

Effects of Banking Sector Credits in Estimating Import Demand of Pakistan: Evidence from FMOLS and DOLS Approach

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ABSTRACT

The role of financial development in trade policies is one of the most concerning issues in developing countries. In this context, the current research highlights the crucial role of banking sector credits in determining Pakistan's import demand. The analysis is based on annual data from 1985 to 2020. This study formulated three import demand models that incorporate sector-wise bank credits in the industrial, agricultural, and service sectors, used as a proxy for financial development. The Dynamic Ordinary Least Squares (DOLS) estimation results indicate that, in the long run, credit to the agriculture sector has a negative and significant effect on import demand. In contrast, industrial sector credit has a positive and significant effect on import demand. This finding suggests that the higher credit demand of the industrial sector intensifies the burden on Pakistan's balance of payments. Moreover, the coefficient of consumption expenditure is the primary driver of import demand in all models. The coefficient of relative price has shown a theoretically negative sign and a significant effect on import demand. The Fully Modified Ordinary Least Squares (FMOLS) test reconfirmed the (DOLS) findings. However, the CUSUM test also confirms the stability of the model parameters. It is recommended that the import substitution policy be adopted to curb the industrial sector's demand for imported items, as well as that the central bank increase the share of credit allocated to the agricultural sector to promote its growth. This could also contribute to reducing Pakistan's balance of payment deficit.

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ملخص

يُعدّ دور التطوّر المالي في سياسات التجارة من القضايا المحورية في البلدان النامية. وفي هذا السياق، تُسلّط الدراسة الحالية الضوء على الدور الحاسم للائتمان المصرفي في تحديد الطلب على الواردات في باكستان، بالاستناد إلى بيانات سنوية تغطي الفترة من 1985 إلى 2020. تم تطوير ثلاثة نماذج للطلب على الواردات، تأخذ بعين الاعتبار الائتمان المصرفي القطاعي الموجّه لقطاعات الصناعة والزراعة والخدمات، باعتباره مؤشرا للتطور المالي. تشير نتائج التقدير باستخدام أسلوب المربعات الصغرى العادية الديناميكي (DOLS) إلى أن الائتمان الموجّه إلى القطاع الزراعي له أثر سلبي ومعنوي على الطلب على الواردات في الأجل الطويل، في حين أن الائتمان الممنوح للقطاع الصناعي يُظهر أثرا إيجابيا ومعنويا. وتُبرز هذه النتيجة أن ارتفاع الطلب على الائتمان في القطاع الصناعي يُسهم في تفاقم العجز في ميزان المدفوعات الباكستاني. كما تُظهر معاملات الإنفاق الاستهلاكي أنه العامل الرئيسي المحرك للطلب على الواردات في جميع النماذج، بينما جاء معامل السعر النسبي سالبًا كما تتنبأ النظرية، وكان ذا دلالة إحصائية. وقد أكدت نتائج اختبار المربعات الصغرى المعدّلة بالكامل (FMOLS) نتائج نموذج DOLS، كما أظهر اختبار CUSUM استقرار معلمات النموذج. توصي الدراسة باعتماد سياسة إحلال الواردات للحد من الطلب الصناعي على المنتجات المستوردة، وزيادة حصة الائتمان الموجّه إلى القطاع الزراعي من قبل البنك المركزي لتعزيز نموه، وهو ما قد يُسهم أيضا في تقليص عجز ميزان المدفوعات في باكستان.

RESUMÉ

Le rôle du développement financier dans les politiques commerciales est l'une des questions les plus préoccupantes dans les pays en développement. Dans ce contexte, la présente étude met en évidence le rôle crucial des crédits du secteur bancaire dans la détermination de la demande d'importations du Pakistan. L'analyse est basée sur des données annuelles de 1985 à 2020. Cette étude a formulé trois modèles de demande d'importations qui intègrent les crédits bancaires par secteur dans les secteurs industriel, agricole et des services, utilisés comme indicateur du développement financier. Les résultats de l'estimation par les moindres carrés ordinaires dynamiques (DOLS) indiquent qu'à long terme, le crédit au secteur agricole a un effet négatif et significatif sur la demande d'importations. En revanche, le crédit au secteur industriel a un effet positif et significatif sur la demande d'importations. Cette conclusion suggère que la demande de crédit plus élevée du secteur industriel alourdit la charge qui pèse sur la balance des paiements du Pakistan. En outre, le coefficient des dépenses de consommation est le principal moteur de la demande d'importations dans tous les modèles. Le coefficient du prix relatif a montré un signe théoriquement négatif et un effet significatif sur la demande d'importations. Le test des moindres carrés ordinaires entièrement modifiés (FMOLS) a confirmé les

résultats du test DOLS. Toutefois, le test CUSUM confirme également la stabilité des paramètres du modèle. Il est recommandé d'adopter une politique de substitution des importations afin de freiner la demande du secteur industriel pour les produits importés, et de demander à la banque centrale d'augmenter la part des crédits alloués au secteur agricole afin de promouvoir sa croissance. Cela pourrait également contribuer à réduire le déficit de la balance des paiements du Pakistan.

