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Article

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Financial development and economic growth: evidence from emerging African and Asian countries

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ABSTRACT

The connection between financial development (FSD) and economic growth has been the focus of both theoretical and empirical research. However, the specific nature of this relationship depends on factors such as the level of economic development, the extent of financial activities, and integration into the global financial system. The aim of this study is, therefore, to investigate the link between FSD and economic growth in the context of 22 emerging African and Asian countries. And both descriptive and econometric analyses were conducted using panel data from 1981 to 2021. Besides, the study used the Dynamic Common Correlation Effect (DCCE) model, which takes into account cross-sectional dependency, allows for parameter variation, and combines the characteristics of both MG and PMG. The descriptive results indicate that emerging Asian countries have a relatively higher FSD level than emerging African countries, with the average FSD for the sampled emerging countries being 23.74 percent; for emerging Asian countries, it is 30.98 percent; and for emerging African countries, it is 17.71 percent. Furthermore, the econometrics results show that FSD has a positive but negligible influence on the growth of emerging Asian and African nations, suggesting that although there is rapid and sustainable growth, the current level of FSD is insufficient to sustain this trajectory. Thus, among the crucial policy options that policymakers should implement to improve financial sector development and sustain economic growth in emerging African and Asian countries are strengthening institutions, financial openness and liberalization, improving technologies, and digitalizing economies.

IMPACT STATEMENT

'By 2050, 19 of the top 30 world economies will be the ones known today as emerging economies'. According to world economics, the GDP of emerging economies is more than 40 trillion USD, or half of the global GDP in 2023 and 69% of the global GDP growth between 2013 and 2023. Empirical research indicates that stable and effective financial systems, or financial development, including banks and capital markets, are advantageous for economic growth. This is particularly true for developing nations in Asia and Africa, where the financial systems are still less competitive than those in developed nations and are often fragmented and monopolized by the state. In addition, some of these developing nations are currently waiting for the prosperity of Western economies and are immobilized by the sovereign debt crisis in order to capitalize on their economic advantages and seize new markets. Thus, from 1981 to 2021, this study looks into the relationship between FSD and economic growth in Asian and African nations. Through the findings of this study, we contribute to the actualization of the 2050 world economy projection, which predicts the economic power of newly emerging countries. Furthermore, we make readily available evidence-based information for rational and knowledgeable policymakers through our research. As a result, we think that our research strengthens economies not only in Asia and Africa but also in other parts of the world.

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1. Introduction

Financial development refers to the advancement of capital markets and financial institutions that together reduce information, transaction, and enforcement costs. It enhances inclusivity in credit markets, lowers information asymmetry, makes the implementation of financial innovation easier, and, consequently, create a positive linkage with economic growth (Ibrahim & Alagidede, 2017). A well-established financial sector has significant effects on output productivity in many ways: it amasses national savings, creates an enabling business environment for investment, and accelerates capital formation; it facilitates the allocation of resources to productive economy sectors and improves the efficiencies of factors of production; it speeds up the development and provision of economic infrastructure; it facilitates the creation of new methods of production through investment in human capital or funding research and development. It also minimizes the risks and uncertainties that arise as a result of natural and man-made disasters. Moreover, the development of the financial sector, in particular capital markets, paves the way for the inflows of foreign direct investment (FDI) and consequently, assures economic growth (Inoue & Hamori, 2019; Paudel & Acharya, 2020; Zakaria & Basah, 2021).

Similarly, economic growth has multi-dimensional contributions to the progress of the financial system. Rapid and sustainable growth requires scaling up the marginal propensity to save from growth itself. The involvement of the financial system also plays a very indispensable role in growing economies; it is needed to finance the advancements of broad-based growth that emanate from each segment of the economy (Gözgör & Gözgör, 2013; Hassan et al., 2017; Raz, 2013). However, the primary linkage between the funding sector and output growth is very complex and influenced by factors like the openness of the economies, the degree of economic development, the strength of institutions, the quality of the labor force, and the mechanisms of the widespread financial system. And their link is also further affected by the economy's boom-bust cycles and financial fragility, the level of investment, the level of telecommunication infrastructure, the sampling regimes, and the stage of countries' growth (Abeka et al., 2021; Ahmadpour Kacho & Dahmardeh, 2017;Heras Recuero & Pascual González, 2019; Levine, 2005; Silva et al., 2021).

Meanwhile, evidence suggests that emerging Asian and African countries have been responsible for approximately two-thirds of global economic growth and more than half of new consumption for almost two decades; nevertheless, they are at different stages of financial development, relying on the quality of institutions and human capital they have, the level of technologies they use, the magnitude of money they invest in telecommunications, and their degree of participation in the global financial system (Woetzel et al., 2018). Furthermore, the financial sector activities of most of these emerging countries are under government regulations, are not capital market-oriented, and are less competitively carried out. To this effect, in these countries, the cost of borrowing is very high, and bank credit to the productive sector is very low. Comparatively speaking, industrialized countries have bank credit levels that significantly surpass the volume of their GDP, whereas the majority of emerging countries have credit levels that are lower than half of their GDP (IMF., 2023). Hence, considering these facts, it remains to be seen if the majority of emerging economies will grow sustainably or at a faster rate than before due to the development of the financial sector.

Additionally, as noted at the conclusion of the literature review, despite the extensive empirical research done to examine the relationship between growth and financial development, three significant gaps remain that require further investigation. Thus, this study differs from the others in that it closes those three significant gaps and adds the following three fundamental ideas to the body of knowledge in finance and economics: First, the study used the broad-based financial development index calculated by the IMF, which measures openly the availability of financial services to all income groups and the competitiveness with which these services are provided to the entire economy. Secondly, the study used the Dynamic Common Correlation Effect (DCCE) estimation strategy, which eliminates the possibility of parameter inconsistencies and related issues that frequently arise from cross-sectional unit dependencies. Lastly, the study focused especially on the relationship between financial development and growth in emerging African and Asian countries. Therefore, the main objective of this research is to investigate how financial development affects the economic growth of emerging nations in Asia and Africa between 1981 and 2021. Furthermore, the null hypothesis of this research is that financial sector

development has a positive effect on the economic growth of emerging African and Asian countries, while the alternative hypothesis is that financial sector development does not have a positive effect on the economic growth of emerging African and Asian countries.

