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RESEARCH ARTICLE

Cross-Border Bank Flows to Pakistan: Does Domestic Bank Performance Matter?

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Abstract: This paper empirically investigates the role of domestic bank performance in attracting cross-border bank flows to Pakistan utilizing quarterly data ranging from 2005Q4 to 2022Q4. We employ the ADF test to determine the order of integration of variables. The outcomes of the test substantiate that some variables are stationary and some are first-order integrated. Interest rate differential and foreign inflation are stationary at the level, while all other variables are first-order integrated. Therefore, we exploit the ARDL bounds approach to detect the presence of cointegrating relationships among the variables. The outcomes of the test confirm the existence of long-run relationships among the variables. Further, it is observed that the nature and magnitudes of effects vary across lags and variables in the short run. All the lags of cross-border bank flows and domestic economic activity have positive and significant effects, while the lags of all other variables have mixed effects in the short run. Domestic industrial production index, bank performance REER, interest rate differential, and foreign inflation boost up, while domestic inflation, stock price, and exports distort bank flow to Pakistan in the long run. Overall, it is confirmed that domestic economic activity and bank performance play a significant and crucial role in attracting cross-border bank flows to Pakistan. Therefore, we recommend that domestic economic conditions, as well as banking conditions, should be improved to allure foreign bank flows to Pakistan.

Keywords: Cross border bank flows; Domestic bank performance; Real effective exchange rate; Industrial production index; ARDL
JEL Classification Codes: F21, F32, F42, G15, G18

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1. Introduction

The interconnection of worldwide economic activities is increasingly deepening in this era of globalization. In recent years, economic and financial integration has been the defining feature of the global financial system. International lending and the growing interconnectedness of financial institutions across borders have led to interdependence among economies, especially in the financial sphere (Sahoo & Sethi, 2023; Takáts & Temesvary, 2020). Researchers have extensively studied the integrating nature of the global financial system to the extent that the phrase "the world is growing increasingly connected" now sounds like a cliché (Bruno & Shin, 2014).

Given the growing financial integration, the world witnessed an enormous surge in cross-border bank flows (henceforth CBBFs) during the 1990s till the global financial crisis (henceforth GFC), and a sudden

slowdown in the immediate aftermath of GFC (Tran et al., 2022; Choi & Furceri, 2019). International bank flows grew by around 8.5 percent between 1980 and 2010. However, financial uncertainty and fragility prevailed during the GFC substantially squeezing the volume of these flows. To ensure financial soundness and insolvency of the banks operating across borders during financial stress, the Basel III regulatory framework focuses on enhancing banks' resilience through improving standards of capital adequacy (Oyetade et al., 2022; Gehrig & Iannino, 2021; Figuet et al., 2015).

The CBBFs provide funds (in foreign currency) required to carry out international transactions and, hence, serve as a spur to domestic economic activity in the recipient countries. The developing countries often face the problem of shortage of foreign exchange which can, to some extent, be tackled by international borrowing. Besides, CBBFs also function as a mode of transfer of capital across borders, facilitating international investment. The nature of the effect of capital flows on the recipient economy depends on the initial macroeconomic conditions in the receiving economy and the nature of capital inflows. A sound domestic economic and financial environment warrants a favorable impact of capital inflows, while vulnerable domestic conditions heighten economic risk that, in turn, causes a sudden stop of capital inflows, resulting in an exacerbating effect of capital inflows (De Crescenzio & Lepers, 2024).

Realizing the importance of CBBFs several research explorations attempt to detect and investigate the role of their driving factors (Correa et al., 2022; Cerutti et al., 2023, 2017). These studies classify the drivers of CBBFs into major two categories: push factors and pull factors (Choi et al., 2023). The economic and financial conditions in the country of origin are referred to as "push factors" while those in the receiving countries are termed "pull factors". Further, there is a debate on whether push or pull factors play a dominant role. In this context, it is argued that drivers of bank flows vary from country to country, hence policy responses aimed to attract them also differ across countries (Shirota, 2015). Nevertheless, Barrel and Nahhas (2020) and Bruno and Shin (2015, 2013) maintain that push factors play a comparatively dominant role than pull factors.

Further, researchers have examined the channels through which bank flows transmit. Among these channels, bank lending and risk-taking channels are the most prominent ones. There exists a stance that global risk and uncertainty, measured by VIX , are very important push factors (Choi & Furceri, 2019; Julio & Yook, 2016). On the other hand, it is also maintained that bank credit channel also plays a significant role in the transmission of CBBFs and capital flows. The presence of bank branches across borders and a well-connected network of central banks supported by advanced bank technology facilitate quick transmission of bank flows. Even central bank policy action – change in interest rate – stimulates bank flows by making cross-border lending and borrowing lucrative (Fabiani & Neanidis, 2023; Filardo & Siklos, 2020).

Academicians and policy analysts have also explored many other factors that drive CBBFs. They are of the view that the economic and financial conditions of receiving and origin countries play a critical role. Among them, financial sector development, economic growth, and trade openness stand prominent (Cerutti et al., 2023, 2017; Khan, 1996). However, the existing literature overlooks the role of domestic bank performance. Likely, domestic banking conditions may significantly influence bank flows because

the soundness and stability of domestic financial conditions improve the credibility of local banks. Thus, it merits investigation to explore whether domestic bank performance attracts or discourages foreign bank inflows.

1.1.Research Problem

With categorizing the drivers of CBBFs as 'push factors' and 'pull factors', a number of studies have investigated the drivers of CBBFs (Mercado Jr, 2023; Barrell & Nahhas, 2020; Calvo et al., 1993). The recent work in this area focuses on the channels of CBBFs. One string of this literature analyses the role of the risk channel in transmitting CBBFs (Brana et al., 2024; Karolyi et al., 2023; Goyal et al., 2022; Correa et al., 2022). On the other hand, the other strand of recent literature investigates the role of banking channel (Fabiani & Neanidis, 2023; Radev, 2021; Filardo & Siklos, 2020). Overall, researchers have investigated global economic and financial conditions, global risk, domestic economic conditions, monetary policy stances of major economies, and the network of international banking as drivers of CBBFs, but they have overlooked the role of domestic bank performance in attracting CBBFs. Since the financial stability as well as financial development strengthens the credibility of banking system, domestic bank performance can potentially play its part in attracting CBBFs.