Keywords: import demand, consumption, financial development, central bank

JEL classification: F14, E21, G20, E58

1. Introduction

The role of financial development in international trade policies has received more attention from policymakers. The economic operation of any economy is closely linked to both macroeconomic and foreign policy. The establishment of trading zones and the volume of trade agreements accelerate production capacity around the world. Trade liberalization in any economy plays a crucial role in facilitating the transfer of human and physical capital across borders (Jaimovich & Kamuganga, 2010). Moreover, trade liberalization increases the demand for intermediate and capital goods imports that support the industrial growth of the economy. Therefore, in developing countries, a stable import demand function is essential for managing the trade deficit and preventing the economy from a sudden balance of payments crisis.

In this era of globalization, the financial sector plays a supporting role in strengthening the trade sector of the economy. The structure of the financial sector is characterized by the provision of multiple financial services, access to loans, and efficient financial intermediation, which can directly impact imports by reducing liquidity constraints and minimizing the cost of financing. According to Ahad and Dar (2016), an efficient financial structure of an economy can support imports. In developing countries, the financial sector actively mobilizes savings into high-demand sectors through credit channels, thereby supporting trade and economic growth. Therefore, the financial sector can alter the domestic production spectrum by providing financial services to entrepreneurs for acquiring imported new technology, machinery, and raw materials. An efficient financial sector facilitates the growing needs of firms and consumers for imported goods (Beck, 2002).

Most studies have provided empirical evidence on the stability of the import demand function by incorporating financial development. Harrison et al (2004) argued that the financial sector facilitates trade opportunities by efficiently allocating resources. Empirical evidence has shown that trade liberalization promotes the development of more robust financial markets (Law et al., 2013). However, the countries' volume of trade not only depends on the size of the economy, but the propensity to import from other countries is also a matter. For this, the Gravity model explains that large market economies tend to have smaller trade openness than small market economies. Following this, the demand for foreign goods is likely to rise with GDP per capita, and when combined with domestic financial activity, it could be an important determinant of trade.

This research aims to deepen our understanding of the effect of the financial sector on import demand in Pakistan. To the best of our knowledge, no empirical studies have examined the impact of sectoral private sector credits on import demand in Pakistan. Ahad et al. (2007) analyzed the import demand function by incorporating private sector credit as a proxy for financial development in the case of Pakistan. However, this analysis is limited to the aggregate level of credit, and the study did not highlight the sectoral specification of bank credits. On the other hand, Majeed et al. (2019) investigated the impact of sectoral allocation of bank credits on economic growth, highlighting the role of banking sector credit in driving economic activity. Despite these empirical findings, a significant gap remains in the literature. Therefore, this study aims to fill the gap in finance-trade literature by examining how credit distribution across sectors affects import demand. Specifically, this study provides empirical evidence on the finance-trade nexus, serving as a guideline for policymakers when shaping trade policies in different macroeconomic contexts. Moreover, the present study offers effective policy tools for monetary policy aimed at accelerating trade in Pakistan.

Table 1: Performance of the Trade and Financial Sector

Years	Trade Sector as % of GDP (Averages)			Banking Sector credit as % of GDP (Averages)		
	Import	Export	Trade Deficit	Agricultur e sector credit	Industria l sector credit	Service s sector credit
1986-1990	19.84	13.77	6.07	4.58	7.89	2.14
1991-1995	19.91	16.65	3.26	4.03	8.39	2.44
1996-2000	18.30	15.68	2.62	2.75	9.44	1.69
2001-2005	16.31	15.62	0.69	2.17	9.71	1.75
2006-2010	21.32	13.52	7.80	1.42	10.82	3.18
2011-2015	19.03	12.50	6.53	1.00	6.88	1.58
2016-2020	18.31	9.30	9.01	0.86	7.85	1.72

Source: Author's estimation.

Table 1 presents the performance of Pakistan's financial and trade sectors. After the structural adjustment program in 1988, the foreign trade and financial sector reforms took place in Pakistan in terms of a liberalized banking system, increased capitalization in the stock market, regulation in lending, reduced tariff rates, abolition of the import licenses scheme, increased foreign exchange inflows, and a noticeable increment in FDI and portfolio investment. In the late 1990s, efforts by donor agencies, such as the World Bank, the IMF, and the WTO, stimulated growth in many sectors, particularly during the period from 1997-98 to 2002-03. Between 2006 and 2010, both imports and exports exhibited an increasing trend, driven by efforts aimed at rationalizing the tariff structure and promoting exports in Pakistan.

The rest of the paper is structured as follows: Section 2 provides a literature review. Section 3 discusses the model specification and data source, and Section 4 assesses the empirical findings. Section 5 concludes and outlines policy implications.

2. Empirical Literature

An in-depth analysis of import demand plays a crucial role in the formulation of the economy's trade policies. Therefore, several previous studies have examined the determinants of import demand and provided strategic policies to address the economy's trade deficit. This study sheds light on various empirical studies, which are as follows:

Prodromidis (1975) examined the Greeks' import and export disaggregated function from the period 1961 to 1969. The author applied the double-logarithmic form of equations to estimate the elasticities. The results indicate that various categories of exports are significant and elastic with respect to income and relative price. Furthermore, the major imports are highly elastic with respect to income and inelastic with respect to relative price. The study concludes that import and export disaggregated elasticities can give better suggestions in trade policy formulation.

