

The Domestic Debt and Financial Development Nexus: A Case Study of Pakistan

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Abstract

This study aims to check the impact of domestic debt on financial development by using three dimensions of financial development: depth, stability, and efficiency. The proxy variable for measuring the depth dimension of the financial development is Liquid liabilities to GDP in percentage. For the stability dimension of the financial development, the proxy variable is bank capital relative to total assets (%). Bank deposits to GDP (%) are a proxy variable for measuring other dimensions of financial development. Time series data of Pakistan is analyzed from 1972 to 2022 using the ARDL Model. Some variables are stationary at the level and first difference through ADF. CUSUM, LM, Jarque Bera, and Ramsey RESET show that the model is error-free. Domestic debt positively and significantly impacts financial development's depth and stability dimension. However, it harms the efficiency dimension of financial development and supports the lazy bank hypothesis. It means that the crowding-out effect is present in Pakistan's financial markets. Conclusively, domestic debt positively impacts the efficiency dimension of financial development and supports the safe asset hypothesis in the case of Pakistan. Currently, the government is borrowing 56% of its GDP domestically. Therefore, it is creating a positive impact on the financial development as a whole, and the financial sector is risk-averse and holds only government securities. The bulk of the finance can be generated through external means, particularly from external debt when the domestic debt market is not fully developed.

Keywords: Domestic Debt, Financial Development, ARDL Model, Financial Markets and institutions

The government needs to finance its public expenditures, which can be sourced from revenue through taxes, and the gap between revenue and public spending could be filled through public borrowings. The bulk of the finance can be generated through external means, particularly from external debt, when the domestic debt market is not fully developed (Matiti, 2013). Pakistan Economic Survey (2021-2022) defined it as "A country borrows from the financial institutions operating in its territory or its public is known as domestic debt." In the debt composition, 56% of Pakistan's debt is in the form of domestic debt, and further classes of domestic debt are permanent debt, floating debt, and unfunded debt. Many countries focus on their domestic market to meet their public expenditures and reduce external debt by substituting it with domestic debt. Countries are paying more attention to securing aid inflows while building up their domestic market loans (Panizza, 2007). According to Levine et al. (2000), domestic debt implications could significantly influence the financial system, particularly the crowding effect. In the crowding effect, the government secures loans more easily from the domestic market than private firms due to paying high interest. That is why private firms remain crowded out from financing and demotivate financial intermediaries to lend out to private firms. Furthermore, DMO (2014) narrates that the problem associated with domestic borrowing is the crowding out effect, which negatively impacts the private sector and financial development.

Financial sector development aims to minimize the costs associated with a financial transaction in the financial system. This includes minimizing the costs associated with acquiring information, enforcing contracts, and making a financial transaction due to any financial contract, intermediaries, and markets. According to Global Development Finance, financial development has four measurements and dimensions. First, Financial services are made accessible to every

individual and enterprise, and becoming a participant in the financial system is called financial access. The second is that the breadth of a nation's financial sector with its GDP is gauged by its financial depth. Third, financial efficiency is the intermediation of financial resources and facilitating financial transactions. Finally, the failure of the financial system to function efficiently and effectively, particularly in the allocation of financial resources, is called financial stability, according to the World Bank.

The private credit to GDP ratio is the most accurate gauge of financial development. Furthermore, according to Hauner (2008), governmental debt is the most significant influence on financial development. The percentage of government loans to total banking system credit—a positive indicator of financial development—concerns domestic debt. In the bank's view, risk-free investment is investing in government bonds and is more profitable than lending out to private firms due to risk premiums, which could be riskier for banks to lend out. Financial liberation can compensate for the risk premium provided by a ceiling interest rate. Most banks prefer lending to the government and its subsidiaries, hampering the development of financial institutions and markets. The dominant view in the banking sector is investing in safe assets, and these thresholds are set at the level of banks and countries. Given the lazy banks, exceeding the threshold level of debt could be harmful, and no bank crosses the set-out threshold.

An economy runs smoothly when its financial markets and institutions are operating well. If not, the country's economy would be severely disrupted by financial institutions and markets malfunctioning. The primary purpose of the financial markets is to add high-value assets to help countries with lower incomes manage financial resources efficiently and effectively. In a complex setting, the financial system significantly changes the economy. Additionally, the government consistently depends on domestic banks and financial markets to close the budget deficit gap, which raises credit demand, according to Mok and Ismail (2015) and Dreger and Reimers (2016). It might result in higher interest rates for private companies borrowing money from the financial markets. As a result, the funding options for individual investment are diminished. According to Bahal et al. (2018), the government raises taxes in order to pay for debt servicing and repayment. Because of the increased cost of investment and crowding out, which compromises financial stability, the variables above have a detrimental impact on financial development.

The impact of government borrowing on financial development in Pakistan was examined by Ali et al. (2016) utilizing just the depth dimension of financial development as defined by the proxy variable, domestic credit to the private sector (% of GDP). In the case of Malaysia, Yeea and Ismail (2020) further divided the public debt into domestic and external debt by utilizing the financial system's depth, efficiency, and access characteristics. Using panel data, Abbas et al. (2022) studied the relationship between public debt, state institutions' caliber, and the financial development nexus. Benayed and Gabsi (2020) investigated how public debt affected the financial development of Sub-Saharan African nations. This study uses three dimensions of financial development: depth, stability, and other dimensions. The proxy variable for measuring the depth dimension of the financial development is Liquid liabilities to GDP in percentage. For the stability dimension of the financial development, the proxy variable is bank capital relative to total assets (%). Bank deposits to GDP (%) are a proxy variable for measuring other dimensions of financial development. This study aims to check the impact of the domestic debt on the depth aspect, the stability component, and the efficiency facets of Pakistan's financial development.

