estimated using the Static Panel Fixed Effects (within) regression, except for Model 6, which uses the Panel Ordinary Least Squares (POLS) with robust standard errors. Values in the parentheses are Driscoll and Kraay's (1998) standard errors except for the BP LM test, Hausman test, Pesaran CD test, and M.Wald test for panel heteroscedasticity, which are p-values. ***, ** and * indicate significance at 1%, 5% and 10% levels, respectively.*

On the other hand, we find a positive and significant impact of PROT (property taxes) on economic growth. The results reveal that a percentage point increase in this tax promotes growth rates by 0.24 percentage points in Asian countries. The estimated coefficient shows the highest impact on growth compared to the other types of tax structures. This is in line with the studies by Stoilova (2017), Acosta-Ormaechea et al. (2019), and Neog and Gaur (2020), which conclude that property and consumption taxes contribute to the economic growth in middle- and high-income countries. The property tax can play a significant role in bolstering local government funding, encouraging rural development, and enhancing the equitable allocation of tax burdens (Bahl et al., 2008). Moreover, a study done by Arnold (2008) suggested that the most growth-friendly taxes appear to be those related to property, especially recurrent taxes on immovable property, followed by taxes on consumption.

Looking at the other two types of taxes, labour tax (LABORT) and international trade tax (TRADET) show insignificant but mixed effects on growth. The positive relationship between LABORT and per capita GDP growth follows Lubian and Zarri (2011). A rise in labour tax can lead to an increase in the working effort to achieve a higher level of income before taxation. This situation directly contributes to the higher GDP per capita growth in Asian countries. Specifically, the coefficient estimates point to a 0.07 per cent increase in growth rates.

5. Conclusions

In this study, we intend to investigate the effects of tax structures on economic growth in 31 Asian countries from 2000 to 2020. All the data were collected from the World Bank Database, World Development Indicators (WDI). Empirical evidence from regression analysis using both the Panel Fixed Effects (within) with the Driscoll and Kraay Standard Errors and Panel Ordinary Least Squares (POLS) estimations suggest that total tax revenue/GDP significantly and negatively affects economic growth. When looking at the types of tax structures, the empirical evidence revealed that taxes on income, profit and capital gain (direct taxes), goods and services tax, and international trade tax (indirect taxes) affect growth negatively. In this case, the empirical results proved that these taxes are harmful to the GDP per capita growth in Asian countries. The rise in these taxes may restrict the ability of individual and corporate taxpayers to contribute to economic growth in their country by limiting their willingness to produce and consume more products in the market. In contrast, we find a positive and significant impact of property taxes, while labour taxes have an insignificant but positive impact on GDP per capita growth in Asian countries. This implies that the policymakers and governments in Asian countries need to pay more attention to these types of taxes, especially property taxes, which have potentially positive effects of sustaining and promoting higher economic growth rather than relying on income and consumption (goods and services) taxes.

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References

Acosta Ormaechea, S., & Yoo, J. (2012). *Tax composition and growth: A broad cross-country perspective* (Working Paper No. 12/257). International Monetary Fund.

Acosta-Ormaechea, S., Sola, S., & Yoo, J. (2019). Tax composition and growth: A broad cross-country perspective. *German Economic Review, 20*(4), 70–106.

Ahmad, S., Sial, M. H., & Ahmad, N. (2018). Indirect taxes and economic growth: An empirical analysis of Pakistan. *Pakistan Journal of Applied Economics, 28*(1), 65–81.

Angelopoulos, K., Economides, G., & Kammas, P. (2007). Tax-spending policies and economic growth: Theoretical predictions and evidence from the OECD. *European Journal of Political Economy, 23*(4), 885–902.

Arnold, J. (2008). *Do tax structure affect aggregate economic growth? Empirical evidence from a panel of OECD countries* (OECD Economics Department Working Papers No. 641). OECD Publishing. https://dx.doi.org/10.1787/236001777843

Bahl, R., Martinez-Vazquez, J., & Youngman, J. (2008). Making the Property Tax Work. *Cambridge, Massachusetts: Lincoln Institute of Land Policy*. http://www.lincolninst.edu/pubs/1374_Making-the-Property-Tax-Work

Bakari, S. (2018). If France continues this strategy, taxes will destroy domestic investment and economic growth. *University Library of Munich, Germany, Munich Personal Repec Archive Paper*, 88944.

