

Human Capital and Financial Development in Pakistan: A Bayesian VAR Analysis

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ABSTRACT

Human capital plays a vital role in economics development of a country. Individuals, being well-educated human lower the knowledge gaps and increase the efficiency of the institutions. This study focuses on the impact of human capital on Pakistan's financial development. Human capital is measured at three stages of schooling: primary, secondary, and higher education. The data is from 1980 to 2019, and the Bayesian VAR estimation is used to reduce the consequences of overfitting variables. The result reveals that positive shock in human capital promotes financial development in Pakistan, also we find that inflation along with domestic credit and government expenditures negatively influence financial development however trade and investment have a positive contribution. Overall the study findings suggest that higher education explains a large share of changes in the financial development index in Pakistan.

Keywords

Education Level, Higher education, Financial development, Pakistan and Bayesian VAR

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INTRODUCTION

The key foundation for economic development is the development in the financial system as well as human capital. Scholars such as Schumpeter (1911), McKinnon, and Shaw (1973) have thoroughly investigated the relationship between financial and economic progress. This financial system is made up of institutions, markets, intermediaries, and various asset types. Foreign capital inflows and technical advancement are facilitated by a healthy financial system. However, saving mobilization, access to financial services, high-yield investment, and reductions in poverty and income inequality are all results of a country's financial progress. Furthermore, education, as a crucial component of human capital, may influence economic growth in a variety of ways, including enhancing individuals' learning ability to perform new tasks as well as appraise changing conditions and adapt to changes. (Yardimcioglu et al., 2014).

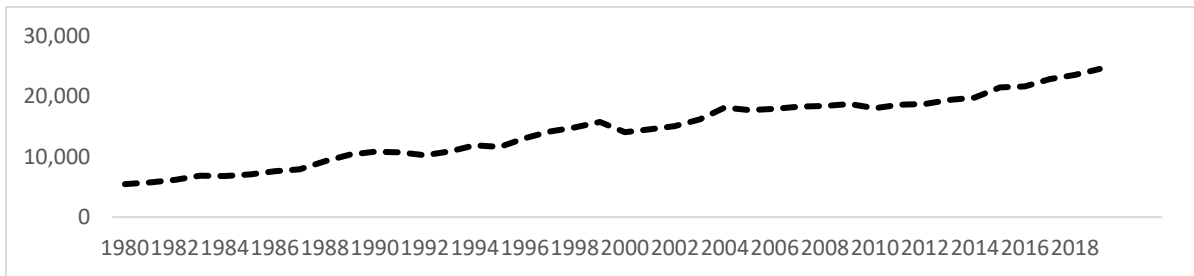
Outreville (1999) explored the positive effect of human capital on financial development in developing economies. Similarly, Human capital along with economic growth significantly determines the financial development and size of markets (Asghar et al., 2012; Barro, 2001; Bassanini and Scarpetta, 2002). human capital development may stimulate financial development by narrowing information gaps and rising demand for various financial instruments (Hatemi-J and Shamsuddin, 2016). Skilled and well-educated individuals have more access to information and behave as less risk-averse people. Lower risk aversion and more savings are achieved through higher education as suggested by Kelly (1980). Well-educated human capital means knowledgeable society about the efficiency in resource utilization. Resourceful use of resources means healthier transfers of the sources through improved financial intermediaries and through better financial instruments from savers to the borrowers

Human capital role in the financial system specifies that improvement in the performance of financial intermediation is achieved through scientific education. (Bottazzi et al, 2004). Literature indicates that accessibility to financial markets and minimization of constraints are the result achieved through the deepening of human capital. Countries having the highest quality of human capital achieved more benefits from financial development (sharma2016). Furthermore, high education ratio helps in lowering growth losses that arises from limited financial activities. Limited innovation levels in financial markets may restrict the level of investment in the economy. However developmental variations may arise among economies where low human capital restricts financial markets and institutions, while lower human capital and employment are affected by low financial activities (Evans et al, 2002; Kendall, 2009; Sharma, 2016). Which guides in exploring the linear association between human capital and the financial system (Parente & Prescott, 1994).

This article aims to determine the connection between human capital and the financial development index covering the period from 1980 to 2019. Pakistan has over 200 million populations of which 70% are youth. According to the criteria defined by the organization for economic cooperation and development (OECD 2019), The ratio of educated individuals in Pakistan will be depressing and possibly rate it at the lowest ebb. Since there is a need to emphasize the facts related to human capital with a special focus in the context of Pakistan. Good professionals in Pakistan remain a rarity, owing mostly to the low level of education, which has been exacerbated by a significant brain drain over the years as a result of a lack of attractive opportunities within the nation. This analysis used logarithmic enrollments in primary, secondary, and higher education as a proxy for human capital. Figures 1 -3 portray the three levels of education over the years, as a positive trend supports the aforementioned potentials in

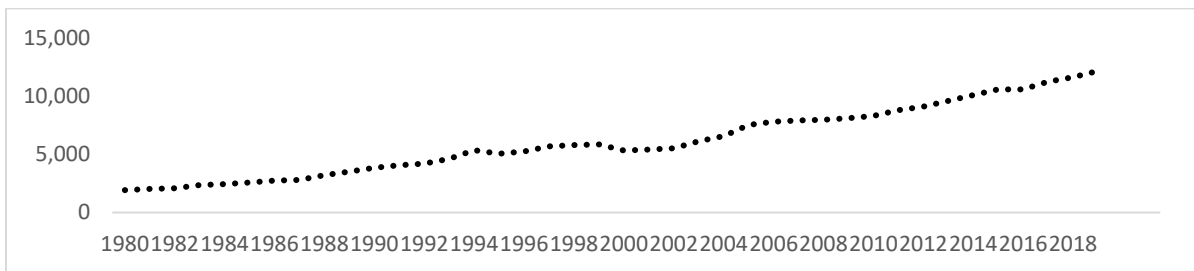
Pakistan. In terms of challenges, Pakistan suffers from many obstacles for human capital, which include inconsistencies in policy implementation, lack of commitment at professional level, and absence of innovation and synergies among academia, researchers and the private sector.