Firstly, this study contributes by incorporating the dimensions of depth, stability, and other dimensions developed by Global finance development. The impact of domestic debt on the dimensions of financial development (access, stability, depth, and others). Whether it increases access, stability, depth, or other aspects of financial development, it helps to understand the framework of domestic debt in the development of the financial sector relating to the issue of domestic bonds in the local financial markets by improving it. What could be the government debt policies to develop the financial market mechanism, operating locally instead of relying on the international financial markets to fill its financing gap? The issue of the local government debt instrument can develop and increase the efficiency of the country's domestic financial markets. Are both of these reciprocal or interdependent of the one and the other?

The **research objectives** are formulated as

1. To check the impact of domestic debt on the depth of Pakistan's financial development.
2. To ascertain the impact of domestic debt on the stability component of Pakistan's financial development.
3. To find out the impact of the domestic debt on the other facets of Pakistan's financial development.

Research questions

1. Does Pakistan's domestic debt have any bearing on the depth of its financial development?
2. Does Pakistan's domestic debt affect the financial development's stability component?
3. Does Pakistan's domestic debt have any bearing on the country's other financial development?

Hypothesis

1. Domestic debt significantly impacts the depth dimension of Pakistan's financial development.
2. The impact of the domestic debt is statistically significant on the stability dimension of Pakistan's financial development.
3. The impact of the domestic debt is significant on the other dimension of Pakistan's financial development.

The rest of the paper is structured as follows: theoretical and empirical studies on domestic debt and financial development, the econometric estimation methodology, and the last section discussing results and policy implications.

Literature Review

Theories of public debt and financial development

The following are theories relating to public debt

Neoclassical Model/Crowding Out Hypothesis

This hypothesis, presented by Neoclassical, narrates that if a Government wants to finance its project by imposing a tax or borrowing from the debt market. If it imposes a further tax, it will cost consumption minimization and reduce aggregate demand if it borrows from the debt market to finance its projects. It creates competition between the government and individuals for funds. The government takes funds and leaves the least financial resources for the private sector. This is known as the crowding out hypothesis under the neo-classical hypothesis.

Ricardian Equivalence Model

David Ricardo developed this model in the 19th century, but Professor Robert Barro revised it; that is why it is known as the Barro-Ricardo equivalence model. This model suggests that the government finances itself by imposing more taxes or using debt financing to stimulate the economy. The aggregate demand remains unchanged, although government spending has increased. Both variables affect the country's aggregate demand similarly because people save their excess money to pay the expected increase in future tax, which is used to offset the debt.

Dual Gap Analysis

In this theory, domestic savings provide funds to an investor, which the investor uses for investment purposes. This causes an increase in capital accumulation, paving the way for development. Domestic savings are insufficient to sustain development, so external funds must be invested. These funds and savings are equivalent, known as dual gap analysis.

Empirical Studies

The empirical studies are categorized into three parts. The first category deals with the positive role of public debt on financial sector development. Second, a threshold level of public debt determines the positive or negative impact on financial sector development, and finally, the negative impact of public debt on financial sector development. Many studies show a positive impact of public debt on financial development. Arguably, the key feature of government bonds (public debt) is that they provide high liquidity and security and guarantee debt. The accumulation of bank loans from savings to the government could provide better opportunities concerning the security of the assets, and the government pays more profit with a guarantee. The financial sector strengthens due to a steady flow of profits from government securities (Kumhof & Tanner, 2005). Furthermore, Hauner (2009) and Dungey et al. (2019) state that the predictable debt management in banks' consideration is lending to the government. Thus, purchasing only government securities can safeguard the bank's assets. Moreover, Hauner (2009) states that in developing countries derivative markets, liquid collateral plays an important role and is essential for settlement systems and payments. Banks consider investment in government securities to be secure and lead to further improvement in the financial development of developing countries. The banks hold government bonds to them for safe and secure investment to offset the risk associated with private sector credit, which further improves the financial sector development of developing countries where the legal and institutional structure is weak. According to Hauner (2009) and Montes (2013),

public debt positively impacts financial institutions' profit. Likely, Reinhart and Sack (2000) and Hauner (2009), in these countries, government bonds have a good benchmark of the yield curve to facilitate corporate bonds and equities for the yield curve and facilitate financial development. Additionally, Kumhof and Tanner (2005) state that more savings can be mobilized through public debt because depositors invest in government securities that are safe and secure for risk-averse investors to avoid investing in risky markets. In addition, the pricing of the credit and equities risk is more complicated for the financial markets of developing countries due to the lack of a yield curve benchmark. The derivative markets are too underdeveloped and face difficulty diversifying the risk. Additionally, it helps the banks overcome institutional and legal weaknesses by explicitly showing the public debt as collateral in repurchase agreements. It allows banks to offset the risk of lending to the private sector.