2. Literature review

2.1. Theoretical literature review

Theoretically, although the ideas that express the relationship between financial sector development and growth date back to the work of Adam Smith (1776) in that he expressed the high density of banks in Scotland of his time as a crucial factor for the rapid development of the Scottish economy, the view that financial development has a significant relationship with economic growth has come under attack from various neoclassical economists, particularly with that of the Modigliani-Miller theorem, which states that the existence of financial institutions does not matter. Similarly, using several empirical pieces of evidence, Graff (2002) strengthened their thoughts by stating that regardless of how developed financial markets may be in a particular country, self-financing is always governing and beyond the average margin. However, in the first decade of the twentieth century, Schumpeter argued that the creation of credit through the banking system was an essential source of firms' ability to drive economic growth. His leading argument was about the effect of technological progress on the finance-growth relationship. Hence, starting from the work of Schumpeter (1934), mainstream economists, especially those engaged in this field, considered finance to be supply-leading or positively influencing the economy. Schmitt (1974) also protracted this argument by noting that financial deepening entails not only higher capital efficiency but also a higher savings rate and, therefore, a higher volume of investment. They argue that policies that lead to financial repression reduce incentives to save, which in turn results in lower investment and economic growth. On the contrary, Robinson (1952) stated that 'finance follows where enterprise leads'. In this statement, he perceived financial sector development as endogenously derived from the demands of an expanded economy. His view was also consistent with the Coase theorem and much of New Institutional Economics, which argued that institutions adjust to market imperfections in a way that maximizes individual utilities. This demand-following approach is often based on empirical evidence and is regarded as a temporary situation that may persist only under special circumstances, such as the transition to a market economy. Patrick (1966) and Goldsmith (1969) suggest mutual influence, implying that financial depth drives real growth while the growing economy's demand for finance is met by the advancing financial sector. Additionally, financial development plays a prominent role in endogenous growth theory (Romer, 1986) through its positive impact on the levels of capital accumulation and savings (Romer, 1990) through its effect on technological innovation. In this framework, the role of financial institutions is to collect and analyze information and channel investible funds to investment activities that yield the highest returns. That is, growth inspires higher involvement in the financial markets and, in doing so, facilitates the growth of financial institutions. Similarly, by gathering information from potential investors, the financial sector intensifies the efficiency of invested projects and consequently stimulates growth. Similarly, the regularly constructed endogenous finance-growth models use the Pagano (1993) AK production function in that they redefine the closed-economy equilibrium condition by using a variable indicating the costs associated with the financial system's activity, that is, only a fraction of income saved transforms into an investment, the rest being used up by the financial system. In this model, economic growth is increased either by an increased savings rate or by an increase in the overall efficiency parameter. A capital-intensive economy may use a relatively high fraction of real income to run a financial system, which does not necessarily imply that this system is inefficient. To go one step further, by considering the costs of a financial system and its ability to promote real growth, it should be possible to determine the optimal size of an economy's financial sector.

2.2. Empirical literature review

There is a wealth of empirical literature that networks financial development and economic growth, both in the case of developed and developing countries, and builds on theoretical discussions. However,

these empirical studies yield contradictory and ambiguous results as per countries' macroeconomic features, stages of development, and financial development characteristics. Most literature reveals a positive link between financial sector development and growth. Gözgör and Gözgör (2013) used a balanced panel framework to evaluate the connection between credit and economic growth in 20 Latin American nations between 1960 and 2010. The results indicate that domestic credit and GDP per capita have a significant long-run relationship and that there is also a one-way causal relationship between them. Given this justification, Raz (2013) sought to determine the relevance of the relationship between economic growth and credit market development by examining their long-term causal relationship over the years 1985–2011. Empirically, they confirm that economic growth and the credit market in Indonesia are correlated in both directions. Prochniak and Wasiak (2017) examined the theoretical and empirical relationship between financial systems and economic growth for two groups of nations: 34 OECD economies and 28 EU countries, for the years 1993–2013. They examined the theoretical and empirical relationship between the financial system and economic growth. The results prove positive links between them when the regression equations are estimated using the system GMM estimator. Ahmadpour Kacho and Dahmardeh (2017) investigated the potential impacts of financial development and institutional quality on economic growth in economic development and cooperation organizations using the GMM method of dynamic panel data. His findings demonstrate that financial sector development (FSD) has a favorable and significant impact on the economic expansion of OECD countries. Hassan et al. (2017) provided evidence regarding the influence of FSD on the growth of the Organization of Islamic Conference Countries (OICC). They estimated the variance decompositions of growth rates along with unbalanced panel regressions and found a positive one-way causal correlation between economic growth and financial development in emerging OICC countries. By estimating panel data from 168 countries from 2004 to 2014, Inoue and Hamori (2019) also investigated the connection between financial sector inclusion and growth. They also find that financial deepening has a positive and significant impact on economic growth. In Le et al. (2019), the Cobb-Douglas theoretical framework was used to examine the nexus between financial strength and economic growth among ASEAN countries. The findings demonstrate that domestic loans to the private sector (M3) and stock market capitalization (all indicators of financial depth) have a positive and considerable impact on economic development. Heras Recuero and Pascual González (2019) linked growth, the quality of institutions, and FSD using data from middle-income nations. The results indicate a unidirectional positive link between growth and the financial sector. Using longitudinal data from Nepal, Paudel and Acharya (2020) conducted a brief examination of the financial system and examined the overall influence of FSD on economic growth. Their findings imply that financial sector development (FSD) greatly contributes to economic growth. Zakaria and Basah (2021) observed several economic variables to analyze the connection between Malaysia's financial development and economic growth from 1990 to 2019. The results show that domestic credit and FBMKLCI have significant long- and short-term relationships with GDP per capita. Silva et al. (2021) used a large database of Brazilian municipalities and their various stages of financial development to analyze the impact of financial development on economic growth. They found a positive and significant relationship between finance and growth in Brazil; however, this relationship changed during the global financial crisis, and non-earmarked credit had a substantial association with higher rates of economic growth than designated credit. Taddese Bekele and Abebaw Degu (2023) also looked at how the growth of the financial sector affected the economic expansion of the SSA countries. Utilizing panel data from 2010 to 2017, they estimated the two-step system GMM model. According to the estimation results, FSD has a significant and positive impact on the economic growth of SSA nations. Using annual data from 1990–2022, Naeem et al. (2024) examined the causative and dynamic relationship between Pakistan's economic growth and green financial development. The study's findings demonstrated a correlation between the green finance package and the expansion of the economy over time. Specifically, it suggests that green employment, credit, securities, insurance, investments, and FDI have a strong, long-term association with economic growth.

Meanwhile, other empirical works have recognized the existence of a certain threshold of financial development beyond which further deepening generates decreasing returns to economic growth and stability. Law and Singh (2014) used data from 87 countries from 1980 to 2005. They also suggest that financial development has a favorable impact on economic growth at levels below the threshold;

however, exceeding the threshold has a negative influence on growth. Similarly, Ho and Saadaoui (2022) explored the presence of threshold points in the link between economic development and bank loans, using a sample of ASEAN nations from 1993 to 2019. Threshold estimation is based on a dynamic panel model. The credit-to-GDP ratio was determined to have a threshold of 96.5 percent, confirming the disappearance of the impact of finance on ASEAN growth. That is, the impacts of bank loans are favorable before the threshold (96.5 percent), but are only marginally significant after the threshold. Nguyen (2022) investigated how the banking sector contributed to Vietnamese growth during the early 1990s-era transition. The empirical results show a nonlinear effect of bank sector development on growth from 2007 to 2020. The cutoff points for the two banking development metrics were calculated to be approximately 107 percent and 101 percent of GDP, respectively. This conclusion shows that bank loan expansion must be tightly controlled to adjust to the economy's capacity to absorb capital.