Sarmad and Mahmood (1985) estimated the consumer goods import and raw material demand functions for import demand in Pakistan, covering data from 1960 to 1986. The results found that the relative price had to be statistically significant in relation to imports of milk food. On the other hand, the other categories of imports, such as fresh fruits, crude petroleum, and soya bean oil, are inelastic with respect to relative prices. The study concludes that devaluation and tariff policies would not be effective in reducing Pakistan's trade deficit. Furthermore, the import substitution policy is necessary to reduce import dependence.

Giovannetti (1989) empirically examines the import demand function in the context of expenditure components in Italy. The annual data set is used from 1970 to 1986. The ordinary least squares technique is used for model estimation. The study found that consumption and investment have a statistically significant effect on import demand. Similarly, export and relative price both have a significant effect on import demand. Moreover, this analysis raises some ambiguity due to the absence of a unit root test. Therefore, the results may be considered spurious based on level estimation.

Sarmad (1989) identifies the determinants of the import demand function and analyzes time series data from 1959 to 1986 for Pakistan. The study finds that disaggregated imports are highly elastic with respect to income but less elastic with respect to relative price. The study concludes that neither tariff nor devaluation policies provide effective outcomes for reducing the trade deficit in Pakistan. Furthermore, there is a need to reconsider the import substitution policy.

Xu (2002) raised criticism on the research work of Senhadji (1997). First, the estimation reported an AR(1) process without applying the unit root

test, and second, the study ignored the investment and government indicators in the import demand model. This study drives a structural model of import demand by introducing ‘national cash flow’ as a correct activity variable. The author concludes that national cash flow, relative price, and time trend contribute to the development of the import demand model at a more general and flexible level.

Beck (2002) highlighted the role of financial services in shaping trade structure, using data from 65 countries. The study found that an efficient financial system may reduce import demand by providing financial services to domestic firms, enabling them to produce import-substitution goods. Moreover, the study concludes that the financial sector may encourage the manufacturing sector's export and can gain a comparative advantage, which in turn increases the trade surplus. Similarly, Tang (2004) constructs an import demand function for Japan from the period 1973 to 2000. He used financial indicators in estimating the import demand function. The study employs the ARDL bounds testing technique and an error correction model. This research concluded that the monetary authority should consider the financial variables in the formulation of trade policies.

Ho (2004) employed the JJ Maximum likelihood cointegration and Error correction techniques to investigate the relationship between import demand and its determinants. The study used quarterly data from the period 1970-1986. The author constructed two econometric models: (1) an aggregated import demand model and (2) a disaggregated import demand model. The results found that the import demand elasticities with respect to investment, export, and relative price are (0.139), (1.481), and (0.304), respectively, with their expected theoretical signs.

Zaman and Imrani (2005) incorporated foreign remittance into the import demand function at both the aggregate and disaggregate levels. The study used quarterly data from 1975 to 2004. The estimated results indicate a positive association between foreign remittance and import demand at the aggregate level. Similarly, remittances have a positive impact in the case of importing raw materials and capital goods, but they are not in favor of importing consumer goods.

Funke and Nickel (2006) analyzed import demand with expenditure components using quarterly data from 1970 to 2002 for the G7 countries.

To estimate the import demand elasticities, the study used private consumption expenditure, government expenditure, investment, export, and relative price variables. The estimated results indicate that the imported goods are inelastic and statistically significant with respect to all variables. Private consumption expenditure, government expenditure, investment, export, and relative price are (0.102), (0.392), (0.427), (0.435), and (-0.665), respectively. On the other hand, import services are to be elastic with respect to private consumption and relative prices, and inelastic with respect to government expenditure, investment, and exports.

Kim et al. (2010) utilized unbalanced data from 87 OECD countries to examine the interaction between financial development and trade from 1960 to 2005. The short-run analysis supports the positive relation between finance and trade. However, the results reveal a different scenario when the sample is split into OECD and non-OECD countries. The results indicate that finance is a significant indicator for determining trade in non-OECD countries compared to OECD countries.

Kim et al. (2012) investigated the empirical relationship between the financial sector, trade openness, and economic growth in 63 countries from 1960 to 2007. In poor countries, the authors found a positive impact of financial sector development on the trade sector and a negative effect of trade on the financial sector, using a simultaneous equation approach. In richer countries, the financial sector accelerates trade, but trade has an ambiguous impact on financial sector development.

Fukumoto (2012) examined the impact of disposable income, GDP, exports, investment, and relative prices on imports of capital goods, intermediate goods, and consumption goods in China. The study employed ARDL and ECM analyses using data from 1988 to 2005. The empirical findings show that, in the long run, the price elasticity of imports for consumer goods is higher than that for capital and intermediate goods. This suggests that domestically produced consumption goods serve as better substitutes for imported ones. The author concludes that an import substitution policy would be more effective in the case of consumer goods. Furthermore, China's economic growth could negatively impact the trade balance if it is not export-led.