Acquiring insight from the existing literature that highlights the importance of bank inflows to developing countries, this study attempts to explore the drivers of CBBFs to Pakistan, with a special focus on the role of domestic bank performance. This study contributes to literature in the following ways. Firstly, it investigates the role of domestic bank performance in attracting CBBFs which has not received considerable attention from the researchers. Secondly, hardly any study has investigated the drivers of CBBFs to Pakistan. To the best of our knowledge, there exists hardly any study that has rigorously investigated this area. Thirdly, it prescribes policy actions based on empirical analysis.

This paper proceeds as follows. Its second section briefly reviews the literature on the topic. The third section elaborates variables under investigation and their data sources and presents an econometric model. The fourth section discusses the results obtained through different econometric tests. The last section concludes and suggests policy actions to the practitioners.

2. Literature Review

Researchers have rigorously investigated various kinds of drivers of CBBFs using different datasets and econometric techniques. The findings of the research endeavors made in this area provide valuable insights into and highlight the importance of bank flows and their determinants for many reasons.

The empirical literature in this field focuses on the elements of cross-border capital flows, bank loans, and debt instrument flows. Moreover, the studies that examine the drivers of these international financial flows, considering their origin and destination, classify their drivers into two major categories: "pull" (domestic) and "push" (global) factors. In this regard, one of the pioneer works is attributed to Calvo et al. (1993) in which they, highlighting the significance of common global (push) factors, draw a line between push and pull factors that drive cross-border capital flows. Further, the pull factors of these flows include the recipient country's degree of openness of the capital account, credit risk, and GDP

(output) growth. On the other hand, the push factors consist of monetary policies of advanced economies, global output growth, and global risk aversion (Mercado Jr, 2023; Barrell & Nahhas, 2020; Belke & Volz, 2019; Cerutti et al., 2017).

In addition, some authors identify improved macroeconomic conditions as pull factors and advantageous global conditions as push factors of the surges in capital flows to the EMEs and advanced economies (Chuhan et al., 1998; Taylor & Sarno, 1997). Further, Brana et al. (2024) argue that the presence of foreign banks in EMEs and their compliance with banking regulations and financial soundness are potential pull factors. Additionally, Mercado Jr (2024) investigates the functioning of gravity factors such as economic ties, asymmetric information, and global risk aversion as push and pull factors of bilateral capital flows among 10 advanced economies, and provides evidence for regional contagion. Adding to the same sort of literature, Bruno and Shin (2013, 2015) establish the supremacy of push (global) factors over the pull (domestic) factors in determining the intensity of cross-border capital flows.

Another string of literature investigates the drivers of different episodes of capital flows. For instance, Forbes and Warnock (2012) stress the role of global factors, especially global risk aversion sentiment, in driving four extreme episodes of global cross-border capital flows: surge, flight, stop, and retrenchment. Along the same line, some other studies, investigating the drivers of gross international flows, impute retrenchment of CBBFs after the GFC to de-globalization, risk aversion, and deleveraging (Cerutti et al., 2017; Forbes et al., 2015). Further, Radev (2021) substantiates that undercapitalization of parent banks transmits solvency shock across borders, while anomalies in wholesale lending from parent banks to their foreign subsidiaries lead to the transmission of wholesale funding shocks.

Besides, many studies substantiate that global risk conditions are important drivers of cross-border capital and bank flows. For example, Correa et al. (2022) argue that the risk-taking channel plays its part in the transmission of bank flows across borders. They also find that monetary policy stance is also a crucial determinant of CBBFs. However, Avdjieve et al. (2020), documenting changes in the responses of cross-border lending and bond flows in the aftermath of the GFC, contend that cross-border loans became increasingly responsive to the US monetary policy and less responsive to global risk. Bruno and Shin (2015) envisage that market participants' risk appetite is one of the key factors affecting global liquidity conditions. Further, the periods of serenity in financial markets, where global investors present less risk-averse attitudes, are connected with high bank leverage and a surge in CBBFs. Opposite to this, several authors document retrenchment or reduction in capital flows by global investors during the "risk-off" periods (McCauley, 2012; Forbes & Warnock, 2012).

Further, Choi and Furceri (2019) find global risk, measured by VIX, is an important driver of CBBFs. They further investigate the roles of supply and demand side drivers, and country-specific uncertainty. Analogously, Rey (2015) asserts that the VIX is one of the key drivers of global liquidity. Nonetheless, he observes that the monetary conditions of major financial centers are highly associated with the VIX, and deeply influence the common global financial cycle of international capital flows. Further, Reinhardt and Riddiough (2015) utilize panel data of 25 advanced and emerging economies to

analyze the reactions of intra-bank and interbank cross-border flows to variations in global risk. They endorse that interbank cross-border flows shrink during periods of high global risk volatility while intra-bank cross-border flows remain stable or even increase. Additionally, Brana et al. (2024) and Goyal et al. (2022) also note that global uncertainty deeply influences CBBFs in the post-GFC period.

Another thread of literature explores banking sector indicators as drivers of international financial flows. For instance, Karolyi et al. (2023) find systemic risk is an important factor of cross-border financial flows. They maintain that lower systemic risk associated with the banking system of target country results in an upsurge in financial inflows. Further, asset quality, profitability, and efficiency of the banking sector of the target country also play an important role in this context. Park and Shin (2021) find that non-performing loans are also stimuli of capital flows. According to Takáts and Temesvary (2021), the monetary policy stance of major economies coupled with easy monetary policy in home countries serves as an impetus to bank flows. Nevertheless, Siwińska-Gorzelak (2024) argues that fiscal rules in origin and host countries also affect cross-border bank claims.

