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Full Length Article

The relationship between long-term portfolio investments and growth in the context of asset characteristics and development level

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Abstract

This study investigates the linkage between portfolio investment and economic growth in 18 developed and 27 developing countries. Furthermore, it compares and analyzes interest-bearing and non-interest-bearing assets and the economic development level. The results of our analysis show that long-term portfolio investment is positively associated with economic growth in developing countries. Long-term portfolio investment through non-interest-bearing assets contribute more to economic growth in developing countries. However, stocks and long-term bond portfolio investment are unrelated to economic growth in developed countries. Moreover, capital accumulation positively affects growth in developing and developed countries, but trade openness decreases growth in developing countries. Our policy recommendation is for the relation between long-term portfolio investment and economic growth to be evaluated by the characteristics of their assets, instead of a general framework, and for decision makers to adapt their policies accordingly. In addition, non-interest-bearing portfolio investment is encouraged for better growth performance in developing countries.

JEL classification: E44; F21; F43; G11; O16

Keywords: Capital inflows; Economic growth; Portfolio investment

1. Introduction

Production activities, which increased greatly after the Industrial Revolution, also increase investment expenditures in these activities. At present, firms and governments use national resources or funds borrowed from the financial system to finance investment in production. In general, because of the need for large amounts of investment expenditure, these types of local investment are insufficient, thus funding from financial markets is typically used. In the structure of the current financial markets, because of the low level of capital mobility, the supply of loanable funds consists mainly of domestic savings. For this reason, investment is financed through domestic savings, and the amount of investment depends only on the level of domestic savings available. In this context, in economies with a low level of the domestic saving, the rate of investment is low, and therefore the increase in the production level is low. Nurkse (1952) stated that in developing countries the savings rate is low because of a low level of income per capita, so investment is inadequate, and the income level is low. He summarized this vicious circle by saying “a country is poor because it is poor.” Thus, one might conclude that because the supply of funding in the financial market consists mostly of domestic savings, economic development is not possible in developing countries where domestic savings are low.

Neoliberal economic policy arguments have gained importance since the 1980s. The resulting open economic policies and developments in technology infrastructure have increased

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the mobility of labor and capital. Increased capital mobility has given governments and firms the opportunity to finance their investments through the use of loanable funds (savings) in other countries using portfolio investment. Because of subsequent developments in technological infrastructure, transnational capital flows began, and the volume of portfolio investment became significant, substantially affecting macroeconomic parameters. Because productive investment is financed by portfolio investment, it affects the rate of growth.

In the theoretical framework, three basic views explain the relationship between portfolio investment and economic growth. The first widely accepted view argues that portfolio investment promotes economic growth. Solow (1956) accepts the view of the Harrod-Domar model that saving rates are an important determinant of economic growth. In the Solow growth model, savings rates, which include portfolio investment, increase economic growth. Solow stated that if the propensity to save is zero when income is positive, an economy will have no net investment or the capital stock will be stagnant (Solow, 1956). The augmented Solow model comes from the fact that the Solow growth model is insufficient for explaining economic events and phenomena. It concludes that portfolio investments and economic growth have a positive relationship (Mankiw, Romer, & Weil, 1992). These two models claim that real interest rates do not need to be set as high because the marginal product of capital is high in countries with low savings. The Schumpeterian view supports these two models. According to Schumpeter, if foreign savings are a less profitable investment in one country than in another, the first country will have capital outflows, and an economic crisis will occur when these capital outflows are rapid and unpredictable (Schumpeter, 1949). In both the Solow and Schumpeterian economic growth theories, portfolio investment affects economic growth through capital accumulation and other positive spillovers created by increasing investment. In endogenous growth theories, portfolio investment promotes economic growth through a different channel. In the endogenous growth theory, portfolio investment affects economic growth through domestic financial intermediation, rather than increasing investment rates and positive spillovers created by increasing investment, such as technology and skills transfer (Bailliu, 2000). Accordingly, portfolio investment increases the number and efficiency of domestic financial intermediaries.

The second view claims that portfolio investment has no effect on economic growth. Griffin (1970) argued that portfolio investment increases the propensity for consumption, rather than the investment ratio. In his theoretical framework, he stated that foreign capital inflows reduce domestic savings; in other words, a decrease in foreign capital inflows may increase domestic savings and output-capital ratios (Griffin, 1970). Feldstein and Horioka (1980) claim that, in countries with high savings, savings only increase domestic investment rates—that is, high savings rates do not result in a large current account surplus, so countries with high savings cannot transfer funds to countries with low savings. The third view posits that portfolio investment decreases economic growth. McKinnon and Pill (1997) claim that unrestricted capital inflows have a negative impact on economic growth because the banks face moral hazard when the capital market has moral hazard. They believe that the Chilean and Mexican economic crises occurred because of unrestricted capital inflows. Similarly, Calvo (1998) argues that capital inflows might harm human capital and local credit potential and could increase the rate of bankruptcy through a sudden halt in foreign capital.

