Tax Revenue and Economic Growth
in Emerging Markets: Is Financial Development Relevant?

Kunofiwa Tsaurai[1]

Abstract: The study investigated the impact of taxation on economic growth in emerging markets using the dynamic generalized methods of moments (GMM), fixed effects, pooled ordinary least squares (OLS) and random effects methods with panel data ranging from 2008 to 2018. The research also examined whether financial development is relevant in enhancing taxation's impact on economic growth in emerging markets. Tax revenue was found to have had a significant positive impact on economic growth under the dynamic GMM and random effects whilst financial development's significant positive influence on economic growth was confirmed under the fixed and random effects methods. The study also found out that the complementarity between taxation and financial development had a significant positive impact on economic growth in emerging markets under the dynamic GMM and pooled OLS econometric estimation approaches. In other words, financial development was found to be a channel through which taxation enhances economic growth in emerging markets. Emerging markets are therefore urged to develop and implement robust tax revenue generating and collecting and financial development policies in order to enjoy sustainable long-term economic growth prospects.

Keywords: Tax Revenue; Foreign Direct Investment; Emerging Markets; Economic Growth

JEL Classification: F21; F43; H2; P2

1. Introduction

This section discusses the background of the study, gaps found in the literature, contribution of the study towards literature and the structure of the rest of the paper.

Background of the study and gaps found in the literature: The positive impact of tax revenue on economic growth is supported by researchers such as Stoilova and Patonov (2012) and Macek (2014), among others. Other researchers led by Ferede and Dahlby (2012) however observed that taxation has a negative effect on economic growth. Another school of thought supported by Poulson and Kaplan (2008) noted that the impact of taxation on economic growth depends on the type of tax being levied. For example, high income tax reduces consumption spending and dampens economic growth whilst high capital gains tax reduces the incentive to invest in the country, dissuades foreign investors and curtail economic activities in the country. High exercise duty on dangerous consumables is good for the economy as it ensures a healthy and more productive workforce. As confirmed by Ouma (2019), the other category of findings noted that taxation and economic growth have a bidirectional kind of

[1] Full Professor, Department of Finance, Risk Management and Banking, University of South Africa, South Africa, Address: P.O. Box 392, UNISA 0003, Pretoria, South Africa, Corresponding author: tsaurk@unisa.ac.za.

relationship. It is clear from these theoretical views supported by empirical literature that the relationship between taxation and economic growth is still far from being regarded as conclusive.

Majority of empirical researchers on the impact of taxation on economic growth focused on other economic groupings and not emerging markets. In other words, literature on the subject matter on emerging markets is still scant. Most of the existing empirical researchers ignored the endogeneity problem prevalent in the economic growth function, did not consider the fact that economic growth is affected by its own lag and in some instances wrongly assumed that the economic growth function is linear. Although researchers such as Kate and Milionis (2019) implied that financial development enhances taxation's ability to influence economic growth, a study on the influence of the complementarity between taxation and financial development on economic growth let alone in emerging markets does not exist. This study is the first of its kind to investigate such a theoretical narrative.

Contribution of the study: This study contributes towards literature in the following ways. Firstly, it is the first of its kind to study the impact of the complementarity between taxation and financial development on economic growth in emerging markets. Secondly, the study considered the dynamic characteristics of economic growth data, using the dynamic GMM approach. Majority of empirical studies on the subject matter ignored this feature of economic growth data. Thirdly, the study is the first one to be done exclusively focusing on emerging markets. Fourthly, the study rightly assumed that the economic growth function is non-linear in nature. Fifthly, the study used the most recent data set, ranging from 2008 to 2018. The dynamic GMM approach addressed endogeneity problem which normally characterize the economic growth function.

Structure of the paper: Section 2 focuses on theoretical literature review. Section 3 discusses the empirical literature on the impact of taxation on economic growth. Section 4 describes the role played by financial development in economic growth. How taxation and financial development can complement each other in enhancing the growth of the economy is also highlighted. Section 5 describes the research methodological framework, panel unit root tests, panel co-integration tests and main data analysis. Section 6 concludes the study.

2. Impact of Taxation on Economic Growth: Theoretical Literature

The impact of taxation on economic growth is grouped into two, namely its positive impact and negative influence on the economy. Taxation's positive impact on economic growth was supported by researchers such as Macek (2014), Stoilova and Patonov (2012) and Brebler (2012), among others. According to Macek (2014), taxation increases revenue available to the government which it can use to spearhead various economic growth enhancing activities such as infrastructural development, human capital development, supporting start up projects, among others.