Furthermore, empirical studies believe that financial development has an indirect influence on growth and state that the relationship between finance and growth is significantly dependent on other macroeconomic factors and the expansion of various infrastructures. Xu, (2000) employed a VAR technique to investigate the effects of FSD on investment and output in 41 nations between 1960 and 1993. Compelling evidence suggests that investment is a key route through which financial development influences growth and that financial development itself is vital for growth. Ndebbio (2004). Using a cross-country regression, 34 SSA countries were investigated. Moreover, he argued that if investment volume increases, among other recommended ways, financial development could have a favorable impact on production growth. Vazakidis and Adamopoulos (2009) developed a link between credit market expansion and economic growth in Italy using annual data for 1965–2007. In Italy, a 1 percent increase in short-term economic growth causes a 0.4 percent increase in bank lending, whereas a 1 percent increase in inflation causes a 0.5 percent relative decrease in bank lending. They concluded that economic growth stimulates the development of the credit market during periods of low inflation. Using data from ASEAN nations from 1980 to 2011, Malarvizhi et al. (2019) investigate the connection between financial sector expansion and economic growth. In addition, FSD boosts economic growth significantly. However, the estimated models reveal that domestic investment and exports have a greater impact on economic growth than FSD does. Using the system GMM estimate, Abeka et al. (2021) explored the effects of financial development on the economic growth of sub-Saharan African economies with robust telecommunication infrastructure. It was discovered that the telecommunication infrastructure of sub-Saharan African countries improved the impact of financial development on growth. Error correction and the ARDL models were used by Ishfaq et al. (2024) to study the relationship between growth and financial development in Pakistan. The findings show that financial development stimulates economic growth, but they also suggest that the effects are highly dependent on certain context-specific variables and are therefore highly variable. With a sample of nine commonwealth members and data spanning from 1995 to 2020, Öncel et al. (2024) examined the connection between financial development, exports, and growth. The bank's private business credit and economic growth, as well as financial development and economic growth, are positively correlated, according to the results of the VECM estimation. By utilizing panel data spanning from 2005 to 2018 and the GMM model, Miguel and Leonardo (2024) examine financial development in Mexico as measured by bank credit extended to the non-financial private business sector and regional economic growth. Their findings indicate that augmenting the quantity of bank credit extended to private enterprises contributes to an increase in GDP per capita growth in Mexico. Zaheer et al. conducted a study on the link between FD, economic growth, and economic inequality, and the results show that FD, when combined with the ARDL model and data spanning from 1995 to 2018, eventually attributes to growth in both income categories. Nonetheless, upper-middle-income countries exhibit a more pronounced correlation between financial development and growth.

Finally, some empirical studies also comparatively link financial development with economic growth and examine the differences in their relationship from country to country, sector to sector, or region to region. In Damyana Bakardzhieva & Bassem Kamar's (2009) growth and private sector credit examination for the three economies, the results indicate that in Poland and Hungary, there are positive links between growth and financial sector credit; however, in the Czech Republic, there are negative two-way links between them. Similarly, Mohamed and Aguir (2017) empirically examined the relationship between FSD and growth in southern Mediterranean countries. The results indicate that domestic credit

shocks only have a favorable impact on Jordan; they have a major negative impact on economic growth in Egypt and Israel. However, the impact of shocks on economic growth in Morocco and Tunisia is minimal. Using data from five ASEAN countries, Phan et al. explored the importance of financial development and liberalization for economic growth. In the case of financial depth, the only positive impact is found in the credit used by the public sector; however, in the case of other aspects of financial depth, they found significant and negative impacts on economic growth. Valickova et al. (2015) assessed an estimate from 67 studies that examine the relationship between financial development and economic growth. Overall, this study indicates a positive and statistically significant effect; however, there are discrepancies in the results because of the large differences in the individual estimations. Gozgor (2015) investigated the causal relationship between domestic credit and growth using data from 58 developed and developing nations between 1970 and 2010. Their results indicate that only seven developing nations have a causal relationship between domestic credit and growth. Moreover, domestic credit and economic development have a one-way causal link in ten emerging economies and five industrialized economies. Using the panel econometric technique, Dinh et al. (2019) estimated the link between financial inclusion and growth. They demonstrate that their link is more significant in low-income countries with lower levels of financial inclusion. The impact of financial development on growth in 12 Asian countries at varying stages of development was investigated by Wang et al. (2024) using the DCCE estimation strategy and 26 years of annual data (1995–2020). The study's findings showed that different countries at different economic levels had different effects of financial development on growth. For underdeveloped nations, there was a strong negative correlation between financial development and growth, but there was a positive correlation between the sampled moderately and highly developed nations and areas.

Ultimately, even though the empirical studies mentioned above have made significant contributions to the field of finance and economics, there are still some gaps that need to be filled by further research. The first gap they left is that almost all of them measured financial development using narrow metrics, like the broad money supply (M2) and the percentage of GDP that banks lent to the public and private sectors. In contrast to the narrow metrics, a broad-based financial development metric that was recently developed by the IMF assesses the breadth and depth of financial development. It included access, depth, and efficiency metrics from financial markets and financial institutions. Secondly, cross-sectional dependencies were identified as a significant problem that leads to bias and inconsistent model parameters by recent econometrics knowledge; however, none of the studies addressed these dependencies, except for Wang et al. (2024). Lastly, the majority of prior empirical studies on Asian and African nations relies on scant or out-of-date data; even Tadesse and Degu's (2023) recent study used panel data from 2010 to 2017. In contrast, this study investigated the relationship between FSD and economic growth in emerging Asian and African nations using panel data spanning from 1981 to 2021.

3. Data and methodology

3.1. Data source and variables description

The study used annual time series panel data for ten emerging Asian and twelve emerging African countries from 1981 to 2021. And only 22 emerging countries (see Table A1 in the appendix) were selected using publicly available data from the World Bank and IMF, which acknowledged 36 emerging countries (17 emerging African countries and 19 emerging Asian countries) as emerging countries. Real GDP (Y), the dependent variable, is measured as the total gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included as a value of product; these data are in constant 2015 prices and are expressed in U.S. dollars and taken from the World Bank Development Indicator Database (WBDI). The broad-based financial development index data, which are publicly available on the IMF website, is used to measure financial sector development (FSD), an independent variable; it considers the breadth, accessibility, and effectiveness of intermediaries as well as financial markets. The financial development index is a scale that goes from 0 (the lowest level) to 1 (the highest level). Through its effects on investment, capital formation, and saving, financial development has a positive relationship with real GDP (Y). Globalization is measured using the globalization

index, which is freely available on the KOF website or at ETH Zurich. This index has various sub-indices: trade globalization index, financial globalization index (foreign direct investment), interpersonal globalization index, informational globalization index, cultural globalization index, and political globalization index. And also, it assumes values between 1 (minimal globalization) and 100 (maximum globalization); hence, depending on the degree of globalization, it is expected to affect real GDP (Y) either positively or negatively. Put differently, globalization promotes the free flow of capital between nations and increases the output of tradable goods and services, which in turn has a positive impact on the growth of real GDP; however, since globalization undermines infant domestic industries badly, it affects the growth of real GDP negatively. Gross capital formation, which is determined by the World Bank, is a measure of physical capital (K). It is expected that the level of net inventories may have a positive or negative impact on the dependent variable because capital stock is composed of expenditures for additions to fixed assets as well as net changes in the level of inventories. In other words, a positive net change inventory has a positive impact on real GDP, whereas a negative net change inventory has a negative impact on real GDP. Price instability (Econstab) is calculated using inflation data from the World Bank and the consumer price index, which measures the annual percentage change in the cost of acquiring a basket of goods and services for the average consumer. Real GDP growth is hampered by inflation as it drives up the cost of production inputs, which discourages production.