Portfolio investment could affect economic growth differently based on a particular country's development level. The effect of portfolio investment on growth differs in developed and developing countries for two main reasons. First, portfolio investment could finance investment, thereby increasing growth rates. Second, the impact of portfolio investment on growth can differ depending on the level of economic development. For example, portfolio investment in developed countries with more developed financial systems may be more productive (Choong, Baharumshah, Yusop, & Habibullah, 2010), demonstrating that developed countries tend to attract more portfolio investment because their institutional foundations are better, whereas developing countries tend not to attract sufficient portfolio investment because they do not have sufficient institutional development. The other important issue is whether portfolio investment has the same causality in interest-bearing and non-interest-bearing assets. Fisher (1935) and Friedman (1969) state that interest-based financial systems are not stable, which may be interpreted as interest-bearing assets having an unstable structure that can contribute to unstable economic outcomes. For all these reasons, the investigation and comparison of portfolio investment is important because of these asset classifications. Therefore, this study investigates the relationship between long-term portfolio investment and economic growth in developed and developing countries, considering interest-bearing and non-interest-bearing types of assets. Little previous research has focused on the effects of long-term portfolio investment on growth considering the types of interest-bearing investment and the economic development level We contribute to the literature by filling this gap through analyzing the link between stock and long-term bond portfolio investment and economic growth in 18 developed and 27 developing countries, using the generalized method of moments–panel vector autoregression (GMM-PVAR) approach as a method of analysis.

After this introduction, the previous literature is reviewed in Section 2. Data, explanatory variables, and methodology are given in Section 3. Section 4 presents the empirical results, and Section 5 provides conclusions and implications.

2. Literature review

Several studies have examined the impact of portfolio investment on growth. This previous research usually supports the first theoretical opinion claiming that portfolio investment promotes economic growth. Furthermore, some studies confirm the second opinion, which argues that portfolio investment has no effect on economic growth, and the third opinion that puts forward negative relationship between them. Apart from theoretical views, few studies argue that the effects of portfolio investment differ by development level. The previous studies investigate the portfolio investment-growth relationship in three ways. The first is that they analyze it without country distinctions and frequently find a positive relationship. Baharumshah, Slesman, and Devadason (2017) examine the effects of portfolio investment on growth in 80 countries through analyzing the impact of portfolio equity and portfolio debt, which are the components of portfolio investment, on growth. Their findings show that portfolio equity positively affects growth in countries with high financial development. However, portfolio equity negatively affects less financially developed countries, but portfolio debt is negatively associated with economic growth in less financially developed countries. Reisen and Soto (2001) analyze the effects of capital inflows on growth in 44 countries in 1986–1997. The GMM estimation results confirm the positive interaction from capital inflow to economic growth. In addition, Soto (2003) investigates the impact of capital flow on income growth in 72 countries in 1985–1996 using the system-GMM methodology. He concludes that a positive link exists between portfolio equity flow and income growth. The few studies examine their relationship without considering a comparison of the countries or their similarity, and they support the second view. Aizenman, Jinjarak, and Park (2013) study the causality from capital flows to economic growth in 100 countries using a 1990–2010 dataset and fixed effect and cross-sectional regression methodology. They find that the causality is not stable. Like Aizenman et al. (2013), Durham (2004) analyzes the effects of foreign direct investment and portfolio investment on growth in 80 countries, finding no direct positive relationship between equity portfolio investment and economic growth.

The second investigation method used in the previous research is comparison of the effect of portfolio investment on growth based on the development level of countries. They support both theoretical views and negative associations. Some authors conclude that the development level is a determinant in the effect of portfolio investment on economic growth. Vergil and Karaca (2010) examine the effect of portfolio investment on growth in 25 developing countries during the period 1980–2005 using a fixed-effects model. The results of analysis indicate that portfolio investments positively affect growth and that short-term capital investment decreases economic growth. However, Choong et al. (2010) explore the effect of portfolio investment on growth using the panel-GMM method in 32 developing and 19 developed countries between 1988 and 2002. The findings show a negative relationship between portfolio investment and growth in developed and developing countries. Kinda (2012) studies the drivers of portfolio investment in the period 1970–2003 using two-stage least squares (TSLS) and three-stage least squares (3SLS) models. The analytical results demonstrate a positive relationship between infrastructure and financial development, capital control, economic growth, and portfolio investment. Unlike other studies, De Vita and Kyaw (2009) investigate the relationship between portfolio investment and growth in 126 developing countries. According to their results, a significant positive relationship is found between portfolio investment and growth rates only in upper-middle-income countries. Hence, they conclude that the development level of the country creates variation in the relationship between portfolio investment and growth.

