

Impact of External Debt and Financial Integrity Management on Economic Growth in Developing Countries: Evidence from the MMQR Approach

Kazi Musa¹, Norli Ali², Jamaliah Said^{1*}, Norhayati Mohamed¹ and Inna Junaine³

¹Accounting Research Institute (HICoE), Universiti Teknologi MARA (UiTM), Malaysia

²Faculty of Accountancy, Universiti Teknologi MARA (UiTM), Malaysia

³Faculty of Law, Universitas Padjadjaran, Bandung, Indonesia

ABSTRACT

The study examined the impact of external debt on economic growth in the context of developing countries. Since the level of financial integrity plays a vital role in the growth factor, we also investigated the direct impact of financial integrity (FI) management on economic growth as well as the moderating role of FI on the nexus between external debt and economic growth. To achieve the goals, we deployed a newly developed econometric approach, the Method of Moment Quantile Regression (MMQR), considering the quantile in both scale and location due to highly heterogeneous panel data from 1990 to 2020. The empirical estimation of the MMQR approach demonstrated that external debt is counterproductive in all quantiles for economic growth in the context of developing countries. Besides, FI management was insignificant in the bottom to top quantiles. Besides, the results also depicted that external debt works better for economic growth by the presence of FI in upper quantiles than the lower quantiles. The findings indicated that external debt is detrimental to economic growth in developing countries, while financial integrity management supports the debt-growth relationship. The study provides several policy implications.

Keywords: external debt, economic growth, MMQR, financial integrity, developing countries

ARTICLE INFO

Article History:

Received: 3 December 2022

Accepted: 8 December 2022

Published: 31 December 2022

* Corresponding Author: Jamaliah Said. Email: jamaliah533@uitm.edu.my

INTRODUCTION

Developing countries pay significant attention to growth prospects to elevate their economic status in comparison to developed economies (Berg et al., 2018, Akram et al., 2021). Stable economic growth strengthens public goods and services for the citizens, i.e., education, healthcare, welfare support and basic public services (Ekanayake & Thaver, 2021; Hieu & Mai, 2022). In addition, high economic growth encourages full employment, tax revenue, and purchasing power and motivates the demand side of economics, which further supports the growth cycle (Ekanayake & Thaver, 2021; Hieu & Mai, 2022). Governments of emerging and developing countries often struggle to maintain stable economic growth due to high expenditure and low domestic revenue (Gaies & Nabi, 2019; Khuong, Liem & Dung, 2021). At this point, economics adopt expansionary fiscal policy tools to motivate the economy through external public debt.

In the age of economic transformation, public debt is becoming more and more crucial for the expansionary fiscal policy adopted by most developing countries (Turan & Yanikkaya, 2021). Developing economies frequently adopt budget deficits through huge external public debt ignoring fiscal space and weak debt management to grease up the wheel of the economy (Pedersoli & Presbitero, 2022; Turan & Yanikkaya, 2021). A number of studies argue that some developing economies frequently adopt external public debt from risky sources with high-interest rates and even short-term payback policy and with high-interest rates, which barely motivate macroeconomy (Linh et al., 2019). In addition, with a stable macroeconomic setting, many countries experience hardship in debt management due to risky debt policy adoption (Stubbs et al., 2021; Linh et al., 2019).

On the other hand, external public debt with strong debt management, long-time payback policy and low-interest rate issues motivates macroeconomic stability in some economies (Linh et al., 2019). Loayza and Pennings (2020) argue that strong debt management and fruitful investment of the external debt support economic growth through new investment in a country. Mohsin et al. (2021) found that external debt is more beneficial for the economy than internal debt, which can create crowding effects and affect the domestic banking sector. A number of other empirical studies also

confirmed that external public debt supports the growth process while it is adopted logically with strong debt management (Pedersoli & Presbitero, 2022; Stubbs et al., 2021). So, the effectiveness of external debt depends heavily on how it is handled and managed.

Another group of studies argue that the level of financial integrity management is conditional on the effectiveness of public debt for an economy (Combes et al., 2019). Financial integrity provides knowledge and standard of the transparency and legitimacy of financial transactions nationally and internationally, considering illicit financial flows, trade misinvoicing, tax evasion, illicit trades and money laundering (Marakbi & Villieu, 2020; Loayza, Villa & Misas, 2019). According to several studies, financial integrity management (FI) management is one of the factors strongly linked to both effective and ineffective public fund management (Dutta, 2020; Osadume & Imide, 2022).

Empirical studies assert countries with low FI management frequently experience fund leakages from public sources through certain loopholes, such as illegal financial flows, trade misinvoicing, tax fraud, and money laundering, while strong FI management can limit fund leakages from the channels (Fisera, Tiruneh & Hojdan, 2021; Ortega, Sanjuán & Casquero, 2019). Transparent and leakage-free national and international transaction helps keep the money transparent and help to implement economic policies through the proper use of the public fund according to the projected trajectory (Osadume & Imide, 2022; Slama & Gueddari, 2022).

Governments' financial transparency, openness and accountability in financial transactions are the signs of the strong level of FI, which deliberately support public fund management, create barriers to fund leakage, and further strengthens budgetary implantation (Loayza, Villa & Misas, 2019; Slutzky et al., 2020). This anecdotal evidence designates that financial integrity plays a sensitive role in implementing the economic goals of government, specifically economic growth, by controlling monetary leakage, tax loss, money laundering, and other illicit fund transaction risks. Studies confirm that FI management is sensitive to economic growth, while FI management also plays an important role in debt-growth relationships. However, the existing studies mostly consider components of FI in examining the growth impact, but a minimal number of studies have focussed on external debt,

FI management and economic growth relationship which is the focus of this study.

A number of issues motivated us to conduct the study. First, the existing studies mostly focussed on the debt-growth relationship while ignoring incorporating financial integrity management. Second, the debt-growth relationship is highly prioritised in the context of high-income countries, the European Union, Organization for Economic Co-operation and Development countries, Sub-Saharan African countries and individual countries but comparatively shed limited light on developing countries, while most of the developing countries are highly reliant on external public debt. Finally, the existing literature mostly applied linear and static methods, and sometimes conventional Quantile Regression approaches, which are unable to provide information about scale and location and produce biased estimation. The stated limitations motivated us to conduct the current study with a robust methodology to close the literature gaps and contribute new knowledge on the debt-growth debate.