Stoilova and Patonov (2012) argued that taxation helps to raise funds that can be used to finance public expenditure, as an income redistribution tool, to influence resources allocation in the economy, all of which are necessary ingredients for economic growth. Brebler (2012) argued that lower corporate taxation enhances economic growth through its stimulating influence on the FDI inflows.

The negative impact of taxation on economic growth was argued by researchers such as Ferede and Dahlby (2012) and Poulson and Kaplan (2008). According to Ferede and Dahlby (2012), high level of taxes increases the cost of capital, discourages investment and thereby negatively affecting economic

growth in the long run. Poulson and Kaplan (2008) also argued that high income taxes negatively affect the supply of labour and investment in human capital development whilst high capital gains tax takes away the incentive to save and invest. Apart from altering the capital structure of the company, the return on investment is lowered by an increase in corporate taxation.

3. Empirical Literature on the Impact of Taxation on Economic Growth

Table 1. Empirical Literature on the Impact of Taxation on Economic Growth

Author	Country/Countries of study	Period	Methodology	Results
Macek (2014)	Organization for Economic Cooperation and Development (OECD) countries	2000-2011	Panel regression data analysis	Corporate and personal income taxes was found to have had a negative impact on economic growth.
Stoilova and Patonov (2012)	European Union	1995-2010	Cross country analysis	Direct taxation-based structure supported economic growth in European Union.
Myles (2000)	World-wide	Not applicable	Literature review analysis	Economic growth was found to have been enhanced by taxation.
Neog and Gaur (2020)	14 Indian states	1991-2016	Panel data analysis	Service-commodity and income tax had a deleterious effect on economic growth. On the other hand, property tax and capital gains tax had a positive impact on economic growth across all the fourteen Indian states.
Gashi et al (2018)	Kosovo	2007-2015	Ordinary Least Squares	Taxation had significant positive influence on economic growth.
Ferede and Dahlby (2012)	Canadian provinces	1977-2006	Descriptive statistics	A slight reduction in corporate tax cuts led to a significant growth in the economy.
Jaimovich and Rebelo (2016)	Developing countries	1981-2012	Panel regression analysis	An increase in tax rates had a negative influence on economic growth
Durusu-Ciftci et al (2018)	30 OECD countries	1995-2016	Panel data analysis	Only consumption tax was found to have had a significant negative effect on the economy. The other forms of taxation had a heterogeneous effect on the economy.
Glykou and Siokorelis (2013)	Bulgaria and Croatia	1993-2009	Ordinary Least Squares	Taxation was found to have a positive impact on economic growth in both countries.
Almeida and Mendonca (2019)	96 countries	1976-2014	Panel data analysis	Unlike direct taxation, indirect taxation failed to stimulate economic growth.
Veronika and Lenka (2012)	European Union countries	1998-2010	Panel data analysis	Taxation led economic growth hypothesis was confirmed.
Al-tarawneh et al (2020)	Jordan	1980-2018	Autoregressive Distributive Lag (ARDL)	Taxation had a negative effect on economic growth both in the short and long run.

Babatunde et al (2017)	African countries	2004-2013	Fixed and random effects	A significant positive relationship running from taxation towards economic growth was detected.
Moraru and Ionita (2015)	Romania	2006-2012	Multiple linear regression analysis	Economic growth was enhanced by taxation in Romania
Padda and Akram (2009)	South Asian Economies	1975-2006	Time series data analysis	Tax increase spurred economic growth
Kate and Milionis (2019)	OECD countries	1965-2014	Unbalanced panel data regression analysis	Capital taxation was found to be the engine for economic growth in countries where domestic innovation activities are at the centre stage
Simionescu and Albu (2016)	Central and Eastern European Countries (CEE)	1995-2015	Random effects, dynamic panel, panel vector-autoregression	Value added tax had a positive impact on economic growth in CEE-5 countries
Harelimana (2018)	Rwanda	2013-2016	Descriptive statistics	Rwanda's economic development was mainly attributed to taxation.
McNabb (2018)	100 countries	1980-2013	Panel data analysis	Increase in tax had a positive long-term economic growth implication.
Ouma (2019)	Kenya	1964-2016	Descriptive statistics, non-linear regression	Both taxation and economic growth influenced each other in the case of Kenya.

Source: Author Compilation

It is clear from Table 1 that the empirical results on the impact of taxation on economic growth is quite divergent, inconclusive, mixed and far from agreeing. The causality between taxation and economic growth is far from being ascertained judging by the empirical results on the subject matter.

