Financial development, human capital and its impact on economic growth of emerging countries

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Abstract

Purpose – This paper aims to investigate the critical aspect of financial development, human capital and their interactive term on economic growth from the perspective of emerging economies.

Design/methodology/approach – Data set ranged from 2002 to 2017 of 83 emerging countries used in this research and collected from world development indicators of the World Bank. The two-step system generalized method of moments is used to conduct this research within the endogenous growth model while controlling time and country-specific effects.

Findings – The findings of the study indicate that financial development has a positive and significant effect on economic growth. In emerging countries, human capital also has a positive impact on economic growth. Financial development and human capital interactively affect economic growth for emerging economies positively and significantly.

Research limitations/implications – The data set is limited to 83 emerging countries of the world. The time period for the study is 2002 to 2017.

Originality/value – This research contributes to the existing literature on human capital, financial development and economic growth. Limited research has been conducted on the impact of financial development and human capital on economic growth.

Keywords Financial development, System GMM, Economic growth, Emerging countries, Human capital

Paper type Research paper

Introduction

World Bank Report (2012), the financial sector is a legal system, regulatory institutes, instruments and markets that enable transactions to be carried out by credit extension. The financial sector's development aims to overcome the costs involved in the financial system. This process of reducing the information costs acquisition, contract enforcement and transactions led to intermediaries' appearance, financial contracts and markets. Moreover, the report suggested that these financial institution systems perform and play a more important role in developing economic growth. Well-developed financial institutions in a country can perform better over a long time as they tend to grow faster due to the causal effect of financial development's contribution to growth.

According to Levine (1997), a well-developed financial institution is a key to the economic growth of the country as it acts to reduce the risk/uncertainty through well-organized risk management processes, effective sharing and utilization of saving by lowering the cost of transaction and access to financial institutions, monitoring transactions through proper regulatory bodies to promoting efficient market and comfort in trade by exchanging of goods, services, knowledge, technology and innovation. According to Ibrahim (2018), the recent constant growth rates of world development indicators (WDIs) practiced in different regions partially stimulate financial deepening, with the financial sector's development playing an important role in growth. In general, the role of finance in facilitating investment productivity and growth models of economics has been expanded to provide a theoretical basis for examining the relationship between financial sector development and economic growth. The growth in the economy can be facilitated via the financial system by increasing human and physical capital by assigning money to the utmost fruitful activities and sinking the cost of the resources used in saving and investment (Montiel, 2011).

Besides financial development, the role of human capital is also essential in the growth process. Some countries have less stock of human capital, while some have a high supply of human capital. So due to this, the impact of financial development may not be the same for all countries. Barro and Sala-i-Martin (1999) stated that if capital is generally defined as human capital, it relaxes the limitations of declining returns and contributing to per capita long-term growth even in the lack of exogenous technological advancements. Barro and Lee (1996) investigated the human capital by using education and life expectancy proxy on economic growth and found that it affects economic growth. Blundell *et al.* (1999) revealed that the growth rate highly depends on human capital accumulation and innovation as the stock of human capital and education level influences labor productivity.

Countries with high-quality human capital stocks can benefit more from the financial sector, as many scientists, researchers, doctors, accountants and financial analysts in these countries can make efficient and effective choices among different alternates. They are more efficient and effective in using opportunities and resources and can also innovate better to support the financial sector growth. These are all essential to promote growth in the economy. Many studies have been researched the impact of financial development on economic growth (Acaravci *et al.*, 2009; Eita and Jordaan, 2010; Levine, 2005; Rousseau,

2003). Many previous studies claimed that financial development significantly impacts economic growth in developing economies (Acaravci *et al.*, 2009; Khan and Senhadji, 2003; Khan *et al.*, 2020; Rousseau and Sylla, 2005).

But in contrast, some studies also claim that government intervention and restriction in financial sectors negatively affect as restriction causes the problem to the economic development and adverse this relationship to real growth (Boyreau-Debray, 2003; Fry, 1980; Lucas, 1988). On the other hand, many studies have also researched the effect of human capital on economic growth (Barro and Lee, 1996; Blundell *et al.*, 1999; Lucas, 1988). They ignore the human capital and financial development interactive term on economic growth. There is less study on the human capital and financial development interactive term on economic growth. Kendall (2012) researched both human capital and financial development on economic growth in India's sub-national economy. Hakeem (2010) and Ibrahim (2018) conducted the same research in Sub-Saharan Africa. Munir and Arshad (2018) mentioned two foremost difficulties that most developing economies face: achieving high growth in the economy and keeping economic development at the highest rate.