Adiguzel et al. (2012) employed various proxies for financial development.⁴ in the determination of the import demand function of Turkey. The Structural vector autoregressive (VAR) approach is applied to a sample size from 2002 to 2009, based on the Transition Program for Strengthening the Turkish Economy. The results indicate that cash flow (GDP-I-G-EX) and relative price are both positively related to import demand. Furthermore, the total credit volume in the banking sector and the interest rate on deposits both have a positive effect on import demand. The study concludes that the monetary authority should consider the importance of financial development in the formulation of trade policy.

Khan et al. (2013) determined the import demand function of Pakistan. The authors used the ARDL bounds testing approach of cointegration. The estimated results indicate that import demand is positively related to expenditure components, whereas the relative price has a negative impact on import demand. On the other hand, Ahad and Dar (2016) highlighted the role of financial development in determining the import demand of Bangladesh. The author used quarterly data from 1986 Q1 to 2014 Q4. The Bayer and Hanck cointegration and ECM are used to estimate long-run and short-run analysis. The estimated results reveal a long-run relationship between import demand and financial development. The study concluded that policymakers should focus on financial sector development for the import of technology by adopting an import substitution policy.

Ahad et al. (2017) examined the relationship between financial development and Pakistan's import demand. They used quarterly data from 1972Q1 to 2012QIV and applied the Bayer-Hanck combined cointegration as well as the Johansen cointegration test to determine whether the variables are cointegrated or not. The study also applied the VECM Granger Causality approach to test the causal relationship between variables. The results indicate that financial development plays a significant role in promoting import demand, whereas economic growth and relative price have an adverse effect on import demand. The author concluded that financial development can be used to control import demand by providing financial loans to promote the import substitution policy in Pakistan.

⁴Total credit volume in banking sector, share prices, stock exchange transactions volume, exchange market transaction volume and interest rate.

Majeed (2019) investigated the elasticities of import demand from China in the case of Pakistan. The study employs the ARDL technique of cointegration, utilizing time series data from 1972 to 2016. The results indicate that import demand is positively associated with consumption, export, and government expenditure. On the other hand, investment expenditure is found to have a negative and significant impact on imports. Similarly, the relative price has a positive but insignificant impact on import demand. The author concludes that exchange rate policy may not be feasible to restrict import demand in Pakistan. Furthermore, monetary and fiscal policy should be designed to improve the efficiency of domestic industries.

The relationship between imports and their determinants remains a crucial issue for policymakers. Therefore, a wide range of literature has empirically examined the import demand function, as it has vast implications for the effective planning of international trade and policy formulations. In the case of Pakistan, although many empirical works highlighted the problem of foreign trade of Pakistan by using different macroeconomic indicators in the estimation of aggregate import demand, no empirical work has yet been done to highlight the role of sectoral-level banking sector credits as a proxy of financial development in the estimation of import demand. Therefore, this study fills the research gap and enriches the existing literature by providing an analytical evaluation of the contribution of financial sector development to the estimation of Pakistan's import demand.

3. Model Specification

Theoretically, the imperfect substitute model of import demand is a function of real income and relative price. Previous empirical studies have extended the traditional import demand function with expenditure components, as seen in Funke and Nickel (2006), Fukumoto (2012), and Majeed and Waheed (2012). Furthermore, Ahad et al. (2017) and Adiguzel et al. (2012) used financial development variables to determine the import demand function. Based on this empirical analysis, this study examined the import demand model by introducing sectoral-level bank credits and liquid liabilities as proxies for financial development. However, we develop the import demand function in the following manner:

$$M = f (CG, I, EX, RP, F) \quad (1)$$

Here, (M) is import demand, (CG) is the sum of household and government consumption expenditure, (I) indicates the gross fixed capital formation, (EX) explains the export expenditure, (RP) is relative price and (F) represents the financial sector development which includes banking sector credit to agriculture, industrial and services sectors Majeed et al. (2019) and the other financial variable is liquid liabilities, it is proxy of financial depth King and Levine (1993).

For measuring the elasticities, we transformed all the variables into log form in the following manner:

$$LM_t = \beta_0 + \beta_1 LCG_t + \beta_2 LI_t + \beta_3 LEX_t + \beta_4 LRP_t + \beta_5 LF_t + \mu_t \quad (2)$$

Where (LM) indicates the log of import, (LCG) is the sum of log of general government and household consumption expenditure (LI) is the log of gross fixed capital formation, (LEX) is the log of export of goods and services, (LRP) represents the log of relative price of imports, and (LF) is the log of banking sector credit to agriculture, industrial and services sector. The other financial variable is liquid liabilities, and ui is an error term.

The following models estimate the effects of financial development on import demand.