Few researchers developed a criterion that if public debt increases by 35% of banking deposits, it hurts economic growth and financial sector efficiency. Abbas and Christense's (2007) research covered 93 developing countries by applying the Granger causality regression model. They found the domestic debt market's positive role in economic growth and development. If the public debt level increases by 35% of the banking deposit, then the public debt hurts the country's economic growth. In addition, Onyeiwu (2012) conducted research to evaluate the impact of domestic on the economic growth of Nigeria. He found the negative impact of public debt on Nigerian economic growth due to crowding out. If the domestic debt is more than 35% of total banking deposits, it causes crowding out. On the other hand, Ilgun (2016) finds a tradeoff between crowding out effects on private investment and the efficiency of the banking sector. In addition, Lau et al. (2019) state that governments and firms compete imperfectly to secure funds from financial markets and asymmetric information between government and banks, which may have an asymmetric effect on public debt. The government is so powerful in securing funds from banks on terms and conditions that it has no advantage in depositing and providing credit to private firms. Banks receive guaranteed and reliable profits from the government on borrowed amounts that could reduce the bank's efficiency and are dissatisfied with developing a banking market. Likely, Demetriades and Luintel (1997) explain that the pricing of loanable funds and bank loanable funds should be interfered with by government intervention by depressing real interest rates, causing savings deficiency, which could negatively impact the availability of credit and productivity of investment, thus, harm the depth dimension of the financial development (Hauner, 2009). Additionally, Fry (1995) states that lowering bank efficiency results in a deadweight loss that can harm financial development. Resultantly, the progress of the banking system may slow down due to the holding of too much public debt. The bank holds too much public debt in the form of their investment, and the development of the banking sector slows down gradually.

However, several studies show the harmful impact of public debt on financial development. Likely, in the case of default, the Government's payment of the debt and its servicing then leads to a credit crunch and bank crises (Borensztein & Panizza, 2008). Furthermore, Mok and Ismail (2015) state that a large volume of public debt negatively impacts the banks' efficiency, and private investment is crowded out due to domestic debt—inconclusive findings relating to public debt and financial development. According to Lau et al. (2019), the existence of information asymmetry affects the public debt in Malaysia. In the case of government deficit financing, banks may know more about private borrowers than government borrowing. Acquiring more government information is expensive and difficult for financial institutions. The perception behind holding public debt is to offset the credit risk associated with private-sector credit. If a country's institutions are imperfect, then no one can enforce the rules of the laws relating to financial markets and institutions. Moreover, Kumhof and Tanner (2005) link financial institutions' holding of public debt with the quality of institutions and law and found a robust negative association between them. According to Jorda et al. (2014), the banking sector's vulnerability increases when holding these debts as significant assets on their balance sheet side when they are under attack in the financial market. In addition, Demetriades and Luintel (1997) state that the essential function of financial institutions is that financial intermediation means channeling funds from savings to investment. However, it is considered to have zero cost in a perfectly competitive market. Furthermore,

Is미han and Ozkan (2012) state about the crowding out effect; if the government enters the market, then perfect competition conditions will be violated because the government has a massive demand for loanable funds by offering a high interest rate compared to firms. Thus, it reduces private sector investment. Moreover, Hauner (2009) states that the financial markets of developing countries are developing because they are the only lender to the government of those particular developing countries, which leads to a decrease in the development of the financial market. Secondly, it causes information asymmetry as the government borrows from financial markets. Similarly, the government regulates the borrowing to the private sector to prevent itself from asymmetric information.

Institutional governance is incorporated to study the nexus of public debt and financial sector development. Abbas et al. (2022) studied public debt and the development nexus of the financial sector with a moderating role of institutional quality. They found that public debt has a negative impact on financial sector development, but it turns positive when state institutions have high quality. Thus, institutional quality is a threshold for the public debt and financial sector development nexus. Chung-Yee et al. (2020) found the asymmetric effect of public debt on financial sector development for the Malaysian economy due to the crowding out effect, lower risk premium involving lending, and higher interest payments than the private sector.

Summary of Empirical Findings

After reviewing the literature, the findings of the various studies are given below.

Table 1.

Summary of Empirical Findings

Study	Public Debt	Domestic debt
Kumhof and Tanner (2005)	Negative	
Abbas and Christense (2007)	Negative	Negative impact of the domestic debt exceeds 35% of the banking deposit
Naqvi (2002)	Positive	
Krugman (1998)	Negative	
Demetriades and Rousseau (2010)	Negative	
Hussain et al. (2009)	Negative	
Shahe and Subika (2008)	Negative	
Ardagna et al. (2007)	Negative	
Onyeiwu (2012)		Negative
Narayan (2004)	There was a negative impact during the first period and a positive impact in the second period.	

Based on the existing literature findings, we conclude that public debt impacts financial development negatively but positively in some instances. In most cases, depth dimension is used in their studies and public debt. We use three dimensions of financial development: efficiency, stability, and depth, and face data constraints for the access dimension of financial development. Specifically, according to the lazy bank's hypothesis, domestic debt impacts financial development due to the crowding-out effect.

Research Methodology

Conceptual framework

Two hypotheses regarding the nexus of public debt and financial development were drawn from the existing literature. The first hypothesis is the safe asset view, which narrates that public debt positively impacts financial development. The second hypothesis is the lazy bank's concept in which public debt negatively impacts financial development. Our study is based on this hypothesis because Pakistan's government continuously borrows from its domestic financial market and offers the highest interest rate, negatively impacting private sector firms. Therefore, these firms remained crowded out because they did not compete with the government on interest

rates and guaranteed debt. The lazy banks hypothesis is used in various studies in the existing literature, e.g., by Ismihan and Ozkan (2012).