The primary aim of this study is to evaluate the interaction role of financial development and human capital on economic growth in the context of emerging countries. This study extends the existing literature in the following ways: first, there are limited studies on the simultaneous impact of financial development and human capital on economic growth. This study evaluates the interactive effect of financial development and human capital on economic growth in developing economies. Second, this study investigates the marginal impact of human capital and financial development on economic growth in developing countries. Finally, this study investigates the econometric relationship between financial development, human capital and economic growth. This study is important for policymakers and researchers in modeling the stability of the human capital and financial sector development in emerging economies in the future.

Literature review

This portion outlines the theoretical implications and related research in developed and developing economies. It evaluates a specific research section on the relationship between financial development, human capital and economic growth. Such understanding is critical and essential for the developing economies to carry out an empirical study on the relationship between financial development, human capital and economic growth.

Theoretical background

The basic principle of the endogenous growth theory is that capital stock increases (all these physical and human resources) create beneficial externalities that raise productivity. If the spillover effects are high, these will deter declining returns on investment. The consequences for growth are similar to those observed when separately examining technical development and human capital, but assuming that there are diminishing returns to human capital in the production of final output and education. Fischer (1991) stated that the interaction effect of financial development and human capital on economic growth fabricates certain appealing repercussions for the transitional dynamics. However, Young (1995) observed that although long-term growth is induced by independent-scale changes in the product quality, and therefore does not show nonlinearities, human capital is the long-term impact of growth rate on the economy. Recognizing that the economy's growth rate is largely dictated by the potential to deliver human capital, human capital accumulation determines investment opportunities.

A deep-rooted financial system is an essential part of human resource development (Diamond and Dybvig, 1983). Although recognized in the established theoretical literature, the relationship between financial growth and human capital remains less discussed at the empirical level. The literature shows that people with better education are less risk-averse, have high knowledge and are high savers. Improving education rates like adult education, thus, offer new opportunities for empowerment for people. Training also enables individuals to switch from informal to formal sector opportunities allowing them to access formal financial services. Development of the financial sector through credit channels often provides for the accumulation of human capital and influences economic growth. The consequence, then, is both ways.

Financial growth and good human capital endowment will promote greater use of the borrowed funds than individual savers. This may also increase management performance by fostering competition by successfully taking over or attempting to take over. Demirgüç-Kunt and Maksimovic (2005) argue that financial development and human capital allow specific entrepreneurs to engage in creative activity that impacted growth through productivity enhancement and viewed the financial and human capital environment as an important role in mitigating the effect of external shocks on domestic economies. They conclude that financial structures without the requisite institutional growth, human growth, educational achievement have led rather than mitigation to poor handling or even amplification of the danger. Such relationships provide the theoretical basis for the present study.

Empirical literature

Human capital has been articulated differently in different studies. They include human capital as health, education, Knowledge, migration, training and other factors investment in labor that can enhance labor productivity to contribute to the gross domestic product (GDP) of the country, as discussed in the previous literature. In the past two decades of twenty centuries, human capital has been dominated in growth literature with the great appearance of endogenous growth theory presented by Lucas (1988) and Romer (1986) as they contend in oppose to previous neo-classical growth theory. They said that if capital is efficiently allocated to the human capital, the return can be getting back in the shape of a stable return to scale despite diminishing and the low return to scale. Romer (1986) specified a long-term economic growth model in which human education capital includes an input to the production, which increases marginal production and growth over the long run. He further reasons that a country with a large size of human capital may grow much quicker than a country with a small human capital size.

Munir and Arshad (2018) practice the endogenous growth model to find the impact of stock of human capital and real physical capital to investigate the long-term and short-term effects on Pakistan's economic growth. The research findings follow the endogenous growth model, suggesting that GDP per labor increases with accumulation factors of human capital and real physical capital as accumulation factors increase employment rate level, per capita income, labor productivity and economic growth sources. Rosendo Silva et al. (2018) investigated human capital on economic growth. Results show that better health also has a strong significant and positive impact on economic growth because the healthy worker can improve labor productivity more. Li and Liang (2010) practice human capital in East Asia, and results show that both stocks of health and education have a positive correlation to growth. Still, the stock of health capital is highly significant to growth than the stock of education capital. Neeliah and Seetanah (2016) study the positive relationship between human capital and economic growth in both the short run and long run. The study stated

that there is a bi-directional association between human capital and growth. The main conclusion suggested that any shock to the development of human capital can destroy growth, so policy-making must pay attention to human capital.

