An empirical investigation into the determinants of external debt in Asian developing and transitioning economies

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ABSTRACT
This paper investigates the determinants of external debt in 32 Asian developing and transitioning economies for the period 1995–2019. Estimation is carried out using the generalized method of moments (GMM), which is capable of dealing with potential endogeneity problems. The results show that in both the short- and long-run, economic growth and investment reduce external debt, whereas exchange rate, trade, and government expenditure increase external debt. Diagnostic tests confirm the reliability and consistency of our findings, which should be taken into account by policymakers for policy formulation and implementation. Based on our empirical findings, relevant policy implications, aimed at reducing external debt in the selected Asian developing and transitioning economies, are provided for policy consideration.

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1. Introduction
Over the last four decades, the external debt of many developing countries has risen dramatically due to the chronic current account (import-export gap), lack of capital (saving–investment gap), and fiscal imbalances (revenue-expenditure gap) (Beyene and Kotosz 2020a). This growing strain of foreign debt and large debt payments is a persistent problem for the whole world, but an even greater challenge for developing countries (Duodu and Baidoo 2020a; Baidoo et al. 2021; Ofori-Abebrese, Baidoo, and Olesu 2021). Developing countries have borrowed a huge amount of external funds as a result of budget deficits, trade deficits, and saving–investment gaps. Given this, researchers and policymakers have investigated the determinants of external debt since the debt crises of the early 1970s. After the 1970s and 1980s, global developments, such as oil price shocks, high-interest rates, low commodity prices, and recessions in developed countries, affected the domestic macroeconomic factors of developing countries (Waheed 2017).

Common determinants of external debt reported in existing literature are economic growth, imports, population, foreign exchange reserves, total debt service, poverty, income instability, depreciation of the currency, budget deficit, exchange rate, trade openness, terms of trade, inflation, interest rate, national savings, and financial development (Abdullahi, Bakar, and Hassan 2015; Bittencourt 2015; Lau, Lee, and Apir 2015; Vighneswara 2015; Lau and Lee 2016; Al-Fawwaz 2016; Belgith and Omran 2017; Özata 2017; Udoh and Rafik 2017; Chiminya, Dunne, and Nikolaidou 2017; Chirwa and Odhiambo 2018; Adamu 2019; Brafu-Insaidoo et al. 2019; Fatukasi et al. 2020). For instance, Vighneswara (2015) and Beyene and Kotosz (2020a) asserted that government expenditure is one of the key factors that increase external debt due to budget deficits, which compel governments to borrow. Democracy, political stability, control of corruption, and quality of laws are also noted to be political factors that determine external debt (see: Harold 2019). Furthermore, Awan, Anjum, and Rahim (2015) and Azolibe (2020) indicated that corruption, foreign aid, government expenditure, external reserve, population growth, economic growth, and unemployment rate are macroeconomic and socioeconomic factors that determine external debt.

Countries tend to rely on foreign borrowing to maintain financial liquidity and stimulate economic growth, especially, when there are limited domestic capital and savings to fulfill developmental goals. When a country has insufficient internal resources to cover domestic demands, it is then compelled to use external financing...
options to sustain economic growth. Existing studies have considered economic growth as the primary determinant of external debt. It is reported that the slow growth of an economy puts upward pressure on external debt (see: Bittencourt 2015; Murvirapachena and Kapingura 2015; Globan and Matošec 2016). The exchange rate, which is the rate at which one currency is exchanged for another, is one of the factors that influence external debt (see: Wahyuni, Muhammad, and Nazamuddin 2019). The exchange rate plays a vital role in economies as it facilitates economic integration, trade, and capital movements among countries. It also determines the value of the amount of foreign debt that has to be paid in foreign currency. Özata (2017) and Wahyuni, Muhammad, and Nazamuddin (2019) indicated that the exchange rate has a significant positive effect on the external debt of countries. Aside exchange rate, gross fixed capital formation, which facilitates domestic investment, has been asserted as another key factor that affects the external debt of economies. For instance, Vighneswaran (2015) reported that gross fixed capital formation has a positive effect on external debt.

Given the increasing interest in globalization, countries have introduced policies aimed at opening up to the rest of the world. Such economic integration through globalization is embarked upon in the hope of reaping some associated benefits which include the transfer of technologies and foreign direct investment. Thus, foreign trade has become an essential part of countries’ economic growth and development. On one hand, trade openness creates or generates employment opportunities and foreign exchange reserves (Duodu and Baidoo 2020b). On the other hand, it leads to higher external debt when imports exceed exports, as reported by Al-Fawwaz (2016).