Model 1:

$$LM_t = \alpha_0 + \alpha_1 LCG_t + \alpha_2 LI_t + \alpha_3 LEX_t + \alpha_4 LRP_t + \alpha_5 LINDC_t + \alpha_6 LL_t + \mu_t \quad (3)$$

Model 2:

$$LM_t = \alpha_0 + \alpha_1 LCG_t + \alpha_2 LI_t + \alpha_3 LEX_t + \alpha_4 LRP_t + \alpha_5 LAGC_t + \alpha_6 LL_t + \mu_t \quad (4)$$

Model 3:

$$LM_t = \alpha_0 + \alpha_1 LCG_t + \alpha_2 LI_t + \alpha_3 LEX_t + \alpha_4 LRP_t + \alpha_5 LSERC_t + \alpha_6 LL_t + \mu_t \quad (5)$$

3.1. Data Source

This empirical research uses annual time series data of the variables from 1985 to 2020. The data on imports of goods and services (M), gross fixed capital formation (I), General Government Consumption and Private consumption expenditure (CG), Export expenditure (EX), unit value of imports, and GDP deflator are taken from the Economic Survey of Pakistan (various issues). The data on the nominal exchange rate is obtained from the World Development Indicator (WDI). At the same time, data on banking sector credit to the industrial, service, and agricultural sectors are obtained from the Handbook of Statistics, State Bank of Pakistan (SBP). The data on liquid liabilities is collected from the Financial Development and Structural databases. All data series are in million rupees, with the base year 2000, and are transformed into natural logs, except for liquid liabilities, which are expressed as a ratio.

4. Empirical Findings

4.1. Test for Variables Integration

This study examines the long-run elasticities of import demand. Therefore, it is essential to verify that all the series are integrated at the same level.

By using time series data, we must focus on the properties of time series that might have been introduced into the model, as they could lead to spurious regression. Therefore, standard unit root tests, such as the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, are used to determine whether the series exhibits a stationary trend or a non-stationary one. The time series data is stationary if the mean, variance, and autocovariance are not time-dependent.

In Table 2, we present the unit root tests to confirm that the orders of integration are the same. We note that all the series are non-stationary at the level, but the entire series becomes stationary after first differencing.

Table 2: Results of the Unit Root Test

Variables	ADF test statistic p-value				PP test statistic p-value			
	I(0)		I(1)		I(0)		I(1)	
	C	C&T	C	C&T	C	C&T	C	C&T
LM	0.9009	0.2847	0.0001	0.0008	0.8923	0.2213	0.0001	0.0009
LCG	0.9657	0.6947	0.0001	0.0010	0.9651	0.6208	0.0001	0.0009
LEX	0.0090	0.0582	0.0005	0.0016	0.0010	0.0194	0.0006	0.0009
LRP	0.7376	0.3779	0.0000	0.0002	0.6331	0.3390	0.0000	0.0000
LI	0.6441	0.1005	0.0037	0.0189	0.6137	0.2945	0.0037	0.0189
LINDC	0.5958	0.5477	0.0002	0.0016	0.5855	0.4184	0.0002	0.0016
LAGC	0.5523	0.2129	0.0016	0.0076	0.3784	0.2022	0.0003	0.0047
LSERC	0.3840	0.2470	0.0005	0.0032	0.2116	0.2916	0.0004	0.0030
LL	0.8674	0.5205	0.0001	0.0005	0.8574	0.5205	0.0001	0.0005

Source: Authors' estimations

The results of the descriptive analysis are shown in Table 3. The current structure shows that the average values of import, consumption expenditure, export expenditure, investment expenditure, and relative price are 13.4805, 10.614, 8.751, 8.908, and 4.153, respectively. On the other hand, the credit to the agricultural, industrial, and services sectors is on average 6.851, 8.294, and 6.817, respectively.

Table 3: Summary Statistics of Data

Variables	Mean	Std.dev.	Minimum	Maximum	Observations
LM	13.48057	0.358098	12.95443	14.22061	36
LCG	10.61487	0.458534	9.922819	11.39042	36
LEX	8.751115	0.352772	7.740230	9.158152	36
LI	8.908067	0.373400	8.186186	9.584982	36
LRP	4.153916	0.744509	2.844909	5.252273	36
LAGC	6.851536	0.245701	6.443813	7.328175	36
LINDC	8.294071	0.452615	7.424464	8.981003	36
LSERC	6.817177	0.514759	5.770506	7.665988	36
LL	37.03639	5.526622	28.10000	47.13000	36

Source: Authors' estimations

4.1.2. Test for Cointegration

After confirming the integration of the variables in the same order, the study applied the Johansen and Juselius (1990) cointegration test. This method provides evidence of cointegration through trace and Maximum Eigen value statistics. The estimation results are presented in Table 4, which provides evidence of long-run links among the estimated series. Both Trace and Maximum Eigen-value statistics indicate that the null hypothesis of no cointegration vector is rejected in all three equations at the 1% level of significance, whereas there is no possibility of rejecting the other hypotheses, confirming the existence of a long-run relationship between the variables. However, both tests appear to prove the existence of one unique statistically significant co-integration in equations 3, 4, and 5.

