



Determinants of Tax Revenue in Upper Middle-Income Group of Countries

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Abstract: The study had two main objectives. Firstly, to investigate the determinants of tax revenue in upper middle-income countries. Secondly, to explore the impact of the interaction between foreign direct investment (FDI) and financial development on tax revenue in upper middle-income countries. Panel data ranging from 2007 to 2017 was used in this study. Econometric estimation methods used include the dynamic generalized methods of moments (GMM) approach, random effects, pooled ordinary least squares (OLS) and fixed effects. Lag of tax revenue, financial development, FDI, economic growth, urbanization, human capital development, population growth and the interaction between FDI and financial development to a greater extent were found to have a significant positive impact on tax revenue. Exchange rate and trade openness had a deleterious effect on tax revenue. Upper middle-income countries are therefore urged to develop and implement policies aimed at increasing FDI inflows, urbanization, economic growth, population growth, human capital development and financial development in order to enhance tax revenue generation and collection. Future empirical research should investigate the minimum threshold levels of these explanatory variables of tax revenue that must be attained in order to trigger significant tax revenue collection.

Keywords: Tax Revenue; Upper Middle-Income Countries; Panel Data Analysis

JEL Classification: C23; F21; G15; H2

1. Introduction

The focus of this section is to lay bare the foundational aspects of this study. This include the background, contribution towards literature and the organization of the study.

Background of the study: The positive impact of tax revenue on economic growth is no longer a debatable issue in finance and economics (Brebler, 2012). Majority of theoretical literature agrees that tax revenue enhances economic growth through availing funding to the government to enable it to spearhead several infrastructural and economic boosting activities (Macek, 2014; Brebler, 2012; Stoilova & Patonov, 2012). It is however difficult for government authorities to design and implement policies aimed at enhancing economic growth through taxation if not enough information is known about the determinants of tax revenue. It is against this background that this study investigated the

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determinants of tax revenue in the upper middle-income countries. The policy implications is that the study should help or act as a guideline to upper middle-income countries when they are designing and developing taxation policies that enhances economic growth of their economies.

There are several empirical researches that have attempted to investigate the determinants of tax revenue (see section 3 of this study). What is coming out of the available empirical research is that (1) the findings are mixed, divergent and non-conclusive), (2) majority of them wrongly assumed that the tax revenue function is linear, (3) majority ignored the endogeneity problem and excluded the impact of the lag of tax revenue on tax revenue, (4) wrongly assumed that variables influenced tax revenue directly not through some channels, (5) focused on other countries or economic groupings, which is not the upper middle-income countries. These characteristics of available empirical research on the determinants of tax revenue shows that further empirical research on the subject matter is required.

Contribution of the study: The study contributes towards literature in a number of ways. Firstly, this study is the first of its kind to investigate the determinants of tax revenue in upper middle-income countries. The only known study to the best of the author's knowledge which investigated the determinants of tax revenue in middle-income countries was done by Boukbech et al (2019) but used lower middle-income countries as a unit of analysis. Secondly, this study assumed that the tax revenue function is a non-linear one, unlike majority of earlier empirical research work on the subject matter. Thirdly, the study used the dynamic GMM econometric estimation approach, a superior methodology in that it captures the dynamic features of the tax revenue data and also addresses the endogeneity problem. Fourthly, four panel data analysis methods (dynamic GMM, pooled OLS, random effects, fixed effects) were used for results comparison and robustness purposes. Fifthly, this study is the first of its kind according to the author's best knowledge to investigate the impact of the complementarity between FDI and financial development on tax revenue in upper middle-income countries.

Organization of the rest of the paper: The paper has six more sections. Section 2 discusses and explains the theoretical literature on the determinants of tax revenue. Section 3 reviews empirical literature that exists on the determinants of tax revenue. Section 4 describes, explains and justifies the research methodology. In particular, the section focuses on the general and econometric model specifications. Section 5 is the data analysis and results discussion. Panel root tests, panel co-integration, presentation of results, discussion and interpretation of results are the major highlights of this section. Section 6 concludes the paper. Section 7 is the reference list.

2. Tax Revenue Determinants – Theoretical Literature

The determinants of tax revenue from a theoretical literature viewpoint are discussed and summarized in Table 1.