Another strand of literature documents that global bank leverage and its cycles are important determinants of bank flows and financial conditions. To investigate this stance, Bruno and Shin (2013) use panel data for 46 developed and emerging economies and endorse that the important driver of banking sector capital flows is the global banks' leverage cycle. Further, global liquidity, in turn, determines the credit growth in the recipient country by following the global banks' leverage cycle. However, Bruno and Shin (2014) argue that global liquidity is determined by global banks' leverage before 2008. Moreover, they are of the view that the magnitude of gross capital flows among countries mainly determines their financial conditions. Besides, Everett (2016) utilizes the determinants of global liquidity as its proxy to examine their impact on CBBFs. For this purpose, the study exploits the US broker dealers' equity scaled by assets as a proxy of global bank leverage and the VIX as an indicator of global risk, considering them the determinants of global liquidity.

Some other empirical studies discover some macroeconomic and financial factors as drivers of international capital and bank flows, using panel data analyses. They investigate and pinpoint broker-dealers' leverage, short-term real interest rates, term spread (slope of yield curve), TED spread , VIX, growth rate of M2, real GDP growth, inflation, interest rate differentials, index of financial globalization and stock market turnover ratio as determinants of international financial flows (Osina, 2021; Cerutti et al., 2017). However, Cerutti et al. (2023) observe different associations of Chinese banking indicators with international financial flows. They are of the view that normally bank lending is sturdily correlated with FDI flows, but this is not the case in the context of Chinese banks.

Overall, the studies, investigating the relationships between cross-border capital and CBBFs and their determinants, find that CBBFs increase with the increase in the US broker-dealers' leverage and real interest rates, and decrease with the increase in the US VIX index, TED spread, term spread and appreciation of the US dollar (in terms of real effective exchange rate (henceforth REER)) (Cerutti et al., 2017; McCauley et al., 2015; Rey, 2015). Apart from this, some authors investigate the role of lending borrowing countries' banks in CBBFs. In this line, Park and Shin (2021) examine the role of

nonperforming loans. They document that the ratios of nonperforming loans both in lending and borrowing countries are positively associated with CBBFs.

3. Data and Methodology

This section sheds light on the variables used in the analysis and presents the sources from which data on different variables is obtained. It also gives the reason for the selection of the econometric technique and sketches the model exploited in this exploration.

3.1 Variables and Data Sources

This study explores the drivers of CBBFs to Pakistan, with a special focus on the role of domestic bank performance, using quarterly data ranging from 2005Q4 to 2022Q4. The availability of data on regulatory capital to risk-weighted assets, which we use as a measure of domestic bank performance, primarily determine the selection of this period, as its data is available only for this period. Overall, as the data on all variables is not available in one database, it has been extracted from different data sources. The data on the industrial production index of Pakistan (domestic economic activity), the REER of Pakistan, domestic and foreign CPIs and interest rates, and stock price of Pakistan has been extracted from International Financial Statistics (IFS), IMF. The data on CBBFs has been obtained from the BIS, that on regulatory capital to risk-weighted assets for Pakistan from the Financial Soundness Indicator (FSI), IMF, and on Pakistan's exports from the Direction of Trade Statistics (DTS), IMF.

3.2 Descriptive Statistics

Table 1 exhibits that the mean values of variables are approximately equal to their median values which implies that the variables approximately follow normal distribution. The mean values of CBBFs, industrial production index, REER, interest rate differential, and foreign inflation are slightly greater than their median values which indicates that these variables take on greater median values most of the time in the sample period, while the mean values of other variables are slightly smaller than their mean values.

Table 1: Descriptive Statistics

Variables	Obs	Mean	Median	Std. Dev.	Maximum	Minimum
LCBBF	69	9.1234	9.0875	8.0614	9.7283	8.3422
LIPID	69	4.7203	4.6803	0.1715	5.1887	4.4581
REER	69	104.2058	101.5960	7.9888	124.4857	93.1791
INTD	69	10.0543	10.0020	2.5208	15.0032	6.2501
DBP	69	15.3001	15.5287	1.8975	19.4579	11.5321
LSTP	69	10.1717	10.2617	9.5693	10.8052	8.6358
INFD	69	3.3706	2.5710	3.9533	25.3591	-1.8721
INFF	69	0.6790	0.5104	0.7859	4.0553	-1.0531
LEXP	69	8.6251	8.6353	0.1792	9.0374	8.2568

Note: LCBBF is the log of CBBFs to Pakistan, LIPID is the log of the industrial production index of Pakistan, LSTP is the log of the stock price index of Pakistan, INTD is the interest rate differential, DBP is domestic bank performance, INFD is domestic Inflation, REER is the REER of Pakistan, INFF is foreign inflation and LEXP is the log of Pakistan's

exports.

It is apparent from Table 2 that CBBFs are comparatively more strongly associated with the stock price, domestic bank performance, and Pakistan's exports, with correlation coefficients of -0.5909, 0.5772, and 0.5575 respectively. Further, the stock price index and industrial production index are highly and positively correlated, with correlation coefficient of 0.7665. REER and interest rate differential, and stock price index and industrial production index are also substantially pair-wise correlated.

Table 2: Correlation Matrix

Variables	LCBBF	LIPID	REER	INTD	DBP	LSTP	INFD	INFF	LEXP
LCBBF	1								
LIPID	-0.4728	1							
REER	-0.0018	-0.1306	1						
INTD	0.2158	-0.1844	-0.7222	1					
DBP	0.5772	0.6945	0.1972	-0.4312	1				
LSTP	-0.5909	0.7665	0.3717	-0.5833	0.7916	1			
INFD	-0.2242	0.5783	-0.4113	0.2103	0.2291	0.2973	1		
INFF	-0.1333	0.6115	-0.2109	-0.0121	0.1442	0.3603	0.6036	1	
LEXP	0.5575	0.7139	-0.1106	0.0302	0.5279	0.5109	0.5113	0.5654	1

3.3 Econometric Model

The legitimacy of the findings of a research exploration principally depends on the suitability and compatibility of statistical tools and econometric techniques it employs for the analysis, as incompatible econometric models may yield spurious and nonsense results. There is a variety of econometric models available for the analysis of economic data, but researchers try to employ the most suitable to the data and objectives of the exploration. Therefore, the research endeavors aiming to explore the determinants of CBBFs have exploited a wide range of models that they find well fit to their data and objectives. For instance, some authors have employed panel data techniques and some others have utilized time series econometric techniques.