Table 4: Test of Co-integration: Johansen and Juselius

Null Hypothesis	Trace Statistics	5 percent critical values	Max Eigen Value Statistics	5 percent critical values
Model 1				
None*	162.7921	125.6154	55.7984	46.2314
At most one	106.9936	95.7536	37.3833	40.0775
Model 2				
None*	152.7126	125.6154	64.62198	46.2314
At most one	88.0906	95.7536	27.13166	40.0775
Model 3				
None*	171.0669	125.6154	70.8730	46.2314
At most one	100.1939	95.75366	34.1948	40.0775

Source: Authors' estimations

4.1.3. Long Run Coefficients through Dynamic Ordinary Least Squares (DOLS) Test

The existence of a long-run relationship, estimated through Johansen and Juselius (1990), may be biased due to misspecification. Stock and Watson (1993) supported the notion that Dynamic Ordinary Least Squares is an appropriate method for estimating long-run coefficients. Dynamic Ordinary Least Squares (DOLS) applies to small samples, as well as in cases where dynamic sources of bias are present in the estimated coefficients. To address endogeneity and serial correlation issues, this

method employs leads and lags of the first differences of independent variables. Table 5 presents the long-run coefficients estimated using the DOLS method for equations 3, 4, and 5.

Table 5: Long Run Estimation through Dynamic Ordinary Least Squares

Variables	Model 1	Model 2	Model3
C	-2.3160 (0.1564)	2.8403 (0.0014)	4.0341 (0.0023)
LCG	1.0644 (0.0003)	0.5646 (0.0000)	0.6342 (0.0001)
LEX	0.3525 (0.0361)	0.3279 (0.0000)	0.1748 (0.0462)
LI	0.1313 (0.3766)	0.5443 (0.0000)	0.0217 (0.8550)
LRP	-0.6451 (0.0006)	-0.4213 (0.0000)	-0.2305 (0.0083)
LINDC	0.3071 (0.0513)	-	-
LAGC	-	-0.2528 (0.0000)	-
LSERC	-	-	0.1869 (0.0011)
LL	0.0110 (0.1172)	0.0124 (0.0000)	0.0193 (0.0000)
R ²	0.9950	0.9938	0.9926
Adj.-R ²	0.9801	0.9864	0.9838

Source: Authors' estimations

In Table 5, Model 1 indicates that consumption expenditure has a significant and positive impact on import demand, which aligns with the Keynesian theory, suggesting that an increase in consumption leads to an increase in demand for both domestic and foreign goods. This reveals that consumption expenditure is the most relevant factor in promoting a trade deficit in Pakistan, as argued by Majeed and Waheed (2012). Similarly, the coefficients of export and investment have shown a significant and positive relationship with import demand. According to the Keynesian theory, investment is the component of aggregate demand; when it increases, the rise in import demand follows.

This finding is similar to that of Joseph and Fosu (2006) for Ghana. Moreover, import demand is positively influenced by export expenditure, which supports the export-led growth hypothesis. An increase in exports

requires imported inputs, thereby increasing productivity. On the other hand, the relative price is -0.421, which has the correct negative sign and a statistically significant impact on import demand. Furthermore, credit provided to the agricultural sector has a negative and significant impact on import demand. This result suggests that credit facilities provided to the agricultural sector have a positive contribution to improving the trade deficit in Pakistan. This result is consistent with Bilas et al. (2017), who confirmed the negative impact of financial development on import demand. In Models 2 and 3, consumption expenditures and exports both have positive and significant relationships with import demand. On the other hand, investment has a positive but insignificant effect in both models. The Model 2 found a positive and statistically significant contribution of credit to the industrial sector in Pakistan's import demand. This finding suggests that allocating credit to the industrial sector increases demand for imported items, thereby enhancing domestic production and promoting sustainable economic growth. These results are supported by Ahad et al. (2017), who argued that firms need finance to enhance production capacity, which in turn promotes economic growth. Similarly, in Model 3, the coefficient of services credit has a positive and significant impact on import demand. Similar findings by Chebbi and Boujelbene (2008) highlighted that credit allocation to the trade and services sector has a significant positive impact on import demand in Tunisia.

4.1.4. Long Run Coefficients through Fully Modified Ordinary Least Squares (FMOLS) Test

To assess the reliability of earlier estimated results through Johansen co-integration testing (1990), the study also employed the Fully Modified Ordinary Least Squares (FMOLS) test. This technique was introduced by Phillips and Hansen (1990) to investigate the consistency and robustness of the results. To achieve robustness in the results, the long-run coefficients are estimated using the Fully Modified Ordinary Least Squares (FMOLS) method, as reported in Table 5.