Knowles et al. (2002) practice a neo-classical growth model approach, which included female and male human capital education separately. The research results show that female human capital is more important than male human capital in boosting labor productivity. Similarly, Sehrawat and Giri (2017) also examine female human capital and male human capital separately on India's economic growth. The statistical results disclose that in both the short and long run, female human capital is statistically significant and positive to the development and increases labor productivity. However, male human capital is positive but unexpectedly insignificant to the growth. The study noted in long-run causal relationship of growth variable with physical capital, male and female human capital.

The early study of King and Levine (1993) presented a cross-country analysis based on Schumpeter's view that the financial institution system can encourage growth in the economy. The level of financial development with various measures predicts strong relation with real GDP per capita. Levine (2005) evaluated and encountered the linkage between the system of financial operation and the economy's growth. Evidence suggested that both the financial market and intermediary institutions are important for growth in a financial system. Moreover, the study proposed that well developed financial system comfort and illuminate constraint of external financing that firms may face in a way to economic growth.

Nyasha and Odhiambo (2015) conducted a review paper to highlight the empirical and theoretical relationship of bank-based and market-based financial development on growth in the economy of both developed and developing countries. They concluded that casualty relationship direction highly depends on the countries' various specific characteristics, methodology, data sets and different factors used by the study. According to Jalles (2016), there is a growing interest in the financial institution's importance and are quality in the development process. Corruption is the main obstacle in economic development and lower corruption or better high-quality establishment enhancing financial development, and thus enhancing growth. Phiri (2015) claimed that there is an asymmetric relationship between financial development and growth. Banking activity proved a key factor for growth, while growth in the economy was confirmed as a lashing force behind the stock market development. Shahid et al. (2015) also specified that financial development has a significant and positive connection to economic growth.

The effects of financial development and growth in the SAARC nations have been studied by Sehrawat and Giri (2016) and the long-term connection of economic and economic growth has been explored. Sehrawat and Giri (2015), long-term relationships in India's economic and economic development, are also found. The impact of financial development in emerging economies and using the endogenous growth model is further studied by Masoud and Hardaker (2012). It is investigated that the development of financial development is essential to growth and that the connection between stock market development and financial growth is stable in the long term.

There is growing concern about the relationship with economic growth in the human capital and financial development interactive term. The human capital and financial development growth in Sub-Saharan Africa has been examined by Ibrahim (2018) in the latest research. He said human capital and financial development boost economic growth in the short and long-term. The combined effect of human capital and financial development has suggested that financial development primarily stimulates growth with strong human capital quality. Better accumulation of human capital leads to innovation and adaptation of new technologies to promote global economic growth. Hakeem (2010), the stock of physical

capital and human capital is compulsory for growth. Due to financial under-development, the study did not find any strong effect of economic development on growth. However, the combined impact of human capital and financial development is key to accelerate the growth and nonappearance of anyone who can affect and reduce development speed in the Sub-Saharan Africa region. Evans *et al*. (2002) also claim positive and significant interaction of human capital and financial development toward the economy's growth and ignorance can mislead as both are of the same importance to growth.

This study's general purpose is to evaluate the impact of human capital and financial development on economic growth in emerging countries. Following are the research questions on which this research is based on:

RQ. Is there any combined impact of human capital and financial development on economic growth in emerging countries?

Methodology
Data and preliminary findings
This study constructed a set of panel data of 83 emerging economies from 2002–2017. The selected time interval and the number of countries were only based on the availability of data. Data related to all the variables used in this research was collected from WDIs, listed on the World Bank website. The study used two financial development indicators; domestic credit provided by the financial sector (DCfs) and domestic credit to private sectors (DCps), and two human capital indicators; secondary school enrollment (SSE) and primary pupil-teacher ratio (PPTR). DCps refers to financial resources provided by financial corporations to the private sector as a percentage of GDP such as via loans, non-equity securities purchases, commercial credits and other receivable accounts. While, DCfs includes all gross credit to different sectors as a percentage of GDP, except for net central government credit. SSE ratio is the ratio of total enrollment, irrespective of age, to the age group population in a percentage that corresponds officially to the educational level shown. SSE concludes the basic education that started at the primary level and is intended to lay the basis for permanent learning and human development. At the same time, the PPTR is the average number of pupils per primary school teacher in a percentage. In this research, we use real GDP per capita as an indicator of economic growth taken as the constant prices of the year 2010 in the US dollar amount in line with standard literature.