Since the focus of this study is on the inspection of the determinants of CBBFs of one country and the data under analysis is time series, it employs time series econometric techniques. The selection of the time series econometric technique further depends on the dynamics of the data, particularly on the order of which variables under investigated are integrated, which is a prerequisite for the soundness of the

econometric model. For this purpose, unit root tests are generally utilized.

Unit Root Test

Econometricians have devised several tests to determine the stationarity of time series, but the most widely used are the ADF devised by Dickey and Fuller (1979), PP designed by Phillips and Perron (1988), and KPSS developed by Kwiatkowski et al. (1992). However, Arltová and Fedorová (2016) argue that the ADF test relatively performs better under some of the conditions and, hence is the best choice to analyze the presence of unit root. Nonetheless, it is also the most widely employed in the literature. In line with the prior literature and keeping in view the limitations and advantages of the battery of tests, this study utilizes the ADF test.

Cointegration Analysis

It is generally maintained that if time series are unit root processes and are not cointegrated, their regression analysis yield spurious findings. Owing to this reason, the second in time series analysis is to check the presence of cointegrating relationship among the variables. For cointegration, the popular cointegration tests are Johansen-Juselius, Engle-Granger and autoregressive distributed lag (henceforth ARDL) bounds tests. The Johansen and Engle-Granger tests take the series under investigation must be first-order integrated (unit root processes); none of them should be stationary. Whereas, the ARDL bounds test check the presence of long-run relationship (cointegration) even when some series are stationary, and some are unit root processes, but none of them should be second or higher order integrated.

We have a combination of stationary and unit root series, with the highest order of integration being one. Moreover, we also attempt to inspect the dynamics of the relationships among variables in the short-run as well as in the long-run. So, the ARDL bounds test better serves our objectives. The ARDL bounds test conforming to our analysis can be as:

$$\begin{aligned}
&\Delta LCBBF_t \\
&= \alpha + \beta LIPID_{t-1} + \gamma REER_{t-1} + \delta INTD_{t-1} + \eta DBP_{t-1} + \theta LSTP_{t-1} + \vartheta INFD_{t-1} + \kappa INFF_{t-1} \\
&+ \lambda LEXP_{t-1} + \sum_{i=0}^{I} \nu_i \Delta LIPID_{t-i} + \sum_{j=0}^{J} \pi_j \Delta REER_{t-j} + \sum_{k=0}^{K} \rho_k \Delta INTD_{t-k} + \sum_{l=0}^{L} \sigma_l \Delta DBPCR_{t-l} \\
&+ \sum_{m=0}^{M} \tau_m \Delta STP_{t-m} + \sum_{n=0}^{N} \varphi_n \Delta INFD_{t-n} + \sum_{p=0}^{P} \phi_p \Delta LEXP_{t-p} + \sum_{q=0}^{Q} \psi_q \Delta LCBBF_{t-q} + \varepsilon_t
\end{aligned}$$

Where the null hypothesis is:

$$H_0: \beta = \gamma = \delta = \eta = \theta = \vartheta = \kappa = \lambda = 0$$

The alternative hypothesis is: at least one of them is not zero.

Stating another way it becomes:

$$H_1: \beta \neq \gamma \neq \delta \neq \eta \neq \theta \neq \vartheta \neq \kappa \neq \lambda \neq 0$$

Here, the rejection of null hypothesis validates the presence of cointegrating relationship. The conclusions in this regard are made by comparing the value of the *F-statistic* with its lower and upper

bounds given by Pesaran et al. (2001). It is held that the *F-test* suffices for the existence of cointegrating relationships but Pesaran et al. (2001) also accept the *t-test* and further argue that there might be degenerated relationships among the variables if the *t-test* is not satisfied. For the existence of the cointegration relationships, the *t-test* requires that the coefficient β must be significantly different from zero (i.e. $\beta \neq 0$). We follow both *F* and *t*-tests to derive conclusions.

Further, the long-run form of the model can be sketched as:

$$LCBBF_t = \alpha + \gamma LIPID_t + \delta REER_t + \eta INTD_t + \theta DBP_t + \vartheta LSTP_t + \kappa INFD_t + \lambda INFF_t + \mu LEXP_t + \varepsilon_t$$

The short-run form can be shown as:

$$\Delta LCBBF_t = \varpi + \sum_{j=0}^{J} \nu_j \Delta LIPID_{t-j} + \sum_{k=0}^{K} \pi_k \Delta REER_{t-k} + \sum_{l=0}^{L} \rho_l \Delta INTD_{t-l} + \sum_{m=0}^{M} \sigma_m \Delta DBP_{t-m} + \sum_{n=0}^{N} \tau_n \Delta LSTP_{t-n} + \sum_{p=0}^{P} \varphi_n \Delta INFD_{t-p} + \sum_{q=0}^{Q} \phi_q \Delta INFF_{t-q} + \sum_{r=0}^{R} \psi_r \Delta LEXP_{t-r} + \chi ECM_{t-1} + \varepsilon_t$$

Here, $LCBBF_t$is the natural log of CBBFs in time *t*, $LIPID_t$ is the natural log of the industrial production index of Pakistan in time *t*, $REER_t$ is the REER of Pakistan in time *t*, $INTD_t$ is interest rate differential, measured as a difference between the policy rate in Pakistan and the federal rate in the US, in time *t*, DBP_t is the domestic bank performance in time *t*, $LSTP_t$ is the natural log of the stock price in Pakistan in time *t*, $INFD_t$ is domestic inflation in time *t*, *INFF* is foreign inflation in time *t*, $LEXP_t$ is the natural log of Pakistan's exports in time *t*, ε_t is the white noise term and Δ represents the first difference. Further, the lag length can differ across variables, as the ARDL model allows for it. Moreover, the coefficient of error correction term (henceforth ECT), χ, captures the speed of adjustment of short-term deviations to the equilibrium path. Further, as recommended in the literature, it must be negative with an absolute value smaller than one to ensure convergence to the long-run equilibrium path. And *J*, *K*, *L*, *M*, *N*, *P*, *Q*, and *R* represent optimal lag lengths chosen on the basis of AIC. Their values may differ from one another.