Bansal, A., & Alfardan, A. A. (2020). Role of value added tax in the economic development of Kingdom of Bahrain. *Journal of Critical Reviews, 7*(3), 17–24. https://doi.org/10.31838/jcr.07.03.03

Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy, 98*(5), 103–126.

Barro, R.J. (1991). Economic growth in a cross section of countries', *The Quarterly Journal of Economics, 106*(2), 407-43.

DeHoyos, R. E., & Sarafidis, V. (2006). Testing for cross-sectional dependence in panel data models. *Stata Journal, 6*, 482–496.

Driscoll, J., & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent data. *Review of Economics & Statistics, 80*, 549–560.

Ferede, E., & Dahlby, B. (2019). The effect of corporate income tax on the economic growth rates of the Canadian provinces. *The School of Public Policy Publications, 12*(29).

Field, A. (2005). Discovering Statistics Using SPSS. Sage Publication Ltd.

Gashi, B., Asllani, G., & Boqolli, L. (2018). The effect of tax structure in economic growth. *International Journal of Economics and Business Administration, 6*(2), 56–67.

Hakim, T. A. (2020). Direct versus indirect taxes: Impact on economic growth and total tax revenue. *International Journal of Financial Research, 11*(2), 146–153. https://doi.org/10.5430/ijfr.v11n2p146

Halim, M. A., & Rahman, M. M. (2022). The effect of taxation on sustainable development goals: evidence from emerging countries. *Heliyon. 8*(9), 1–9. https://doi.org/10.1016/j.heliyon.2022.e10512

Hoang, L. K., Cao, B. T., Le K. M., & Nguyen, T. T. (2021). Taxation and economic growth: a regression analysis based on a new classification. *Economic Horizons, 23*(3), 215–229. https://doi:10.5937/ekonhor2103225H

Hoechle, D. (2007). Robust standard errors for panel regression with cross-sectional dependence. *The Stata Journal, 7*(3), 281–312.

International Monetary Fund (2023). *Financial access survey*.

Islam, M. R. (2016). Contribution of indirect taxes on GDP of Bangladesh. *Asia Pacific Journal of Research, 1*(38), 213–217.

Iswahyudi, H. (2018). Do tax structures affect Indonesia's economic growth? *Journal of Indonesian Economy and Business, 33*(3), 216–242.

Jones, L., Manuelli, R., & Rossi, P. (1993). Optimal taxation in models of endogenous growth. *Journal of Political Economy, 101*(3), 485–517

Kate, F., & Milionis, P. (2019). Is capital taxation always harmful for economic growth? *International Tax and Public Finance, 26*(4), 758–805. https://doi.org/10.1007/s10797-019-09530-3

King, R., & Rebelo, S. (1990). Public policy and economic growth: developing neoclassical implications. *Journal of Political Economy, 98*(5), 126–150.

Korkmaz, S., Yilgor, M., & Aksoy, F. (2019). The impact of direct and indirect taxes on the growth of the Turkish economy. *Public Sector Economics, 43*(3), 311–323. https://doi.org/10.3326/pse.43.3.5

Lubian, D., & Zarri. L. (2011). *Happiness and tax morale: an empirical analysis* (Working Paper No. 04). University of Veroa.

Macek, R. (2014). The impact of taxation on economic growth: Case study of OECD countries. *Review of economic perspectives, 14*(4), 309–328. https://doi.org/10.1515/revecp-2015-0002

Martinez-Vazquez, J. (2014). *Taxation in Asia*. Asian Development Bank.

Mcnabb K. (2018) Tax structures and economic growth: new evidence from the government revenue dataset. *Journal of International Development, 30*, 173–205. https://doi.org/10.1002/jid.3345.

Mdanat, M. F., Shotar, M., Samawi, G., Mulot, J., Arabiyat, T. S., & Alzyadat, M. A. (2018). Tax structure and economic growth in Jordan, 1980-2015. *EuroMed Journal of Business, 13*(1), 102–127. https://doi.org/10.1108/EMJB-11-2016-0030

Mose, N. (2021). Determinants of regional economic growth in Kenya. *African Journal of Business Management, 15*(1), 1–12.

Nazir, A., Anwar, S., & Nasreen, S. (2020). Tax structure and economic growth: middle-income Asian countries analysis. *Forman Journal of Economic Studies, 16*, 53 – 80. https://doi.org/10.32368/FJES20201603

Neog, Y., & Gaur, A. K. (2020). Tax structure and economic growth in India: Insights from ARDL model. *Indian Growth and Development Review, 13*(3), 589–605.