The final method of investigation concentrates on the relationship between portfolio investment and growth considering countries by region. These studies often confirm the first view in the countries by region with limited studies supporting the second view. In addition, a few studies find no evidence between portfolio investment and growth. Asamoah and Alagidede (2020) analyze the relationship between portfolio investment and real sector growth rates in 42 sub-Saharan African countries using the panel-GMM method. The results show that portfolio investment positively affects real sector growth rates in sub-Saharan African countries. Furthermore, Asamoah, Alagidede, and Adu (2021) investigate the interaction between portfolio investment and real sector growth using the GMM method and a dataset for the period 1990–2017. They find no relationship between portfolio equity and real sector growth; however, they show that portfolio investment negatively affects debt flows. In the same way, Alley (2015) tests causality between portfolio investment and growth using TSLS and system-GMM models in 14 sub-Saharan African countries between 1990 and 2013. The findings demonstrate that private capital flows increase growth. Moreover, Baharumshah and Thanoon (2006) study the impacts of short- and long-term debt instruments, which are components of portfolio investment, on growth in 6 East Asian countries (Malaysia, Philippines, Singapore, Thailand, Korea, China, Myanmar, and Fiji) using a time series between 1982 and 2001. The results indicate that long-term debt instruments positively affect growth, but short-term debt instruments negatively affect growth. Also, Albulescu (2015) analyzes whether foreign portfolio investment is related to growth in 13 Central and Eastern European countries between 2005 and 2012 using the system-GMM method. They find that portfolio investment is positively related to long-run growth. The geographically classified studies by region analyze the relationship between portfolio investment and growth. They have a negative relationship or no relationship between portfolio investment and economic growth. Agbloyor, Abor, Adjasi, and Yawson (2014) investigate the effects of foreign investment and portfolio investment on growth by analyzing data on 14 African countries between 1990 and 2007 using the panel instrumental variable (IV)-GMM method. The findings show that portfolio investment negatively affects growth rates. Brambila-Macias and Massa (2010) examine the relationship between private capital inflows and growth in 15 sub-Saharan African countries in 1980–2008 using the least-squares dummy variable (LSDV) estimator. Their results confirm that private equity inflows and portfolio equity flows are unrelated to economic growth. Simpson, Tomljanovich, and Georgiev (2005) investigate the macroeconomic fundamentals of capital flows in developed regions of the US. They employ regression analysis using quarterly data from 1988 to 2003. Their findings show that macroeconomic factors are associated with capital inflows.

Several studies examine the linkage between mutual funds, stock markets, and economic growth. Levine and Zervos (1996) investigate the relationship between the stock market and economic growth in 41 countries using two samples (1976–1985 and 1986–1993) and performing a pooled regression. They find a positive effect between the stock market and long-run economic growth. Qureshi, Kutan, Ismail, and Gee (2017) investigate the effects of mutual funds and stock market volatility on economies and financial markets in Asian emerging markets. They study the 2005–2014 period using the PVAR approach. Their results verify that mutual funds positively affect economic growth. Moreover, Qureshi, Khan, Rehman, Ghafoor, and Qureshi (2019) analyze the types of mutual funds, measures of investor expectations, and business cycle movements in the markets in Brazil, Russia, India, China, and South Africa (BRICS) using the PVAR approach and a dataset covering the period 1996Q1-2017Q3. Their findings suggest strong causality between mutual fund flows and measures of future investor expectations. Qureshi, Kutan, Ghafoor, Khan, and Qureshi (2019) examine the relationship between mutual funds, stock markets, and macroeconomic indicators using the GMM-PVAR and a dataset from 2001 to 2017. They suggest the existence of bidirectional causality from fund flows to macroeconomic conditions. Similarly, Qureshi, Qureshi, Shah, Rehman, and Shahzad (2020) focus on the relationship between the asset management sector and economic conditions by providing information from BRICS countries using wavelet analysis. They find that portfolio diversification and hedging strategies are important for market players and policy makers in order to prevent economic turmoil.

Few studies analyze the link between portfolio investment and growth in developed and developing countries by distinguishing long-term interest-bearing and non-interest-bearing assets. This study fills this gap in the literature by comparing developing and developed countries and analyzing long-term bond and stock portfolio investments.

3. Dataset, explanatory variables, methodology, and model

3.1. Dataset and explanatory variables

This study assesses the causality of portfolio investment on economic growth considering the development level as well as by distinguishing long-term interest-bearing and non-interest-bearing assets. In this context, 27 developing and 18 developed countries are examined using annual data between 2004 and 2020 (see Table 1 for details). Trade openness datasets were obtained from the World Bank–World Development Indicators (WDI) database. Labor force participation rates were taken from the International Labor Organization (ILO) database. Gross fixed capital formation and gross domestic product (GDP) datasets were obtained from the United Nations (UN) database. Long-term debt securities and equity and investment fund shares datasets were accessed through International Monetary Fund (IMF) and World Bank–WDI databases.