Post-Estimation Diagnostics

The ARDL model requires some post-estimation tests for the calibration of results. The post-estimation diagnostics analyze the problems of serial correlation, heteroscedasticity, model errors, and instability of parameters. In this scenario, we execute some diagnostic tests for the authenticity of our findings. These tests are briefly described below.

Serial Correlation

The problem of serial correlation occurs in time series analyses when the error term of one period correlates with that of another period(s). It may create misleading conclusions because it deeply affects the efficiency of estimators. However, estimates remain unbiased and consistent. Following the existing literature we employ the Breusch-Godfrey (henceforth BG) LM test for serial correlation with lag length 8 to analyze this problem.

Heteroscedasticity

It refers to the situation where the variance of residuals does not remain constant rather it

becomes dependent on explanatory variable(s). It may affect standard errors of the estimates and hence may lead to wrong inferences regarding the significance of the estimates. To this end, we use the Breusch-Pagan-Godfrey (hereafter BPG) test.

Model Specification

Model misspecification may lead to misleading findings. For this purpose, we use regression specification error test (RESET) designed by Ramsey to test linear specification against the non-linear (quadratic) specification.

Stability of Parameters

The credibility of findings requires that the estimates of the model remain consistent over time. It implies that there are no shifts and abrupt changes in estimates over the sample period. To check the consistency of parameters, getting insight from the existing literature, we exploit CUSUM and CUSUMSQ plots.

4. Results and Discussion

This section presents the findings of the study and provides interpretation and analysis of the results derived. In this section, we delve into the key outcomes of our research endeavor and examine their significance with relevance to our focus and aim.

4.1 Unit-Root Test Results

It is evident from Table 3 that some variables are stationary at their level and some are first-order integrated (stationary at their first difference) but none of them is second or higher-order integrated. The rejection of null hypothesis at 5% level of significance for the cases of interest rate differential and foreign inflation implies that these variables are stationary at their level. However, all other variables are not stationary at their level as we cannot reject the null hypothesis even at a 10% level of significance, but they are first order integrated.

Table 3: Unit Root Test

Variable	Level		First Difference	
	t-test	p-value	t-test	p-value
LCBBF	-1.7444	0.4047	-7.5355	0.00
LIPID	-0.7272	0.8323	-13.5270	0.00
REER	-1.3790	0.5875	-6.5287	0.00
INTD	-2.9662	0.0487	-	-
DBP	-1.9310	0.3164	-6.8326	0.00
LSTP	-0.8470	0.7989	-7.6351	0.00
INFD	0.9117	0.9951	-10.6106	0.00
INFF	-3.4246	0.0134	-	-
LEXP	-2.5243	0.1143	-7.6674	0.00

4.2 Cointegration Test Results

As this study has a mixture of stationary and unit root process variables, it exploits the ARDL bounds cointegration technique to detect the presence of long-run cointegrating relationships among the variables. It is substantiated by Table 4 that the series under investigation are highly cointegrated. The lower and upper bounds (tabulated) values of *F-Statistic* corresponding to 1% level of significance and eight parameters are 2.62 and 3.77. The calculated value of *F-Statistic* is 4.0608 which is larger than the upper-bound value. Hence, it can be inferred that the variables under inspection possess cointegrating relationship.

Table 4: ARDL-Bounds Test Results

F-Statistic (Tabulated)	Number of Parameters	Level of Significance	Lower Bound	Upper Bound
	8	10%	1.85	2.85
	8	5%	2.11	3.15
	8	2.50%	2.33	3.42
	8	1%	2.62	3.77
F-Statistic (Calculated)	4.0608			

4.3 Results of the Short-Run Determinants

The first three lags of CBBFs have positive and significant bearings on the bank flows to Pakistan (as portrayed in Table 5). It implies that the flows to Pakistan are, to some extent, characterized by inertia. A surge in bank flows in the previous period causes elevated bank flows in the following periods. It can further be concluded that the second quarter of CBBFs has the strongest (in terms of the magnitude of the coefficient), while the third quarter has the weakest effect. Analogously, the industrial production index of Pakistan has also significant and favorable impact on bank flows to Pakistan in the short run. Its current and second lag is significant, while the first lag has an insignificant effect on bank flows to Pakistan. It suggests that stable and strong domestic economic conditions attract foreign bank flows which is consistent with the existing literature, as domestic economic conditions are regarded as strong pull factors.

Further, the REER of Pakistan also significantly influences bank flows to Pakistan. Its current period and third quarter (lag) serve as a short-term impetus to bank flows to Pakistan, as their coefficients are positive and significant. However, it first lag has a significant and negative effect, while the second lag has no effect. The domestic bank performance also significantly determines bank flows to Pakistan in the short run. Domestic bank performance discourages flows in the short run as it has significant and negative effect. However, in the long run, it allures foreign bank flows. The current period and the first lag of Pakistan's stock price boost bank flows to Pakistan as they have positive and significant coefficients. However, its second lag has a negative effect.