The study aimed to examine the impact of external debt and financial integrity management on economic growth in the context of developing countries. A group of studies have found that financial integrity management has a close connection with public fund management and economic growth. Therefore, the study also examined the moderating role of financial integrity management on the nexus between external public debt and economic growth in the context of developing countries.

The study deployed a newly developed Method of Moment Quantile Regression (MMQR) approach to obtain the objectives of the study. The MMQR method is able to perform an estimation with the nonlinearity issue and can observe the conditional heterogeneous covariance impact. Besides, the approach also provides information about the scale and location effects, which the conventional Quantile Regression is unable to examine. However, the existing literature barely employs the MMQR approach to examine the external debt and growth relationship, while studies in developing countries are extremely scarce with the method. These issues motivated us to conduct this current study.

The next section of the study discusses the relevant literature about the focused variables. Section 3 provides the methodology of the study, including data source and measurement, empirical equations, and estimation approach. Sections 4 and 5 provide results, discussion, and the study's conclusion and policy implications, respectively.

LITERATURE REVIEW

The impact of public debt on economic growth is still a debated issue in macroeconomics from different viewpoints. For several decades, most countries have been experiencing high external debts through budget deficits following the Keynesian economics philosophy (Petrović, Arsić & Nojković, 2021; Baum et al., 2013). Keynesian economists believe that by implementing an expansionary fiscal policy and running up external debt, the government can influence the macroeconomy by igniting the demand side of the economy, which in turn stimulates the entire economy through its multiplier effects (Albonico, Ascari & Gobbi, 2021; Butkus et al., 2021). On the other hand, the classical growth theories claim that public debt or external debt barely supports the economy but increases inflation and tax payment, which deteriorates economic growth in the long term (Asteriou, Pilbeam & Pratiwi, 2021; Sharaf, 2021). Therefore, the effectiveness of debt finance is still conflicting from a theoretical perspective.

The empirical and seminal papers also provide mixed findings on the effectiveness of external debt funding. Proponents state that external debt motivates economic growth when used wisely in productive sectors, i.e., improving human capital, physical capital and infrastructure developments (Petrović, Arsić & Nojković, 2021; Baum et al., 2013). Kharusi and Ada (2018) found that an increase in the share of current spending through external public debt has a positive and statistically significant growth effect, while an increase in the share of capital expenditure has negative growth consequences. Mohsin et al. (2021) similarly found that external debt is effective for economic growth when the debt fund lies below the threshold level.

Another club of studies argue that the effect of external debt on economic growth is not always enhancing growth perspectives but sometimes

affects growth negatively as well. For example, Sharaf (2021) reports that external debt is insignificant to economic growth in the short run, but in the long run, it has growth-enhancing effects. Alimov (2022) and Kharusi and Ada (2018) found similar results in the context of emerging Middle Eastern and North African countries where external debt rarely affects economic growth positively due to fund leakage. Similarly, Odhiambo (2015) found no evidence to support the claim that increasing government spending through foreign debt improves economic development in South Africa over the short- and long terms using the ARDL-bound testing approach. So, the existing studies on the debt-growth relationship are still conflicting, which motivated us to conduct the current study.

Studies find financial integrity management closely linked to economic growth through financial transaction channels, directly or indirectly affecting the macroeconomic environment (Tellman et al., 2020). Bethencourt and Kunze (2020) and Loayza, Villa and Misas (2019) argue that illicit financial flows negatively impact a country's development due to huge fund loss from the economy. According to several empirical studies, developing countries have a high rate of illicit financial flows, money laundering, tax evasion and trade misinvoicing, which are the core components of financial integrity management (Marakbi & Villieu, 2020). Studies also report that poor management of financial integrity issues is sensitive to the use of public funds, including external debt.

In addition, a better level of financial integrity also indicates that a government can achieve its economic policies, which accelerate the overall economic progress through better use of public funds (Combes et al., 2019; Ortega, Sanjuán & Casquero, 2019). Moreover, governments' efficiency in domestic and international fund transactions can positively affect monetary activities, removing obstacles to fund leakage from the illicit leakage and helping in achieving economic goals (Bashi et al., 2022; Kengatharan, 2021).

In contrast, weak financial integrity management does not always bring distortion to the economy, but laundered funds sometimes positively affect the economy by investing in licit sectors (Ogbonnaya & Ogechuckwu, 2017; Mmaduabuchukwu & Ndidamaka, 2019). Baklouti and Boujelbene (2020) acknowledge that poor financial integrity management sometimes promotes financial corruption in the financial sectors, which is highly detrimental

to long-term economic growth. Illicit financial issues that create a loss in a country's financial sectors and negatively affect the economy are also acknowledged. So, the discussion implies that FI plays a critical role in macroeconomic economic environments and significantly affects the growth process directly or indirectly. This deserves an intense examination with a robust method to draw the picture in the context of developing countries.

Additionally, several studies focussed on the components of financial integrity management, while limited studies focussed on financial integrity management and economic growth incorporating external debt. For example, the high capital flight and poor growth in Myanmar (Kar & Spanjers, 2015), corruption and money laundering affect foreign direct investment of emerging nations (Loayza, Villa & Misas, 2019; Combes et al., 2019), and trade misinvoicing between developing countries and growth (Bashi et al., 2022). Other studies focussed on regulations, anti-money laundering governance (Slama & Gueddari, 2022), and cross-border money laundering in least-developed countries (Loayza, Villa & Misas, 2019). Therefore, the current study focussed on financial integrity management, external debt and economic growth to contribute to the literature.

METHODOLOGY

Data and Measurement

The study considered 44 developing countries as the sample to investigate the issue based on the data availability. The longitudinal data from 1990 to 2020 was considered for this study. As the developing countries started to adopt external debt on a bigger scale from 1990, the study considered the starting period of that year. The dependent variable of the study is in logarithmic form, Economic Growth (LGDPC) which is determined by the Gross Domestic Product per capita (Constant US \$ 2010) obtained from the World Development Indicators (WDI). The External Debt (ED) per cent of GDP was the main independent variable collected from the Government Finance Statistics of the International Monetary Fund. Financial Integrity (FI) was another independent variable which used a proxy of the Basel AML Index (anti-money laundering index) to determine financial integrity collected from the Basel AML Index.

The study also considered some control variables, i.e., Trade Openness (TO), Labor Force (LF), and Fixed Capital Formation (FCF) data collected from the World Bank (World Development Indicators). We considered the control variables to provide robust estimations, whereas the focused variables are important components of the growth function.