Nguyen, H. H. (2019). Impact of direct tax and indirect tax on economic growth in Vietnam. *Journal of Asian Finance, Economics, and Business, 6*(4), 129–137. https://doi.org/10.13106/jafeb.2019.vol6.no4.129

Nguyen, M. H., Pham, T. M., & Quan M. Q. B. (2022). The determinants of tax revenue: A study of Southeast Asia. *Cogent Economics & Finance 10*(1), 1–20. https://doi.org/10.1080/23322039.2022.2026660

Ogundana, O. M., Ogundana, O. M., Ogundama, O. M., Ibidunni, A. S., & Adetoyinbo, A. (2017). Impact of direct and indirect tax on the Nigeria economic growth. *Binus Business Review, 8*(3), 215–220. https://doi.org10.21512/bbr.v8i3.3621

Ojede, A., & Yamarik, S. (2012). Tax policy and state economic growth: The long run and short-run of it. *Economics Letters, 116*(2), 161-165.

Ojong, C. M., Anthony, O., & Arikpo, O. F. (2016). The impact of tax revenue on economic growth: Evidence from Nigeria. *Journal of Economics and Finance, 7*(1), 32-38.

Owino, O. B. (2018). The trade off between direct and indirect taxes in Kenya: An empirical analysis. *Journal of Economics and Development Studies, 6*(4), 187–201. https://doi.org.10.15640/jeds.v6n4a16

Pesaran, M. H. (2004). *General diagnostic tests for cross section dependence in panels* (Working Papers in Economics No. 0435). University of Cambridge.

Rehman, Z. U., Khan, M. A., & Tariq, M. (2020). Indirect taxation and economic growth relationship: empirical evidence from Asian countries. *Pakistan Journal of Humanities & Social Sciences Research, 3*(1), 132–144.

Sayari, K. T., Jassem, S., & Vahdati, S. E. (2023). VAT revenue and economic growth in the Middle East and North Africa region: evidence from panel data analysis. *Journal of Tax Reform, 9*(2), 233–245. https://doi.org/10.15826/jtr.2023.9.2.139

Schwellnus, C., & Arnold, J. (2008). *Do corporate taxes reduce productivity and investment at the firm level? cross-country evidence from the Amadeus dataset* (OECD Economics Department Working Papers No. 641). OECD Publishing.

Shrestha, N. (2020). Detecting multicollinearity in regression analysis. *American Journal of Applied Mathematics and Statistics 8*(2), 39–42. https://doi:10.12691/ajams-8-2-1

Solow, R. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics, 70*(1), 65–94.

Stoilova, D. (2017). Tax structure and economic growth: Evidence from the European Union. *Contaduría y Administración, 62(*3), 1041–1057. https://doi.org/10.1016/j.cya.2017.04.006

Swan, T. (1956). Economic growth and capital accumulation. *Economic Record, 32*(2), 334–361.

Waweru, D. (2021). Government capital expenditure and economic growth: An empirical investigation. *Asian Journal of Economics, Business and Accounting, 21*(8), 29–36.

Widmalm, F. (2001). Tax structure and growth: are some taxes better than others? *Public Choice, 107*(3), 199–219.

Wooldridge, J. (2002), Econometric Analysis of Cross Section and Panel Data, MIT Press.

Xing, J. (2012). Tax structure and growth: how robust is the empirical evidence? *Economics Letters, 117*(1), 379–382.

Yanikkaya, H., & Turan, T. (2020). Tax Structure and economic growth: Do differences in income level and government effectiveness matter? *The Singapore Economic Review, 65*(1), 217–237.

Appendix

Appendix 1: List of 31 Asian countries

No.	Country	No.	Country
1	Armenia	17	Macao SAR, China
2	Azerbaijan	18	Malaysia
3	Bangladesh	19	Maldives
4	Bhutan	20	Mongolia
5	Cambodia	21	Myanmar

6	China	22	Nepal
7	Georgia	23	Philippines
8	India	24	Saudi Arabia
9	Indonesia	25	Singapore
10	Iran, Islamic Rep.	26	Sri Lanka
11	Iraq	27	Thailand
12	Jordan	28	Timor-Leste
13	Kazakhstan	29	Turkiye
14	Korea, Rep.	30	United Arab Emirates
15	Kyrgyz Republic	31	Uzbekistan
16	Lebanon		