3.2. Model specifications

The theoretical foundation for model formulation is Romer's (1990) endogenous growth theory. The fundamental tenet of sustained economic growth is that ideas are non-rival; as such, output per person is dependent on the total stock of knowledge. He introduced the idea of imperfect competition—which was first established by Ethier (1982) and Dixit and Stiglitz (1977)—into the growth theory. This is:

$$Y = AK \tag{1}$$

Where y denotes production, A denotes stock of knowledge, and K denotes capital stock.

Based on this knowledge, the model suggests that the possibility of financial benefit from producing something valuable is the rationale behind the decentralized allocation of resources to researchers who are innovative and look for new ideas. A patent is another prize given to successful inventors, granting them the only authority to commercialize their creations. Hence, financial development acts as a reward to encourage the quest for novel concepts. Parallel to these ideas, contemporary Romans like Kortum (1997), Segerstrom (1998), & Trimborn et al. (2008) created the following condensed version of Eq. (1):

$$Y_t = A_t^{\sigma} L_t K_t \tag{2}$$

Here, Eq. (2) states that output is manufactured by a production function that has constant returns to objects (labor and capital) and increasing returns to objects and ideas (A). Parameter σ measures the degree of increasing returns to scale in the goods production function.

$$A_t = A_0^{e^{FSDt+GIt+Econstabt}} \tag{3}$$

By using the logarithmic transformation of both Eqs. (2) and (3), and replacing the result of Eq. (3) with the modified Eq. (2):

$$lnY_{it} = \sigma_0 + \sigma_1 K_{it} + \sigma_2 FSD_{it} + \sigma_3 GI_{it} + \sigma_4 econstab_{it} + \varepsilon_{it} \tag{4}$$

Lastly, by adding a country-specific τ_i and time-varying parameter γ to Eq. (4) and permitting cross-sectional dependency and slope heterogeneity amongst countries:

$$lnY_{it} = \sigma_0 + \sigma_1 y_{it-1} + \sigma_2 K_{it} + \sigma_3 FSD_{it} + \sigma_4 GI_{it} + \sigma_5 econstab_{it} + \gamma_t + \tau_i + \varepsilon_{it} \tag{5}$$

Where, FSD is financial development, GI is globalization index and *econstab* is price instability, σ_0 is constant parameter, σ_1 is parameter of lag dependent variable, $\sigma_2, \sigma_3, \sigma_4, and\ \sigma_5$ are slope parameters, *i* is cross-sectional unit, *t* is time and ε is error term

3.3. Methodology

The dynamic common correlated effects (DCCE) estimator from Chudik et al. (2016) and the xtdcce2 Stata syntax from Ditzen (2018) were utilized in this work. The CCE, MG, and PMG estimators are essentially supported by the DCCE techniques. And to implement this estimation technique in a procedural manner, we completed the following actions: We first evaluated each variable's weak cross-sectional dependence (CRD) using the Pesaran (2004) test for N and T, where N is the cross-section dimension and T is the time dimension. Secondly, the panel stationarity test, also known as the second-generation unit root test, was utilized. It was modified to account for cross-sectional dependency in accordance with Pesaran's (2007) description. Third, both first- and second-generation panel co-integration tests are applied, depending on the integration levels, cross-sectional dependence, and slope heterogeneity of the variables. Ultimately, DCCE techniques were used to estimate the panel data. The DCCE estimation technique has several advantages, including being robust to a wide variety of data generation processes, being applied to small samples, the jackknife correction method being used to account for small-sample bias, the representation being more realistic and being able to handle situations with nonlinear functions of explanatory variables or discrete explanatory variables without change, incorporating cross-sectional means and cross-sectional moments, dealing with slope heterogeneity, and producing reliable results in the existence of structural breaks. Hence, because of these merits, DCCE has many superior qualities compared to other dynamic panel data estimation models, in particular, compared to dynamic fixed effect and system GMM models; it addresses the problem of cross-sectional dependency and allows parameter heterogeneity by using the properties of MG estimation similarly compared to MG and PMG; it is capable of overcoming the problem of cross-sectional unit dependencies; and compared to Common Correlation Effect (CCEMG) and Augmented Mean Group (AMG) estimators, it was used in a situation where the time period (T) was greater than cross-sectional units (N) in the panel.

3.3.1. Cross-sectional dependency test

Establishing cross-sectional dependency in the macroeconomic panel data can be caused by some factors that impact each cross-sectional unit in the panel. Typically, panel estimators may become biased and inconsistent in such a situation due to time-varying variability. For each variable, a simple test recommended by Pesaran (2004) was employed along with the OLS regression residuals to solve the issue of cross-sectional dependency. Moreover, the following is the computation of the CRD test statistic:

$$y_{it} = \hat{\partial}_i + \hat{\beta}_{it} x_{it} + \hat{u}_{it} \tag{6}$$

Where y is the dependent variable, N is the number of cross-sectional units, T is the time, x is the vector of observed independent variables, and $\hat{\partial}_i$ *and* $\hat{\beta}_i$ represents the intercepts and slope coefficient, respectively. Finally, the Pesaran CRD-test statistics are expressed as:

$$CRD_{\rho} = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij} \right) \Rightarrow N(0,1) \tag{7}$$

The approximation of the pairwise correlation coefficient is represented by $\hat{\rho}ij$, in the case of the OLS residuals, and the alternative hypothesis that there is dependency among the cross-sectional units is tested against the null hypothesis, which states no connection among them.

3.3.2. Panel stationarity test

Unless the means, variances, and covariance are constant across all series in the panels, their relationship becomes nonsense. Hence, conducting a stationarity test of the data is a crucial pre-analysis test that must be performed before performing the regression analysis. And, even though both first- and second-generation stationarity tests are alternatively available in this test, due to the presence of cross-sectional dependency, using the former test may give us the wrong estimation coefficients and mislead us to inappropriate conclusions. Thus, in this study, we used the second-generation stationary test, or the CIPS test, which was developed by Pesaran (2007). This test takes into account the problem of cross-sectional dependence. It is also based on a cross-sectionally augmented Dickey-Fuller (CADF) regression, and the calculation of CADF is given as follows:

$$\Delta Y_{it} = \alpha_i + \beta_{it} Y_{it} + \omega_i \bar{Y}_{i,t-1} + \delta_i \Delta \bar{Y}_{t-1} + \varepsilon_{it} \tag{8}$$

From Eq. (8) above, the CADF test statistic for each of the estimated value of β_i *is* computed and the CIPS test statistic is the mean of the t-statistics and calculated as follows:

$$CIPS(N,T) = \frac{\sum_{i=1}^{N} t_i(N,T)}{N} \tag{9}$$

Where $t_i(N,T)$, indicates the t statistics of β_i

Finally, if the absolute values of CADF and CIPS statistics surpass the critical values, we reject the hypothesis that the series is non-stationary, and alternatively, if the absolute values of CADF and CIPS statistics are less than the critical values, we accept the hypothesis that the series is non-stationary.