Table 1. Theoretical Literature on the Determinants of Energy Consumption

Variable	Proxy used	Theory intuition	Expected sign
Financial development (FIN)	Domestic credit by financial sector (% of GDP)	Increased development of the formal financial sector lead to an increase in formal financial activities and tax revenue collected in the economy (Masiya et al., 2015). The same study noted that tax revenue goes up in response to increased monetization of the economy (M2), which is broad money.	+
Economic growth (GROWTH)	GDP per capita	High levels of economic growth activities increase the chances of firms making a profit and thereby contributing more towards tax revenue (sales tax, value added tax, excise duty, corporate income tax) to the government (Gupta, 2007).	+
Trade openness (OPEN)	Exports of goods and services (% of GDP)	Castro and Camarillo (2014) argued that import taxes increase the overall tax revenue collected for the country. More possibilities to collect various forms of taxes emerge as trade expands, competitiveness in the economy and formalization of the economy increases. On the other hand, Baunsgaard and Keen (2010) argued that trade openness is associated with removal of trade barriers and general tariff reduction in the economy hence lower tax revenue collected.	+/-
Foreign direct investment (FDI)	Net FDI inflows (% of GDP)	Consistent with Amoh and Adom (2017), FDI inflow contributes to an increase in overall tax revenue collection in the economy through two ways. Firstly, through enhancing economic growth and expansion activities in the economy. Secondly, through increasing formalization of economic activities and competitiveness in the economy.	+
Urbanization (URBAN)	Urban population (% of total population)	Urbanization is associated with a move away from informal to formal economy, hence boosting the amount of tax revenue collected (Chilima, 2005). Engagement in more formal work as urbanization levels grows enhances the amount of tax revenue collected.	+
Human capital development (HCD)	Human capital development index	The population's general ability to comprehend, follow and adhere to tax revenue rules, procedures and codes is mainly determined by the human capital development indices (Chilima, 2005, p. 57). Consistent with Castro and Camarillo (2014), high levels of human capital development leads to further specialization, better skills, more sophisticated production approaches and entrenched	+

		economic growth activities which leads to more tax revenue collection.	
Population growth (POP)	Population growth (annual %)	An increase in population is associated with an increase in the demand and consumption of goods and services hence boosting the tax base size in the economy (Awasthi et al., 2020, p. 8).	+
Exchange rate (EXCH)	Official exchange rate (LCU per US\$, period average)	According to Masiya et al (2015), undervaluation of the domestic currency normally tends to have a positive effect on economic activities through increasing demand of locally produced goods and services in international markets and hence leads to increased tax revenue collected. Overvaluation of the domestic currency negatively affects economic activities in the country because it reduces the demand of local goods and services in the international markets, which leads to reduced tax revenue generated and collected (Masiya et al., 2015, p. 5).	+/-
Complementarity between financial development and foreign direct investment	Net foreign direct investment inflow (% of GDP) x Domestic credit by financial sector (% of GDP)	Foreign direct investment flowing in through more developed formal financial systems are more likely to lead to increased revenue collection by the government (Amoh and Adom, 2017; Masiya et al., 2015).	+

Source: Author compilation

The theoretical literature on the determinants of tax revenue is not exhaustive on the subject matter. The determinants of tax revenue are discussed by theorists as stand alone and not in a consolidated manner. In other words, theory which explains the determinants of tax revenue as a unit is so far not available. There is no theory which attempted to argue one single list of the determinants of tax revenue. This study attempts to fill in that gap.

3. Empirical Literature on Tax Revenue Determinants

The determinants of tax revenue's empirical literature is reviewed in Table 2.

