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NAVIGATING MACROECONOMIC PUT OVERS OF ECONOMIC GROWTH OF PAKISTAN

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ABSTRACT

This study explores the role of the macroeconomic pull of economic growth of Pakistan. This study employs the (Autoregressive Distributive Lag) ARDL model to check the association among dependent and independent variables. This study uses economic growth (GDP) as a dependent variable, and human capital, labor force, financial development, and trade as independent variables. Time series data is engaged from 1998 to 2022 from WDI. The results of the ARDL show that in the long run, all variables are positively significant except financial development, inflation, and government expenditure. In the short period, all variable impacts on economic growth are positive, and financial development is insignificant. Policymakers and government officials ought to focus on maintaining appropriate macroeconomic stance to achieve sustainable economic growth in Pakistan.

Keywords: Economic Growth, Labor Force, Human Capital, Financial Development, ARDL, Pakistan

1. INTRODUCTION

The economic growth of Pakistan has notably improved at the back of investments in human capital, surpassing previous benchmarks. Emphasizing the attainment of higher education, skill development, and training can significantly bolster overall economic well-being in the country. It has been observed that increasing the labor force participation rate is imperative for fostering rapid economic growth. A well-functioning labor supply is crucial for achieving comprehensive economic advancement. Economic fact findings indicate that solely focusing on poverty alleviation is insufficient for achieving economic development. It is rather imperative to establish robust indicators of economic development and prioritize the enhancement of human capital, which serves as a fundamental pillar for economic expansion (Ali et al., 2020). Furthermore, human capital formation and income inequality are closely intertwined, reflecting the overall well-being of a nation. The formation of human capital serves as a foundation for enhancing the skills and capabilities of the populace, thereby contributing to national development. The major role in an economy is based on their labor force their human capital and their competitiveness. The economy shows its development on the base of human capital. Another study of Aliyu et al. (2023) mentioned the quantity of the labor force, human capital expertise, skills, and education level that have contributed to the financial development or growth of the economy. Tariq et al. (2023) evaluated that human capital and economic growth have a significant role. The growth of any nation highly depends on its human capital. Intellectual capital is also part of human capital. It includes human-related factors like knowledge, skills, experience, sufficiency, business quality, employee relations, emotional intelligence, entrepreneurship, flexibility,

employee loyalty, employee satisfaction, education, and creativity and serves as a representation of investments made in people (Obeidat, 2016). The goal of each economy is to raise the per capita income either there's a socialist or capitalist economy and it comes into reality when the total output level increases. Awogbemi, (2023) found that labor, physical capital, and human capital are the main sources of productivity and economic growth. All the technological equipment are created by humans and only man can handle all productivity programs depending on the human participation and activation.

Human capital development is a way to get the huge quantity of skilled, educated, and experienced labor that is essential for the economic growth of every country. (Sankay et al., 2010). From a theoretical perspective, human capital has a great impact on economic growth.

The recent work on growth and development showed human capital (HC) increases economic growth and also international trade has a great role in improving economic growth. There was discussed many types of trade perspectives. One of them is trade improves the economic growth in a single period due to the comparative advantage. The neoclassical growth model defines technological changing occur due to these changes the trade and economic growth fluctuate. The new growth model postulates that in trade new technology was adopted and this grew the open economy fast as compared to the closed economy (Suri et al., 2011).

This study looks into the nature of effects of such macroeconomic pull overs on the economic growth of Pakistan. The organization of the study is that; Section 1 is located for introduction. Section 2 is elaborated for the literature review. Section 3 is written for methodology whereas Section 4 is bestowed for the interpretation of the results that ends up at Section 5 which is conclusion and policy recommendation.