Figure 1 Primary education over the period 1980 to 2019



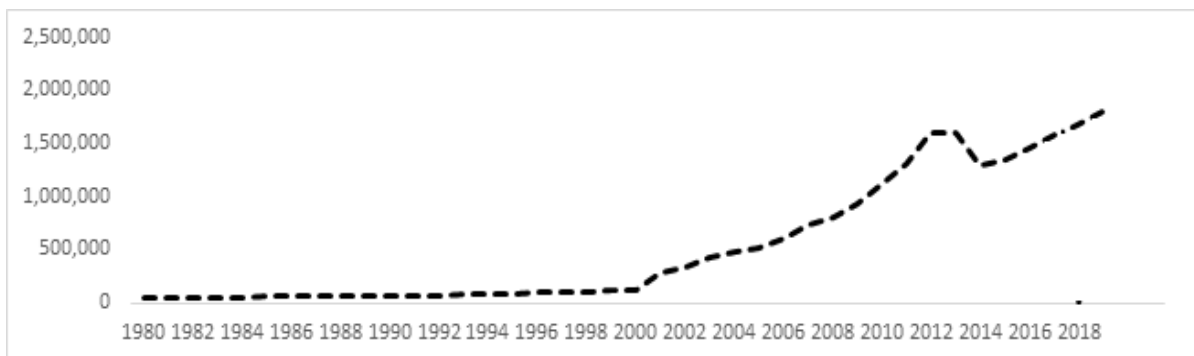
Data Source: (Handbook Statistics of Pakistan, 2020)

Figure 2 Secondary education over the period 1980 to 2019



Data Source: (Handbook Statistics of Pakistan, 2020)

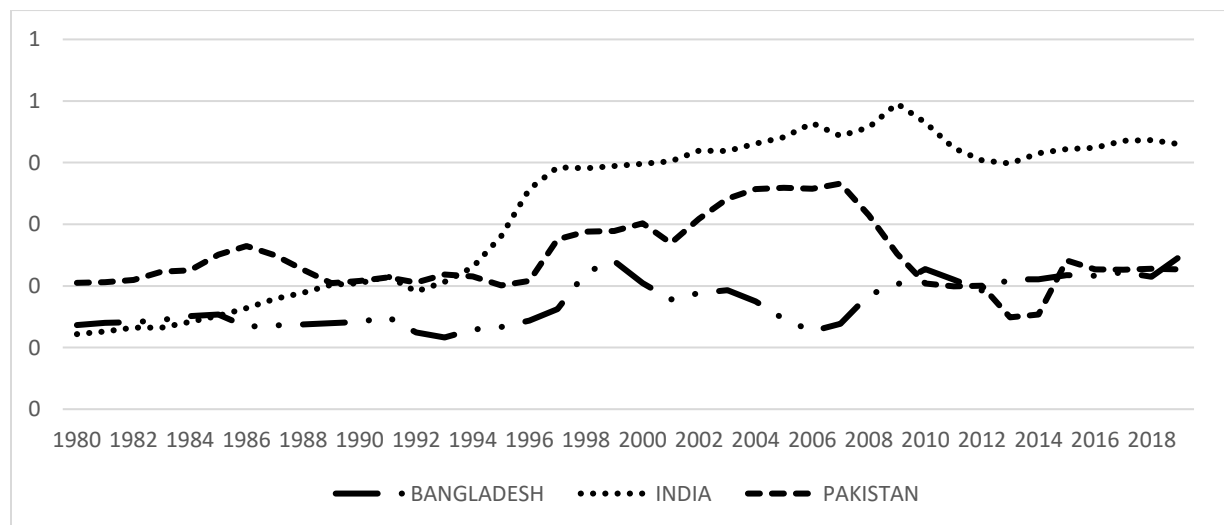
Figure 3 Higher education over the period 1980 to 2019



Data Source: (Handbook Statistics of Pakistan, 2020)

On the other hand, financial sector development determines the strength, stability, and effectiveness of financial institutions and markets. According to World Bank estimates, only 18% of Pakistanis have access to accounts in financial institutions in 2017. Access to financial services is seen as a basic demand in today's economy. There are various measures to quantify financial performance in financial development, but prior work on Pakistan concentrated on banking sector indicators. However, this article overcomes financial structure issues and focuses on both financial institutions and financial markets as financial development indicators by utilizing the IMF's broad-based Financial Development Index. The index measures the depth, accessibility, and efficiency of financial institutions and markets. Figure 4 shows the trends in the financial development Index in Pakistan along with Bangladesh and India. The trend outlines that there are more prospects of development in the financial services of India relative to Pakistan and Bangladesh.

Figure 4 Financial development index over the period 1980 to 2019



Data Source: (IMF, 2020)

Following the introduction, we review related literature on financial development and human capital. The model and methodology have been discussed after reviewing. In the following

section, empirical findings have been reported and finally, the last section concludes the recommendations.

LITERATURE REVIEW

Empirical studies in general specify a positive contribution of human capital on financial development as it may stimulate financial development by narrowing information gaps and rising demand for various financial instruments. However, there is still an insufficient amount of research exist regarding their association therefore this section summarizes some of the studies.

The study by Outreville (1999) explored the association between human capital and financial development for 57 developed countries. Financial development is represented by a ratio of broad money supply(M2) and human capital with university graduate labor force ratio. This study concluded that human capital is a major component of financial development. Evans, Green, and Murinde (2002) performed a study on 82 countries and evaluated financial development through the ratio of broad money supply (m2) and domestic credit to GDP ratio, whereas human capital is measured in terms of primary and secondary enrolment rates. This study identifies linear association between human capital and financial development and concluded their joint effect on economic growth. Similarly, research on emerging market economies by Cüneyt Kiliç et al. (2018) determines the effect of financial development on human capital, considering two samples of 16 and 17 emerging countries. Where Human capital is represented through tertiary enrollment rate and government education expenditures. Furthermore, a bidirectional causality linkage between government education expenditure and financial development has been observed. although a unidirectional causality linkage has been identified from tertiary enrollment rate to financial development.