Table 2. Tax Revenue Determinants -Empirical Literature Review

Author	Country/Countries of study	Period	Methodology	Results
Gupta (2007)	Developing countries	1980-2004	Panel data analysis	Economic growth, trade openness, foreign aid and agricultural sector production were found to have determined tax revenue growth in developing countries.
Castro and Camarillo (2014)	Organization for Economic Cooperation Department (OECD)	2001-2011	Panel data analysis	Industrial sector growth, civil liberty availability and economic growth were found to have had a significant positive impact on tax revenue in OECD group of countries. Tax revenue was also found to have been affected by its own lag.
Ade et al (2018)	Southern Africa Development Community (SADC) countries	1990-2010	Panel data analysis	Tax reforms and foreign direct investment inflows improved tax revenue inflows in the SADC region.
Boukbech et al (2019)	Lower middle-income countries	2001-2014	Fixed and random effects	Agriculture and economic growth had a significant positive influence on tax revenue. Trade openness had a non-significant positive impact on tax revenues. Population growth had an insignificant negative effect on tax revenue in lower middle-income countries.
Rodriguez (2018)	Developing countries	1976-2015	Unbalanced panel data analysis	Financial development, agricultural productivity, natural resources, human capital development, democracy and quality of governance were found to have had a significant positive influence on tax revenues.
Terefe and Teera (2018)	East African countries	1992-2015	Fully Modified Ordinary Least Squares and Dynamic GMM approach	Economic growth, trade openness, agricultural growth, service industry growth, foreign aid and manufacturing industry growth had a significant positive effect on tax revenue in East African countries. Exchange rate, urbanization and inflation were found to have had a significant negative impact on the whole region. On the other hand, one period lag of taxation and

				urbanization had a deleterious effect on tax revenue whilst two period lag of taxation and that of urbanization had a significant positive influence on tax revenue on East African group of countries.
Masiya et al (2015)	Malawi	2003-2012	Ordinary least square regression	An increase in broad money and economic growth were found to enhance revenue generation in Malawi.
Helene (2009)	Developing countries	1990-2005	Panel data analysis	High level of democracy in rich natural resources countries enhanced the tax revenues in developing nations.
Chilima (2005)	Malawi	1980-2016	Autoregressive Distributive Lag (ARDL)	Broad money supply, economic growth, service industry growth and exchange rate had a significant positive effect on tax revenue in Malawi. Trade openness had a positive impact on tax revenue in Malawi.
Piancastelli and Thirlwall (2020)	Developed and developing countries	1996-2015	Panel data analysis	Industrial growth, broad money supply, economic growth, trade openness and agricultural productivity are some of the variables found to have a positive influence on tax revenue.
Amoh and Adom (2017)	Ghana	Not shown in the abstract	Time series data analysis	Foreign direct investment, external debt, manufacturing and service industry growth and government consumption had an influence on tax revenue growth in Ghana.
Awasthi et al (2020)	United States, Australia, Chile, Canada, Organization for Economic Cooperation and Development	2006-2016	Fixed effects model	Increase in population and gross domestic product (GDP) enhanced tax revenues.
Anuah (2019)	Malaysia	1980-2015	Ordinary least squares and time series data analysis	Inflation, exchange rate and agricultural productivity increased tax revenue whilst trade openness had a deleterious effect on tax revenue in Malaysia
Andrejovska and Pulikova (2018)	European Union countries	Not given in the study	Fixed effects, pooled ordinary least squares (OLS) and random effects	Employment, economic growth and foreign direct investment had a positive impact of tax revenue growth.

Chaudry and Munir (2010)	Pakistan	1973-2009	OLS	Low literacy level, narrow tax base and dependence on foreign aid and agricultural sector led to low levels of tax revenue in Pakistan during the period under review.
Ahmad et al (2016)	Pakistan	1975-2012	ARDL	Tax compliance and economic growth were found to be significant positive factors affecting tax revenue. Narrow tax base and informal economic growth had a deleterious effect on tax revenue in Pakistan.
Aamir et al (2011)	India and Pakistan	1999-2009	OLS	India raised more revenue through charging direct taxes whilst Pakistan raised more revenue through indirect taxes.
Karagoz (2013)	Turkey	1970-2010	OLS	Foreign debt, urbanization, agricultural and industrial sector growth had a significant positive impact on tax revenue in Turkey.

Source: Author compilation

The fact that the results coming from the existing empirical literature is mixed, divergent and far from agreeing on a common list of factors that determine tax revenue means that this subject matter requires further empirical analysis. It also means that there is still room for contribution to literature in as far as the determinants of tax revenue is concerned.