3.3.3. Panel co-integration test

An econometric method called co-integration is typically used to examine the correlation over an extended time or between several non-stationary series. This method assists in locating circumstances in which several non-stationary series are integrated so that their long-term deviation from equilibrium is prevented. By identifying whether the stochastic trends in a set of variables are shared by the series, this approach can occasionally be used to find out the causal relationships between variables. There are several panel co-integration testing methods for panel data analysis; however, we only employed two of them in this study: Pedroni's (1999) first-generation panel co-integration tests and Westerlund's (2007) second-generation panel co-integration tests. Based on regression residuals, the Pedroni test permits differences in intercepts and slopes amongst panel members. It looks at all tests for the null hypothesis that there is no co-integration and contains seven statistics; however, it ignores the effects of cross-sectional dependency. As an alternative, the Westerlund test takes into account the effects of cross-sectional dependency and is based on the error correction term. It also features statistics from four-panel co-integration tests. Additionally, the following is the Westerlund co-integration test formula, which is based on error correction:

$$\Delta y_{it} = \alpha_i d_i + \mu_i y_{it-1} - \mu_i \beta_i x_{it} + \sum_{j=1}^{p_i} \lambda_{ij} \Delta y_{it-j} + \sum_{j=-q_i}^{p_i} \theta_{ij} \Delta x_{it-j} + \varepsilon_{it} \tag{10}$$

Where t and i are the time-period and cross-sectional unit index, p_i denotes the number of lags; q_i denotes the number of leads, d_t denotes the deterministic component, and it x_{it} denote explanatory variables. And d_t has three possibilities: first when $d_t = 0$ meaning that doesn't have a deterministic term; second when $d_t = 1$ denotes constant intercept, but no trend; third, $d_t = (1.t)$ designate both constant intercept and trend. Additionally, μ_i denotes the coefficient of ECT or the speed at which the system returns to the long-run equilibrium relationship. In other words, if the coefficient of ECT is less than zero and β_i is different from zero, the system is said to be error-correcting, suggesting that the independent and dependent variables in the model are co-integrated.

4. Results and discussion

The outcomes of both descriptive and econometric statistics are shown in this section. The econometric analysis provides the long- and short-term results for the MG, PMG, and DCCE results, in addition to the panel unit root, panel co-integration, and cross-sectional dependency results for the emerging country subgroups (Africa and Asia). Based on the pairwise correlation matrix of the explained and explanatory variables and the dataset summary statistics, the descriptive statistics provide a clear and thorough picture of the dataset.

4.1. Descriptive results

With particular reference to other macroeconomic variables, the purpose of the succinct descriptive results is to quantify and indicate the degree of financial development in emerging nations. This section

Table 1. Summary data for all of the sampled emerging countries between 1981 and 2021.

Variables	Obs	Mean	Std. Dev	Min	Max
Log Real GDP	902	7.168089	1.001518	5.230456	9.325734
Financial development	902	.2373791	.1571154	.0200848	.7408382
Log Physical capital	902	12.42918	2.170523	7.745405	18.41676
Price instability	902	3.763087	1.408106	−4.602869	6.199204
Globalization Index	902	46.13878	13.50393	18.41768	81.44238

Source: Authors own computation using Stata 14 software.

Table 2. Summary data for emerging African and Asian countries separately.

Africa						Asia				
Variable	Obs	Mean	Std. Dev	Min	Max	Obs	Mean	Std. Dev	Min	Max
Real GDP	492	23.29975	1.369309	20.29529	26.60803	410	25.73909	1.733554	22.45169	30.39426
Financial development	492	.1770567	.1139248	.0200848	.5925185	410	.3097659	.1707896	.0562028	.7408382
Physical capital	492	3.024014	.5749359	.7052197	12.60294	410	5.328203	6.130568	2.550374	25.21807
Price instability	492	3.666176	1.612927	−4.602869	6.199204	410	3.87938	1.104502	−.5664032	5.374651
Globalization Index	492	44.27936	11.51394	20.87618	72.04652	410	48.37007	15.27804	18.41768	81.44238

Source: Authors own computation using Stata 14 software.

also compares the financial development levels of developing Asian and African nations. The results of the descriptive analysis were displayed in Table 1 for all of the sampled countries. The mean values of logged real GDP and physical capital are 7.17 and 12.43, respectively, with standard deviations of 1.00 and 2.17 and ranges of 5.23 to 9.32 and 7.74 to 18.41, respectively. In addition to having an average level of 0.23, the financial development index for these nations ranges from a minimum of 0.02 to a maximum of 0.74, suggesting that emerging Asian and African nations have weaker financial development indices. Additionally, it demonstrates that the globalization index's mean, standard deviation, and range values are 46.14, 13.51, and 18.42 to 81.44, respectively, and the price instability index's mean, standard deviation, and range values are 3.76, 1.4, and -4.6 to 6.19, respectively. The globalization index, thus, indicates that these emerging countries' economies have only a moderate level of integration with the world economy.

Likewise, Table 2 provides the same information, but separately for emerging African and Asian countries. Furthermore, according to the average description of the statistics of the regressed and regressors variables, emerging Asian countries have made more progress than emerging African countries and are also more globally connected. For example, Table 2 illustrates that emerging Asian countries have an overall financial development index of about 0.31, while emerging African countries have an index of about 0.18. With regard to globalization, physical capital formation, and real GDP growth, emerging Asian nations differ slightly from emerging African nations.

Table 3 displays the sign and degree of correlations between the regressed and regressors' variables for emerging Asian and African countries, respectively. This means that regarding emerging Africa, real GDP has a significant positive correlation with all regressors except price instability; concerning Asian countries, real GDP has a significant negative correlation with price instability and physical capital formation but a positive correlation with financial development and globalization. In both scenarios, there is a noteworthy inverse relationship between price instability and real GDP; however, this relationship is only significant in Asia. Additionally, it significantly correlates with both globalization and financial development. Likewise, in the case of emerging Asian and African nations, financial development significantly positively correlates with real GDP, physical capital, and globalization.

4.2. Econometrics results

4.2.1. Cross-sectional dependence test results

In this subsection, cross-sectional dependency indicates the correlation of variables among the cross-sectional units, that is, countries. This is due to worldwide shocks; the macro-variables in one country may depend on another country; hence, regressing these variables without considering their dependencies may result in inconsistencies in the estimation process. Table 4 comparatively presents the cross-sectional dependency statistics of emerging African and Asian countries separately. In this table, the degree of

Table 3. Variable pairwise correlations for emerging African and Asian countries.

		Emerging Africa countries				
No	Variables	1	2	3	4	5
1	Real GDP growth	1.0000				
2	Physical capital	0.1408*	1.0000			
3	Price instability	−0.0583	−0.1587*	1.0000		
4	Financial development	0.3912*	0.1037*	−0.2101*	1.0000	
5	Globalization	0.4722*	0.2937*	−0.1611*	0.6166*	1.0000
		Emerging Asia countries				
1	Real GDP growth	1.0000				
2	Physical capital	−0.0626	1.0000			
3	Price instability	−0.3328*	−0.0399	1.0000		
4	Financial development	0.6996*	−0.2208*	−0.4140*	1.0000	
5	Globalization	0.5680*	−0.1996*	−0.4044*	0.8254*	1.0000

Source: Authors own computation using Stata 14 software.
Notes: * represents a 5 percent level of significance.

Table 4. Cross-sectional dependence tests results for emerging African and Asian countries separately.