Due to the negative consequences of external debt [such as reduction in the standard of living and ultimately, welfare as indicated by Baidoo et al. (2021)] on economies, there is an urgent need for countries to understand the key determinants of external debt. Ascertaining these key determinants helps to avert such negative repercussions, and this, therefore, requires empirical research such as the present study.

The main objective of this study is to examine the determinants of external debt in the context of Asian developing and transitioning economies, which is virtually missing in the literature. In recent years, researchers and policymakers have paid greater attention to external debt, and hence investigated the determinants of external debts in developing countries, which are mostly non-Asian. Most studies on external debt are country-specific (see, for example, Awan, Anjum, and Rahim 2015; Al-Fawwaz 2016; Belguith and Omrane 2017; Özata 2017; Brafu-Insaidoo et al. 2019; Wahyuni, Muhammad, and Nazamuddin 2019), and for that matter, the findings could not be generalized for the rest of the world; this is as a result of differences in geographical and economic conditions among countries. Again, some past studies have focused on the impact of external debt on economic growth, but it is equally prudent and imperative to ascertain the factors which affect or cause external debt. Given what has been expounded, and also, the fact that there is virtually no empirical study on the determinants of external debt in the context of Asian developing economies makes the present study essential. The present study, therefore, makes at least two contributions to the literature and knowledge. First, it examines this important phenomenon in the context of Asian developing and transitioning economies. Prior to the present study, determinants of external debt within the context of Asian developing and transitioning economies have not been given attention in the literature. This raises concerns because external debt has engulfed these Asian economies, making it imperative to identify ways to eliminating or reducing such debts and its associated negative repercussions. Second, to the best of authors’ knowledge, this is the first-panel study to examine the determinants of external debt from the perspective of the Asian developing and transitioning economies. The findings will help governments and policymakers of these economies to implement policies and strategies geared toward reducing external debt. This is because external debt has the potency of retarding economic growth if it becomes extra higher. Last but not least, the present study employs a more robust estimation technique – the generalized method of moments (GMM), which is capable of dealing with any potential endogeneity problem for the analysis, hence making the results reliable for effective policy purposes.

The remainder of this paper is arranged as follows. Next is the literature review and it is followed by the methodology of the study. The results and discussion is presented in the fourth section, whereas the conclusions and policy implications are reported in the last section.

2. Literature review

This section presents the theoretical and empirical literature, which form the basis of the present study. Specifically, it begins with the theoretical framework of the study, and this is followed by a review of the past studies.

2.1. Theoretical framework

Beyene and Kotosz (2020a) mentioned three different financing options through which governments of
countries finance their spending and other developmental projects: they are borrowing, taxation, and money printing. Similarly, Waheed (2017) documented four ways in which governments finance their budget deficit: printing of money, running down resources, domestic borrowing, and external borrowing. Countries borrow money to enhance the welfare of society, promote economic growth, and fulfill public demands. There are several frameworks and econometric models in the literature used in analyzing external debt determinants. These include the two-gap model (Chenery and Strout 1966), three-gap models (Bacha 1989), Harrod (1939) and Domar (1946)’s growth models which capture the saving–investment gap, foreign exchange gap, and fiscal-constraint gap. In the event of spending gaps and deficits, countries are compelled to borrow from external sources.

A typical model for an open economy depicting the dual-gap phenomenon without government expenditure is specified in Equation (1).

$$Y = C + I + X - M$$

(1)

where $Y$, $C$, $I$, $X$ and $M$ are income, consumption, investment, exports of goods and services, and imports of goods and services, respectively. Considering the fact that income ($Y$) minus consumption ($C$) is equal to savings ($S$), Equation (1) can be rewritten as Equation (2).

$$S - I = X - M$$

(2)

where the variables are as already defined. Equation (2) represents an open economy with a two-gap model without considering government expenditure. $S-I$ is the saving–investment gap and it is equal to the trade gap given by $X-M$.