4. Research Methodology

Empirical researchers such as Karagoz (2013), Aamir et al (2011), Ahmad et al (2016), Andrejovska and Pulikova (2018), Anuah (2019), Awasthi et al (2020), Piancastelli and Thirlwall (2020) and Amoh and Adom (2017) informed the current study's general model specification construction (see equation 1).

$$TR=f(FDI, FIN, GROWTH, OPEN, URBAN, HCD, POP, EXCH) \quad (1)$$

Where abbreviations TR, FDI, FIN, GROWTH, OPEN, URBAN, HCD, HCD, POP and EXCH respectively represents tax revenue, foreign direct investment, financial development, economic growth, trade openness, urbanization, human capital development, population growth and exchange rate. TR is proxied by tax revenue (% of GDP), FDI is measured by net foreign direct investment (% of GDP) whilst domestic credit by financial sector (% of GDP) was used to mimic financial development. Whilst GDP per capita and total trade (% of GDP) were used as measures of economic growth and trade openness respectively, urban population (% of total population) is the proxy of urbanization employed in this study. Human capital development was measured by human capital development index whilst population growth (annual %) is the measure of population growth used in this study. Official exchange rate (LCU per US\$, period average) was used as a measure of exchange rate. The choice of proxies was to a large extent informed by empirical studies done on a similar subject matter. The most recent of them being Karagoz (2013), Ahmad et al (2016), Aamir et al

(2011), Andrejovska and Pulikova (2018), Piancastelli and Thirlwall (2020), Awasthi et al (2020), Amoh and Adom (2017) and Anuah (2019).

Equation 2 is the transformed equation 1, in econometric terminology.

$$TR_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 FIN_{it} + \beta_3 (FDI_{it} \cdot FIN_{it}) + \beta_4 GROWTH_{it} + \beta_5 OPEN_{it} + \beta_6 URBAN_{it} + \beta_7 HCD_{it} + \beta_8 POP_{it} + \beta_9 EXCH_{it} + \mu + \varepsilon \quad (2)$$

β_0 is an intercept whereas $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9$ are coefficients for foreign direct investment, financial development, combination of foreign direct investment and financial development, economic growth, trade openness, urbanization, human capital development, population growth and exchange rate respectively. If the co-efficient β_4 is positive and significant, it means the combination of foreign direct investment and financial development significantly enhances tax revenue in upper middle-income countries and vice versa if the same co-efficient is negative. Pooled OLS, fixed and random effects econometric estimation techniques are used to approximate equation 2.

$$TAX_{it} = \beta_0 + \beta_1 TR_{it-1} + \beta_2 FDI_{it} + \beta_3 FIN_{it} + \beta_4 (FDI_{it} \cdot FIN_{it}) + \beta_5 X_{it} + \mu + \varepsilon \quad (3)$$

Consistent with Masiya et al (2015), the lag of tax revenue (see equation 3) is included in the model in order to get rid of autocorrelation and also capturing the dynamic effects in political processes. Due to the fact that current tax revenue to a large extent rely on the prior tax revenue collected, tax revenue is expected to be positively related to its lag. According to Castro and Camarillo (2014), a positive sign of the impact of the lag of tax revenue follows a Keynesian approach in which high tax levels collected leads to increased public expenditure and economic growth activities. This leads to more tax revenue collection. A negative sign of the lag of tax revenue is in line with the neo-classical approach. The latter dampens economic growth activities and consequently stifle the amount of tax collected. The dynamic GMM econometric approach was used to estimate equation 3.

5. Data Analysis and Results Discussion

The study made use of 2007 to 2017 panel data which was extracted from international databases such as United Nations Development Programmes, International Financial Statistics, International Monetary Fund, World Development Indicators, Africa Development Bank, among others. Upper middle-income countries constituting this study included South Africa, Brazil, Argentina, Colombia, China, Mexico, Malaysia, Russia, Peru, Turkey and Thailand. Consistent with Aye and Edoja (2017), all the data sets were converted into natural logarithms in order to deal away with autocorrelation, multicollinearity and spurious results.

Panel unit root tests: The results are presented in Table 3.