Theoretical framework

To explore the relationship between public debt and the financial development nexus, we use the same regression model used by (Gabsi, 2020, and Chung-Yee et al., 2020).

$$FD_{it} = \beta_0 + \beta_1 FD_{it-1} + \beta_2 DEBT_{it} + \gamma X_{it} + \rho_{it} + e_{it} \dots\dots\dots 1(a)$$

FD denotes financial development, i and t represent the number of countries and periods, and the parameters to be estimated are β and γ . Debt shows X denotes public debt and control variables.

Empirical framework

The equations are given below as per the research objectives for estimation;

Depth dimensions of financial development

$$DFD_{it} = \beta_1 DD_{it} + \beta_2 IFN_{it} + \beta_3 KF_{it} + \beta_4 GE_{it} + \beta_5 OPP_{it} + e_{it} \dots\dots\dots 1$$

Stability dimensions of financial development

$$SFD_{it} = \beta_1 DD_{it} + \beta_2 IFN_{it} + \beta_3 KF_{it} + \beta_4 GE_{it} + \beta_5 OPP_{it} + e_{it} \dots\dots\dots 2$$

Other dimensions of financial development

$$OFD_{it} = \beta_1 DD_{it} + \beta_2 IFN_{it} + \beta_3 KF_{it} + \beta_4 GE_{it} + \beta_5 OPP_{it} + e_{it} \dots\dots\dots 3$$

The details of the abbreviations used in equations are given below

- DFD_{it} =Depth dimensions of financial development
- SFD_{it} =Stability dimensions of financial development
- OFD_{it} =Efficiency dimensions of financial development.
- IFN_{it} =Inflation
- GE_{it} =Government expenditure to GDP ratio
- KF_{it} =Gross capital formation to GDP ratio
- DD_{it} = Domestic Debt to GDP ratio
- OPP_{it} = openness to trade

The proxy variable for measuring the depth of financial development is private credit by deposit money banks in the percentage of GDP. Likely, Bank capital to total assets in percentage is used as a proxy variable for measuring the depth of financial development. The proxy variable for measuring other (efficiency) of financial development is Bank concentration in terms of percentage. The proxy variable of inflation is the GDP Deflator. Government expenditure to GDP ratio, Gross capital formation to GDP ratio, Domestic Debt to GDP ratio, and openness to trade are used in this study.

Justification for using variables

The justification for using variables in this study is mentioned below.

Independent variable

Domestic debt is the independent variable issued in the local financial market or financial institutions. This study uses domestic debt in terms of GDP, following Altayliligil and Akkay (2013), to study domestic debt and the relationship between financial development and the Turkish economy.

Dependent variables

The dependent variables in this study are the dimensions (stability, depth, and others) of financial development. Global Financial Development (GFD) divides financial development into four categories: access, stability, depth, and other dimensions. The dimension for stability is Bank capital to total assets in percentage in the global development finance. The dimension for depth is private credit by deposit money banks in the percentage of GDP, which is used as a proxy variable in global development finance. The efficiency dimension used is Bank concentration in terms of percentage in the global development finance.

Controlling variables

Inflation, gross capital formation government expenditure, and openness to trade are used as control variables in this study, and a description is given below;

Inflation

The proxy variable for inflation is the consumer price index (Ramzan & Ahmed, 2011). It is essential to study debt relations because inflation may cause an increase in interest rates, and ultimately, the debt servicing cost may be increased for both the public and private sectors.

Gross capital formation

Hauner (2009) used gross fixed capital formation (GFC) as a controlling variable, as it is seen as a measure of investment because most borrowing is primarily invested.

Government Expenditure to GDP ratio

Hauner (2009) uses the total government expenditure to GDP ratio as a controlling variable. The fundamental motivation behind this variable is the budget deficit that can be filled by issuing bonds.

Openness to trade

Openness to trade, financial liberation, better institutional quality, and civil and political freedom lead to more financial development (Huang, 2005).

Data and its source

The secondary data is collected from the Global Financial Development (GFD), World Bank Indicators (WDI), and State Bank of Pakistan (SBP) from 1972 to 2022 by using the ARDL Model. The data of the dimensions of the financial development, like private credit by depositing money from banks in the percentage of GDP, bank capital to total assets in percentage, and bank concentration in terms of percentage. The source of the data collection of the Consumer Price Index and openness to trade is World Bank Indicators (WDI). The data on domestic debt, gross capital formation, and total government expenditure to GDP is taken from the State Bank of Pakistan (SBP).

Table 2.

Summary of the Data Sources and Variables

Variables	Symbol	Description	Source
Domestic Debt	DDt	Domestic debt as a percentage of GDP	State Bank of Pakistan
Depth Dimensions of Financial Development	$,DFD_{it}$	private credit by deposit money banks in the percentage of GDP	Global Development Finance
Stability Dimensions of Financial Development	SFD_{it}	Bank capital to total assets in percentage	Global Development Finance
Other Dimensions of Financial Development	OFD_{it}	Bank concentration in terms of percentage	Global Development Finance
Government Expenditure	GEt	The size of the government	State Bank of Pakistan
Gross Capital Formation	KFt	KD as a percentage of GDP. Proxy variable for capital	State Bank of Pakistan
Openness to trade	OPPt	(Export +Import)/ GDP	World Bank indicators
Inflation	INFt	GDP Deflator is used as a proxy variable of inflation	World Bank indicators

Data Analysis and Results

Correlation analysis

The correlation among variables is as follows

Table 3.