The three-gap model is formulated as follows:

$$I = (Y_p - C_p) + (T - G_c) + (M - X)$$

(3)

where $I$ is the investment, $Y_p$ and $C_p$ are the private income and consumption respectively, $T$ and $G_c$ represent government revenues and expenditures accordingly, and $M$ and $X$ are as defined in Equation (1). Equation (3) can be related to external debt; when private consumption exceeds private income, the saving–investment gap occurs, and this is covered by external borrowing. Secondly, when government expenditure is higher than its revenues, a fiscal deficit occurs, and the attempt to fill this gap leads to borrowing, which is one of the leading causes of external indebtedness. The final gap, which determines external debt, is the higher import cost and smaller export earnings. Waheed (2017) documented the two-gap and three-gap models in relation to external debt, and how these gaps (saving–investment gap, foreign exchange gap, and fiscal-constraint gap) determine external debt. The fiscal-constraint gap is shown in Equation (4).

$$T_t + (D_t - D_{t-1}) = G_t - rD_{t-1}$$

(4)

where $T_t$, $D_t$, $D_{t-1}$ and $G_t$ are government revenue, current debt, past debt, and government expenditure, respectively, and $r$ is the interest on the past accumulated debt. The current debt can be obtained by rearranging Equation (4), and this yields Equation (5).

$$D_t = G_t - T_t + (1 + r)D_{t-1}$$

(5)

where $G_t - T_t$ is the primary budget deficit. When there is an increase in government expenditure and the interest rate on past accumulated debt also increases, the current debt rises and an increase in government revenue reduces the debt.

From the balance of payment perspective, debt can be determined as follows:

$$CAB = X_t - M_t - rD_{t-1}$$

(6)

$$KAB = (D_t - D_{t-1}) + (R_t - R_{t-1})$$

(7)

where $CAB$ is the current account balance and $KAB$ is the capital account balance, $X_t$, $M_t$, $D_t$ and $D_{t-1}$ are as already defined, $R_t$ and $R_{t-1}$ are current international reserve and accumulated international reserves, respectively and $rD_{t-1}$ is the interest on the accumulated debt. Rearranging Equations (6) and (7) yields the balance of payment equation ($CAB + KAB = 0$) specified in Equation (8).

$$D_t = M_t - X_t + (1 + r)D_{t-1} - \Delta R$$

(8)

The debt accumulation from saving–investment gap can be specified as follows:

$$S_t + (D_t - D_{t-1}) = I_t + rD_{t-1}$$

(9)

where $S_t$ and $I_t$ are savings and investment and the remaining variables are as already defined. Equation (9) can be rearranged to obtain the current debt as follows:

$$D_t = I_t - S_t + (1 + r)D_{t-1}$$

(10)

where the variables are those already defined. Equation (10) shows that external debt increases when the savings–investment gap increases, or when the interest rate increases.

Following the above discussion, the present paper considers six important variables based on the three-gap model of Bacha (1989): economic growth, exchange rate, gross fixed capital formation (proxy for investment), trade openness (proxy for imports and exports), inflation, and government expenditure (proxy for government consumption). Developing countries have low domestic savings, and lack sufficient foreign exchange
to finance the investment needed to boost economic growth and capital goods. The low savings and lack of foreign exchange compel governments of these countries to acquire foreign funding. Other reasons for over-dependence on borrowing are higher imports and exchange rates. In Asian developing and transitioning economies, the domestic currency always depreciates against the dollar and this leads to a high cost of imports compared with the low earnings from exports. As a result, the imports-exports gap increases, as exports earnings are usually insufficient to generate enough foreign currency to finance imports. Therefore, developing countries tend to borrow to finance imports which, in turn, influence debt.

2.2. Empirical review

This section focuses on the review of some recent studies related to external debt. Vighneswara (2015) investigated the macroeconomic determinants of government debt in 252 sovereign countries for the period 1980–2009. The results from the generalized method of moments show that real GDP growth, government expenditure, inflation, and population growth escalate debt. Gross fixed capital formation, final consumption expenditure, and trade openness were also revealed to increase debt. Using data for the period 1970–2007, Bittencourt (2015) employed pooled ordinary least squares, fixed effect and fixed effect-instrumental variable estimation techniques to show that, economic growth significantly reduces debt for young democracies in South America. Using the error correction model and dataset spanning the period 1976–2010, Awan, Anjum, and Rahim (2015) revealed that there is a positive relationship between fiscal deficit, exchange rate, trade openness, and external debt for Pakistan. The study further revealed that the relationship between terms of trade and external debt is negative. In a related study, Al-Fawwaz (2016) applied the autoregressive distributed lag model to a dataset covering the period 1990–2014. The results revealed that trade openness, terms of trade, and exchange rate have a significant positive effect on external debt for Jordan. The results further showed that gross domestic product per capita reduces external debt.