Model Specification

$$LGDPC_{it} = B_0 + \beta_1 ED_{it} + \beta_2 TO_{it} + \beta_3 LF_{it} + \beta_4 FCF_{it} + \epsilon_{it} \dots\dots\dots (1)$$

$$LGDPC_{it} = B_0 + \beta_1 ED_{it} + \beta_2 TO_{it} + \beta_3 LF_{it} + \beta_4 FCF_{it} + \beta_5 FI_{it} + \epsilon_{it} \dots\dots\dots (2)$$

The moderating role of financial integrity

$$LGDPC_{it} = B_0 + \beta_1 ED_{it} * FI + \beta_2 TO_{it} + \beta_3 LF_{it} + \beta_4 FCF_{it} + \beta_6 FI_{it} + \epsilon_{it} \dots\dots\dots (3)$$

Where, LGDPC = logarithmic form of GDP per capita, ED = External Debt, FI = financial integrity management, TO = trade openness, LF = labour force, FCF = fixed capital formation.

Technique of Analysis

We employed the Method of Moment Quantile Regression (MMQR) econometric technique to examine the empirical model of the study, which was developed by Machado and Silva (2019). The method overcomes the criticism of the conventional Quantile Regression and offers robust results providing information about the scale and location. It provides impacts of the independent variable at different points called the quantile of the dependent variable. Hence, external debt and financial integrity management motivate economic growth in different magnitudes in different economic conditions. This approach similarly produces estimations considering different economic circumstances with q10, q20 up to q90 (quantile).

The Basic Idea of Technique: The mathematical set-up introduces the MMQR approach to guide the method. The technique estimates the conditional mean demonstrated by the quantiles of the random variable *Y*. While the distribution of the variable is conditional on a *k*-vector of covariates *X*, and that can be written as follows to guide the estimations.

$$Y = \alpha + X' \beta + \sigma(\delta + Z' \gamma)U \quad (1)$$

$$E(U) = 0 \text{ and } E(|U|) = 1 \quad (2)$$

$$Q_y(\tau|X) = \alpha + X'\beta + \sigma(\delta + Z' \gamma)q(\tau) \quad (3)$$

Where $q(\tau) = F_U^{-1}(\tau)$, so $\Pr(U < q(\tau)) = \tau$

$$Q_y(\tau|X) = \alpha + \delta q(\tau) + X'(\beta + \gamma q(\tau)) \quad (4)$$

To estimate the impact of X_i , independent variable on the τ -th quantile of Y (the “regression quantile coefficient”) stands as

$$\beta_l(\tau, X) = \beta_l + q(\tau)D_{X_l}^\sigma \quad (5)$$

$$D_{X_l}^\sigma = \frac{\partial \sigma(\delta + Z' \gamma)}{\partial X_l} \quad (6)$$

$$E[RX] = 0$$

$$E[R] = 0$$

$$E[(|R| - \sigma(\delta + Z' \gamma))D_\gamma^\sigma] = 0 \text{ a} \quad (7)$$

$$E[(|R| - \sigma(\delta + Z' \gamma))D_\delta^\sigma] = 0$$

$$E[I(R \leq q(\tau)\sigma(\delta + Z' \gamma)) - \tau] = 0$$

$$R = Y - (\alpha + X' \beta) = \sigma(\delta + Z' \gamma)U \quad (8)$$

Mostly, X_i on the τ -th quantile of Y determines the marginal impacts of the regressor (regression quantile coefficient), which is

$$D_\gamma^\sigma = \frac{\partial \sigma(\delta + Z' \gamma)}{\partial \gamma} \quad (9)$$

$$D_\delta^\sigma = \frac{\partial \sigma(\delta + Z' \sigma)}{\partial \delta} \quad (10)$$

$$E[UX] = 0$$

$$E[U] = 0$$

$$E[(|U| - 1)D_\gamma^\sigma] = 0 \quad (11)$$

$$[(|U| - 1)D_\delta^\sigma] = 0$$

$$U = \frac{Y - (\alpha + X'\beta)}{\sigma(\delta + Z'\gamma)} \tag{12}$$

Endogenous Regressors: The MMQR method is able to estimate the cross-sectional model along with the endogenous explanatory factors in the model. To estimate the endogenous variable, the vector, which is a random variable with the form of $(D', C'1, C'2)'$ while the dimensions are written as $(kD, k1, k2, \text{ respectively, and } k2 \geq kD)$, and finally follow the forms written below:

$$Y = D'_{BD} + C'_1 \beta_1 + \sigma(D'\gamma_D + C'_1 \gamma_1)U \tag{13}$$

$$D_1 = D_1(C_1, C_2, U^*) \text{ for } 1 = 1, \dots, k_D \tag{14}$$

where $D_1(\cdot) : R^{k1 + k2 + 1} \rightarrow R, \sigma(\cdot)$

Let's have $X' = (D', C_1), C' = (C'_1, C'_2), \beta' = (\beta'_D, \beta'_1)$ and $\gamma' = (\gamma'_D, \gamma'_1)$

$$\Pr\{Y \leq S_y(\tau|X)\} = \Pr\{Y \leq S_y(\tau|X)|C\} = \tau \tag{15}$$

$$S_y(\tau | C) = X' \beta + \sigma(X'\gamma)q(\tau) \tag{16}$$

$$\frac{1}{\sqrt{n}} \sum_1^n C_i \left(\frac{Y_i - X'_i \hat{\beta}}{\sigma(X'_i \hat{\gamma})} \right) = 0 \tag{17}$$

$$\frac{1}{\sqrt{n}} \sum_1^n C_i \left(\frac{|Y_i - X'_i \hat{\beta}|}{\sigma(X'_i \hat{\gamma})} - 1 \right) = o_p \tag{18}$$

$$\frac{1}{\sqrt{n}} \sum_1^n \psi_i \left(\frac{|Y_i - X'_i \hat{\beta}|}{\sigma(X'_i \hat{\gamma})} - 1 \right) = o_p(1) \tag{19}$$

In addition, the approach has a number of benefits compared to the conventional Quantile Regression and some other methods. First, the method is able to produce reliable estimation from the highly heterogeneous and nonlinear data, where our data is heterogeneous in different developing countries. Second, some panel data models fail to address cross-sectional heterogeneity; at this point, MMQR overcomes cross-sectional heterogeneity. Third, this method is mathematically more robust than the existing panel data methods. Fourth, (Chernozhukov & Hansen (2008) and (Chen & Lee

(2018) identify a number of methodological shortcomings, i.e., computing issues, optimisation algorithm tuning, tolerance parameter selection, and binary treatments issues have been efficiently addressed by this model, that supports producing less biased estimations. These benefits motivated us to examine the impacts of external debt and financial integrity management on economic growth with this econometric tool.