This research uses five control variables, namely, general government expenditure, inflation, labor force, trade openness and fixed capital formation. These variables are developed based on the growth theory of neo-classical. Government general expenditure measures the size of government and is projected to influence economic growth negatively. Inflation relates to the consumer price index, representing an annual shift in the cost for the average user of services and products. Inflation is used as the macroeconomic proxy of (in) stability and is expected to influence the economy's growth negatively. Trade openness relates to the number of products and services as a percentage share of GDP exports and imports and is anticipated to impact economic growth positively. The labor force's participation rate is the proportion (percentage) of the population 15 to 64 years of age who are economically active and is expected to positively influence the economy's growth. While the gross capital formation relates to the cost of additions to the economy's fixed assets plus net inventory changes as a proportion of GDP and is anticipated to have a positive effect on the economy's development.

Specification of the model
In this study, to assess the impact of human capital and financial development on economic growth in emerging nations, we use Ibrahim (2018)'s the endogenous model. This study uses SSE and PPTR variables as the stock of human capital and uses DCps and DCfs variables as financial development indicators:

$$\Delta lny_{it} = \delta + \rho lny_{it-1} + \alpha_2 l_{it} + \alpha_3 pk_{it} + \alpha_4 hk_{it} + \alpha_5 fd_{it}$$
$$+ \alpha_6(hk_{it} \times fd_{it}) + \alpha_7 q_{it} + \tau_i + \vartheta_t + \varepsilon_{it}$$

where
y_{it} = Real GDP per capita in the country $_i$ at time $_t$
l_{it} = Labor force in the country $_i$ at time $_t$
pk_{it} = Stock of physical capital in the country $_i$ at time $_t$
hk_{it} = Stock of human capital in the country $_i$ at time $_t$
fd_{it} = Financial development indicators in the country $_i$ at time $_t$
q_{it} = Government expenditure, inflation, trade openness in the country $_i$ at time $_t$
τ_i = Time effect in the country $_i$
ϑ_t = Country fixed effect at time $_t$
ε_{it} = Error term in the country $_i$ at time $_t$.

The direct impact of human capital and financial development is examined based on α_4 and α_5, while the indirect effect of an interactive term is evaluated based on α_6. As we rely on prior studies, we expect the direct impact of human capital and financial development α_4, α_5 > 0. However, the PPTR is expected to negatively influence growth as learning and teaching must be efficient and effective if the ratio is low. On the other hand, the impact of an interactive term of both human capital and financial development is expected $\alpha_6 > 0$.

The research used the two-step system generalized method of moments (GMM), the dynamic panel estimate, to determine the impact of human capital and financial development on economic growth in emerging nations. Meanwhile, Hansen (1982) presented the two-step system GMM; the system GMM has become a valuable estimation procedure in many fields of finance and applied economics. It can be viewed as a generalization of various other estimates, i.e. maximum likelihood and ordinary least square. System GMM is much more versatile. It uses assumptions about the extra moment conditions by using the lagged value of an independent and dependent variable as valid instruments in the model and levels of lagged for endogenous variables in the model. It is, therefore, less probable to be incorrectly specified. The system GMM is a suitable method to make unbiased and consistent estimates based on the system regression in variations with the regression level. Blundell and Bond (1998), system GMM which considering the valid tools on even back of extremely persistent variables, is preferable to the GMM of first difference. However, the effectiveness and consistency of the system GMM technique depend on the validity of test tools as examined by the serial AR1 or AR2 correlation test and by the Hansen exogeneity test for overstated limitations.

Descriptive analysis
The total observations for real GDP are 1,328, with the mean value of the 3,443.437and having the standard deviation value of 2,952.97. The total observations for the government's general expenditures are 1,278, with a mean value of 15.224 and having a standard deviation of 6.532. The inflation rate has a mean value of 6.28 with a total observation of 1,292 and has a standard deviation value of 6.47. The total number of observations for trade openness is

1,306, with a mean value of 79.11 and a standard deviation of 32.111. The total number of observations of the labor force is 1,328, with its mean value is 66.144 and its standard deviation value is 10.502. The number of observations for the variable of physical capital is 1,276, with a mean value of 24.075, while the standard deviation of 8.778.