	Africa				Asia			
Variable	CD-test	p-value	Mean ρ	Mean $\|\rho\|$	CD-test	p-value	Mean ρ	Mean $\|\rho\|$
Log real GDP	49.58	0.000	0.953	0.953	42.08	0.000	0.980	0.980
Log physical capital	6.09	0.000	0.117	0.326	8.49	0.000	0.198	0.459
Globalization Index	49.93	0.000	0.960	0.960	40.95	0.000	0.953	0.953
Financial development	10.26	0.000	0.197	0.501	30.55	0.000	0.711	0.711
Price instability	8.04	0.000	0.154	0.253	8.34	0.000	0.194	0.231

Source: Authors own computation using Stata 14 software.
Notes: 1. Both the Stata syntax 'xtcd' and 'xtcd2' are used to test cross-sectional dependency.
2. under the null hypothesis of cross-sectional independence, CD-N (0, 1).
3. The closer the p-values are to zero, the more variables are correlated across panel groups.

correlation between variables in the 'i' cross-section measured by ρ and the absolute value of the contemporaneous correlation across countries denoted by $|\rho|$ and their p-values are used to accept or reject the null hypothesis of cross-sectional independence at the 1%, 5% and 10% level of significance.

The p-values for all variables were close to zero, indicating that the null hypothesis of no cross-sectional dependence is rejected at all significance levels. Stated differently, the cross-group error test results, which were reported in Table 4 and Table A2 (see in the appendix), show the existence of cross-sectional dependence in both groups of emerging countries for all variables in the panel. And the coefficients of ρ indicate a pairwise cross-sectional correlation between emerging African and Asian countries for each variable. Furthermore, it indicates that the coefficients of correlation are more sizable in the case of globalization and real GDP for both groups, implying that the economic shock in one of these emerging countries is transmitted to others due to globalization, and technically ignoring such dependencies in the estimation process may produce biased estimates. Thus, using econometric techniques like second-generation panel unit root, Westerlund co-integration tests, and the DCCE model reduces the potential problem that occurs due to cross-sectional dependency.

4.2.2. Stationarity test results

The cross-sectional dependence test results of sub-section 4.2.1 explicitly indicate that all macro-variables in one cross-sectional unit correlate with others. Besides, we are working with characteristic macroeconomic variables (which are constantly found to be non-stationary); hence, conducting panel unit root tests and identifying their order of integration is inevitable.

Additionally, numerous authors have developed various panel unit root test techniques based on different sets of assumptions, and applying selective techniques that overcome the shortcomings of cross-sectional dependency is advisable. Hence, we used the second-generation unit root test, or 'CIPS', which was proposed by Pesaran (2007), and applied it to two groups (Africa and Asia) separately, in level and first difference, without trend and with trend. Generally, the CIPS test results in Table 5 indicate that price instability and globalization are stationary at level, both without and with a trend; however, using their first difference, all variables are stationary. Similarly, Table A3 in the Appendix shows that level

Table 5. Panel unit root test results for emerging African countries.

	In level				In first difference			
	Specification without trend		Specification with trend		Specification without trend		Specification with trend	
Variables	Zt-bar	p-value	Zt-bar	p-value	Zt-bar	p-value	Zt-bar	p-value
Log real GDP	0.358	0.640	2.400	0.992	−11.455	0.000	−11.920	0.000
Log physical capital	−2.900	0.002	−0.470	0.319	−14.564	0.000	−13.704	0.000
Price instability	−9.834	0.000	−9.651	0.000	−16.028	0.000	−15.682	0.000
Financial development	−1.460	0.072	−0.612	0.270	−15.139	0.000	−14.555	0.000
Globalization Index	−3.066	0.001	−1.735	0.041	−14.680	0.000	−13.908	0.000

Source: Authors own computation using Stata 14 software.
Note. 1. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.
2. The CIPS test assumes that cross-sectional dependence is in the form of a single unobserved common factor.
3. Multipurt uses Scott Merryman's xtfisher and Piotr Lewandowski's pescadf.

Table 6. Panel co-integration test results for emerging African countries.

First-generation cointegration test (Pedroni)

	Co-integration dependent variables			
	Log real GDP (lnRGDP)		Financial sector development (FSD)	
Test statistics	Panel	Group	Panel	Group
v	−2.081	–	1.149	–
rho	2.079	1.754	−1.132	−.2216
t	.4534	−.09226	−3.855	−3.765
adf	2.094	2.688	−2.702	−3.548

Second-generation cointegration test (Westerlund)

	P-value	Z-value	Robust P-value	P-value	Z-value	Robust P-value
Gt	0.278	−0.589	0.800	0.000	−6.733	0.010
Ga	0.000	−7.914	0.000	0.000	−4.847	0.080
Pt	0.844	1.009	0.870	0.000	−5.165	0.090
Pa	0.002	−2.961	0.370	0.000	−3.750	0.220

Source: Authors own computation using Stata 14 software.
Note. 1. All Pedroni test statistics are distributed N (0, 1), under a null of no co-integration, and diverge to negative infinity.
2. The Pedroni tests are done using STATA syntax 'xtpedroni' and the 'xtwest' command.
3. The Westerlund tests are conducted using Stata syntax 'xtwest'.
4. Westerlund (2007) only applied in the case of one dependent and one independent variable.
5. The bootstrapped robust critical values are only for the Westerlund technique, and robust p-values against cross-sectional dependencies are obtained from bootstrapping 100 times in the Westerlund test.

price instability and financial development are stationary, both without and with trends; however, in the first difference, all variables are stationary.

4.2.3. Co-integration test results

In the two sections that came after each other, both CRD and stationary variables in level and first difference were mentioned; hence, in this section, we therefore used Pedroni and Westerlund for a co-integration test, which we conducted independently for the two groups (Africa and Asia) based on the results of these two sections. The Westerlund test is based on the rate at which the adjustment coefficient in the ECM varies, while the Pedroni test uses the regression residuals. Both tests make use of the BIC (Bayesian information criterion), which automatically calculates the proper lag duration. Furthermore, we conducted co-integration tests, accounting for time trends in both specifications, using real GDP and financial development as the dependent variables. In light of this, Table 6's Pedroni test results show that, of seven statistics, roughly four of them accept the alternative hypothesis of co-integration between the independent variables—price instability, globalization, and financial development—and the dependent variable, real GDP; additionally, it ensures co-integration between FSD and these three variables. Likewise, Westerlund statistics show that there is a long-term relationship between FSD and real GDP if FSD is considered the only dependent variable.

Comparably, Table A4 in the appendix for Asian nations demonstrates that, of seven statistics, over half of the Pedroni test statistics reject the null hypothesis of no co-integration and establish the existence of long-term relationships between real GDP and financial development. When financial sector

development (FSD) is considered a dependent variable, the Westerlund statistics strongly support the existence of co-integration. However, they do show a long-term relationship between FSD and real GDP.