2 Literature Review

2.1 Review of Empirical Studies

In the section, the literature review of previous studies is discussed. The review starts with the contribution of Manasseh et al. (2024) who explained that financial development has positive impacts on economic growth in emerging African countries. The study included by Sarker (2024) used money supply, capital stock, and trade as financial development in Bangladesh and showed a positive relationship with economic growth. In another research, Oncel et al. (2024) analyzed the factor of economic growth. The study included domestic to private credit sector, export, and capital accumulation as proxies of financial development and discovered a positive impact on economic growth. A study conducted by Abeka et al. (2021) on sub-Saharan Africa measured financial development, trade openness, and capital accumulation and suggested that these factors have a positive impact on economic growth. Another study by Azam et al. (2021) explained that capital accumulation promotes economic growth. In other research Awan and Bibi (2021) explained that economic growth not to have a significant impact on trade. Malefanel (2020) reported that economic growth and trade have a positive relationship meaning that trade expands when economic growth increases. Moreover, the studies reported that the BRICS, Pakistan, and India are checked for the association between financial development, economic growth, trade, and exports and concluded that all these are increasing factors of trade (Paudel & Sun, 2020; Khan & Eminullah, 2019; Rani & Kumar, 2018). Bist (2018) studied 16 African and Non-African countries macroeconomic factors that are related to economic growth and the results explained that trade openness, financial sectors, and capital stock have a positive relation with economic growth. The study conducted by Rahman et al. (2015) concluded financial sector and trade openness have an increasing impact on economic growth. They also included that the finance sector and trade have two-way impacts on economic growth increasing or decreasing. Nazir and Qayyum (2014) revealed that inflation and public debt have negative impacts on economic growth and also the labor force in Pakistan. Amber and Chichaibelu (2023) and Sheikh et al. (2022) studied the issue of low participation of the female labor force and socioeconomic factors in the context of Pakistan's economy. They suggested that increasing the population rate of single women does not increase the labor force and trade openness, literacy rate, government expenditure, life expectancy and economic growth have a positive relationship with labor force supply. Soava et al. (2020) investigated the European Union (EU) economies' economic growth and focused on the role of basic indicators including gross domestic product per capita, labor force participation rate, gross fixed capital formation, and personal remittances. Findings

suggested that all macroeconomic variables have a positive impact on these economies' economic growth. Aziz et al. (2022) explored the association between ICT, financial development, and economic growth of ten Asian economies. The results demonstrated that there was a positive impact of financial development on economic growth. Talukder (2023), and Tariq et al. (2023) checked the impact of human security, financial development, and human capital on the economic growth of the selected economy and suggested that human capital has a positive association with economic growth in Pakistan. Awogbemi (2023), and Shabaz et al. (2022) explored the interplay among human capital (HC) development, financial development, and economic growth (EG) in the top ten developed countries. They suggested that financial development, human capital, and economic growth are the alleviating factors for trade in these economies. In other studies, Aliyu et al. (2023) and Zhang et al. (2023) measured individual labor as human capital, economic growth financial development, and trade in China. Results revealed that China improved the economic growth contributed by human capital and financial development. Madugba et al. (2022) and Dankyi et al. (2022) examined the relationship between economic growth and human capital in Nigeria and selected countries respectively. Suggested that human capital's impact on economic growth was positive in Nigeria and negative impact on economic growth in selected countries. Mahmood (2013) conducted a study to check the association among economic growth and financial development in Pakistan. Results revealed that the impact of interest rates on economic growth is elevating. Solaymani and Montes (2024) studied the New Zealand economy and explained that natural resources and exchange rates hurt economic growth.

Pham et al. (2024) and Sohail and Li (2023) initiated a study to analyze the relationship of financial development, and natural resources on the economic growth of Asian economies and showed a positive association. Mustafa (2023) and Akash et al. (2023) studied the development economies relationship among economic growth, financial development, natural resources, and interest rate. The results explained that in India's financial development, foreign direct investment and trade improve economic growth. If the population's old age increased the physical capital reduced that negative impact on economic growth in the long run. Bloom et al. (2001) explained that education has a great role in economic growth because, with health and education, people are well aware of their physical and mental health and do more work and contribute to economic activities. Researchers explained that old age people have a high burden on government expenditure, especially public health expenditure. Several studies by Imran (2013), Nagarajan et al. (2016), and Barro (1991) explained that there was a direct relationship among government spending and economic growth. Gwartney (1998) suggested that government expenditure and economic growth are related in opposite directions. Sanz and Velazquez (2007) analyzed both industrialized and developed economies and the results suggested that more government spending reduces economic growth. Moreover, Gwartney et al., (1998) and Kneller et al. (1999) explored that there was not all public expenditure which enhanced the growth. Specifically, Gwartney et al. (1998) showed that much spending protects economic growth like property rights protections, law and regulation, defense, and competitive market are the duties of government. From a different perspective, Kneller et al. (1999) focused on the revenue side where more government expenditure affects the output level and many allocations affect the economic growth. Ormaechea and Morozumi (2013) used fifty-six economic data developing and developing to examine government expenditure and its impact on economic growth. Ormaechea and Morozumi (2013) suggested that in the long time period expenses in the education sector have a significant role on economic growth.