RESULTS AND DISCUSSION

Table 1 demonstrates the descriptive statistics of the study, including the name of the variables, number of observations, mean value, standard deviation, minimum value and maximum value. Descriptive statistics also help to understand the data structure and behaviour that support the study to choose the perfect econometric approach to come up with robust results. In addition, the total N for this study was 44, and the number of observations varies from variable to variable because some years' worth of data is missing. The lowest mean for ED was 3.74, whereas the mean for FCF was 23.69, the highest mean. The LGDPC standard deviation was 1.18, and the TO standard deviation was 0.54.

Table 1: Descriptive Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
LGDPC	1,346	8.41	1.18	5.87	11.13
ED	1,085	3.74	0.78	0.98	5.66
TO	1,319	4.35	0.54	2.62	6.08
LF	1,330	15.44	1.87	11.73	20.48
FCF	1,266	23.69	7.64	0.10	69.67
FI	341	5.71	0.92	3.12	8.49

Descriptive Statistics: 44 Developing Countries

Main Findings

Table 2 depicts the results of the equation (1). The coefficients of external debt (ED) were negative and significant at the 1% significance level in all quantiles on economic growth. At the same time, the magnitudes of the coefficients were almost stable from the lower quantiles to the topmost quantiles. Specifically, in the very first quantile or q10, the coefficient was

-0.256, and the highest quantile, q90, showed the coefficient as -0.275. Besides, both the coefficients were negative and significant at the 1% significance level. The results implied that external debt is highly detrimental to the economic growth of developing countries.

A group of studies acknowledges that developing countries deprive trigger economic growth of external debts due to fiscal mismanagement, poor policymaking, high debt service charge and the presence of high corruption (Nuru & Gereziher, 2021). Temsumrit (2021) argues that the level of democracy and institution quality highly affect economic growth. So, perhaps developing countries have democracy and governance issues that might be the reason for the negative growth from the external debt.

Table 2 also provides the impacts of the control variables. The coefficients of TO were highly positive and significant at the 1% significance level from the lowest quantile to the upper quantile. The LF was found to be negative and significant under all quantiles by the 1% significance level except the first quantile, which was negative but insignificant. As for FCF, the magnitudes of coefficients were negative and significant under lower quantiles at the 5% significance level up to q50. Where q60 was also negative and significant, but by the 10% significance level, where rest of the upper quantiles were negative and insignificant.

Table 2: Impact of External Debt on Economic Growth Under Quantiles

VARIABLES	location	scale	q10	q20	q30	q40	q50	q60	q70	q80	q90
ED	-0.265***	-0.00584	-0.256***	-0.259***	-0.262***	-0.263***	-0.265***	-0.266***	-0.269***	-0.272***	-0.275***
TO	-0.0367	-0.022	-0.0484	-0.0406	-0.0376	-0.0366	-0.0366	-0.0377	-0.041	-0.0473	-0.0562
LF	0.840***	-0.184***	1.143***	1.025***	0.953***	0.901***	0.853***	0.797***	0.720***	0.623***	0.518***
FCF	-0.0623	-0.0373	-0.0825	-0.0694	-0.0641	-0.0621	-0.0622	-0.0643	-0.0704	-0.0807	-0.0948
Constant	-0.112***	-0.0567***	-0.0191	-0.0552***	-0.0774***	-0.0934***	-0.108***	-0.126***	-0.149***	-0.179***	-0.212***
Observations	-0.0182	-0.0109	-0.0242	-0.0203	-0.0188	-0.0182	-0.0182	-0.0189	-0.0206	-0.0236	-0.0277
	-0.00803**	0.00252	-0.0122**	-0.0106**	-0.00958**	-0.00887**	-0.00820**	-0.00744*	-0.00638	-0.00506	-0.00361
	-0.00404	-0.00242	-0.00532	-0.00446	-0.00414	-0.00402	-0.00402	-0.00414	-0.0045	-0.0052	-0.00617
	7.650***	2.415***	3.679***	5.214***	6.159***	6.842***	7.481***	8.211***	9.222***	10.49***	11.87***
	-0.513	-0.307	-0.684	-0.577	-0.532	-0.511	-0.513	-0.535	-0.588	-0.669	-0.776
	1,241	1,241	1,241	1,241	1,241	1,241	1,241	1,241	1,241	1,241	1,241

Note: ***, **, * indicate 1%, 5% & 10% significance level
 Observation: 44 Developing Countries

The effect of external debt on economic growth in developing countries is graphically shown in Figure 1. The impact of the external debt was close to -0.25 in the lower quantile and was deepening in the upper quantiles, according to the first graph. The top quantile indicates that the impact is about to fall below zero, or -0.30 . The Figure also presents the graphical impacts of control variables on economic growth.

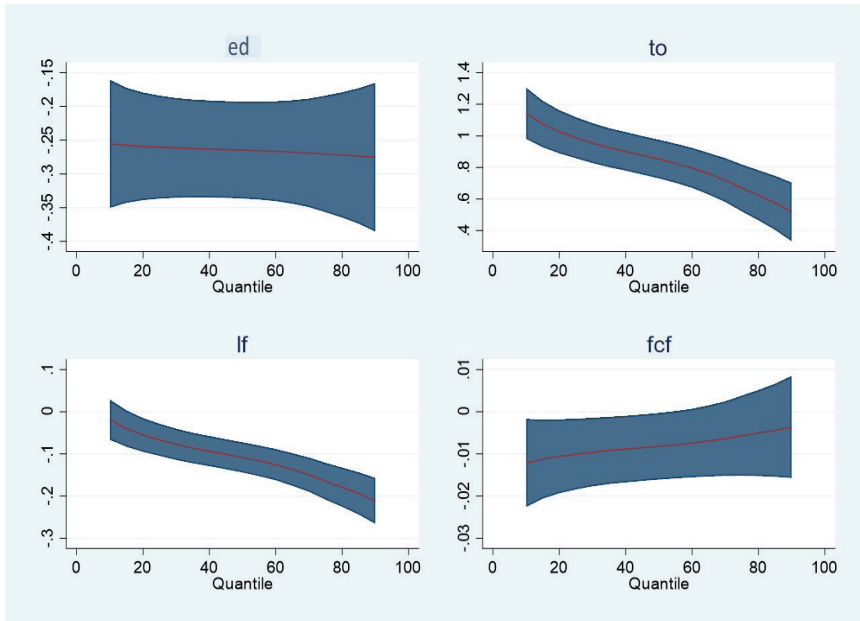


Figure 1: The Impact of External Debt on Economic Growth Under Different Quantiles