Waheed (2017) investigated the macroeconomic determinants of external debt in 12 oil and gas exporting and 12 oil and gas importing countries for the period 2004–2013. The results for the exporting countries showed that economic growth, foreign exchange reserves, price of oil, and domestic investment reduce external debt, whereas current account deficit and inflation increase external debt. With regard to importing countries, the results indicated that economic growth and gross domestic savings reduce external debt, while trade deficit, price of oil, interest payment on external debt, foreign direct investment, and domestic investment increase external debt. Applying the vector error correction model to a dataset spanning the period 1970–2013, Udoh and Rafik (2017) showed that capital expenditure increases external debt, whereas economic growth reduces it for the case of Malaysia. Lau, Lee, and Apr (2015) also reported a similar finding for Malaysia. Employing the autoregressive distributed lag model and using data on Turkey, Özata (2017) revealed that budget deficit and exchange rate escalate external debt, whereas savings reduce it.

In examining the determinants of external debt for 36 sub-Saharan African countries over the period 1975–2012, Chiminya, Dunne, and Nikolaïdou (2018) through the generalized method of moments showed that trade and economic growth reduce external debt, whereas investment increases it. The study further revealed that countries with democratic administrative government tend to accumulate more debt than countries with the autocratic government. Similarly, Chirwa and Odhiambo (2018) employed the autoregressive distributed lag model to show that while economic growth reduces external debt, government expenditure worsens it for the case of the Euro area. In a related study on South Asia, Abbas and Wizarat (2018) applied the fixed effect model to a dataset that spans the period 1990–2015. The results revealed that military expenditure increases external debt, whereas domestic investment and trade reduce it.

Adamu (2019) investigated the determinants of external debt for Nigeria over the period 1970–2017. The results from the general to specific (GETS) approach and Johansen cointegration showed that oil price, domestic savings, exchange rate, debt relief, and fiscal deficits increase external debt. Another related study on Nigeria over the period 1980–2013 by Abdullahi, Bakar, and Hassan (2015) revealed that interest rate, exchange rate, and budget deficits have a significant negative relationship with external debt. The study employed the autoregressive distributed lag model as the estimation technique. Brafu-Insaidoo et al. (2019) examined the determinants of foreign debt over the period 1970–2012 for the case of Ghana. The results from the autoregressive distributed lag model indicated that whereas trade openness reduces short-term foreign debt, economic growth worsens it.

In a related study, Azolibe (2020) examined the determinants of external debt for 39 heavily indebted poor countries (HIPCs) over the period 1996–2018. The results from the panel fully modify ordinary least
squares revealed that corruption, government expenditure, and population growth increase external debt, whereas economic growth reduces it. Using the two- and three-gap models as a theoretical framework in determining debt, Beyene and Kotosz (2020a) applied the autoregressive distributed lag model to a dataset covering the period 1981–2016. The results showed that the saving–investment gap, trade deficit, fiscal deficit, and debt servicing increase external debt for Ethiopia. On the other hand, growth rate of GDP, trade openness, and inflation were revealed to decrease external debt. Furthermore, using the panel corrected standard error estimation technique and dataset spanning the period 1990–2017 for heavily indebted poor countries, Beyene and Kotosz (2020b) revealed that debt servicing, import, and growth rate increase external debt, whereas exports and foreign direct investment reduce it. Also, using the fully modified ordinary least squares and employing data from 1981 to 2018, Fatukasi et al. (2020) revealed that debt servicing and trade openness reduce external debt for Nigeria.

From the above review, it is observed that different studies have revealed different results, and this is due to the differences in geographical and economic conditions among the countries. This further clearly confirms that conclusions from studies on different countries or regions could not be effectively generalized for the rest of the world. Given this, and considering that, this important phenomenon has not been investigated in the context of the Asian developing and transitioning economies, there is, therefore, the need for a study to consider that to fill the gap created, and the present study seeks to fill this lacuna in the literature.

3. Methodology

3.1. Model specification

Following the panel nature of the dataset used, the study specifies a panel model for estimation.

\[
EXD_{it} = \pi_0 + \pi_1 EXD_{it-1} + \pi_2 X_{it} + \eta_i + \lambda_t + \mu_{it} \tag{1}
\]

where \(EXD_{it}\) represents external debt and \(EXD_{it-1}\) is its lag and measures the persistence of external debt over time. \(X_{it}\) is a vector of explanatory variables that are presumed to affect external debt and they are economic growth, exchange rate, investment, trade, inflation, and government expenditure. \(\eta_i\) and \(\lambda_t\) denote the individual and time effects, respectively, and \(\mu_{it}\) is the usual error term assumed to have zero mean and constant variance. The parameter \(\pi_2\) captures the effect of the various explanatory variables on the dependent variable, and \(\pi_1\) is the coefficient of the lag-dependent variable. The parameter \(\pi_0\) is the intercept of the specified model. Also, \(i = 1, 2, 3, \ldots, N\) and \(t = 1, 2, 3, \ldots, T\); \(N\) and \(T\) represent country and time, respectively.