The SSE and PPTR are the representative variables of the human capital. The SSE's mean value is 67.57, with a total observation of 1,007 and has a standard deviation of 26.191. While on the other hand, the PPTR has a mean value of 30.292, with several observations of 1,024 and having a standard deviation of 12.69.DCps and DCfs are the representative variables of financial development. The mean value of the DCfs is 45.87, which indicates that financial sectors provide 45.87% of the GDP as a domestic credit. While on the other hand, the mean value of the DCps is 35.799, which indicates that almost 35.80% of credit provided by financial sectors in the form of domestic credit is allocated to private sectors. The standard deviation values of the DCps and DCfs are 27.582 and 38.301 correspondingly (Table 1).

Results

The correlation analysis of the variables allows the researchers to identify the correlation between the different variables that potentially affect the investigation's independent variable contribution. However, the correlation analysis results shown in Table 2, no variable presents a larger correlation that may affect the analysis results of this study.

Table 2 shows a significant and positive correlation between real GDP and SSE, the relationship between the real GDP and the PPTR as expected, which is negative and significant according to the suggested hypothesis. The correlation between real GDP and the two variables, i.e. DCps and DCfs, is positive and statistically significant, consistent with the hypothesis proposed.

The relationship between a dependent variable and control variables in this research is also according to the study expectations. It is positive and significant that real GDP is linked to per capita and capital formation, trade openness and government expenditure. There are adverse and significant inter-relation of labor and real GDP per capita while also negative, statistically significant interrelationship of inflation and real GDP. The correlation matrix generally shows a stable and not so preeminent correlation between all of these variables that may impact the analysis of this research.

We examine human capital and financial development and their interactive term through a two-step system GMM in panel data estimation in 83 emerging countries. In the model, we use a lag value of real GDP, financial development indicators, human capital indicators, inflation, physical capital, labor force, general government expenditure and trade openness

Variable	Observations	Mean	Std. dev.	Min	Max
Real GDP per capita (US$ at 2010 constant prices)	1,328	3,443.437	2,952.973	212.547	1,5219.88
Government general expenditure (% of GDP)	1,278	15.235	6.532	3.460	135.784
Inflation (% growth in consumer price index)	1,292	6.284	6.471	−18.109	59.2197
Trade openness (% of GDP)	1,306	79.113	32.111	0.167	203.829
Labor force (% of total population ages 15–64)	1,328	66.144	10.502	39.49	90.34
Fixed capital formation (% of GDP)	1,276	24.075	8.778	2.047	75.195
Secondary school enrollment (% gross)	1,007	67.575	26.191	6.619	126.054
Primary pupil-teach ratio (%)	1,024	30.292	12.691	8.680	82.795
Domestic credit to private sector (% GDP)	1,292	35.799	27.582	0.001	160.125
Domestic credit provided by financial sector (% GDP)	1,282	45.872	38.301	−28.735	215.238

Table 1.
Descriptive statistics
of variables

	(1) Real GDP	(2) Govt gen exp	(3) Inflation	(4) Trade openness	(5) Labor force	(6) Capital formation	(7) Sec school enrl	(8) Pup teach ratio	(9) Private credit	(10) Domestic credit
Real GDP (1)	1									
Govt gen exp (2)	0.09***	1								
Inflation (3)	−0.04*	−0.1***	1							
Trade openness (4)	0.06***	0.22***	−0.02	1						
Labor force (5)	−0.11***	−0.19***	−0.01	−0.01	1					
Capital formation (6)	0.07***	0.078***	−0.02	0.23***	0.02	1				
Sec school enrl (7)	0.66***	0.08***	−0.01	0.19***	−0.22***	0.04	1			
Pup teach ratio (8)	−0.62***	−0.07**	−0.04	−0.19***	0.28***	−0.16***	−0.85***	1		
Privat credit (9)	0.46***	0.06**	−0.17***	0.18***	−0.05*	0.15***	0.48***	−0.44***	1	
Domestic credit (10)	0.42***	−0.001	−0.14***	0.07**	−0.13***	0.1***	0.43***	−0.42***	0.91***	1

Note: ***, **, * Shows significance at 1%, at 5% and at 10% correlation

Table 2.
Correlation matrix

variables consistent with standard literature. We include country and time effect in our estimation to deal with time associated shocks and heterogeneity of the country in growth. We estimate four different model combinations by introducing the different indicators of human capital and financial development in the model, and the results are presented in Table 3.