4. Influence of Financial Development on Economic Growth

Financial development enhances economic growth through its ability to mobilise savings, efficient allocation of resources and risk management (Schumpeter, 1911). On the contrary, Keynes (1936) argued that stock market returns volatility negatively affects economic growth through encouraging foreign capital outflow and non-efficient allocation of resources. Table 2 summarizes the role played by financial development in enhancing economic growth.

Table 2. A Summary of the Impact of Financial Development on Economic Growth

Theory intuition	Source	Sign
Mobilizing savings	Schumpeter (1911); Levine (1997)	+
Risk diversification and sharing	Pagano (1993), Townsend (1983), Schumpeter (1911), McKinnon (1973)	+
Providing liquidity	Schumpeter (1911), Pagano (1993)	+
Facilitating risk management	Levine (1997), Schumpeter (1911)	+
Technological financial innovation	Schumpeter (1911)	+
Efficiently allocating financial resources	Levine (1997), Townsend (1983)	+

Source: Author's Compilation

Stoilova and Patonov (2012) noted that taxation can be used to influence financial resources allocation in the economy whilst Levine (1997) argued that financial development is of the view that financial development efficiently allocates financial resources in the economy. It is the author's judgement from these cited statements that the study postulates that the complementarity between tax revenue and financial development enhances economic growth. Moreover, tax revenue collection, allocation and distribution in the economy for growth purposes is only effective if the financial system of the country is developed, efficient and watertight, consistent with Kate and Milionis (2019).

5. Research Methodological Framework

Data description, general and econometric model specification, control variables, panel unit root tests, panel co-integration tests and data analysis and interpretation in that chronological order are the main headings under this section.

Data description: The study used secondary panel data (2008 to 2018) to examine the impact of tax revenue on economic growth in selected emerging markets (Argentina, China, Czech Republic, Indonesia, Peru, Portugal, Brazil, Colombia, Greece, Mexico, Poland). Sources of data include World Development Indicators, United Nations Development Programme, International Financial Statistics and Organization for Economic Cooperation and Development (OECD).

General model specification: Consistent with recent empirical research on the tax revenue-led growth hypothesis such as Ouma (2019), Harelimana (2018), Kate and Milionis (2019) and Al-tarawneh et al (2020), this study uses the following economic growth function.

$$GROWTH = f \text{ (TAX, FIN, FDI, POP, OPEN, GC, SAV)} \tag{1}$$

Where economic growth, tax revenue, foreign direct investment, financial development, population growth, trade openness, government consumption expenditure and savings are represented by GROWTH, TAX, FDI, FIN, POP, OPEN, GC and SAV respectively.

Economic growth is measured by gross domestic product (GDP) per capita, tax revenue is proxied by tax revenue (% of GDP) whilst FDI is measured by net foreign direct investment (% of GDP). Credit provided by the financial sector (% of GDP) measured financial development, total trade (% of GDP) is the proxy for trade openness whereas population growth is measured by population (% of total population). Final government consumption expenditure (% of GDP) measures government consumption whilst gross domestic savings (% of GDP) is the proxy for savings used.

Econometric model specification: The econometric equation of the economic growth function is therefore presented as follows:

$$GROWTH_{it} = \beta_0 + \beta_1 TAX_{it} + \beta_2 FIN_{it} + \beta_3 (TAX_{it}.FIN_{it}) + \beta_4 X_{it} + \mu + \varepsilon \tag{2}$$

β_0 stands for the intercept term. μ represents the time invariant and unobserved country specific effect. ε is the error term. Time and country are respectively represented by t and i subscripts. X_{it} is the vector of explanatory variables (foreign direct investment, population growth, trade openness, government consumption expenditure, savings). β_1 is the co-efficient of tax revenue, β_2 is the co-efficient of financial development whilst β_3 is the co-efficient of the complementarity between tax revenue and financial development. The co-efficient of the explanatory variables is denoted by β_4.

When the dynamic characteristic of economic growth data is included, equation 2 appears as follows:

$$GROWTH_{it} = \beta_0 + \beta_1 GROWTH_{it-1} + \beta_2 TAX_{it} + \beta_3 FIN_{it} + \beta_4 (TAX_{it} . FIN_{it}) + \beta_5 X_{it} + \mu + \varepsilon \quad (1)$$

A significant positive value of β_4 means that taxation enhances economic growth through the financial development channel, consistent with Brebler (2012). Equation 2 is estimated using pooled OLS, fixed and random effects whilst the dynamic GMM approach is used to econometrically estimate equation 3.

The influence of control variables on economic growth: How each control variable affects economic growth from a theoretical viewpoint is discussed in Table 3.