3.2. Estimation strategy

Equation (1) is estimated using the generalized method of moments (GMM) suggested by Arellano and Bond (1991). This technique is used due to the merits it has over other panel estimation techniques such as fixed effect, random effect, and pooled ordinary least squares. Some of the advantages GMM has are, being able to control for endogeneity, autocorrelation and simultaneity bias problems, and properly exploiting the between and within variations in the data. Again, Equation (1) is dynamic in nature due to the lag-dependent variable introduced as an explanatory variable. Due to the inclusion of this lagged variable, the traditional panel models, such as the fixed effect and random effect which are static in nature, cannot handle the endogeneity problem introduced in the equation by the lagged term at the right-hand side of Equation (1). The lagged term as an explanatory variable causes an endogeneity problem in the sense that, it is correlated with the white noise error term. This is so because there may be unobserved variables that are imbedded in the error term which might also correlate with the lag-dependent variable term. In Equation (1), there is also likely to be a reverse causality, which will cause an endogeneity problem and hence the need for a technique like the GMM to handle that efficiently. For instance, in as much as economic growth is expected to affect external debt, it is equally plausible that external debt will influence economic growth. This is because the funds borrowed are used to undertake economic activities which apparently will have an influence on the economy.

To ensure that the results obtained from the GMM are reliable and consistent, some diagnostic tests are performed. First, to ensure the absence of second-order autocorrelation in the estimated model, the Arellano and Bond test by Arellano and Bond (1991) is utilized. Also, considering the fact that the GMM is noted for its usage of more instruments, which weakens the power of the Hansen J test for instrument validity, the study adopts the Roodman’s Stata routine approach to collapse all the internally generated instruments. In this regard, the Hansen J test is employed to ascertain the validity of the instruments used. Also, to ensure that the model does not suffer from severe multicollinearity problems, the study employs the Pearson’s correlation coefficient test and the variance inflation factor (VIF) to detect the presence or otherwise of any possible multicollinearity issue.
Finally, for effective long-term policy purposes, the long-run coefficients, which measure the permanent impact of the variables (with the exception of the lag-dependent variable), are estimated in addition to the short-run coefficients which measure the immediate effect of the explanatory variable on the dependent variable. In obtaining the long-run coefficients, the approach by Papke and Wooldridge (2005) is adopted. With this approach, the coefficients are obtained by multiplying the short-run coefficients by \((1 - \pi_1)^{-1}\), where \(\pi_1\) is the coefficient of the lag-dependent variable in Equation (1).

### 3.3. Data and variable description

The study uses panel data on 32 Asian developing and transitioning economies (see the Appendix for the list of economies) over the period 1995–2019. The data on external debt, economic growth, exchange rate, investment, trade, inflation, and government expenditure are obtained from the country dataset of the Economic Intelligence Unit (EIU). The period of study and country selection is based on data availability. It must be mentioned that, though the study period spans 1995–2019, the study uses five-year data point averages (1995–1999, 2000–2004, 2005–2009, 2010–2014, 2015–2019) for all variables and the analysis. The reason and motivation for using the five-year averages are that, according to Islam (1995) and Egyir, Sakyi, and Baidoo (2020), it is not helpful to use a relatively longer period for panel analysis. This is because the data are likely to contain outliers which may cause threatening disturbances in the data and subsequently affect the efficacy of the results. In addition, Sala and Trivín (2014) note that this data transformation is helpful as it helps in analyzing long-run relationship among the variables which is more important for effective policy resolutions. Summary of the definition of variables, notations, and the source of data are reported in Table 1.

### 4. Results and discussion

This section presents the results of the study. Precisely, the summary of descriptive statistics of the variables, results of the correlation matrix and variance inflation factor are presented. Afterward, the short- and long-run estimates from the generalized method of moments (GMM) are reported and discussed accordingly.

#### 4.1. Descriptive statistics and correlation matrix of variables

The summary of descriptive statistics of the variables, correlation matrix, and variance inflation factor (VIF) results are reported in Tables 2–4, respectively.

#### 4.2. Estimated short- and long-run results

The short- and long-run results of the GMM are reported in Table 5.

It is observed from the outcome that, the short-run results are not statistically different from those of the long-run in terms of signs of the coefficients and significance level. However, the long-run coefficients are much greater than the short-run coefficients. This indicates that the long-run impact of the explanatory variables on the external debt is much greater than the short-run impact.