Table 1
Data sources and variable definitions.

Variable	Definition	Source
GDP	GDP in constant 2015 prices in US dollars	United Nations (UN)
GFCF	Gross fixed capital formation (% of GDP)	
STOCK	Equity and investment fund shares (portfolio investment liability, US dollars [% of GDP])	IMF and World Bank–WDI
LBOND	Long-term debt securities (portfolio investment liability, US dollars [% of GDP])	
TRADE	Trade openness (sum of exports and imports) (% of GDP)	World Bank–WDI
LABOR	Labor force participation rate, total (% of total population age 15+) (modeled ILO estimate)	International Labor Organization (ILO)
Crisis Dummy	2008 Global Crisis Dummy (2008 and 2009 equal 1; otherwise, 0)	
Countries Analyzed	*Developing Countries*: Argentina, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Croatia, Ecuador, India, Indonesia, Jordan, Kazakhstan, Malaysia, Mexico, Morocco, Oman, Pakistan, Peru, Philippines, Poland, Romania, Russia, Saudi Arabia, Thailand, Tunisia, Turkey, and Ukraine *Developed Countries*: Australia, Belgium, Canada, Czechia, Denmark, Finland, France, Germany, Israel, Italy, the Netherlands, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and United Kingdom	

The selection of variables is a crucial stage in empirical analysis. In this study, portfolio investments were divided into long-term bonds (interest-bearing assets) and stocks (non-interest-bearing-assets). Long-term bond portfolio investments are measured by long-term debt securities, and stock portfolio investments are represented by many indicators. Market capitalization, turnover and total value traded ratios, and international arbitrage pricing model (IAPM) pricing error measures of stock market integration are generally accepted as stock market development indicators (Levine & Zervos, 1996). Thus, the total market value was determined as an indicator of stock portfolio investments. Capital and labor are also important drivers of economic growth. Solow (1956) and Mankiw et al. (1992) state that capital accumulation and the labor force have high growth rates. Finally, trade openness is the other variable related to economic growth. According to Helpman and Krugman (1987), trade is beneficial in a world with assumptions of economies of scale and imperfect competition. Moreover, the Hecksher–Ohlin–Samuelson (H–O–S) model argues that trade liberalization increases the growth rate in developing countries (Jayme, 2001). The multiple-cone neoclassical growth model attempts to explain the effects of trade liberalization on economic growth and income distribution. According to this model, if a country is labor abundant in a global sense and capital abundant in a local sense, trade liberalization decreases GDP per capita (Kiyota, 2012).

3.2. Methodology and models

This section explains the method of analysis and models used in this research. Similar studies are concerned about the endogeneity of explanatory variables (Agbloyor et al., 2014; Albulescu, 2015; Asamoah & Alagidede, 2020; Asamoah et al., 2021). Thus, the GMM-PVAR approach is employed as it considers the lagged variables of instrumental variables (IVs), data structure, and variable relations (Arellano & Bond, 1991; Blundell & Bond, 1998). Moreover, the GMM estimator can reliably address heteroskedasticity issues. The PVAR model in reduced form is as follows:

$$Y_{i,t} = \varphi_1 Y_{i,t-1} + \varphi_2 Y_{i,t-2} + \cdots + \varphi_{p-1} Y_{t-p+1} + \varphi_p Y_{t-p} + \theta X_{i,t} + \mu_i + \varepsilon_{i,t} i\cdot\varepsilon\cdot\{1,\ 2,\ \ldots, N\}, \mathrm{t}\cdot\varepsilon\{1, 2, \ldots, T_i\} \tag{1}$$

where $Y_{i,t}$ is defined as the vector of the dependent variables in a $(1 \times k)$ matrix; $X_{i,t}$ represents the vector of the explanatory variables in a $(1 \times \mathrm{l})$ matrix; μ_i is the vectors of specific fixed effects in the dependent variables; and $\varepsilon_{i,t}$ represents idiosyncratic errors. GMM estimation is enabled by including $(k \times k)$ matrixes $(\varphi_1 + \varphi_2 + \ldots + \varphi_{p-1}, \varphi_p)$ and the $(l \times k)$ matrix B. This study covers four models in the empirical analysis. Models 1 and 2 analyze developing countries while Models 3 and 4 investigate developed countries. In these models, GFCF, TRADE, LABOR, and crisis dummy variables are employed as control variables. Before the GMM-PVAR estimation, a cross-sectional augmented Dickey-Fuller (CADF) test was performed to detect the stationarity level of the variables. Next, we conducted a lag order selection test to determine the optimal number of lags. Finally, we obtained impulse response functions (IRFs) to measure the response to exogeneous shocks, and we checked the robustness of the estimation with a unit-circle test and panel Granger-causality analysis.