Table 3. Impact of Control Variables on Economic Growth - Theory Intuition and Expected Sign(s)

Variable	Theory intuition	Proxy used	Expected sign
FDI	Human capital development, new technology, new skills and technical know-how are some of economic growth enhancing ingredients which flow along with foreign direct investment into the host country (Romer. 1986). The same author noted that over dependence on foreign direct investment has got long term negative consequences for the economy. Foreign direct investment is also attracted by low rates of taxes in the host country, according to Devereux and Freeman (1995) and Mohs et al (2018).	Net foreign direct investment (% of GDP)	+/-
POP	High level of population is good for the economy because it is one of the factors that attracts foreign investors according to the market size hypothesis (Jorgenson. 1963). Governments faced with high levels of population channels more funds towards necessary consumption expenditure aimed away from capital expenditure which triggers economic growth (Becker et al. 1999). The latter also argued that high population size is associated with positive economic growth spillovers.	Population (% of total population).	**+/-**
OPEN	Exports brings into the country the much-needed foreign currency whilst the importation of inputs, implements and resources is essential for the proper running of the local economies (Baltagi et al. 2009). The same author also noted that high levels of trade openness allows the country to be exposed to international shocks, which might have deleterious consequences on the local economies.	Total trade (% of GDP)	**+/-**
GC	Government consumption expenditure is inflationary and causes long term negative growth in the economy (Suruga and Le. 2005). The same study argued that government consumption expenditure takes away financial resources from production related activities, hence stifling economic growth. On the other hand, Keynes (1936) noted that government consumption expenditure stimulates production and economic growth through its expansionary force on the market of the goods and services.	Final government consumption expenditure (% of GDP)	**+/-**
SAV	Savings lubricates the economy thereby providing liquidity and even attracting foreign capital (McKinnon. 1973). The same study noted that savings have a long-lasting positive impact on economic growth especially if they are channelled towards the productive sectors of the economy.	Gross domestic savings (% of GDP)	+

Source: Author's compilation

Panel unit root tests: Using methods such as Levin, Lin and Chu (2002) , PP Fisher Chi Square tests Im, Pesaran and Shin (2003) and Augmented Dicky Fuller (ADF) Fisher Chi Square tests, the stationarity tests among all the variables used was done.

Table 4. Panel Root Tests – Individual Intercept

	Level			
	LLC	IPS	ADF	PP
LGROWTH	1.45	4.78	8.97	7.54
LTAX	-2.66***	-1.71**	62.17**	88.09***
LFIN	-2.03***	-1.34***	56.66**	98.99***
LFDI	-4.76***	-4.38***	101.52**	141.11***
LPOP	-1.65	0.94	30.44	62.92**
LOPEN	-3.81***	-2.65***	66.12***	113.45***
LGC	-1.45*	-1.56*	39.81**	55.75***
LSAV	-3.12	-2.19	-4.78**	-3.89***
	First difference			
LGROWTH	-5.87**	-5.98**	91.18**	101.38*
LTAX	-10.29***	-10.78***	150.83***	403.39***
LFIN	-11.64***	-12.47***	202.36***	523.82***
LFDI	-10.72***	-11.66***	202.63***	951.21***
LPOP	-8.13***	-9.83**	165.87***	361.892***
LOPEN	-11.44***	-12.87***	194.53***	672.82***
LGC	-7.88***	-8.45***	133.23***	493.18***
LSAV	-6.17***	-5.43***	-9.87***	-7.12***

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 1%, 5% and 10% levels of significance, respectively.
Source: Author's compilation - E-Views figures

As can be seen in Table 3, all the variables used in this study were integrated of order 1 (stationary at first difference). Consistent with Kibara and Odhiambo (2012), the results show that all the variables used in this study are stationary at first difference. The results allowed further econometric tests to be done.

Panel co-integration tests: Kao (1999) approach to integration was used in this study (refer to results in Table 5).

Table 5. Results of Kao Co-Integration Tests

Series	ADF t-statistic
GROWTH TAX FIN FDI POP OPEN GC SAV	-4.9365***

Source: Author compilation

Table 4 shows that the variables used were co-integrated at one percent significant level. Such results confirm the existence of a long run relationship in the economic growth function used in this study. Consistent with Rahman et al (2019), once a long run relationship among the variables is confirmed, final data analysis to establish the causality can be done.

Main data analysis, results presentation and interpretation: The dynamic GMM results of the economic growth function are presented in Table 6.