4.2.4. Estimation results

The second-generation test results, which are reported in the co-integration subsection, indicate the existence of long-run relationships between some variables in the models, both for Africa and Asia. Hence, in this subsection, we estimate and report both the short- and long-run model results. The mean group (MG), pooled mean group (PMG), and dynamic common correlation effects (DCCE) were the three alternative strategies used in this analysis. The MG estimator allows the long-run parameters to be heterogeneous, while these parameters are homogenous in the PMG estimator. However, the choice between these estimators is made using the Hausman test. And the MG and PMG estimation results, both the short- and long-run results, are reported in Tables A5 (see appendix). Accordingly, the MG estimation results suggest that (both in the short-run and long-run) FSD has positive but insignificant effects on the economic growth of emerging African countries. Likewise, the PMG estimation results indicate that FSD has positive and significant effects on the growth of emerging African nations in the long term but not in the short term. In addition, for emerging Asian countries, the MG estimation results indicate that financial development and globalization have positive but insignificant effects on economic growth, both in the long and short run, while physical capital has significant and positive effects on growth only in the short run. The PMG estimation results also indicate that only globalization has positive and significant effects on growth in the long run but not in the short run, while other variables, including financial development, have positive but insignificant effects on growth. Furthermore, the Hausman test chi-square's p-values for emerging African and Asian countries, as shown in Table A5, are 0.121 and 0.473, respectively, pointing to the PMG estimator technique and long-run slope homogeneity. However, the results from both MG and PMG are not dependable results; this is because both estimators have no mechanisms that could control the problems of cross-sectional dependencies in the panels and hence are not efficient and consistent estimators whenever the issue of cross-sectional dependency exists in the panels. Besides, the cross-sectional dependency results indicate that there are cross-sectional unit dependencies in the panel (see Table 4). Hence, to overcome such problems, we further went through the third strategy and estimated the dynamic common correlated effects (DCCE) estimates. And Table 7 presents the DCCE estimates results, both for emerging African and Asian countries, and in this table, the CRD statistics and probability values are -1.09 and 0.2753 (i.e. for the case of emerging African countries) and 0.66 and 0.5079 (i.e. for the case of emerging Asian countries), rejecting the hypothesis of cross-sectional independence for the residuals and recognizing that the third strategy is a more appropriate strategy than the two strategies, MG and PMG. The DCCE estimator results, which are given in Table 7, show that financial development and physical capital have positive but insignificant effects on economic growth, while price instability has negative but significant effects on growth in the emerging African countries, both in the long run and short run. However, globalization has a mixed effect on growth; that is, it has positive and insignificant effects on economic growth in the short run but has negative and insignificant effects on economic growth in the long run. The value of the adjustment term (convergence coefficient) is -.2902751 and significant at the 1 percent level, signifying the presence of steady and converging long-run relationships among the variables and confirming about 29 percent of disequilibrium removed annually.

Furthermore, the DCCE estimator results presented in Table 7 indicate that financial development and globalization have positive and insignificant effects on real GDP growth, while price instability has negative and insignificant effects on real GDP growth, both in the long and short terms. However, physical capital, on the other hand, has significant and positive effects on real GDP growth in both the short and long run. Besides, the convergence coefficient of the DCCE model is negative, and significance at the 1 percent significance level confirms the existence of a stable long-run link between the variables of interest in the case of emerging Asian countries as well. To put it succinctly, the DCCE estimation result in Table 7 shows that FSD has a positive, albeit not statistically significant, impact on the economic growth of emerging African and Asian countries. In different expressions, though these emerging countries have been registering rapid and sustainable economic growth and also exert vigorous efforts so as to change their financial sector, the level of financial development indices of these countries is about 0.23 on

Table 7. Long-run and short-run estimation results for emerging African countries.

Variables	DCCE (i.e. for Africa)	DCCE (i.e. for Asia)
Long-run coefficients		
Dependent variable: Real GDP		
Physical capital formation	.1727285	.1593699
	(0.189)	(0.006)***
Financial development	1.746334	.1623971
	(0.119)	(0.451)
Globalization	−.0080649	.0004594
	(0.182)	(0.921)
Price instability	−.0020089*	−.002777
	(0.092)	(0.146)
Short-run coefficients		
Dependent variable: Real GDP		
Δ Log physical capital	.0610711	.078481***
	(0.189)	(0.002)
Δ Financial development	.2494851	.0698904
	(0.219)	(0.493)
Δ Globalization	.001002	.0009843
	(0.521)	(0.621)
Δ Price instability	−.0009157	−.0010199
	(0.002)***	(0.139)
Convergence coefficients (ECT)	−.2902751***	−.524509***
	(0.000)	(0.000)
Number of observations	480	400
CD test statistic (CD p-value)	−1.09	0.66
	(0.2753)	(0.5079)

Source: Authors own computation using Stata 14 software.
Note. 1. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
2. The probability value for each coefficient is given in the parenthesis.
3. The Dynamic Common Correlated Effects Estimator (DCCE) used in this study is in the form of CS-ARDL, and the Stata syntax 'xtdcce2 was used to get the results.
4. The dynamic ordinary least squares (DOLS) model is not used because it does not contemplate both short- and long-run estimates (it does not fit CS_ARDL).

average, which is not sufficient to sustain their economic growth. Hence, in line with these findings, the previous empirical works argue that financial development positively affects economic growth—that is, it boosts growth through increasing national saving and improving capital efficiency. Besides, through its effect on the innovation of new production techniques, it improves productivity and eventually leads to growth. Similarly, through gathering and analyzing financial information from potential investors and channeling funds to business activities that yield the highest returns, the financial sector intensifies the efficiency of invested projects and positively influences economic growth (Ahmadpour Kacho & Dahmardeh, 2017; Inoue & Hamori, 2019; Le et al., 2019; Naeem et al., 2024; Paudel & Acharya, 2020;Prochniak & Wasiak, 2017; Raz, 2013; Zakaria & Basah, 2021;). Nonetheless, the effects of FSD on growth could be significant, insignificant, or even negative, depending on the level of countries' economic development, their financial development, and their integration into the world financial system (Mohamed & Aguir, 2017; Valickova et al., 2015; Wang et al., 2024).

5. Conclusion and policy implications

Dynamic common correlation effect (DCCE) estimation techniques and the endogenous growth model have been used to study the link between financial sector development and growth in emerging economies between 1981 and 2021. While the connection between financial sector development and economic growth has previously been empirically studied in the context of several developing countries, we examined their relationship using globalization and an extensive financial development index that was developed by the IMF. Furthermore, this research compares the degree of financial development of the emerging economies of Asia and Africa. To this end, we carried out econometric and descriptive analyses. According to the findings of the descriptive analysis, emerging Asian and African nations' average financial development index during the study periods was 0.23. Specifically, upon analyzing the financial development of the two emerging groups separately, we discovered that emerging Asian countries have a financial sector development (FSD) index level of about 31, whereas emerging African

countries have reached an index level of about 18. This suggests that, even though both emerging groups have low levels of financial development, emerging Asian countries have a higher level of financial development than emerging African countries. Additionally, when compared to emerging African nations, emerging Asian nations show a slight difference in terms of capital formation and economic growth. Furthermore, emerging Asian nations have experienced a higher degree of globalization than emerging African nations, suggesting a higher level of interconnectedness with the international community. Similarly, the econometric results show that financial development has positive but insignificant effects on the economic growth of emerging Asian and African nations, both in the short and long term. In conclusion, both the descriptive and econometric results implied that, despite the rapid and sustainable growth that these countries have been experiencing, their current level of financial development is insufficient to support this growth. Therefore, attention should be focused on the growth of financial markets and financial institutions, both of which should be supported by strong institutions and innovations that address critical issues with adverse selection and moral hazards that are prevalent in developing nations' credit markets. When it comes to institutional factors specifically, the primary goal should be to minimize the red tape involved in property registration and contract enforcement. Policies that fortify institutions, promote competition, and further increase financial and digital literacy, as well as contribute to the digitalization of the economy and its banking system, should be applauded since these components are essential to establishing the framework for successful financial development. Finally, to encourage financial openness and establish a favorable business environment that supports the growth of private investment, emerging nations should liberalize their financial policies and strategies as well. However, effective domestic and multilateral surveillance is crucial for preventing financial crises because it must take into account how global interdependence contributes to the spread of financial instability.