4. Empirical results

In this section, we obtain the empirical results and discussed them from a theoretical perspective. Tables 2a and 2b list the CADF unit-root test results, which indicate that all variables have unit roots and that all variables are integrated at an order of 1 with a significance level of 1 percent. Table 3 presents the results of the lag order selection criterion in all models. Optimal lag lengths are found to be 1 in all models based on the MBIC (modified Bayesian information criterion).

Table 4 lists the system-GMM estimation results. The GMM models are consistent because the GDP_{t-1} coefficients are positive and are distributed between 0 and 1 in the four models. According to the estimation results, $STOCK_{t-1}$ is positively related to GDP in Model 2, and $BOND_{t-1}$ is positively associated with GDP in Model 1. However, $BOND_{t-1}$ is statistically

Table 2a
Unit-root tests for developing countries.

Variables	Cross-sectionally augmented Im, Pesaran and Shin (CIPS) statistics			
	At Level		At First Difference	
	Constant	Constant &Trend	Constant	Constant &Trend
GDP	−2.055	−2.133	−2.937*	−2.892*
SHARE	−1.817	−2.466	−3.850*	−3.340*
LBOND	−1.843	−2.315	−2.624*	−3.391*
LABOR	−1.921	−2.432	−2.723*	−2.951*
TRADE	−0.937	−1.923	−2.888*	−2.915*
GFCF	−2.015	−2.455	−2.917*	−3.269*

Critical values of individual cross-sectional augmented Dickey-Fuller (CADF) distribution

Constant			N(27) T(17)	Constant &Trend		
1%	5%	10%		1%	5%	10%
−2.32	−2.15	−2.07		−2.83	−2.67	−2.58

Notes: The optimal lag lengths are determined by the Akaike information criteria. * significant at 1%.

Table 2b
Unit-root tests for developed countries.

Variables	Cross-sectionally augmented Im, Pesaran and Shin (CIPS) statistics			
	At Level		At First Difference	
	Constant	Constant &Trend	Constant	Constant &Trend
GDP	−1.679	−2.157	−2.430*	−4.801*
SHARE	−1.574	−1.876	−3.585*	−3.465*
LBOND	−1.743	−2.051	−2.403*	−3.145*
LABOR	−1.040	−2.218	−2.555*	−3.307*
TRADE	−1.990	−2.402	−2.806*	−3.238*
GFCF	−2.047	−2.373	−3.160*	−3.452*

Critical values of individual cross-sectional augmented Dickey-Fuller (CADF) distribution

Constant			N(18) T(17)	Constant &Trend		
1%	5%	10%		1%	5%	10%
−2.40	−2.21	−2.10		−2.92	−2.73	−2.63

Notes: The optimal lag lengths are determined by the Akaike information criteria. * significant at 1%.

Table 3
Lag order selection criteria.

Lag	MBIC	MAIC	MQIC
Model 1			
1	−38.09949*	−5.552085	−18.40167*
2	−22.47691	−6.203209*	−12.628
Model 2			
1	−34.10176*	−1.554354*	−14.40394*
2	−17.74705	−1.473352	−7.898146
Model 3			
1	−39.09992*	4.081141	−13.25849*
2	−24.90275	3.88463*	−7.675126
Model 4			
1	−23.03404*	6.269647	−5.473502*
2	−13.77121	0.8806331*	−4.990941

Notes: MBIC: Modified Bayesian information criterion, MAIC: modified Akaike information criterion, MQIC: modified quasi Akaike information criterion. * denotes the minimum values of the criterion.

insignificant in Model 3, and $STOCK_{t-1}$ does not affect GDP in Model 4. GFCF is positively related to GDP in Models 1, 3, and 4. However, TRADE negatively affects GDP in Models 1 and 2. Finally, crisis dummy has negative effects on GDP in Models 2–4. Table 5 displays the panel Granger-causality test results. These results confirm the bidirectional causality of LBOND and SHARE to GDP in developing countries. Moreover, they demonstrate the existence of causality from GDP to LBOND and the absence of causality from SHARE to GDP in developed countries. Finally, there is bidirectional causality from ALL to GDP in developing countries and bidirectional causal relations from GDP to ALL in Model 3 in developed countries.

Table 5
Granger-causality tests.

Equation/Excluded	Chi-square
Model 1	
LBOND → GDP	3.691*
ALL	3.691*
GDP→ LBOND	10.992***
ALL	10.992***
Model 2	
SHARE → GDP	17.109***
ALL	17.109***
GDP → SHARE	7.947***
ALL	7.947***
Model 3	
LBOND → GDP	2.009
ALL	2.009
GDP → LBOND	6.558**
ALL	6.558**
Model 4	
SHARE → GDP	0.867
ALL	0.867
GDP → SHARE	2.396
ALL	2.396

Note: *, **, and *** indicate that the statistical values are significant at 1%, 5%, and 10% respectively.