### Table 1. Definition of variables and source of data.

| Variable          | Definition/Proxy                          | Notation | Source of data |
|-------------------|-------------------------------------------|----------|----------------|
| External debt     | Total external debt to gross              | EXD      | EIU country dataset |
|                   | domestic product                           |          |                |
| Economic growth   | Real gross domestic product                | EG       | EIU country dataset |
| Exchange rate     | National currency per US$                 | ER       | EIU country dataset |
| Investment        | Gross fixed capital formation             | INV      | EIU country dataset |
|                   | as a share of gross domestic product      |          |                |
| Trade             | Sum of exports and as a share of           | TO       | EIU country dataset |
|                   | gross domestic product                    |          |                |
| Inflation         | Consumer price index                      | INF      | EIU country dataset |
|                   | (annual)                                   |          |                |
| Government        | General government final                  | GEX      | EIU country dataset |
| expenditure       | consumption expenditure                   |          |                |
|                   | as a share of gross domestic product      |          |                |

The results in Table 2 show that the values of the variables do not deviate much from their mean based on the standard deviation values. The results for the Pearson’s correlation coefficients and variance inflation factor (Tables 3 and 4, respectively) show that there is no threat of severe multicollinearity with regard to the variables used in the estimation. This is so because none of the VIF values exceeds the value of 10, which is the rule of thumb for severe multicollinearity. These tests are crucial because it is important to avoid severe multicollinearity problems as they are likely to bias the results, and hence wrong inferences, if not checked and corrected (in the case of its existence) as indicated by Moreno-brieva, He, and Merino (2019).

### Table 2. Summary of descriptive statistics.

| Variable | Obs | Mean   | Std. Dev. | Min    | Max    |
|----------|-----|--------|-----------|--------|--------|
| InEXD    | 160 | 3.631  | 0.872     | 0.215  | 5.400  |
| InEG     | 160 | 7.640  | 1.241     | 5.123  | 10.747 |
| InER     | 160 | 4.249  | 2.947     | -0.512 | 10.469 |
| InINV    | 160 | 3.176  | 0.290     | 2.070  | 4.109  |
| InTO     | 160 | -0.044 | 0.690     | -2.678 | 3.291  |
| INF      | 160 | 10.28  | 21.843    | -2.264 | 229.159|
| lnGEX    | 160 | 2.484  | 0.395     | 1.482  | 3.214  |

Source: Authors’ estimation.
Starting with the lag-dependent variable (external debt), the results show a significant positive coefficient. This indicates the persistence of external debt among the selected Asian developing and transitioning economies. With regard to the main explanatory variables, the results specifically show that there is a negative relationship between economic growth and external debt and this is significant at a 1 percent level. This implies that improvement in economic growth reduces external debt. The coefficients show that when economic growth increases by 1 percent, external debt reduces by 0.153 and 0.725 percent in the short- and long-run, respectively. The implication is that, when economies grow, their income increases and this reduces their dependence on foreign debt, all other things being equal, and this subsequently reduces their external debt since borrowing will be reduced or halted. This finding is consistent with the results of past studies (see: Bitten-court 2015; Vighneswara 2015; Al-Fawwaz 2016; Waheed 2017; Beyene and Kotosz 2020a).

The results also show that there is a significant positive relationship between exchange rate and external debt. The coefficients specifically reveal that a 1 percent increase in exchange rate leads to 0.067 and 0.318 percent rise in external debt in the short- and long-run, respectively, and these are statistically significant at 1 percent level. When a country’s exchange rate rises, the domestic currency loses its value and the implication is that much more funds will be needed to repay the accrued debt. The value of the debt increases as a result of the depreciation (rise in the exchange rate) of the domestic currency. Past studies, such as Udoh and Rafik (2017) and Adamu (2019), have reported a similar relationship.

Regarding trade and external debt, the results reveal a significant positive relationship in both the short- and long-run. The coefficients show that external debt will rise by 0.249 and 1.181 percent in the short- and long-run, respectively, when trade increases by 1 percent. This outcome is plausible in the sense that, when an economy imports more than it export, there will be a deficit, and for that matter, there will be the need to borrow to finance the spending gap and this will invariably raise the external debt, all other things being equal. Studies by Vighneswara (2015) and Belguith and Omran (2017) also report a similar positive relationship between trade and external debt. However, our findings contradict that of Chiminya, Dunne, and Nikolaidou (2018) for 36 sub-Saharan African countries. Inflation is also revealed to have a significant negative effect on external debt in both the short- and long-run at a 1 percent significance level. The coefficients specifically show that, when inflation increases by 1 percent, external debt reduces by 0.047 and 0.224 percent, respectively, for the short- and long-run periods. According to Vighneswara (2015) and Beyene and Kotosz (2020a), there is a negative relationship between inflation and external debt, as inflation is envisaged to erode the value of debt of a country.