Moreover, domestic and foreign inflations hinder bank flows to Pakistan in the short run. It is quite interesting to see the same nature of the effects of both domestic and foreign inflations. To first three lags of domestic inflation have a negative and significant bearing on bank flows to Pakistan. It

means domestic inflation continues to distort bank flows to Pakistan over a considerable period. On the other hand, only the first two lags, not the current period value, of foreign inflation disrupt bank flows to Pakistan. It implies that foreign inflation has a lagged effect: it takes one quarter of time to influence. Lastly, Pakistan's exports have a significant short-term impact on bank flows to Pakistan. The current period and first lag of Pakistan's exports have a positive and significant 5% level of significance impact, while second and third lags remain insignificant. Overall, Pakistan's exports boost bank flows to Pakistan which is quite normal as a rise in exports of a country increases foreign bank claims which are to settle, hence leading to a surge in bank flows to the country.

It is also evident that the variables have stable long-run relationships, as the coefficient of ECT is significant, negative, and has an absolute value of less than one. It exhibits that in case any short-term drift from the equilibrium path is corrected back. The value of the coefficient is -0.9698 which implies that around 96% of deviations from the equilibrium path are corrected after one period of time (which is one quarter here).

Table 5: Results of the Short-Run Determinants

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCBBF(-1))	0.5302	0.1054	5.0276	0.00
D(LCBBF(-2))	0.5507	0.1141	4.8243	0.00
D(LCBBF(-3))	0.2746	0.1268	2.1648	0.0388
D(LIPID)	0.7955	0.3134	2.5383	0.0168
D(LIPID(-1))	0.5165	0.3934	1.3131	0.1994
D(LIPID(-2))	1.1382	0.3146	3.6180	0.0011
D(REER)	0.0257	0.0065	3.9350	0.0005
D(REER(-1))	-0.0123	0.0059	-2.0722	0.0472
D(REER(-2))	0.0002	0.0064	0.0356	0.9718
D(REER(-3))	0.0195	0.0068	2.8560	0.0078
D(DBP)	-0.0809	0.0284	-2.8471	0.0080
D(DBP(-1))	-0.0657	0.0293	-2.2437	0.0327
D(LSTP)	-0.0028	0.0016	-1.7223	0.0957
D(LSTP(-1))	0.0022	0.0008	2.6333	0.0134
D(LSTP(-2))	-0.0031	0.0007	-4.009	0.0004
D(INFD)	-0.0267	0.0075	-3.5472	0.0013
D(INFD(-1))	-0.0207	0.0063	-3.2660	0.0028
D(INFD(-2))	-0.0360	0.0110	-3.2682	0.0028
D(INFD(-3))	-0.0382	0.0099	-3.8445	0.0006
D(INFF)	0.0356	0.0339	1.0481	0.3032
D(INFF(-1))	-0.2851	0.0650	-4.3830	0.0001
D(INFF(-2))	-0.1579	0.0502	-3.1434	0.0038
D(LEXP)	-0.6074	0.2346	-2.5890	0.0149
D(LEXP(-1))	0.1349	0.2632	0.5125	0.6121
D(LEXP(-2))	0.4861	0.2235	2.1750	0.0379
D(LEXP(-3))	0.3097	0.1699	1.8231	0.0786

CointEq(-1)*	-0.9698	0.1329	-7.2945	0.00
R-squared	0.7983	Mean dependent var		-0.0086
Adjusted R-squared	0.6603	S.D. dependent var		0.1573
S.E. of regression	0.0917	Akaike info criterion		-1.6465
Sum squared resid	0.3195	Schwarz criterion		-0.7433
Log-likelihood	80.5137	Hannan-Quinn criter.		-1.2902
Durbin-Watson stat	2.1566			

4.5 Results of the Long-Run Determinants

In the long run domestic economic activity, REER, interest rate differential, domestic bank performance, and foreign inflation boost bank flows to Pakistan (as showcased in Table 6). Nevertheless, domestic stock price index, domestic inflation and exports hamper bank flows in the long run. Further, if the industrial production index of Pakistan rises by one percent, the CBBFs to Pakistan, on average, rise by 1.1 percent in the long run. It implies bank flows spring up with the improvement in domestic economic conditions. Serene domestic economic conditions strengthen investors' confidence, which also attracts foreign capital and bank flows. Similarly, a one-unit rise in REER leads to a 3 percent upsurge in bank flows to Pakistan.

The CBBFs to Pakistan jumped up by 10 percent in response to a unit rise in interest rate differential in the long run. It might be due to the reason that a rise in domestic interest rates compared to foreign interest rates makes it attractive for foreign investors to station their funds in the center which offers higher returns. Thus, it causes an upsurge in bank flows. Further, favorable and stable domestic banking conditions also play their part in attracting foreign bank flows, as the domestic bank performance of Pakistan has a positive and significant impact on bank flows to Pakistan in the long run. A sound and developed banking system wins and enhances people's confidence to keep their funds with banks. Resultantly, domestic bank performance plays a vital role in attracting foreign bank flows. Specifically, when the domestic bank performance of Pakistan scales up by one unit, it leads to a rise in bank inflows by around 10% in the long run.

Domestic stock prices and inflation exacerbate bank inflows. However, the effect of the stock price is very negligible, but it is still significant and negative, which indicates that the stock market mainly receives funds from local investors, instead of foreign investors. A rise in domestic inflation cuts down the real return (real interest rate) of financial resources, making domestic investment ventures less attractive to foreign investors. Resultantly, soaring domestic prices disrupt bank flows to Pakistan. On the contrary, foreign inflation pushes bank flows to Pakistan. It might be due to the reason that the real return on financial resources gets higher in Pakistan compared to that in other countries, which attracts foreign capital inflows to Pakistan. Apart from this, the negative effect of Pakistan's exports is quite strange. Overall, it can be concluded that domestic economic and bank performance caste a deep influence on bank flows to Pakistan.