Fig. 1 illustrates IRFs in all models for 95 percent confidence intervals (gray shaded areas). The figure indicates that in developing countries SHARE and LBOND react positively to shocks in GDP, and that GDP responds positively to shocks in SHARE and

Table 4
GMM-PVAR estimation results.

Dependent Variable: GDP	GMM-PVAR estimates			
Variable	Model 1	Model 2	Model 3	Model 4
GDP_{t-1}	0.6241131***	0.7098498***	0.6272077 ***	0.8346847 ***
	(0.0686085)	(0.0235438)	(0.1330173)	(0.1259774)
$SHARE_{t-1}$		0.0098474***		−0.0004766
		(0.0023807)		(0.0005118)
$LBOND_{t-1}$	0.0065282*		0.0013879	
	(0.003403)		(0.0009793)	
GFCF	0.0032845*	−0.0006767	0.0015093***	0.0023884 **
	(0.0019673)	(0.0016234)	(0.0004493)	(0.0011974)
TRADE	−0.0024696**	−0.001381***	−0.0009295	−0.0001189
	(0.0011251)	(0.0003673)	(0.0006066)	(0.0006597)
LABOR	−0.0060204	0.0026652	−0.0040707	−0.0032057
	(0.0087241)	(0.0025427)	(0.0030135)	(0.0086205)
Crisis Dummy	−0.060204	−0.025642***	−0.0113744 *	−0.0231816 **
	(0.0115504)	(0.0089663)	(0.0065625)	(0.011458)
Hansen's J Statistic (p value)	0.409	0.134	0.212	0.456

Note: Standard errors in parentheses. ***, **, and * indicate that the statistical values are significant at 1%, 5%, and 10%, respectively.