Correlation Analysis

Variables	DDY	GCFY	BC	BCT	CPI	OPN	CY	PC
DDY	1							

GCFY	-0.094	1						
BC	0.505	0.54	1					
BCT	-0.455	-0.081	-0.605	1				
CPI	0.297	-0.616	0.369	-0.535	1			
OPN	-0.33	0.611	0.369	0.0535	-0.0069	1		
CY	-0.27	0.455	0.76	-0.539	0.0468	-0.398	1	
PC	0.74	-0.109	-0.613	-0.804	-0.105	-0.016	-0.397	1

Domestic debt and Banking capital to total asset ratio are negatively correlated, with a correlation coefficient -0.45. On the other hand, Banking concentration and domestic debt are positively correlated and have a coefficient of 0.505. Private credit by deposit money banks and domestic debt are positively correlated and have a coefficient of 0.74. The correlation between domestic debt and other growth variables is as follows: Domestic debt and gross capital formation are negatively correlated but weakly, with a correlation coefficient of -0.094. The correlation statistic 0.297 between domestic debt and inflation is weakly positive. The correlation statistics is -0.33 between domestic debt and openness to trade, which is weakly positive. The correlation statistics are -0.27 between domestic debt and government expenditure, which is weakly negative.

Econometric Methodology for Data Estimation

The unit root test is employed on the time series data, and then we can conclude our estimation technique econometrically.

Unit root test

The unit root test checks the stationary and non-stationary variables for which the Augment Dickey-Fuller Test is employed.

Table 4.

Unit Root Results

Variables	Stationary at level	Stationary at first difference
BC	-----	-6.34***
BCT	-5.04***	-----
PC	-3.18*	-----
CP	-3.734**	-----
EXPY	-----	4.02**
M2	-3.69**	-----
OPN	-----	-6.06***
CGFY	-4.32*	-----
DD	-----	-5.44*

* ** *** denotes statistical significance at level of 10%, 5% and 1%

Table 4 shows the result of the variables' stationary, and the statistics show the significance level of the variables. The following variables are stationary at the level: Banking Capital to Total Asset to GDP ratio (BCT), Private Credit to banking deposit in terms of GDP (PC), Consumer Price Index (CP), and Board Money Supply (M2). On the other hand, the variables stationary at first difference are Banking Concentration (BC), Government expenditure to GDP Ratio (EXPY), and Openness to trade (OPN). No variable becomes stationary at the second difference. So, the Autoregressive Distributed lags (ARDL) model is used to estimate the data.

Autoregressive Distributed Lags (ARDL) Model

The estimation technique for estimation of the model is the ARDL model because when some variables are stationary at the level, and some are stationary at the first difference, no variable is stationary at the second difference. So, the Autoregressive Distributed lags (ARDL) model is used to estimate the data. The steps of the ARDL model are given based on the equations.

Depth dimension of financial dimension development

The steps followed in the ARDL Model are listed below to estimate the data;

Lag selection criteria

According to Pesran (2001), if the number of observations is the least and not the maximum, then a maximum of 2 lags can be used to conduct the study because our data is from 1972 to 2022 and can be 50 years of observations of Pakistan.

F Bound Test for Co-integration

The bound test indicates that the variables are cointegrated in the long Run. As Table 5 indicates, F statistics are greater than the lower and upper critical values, and the variables are cointegrated in the long run. Suppose the F statistics are greater than the lower critical value but less than the upper critical value. In that case, it leads to an inconclusive decision, so ECT (Error Correction Term) tells the cointegration. If F statistics are lesser than the lower and upper critical values, then no co-integration exists.

Table 5.

Bound F test results

F statistic	K	Lag length	Significance level	Bound critical value		Decision
				I (0)	I (1)	
13.66	6	2	1%	2.62	3.77	Cointegrated
			5%	2.11	3.15	Cointegrated
			10%	1.82	2.85	Cointegrated

Long run and short run results of ARDL Model

The results of the ARDL Model are shown in Table 6.

Table 6.

ARDL Models Results

ARDL Long Run Results		ARDL Short Run Results	
Variables	Coefficient	Variables	Coefficient
Constant	-4.40 (4.61)	Constant	-4.7 (5.428)
DD	0.256*** (0.038)	DDD	0.037 (0.195)
CY(-1)	0.215** (0.061)	DCY(-1)	0.442*** (0.061)
CP	-0.05** (0.008)	DCP	0.105* (0.001)
CGFY	0.225 (0.11)	DCGFY	0.384 (0.460)
M2	-0.57*** (0.098)	DM2	-0.157* (0.076)
OPN (-1)	-0.22** (0.011)	DOPN (-1)	-0.186*** (0.062)
		ECT (-1)	-0.797*
F-Statistic	45.13***	F-Statistic	50.45***
R Square	0.921	R Square	0.758
Adjusted R Square	0.906	Adjusted R Square	0.739