Finance education nexus with growth is studied in BRICS countries by Kunofiwa (2017), covering the period of 1994-2014 employing the GMM technique. The ratio of domestic credit is used for financial development and the ratio of education expenditure is considered for human capital. The study concludes

that the interaction of human capital with finance significantly influences growth in the BRICS economy. Additionally, a similar study on human capital accumulation raises financial development led to economic growth in emerging economies for the period 1994 to 2014 conducted by Kunofiwa (2018). The ratio of Stock market turnover, market capitalization, and domestic public debt is used for financial development whereas, the human development index is considered for human capital. The result supports the positive influences of the interaction of human capital and financial development on growth in emerging countries. Sarwar et al. (2020) have investigated the impact of human capital, financial development, and their interactive term in 83 emerging economies for the period of 2002 to 2017. Financial development proxies as a ratio of domestic credit to the private sector and financial sector, however, human capital is represented by two proxy's secondary enrolment ratio and pupil-teacher ratio. The findings portray that human capital and financial development are jointly needed for economic growth. secondary enrolment positively contributes to growth whereas pupil-teacher ratio negatively influences growth.

The association between human capital formation, financial development, and growth in the Economic Community of West African States (ECOWAS) was studied by Abubakar et al. (2015). Their study concludes that financial development through the human capital development channel had a significant positive impact on economic growth in the ECOWAS region. Kargbo (2016) conducted a study on sub-Saharan African country sierra leone from 1980 to 2012. His study determines how linkages of human capital and financial development influence growth using the ordinary least square estimation technique. Human capital represents through secondary enrolment whereas, the ratio of broad money supply, liquid liabilities, and credit to private sector ratio proxies for financial development. The result supports the existence of positive association among human capital, financial development, and growth additionally interaction of financial and human capital development have a positive influence on growth. Haider et al. (2019) studies the influence of human capital on financial development along with globalization and natural resources in thirty-one Organization of Economic Cooperation and Development (OECD) countries covering a period of 1990 to 2016. Human capital is represented through secondary enrollment

ratios whereas the ratio of domestic credit to private to banks, credit to the private sector, and credit by financial sector were employed for the financial development index using principal component analysis. The study concludes that human capital helps in enhancing financial development in OECD countries.

Development in human capital along with a strong financial system remains an area of focus in Asian and South Asian countries. A study on a region in south Asian countries by Ghulam Akhmat et al. (2013) investigates the linkages between economic growth and financial development in human capital for the period between 1988 to 2008.

Where Financial Development is analyzed through broad money supply, credit to the private sector and bank deposit liabilities, and primary enrolment rates employed for Human capital. The conclusion reached the positive contribution of financial development on human capital. furthermore, Human capital is more explained by domestic credit and broad money flows. Similarly, Narayan Sethi et al. (2019) empirically investigate how market size and financial development influence human capital over the period from 1984 to 2015. The findings reveal that financial development is a major determinant of human capital in South Asian economies.

A study in Iran by Hamed et al. (2013) identifies the impact of financial development on human capital by application of the VAR model. To represent human capital tertiary enrollment ratio employed whereas Ratio of Broad money supply, Domestic Credit to the private sector, Domestic credit provided by banking sector ratio to GDP employed as financial development indicators. The result of the impulse-response function has indicated a positive impact of credit to the private sector on human capital while two variables domestic credit by banking and broad money supply have negatively influenced human capital in Iran. Additionally, Hatemi and Shamsuddin (2016) performed a study in Bangladesh and the conclusion was reached that there was a considerable causal association between the human capital computed with the Barro-Lee index and the financial development assessed through domestic credit ratio offered to the private sector (percent of GDP). According to their research, financial growth in

Bangladesh boosts human capital formation. The purpose of Sehwat and Giri (2015) is to analyze the cointegration between human capital and financial development in India considering the human development index for human capital. The result confirms the presence of long-run relationships among variables and indicates unidirectional causality runs from financial development indicators to human capital.

The study of Satrovic (2015) determines the long-run association between human capital and financial development for Turkey covering the period of 1986-2015, employing the ARDL technique. ratio of broad money supply and liquid liabilities proxies for financial development however secondary enrollment rate approximated for human capital. The result supports the significant impact of human capital on both proxies of financial development in Turkey. Similarly, Mehmet Nar (2019) investigated the association of human capital and financial development for the period 1998 to 2016. The financial index was formed through the ratio of broad money supply and human index from the ratio of education and health expenditures. The conclusion was made that the financial index has a positive influence on human capital in turkey.

The study of Jahfer.A and Abdul Rauf. F. H (2016) explores the joint impact of financial and human development on growth for Srilanka using a vector error correction model covering a period of 1961 to 2016. Financial development is measured through the broad money supply and domestic credit ratios whereas government expenditure and enrolment rate proxy human development. The study concludes financial development and human capital are important drivers of growth in Srilanka. The purpose of the study by ERULGEN et. al (2016) was to determine the causality between human capital accumulation with financial sector depth and growth in North Cyprus. The study forms the education index and financial depth index using traditional indicators of both variables. The findings conclude the existence of short and long-term relationships among human capital, financial development, and growth in North Cyprus.

Khan et al.(2020) explored the association in china among financial development and resource abundance along human capital covering the period 1987 to 2017. Human capital is measured through the number of graduates including masters and PhDs whereas a ratio of domestic credit to private sector is employed for financial development. The study concludes that human capital is an important driver of financial development and positively contributes to the financial development of China.

However, in Pakistan's context, Zaman et al. (2012) explored financial development and human capital relationship through Johnson cointegration from 1975 to 2010. Financial development is assessed by the ratio of broad money supply, bank deposit liabilities, credit to the private sector, and market capitalization whereas primary school enrolment is used for human capital. The conclusion was made that financial development indicators are major drivers of human capital, whereas broad money supply has exerted the largest contribution in human capital formation. Additionally, a study by Imtiaz (2019) analyzed the response of financial development indicators on human capital for the period 1991 to 2016. The human development index is used as a measure of human capital. The findings conclude that a sound financial system has influenced human capital formation in Pakistan.