First, begin with discussing estimated models' fitness, we get p-values (0.0000) of Wald chi^2 for all models, indicating that models are well specified and jointly significant. The Hansen test for over-identifying restrictions shows that the used instruments are valid, and no hypotheses can be rejected. The AR^2 examination of autocorrelation reveals that there is no serial correlation among the variables.

The coefficient of the lag.1real GDP growth per capita is negative and in line with standard growth literature, implying a conditional convergence (Barro, 1991; Ibrahim, 2018; Mankiw *et al.*, 1992). The results indicate that emerging countries are converging to their stable per capita growth, and over time, they will ultimately converge to a common growth rate in the economy. The convergence rate provided by the lagged coefficients improves in all models as we track other independent variables indicating that the region's growth perspective effectively supports the hypothesis.

In model 1, the coefficient value of the human capital variable SSE is 0.0205 (positive) and significant to growth, indicating that human capital increases economic growth. This inline with previous studies like (Barro, 2001; Bosworth and Collins, 2003; Hakeem, 2010; Mankiw *et al.*, 1992). The coefficient value of financial development variable DCfs is 0.0395 (positive) and significant to growth, indicating that financial capital increases economic growth. This is in line with previous studies(Ibrahim, 2018; Levine, 2005; Schumpeter, 1911). The interaction term results indicate that the combined effect of SSE and DCfs increases the growth by 0.0140%, which shows that the interaction term of human capital and financial development has a positive and significant influence on the economic growth at a 1% significance level. These are similar to previous studies (Ibrahim, 2018; Evans *et al.*, 2002; Hakeem, 2010).

	Model 1	Model 2	Model 3	Model 4
Constant	0.1448 0.0151***	0.0549 0.0256**	0.2708 0.0244***	0.1018 0.0247***
Lag.1 (GDP per capita)	−1.0036 (0.0022)***	−0.9981 (0.0017)***	−1.0065 (0.0139)***	−1.0007 (0.0019)***
Labor force	0.0013 (0.0021)	−0.0018 (0.0031)	0.0246 (0.0035)***	0.0103 (0.0025)***
Fixed capital formation	0.0110 (0.0018)***	0.0181 (0.0014)***	0.0084 (0.0011)***	0.0071 (0.0008)***
Trade openness	−0.0019 (0.0014)*	−0.0020 (0.0011)*	−0.0046 (0.0008)***	0.0028 (0.0009)***
Inflation	−0.0001 (0.0000)***	−0.0001 (0.0000)**	−0.0005 (0.0003)***	−0.0002 (0.0000)***
Government expenditure	−0.0265 (0.0012)***	−0.0297 (0.0011)***	−0.0278 (0.0119)***	−0.0144 (0.0013)***
Secondary school enrolment	0.0205 (0.0020)***	0.0127 (0.0023)***	–	–
Primary pupil teacher ratio	–	–	−0.1114 (0.0507)***	−0.0245 (0.0719)***
Domestic credit	0.0395 (0.0036)***	–	0.1153 (0.0576)***	–
Private credit	–	0.0227 (0.0013)***	–	0.0470 (0.0256)***
Enrolment* private credit	–	0.0793 (0.0267)***	–	–
PPTR* private credit	–	–	–	0.0101 (0.0051)***
Enrolment* domestic credit	0.0140 (0.0009)***	–	–	–
PPTR* domestic credit	–	–	0.0330 (0.0164)***	–
Wald χ^2	0.0000	0.0000	0.0000	0.0000
AR(2) z-value (p-value)	−0.55 (0.583)	−1.39 (0.165)	−0.92 (0.359)	−1.44 (0.151)
Hansen (p-value)	75.38 (0.989)	76.66 (0.986)	79.06 (0.977)	80.30 (0.97)

Note: ***Shows significance level at 1%, **at 5% and *at 10%

Table 3.
Estimations using
two-step system
GMM

The Model 1 control variables' findings indicate that the workforce is positive but insignificant for economic growth. Fixed capital formation influences financial development significantly and positively. While trade openness, inflation and overall government expenditure impact development are negatively and statistically significant.