*** indicates significance level at 10%, 5% and 1%

The bracket values show Standard error

If there is an increase in 1% of domestic debt. In that case, the private credit to bank deposit ratio is enhanced by 0.256% by keeping the rest of the variables constant and statistically

significant at 1%. Similarly, when government expenditures increase by 1%, then the private credit-to-bank deposit ratio increases by 0.215%; all other variables remain the same and statistically significant at 5%. The reason behind it is deficit financing, and the government goes to financial institutions and markets to fulfill that budget deficit. Likely, inflation increases by 1%, and then the private credit-to-bank deposit ratio decreases by 0.256%, keeping the remaining variables constant and statistically significant at 5%. Inflation creates ambiguity in savings and investment. Therefore, financial development disturbs it (Ramzan & Ahmed, 2011). In addition, gross capital formation has an insignificant impact on the dimension of financial depth. Likewise, if the money supply increases by %, then the private credit to bank deposit ratio is reduced by 0.57%, assuming the other variables are constant and statistically significant at the level of 1%, and the finding is supported by Yee, Ismail, and Lian (2020). Moreover, openness to trade increased by 1%, and then the private credit-to-bank deposit ratio was reduced by 0.22% by keeping the rest of the variables constant and statistically significant at 1%. This finding aligns with Do and Levchenko (2004), who stated that financial sector development is an endogenous variable linked with import and export. In the case of Pakistan, it is facing current account crises that hinder its financial development.

The significant and negative error term shows convergence speed in the long run after a disturbance or shock. The speed of the adjustment towards long-term equilibrium after a shock is 80%. It means that the variables have long-term co-integration after a shock. The f-test reveals the overall significance of the model. The F statistics value is 45.13 and 50.45 for the long run, and the short run furthered statistical significance at 1%. So, the overall model is significant jointly. R square tells how much variation is in the dependent variable due to independent variables. Long and short-run explanatory variables explain the 92% and 75% variation in private credit to total banking deposit ratios. Adjusted R square tells the explanatory power of the number of predictors in the regression model. By adding new terms or variables, the value of the Adjusted R square decreases as compared to expected changes and vice versa. R square and adjusted R square reveal that the model's goodness of fit is satisfactory.

Stability dimension of financial development

The steps followed in the ARDL Model are listed below to estimate the data.

Lag selection criteria

According to Pesran (2001), if the number of observations is the least and not the maximum, then a maximum of 2 lags can be used to conduct the study because our data is from 1972 to 2022 and can be 50 years of observations of Pakistan.

F Bound Test for Co-integration

Table 7 indicates that F statistics is greater than the lower and upper critical values, which means the variables are cointegrated in the long Run.

Table 7.

Bound F test results

F statistic	K	Lag length	Significance level	Bound critical value		Decision
				I (0)	I (1)	
4.32	4	2	1%	2.62	3.77	Cointegrated
			5%	2.11	3.15	Cointegrated
			10%	1.82	2.85	Cointegrated

Long run and short run results of ARDL Models

The results of the ARDL Model are shown in Table 8.

Table 8.

ARDL Models Results

ARDL Long Run Results		ARDL Short Run Results	
Variables	Coefficient	Variables	Coefficient
Constant	21.40*** (7.37)	Constant	-4.7 (5.428)
DD	0.135**	DDD	0.07**

	(0.057)		(0.03)
CY(-1)	-0.442*** (0.061)	DCY(-1)	-0.24*** (0.061)
CP	0.105* (0.001)	DCP	0.05* (0.01)
CGFY	0.384 (0.460)	DCGFY	0.57 (0.38)
OPN (-1)	0.37*** (0.202)	DOPN (-1)	0.218** (0.106)
		ECT (-1)	-0.36*
F-Statistic	12.59***	F-Statistic	10.45***
R Square	0.75	R Square	0.78
Adjusted R Square	0.69	Adjusted R Square	0.72

* ** *** indicates significance level at 10%, 5% and 1%

The bracket values show Standard error

Suppose there is an increase in 1% of domestic debt. In that case, the bank capital to total asset ratio is enhanced by 0.135% by keeping the remaining variables constant and statistically significant at 1%. The finding is in line with Benayed and Gabsi (2020). If the government's domestic borrowing exceeds a certain threshold level, it negatively impacts it. Similarly, when government expenditures increase by 1%, the bank capital to total asset ratio increases by 0.442%, and all other variables remain the same and statistically significant at 1%. The reason behind it is deficit financing, and the government goes to financial institutions and markets to fulfill that budget deficit. Likely, inflation increases by 1%, and then the bank capital to total asset ratio increases by 0.105%, keeping the remaining variables constant and statistically significant at 5%. In addition, gross capital formation has an insignificant impact on the dimension of financial stability. Moreover, openness to trade increased by 1%, and then the bank capital to total asset ratio increased by 0.37%, keeping the rest of the variables constant and statistically significant at 1%. This finding is in line with Bibi (2017), who states that the current account deficit may be reduced, which impacts the efficiency of the financial sector significantly positively.

The speed of the adjustment towards long-term equilibrium after a shock is 80%. It means that the variables have long-term co-integration after a shock. The F statistics value is 12.59 and 10.45 for the long run, and the short run is statistically significant at 1%. So, the overall model is significant jointly. Long and short-run explanatory variables explain the 75% and 78% variation in private credit to total banking deposit ratios.

Efficiency dimension of the financial development

The steps followed in the ARDL Model are listed below to estimate the data.

Lag selection criteria

According to Pesran (2001), if the number of observations is the least and not the maximum, then a maximum of 2 lags can be used to conduct the study because our data is from 1972 to 2022 and can be 50 years of observations of Pakistan.

F Bound Test for Co-integration

Table 9 indicates that F statistics is greater than the lower and upper critical values, which means the variables are cointegrated in the Long Run.

Table 9.

Bound F test results

F statistic	K	Lag length	Significance level	Bound critical value		Decision
				I (0)	I (1)	
8.56	5	2	1%	2.62	3.77	Cointegrated
			5%	2.11	3.15	Cointegrated
			10%	1.82	2.85	Cointegrated

Long run and short run results of ARDL Models

The results of the ARDL Model are shown in Table 10.