Last but not least, the results further show that there is a significant positive relationship between government expenditure and external debt in both the short- and long-run at a 1 percent significance level. Precisely, the coefficients for the short- and long-run reveal that external debt will rise by 0.434 and 2.056 percent, respectively, when government expenditure increases by 1 percent, all other things being equal. The implication is that, when government expenditure increases and there are no readily available funds to finance it, the government will be compelled to borrow, and this will escalate the existing external debt. Finally, the results show that investment has no significant effect on external debt though the coefficient has a negative sign. This implies that as countries invest more, their income could increase and this reduces their reliance

| Variable | VIF | 1/VIF |
|----------|-----|-------|
| lnEG 1.269 | 0.788 |
| lnER 1.376 | 0.727 |
| lnINV 1.222 | 0.818 |
| lnTO 1.112 | 0.900 |
| INF 1.161 | 0.861 |
| lnGEX 1.372 | 0.729 |
| Mean VIF 1.252 |

Source: Authors’ estimation.
on borrowing and hence a fall in external debt. In sum, the significant factors that affect external debt for the selected countries are economic growth, exchange rate, trade, inflation, and government expenditure.

It must, however, be mentioned that the reliability and consistency of the generalized method of moments results depend on the assumption that the instruments used are valid and also the model does not suffer from the second-order autocorrelation, \( AR(2) \). To this end, these tests results are generated and reported in Table 5 under the short-run results column. The results clearly indicate that the model does not suffer from higher-order autocorrelation and the instruments used are also valid. This is so because the probability values of the \( AR(2) \) and Hansen J test for instruments validity are all greater than the conventional 5 percent (0.05) level of significance. This lends credence to the results obtained and for that matter, it can be concluded that the outcome of the study is good for policy guidance purposes.

### Table 5. Regression results for the determinants of external debt.

| Variable  | Short-run results | Long-run results |
|-----------|-------------------|------------------|
|           | Coefficient | Std. Err. | P-value | Coefficient | Std. Err. | P-value |
| \( \ln(EXD)_{i,t-1} \) | 0.789 | 0.044 | 0.000 | – | – | – |
| \( \ln(EG) \) | -0.153 | 0.044 | 0.002 | -0.725 | 0.164 | 0.000 |
| \( \ln(ER) \) | 0.067 | 0.020 | 0.002 | 0.318 | 0.115 | 0.006 |
| \( \ln(INV) \) | -0.136 | 0.212 | 0.526 | -0.645 | 1.012 | 0.524 |
| \( \ln(TO) \) | 0.249 | 0.072 | 0.002 | 1.181 | 0.339 | 0.000 |
| \( \ln(INF) \) | -0.047 | 0.006 | 0.000 | -0.224 | 0.054 | 0.000 |
| \( \ln(GEX) \) | 0.434 | 0.137 | 0.003 | 2.056 | 0.586 | 0.000 |
| Constant  | 1.247 | 0.739 | 0.102 | 5.904 | 3.399 | 0.082 |
| Observation | 128 | | | | | |
| No. of groups | 32 | | | | | |
| No. of instr. | 29 | | | | | |
| \( AR(2) \) [prob] | 0.108 | | | | | |
| Hansen [prob] | 0.287 | | | | | |

Source: Authors’ estimation.

5. Conclusions and policy implications

This paper investigates the key determinants of external debt in 32 selected Asian developing and transitioning economies from 1995 to 2019. To properly account for possible endogeneity problem in the study, the generalized method of moments (GMM) is employed for the analysis. A number of tests are used to ensure the reliability and consistency of our results: the test for second-order autocorrelation, the Hansen J test for instrument validity, as well as multicollinearity tests using correlation matrix and variance inflation factor. Indeed, all these tests confirm that the estimated model does not suffer from endogeneity, higher-order autocorrelation, and multicollinearity problems.