Table 6: Results of the Long Run Determinants

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LIPID	1.1099	0.5253	2.1127	0.0433
REER	0.0370	0.0076	4.8210	0.0000
INTD	0.1045	0.0172	6.0457	0.0000
DBP	0.1093	0.0325	3.3549	0.0022
LSTP	-0.0002	0.0004	-4.2173	0.0002
INFD	-0.0528	0.0305	-1.7285	0.0945
INFF	0.6489	0.1232	5.2642	0.0000
LEXP	-2.1222	0.1922	-11.0414	0.0000
C	15.9858	3.1279	5.1106	0.0000

4.6 Results of Post-Estimation Diagnostics

The outcomes of the BG test confirm that the estimation procedure does have the problem of serial correlation, as the null hypothesis of no serial correlation is not rejected (Table 7). Further, the outcomes of the BPG test validate that the estimated regression model does not have the problem of heteroscedasticity. All this implies that the standard errors of estimates are not affected. Hence, the conclusions derived from the estimates may not be misleading, rather they are very consistent and reliable. Moreover, the outcomes of Ramsey's RESET endorse the fitness of the functional form of the model. It endorses that the model fits to the dynamics and interconnections of variables as far as its functional form is considered.

Table 7: Results of Post-Estimation Diagnostics

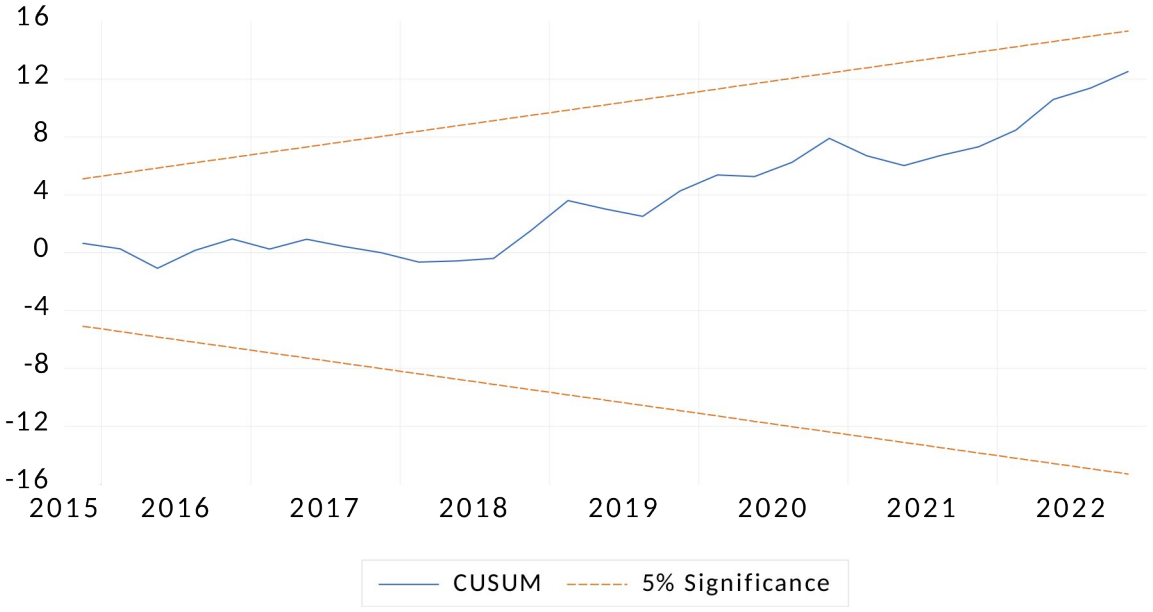
Breusch-Godfrey (LM) Test	F-statistic	1.6150	Prob. F(4,25)	0.2016
Breusch-Pagan-Godfrey Test	F-statistic	0.7001	Prob. F(35,29)	0.8439
Ramsey's RESET Test		Value	Df	Probability
	t-statistic	0.8939	24	0.3802
	F-statistic	0.7990	(1, 24)	0.3802

CUSUM Test

It is apparent from Figure 1 that the CUSUM function does not cross confidence bounds

throughout the entire period. It endorses the stability of relationships among variables and their corresponding coefficients. It indicates that estimates do not encounter any substantial structural break and do not widely fluctuate over the entire period.