METHODOLOGICAL FRAMEWORK

Bayesian VAR Analysis

To explore the responses of human capital on financial development a VAR modeling approach is a quite suitable choice. However, Under The classical VAR approach, parameters are fixed and unknown constant, additionally, it may suffer from shorter data size with a large number of parameters possibly leading to inaccurate inferences. Conversely to avoid such overfitting of parameters we estimate the Bayesian VAR model. Bayesian estimation methods have a better estimation performance than alternative methods in small samples (Rabanal and Rubio-Ramirez, 2005; Karagöz and Keskin, 2016). In the BVAR model, the parameters are regarded as random variables with prior probabilities; it provides parameter estimates where the model includes many variables and relatively little data. Bayesian techniques may

also be used to provide unbiased coefficient estimates when the variables contain unit roots (see, for example, Koop and Korobolis, 2010, Kotzé, 2017).

A typical VAR model can be expressed as follows:

$$Y_t = \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \dots + \beta_p Y_{t-p} + DZ_t + \varepsilon_t \text{-----} (4.1)$$

Where Y_t is a $n \times 1$ vector of endogenous variables; D are $n \times n$ and $n \times d$ matrices of parameters respectively; z_t is a $d \times 1$ vector of exogenous variables while ε_t is a $n \times 1$ vector of error terms independently, identically and normally distributed with variance covariance matrix Σ ; $\varepsilon_t \sim \text{IIN}(0, \Sigma)$, $B_t(t = 1, \dots, P)$

To introduce the Bayesian estimation techniques, equation (4.1) is rewritten in a more compact form as follows:

$$Y_t = X_t \beta_t + \varepsilon_t \text{-----} (4.2)$$

Where

$X_t = (I_n \otimes W_{t-1})$ is $n \times nk$ matrix; $W_{t-1} = (Y'_{t-1}, \dots, Y'_{t-p}, z'_t)'$ is $k \times 1$, $\beta = \text{vec}(\beta_1, \beta_2, \dots, \beta_p, D)$ is $nk \times 1$

The unknown parameters of the model are β and Σ . The Bayesian estimation techniques consist of combining the likelihood function of the VAR model with prior information regarding the distributions of the parameters. Assuming a prior $p(\beta, \Sigma)$ and the likelihood function $(Y / \beta, \Sigma) \propto |\Sigma|^{-t/2} \exp\{-1/2 \sum_t (Y_t - X_t \beta)' \Sigma^{-1} (Y_t - X_t \beta)\}$, the posterior distribution of the coefficients can be obtained by using the following Bayes rule:

$$P(\beta, \Sigma / Y) = \frac{p(\beta, \Sigma) L(Y / \beta, \Sigma)}{p(Y)} \propto p(\beta, \Sigma) L(Y / \beta, \Sigma) \text{-----} (4.3)$$

Where \propto represents “proportional to” (see Cicarelli and Rebucci, 2003).

We use the standard normal-Wishart prior with default hyper parameter values. This method is composed following priors μ_1 and λ_1 . μ_1 is the prior mean; λ_1 is the overall tightness on the variance (first lag) and controls the relative importance of sample and prior information. Hence, there are some adjustments in λ_1 to overcome autocorrelation. The normal-Wishart prior assumes that the model parameters are unknown and in this respect, it is superior to another popular choice—Minnesota (Litterman) prior—which assumes that the residual covariance matrix is known.

Dynamic Feedback Effects

For measuring the influence of human capital on financial development index an impulse response function for each Bayesian Var model was generated. By definition an impulse response function measures the effect of a shock in an endogenous variable due to other variables in the model. The shocks in human capital are identified using a recursive scheme (Cholesky decomposition) and accumulated impulse response is calculated to measure the cumulative response of all variables due to innovation in policy variables i.e human investment in three levels of education.

DATA SOURCES AND DESCRIPTION

The Study uses annual time series data from 1980 to 2019 collected from IMF, World development indicator, and handbook of statistics of Pakistan (2020). The study uses an overall financial development index prepared by IMF. Financial Development Index is the aggregate index that captures the innovation in financial institutions and markets. Human capital is the need to develop financial institutions and markets. Khan, Zaman (2012), and Jafer (2016) have proxy's education enrollment for human capital. Present studies focused on using primary education, secondary education, and higher education enrolment to analyze human capital in Pakistan. Moreover, this analysis employs various control variables such as the domestic credit-to-private-sector ratio, the ratio of government expenditures, gross investment, inflation, and trade.

In line with existing literature Khan (2020) Mehmat Nar (2019) and Satrovic (2015) the study employed three econometric models which are:

Model 1

$$FDIt = \alpha_0 + \beta_1 LPRIEt + \beta_2 DCt + \beta_3 GEXPt + \beta_4 INVt + \beta_5 INFt + \beta_6 TRDt + \beta_7 SB + \varepsilon_t \text{-----} (5.1)$$

Model 2

$$FDIt = \hat{\alpha}_0 + \beta_1 LSECEt + \beta_2 DCt + \beta_3 GEXPt + \beta_4 INVt + \beta_5 INFt + \beta_6 TRDt + \beta_7 SB + \varepsilon_t \text{-----} (5.2)$$

Model 3

$$FDIt = \hat{\alpha}_0 + \beta_1 LHIGEt + \beta_2 DCt + \beta_3 GEXPt + \beta_4 INVt + \beta_5 INFt + \beta_6 TRDt + \beta_7 SB + \varepsilon_t \text{-----} (5.3)$$

Where FDI is Financial Development Index, PRIE is the primary enrolment; SECE is the secondary enrolment and HIGE is higher education enrolment in numbers. DC is the ratio of domestic credit to the private sector; GEXP is the ratio of government final expenditures to GDP; INV is the ratio of gross fixed capital formation to GDP; INF is the inflation rate; TRD is the trade sector, SB is the structural break dummy variable and ε is the residual. The subscript t is for the time.

Univariate Analysis

We are working on univariate time series analysis hence empirical estimation conducted by ensuring variables stationarity. we used the Augmented dicky fuller test along with Perron and Vogelsang (1992) innovation outlier break test including trend and intercept to ensure the structural break in the series. The result of the Augmented dickey fuller test and structural break unit root test is reported in Table 1 reveals the existence of unit root in all series, in other words, variables are not stationary at their level. It can be observed that series including financial development index, primary enrolment, domestic credit, and inflation are stationary at level having a structural break. Whereas remaining variables are integrated of order 1.