Table 10.

ARDL Models Results

ARDL Long Run Results		ARDL Short Run Results	
Variables	Coefficient	Variables	Coefficient
Constant	-4.40 (4.61)	Constant	-3.29 (11.5)
DD	-0.17* (0.100)	DDD	-0.484 (0.195)
CY	0.404* (0.211)	DCY(-1)	1.11*** (0.027)
CP	-0.105* (0.001)	DCP	0.105* (0.001)
CGFY	1.703* (0.90)	DCGFY	5.78* (0.460)
OPN (-1)	-0.28 (0.3)	DOPN (-1)	-0.77 (0.87)
		ECT (-1)	-0.79*
F-Statistic	41.860***	F-Statistic	39.54***
R Square	0.8921	R Square	0.843
Adjusted R Square	0.8786	Adjusted R Square	0.827

* ** *** indicates significance level at 10%, 5% and 1%

The bracket values show Standard error

If there is an increase of 1% in domestic debt, then the bank concentration decreases by 0.17% by keeping the rest of the variables constant and statistically significant at the level of 10%. The finding aligns with Yee, Ismail, and Ai-Lian (2020). If the government's domestic borrowing exceeds that level, it negatively impacts it. Similarly, when government expenditures increase by 1%, the bank concentration increases by 0.404% and all other variables remain the same, statistically significant at 5%. The reason behind it is deficit financing, and the government goes to financial institutions and markets to fulfill that budget deficit. Likely, inflation increases by 1%, and then the bank concentration increases by 0.256%, keeping the remaining variables constant and statistically significant at 5%. Inflation creates ambiguity in savings and investment. Therefore, financial development disturbs it (Ramzan & Ahmed, 2011). In addition, gross capital formation significantly impacts the dimension of financial efficiency. If the gross capital formation increases by 1%, then the bank concentration increases by 0.17%, assuming the other variables are constant and statistically significant at 5%. Moreover, increases in openness to trade have a negative but insignificant impact on bank concentration.

After a shock, the speed of the adjustment towards long-term equilibrium is 79%, showing the long-term co-integration of the variables. The F statistics value is 41.860 and 39.54 for the long and short run, which is statistically significant at 1%. So, the overall model is significant jointly. Long- and short-run explanatory variables explain the 89% and 84% variation in private credit to total banking deposit ratios.

Diagnostic tests

The given below diagnostics are employed;

Table 11.

Diagnostic tests results

	Equation 1	Equation 2	Equation 3
Ramsey Reset			
F Statistics	0.405	0.078	0.075
LM Test			
F Statistics	2.34	0.127	1.39
Jarque Bera	0.478	1.33	1.768

The probability value of the Ramsey Reset is 0.5281 for Equations 1 and 0.078, 0.7814 for Equation 2, and the F statistics value is 0.405. The third equation's probability and F statistic values are 0.78 and 0.078, respectively. Therefore, there are no specification errors in the equations. For LM, the probability value for equation 1 is 0.306, the F statistics value is 0.127, and the probability value for equation 2 is 0.9936. The third equation's F statistic and probability values are 1.398 and 0.46, respectively. There appears to be no serial association between the variables. Jarque Bera's statistics are 0.478, equation 1's probability value is 0.79, its statistics value is 1.33, and equation 2's probability value is 0.514. Equation 3's probability and statistic values are 0.41 and 1.768, respectively. It so demonstrates that the data is normally distributed.

Parameters stability test

Figure 1 shows the Depth dimension of financial development (equation 1), Figure 2 shows the stability dimension of financial development (equation 2), and Figure 3 shows the efficiency dimension of financial development (equation 3). The blue line lies within the boundary, indicating the stability of the parameters.

Figure 1.

Depth dimension of financial development

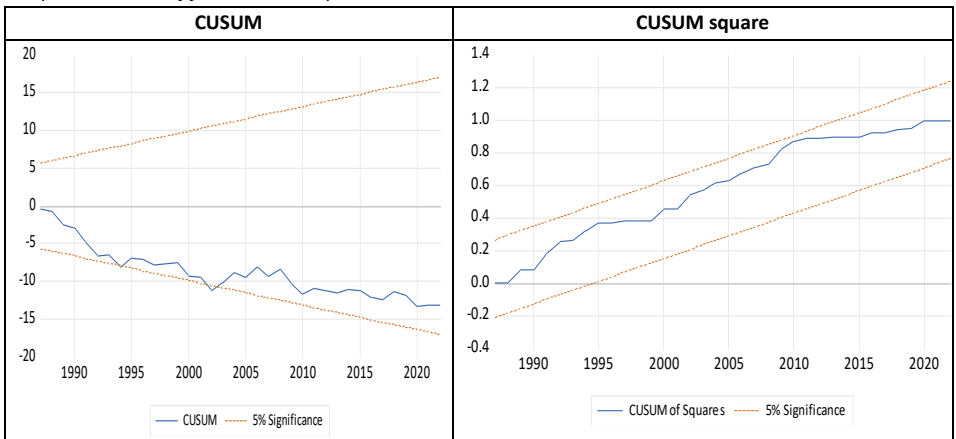


Figure 2.