Table 3. Panel Root Tests –Individual Intercept

Level				
	LLC	IPS	ADF	PP
LTR	-2.2187	-0.4203	10.3429	5.0023
LFDI	-1.6719	0.5048	6.8120	5.8325
LFIN	-2.6298**	-2.1649***	22.8238**	23.8516***
LGROWTH	-1.6719	-3.9538	1.0527	0.9521
LOPEN	-0.7327	-0.0476	7.7616	6.9316
LURBAN	-1.7649**	-3.1274***	27.1218***	73.8429***
LHCD	-2.6518	-1.0934	2.4582	3.7615
LPOP	-1.8734**	-2.7769**	-1.4398	-3.5683*
LEXCH	-1.7628	-1.0056*	2.6523**	7.9945*
First difference				
LTR	-4.0072**	-3.8711***	34.9988***	56.7216***
LFDI	-2.8739***	-4.3487***	33.7218***	67.9923***
LFIN	-4.9921*	-5.8934***	78.9944***	101.4523***
LGROWTH	-5.8723**	-8.9432**	18.0005**	11.5683***
LOPEN	-2.9327***	-1.7645***	27.8318***	48.9341***
LURBAN	-4.0665***	-9.0427***	76.9342***	176.0437***
LHCD	-6.5683***	-3.7629***	32.8218***	44.8652***
LPOP	-3.9954***	-4.9805***	-6.9931***	-9.5123***
LEXCH	-3.6793***	-2.8834***	-13.8834***	-45.8315***

Source: Author's compilation from E-Views

Note: LLC, IPS, ADF and PP stands for Levin, Lin and Chu; Im, Pesaran and Shin; ADF Fisher Chi Square and PP Fisher Chi Square tests respectively. *, ** and *** denote 10%, 5% and 1% levels of significance, respectively.

Using Levin et al (2002), Augmented Dick Fuller Fisher Chi Square, Im et al (2003) and Phillip Peron (PP) Chi square tests methods, panel unit root tests at level shows that not all variables were integrated of order 1. However, at first difference, all the variables were stable and integrated of order 1.

Panel co-integration tests: Kao (1999) approach to panel co-integration was used in this study, results of which are presented in Table 4.

Table 4. Results of Kao Co-Integration Tests

Series	ADF t-statistic
TR FDI FIN GROWTH OPEN URBAN HCD POP EXCH	-4.0026***

Source: Author compilation

The results show that all the variables used are co-integrated or have a long run relationship at one percent level of significance, consistent with Tembo (2018).

Results presentation, description and interpretation: Table 5 presents results of the dynamic GMM, fixed effects, random effects and the pooled OLS econometric methods.

Table 5. Panel Data Analysis Results

	Dynamic GMM	Fixed effects	Random effects	Pooled OLS
TR _{it-1}	0.0453***	-	-	-
FDI	0.3428*	0.0687	0.1167*	0.2452
FIN	0.5483*	0.1165*	0.3666*	0.3566
FDI.FIN	0.0549***	0.3277*	0.0923**	0.4116***
GROWTH	0.0945*	0.2165*	0.4487	0.1005*
OPEN	-0.6572***	-0.0453**	-0.1398**	-0.5311**
URBAN	0.6587***	0.4538***	0.2657	0.2453
HCD	0.1178**	0.2377	0.5008**	0.2341*
POP	0.3422**	0.2299**	0.2043	0.7623**
EXCH	-0.1188***	-0.4365***	-0.4328***	-0.2378***
Adjusted R-squared	0.69	0.58	0.56	0.61
J-statistic/F-statistic	208	187	198	97
Prob(J-statistic/F-statistic)	0.00	0.00	0.00	0.00

***, ** and * denote 1%, 5% and 10% levels of significance, respectively.

Source: Author's compilation from E-Views

Under the dynamic GMM approach, tax revenue was positively and significantly influenced by its own lag. The results resonate with Castro and Camarillo (2014) whose argument was that a significant positive impact of the lag of tax revenue on current tax revenue in line with the Keynesian approach. The latter says that high tax levels collected leads to increased public expenditure and economic growth activities, which then leads to increased tax revenue collected.

FDI had a significant positive impact on tax revenue under the dynamic GMM and random effects whilst its influence on tax revenue under the fixed effects and pooled OLS was positive but non-significant. These results generally resonate with Amoh and Adom (2017) whose study noted that FDI inflow enhances tax revenue collection in the economy through increasing formalization of economic

activities and competitiveness in the economy. The results also agree with empirical research done by Andrejovska and Pulikova (2018), Amoh and Adom (2017) and Ade et al (2018).