2.2 Theoretical Support of the Study

Neoclassical-based growth accounting analysis of Solow's growth model determines the ratio of factor inputs' contribution toward economic growth. The technology ratio is examined by the ratio of the labor force, capital, and the total output growth rate (Lee & Yu 2005). Endogenous growth theory in particular the endogenous technology change model postulates technological change and human capital as endogenous and core factors of economic growth. Theoretical models of economic growth have defined education's role in the production process and economic growth. Its impact is in the form of labor's effects on the production process if the management and labor force are educated. In such state, advanced technology is used in the production process and

thereby the output level improves (Hanushek & Woessmann 2012).

The 'AK' model presented by Rebelo (1991) explains that output level is dependent on the factor productivity, financial institutions, and rate of saving. Researchers further elucidated that financial instruments and innovations also improve economic growth. This notion replaces financial instruments innovations with the framework of Romer (1987), production process model of Romer (1987), and the production model of Grossman and Helpman (1991) explain that the financial intermediaries and inventions have constantly increasing impact on economic growth via physical growth in capital stock together with the technological innovation.

The U Hypothesis by Sinha, (1967), Durand, (1975) illustrated that if the economy faces the issue of a low level of income on the other side labor productivity in the private sector is very high then the technology replaces human capital. Due to the participation of latest technology, man-women labor participation is very low. This explains the plateau phase of the U-curve, where women are preoccupied with their careers and skills acquisition. Also, low fertility rates and social stigma against working women facilitate changes in FLFP at this phase. After the plateau phase, FLFP gradually increases with the level of growth and development, leading to a U-shaped curve (Goldin, 1995). Several authors found that U-shaped relations exist in labor force participation, economic growth, and financial development (Iheonu et al., 2020; Altuzarra et al., 2019; Chapman, 2015).

Grossman and Krueger (1993;1995) identified three different ways through which economic growth can affect the quality of the environment that shapes the EKC first is the scale effect, the increase in pollution when the economy grows, and the composition and technique effect. Second is the composition effect in this context refers to structural changes that occur in the economy, leading to different environmental pressures in the long term. Moreover, it is assumed that the role is played by public pressure towards more governmental regulation and the use of cleaner production techniques by firms. This is based on the assumption that; as income grows the income elasticity of environmental quality increases. Therefore, after a threshold level of income reaches, rich countries tend to be more willing and able to channel resources into environmental protection and higher environmental standards.

3 Methodology

3.1 Data Sources

This study uses economic growth as a dependent variable which is calculated as (GDP constant 2015), the labor force (labor force participation rate, total % of total population ages 15+ (Soava et al. (2020), human capital (school enrolment), financial development index, trade openness (Export + Import/GDP), inflation (Inflation, GDP deflator (annual %), gross capital formation (gross capital formation (% of GDP) and government expenditure (government expenditure on education, total (% of GDP) are used as independent variables. The data of all variables are collected from the WDI and financial development index from the OIC period from 1998 to 2022 in Pakistan.

3.2 Model Specification

The present study is based on the time series analysis and for the empirical analyses, ARDL technique is incorporated to check the association among the selected variables. Unit root tests of Augmented Dicky Fuller (ADF) and Phillips Perron (PP) are used to check the stationarity of the variables data.

ADF test equation is:

$$\Delta yt = \gamma yt - 1 + \sum_{i=1}^{p} \sigma \Delta yt - 1 + \in t \quad [1]$$

where Δy_t is the first difference of the time series, σ used as constant, and y_{t-1} shows the lag value of the series.

Second is the PP test and it's based on the following regression function:

$$\Delta Y_{t-1} + \gamma y_{t-1} + \epsilon_t \quad [2]$$

The result of the unit root indicates that some variables are stationary at the level and some are at 1st difference. That's for we use the ARDL (auto-regressive distributive lag model). ADF and PP tests are used in this study for time series data.

ARDL General Equation

$$EG_t = \beta_1 + \beta_2 HC_t + \beta_3 FD_t + \beta_4 LF_t + \beta_5 TRD_t + \beta_6 INF_t + \beta_7 GCF + \beta_8 GEXP_{tt} + \mu_t \quad [3]$$

3.3 Description of the Variables

Table 1 shows the description of variables mentioned in the Equation [3].