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Authors' contributions

Tesfamlak Gizaw, the corresponding author, planned and conceptualized the study, gathered, analyzed, and interpreted the data, wrote the paper, edited it for intellectual substance, and helped to approve the final version that was going to be published. Zerihun Getachew oversaw the study's conception and design, gathered information, made intellectual content revisions, and helped to approve the final draft of the publication. Malebo Mancha designed the study, made intellectual content revisions to the paper, and helped to approve the final version before publication.

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Data availability statement

Data on the financial development of all sampled countries are freely available in the IMF dataset at https://data.imf.org. Globalization is also freely available at the ETH Zurich at http://globalization.kof.ethz.ch. However, data on all other variables in this study is openly available in the World Development Indicators dataset (https://data.worldbank.org). All data can be provided directly over the corresponding author's email, tesfanatan@yahoo.com, based on the requirements or found in the data repository DOI: 10.5074/7b4d49ac-87c7-4be0-b97b-603ee8dadce5.

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Appendix

Table A1. List of Countries Included in the Sample.

Emerging Africa countries	Emerging Asia countries
Botswana, Burkina Faso, Ethiopia, Ghana, Kenya, Lesotho, Mauritius, South Africa, Rwanda, Uganda, Tanzania, and Zambia	Bangladesh, China, India, Indonesia, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, and Thailand

Table A2. Cross-sectional dependency test results.

CD for Africa					CD for Asia			
variables	CD	CDw	CDw+	CD*	CD	CDw	CDw+	CD*
Real GDP	49.58	1.15	403.95	−9.25	42.08	2.99	285.27	0.22
	(0.000)	(0.251)	(0.000)	(0.000)	(0.000)	(0.003)	(0.000)	(0.830)
Price instability	8.04	−1.30	103.42	1.02	8.34	0.44	64.20	2.37
	(0.000)	(0.194)	(0.000)	(0.310)	(0.000)	(0.659)	(0.000)	(0.018)
Financial development	10.26	−2.31	208.91	−0.62	30.55	1.64	206.61	−6.87
	(0.000)	(0.021)	(0.000)	(0.535)	(0.000)	(0.100)	(0.000)	(0.000)
Globalization	49.93	1.53	407.13	−12.08	40.95	2.38	277.08	0.66
	(0.000)	(0.127)	(0.000)	(0.000)	(0.000)	(0.017)	(0.000)	(0.506)

Source: Authors own computation using Stata 14 software.
Note. xtcd2 tests residuals, or variables, for weak cross-sectional dependence in a panel data model. It implements the tests by Pesaran (2015, 2021) and the weighted CD test (CDw) by Juodis and Reese (2022). It also implements the CD* from Pesaran and Xie (2021).

Table A3. Panel unit root test result for Asia.

	In level				In first difference			
	Specification without trend		Specification with trend		Specification without trend		Specification with trend	
Variables	Zt-bar	p-value	Zt-bar	p-value	Zt-bar	p-value	Zt-bar	p-value
Log real GDP	0.611	0.730	1.031	0.849	−6.577	0.000	−6.709	0.000
Log physical capital	−0.296	0.384	−0.907	0.182	−12.850	0.000	−12.091	0.000
Price instability	−9.980	0.000	−8.983	0.000	−14.657	0.000	−14.255	0.000
Financial development	−2.795	0.003	−2.131	0.017	−14.450	0.000	−13.896	0.000
Globalization Index	−1.263	0.103	−0.224	0.412	−11.888	0.000	−11.163	0.000

Source: Authors own computation using Stata 14 software.
Note. The CIPS test assumes cross-section dependence is in the form of a single unobserved common factor. Multipurt uses Scott Merryman's xtfisher and Piotr Lewandowski's pescadf.

Table A4. Panel cointegration test results for Asian countries.

First generation cointegration test (Pedroni)						
	Co-integration dependent variables					
	Log real GDP (lnRGDP)			Financial development (FD)		
		Group			Group	
Test Statistics Statistic	Panel P-value	Z-value	Robust P-value	Panel P-value	Z-value	Robust P-value
v	−.6017		–	.817		–
rho	2.39	3.662		−.3317	.524	
t	2.464	3.984		−2.596	−2.892	
adf	2.861	4.403		−2.023	−3.013	
Second generation cointegration test (Westerlund)						
Gt	0.671	0.442	0.740	0.000	−3.430	0.050
Ga	0.000	−8.886	0.000	0.077	−1.428	0.320
Pt	0.421	−0.201	0.540	0.000	−3.507	0.100
Pa	0.000	−4.077	0.030	0.000	−4.207	0.050

Source: Authors own computation using Stata 14 software.
Note. 1. All the Pedroni test statistics are distributed N (0, 1), under a null of no cointegration, and diverge to negative infinity (save for panel v).
2. The Pedroni tests are done using the Stata syntax 'xtpedroni' and the 'xtwest' command.
3. The Westerlund tests are conducted using the Stata syntax 'xtwest'.
4. Westerlund (2007) only applied in the case of one dependent and one independent variable.
5. The bootstrapped robust critical values are only for Westerlund technique and the robust p-values against cross-sectional dependencies are obtained from bootstrapping 100 times in the Westerlund test.
6. The Maximum lag length selected in the cointegration test is 9.

Table A5. MG and PMG estimation results for emerging African and Asian countries.

	For emerging African countries		For emerging Asia countries	
Variables	MG	PMG	MG	PMG
Long-run coefficients				
Dependent variable: Real GDP				
Physical capital formation	−.0866411	−.558393	.6466798	
	(0.799)	(0.104)	(0.171)	
Financial development	.9328617	.121725***	.3741957	.2010374
	(0.737)	(0.005)	(0.437)	(0.538)
Globalization	.06898***	.145018***	.0329471	.1480403***
	(0.000)	(0.000)	(0.118)	(0.002)
Price instability	−.0207578***	−.0267427*	.0391422	.0613214
	(0.001)	(0.001)	(0.237)	(0.142)
Short-run coefficients				
Dependent variable: Real GDP				
Δ Log physical capital	.0858032*	.0823333	.0783658***	.0823333
	(0.077)	(0.070)*	(0.006)	(0.070)*
Δ Financial development	.1905995	.195383	.0221202	.0796993
	(0.150)	(0.222)	(0.824)	(0.456)
Δ Globalization	−.0018226	.0017878	.0003523	.0020527
	(0.142)	(0.268)	(0.859)	(0.207)
Δ Price instability	.0002192	−.0005862	−.0007858**	.0000201
	(0.545)	(0.142)	(0.032)	(0.957)
Constant	1.879819***	.2849813	1.009901**	.1165698**
	(0.001)	(0.139)	(0.010)	(0.041)
Convergence coefficients (ECT)	−.0879937***	−.0120353	- .0478907***	−.0043627
	(0.002)	(0.236)	(0.007)	(0.257)
Number of observations	480	480	400	400
Hausman test ($\chi 2$)	−10.6		−4.87	
	(0.121)		(0.473)	

Source: Authors own computation using Stata 14 software.
Note. 1. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
2. The probability value for each coefficient is given in the parenthesis.
3. Stata syntax 'xtpmg' was used to get MG and PMG results.