Both the short- and long-run results indicate that there is a significant positive relationship between exchange rate, trade, government expenditure, and external debt; exchange rate, trade, and government expenditure increase external debt. It is also revealed that the relationship between economic growth, inflation, and external debt is negative and significant; economic growth and inflation reduce external debt. Investment is also revealed to exert a negative effect on external debt albeit insignificant. Based on the findings, it is concluded that, the key determinants of external debt for the selected Asian developing and transitioning economies are economic growth, exchange rate, trade, inflation, and government expenditure.

The findings of the study have vital policy implications for the selected economies. Given that economic growth reduces external debt, these countries need to implement policies that are geared toward enhancing economic growth. Specifically, investment in productive sectors of the individual economy could be an area of focus for policymakers; this is likely to promote economic growth, if well monitored and devoid of any mismanagement. These countries could also focus on economic growth determinants such as foreign direct investment, human resource development, and capital accumulation.

Given that government expenditure exerts a positive influence on external debt, there is an urgent need for governments in the selected countries to spend on productive sectors of their respective economies. These expenditures could further generate income which will help reduce over dependence on external debt. For instance, spending that could create more employment opportunities should be the focus. Individuals, who will be employed, will earn income, pay taxes and revenue will surge. A rise in revenue will reduce the pressure on external borrowing and hence external debt will be reduced drastically, all other things being equal.

The implication of the results, regarding trade and exchange rate, is that there is the need for policymakers...
and governments in the selected economies to make sure that the exchange rate is stabilized, and also much effort is put in to ensure that exports exceed imports to avert the heightening of external debt in their respective economies. Specifically, governments of these economies could provide subsidies for domestic industries to produce the goods that are mostly imported and this is likely to reduce the amount spent on imports and external debt will eventually reduce all else being equal.

Finally, considering the problems caused by the covid-19 pandemic across the globe, it is only prudent that the present study sheds light on what covid-19 may mean in light of our results or the implication of covid-19 for external debt in our study. This is indispensable because covid-19 has the tendency of affecting external debt of countries, as highlighted by international organizations, such as the United Nations Children’s Fund (UNICEF).

The issue of external debt among countries (including the Asian developing and transitioning economies) has to be given much attention, especially, following the outbreak of the covid-19 pandemic. The reason is that governments and stakeholders of these countries are strategizing to ensure that their respective economies recover as quickly as possible from the shock of the pandemic. One of these efforts is through external borrowing, given the gloomy performance of the domestic economies. External debt has been, and continues to be, a major challenge for these countries, and the situation is likely to be worsened for the next few years due to covid-19. This is because, covid-19 has exposed the weakness of most economies, and therefore, the need for foreign assistance (external borrowing) has become eminent. However, these assistances should be sought with caution, because it has the tendency of further exacerbating the debt crisis. Following this outbreak, it has been observed that, health facilities of most economies are not adequately equipped to contain the disease, and one way to improve these facilities is to seek foreign assistance. UNICEF report (Protecting and Transforming Social Spending for Inclusive Recoveries – Covid-19 and the Looming Debt Crisis) in April 2021 alludes that covid-19 has increased the risk of the debt crisis for most countries across the globe, and the Asian developing and transitioning economies are no exception. As the virus continues to threaten economies, there is an urgent need to put measures in place to ensure that the current situation is contained, and also to curb any future similar outbreak. Furthermore, the covid-19 pandemic is likely to cause a surge in external debt, because individual livelihoods have been negatively affected, and therefore, there is now growing campaign for more governments’ role in the area of social intervention programs and social safety net responses. Many individuals, especially those in the informal sector, have also been coerced to rely on governments’ assistance, given the decline in economic activities. Governments and stakeholders have, therefore, responded to these demands by implementing several policies (including social intervention programs) amid the covid-19 to ensure that, economies recover quickly to facilitate economic growth. As these economies grow, debts are likely to be reduced as indicated by the results of the present study. Another implication is that, if good policies, aimed at ensuring economic growth are implemented, these economies will not have much external debt issues after the pandemic.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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### Table A1: List of selected Asian developing economies.

| Country       | Country       | Country       | Country       |
|---------------|---------------|---------------|---------------|
| Azerbaijan    | Iran          | Maldives      | Taiwan China |
| Bangladesh    | Jordan        | Mongolia      | Tajikistan    |
| Bhutan        | Kazakhstan    | Myanmar       | Thailand      |
| Cambodia      | Kyrgyzstan    | Nepal         | Tonga         |
| Hong-Kong China | Korea       | Pakistan      | Turkmenistan  |
| Fiji          | Laos          | Papua New Guinea | Uzbekistan |
| India         | Lebanon       | Philippines   | Vanuatu       |
| Indonesia     | Malaysia      | Sri Lanka     | Vietnam       |