Table 6: Long Run Estimation through Fully Modified Ordinary Least Squares

Variables	Model 1	Model 2	Model3
C	2.4247 (0.0366)	3.2479 (0.0013)	3.3367 (0.0211)
LCG	0.7512 (0.0000)	0.5761 (0.0000)	0.6974 (0.0001)
LEX	-0.0283 (0.7526)	0.2020 (0.0092)	0.0258 (0.7770)
LI	0.2705 (0.0453)	0.5883 (0.0000)	0.3083 (0.0557)
LRP	-0.3165 (0.0005)	-0.4081 (0.0000)	-0.2644 (0.0079)
LINDC	0.2305 (0.0156)	-	-
LAGC	-	-0.2840 (0.0000)	-
LSERC	-	-	0.0386 (0.4420)
LL	0.0086 (0.0546)	0.0107 (0.0008)	0.0162 (0.0001)
R ²	0.9638	0.9695	0.9599
Adj.-R ²	0.9563	0.9632	0.9516

Source: Authors' estimations

Note II:***, **, * stand for coefficients' significance at 1%, 5%, 10%, respectively

Model 1 in Table 6 indicates that the estimated consumption elasticity of import demand is 0.57. This result supports the Keynesian theory that consumption expenditure is a positive driver of demand for foreign goods. This finding is consistent with the result of Chani et al. (2011). The coefficients of exports and investment both have a positive and significant impact on import demand, with elasticities of 0.202 and 0.588, respectively. However, investment and exports are components of aggregate demand, and an increase in either is likely to result in higher import demand. Moreover, the coefficient of credit to the agriculture sector was found to have a negative and significant impact on import demand in Pakistan.

The results of Models 2 and 3 suggest that consumption and investment both have a positive and significant impact on import demand. These results are supported by Tang (2003). On the other hand, export has a

positive effect, but it is shown to be insignificant. Furthermore, the coefficient of the industrial sector credit has a positive and significant impact on import demand in Model 2. This suggests that sectoral credit allocation will lead to an increase in trade, facilitating industries to acquire foreign inputs, as argued by Beck (2002). On the other hand, the coefficient of credit to the services sector has a positive and insignificant impact on import demand in Model 3. Moreover, the elasticities of import demand with respect to the relative price are negative and significant at -0.408, -0.316, and -0.264 in all three models, respectively. This result is similar to that supported by Tang (2004) and Chani et al. (2011). This result suggests that exchange rate policy may be effective in controlling import demand in Pakistan. Finally, the liquid liabilities have shown a positive and significant impact on import demand, a finding also discussed by Marshall (1958) and Chebbi and Boujelbene (2008). Empirical findings by Tang (2005) also highlighted a positive correlation between liquid liabilities and import demand.

Table 7: Diagnostic Tests

	Model 1	Model 2	Model 3
A: Functional Form	F(1, 28) = 1.5853 [0.218]	F(1, 28) = 6.1808 [0.192]	F(1, 28) = 2.2379 [0.145]
B: Serial Correlation	F(2, 24) = 2.4073 [0.111]	F(2, 25) = 2.3007 [0.121]	F(3, 24) = 1.9789 [0.144]
C: Heteroscedasticity	F(6, 27) = 0.4283 [0.853]	F(6, 27) = 1.5104 [0.212]	F(6, 27) = 0.4244 [0.856]
D: Normality	CHSQ (2) = 2.7082 [0.258]	CHSQ (2) = 2.4555 [0.292]	CHSQ (2) = 3.575 [0.167]

Note: A: The square of the fitted values by Ramsey's RESET test.

B: Residual serial correlation by Lagrange multiplier test.

C: Based on the regression of squared residuals on squared fitted values.

D: Based on the test of skewness and kurtosis of residuals.

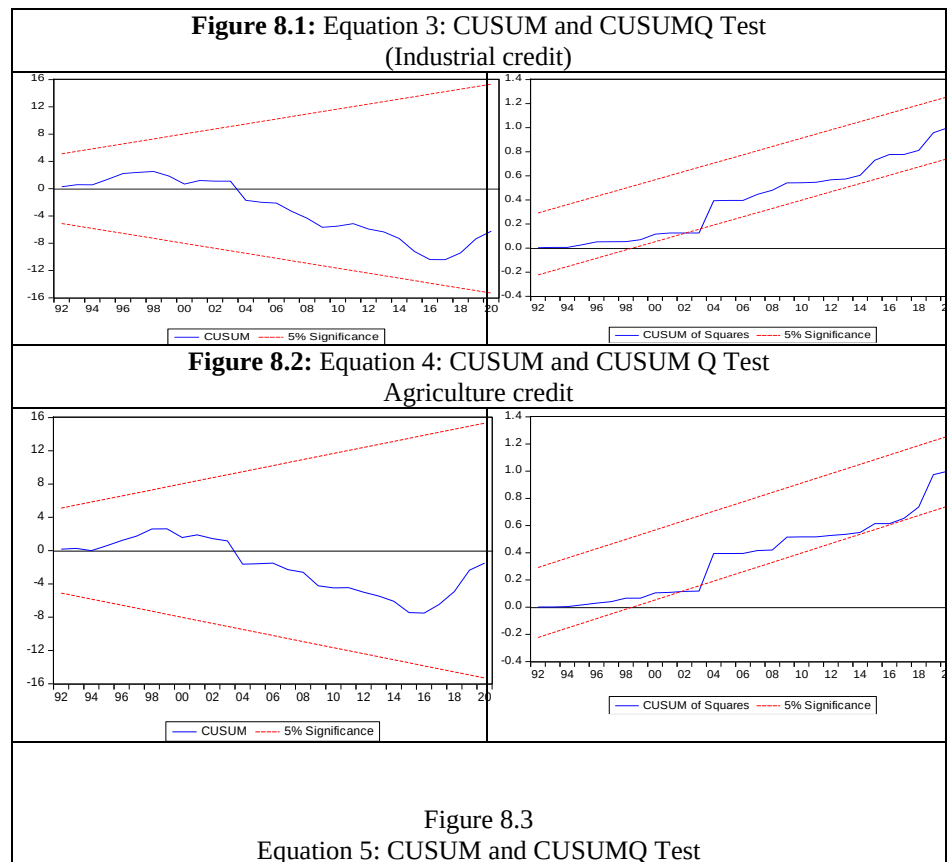
Additionally, the diagnostic tests of the models are reported in Table 7. To check the accuracy of the models, a set of diagnostic tests was performed on the estimated models. The results confirm that there is no diagnostic issue in the estimated models. The LM test showed that no serial correlation exists in the disturbance term, and we therefore accept the null hypothesis of no serial correlation in the models. Moreover, the