Table 3 provides the estimation according to the empirical model (2). The model mainly provides the results of financial integrity and economic growth relationship in different economic conditions. Results showed that the coefficients of financial integrity were close to zero in all quantiles, meaning insignificant. In the lower quantiles, q10 to upper-medium quantiles q60, the coefficients were slightly below the zero level, and the top three

quantiles, q70 to q90, were positive but insignificant. The results implied that the impacts of financial integrity on economic growth were almost neutral in the context of developing countries. However, the coefficients of top quantiles indicated that the better the financial integrity level, the better the growth.

Previous studies acknowledge that the level of financial integrity in developing countries is weak, which sometimes helps the economy inconsistently and creates an unsustainable growth paradigm (Rahman, Mustafa & Turpin, 2018; Chishti et al., 2021). The Table also provides the coefficients of the base variable and control variables.

Table 3: Impact of Financial Integrity Management on Economic Growth

VARIABLES	location	scale	q10	q20	q30	q40	q50	q60	q70	q80	q90
ED	-0.0285	0.358	-0.552	-0.434	-0.319	-0.199	-0.0611	0.0469	0.225	0.349	0.617
	-0.641	-0.366	-0.737	-0.68	-0.645	-0.627	-0.637	-0.664	-0.748	-0.821	-1.014
TO	0.616***	0.00577	0.608***	0.610***	0.612***	0.613***	0.616***	0.617***	0.620***	0.622***	0.627**
	-0.175	-0.1	-0.201	-0.186	-0.175	-0.171	-0.173	-0.181	-0.203	-0.224	-0.278
LF	-0.0804	-0.0483	-0.00977	-0.0258	-0.0412	-0.0574	-0.076	-0.0906	-0.115*	-0.131*	-0.167**
	-0.0536	-0.0306	-0.0616	-0.0568	-0.0541	-0.0526	-0.0536	-0.0557	-0.0631	-0.0689	-0.0843
FCF	0.0059	0.00227	0.00257	0.00333	0.00406	0.00482	0.00569	0.00638	0.00751	0.00829	0.00999
	-0.0118	-0.00676	-0.0136	-0.0126	-0.0119	-0.0115	-0.0117	-0.0122	-0.0137	-0.0151	-0.0188
FI	-0.15	0.388	-0.718	-0.59	-0.465	-0.335	-0.186	-0.0685	0.125	0.259	0.549
	-0.468	-0.268	-0.538	-0.497	-0.472	-0.459	-0.468	-0.486	-0.55	-0.602	-0.738
Constant	8.694***	-0.797	9.859***	9.595***	9.340***	9.073***	8.767***	8.527***	8.130**	7.855**	7.259*
	-2.74	-1.566	-3.15	-2.908	-2.751	-2.675	-2.715	-2.834	-3.185	-3.505	-4.345
Observations	135	135	135	135	135	135	135	135	135	135	135

Note: ***, **, * indicate 1%, 5% & 10 % significance level
 Observation: 44 Developing Countries

Figure 2 demonstrates the impact of financial integrity on economic growth by the last graph of the Figure. At the same time, it shows that primarily financial integrity lies below the zero line in the lower to upper middle quantiles and in top quantiles, it showed slightly up of the threshold line.

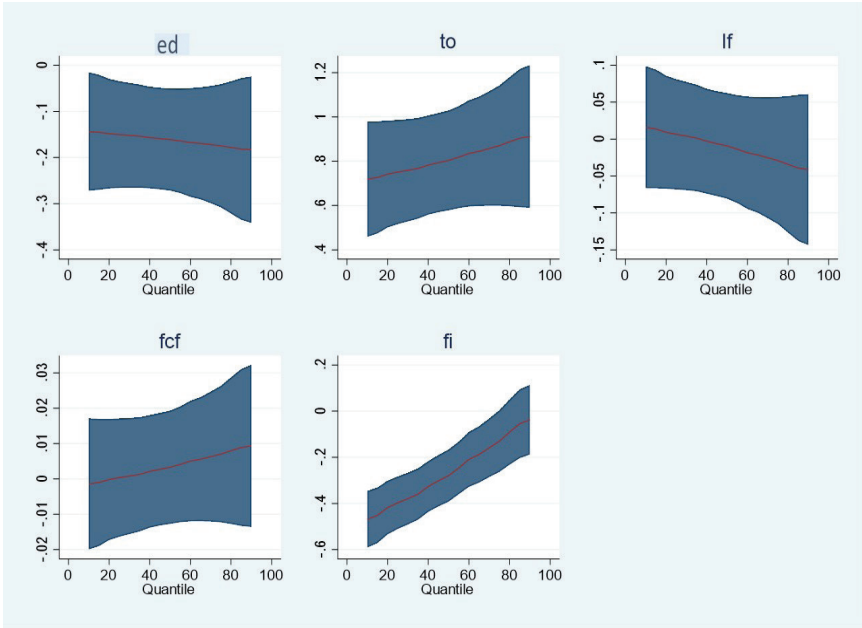


Figure 2: Impact of Financial Integrity Management on Economic Growth Under Quantiles

Table 4 presents the impact of moderating role of financial integrity on the nexus between external debt and economic growth in the context of developing countries following the empirical equation (3). The estimation depicts that the coefficients of moderating role (δ) were insignificant from the lower quantiles to the upper quantiles. In the lower quantiles, the magnitudes of the coefficients were positive but insignificant. On the other hand, from the medium quantile q50 to the top quantile q90, the results were negative and insignificant. The results indicated that the presence of financial integrity management improved the impact of external debt on economic growth compared to the coefficients ED of Table 2.

Though the moderating role of financial integrity management was still insignificant in the lower to upper quantiles, its presence improved the use of public debt for the growth perspective in the context of developing countries. The findings are partially parallel with the number of previous studies (Wang et al., 2022; Beatty et al., 2009). The studies claimed that effective financial integrity management assists in the utilisation of public funds, which also further encourages the growth trajectory of developing countries.