Table 1
Description of Variables

Variable Name	Proxies	Definition of Variables	Abbreviation	Data Sources	Expected Sign
Economic Growth	GDP (constant 2015 US) (Dynan & Sheiner, 2018)	All goods and services produced in a specific period	GDP	WDI	+
Labor Force	Labor force participation rates, total (% of total population age 15+) (Soava et al., 2020)	Total number of individuals either employed or seeking employment	LF	WDI	+
Human Capital	School enrollment, preprimary (% gross) (Earle et al., 2018)	The stock of knowledge, skills, and attributes of the individuals	HC	WDI	+
Financial Development	Financial Development Index (Hassan et al., 2023)	Process of improving the efficiency of the financial system of an economy	FD	SESRIC(OIC)	+
Trade Openness	Export+Import/GDP (Birdsell & Hamaudi, 2002)	Degree in which a country engages in international activities	TRO	WDI	+
Inflation	Inflation, GDP deflator (annual %)	General price level increase in a country	INF	WDI	-
Gross Capital Formation	Gross capital formation (% of GDP)	Measurement of fixed house expenditure and as well as institutions	GCF	WDI	+
Government Expenditure	Government expenditure on education, total (% of GDP)	Government spending on public welfare	GEXP	WDI	-

4 Interpretation of Results

This section of study goes along the interpretation of the results. The section starts with the descriptive statistics in which mean, median, maximum, minimum, and standard deviation are explained. Descriptive statistics are given in Table 2. Wider dispersions are evident in all the series. Apart from HC, TRO, and GEXP, the series are positively skewed. Except INF, series are normally distributed. Moreover, kurtosis on INF is also found to be platykurtic.

Table 2
Description Statistics

	GDP*	HC	FD	LF	TRO	INF	GCF	GEXP
Mean	260	70.166	0.261	51.036	1.12E-10	11.155	16.026	2.271
Median	257	72.127	0.2250	50.990	1.26E-10	9.036	15.810	2.286

Maximum	400	96.501	0.3700	52.730	1.48E-10	68.010	18.282	2.746
Minimum	163	35.741	0.2000	50.030	7.08E-11	0.922	14.534	1.687
Std. Dev.	721	17.218	0.0617	0.774	2.72E-11	13.534	1.106	0.304
Skewness	0.2263	-0.498	0.6675	0.740	-0.3382	3.743	0.612	-0.286
Kurtosis	1.9313	2.396	1.8714	2.801	1.4681	16.381	2.366	2.115
Jarque-Bera	1.2908	1.301	2.9285	2.136	2.6873	205.745	1.664	0.972
Probability	0.5244	0.521	0.2312	0.343	0.2608	0.000	0.435	0.614

* figure are given in Million

Table 3 explains the correlation matrix. According to the results, human capital and labor force have positive and strong correlations with economic growth. Financial development has a negative but strong correlation with economic growth and trade openness, inflation, government capital formation, and government expenditure have a negative weak correlation with economic growth.

Table 3
Correlation Matrix

	GDP	**HC**	**FD**	**LF**	**TRO**	**INF**	**GCF**	**GEXP**
GDP	1							
HC	0.713	1						
FD	-0.661	-0.652	1					
LF	0.829	0.533	-0.670	1				
TRO	-0.029	0.308	0.052	-0.230	1			
INF	-0.417	-0.073	0.175	-0.201	-0.348	1		
GCF	-0.387	-0.252	0.613	-0.649	0.293	0.008	1	
GEXP	-0.125	0.031	-0.022	-0.359	0.482	-0.342	0.492	1

The unit root test results, given in Table 4, show that human capital, financial development, and labor force all are stationary at 1st difference and rest of all variables have different status of stationarity. The stationarity of variables is similar in both methods i.e., ADF and of Phillips Perron. Economic growth, .

Table 4
Unit Root Test

	ADF		**Phillips Perron**	
	At Levels	**At 1st Difference**	**At Levels**	**At 1st Difference**
EG	1.752 (0.9994)	-3.730* (0.0105)	1.789 (0.9995)	-3.661* (0.0123)
HC	-0.654 (0.8385)	-3.610* (0.0146)	-0.837 (0.7881)	-3.582* (0.0155)
FD	-1.584 (0.4743)	-6.233* (0.0000)	-1.252 (0.6338)	-6.233* (0.0000)
LF	-0.629 (0.8468)	-5.728* (0.0001)	-0.629 (0.8468)	-5.731* (0.0001)
TRO	-3.862* (0.0433)	-4.578 (0.0015)	-3.078* (0.0419)	-4.570 (0.0016)
INF	-4.905* (0.0007)	-7.816 (0.0000)	-4.905* (0.0007)	-21.15 (0.0000)
GCF	-2.690* (0.0903)	-4.954 (0.0006)	-2.798* (0.0735)	-4.938 (0.0007)

GEXP	-2.539 (0.1225)	-3.338 (0.0212)	-2.789* (0.0784)	-3.304 (0.0311)

Subsequent to test of stationarity, the cointegration is found through bound test and the results are published in Table 5. The value of the bound test F-statistic is 5.42 which is greater than the upper bound I(1) values which justifies the significance of the variables.