Bayesian VAR Order Selection

For appropriate estimation, the order of Bayesian VAR is determined using (AIC) Akaike information criterion. These selection criteria indicate that the optimal lag is one.⁵ For each model lag selection was made on the basis of Akaike information criterion. All variables are in percentages except human capital which is in the logarithmic form before the test and estimation.

⁵ Bayesian estimates result may available on demand.

Table 1

Unit Root Test and Structural Break Test

VARIABLES	Augmented Dickey Fuller Test Statistics				Innovational Test Statistics		
	Level		First Difference		Level		
	With Trend and Intercept		With Trend and Intercept		With Trend and Intercept		
	t statistics	prob	t statistics	Prob	t statistics	Prob	Time Break
FDI	-1.695	0.7345	-4.443*	0.0057	-5.266*	0.0394	2001
LPRIE	-2.072	0.5448	-5.847*	0.0001	-4.998**	0.0783	1995
LSECE	-1.63	0.7624	-5.615*	0.0002	-	-	-
LHIGE	-1.605	0.7728	-4.950*	0.0015	-5.775*	< 0.01	2000
DC	-3.164	0.1074	-5.159*	0.0008	-6.019*	< 0.01	2002
GEXP	-1.639	0.7588	-4.922*	0.0016	-	-	-
INV	-2.697	0.2433	-5.542*	0.0003	-	-	-
INF	-2.905	0.1721	-6.798*	0	-5.834*	< 0.01	2007
TRD	-2.617	0.2753	-6.495*	0	-	-	-

FDI representing financial development Index, LPRIE representing log of primary enrolment, LSECE representing log of secondary enrolment, LHIGE representing the log of higher education enrolment, DC representing domestic credit, GEXP representing Public spending expenditures, INV representing investment, INF representing inflation and TRD representing Trade. *,** indicates significant at 5% and 10%

EMPIRICAL RESULTS

The empirical effects of three levels of education on the Financial Development Index are discussed in this section. The accumulated impulse response function is being used to generate these effects.

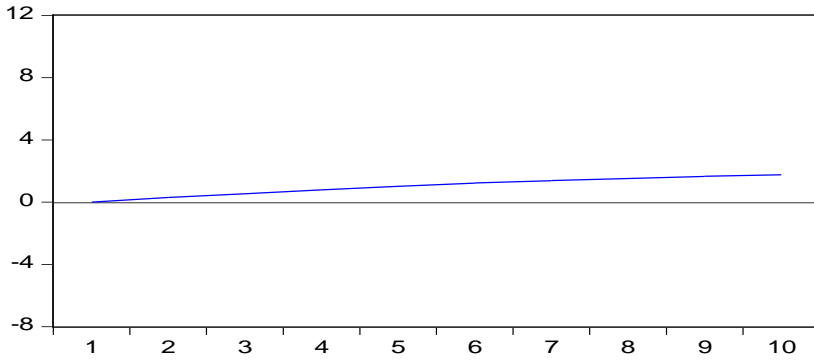
Figure 5a to 5c below shows the response of accumulated impulse response functions of the financial development index to primary education enrolment, secondary education and higher education enrolment with a time horizon of 10 years.⁶ While a positive shock in primary education has a significant and positive influence on the financial development index to a great extent. A positive shock in secondary education has a smoothly positive effect on the financial development index. A positive shock in higher education has a relatively higher positive influence on the financial development index

5a: Impact of Primary Education on Financial Development Index (FDI)

⁶ Accumulated responses of control variables are in Appendix.

Accumulated Response to Cholesky One S.D. Innovations

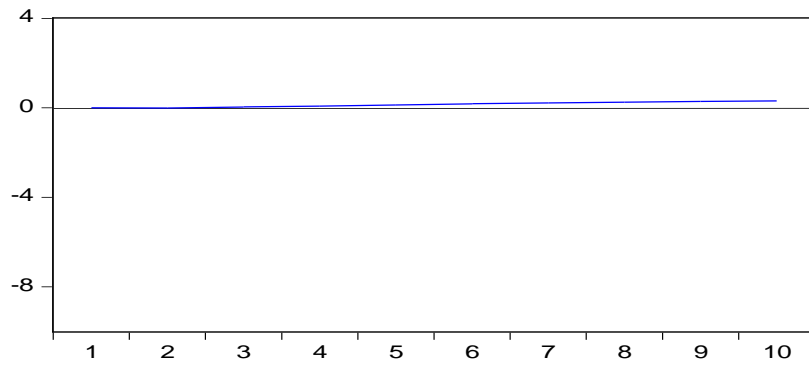
Accumulated Response of FDI to PRIMARY EDUCATION



5b: Impact of Secondary Education on Financial Development Index (FDI)

Accumulated Response to Cholesky One S.D. Innovations

Accumulated Response of FDI to SECONDARY EDUCATION



5c: Impact of Higher Education on Financial Development Index (FDI)

Accumulated Response to Cholesky One S.D. Innovations

Accumulated Response of FDI to HIGH EDUCATION

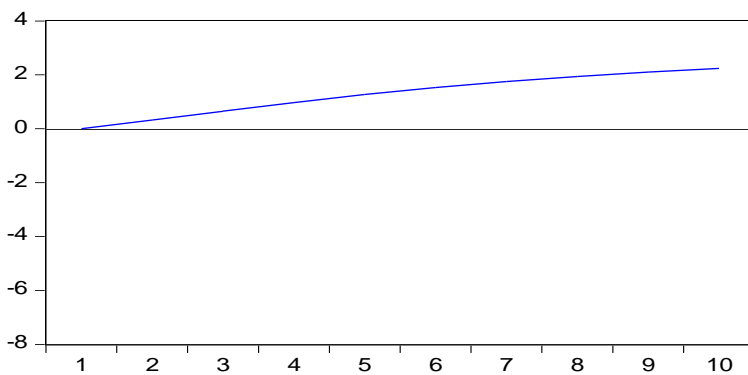


Table 6 presents the forecast error variance of the financial development index are explained by three levels of education. has a relatively larger contribution in explaining the financial development index.⁷ For instance, in the sixth year after the initial shock, about 1.31% variance of FDI is explained by primary education. Whereas secondary education has a relatively small contribution 0.02% in explaining the financial development index. However, higher education has a relatively larger contribution of about 1.77%in explaining the financial development index. Hence, shocks in financial development have increased constantly over time as 2.09% variation explained by higher education enrolments compared to variation in primary enrolment is 1.58% and secondary education enrolment is 0.03% in the tenth year.