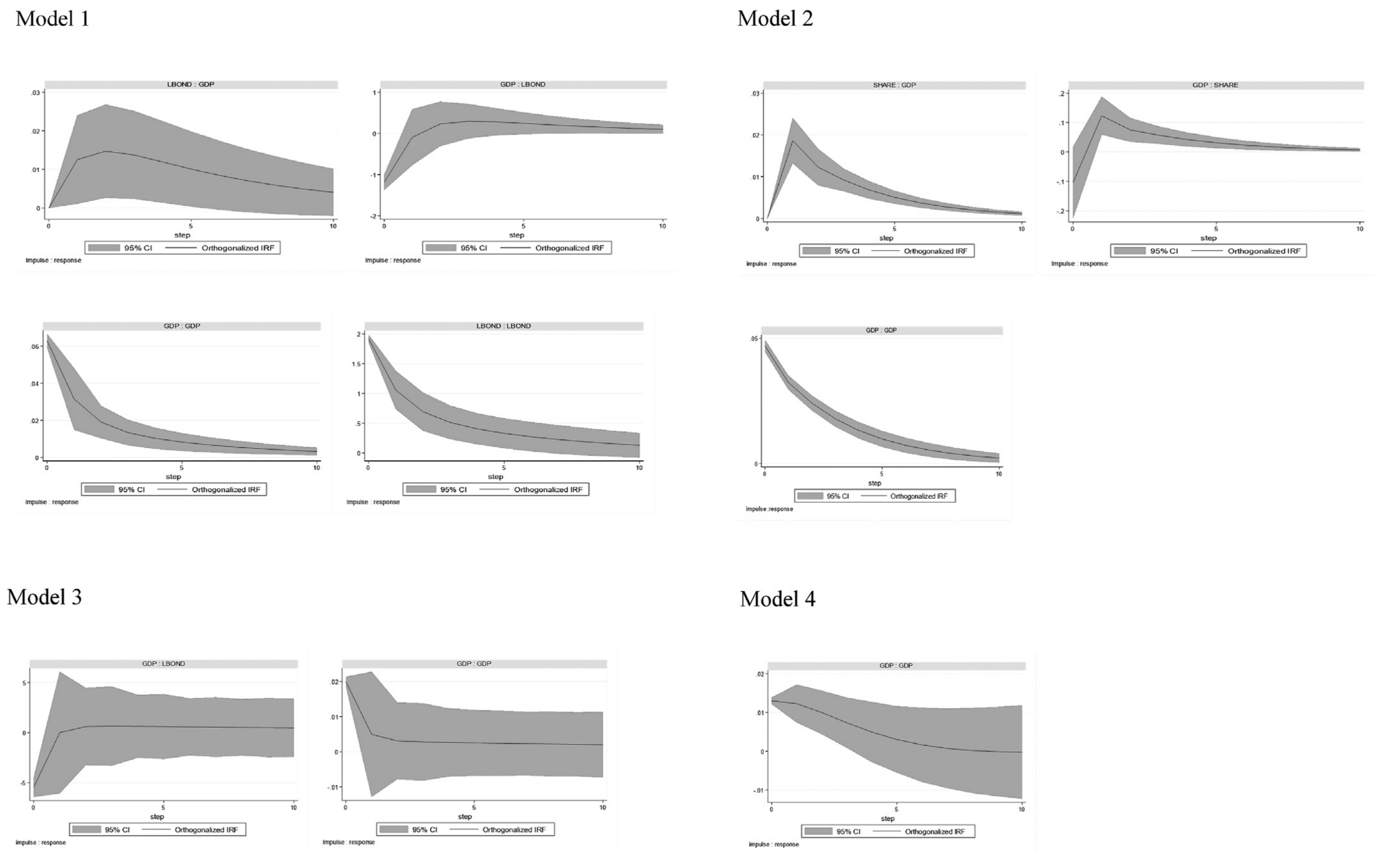

Fig. 1. Orthogonalized impulse response functions.

LBOND. In developed countries, LBOND has a positive response to shocks in GDP. Moreover, the reaction of GDP to its own shocks are positive in developing countries, and GDP in developed countries has a similar reaction to its responses. As a result, these findings confirm the GMM-PVAR estimates.

Fig. 2 displays the unit-circle test results. These results show that the eigenvalues are less than 1, and therefore they fall within the unit circle. Thus, they confirm the stability of the GMM-PVAR estimates. In sum, we can conclude that the impact of portfolio investment on economic growth could differ by economic development level. Stock and long-term bond portfolio investment promotes economic growth in developing countries. However, in developed countries, stock and long-term bond portfolio investment does not affect economic growth. The panel Granger-causality test and IRFs confirm these results. Moreover, they indicate that economic growth causes portfolio investment in developing countries. In addition, economic growth causes only long-term bond portfolio investment in developed countries.

Our theoretical evaluation indicates that these results confirm the first widely accepted view related to the relationship between portfolio investment and economic growth in developing countries, but the results in developed countries confirm the second view. The results obtained in this research support different theoretical perspectives. In addition, capital accumulation contributes to economic growth in developing and developed countries, as supported by the theoretical views of Solow (1956) and Mankiw et al. (1992). Finally, trade openness is negatively related to economic growth in developing countries. This empirical result confirms the theoretical framework in a multiple-cone neoclassical growth model. Thus, it can be said that developing countries in the analysis have a labor-abundant structure in the global sense in the production process. The comparison of asset classification by whether it pays interest indicates that long-term non-interest-bearing assets, which are represented as stock portfolio investment, contribute to economic growth more than long-term interest-bearing assets, defined as long-term bond portfolio investment in developing countries. These results can be interpreted to mean that long-term interest-bearing assets have an unstable structure that might lead to inefficient outcomes for economic growth. Therefore, the theoretical views articulated by Fisher (1935) and Friedman (1969) might be acceptable for an interest-based financial system. All the results support the fact that long-term portfolio investment is beneficial to economic growth in developing countries and promote economic growth more when it includes non-interest-bearing assets. Finally, these findings highlight that economic policy makers should encourage non-interest-bearing assets in long-term portfolio investment.