Table 6. Dynamic Generalised Methods of Moments (GMM) Results

	Dynamic GMM	Fixed effects	Random effects	Pooled OLS
$GROWTH_{i,t-1}$	0.2318***	-	-	-
TAX	0.5884*	0.0316	0.4382*	0.2176
FIN	0.3487	0.6341*	0.4539*	0.3498
TAX.FIN	0.5428***	0.3798*	0.4598**	0.4976***
FDI	0.4678*	0.3987*	0.4528	0.1766
POP	-0.4567	-0.6545**	-0.2345	-0.5878
OPEN	0.4897***	0.6754***	-0.3445	-0.2345
GC	-0.4566	-0.4676	0.5567**	-0.5649
SAV	0.4897	0.6777*8	0.2344	0.4556**
Adjusted R-squared	0.71	0.73	0.69	0.58
J-statistic	217	303	427	287
Prob(J-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

Consistent with Cavalcanti et al (2015)'s argument, economic growth in emerging markets was found to have been positively and significantly affected by its own lag under the dynamic GMM method. Under the dynamic GMM and the random effects, tax revenue had a significant positive impact on economic growth whilst pooled OLS and fixed effects shows a non-significant positive relationship running towards economic growth from tax revenue. These results generally agree with available empirical literature (Macek. 2014; Brebler. 2012; Stoilova and Patonov. 2012) whose research argued that taxation helps to raise funds that can be used to finance public expenditure, as an income redistribution tool, to influence resources allocation in the economy, all of which are necessary ingredients for economic growth.

Under the dynamic GMM and fixed effects approaches, financial development's significant positive impact on economic growth was observed. Yet, random effects and pooled OLS show that financial development's non-significant influence on economic growth is relevant in emerging markets. These results generally support Schumpeter (1911)'s view that financial development enhances economic growth through its ability to efficiently allocate resources, mobilize savings and risk management.

The complementarity between taxation and financial development was found to have had a significant positive influence on economic growth under the dynamic GMM, pooled OLS and fixed effects whilst random effects shows that the complementarity between the two variables had a non-significant but positive influence on economic growth. These results resonate with Kate and Milionis (2019).

FDI was found to have had a significant positive impact on economic growth under the dynamic GMM and fixed effects whilst its influence on growth was observed to non-significantly positive under the random and pooled OLS econometric estimation approaches. The results resonate with Romer (1986) whose study noted that FDI flows along side economic growth ingredients such as new technology, new skills, human capital development and technical know-how.

Population growth had an insignificant deleterious impact on the economy under the dynamic GMM, random effects and pooled OLS whilst fixed effects show a significant negative impact of population growth on economic growth. The results generally resonate with Becker et al (1999) whose argument is that governments faced with high levels of population channels more funds towards necessary consumption expenditure aimed away from capital expenditure which triggers economic growth.

A significant positive impact of trade openness on economic growth in line with Baltagi et al (2009) was observed under the dynamic GMM and fixed effects. Under random effects and pooled OLS, trade openness had a non-significant negative effect on economic growth in support of empirical research which argued that high level of trade openness allows the country to be exposed to international shocks, which might have deleterious consequences on the local economies.

Under the dynamic GMM, fixed effects and pooled OLS, government consumption's impact on economic growth was found to be negative but insignificant. The results support of Suruga and Le (2005) whose study noted that government consumption expenditure is inflationary and causes long term negative growth in the economy. In support of Keynes (1936), whose study argued that government consumption expenditure stimulates economic growth, random effects show that government consumption had a significant positive influence on economic growth.

Savings under the dynamic GMM and random effects had a non-significant effect on economic growth yet fixed and pooled OLS show that the significant positive relationship between savings and economic growth runs from the former to the latter. These results generally agree with McKinnon (1973) whose study argued that savings enhances economic growth by providing liquidity which lubricates the economy.

6. Conclusion

The study investigated the impact of taxation on economic growth in emerging markets using the dynamic GMM, fixed effects, pooled OLS and random effects methods with panel data ranging from 2008 to 2018. The research also examined whether financial development is relevant in enhancing taxation's impact on economic growth in emerging markets. Tax revenue was found to have had a significant positive impact on economic growth under the dynamic GMM and random effects whilst financial development's significant positive influence on economic growth was confirmed under the fixed and random effects methods. The study also found out that the complementarity between taxation and financial development had a significant positive impact on economic growth in emerging markets under the dynamic GMM and pooled OLS econometric estimation approaches. In other words, financial development was found to be a channel through which taxation enhances economic growth in emerging markets. Emerging markets are therefore urged to develop and implement robust tax revenue generating and collecting and financial development policies in order to enjoy sustainable long-term economic growth prospects.

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