Table 6
Variance Decomposition of FDI

Period	S.E.	FINANCIAL DEVELOPMENT INDEX	PRIMARY EDUCATION	SECONDARY EDUCATION	HIGH EDUCATION
1	2.434406	100.0000	0.000000	0.000000	0.000000
2	3.437431	86.06151	0.745776	0.000363	0.847110
3	4.062435	79.88997	0.893593	0.007030	1.151506
4	4.449233	75.10407	1.070380	0.013214	1.427235
5	4.671092	71.95288	1.209404	0.018842	1.630311
6	4.788572	70.05437	1.317965	0.023288	1.779071
7	4.845986	68.99583	1.404306	0.026545	1.889660
8	4.871995	68.44710	1.474740	0.028811	1.973747
9	4.883145	68.17894	1.533917	0.030326	2.039164
10	4.887968	68.05003	1.585618	0.031304	2.091294

Diagnostic Test

The diagnostic tests concerning the properties of the residuals reveal that the estimated BVAR model satisfies the stability condition and it is free from serial correlation and heteroscedasticity problems. As the results are reported in Table 2. The Normality assumption is also tested for all three models and the results do not support the normality assumptions but we can ignore this issue as David (2018) discussed

⁷ Forecast error variance of control variables are in Appendix

that the Bayesian variable selection often assumes normality. Figures 5-7 displays the AR root graph for three models. It suggests that that all three models are stable.

Table 2

Diagnostic Test

Models	Numbers of Lags	Autocorrelation Test P values ¹	Normality Test P values ²	Heteroskedasticity Test P values ³
Equation 1	1	-0.3407	0	-0.1774
Equation 2	1	-0.2013	0	-0.2847
Equation 3	1	-0.1417	0	-0.218

1. Based on VAR residual serial correlation LM test with null no serial correlation.
2. Multivariate Jarque-Bera residual normality test. For the null hypothesis of normality.
3. VAR Residual Heteroskedasticity Tests. For null hypothesis of no Heteroskedasticity.

Figure 5 Model 1

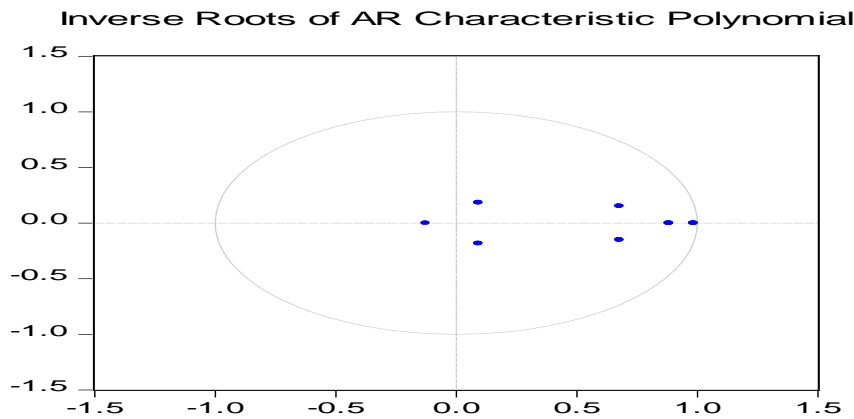


Figure 6 Model 2

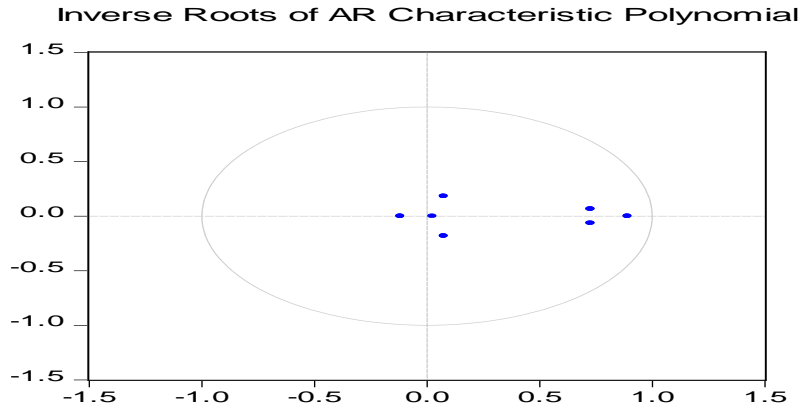
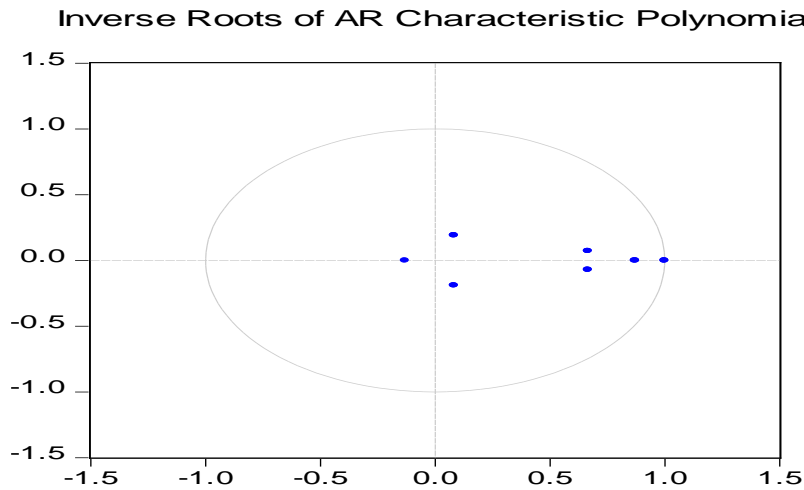


Figure 7 Model 3



CONCLUSION

Human capital is vital in improving a country's financial efficiency. A well-educated human capital helps in the reduction of knowledge gaps and the expansion of financial accessibility among individuals. To achieve this goal, this study investigates the impact of human capital on financial development in Pakistan. We assess human capital using three levels of school enrollment: primary, secondary, and higher education, with the response variable being the financial development index, and the control variables being domestic credit, government expenditures, investment, inflation, and trade. The data

period ranges from 1980 to 2019, and the Bayesian VAR method is adopted to mitigate the effects of variable overfitting.