The impact of financial development on tax revenue was observed to be significantly positive under the dynamic GMM, fixed and random effects yet pooled OLS shows that the influence of financial development on tax revenue was positive but non-significant. The results generally concur with Masiya et al (2015) whose study argued that increased development of the formal financial sector lead to an increase in formal financial activities and tax revenue collected in the economy. The results also agree with empirical research work on the subject matter done by Rodriguez (2018), Chilima (2005) and Masiya et al (2015).

Across all the four econometric methods used in this study, the interaction between FDI and financial development had a significant positive effect on tax revenue. In other words, the study revealed that FDI and financial development complemented each other in the revenue generation and collection process. Put differently, financial development was found to be a channel through which FDI enhanced revenue generation and collection in the upper middle-income group of countries. The results are in line with Amoh and Adom (2017) and Masiya et al (2015) combined whose studies observed that foreign direct investment flowing in through more developed formal financial systems is more likely to lead to increased revenue collection by the government.

Apart from random effects under which economic growth had a non-significant positive impact on tax revenue, the other three econometric methods used show a significant positive relationship running from economic growth towards tax revenue. The results resonate with Gupta (2007) whose study argued that more tax revenue is generated and collected in a country experiencing an upward economic growth trajectory. Empirical research on a similar subject matter which produced similar results include Ahmad et al (2016), Andrejovska and Pulikova (2018), Awasthi et al (2020), Chilima (2005), Masiya et al (2015), Terefe and Teera (2018), Castro and Camarillo (2014) and Boukbech et al (2019).

Consistent with Baunsgaard and Keen (2010)'s argument that trade openness is associated with general tariff reduction and an overall decline in tax revenue collected in the economy, the study shows that trade openness had a significant negative effect on tax revenue across all the four panel data analysis methods employed. The results are also in line with Anuah (2019) whose empirical research observed that trade openness had a negative effect on tax revenue.

A significant positive impact of urbanization on tax revenue was observed under the dynamic GMM and fixed effects yet random effects and pooled OLS shows that tax revenue was positively but insignificantly affected by urbanization. These results resonate with Chilima (2005) whose argument was that urbanization transforms the economy from being informal to be more formal thus boosting the amount of revenue collected as people becomes employed in more formal work. The results are also similar to those produced by an empirical study done by Karagoz (2013).

A significant positive relationship running towards tax revenue from human capital development was observed under the dynamic GMM, random effects and pooled OLS. Fixed effects produced results which show that human capital development's impact on tax revenue was positive but non-significant. These results agree with Castro and Camarillo (2014) who argued that high human capital

development levels advance specialization, better skills, more sophisticated production approaches and entrenched economic growth activities which leads to more tax revenue collection. Empirical studies done by Chaudry and Munir (2010) and Rodriguez (2018) produced results which are in line with this study.

Random effects show that population growth's influence on tax revenue was positive and insignificant. On the other hand, a significant positive relationship running from population growth towards tax revenue was detected under the dynamic GMM, fixed effects and pooled OLS. Generally, these results concur with Awasthi et al (2020)'s argument that a larger population increases the demand of goods and services in the economy thereby boosting the tax base. Exchange rate had a significant negative effect on tax revenue across all the four econometric methods used, in line with Masiya et al (2015) whose study argued that overvaluation of the domestic currency deletes the demand of local goods and services in international markets, dampen local economic activities and consequently lowers the amount of tax revenue generated and collected in such an economy. The results of this study on the relationship between exchange rate and tax revenue are also in line with Terefe and Teera (2018)'s findings.

6. Conclusion

The study had two main objectives. Firstly, to investigate the determinants of tax revenue in upper middle-income countries. Secondly, to explore the impact of the interaction between FDI and financial development on tax revenue in upper middle-income countries. Panel data ranging from 2007 to 2017 was used in this study. Econometric estimation methods used include the dynamic GMM approach, random effects, pooled OLS and fixed effects. Lag of tax revenue, financial development, FDI, economic growth, urbanization, human capital development, population growth and the interaction between FDI and financial development to a greater extent were found to have a significant positive impact on tax revenue. Exchange rate and trade openness had a deleterious effect on tax revenue. Upper middle-income countries are therefore urged to develop and implement policies aimed at increasing FDI inflows, urbanization, economic growth, population growth, human capital development and financial development in order to enhance tax revenue generation and collection. Future empirical research should investigate the minimum threshold levels of these explanatory variables of tax revenue that must be attained in order to trigger significant tax revenue collection.

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