In model 2, the coefficient value of the human capital variable SSE is 0.0127, positive and significant to growth, indicating that human capital increases economic growth. The coefficient value of financial development variable DCps is 0.0227, positive and significant to growth, indicating that financial development increases economic growth. The interaction term results also suggest that the combined effect of SSE and DCps increases the growth by 0.0793%, which shows that the interaction term of human capital and financial development has a positive and significant influence on the economic growth at a 1% significance level.

The Model 2 control variables' findings also indicate that fixed capital formation has a positive and significant impact on financial development. The labor force has a negative but insignificant influence on growth. While trade openness, inflation and general government expenditure have a negative and significant influence on growth.

In model 3, the analysis was done to illuster the interaction effect of human capital (primary pupil-teacher ratio) and financial development (domestic credit) on the economic development in emerging countries. In model 3, the coefficient value of the human capital variable (primary pupil-teacher ratio) is −0.1114 (negative) and significant to growth, indicating that economic growth increases with decreasing primary pupil-teacher ratio as expected. Here human capital also has a positive and considerable influence on growth. The coefficient value of the financial development variable domestic credit is 0.1153 (positive) and significant to growth, indicating that financial development increases economic growth. The interaction term value suggests that the combined effect of the primary pupil-teacher ratio and domestic credit increases the growth by 0.0330%, which implies that the combined impact of human capital and financial development has a positive and significant influence on economic growth. The above analysis interprets that solely human capital and financial development enhance economic growth, but their combined effect boosts the economic growth of developing economies. The findings for Model 3 control variables show that the labor force, fixed capital formation and trade openness positively and significantly impact the growth. However, inflation and government general expenditure have a negative and significant impact on economic growth.

In model 4, the human capital variable PPTR coefficient is −0.0245 (negative) as expected, which indicates an increase of economic growth with the decrease of PPTR. In this respect, human capital influences growth positively and significantly. The financial development's variable DCps coefficient value is 0.0470 and positive for growth, which indicates that financial development is increasing economic growth. The interaction term's findings show that the combined impact of PPTR and DCps improves growth to 0.0101%, demonstrating that human capital and financial development have a positive and significant effect on the growth.

The findings of the control variables of Model 4 also indicate that the labor force, fixed capital formation and trade openness have a positive and significant impact on growth while inflation and government general expenditure have a negative and significant impact on economic growth.

Conclusion and recommendations

This study investigates the key aspects of human capital, financial development and interactive term in emerging countries. This research focuses on all emerging

countries from which 83 economies have been selected based on data availability. This study uses panel data analysis for 2002 and 2017 and collected secondary data from WDIs. In this research, we use SSE and PPTR as human capital proxy and DCfs, as well as DCps variables as financial development indicators. The study uses growth rates of real GDP per capita of US dollars 2010's constant prices to measure economic growth. It uses descriptive analysis, correlation analysis and a two-step system GMM method.

The main findings of this study are that human capital positively affects economic growth. This inline with previous studies like (Barro, 2001; Bosworth and Collins, 2003; Hakeem, 2010; Mankiw *et al.*, 1992). SSE is positive to economic growth in model combinations 1 and 2. While PPTR is negative as expected to economic growth in model combinations 3 and 4. These results indicate that human capital increases economic growth in emerging countries. Besides, financial development has a statistically significant and positive impact on growth. This corresponds to earlier studies (Ibrahim, 2018; Levine, 2005; Schumpeter, 1911). As DCfs is positive to economic growth in model combination 1 and 3. DCps is also positive to economic growth in model combination 2 and 4. These results indicate that financial development increases economic growth in emerging countries.

This study also explored the interactive term of human capital and financial development. The results indicate a positive and significant impact of the interaction term on economic growth in all model combinations. This is in line with previous studies (Ibrahim, 2018; Evans *et al.*, 2002; Hakeem, 2010). In a nutshell, human capital and financial development are twins needed to accelerate growth in emerging countries. Hence, neglect of either could affect the pace of development in the states.

So, emerging countries should invest in human capital and focus on financial development. The results of this research show that human capital and financial development increase economic growth in emerging economies. They should increase access to education by increasing the number of schools across different regions and ensure the supply of highly qualified teachers. They should focus on the financial system and their functions to get the benefits from it. Policymakers in emerging countries should concentrate on this while making and implementing the country's economic policies.

Limitation and future study of research

The data set is limited to 83 emerging countries of the world. The time period for the study is 2002 to 2017. Future studies can be done by increasing the time period of the study or to a specific region of the world. More variables can be added for more deep studies, and comparative analysis can be done among different countries.

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