Table 5
Bound Test Results

Linear ARDL Model	F-Stat		Lowers bound I(0)	Uppers bound I(1)
	5.42	10%	2.44	3.28
		5%	3.15	4.11
		2.5%	3.88	4.92
		1%	4.81	6.02

Long run coefficient estimates are given in Table 6. In the long run, all variables are taken in log form. Findings illuminate that the coefficient of human capital is 0.462 means that 1 percent increase in human capital will increase economic growth by 0.462 percent. The coefficient of financial development is -3.576 percent meaning that 1 percent increase in financial development the growth will decrease at -3.576 percent. The p value of financial development is 0.017 showing the significant impact on economic growth in the long run. The coefficient of labor force is 20.170 meaning that 1 percent increase in the labor force the economic growth will increase at 20.170 percent and the p-value is 0.025 has a significant impact on economic growth. The coefficient of trade openness is 1.024 and the t value is 18.107 meaning that 1 percent increase in trade openness the economic growth will increase at 1.024 percent. The coefficient of inflation is significant at 5 percent. value of coefficient is found to be -0.422 which shows that 1 % increase in inflation will reduce the economic growth by -0.422 percent. The coefficient of gross capital formation is 3.503 meaning that 1 percent increase in gross capital formation posts 3.503 percent increase in economic growth. And coefficient of government expenditure is -0.096 thus indicating that with a 1 % increase in government expenditure economic growth will decrease to by -0.096 percent.

Table 6
Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistics	Prob.
HC	0.462	0.129	3.566	0.005
FD	-3.576	15.238	-0.234	0.017
LF	20.170	8.366	2.410	0.025
TRO	1.024	0.056	18.107	0.000
INF	-0.422	0.198	-2.133	0.052
GCF	3.503	3.176	1.103	0.286
GEXP	-0.096	0.029	-3.219	0.005

The short run coefficients are given in Table 7. The results of all the variables are similar to those found in long run. However, the findings on FD are altered. In short run the coefficient of FD is positive and insignificant however negative impacts are traced in long run. The coefficient of ECT is also significant and correctly signed which shows sufficient convergence towards long run equilibrium position.

Table 7
Short Run Coefficients

Variable	Coefficient	Std. Error	t-Statistics	Prob.
D(HC)	1.749	0.755	2.316	0.032

D(FD)	0.037	0.026	1.430	0.169
D(LF)	0.057	0.026	2.141	0.045
D(TRO)	17.837	3.819	4.670	0.000
D(INF)	-0.017	0.004	-3.415	0.003
D(GCF)	0.096	0.059	1.619	0.125
D(GEXP)	-0.096	0.029	-3.219	0.005
ECT	0.551	0.245	2.248	0.041
Diagnostics				
R Square value		0.996	F. Value = 113.407	
Adj. R value		0.995	D.W=1.909	
J.B Test value		1.838	(0.398)	
LM Test value		0.526	(0.598)	
Hetero Test value		0.908	(0.454)	
Ramsey Test value		0.064	(0.802)	

5 Conclusion and Policy Implication

This study opted economic growth as a dependent variable against the regressors of labor force, human capital, financial development, trade openness, inflation, gross capital formation, and government expenditure. The data of all variables was collected from the WDI and financial development index from the OIC period from 1998 to 2022 for Pakistan. ARDL techniques was applied to check the association among the selected variables. Unit root tests of ADF and Phillips Perron was exercised to know the stationarity of the variable data. To check the stability and significance of the variable and normality; LM test, bound test, Ramsey RESET test, Heteroscedasticity test, and Jarque Berra test were run on the data. The results of ARDL showed that in the long run all variables withheld a positive impact except financial development, inflation, and government expenditure. In the short run, the outcomes were similar to long run except financial development. Policymakers are suggested to focus on improvement of financial development, control of inflation, and to stop the misuse of government expenditure. Policymakers and government officials ought to focus on maintaining appropriate macroeconomic stance to achieve sustainable economic growth in Pakistan.

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