Initially, the results show an upward trend in both proxy variables of financial development and human capital in Pakistan throughout the studied period. There is vast potential for both human capital and financial development. As a result, decision-makers must exert effort to overcome obstacles and capitalize on large growth potential. There is a need to connect the missing links among the stakeholders by utilizing the educational and training institutions for skills development. Gaps in the system need to be identified and synergies must be developed among various sectors aimed at devising mechanisms that help in developing the human capital. The findings indicate that each level of education has a positive and significant impact on the financial development index. Increasing enrollments in higher education may contribute relatively more to financial development relative to primary and secondary education in Pakistan.

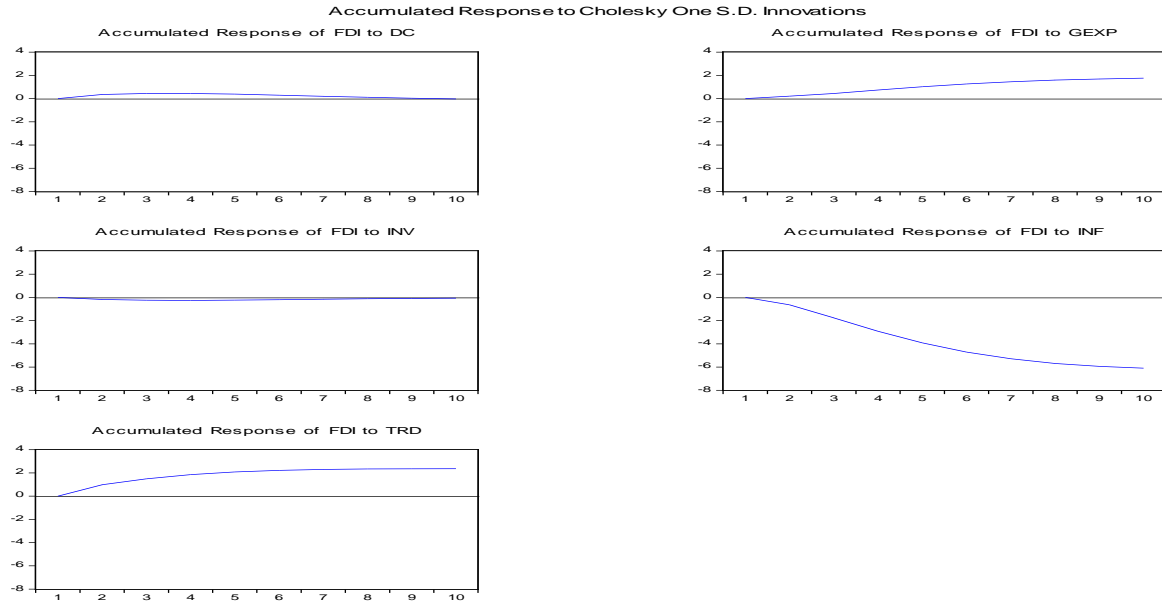
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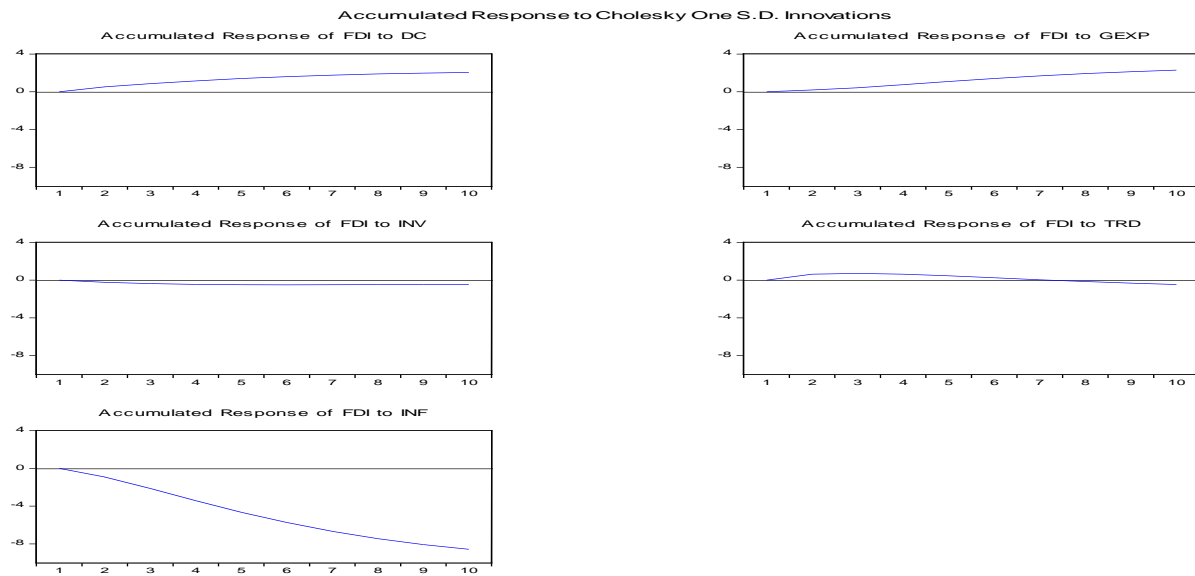
APPENDIX-Impulse Response

Figure 6a: Impact of control variables on FDI (Model 1)