Table 4: The Moderating Role of FI in the Nexus Between External Debt and Economic Growth

VARIABLES	location	scale	q10	q20	q30	q40	q50	q60	q70	q80	q90
ED	-0.0285	0.358	-0.552	-0.434	-0.319	-0.199	-0.0611	0.0469	0.225	0.349	0.617
	-0.641	-0.366	-0.737	-0.68	-0.645	-0.627	-0.637	-0.664	-0.748	-0.821	-1.014
TO	0.616***	0.00577	0.608***	0.610***	0.612***	0.613***	0.616***	0.617***	0.620***	0.622***	0.627***
	-0.175	-0.1	-0.201	-0.186	-0.175	-0.171	-0.173	-0.181	-0.203	-0.224	-0.278
LF	-0.0804	-0.0483	-0.00977	-0.0258	-0.0412	-0.0574	-0.076	-0.0906	-0.115*	-0.131*	-0.167**
	-0.0536	-0.0306	-0.0616	-0.0568	-0.0541	-0.0526	-0.0536	-0.0557	-0.0631	-0.0689	-0.0843
FCF	0.0059	0.00227	0.00257	0.00333	0.00406	0.00482	0.00569	0.00638	0.00751	0.00829	0.00999
	-0.0118	-0.00676	-0.0136	-0.0126	-0.0119	-0.0115	-0.0117	-0.0122	-0.0137	-0.0151	-0.0188
FI	-0.15	0.388	-0.718	-0.59	-0.465	-0.335	-0.186	-0.0685	0.125	0.259	0.549
	-0.468	-0.268	-0.538	-0.497	-0.472	-0.459	-0.468	-0.486	-0.55	-0.602	-0.738
ED*FI	-0.0289	-0.068	0.0705	0.048	0.0262	0.00345	-0.0227	-0.0432	-0.077	-0.1	-0.151
	-0.121	-0.0694	-0.14	-0.129	-0.122	-0.119	-0.121	-0.126	-0.142	-0.156	-0.192
Constant	8.694***	-0.797	9.859***	9.595***	9.340***	9.073***	8.767***	8.527***	8.130**	7.855**	7.259*
	-2.74	-1.566	-3.15	-2.908	-2.751	-2.675	-2.715	-2.834	-3.185	-3.505	-4.345
Observations	135	135	135	135	135	135	135	135	135	135	135

Note: ***, **, * indicate 1%, 5% & 10% significance level
Observation: 44 Developing Countries

Figure 3 depicts the moderating role of financial integrity on the nexus between budget and growth in the setting of developing countries graphically. The Figure demonstrates that the moderating impacts of financial integrity are almost negligible and close to the zero line from lower to upper quantiles. However, the findings were becoming more unfavourable in the top quintiles from the lower quantiles, despite the insignificant results in all quantiles.

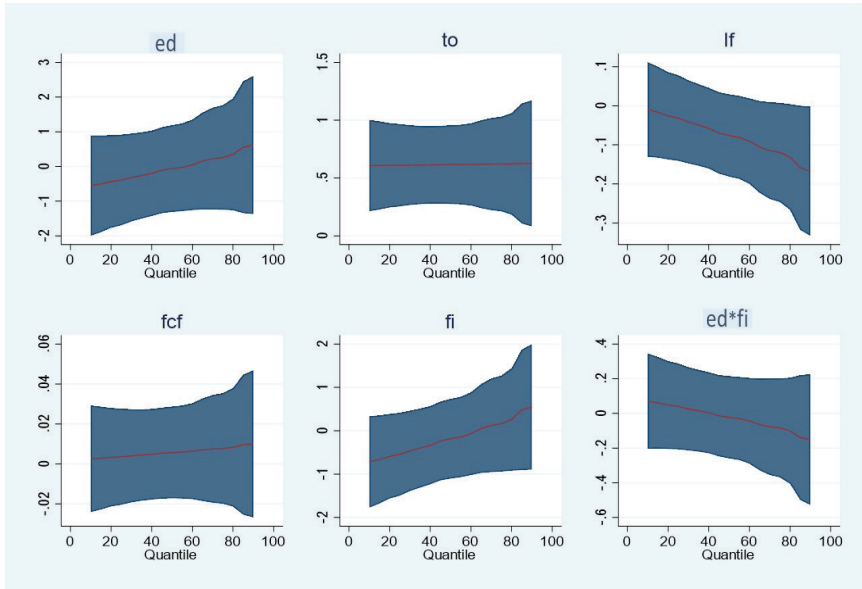


Figure 3: The Moderating Role of FI on the Nexus Between External Debt and Economic Growth Under Quantiles

Discussion

The study scrutinised the impacts of external debt and financial integrity management on economic growth in the context of developing countries. Following the empirical models, we first examined external debt’s impact on economic growth in different economic circumstances. Second, the study investigated the direct impact of financial integrity management on economic growth. And finally, the moderating role of financial integrity management was examined on the nexus between external debt and economic growth in the context of developing countries. We deployed the newly developed Method of Moment Quantile Regression (MMQR) technique to investigate the relationship among considered variables.

The investigation of equation (1) demonstrates the coefficients of external debt and economic growth. The impact of external debt on economic growth is overall counterproductive for developing countries, and the results are almost similarly negative in all quantiles lower to upper. It indicates that following the Keynesian economic growth theory running high external public debt to stimulate economic growth barely supports the macroeconomic condition of developing countries. Moreover, many countries experience debt default, like Sri Lanka and Tunisia, due to huge public debt. Though, the negative impact of external debt in developing countries is in line with the notion of the Debt Overhang Theory (Turan & Yanikkaya, 2021). However, the constant negative results of public debt might be the cause of poor debt management, high corruption, and financial leakage from the debt fund.

The study also examined the direct impact of financial integrity management on economic growth in developing countries. The estimation employing MMQR shows that financial integrity management has low impacts on economic growth in all quantiles. It might be the cause the developing countries still have minimal information or track about the components of financial integrity management, i.e., illicit financial flows, money laundering, tax evasion and trade misinvoicing (Bethencourt & Kunze, 2020; Loayza, Villa & Misas, 2019). Therefore, the utilised data might not be an exact display of the financial integrity management of the developing countries but a partial picture (Moorman, 2018; Calafos & Dimitoglou, 2023). However, the results also imply that the stronger the financial integrity management, the stronger the economic growth. At the same time, the coefficients are insignificant but move towards positivity. It means strong financial integrity management supports economic growth for developing countries.