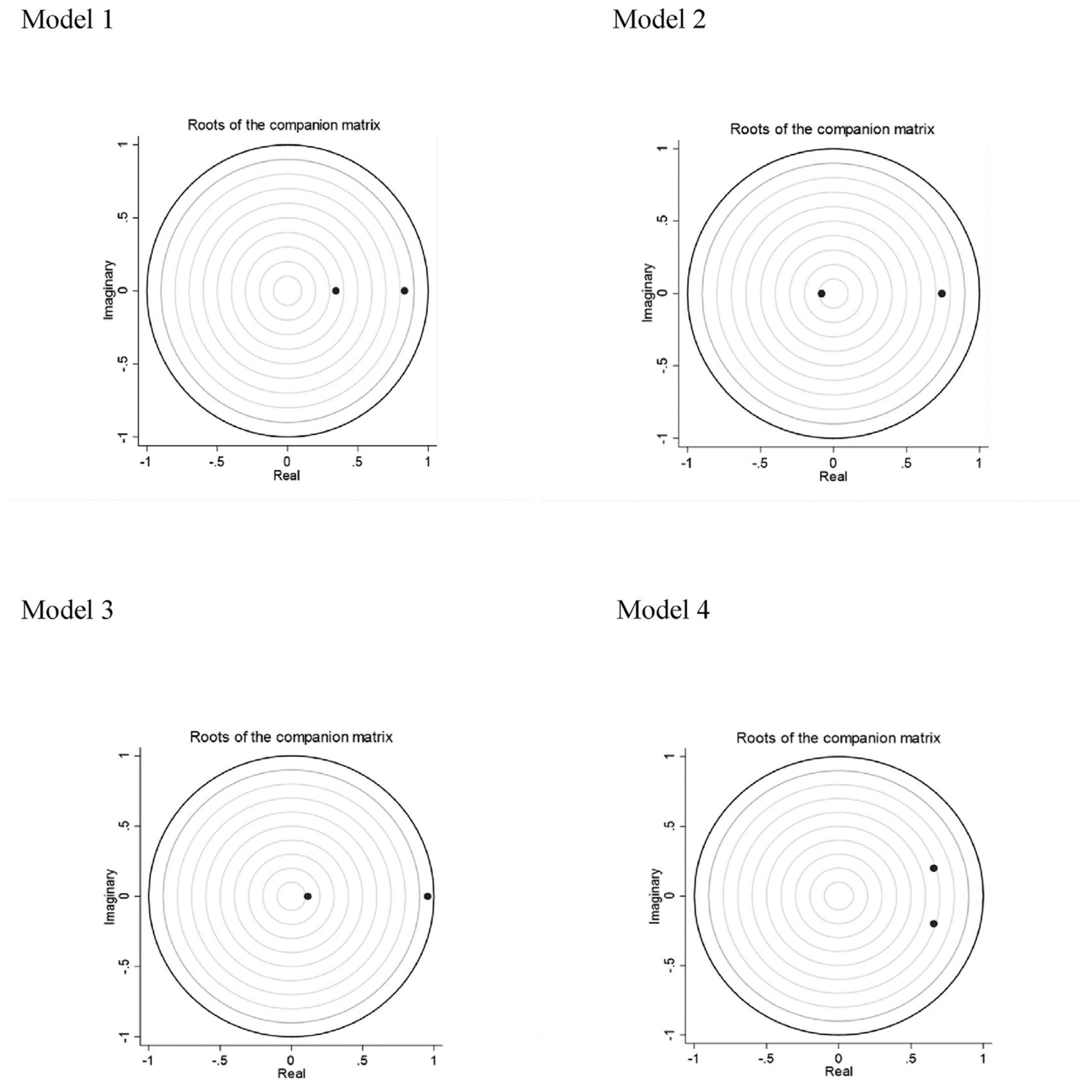

Fig. 2. Module stability.

5. Conclusions and implications

Since the 1980s, many governments have argued in favor of neoliberal policies. Neoliberal economic policies and developing financial infrastructure have increased portfolio investment flows. Therefore, portfolio investment is a significant determinant of macroeconomic balance in economies. Many studies focus on the relationship between foreign savings, which include foreign direct and portfolio investment, and growth in their analyses. However, detailed studies are necessary in addition to general analyses for portfolio investment because their effects on economic growth can differ based on the characteristics of the assets (whether they are long-term interest-bearing or non-interest-bearing assets) and the development level of countries. The motivation for this study is the need for a detailed analysis because portfolio investment has distinct characteristics and economic development levels. The estimation results indicate that stock and long-term bond portfolio investment have a positive impact on economic growth in developing countries. However, stock and long-term bond portfolio investment are not found to be associated with economic growth in developed countries. These results support the first theoretical view on stock and long-term bond portfolio investment in developing countries and the second theoretical view on stock and long-term bond portfolio investment in developed countries. They support that portfolio investment comprising long-term non-interest-bearing assets (stock market assets) encourage economic growth more than long-term interest-bearing assets (long-term bond market assets) in developing countries. Furthermore, the empirical findings demonstrate a negative relationship between trade openness and economic growth, and they show the positive link between capital accumulation and economic growth. Finally, the findings also suggest bidirectional causality between stock and long-term portfolio investment and economic growth in developing countries while suggesting causality from economic growth to long-term portfolio investment in developed countries.

To conclude, stock and long-term bond portfolio investment have different effects on economic growth based on their asset characteristics and economic development level. Stock investment represents a partnership and does not pay interest whereas bonds correspond to debt stocks and pay interest. These asset characteristics affect the performance of portfolio investment on economic growth in developing countries. Thus, one policy recommendation is that portfolio investment in developing countries be directed more toward non-interest-bearing assets in order to achieve higher economic growth. Further, economic decision makers should evaluate portfolio investment in the stock market and long-term bond market separately and apply different policies to them in consideration of the development level of a country. In addition, governments should support stock market performance in order to support the real economy. Economic stability should be a primary objective because of the ease of capital exit in stock markets.

This study has some limitations. The first is that the limited availability of datasets for developed and developing countries for the period 2001–2020, therefore, datasets for the 1990s are not included in the analysis because they are unavailable. The second is that the data period begins in 2004 because of the use of lagged variables and lags as instruments. Therefore, our findings are generalized from 2004 and afterward. Further research is needed to compare the effects of long-term portfolio investment on economic growth in the context of asset characteristics and the economic development level.

Declaration of competing interest:

There is no conflict of interest.

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