Stability dimension of financial development

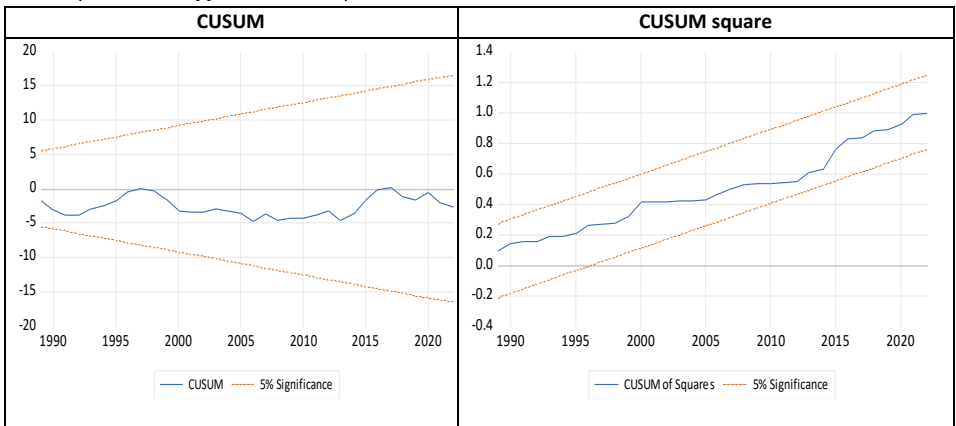
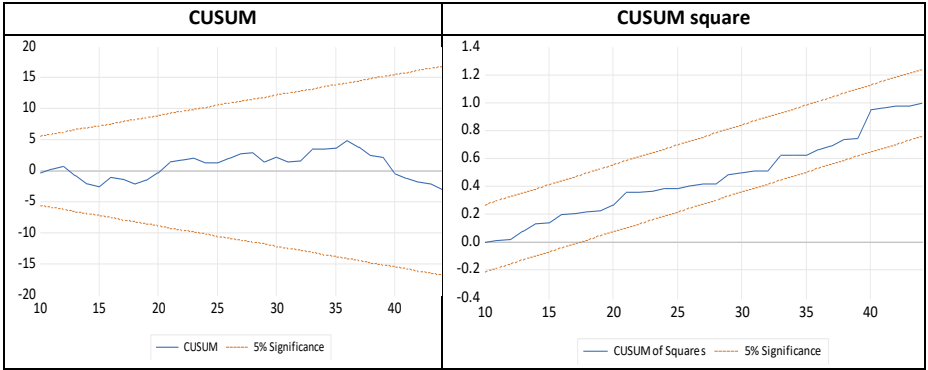


Figure 3.
Efficiency dimension of financial development



Results Discussion

Domestic debt positively impacts the depth and stability dimensions of financial development, and this finding is in line with Benayed and Gabssi (2020). However, domestic debt negatively impacts banking concentration, and this finding aligns with Yee, Ismail, and Ai-Lian (2020). If the government's domestic borrowing exceeds that level, it negatively impacts banking concentration. Inflation decreases bank concentration because it creates ambiguity in savings and investment. Therefore, financial development disturbs it (Ramzan & Ahmed, 2011) in terms of the depth and stability dimension of financial development. Inflation increases bank capital to total asset ratio due to an increase in the interest rate to control inflation. Similarly, government expenditures play a positive role in increasing the dimension of financial development. The reason behind it is deficit financing, and the government goes to financial institutions and markets to fulfill that budget deficit. In addition, gross capital formation has an insignificant impact on the dimension of financial stability. Moreover, openness to trade increases bank capital to total asset ratio. This finding is in line with Bibi (2017), who states that the current account deficit may be reduced, which impacts the efficiency of the financial sector significantly positively.

Conclusion and Recommendations

Domestic debt positively and significantly impacts financial development's depth and stability dimension. At the same time, it hurts the efficiency dimension of financial development and shows support for the lazy bank hypothesis. It means that the crowding-out effect is present in Pakistan's financial markets. Conclusively, domestic debt positively impacts the efficiency dimension of financial development and supports the safe asset hypothesis in the case of Pakistan. Currently, the government is borrowing 56% of its GDP domestically. Therefore, it is creating a positive impact on the dimensions of financial development as a whole, and the financial sector is risk-averse and holds only government securities.

The policy recommendations are as follows

- The public sector dominates the developing countries, and the private sector is marginalized. Therefore, financial development should also concentrate on the private sector for funds.
- The financial sector in Pakistan believes only in safe and secure investment rather than investing in the private sector. So, Pakistan's financial system invests in risk-free assets, specifically government bonds.
- The government should control its expenditure and reduce its budget deficit.
- The high budget deficit causes an increase in interest rates, and firms cannot compete with the government. The private sector remains crowded out for investment.

- Financial accessibility should be provided to every individual or firm considered unbanked, which is the access dimension of financial development.
- The government should promote financial inclusion through financial development.
- Financial literacy and awareness are necessary to participate in the financial markets.
- Financial development is the only tool for minimizing the hazards of money through banking channels, including unbanked individuals and firms in the financial system.

Future Research Directions

The future direction for research in this area could be like this: each dimension of financial development impacts economic growth. Furthermore, financial development impacts the sectorial growth of Pakistan's economy, particularly agriculture, services manufacturing, and industries. A study should be conducted on the impact of public debt as a whole or private debt's impact on the financial sector development. Moreover, the components of disaggregated debt should be studied to develop the financial sector. The moderating effect of the governance indicators and political regime changes was incorporated in addition to studying domestic debt and the financial development nexus.

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