Finally, the moderating role of financial integrity management was explored on the nexus between external debt and economic growth, followed by equation (3). The results indicate that financial integrity management motivates the proper use of external debt for developing countries. Usually, developing countries are prone to bureaucratic corruption including in the financial regulatory bodies, where strong financial integrity blocks financial corruption and fund leakages (Marakbi & Villieu, 2020; Loayza, Villa & Misas, 2019). In this way, financial integrity supports economic growth

through the proper use of public funds, including external debt. Though the empirical results barely provide significant results of the moderating role of financial integrity management. At the same time, financial transparency and regulations are the prime factors in improving the utilisation of external debt for the betterment of the economic trajectory of developing countries.

CONCLUSION

In modern economics, the government often intervene in macroeconomics to smoothen the growth function and guide the market in the right direction. Followed by the Keynesian macroeconomic doctrine, government intervene in the economy through expansionary fiscal policy adopting external public debt to stabilise the economy from a sudden downturn or recession. From this macroeconomic stance, we examined the impact of external public debt on economic growth in the context of developing countries, and typically the countries are highly reliant on external debt for fiscal adjustment. In addition, due to high financial corruption and fragile financial regulatory body, this group of countries lost their budget fund, foreign aid and debt fund, which also affected economic growth. Hence, the study also examined the direct and moderating role of financial integrity management on economic growth and debt-growth nexus, respectively. The highly heterogeneous and nonlinear panel data from 1990 to 2020 were used to examine the impacts, employing the robust MMQR technique. The method was able to produce robust analysis addressing heterogeneity and nonlinearity issues considering the conditional mean.

The estimation followed by the three empirical equations developed according to the objectives of the study provided the results. In the context of developing countries, the impacts of external debt are highly negative and significant throughout the quantiles. This implies that external debt has a counterproductive impact on economic growth. Afterwards, the estimation of financial integrity management shows that it has close to neutral impacts on economic growth. Finally, the moderating role of financial integrity management on external debt and economic growth relationship shows that financial integrity management supports economic growth for developing countries. At the same time, the impacts are more growth-supporting through utilising the external debt in upper quantiles than the

lower quantiles. However, external debt works well for economic growth with the presence of financial integrity management, though the coefficients are still insignificant.

The study recommends some policy implications for practitioners and policymakers. First, external debt is still asymmetric with economic growth; therefore, developing countries should be cautious in adopting expansionary fiscal policy through external debt. At the same time, strong fiscal space and proper debt management might improve external debt sustainability. Additionally, policymakers should improve the quality of financial integrity management in their countries to control fund leakage through different illicit channels to get the benefit of external debt on economic growth.

The study has several limitations that might be addressed in future studies. First, public debt through internal and external sources has been rising significantly in developing countries to motivate the economy from the negative externalities of the exogenous shocks of the COVID-19 pandemic and the Russia-Ukraine war. The current study was unable to incorporate this huge debt issue in this study due to data unavailability, whereas future studies can focus on closing the gap. Besides, the current study only focussed on external debt and developing countries as the sample set, while future studies might consider both external and internal public debt in the context of high-income countries or regional organisations or individual countries to examine economic growth. Finally, future studies can focus on the individual components of financial integrity management, i.e., illicit financial flow, money laundering, tax evasion and trade misinvoicing to examine the impact on economic growth.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

FUNDING

The work is supported by the grant of the Accounting Research Institute (HICoE), Universiti Teknologi MARA (UiTM), Malaysia.

REFERENCES

- Akram, R., Chen, F., Khalid, F., Huang, G., & Irfan, M. (2021). Heterogeneous effects of energy efficiency and renewable energy on economic growth of BRICS countries: A fixed effect panel quantile regression analysis. *Energy*, 215, 119019.
- Albonico, A., Ascari, G., & Gobbi, A. (2021). The public debt multiplier. *Journal of Economic Dynamics and Control*, 132, 104204.
- Alimov, B. (2022). The dynamic effects of debt and equity inflows: Evidence from emerging and developing countries. *The Journal of Economic Asymmetries*, 26, e00259.
- Asteriou, D., Pilbeam, K., & Pratiwi, C. E. (2021). Public debt and economic growth: panel data evidence for Asian countries. *Journal of Economics and Finance*, 45(2), 270-287.
- Baklouti, N., & Boujelbene, Y. (2020). Shadow economy, corruption, and economic growth: An empirical analysis. *The Review of Black Political Economy*, 47(3), 276-294.
- Bashir, M. F., Khan, T., Tariq, Y. B., & Akram, M. (2022). Does capital flight undermine growth: A case study of Pakistan. *Journal of Money Laundering Control*, (ahead-of-print).
- Berg, A., Ostry, J. D., Tsangarides, C. G., & Yakhshilikov, Y. (2018). Redistribution, inequality, and growth: New evidence. *Journal of Economic Growth*, 23(3), 259-305.
- Bethencourt, C., & Kunze, L. (2020). Social norms and economic growth in a model with labor and capital income tax evasion. *Economic Modelling*, 86, 170-182.
- Butkus, M., Cibulskiene, D., Garsviene, L., & Seputiene, J. (2021). The heterogeneous public debt–growth relationship: The role of the expenditure multiplier. *Sustainability*, 13(9), 4602.

- Calafos, M. W., & Dimitoglou, G. (2023). Cyber Laundering: Money Laundering from Fiat Money to Cryptocurrency. In *Principles and Practice of Blockchains* (pp. 271-300). Springer, Cham.
- Chen, L. Y., & Lee, S. (2018). Exact computation of GMM estimators for instrumental variable quantile regression models. *Journal of Applied Econometrics*, 33(4), 553-567.
- Chernozhukov, V., & Hansen, C. (2008). Instrumental variable quantile regression: A robust inference approach. *Journal of Econometrics*, 142(1), 379-398.
- Chishti, M. Z., Ahmed, Z., Murshed, M., Namkambe, H. H., & Ulucak, R. (2021). The asymmetric associations between foreign direct investment inflows, terrorism, CO2 emissions, and economic growth: A tale of two shocks. *Environmental Science and Pollution Research*, 1-19.
- Combes, J. L., Kinda, T., Ouedraogo, R., & Plane, P. (2019). Financial flows and economic growth in developing countries. *Economic Modelling*, 83, 195-209.
- Dutta, S. J. (2020). Sovereign debt management and the transformation from Keynesian to neoliberal monetary governance in Britain. *New Political Economy*, 25(4), 675-690.
- Ekanayake, E. M., & Thaver, R. (2021). The Nexus between Financial Development and Economic Growth: Panel Data Evidence from Developing Countries. *Journal of Risk and Financial Management*, 14(10), 489.
- Fisera, B., Tiruneh, M. W., & Hojdan, D. (2021). Currency depreciations in emerging economies: A blessing or a curse for external debt management?. *International Economics*, 168, 132-165.
- Gaies, B., & Nabi, M. S. (2019). Financial openness and growth in developing countries. *Journal of Economic Integration*, 34(3), 426-464.