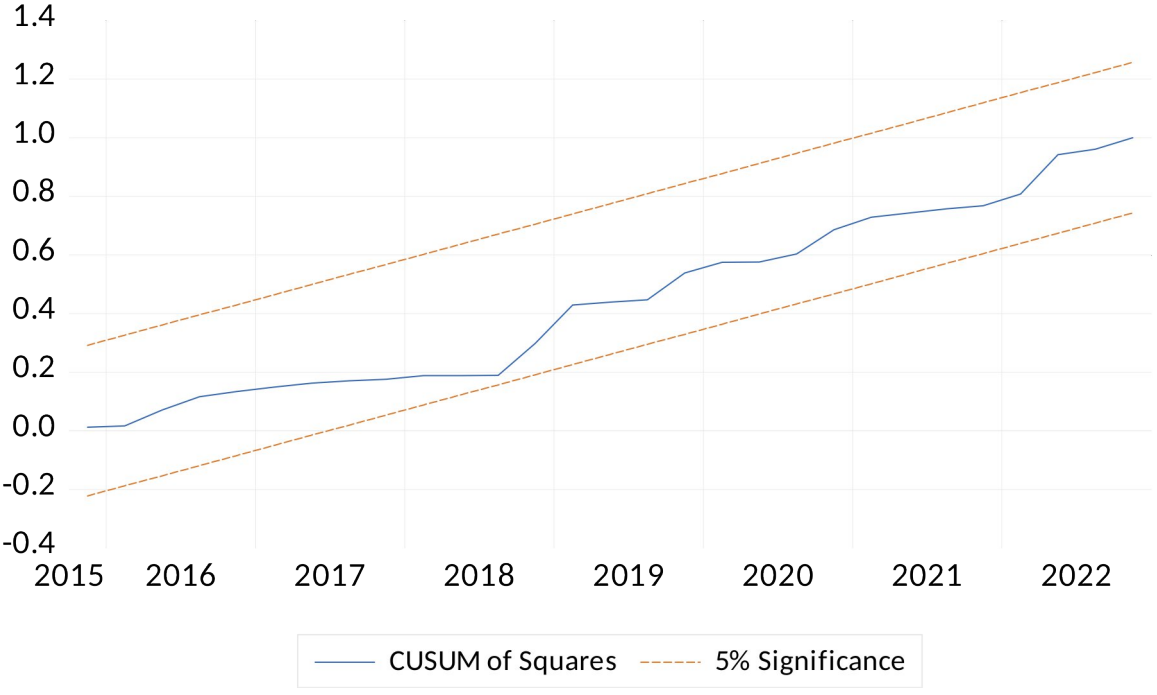
Figure 1: CUSUM Plot



CUSUMSQ Test

Figure 2 depicts that the CUSUMSQ function does not cross confidence bounds throughout the entire period, which endorses the stability of relationships among variables and their corresponding coefficients. Hence, the estimates of regression coefficients do not vary over time, rather they remain consistent.

Figure 2: Plot of CUSUMSQ



5. Discussion, Implications, Limitations and Future Research Direction

Bank inflows play a vital role in economic development and stability by fetching foreign exchange and liquidity to the economies in the times of retrenchment of foreign exchange reserves and liquidity. This study investigates the role of domestic bank performance in attracting CBBFs to Pakistan. The short-run analysis of the study reveals that the nature and magnitude of the effects vary across lags and variables. All the lags of CBBFs and domestic economic activity have positive bearings, whereas all the lags of domestic and foreign inflations harm bank flows to Pakistan. However, all other variables and their lags have mixed effects on CBBFs to Pakistan in the short run.

The long-run analysis establishes that almost all the drivers investigated have positive and significant effects on bank flows to Pakistan. The industrial production index of Pakistan significantly attracts CBBFs to Pakistan in the long run. It is consistent with the existing literature. It further indicates the domestic economic performance works as a pull factor (Calvo et al., 1993). The foreign investors normally invest in the countries with favourable economic conditions. Similarly, interest rate differential also boosts up CBBFs to Pakistan. It is due the reason that people seek opportunities which offer higher returns for their investment. Higher interest rate differential implies higher return offered by Pakistani banks compared to the world interest rate. Further, it supports the stance maintained by Osina (2021) and Takáts and Temesvary (2021). The REER and foreign inflation have a favorable impact on bank flows to Pakistan. These findings are consistent with the standard economics and finance theories as higher REER and foreign inflation imply higher return on the foreign capital, considering interest rate parity, and purchasing power parity and real exchange rate theories of exchange rate determination (Osina, 2021; Cerutti et al., 2017; McCauley et al., 2015).

The domestic bank performance also plays significant role in attracting CBBFs to Pakistan. This evidence supports the hypothesis maintained in this study. It suggests that strengthening confidence of people in banking system, improved domestic banking conditions encourage foreign residents to transfer their capital through banking channels. Moreover, it is also in agreement with the existing literature as noted by Brana et al. (2024). However, domestic stock price, domestic inflation and exports hamper bank flows to Pakistan in the long run. The negative effect of Pakistan's exports and stock prices on CBBFs to Pakistan are quite strange. Maybe, relative stock performance (in comparison to the performances of other stock markets) matter more than the absolute performance of the stock market in Pakistan. The better performances posted by other stock markets may outweigh that by the stock market of Pakistan in attracting CBBFs.

5.1 Policy Implications

Given the findings of the study, it is suggested that policymakers and authorities entrusted with the execution of policy measures should ensure serenity and stability in overall business activity. Sound and stable domestic economic activity and a well-linked and developed banking system boost bank flows to Pakistan, therefore, authorities should take steps to promote domestic economic activity and improve domestic bank performance. Besides, authorities concerned should take measures in a manner to keep the

domestic interest rate marginally above the foreign interest rate and control inflation, as interest rate differential has a favorable effect while domestic inflation has a detrimental effect on bank flows to Pakistan.

5.2 Limitations

The study investigates the role of domestic bank performance in attracting CBBFs by utilizing data for Pakistan only, it does not utilize a broader dataset for many countries or regions. Further, we exploit only one indicator of bank performance because the data on regulatory capital to risk-weighted assets only is available. Other indicators of bank performance may be utilized.

5.3 Future Research Direction

We suggest the investigation of the role of the law-and-order situation and local business environment in attracting CBBFs to Pakistan for future research endeavors. Besides, researchers may also utilize some other indicators of domestic bank performance for the cross-validation of the findings of the study in their future research explorations.

6. Conclusion and Recommendations

This investigation explores the short-term and long-term drivers of CBBFs to Pakistan, with a main thrust on the role of domestic bank performance, using quarterly data ranging from 2005Q4 to 2022Q4. We employ the ADF test to determine the order of integration of variables. The outcomes of the ADF test substantiate that some variables are I(0) while some are I(1). Interest rate differential and foreign inflation are stationary at level, while all other variables are first-order integrated. Therefore, for the cointegration analysis, we exploit the ARDL bounds test which confirms the presence of stable long-run relationships among the variables. Further, the analysis of the short-term effects reveals that the nature and magnitude of the effects vary across lags and variables. All the lags of CBBFs and domestic economic activity have positive bearings, whereas all the lags of domestic and foreign inflations harm bank flows to Pakistan. However, all other variables and their lags have mixed effects on CBBFs to Pakistan in the short run.

The long-run analysis establishes that almost all the drivers investigated have positive and significant effects on bank flows to Pakistan. The industrial production index of Pakistan, interest rate differential, REER, domestic bank performance, and foreign inflation have a favorable impact on bank flows to Pakistan, whereas domestic stock price, domestic inflation and exports hamper bank flows to Pakistan in the long run. Overall, domestic economic activity and domestic bank performance significantly attract foreign bank flows to Pakistan.

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