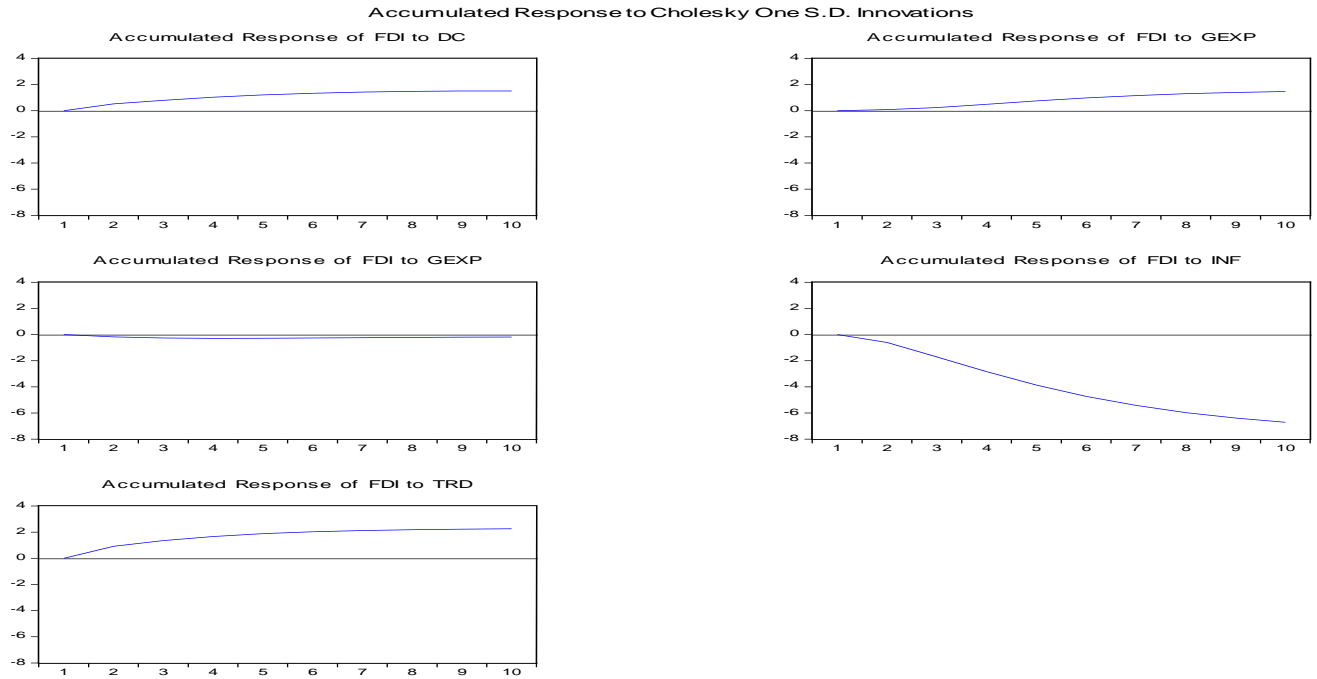
FDI representing financial development index, DC representing domestic credit, GEXP representing Public spending expenditures, INV representing investment , INF representing inflation and TRD representing Trade .

Figure 6b: Impact of control variables on FDI (Model 2)



FDI representing financial development index, DC representing domestic credit, GEXP representing Public spending expenditures, INV representing investment, INF representing inflation and TRD representing Trade .

Figure 6c: Impact of control variables on FDI (Model 3)



FDI representing Financial development index, DC representing domestic credit, GEXP representing Public spending expenditures, INV representing investment, INF representing inflation and TRD representing Trade.

Table 7

Variance Decomposition of FDI

Period	S.E.	FINANCIAL DEVELOPMENT INDEX	DOMESTIC CREDIT	GOVERNMENT EXPENDITURES	INVESTMENT	INFLATION	TRADE
1	2.434406	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	3.437431	86.06151	1.047840	0.373547	0.296823	3.440225	8.034277
3	4.062435	79.88997	0.795825	0.585297	0.235711	10.23742	7.362181
4	4.449233	75.10407	0.663475	0.927572	0.197203	15.24873	6.788563
5	4.671092	71.95288	0.617104	1.211765	0.181646	18.42661	6.400590
6	4.788572	70.05437	0.618991	1.404855	0.179203	20.24843	6.176180
7	4.845986	68.99583	0.642276	1.522327	0.181782	21.19581	6.057672
8	4.871995	68.44710	0.669902	1.588411	0.185420	21.63433	6.000099
9	4.883145	68.17894	0.692992	1.623350	0.188664	21.80824	5.973897
10	4.887968	68.05003	0.708515	1.641085	0.191217	21.86139	5.962152

Table 7b

Variance Decomposition of FDI

Pe riod	S.E.	FINANCIAL DEVELOPM ENT INDEX	DOMESTIC CREDIT	GOVERNMENT EXPENDITURES	INVESTMENT	INFLATION	TRADE
1	2.790884	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	3.989041	90.07661	1.669618	0.238073	0.337217	5.170620	2.507500
3	4.815574	85.88167	1.649335	0.399014	0.311409	10.00178	1.749761
4	5.400509	82.32375	1.619195	0.676637	0.271463	13.67918	1.416563
5	5.806021	79.64505	1.583539	0.926392	0.239084	16.27087	1.316228
6	6.079892	77.72139	1.553008	1.119003	0.218344	18.04821	1.316759
7	6.259957	76.38441	1.529400	1.258171	0.206007	19.24217	1.353294
8	6.375328	75.48036	1.512283	1.354774	0.198948	20.02862	1.396207
9	6.447475	74.88464	1.500384	1.419644	0.195032	20.53619	1.433787
10	6.491574	74.50176	1.492379	1.461930	0.192923	20.85696	1.462742

Table 7c

Variance Decomposition of FDI

Period	S.E.	FINANCIAL DEVELOPME NT INDEX	DOMESTI C CREDIT	GOVERNMENT EXPENDITURE S	INVESTME NT	INFLATION	TRADE
1	2.501535	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	3.557833	87.17587	2.128039	0.047218	0.274439	2.890468	6.636855
3	4.238886	81.96803	1.921038	0.169934	0.228470	8.825644	5.735379
4	4.684050	77.89252	1.821600	0.433674	0.191511	13.08684	5.146618
5	4.966362	75.14014	1.748996	0.658459	0.170545	15.89037	4.761173
6	5.140037	73.38147	1.695910	0.809608	0.161007	17.65014	4.522789
7	5.244164	72.29962	1.657204	0.899441	0.156862	18.71894	4.378273
8	5.305414	71.65425	1.629663	0.947400	0.154902	19.34792	4.292124
9	5.341077	71.27853	1.610722	0.969707	0.153758	19.70688	4.241235
10	5.361867	71.06297	1.598447	0.977857	0.152941	19.90534	4.211157