Ramsey RESET test and heteroscedasticity tests also proved the accuracy of the models by accepting the null hypothesis of a constant variance residual over time.

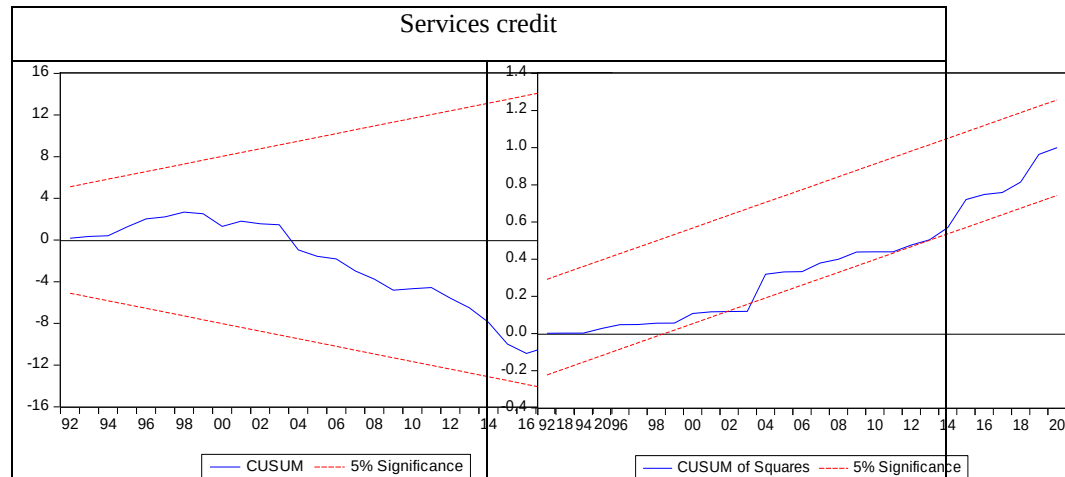
4.1.5. CUSUM test for Parameter Stability

For parameter stability, this study applied the cumulative sum (CUSUM) of recursive residuals and the CUSUM of squares (CUSUMQ) test in equations 3, 4, and 5. The CUSUM identifies the systemic changes in the regression coefficients, while CUSUMQ identifies sudden changes in the constancy of the regression coefficients. The results of this test are presented in Figures 8.1, 8.2, and 8.3. Figures 8.1, 8.2, and 8.3 show that the recursive residuals fall within the 95% boundaries, indicating that the parameters of Equations 3, 4, and 5 are stable.

Table 8: Stability of Parameters through CUSUM Test



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Note: The straight lines represent critical bounds at 5% significance.

Source: Authors' estimation.

5. Conclusion and Policy Implications

The contribution of financial development to trade policies is uncontroversial; however, it is essential to understand the policy indicators that highlight the role of financial development in reducing the trade deficit in Pakistan. This study aims to highlight the linkages between import demand, financial development, expenditure components, and relative prices throughout 1985-2020 for Pakistan. The ADF and PP unit root tests are used to determine the stationarity of the series. The study developed three models by incorporating sector-wise bank credit to the industrial, agricultural, and services sectors as a proxy for financial development in equations 3, 4, and 5. The long-run coefficients estimated through Dynamic Ordinary Least Squares (DOLS) indicate that credit to the agricultural sector has a negative and significant impact on import demand in Model 1. In contrast, industrial sector credit was found to be positively and significantly associated with import demand in Model 2. Moreover, consumption expenditure is the primary driver of import demand in equations 3, 4, and 5. The coefficient of relative price has shown a negative and significant impact on import demand in all estimations. Fully modified ordinary least squares (FMOLS) reconfirmed the previous findings. The CUSUM test found that the parameters of equations 3, 4, and 5 are stable. The study recommended that policymakers should design financial development policies that support import substitution in the economy. Additionally, the import of new

technology will be effective in developing new business, increasing domestic production, and exports, which will lead to an increase in foreign exchange reserves. Furthermore, the credit policies should be designed to promote industrial expansion, but this policy should be growth-oriented and aimed at maintaining a manageable current account deficit. In addition, the central bank's accommodative policies face constraints such as weak banking penetration, informal credit markets, and lack of investor confidence, all of which need to be addressed while making trade policies.

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