- Hieu, V. M., & Mai, N. H. (2022). Impact of renewable energy on economic growth? Novel evidence from developing countries through MMQR estimations. *Environmental Science and Pollution Research*, 1-16.
- Kar, D., & Spanjers, J. (2015). *Flight capital and illicit financial flows to and from Myanmar: 1960-2013*. Washington DC: Global Financial Integrity.
- Kengatharan, L. (2021). Determinants of dividend policy in Sri Lanka: The panel data analysis. *Asia-Pacific Management Accounting Journal*, 16(2), 289-313.
- Kharusi, S. A., & Ada, M. S. (2018). External debt and economic growth: The case of emerging economy. *Journal of Economic Integration*, 33(1), 1141-1157.
- Khuong, N. V., Liem, N. T., & Dung, B. T. N. (2021). Does real earnings management explain cost of debt? evidence from an emerging economy. *Asia-Pacific Management Accounting Journal (APMAJ)*, 16(3), 221-236.
- Linh, T. N., Long, H. T., Chi, L. V., Tam, L. T., & Lebailly, P. (2019). Access to rural credit markets in developing countries, the case of Vietnam: A literature review. *Sustainability*, 11(5), 1468.
- Loayza, N., & Pennings, S. M. (2020). Macroeconomic policy in the time of COVID-19: A primer for developing countries. *World Bank Research and Policy Briefs*, (147291).
- Loayza, N., Villa, E., & Misas, M. (2019). Illicit activity and money laundering from an economic growth perspective: A model and an application to Colombia. *Journal of Economic Behavior & Organization*, 159, 442-487.
- Loayza, N., Villa, E., & Misas, M. (2019). Illicit activity and money laundering from an economic growth perspective: A model and an application to Colombia. *Journal of Economic Behavior & Organization*, 159, 442-487.

- Loayza, N., Villa, E., & Misas, M. (2019). Illicit activity and money laundering from an economic growth perspective: A model and an application to Colombia. *Journal of Economic Behavior & Organization*, 159, 442-487.
- Machado, J. A., & Silva, J. S. (2019). Quantiles via moments. *Journal of Econometrics*, 213(1), 145-173.
- Marakbi, R., & Villieu, P. (2020). Corruption, tax evasion, and seigniorage in a monetary endogenous growth model. *Journal of Public Economic Theory*, 22(6), 2019-2050.
- Mmaduabuchukwu, M., & Ndidamaka, S. M. (2019). Effects of illicit financial outflows on political stability and food debt in West Africa and the Sahel: A panel data analysis.
- Mohsin, M., Ullah, H., Iqbal, N., Iqbal, W., & Taghizadeh-Hesary, F. (2021). How external debt led to economic growth in South Asia: A policy perspective analysis from quantile regression. *Economic Analysis and Policy*, 72, 423-437.
- Moorman, T. C. (2018). Kleptocracy and foreign corruption manifesting in illicit financial flows. *Journal of Financial Crime*, 25(3), 681-701.
- Nuru, N. Y., & Gereziher, H. Y. (2021). The effect of fiscal policy on economic growth in South Africa: A nonlinear ARDL model analysis. *Journal of Economic and Administrative Sciences*, 38(2), 229-245.
- Ogbonnaya, A. K., & Ogechuckwu, O. S. (2017). Impact of illicit financial flow on economic growth and development: Evidence from Nigeria. *International Journal of Innovation and Economic Development*, 3(4), 19-33.
- Ortega, B., Sanjuán, J., & Casquero, A. (2019). Illicit Financial Flows: Another Road Block to Human Development in Low-and Middle-Income Countries. *Social Indicators Research*, 142(3), 1231-1253.

- Osadume, R. C., & Imide, I. O. (2022). A comparative assessment of external debt management and infrastructural developments: perspectives on Nigeria's economy, 1979–2020. *Journal of Money and Business*, (ahead-of-print).
- Pedersoli, S., & Presbitero, A. F. (2022). Public debt management and private financial development. *Economic Systems*, 101010.
- Rahman, M., Mustafa, M., & Turpin, L. (2018). Determining illicit financial outflows from sixty developing countries. *Journal of Financial Economic Policy*, 11(1), 62-81.
- Sharaf, M. F. (2021). The asymmetric and threshold impact of external debt on economic growth: New evidence from Egypt. *Journal of Business and Socio-economic Development*, 2(1), 1-18.
- Slama, M. B., & Gueddari, A. (2022). The Relationship Between Money Laundering and Economic Growth in the MENA Region—A Simultaneous Equation Model. In *Key Challenges and Policy Reforms in the MENA Region* (pp. 123-141). Springer, Cham.
- Slutzky, P., Villamizar-Villegas, M., & Williams, T. (2020). Drug Money and Bank Lending: The Unintended Consequences of Anti-Money Laundering Policies. Available at SSRN 3280294.
- Stubbs, T., Kring, W., Laskaridis, C., Kentikelenis, A., & Gallagher, K. (2021). Whatever it takes? The global financial safety net, Covid-19, and developing countries. *World Development*, 137, 105171.
- Tellman, B., Magliocca, N. R., Turner, B. L., & Verburg, P. H. (2020). Understanding the role of illicit transactions in land-change dynamics. *Nature Sustainability*, 3(3), 175-181.
- Temsumrit, N. (2021). Democracy, institutional quality and fiscal policy cycle: Evidence from developing countries. *Applied Economics*, 1-24.
- Turan, T., & Yanikkaya, H. (2021). External debt, growth and investment for developing countries: some evidence for the debt overhang hypothesis. *Portuguese Economic Journal*, 20(3), 319-341.

Wang, H., Fu, X., Fan, M., Wang, S., Meng, L., & Du, W. (2022). Fault growth and linkage: Implications for trap integrity in the Qi'nan area of the Huanghua Depression in Bohai Bay Basin, China. *Marine and Petroleum Geology*, 145, 105875.