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Migration As A Governance Signal: World Bank Governance Indicators Predict Bree Outflow Volumes In Pakistan (1996-2024)

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	Abstract
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Keywords:	ARDL bounds testing; BEOE; brain drain; Granger causality; governance indicators; Pakistan; political economy; vicious cycle; World Bank Governance Indicators

1. INTRODUCTION

Pakistan's annual emigration has grown from under 200,000 registered workers in the mid-1990s to 832,339 in 2022 and 862,625 in 2023 (Shah, Shahzad, Quddus, & Qazi, 2024). In the same time period, the Pakistan's governance has not been improving consistently in any dimension as represented by the six World Bank Governance Indicators (WBGI). Terrorist attacks, military-civilian conflicts and constitutional crisis have caused significant deterioration in political stability. Government effectiveness continues to be lower than the global average. When there is a conflict between the Judiciary and the Executive the rule of law is reduced. There has been no significant improvement in the government's record of dealing with corruption. In the context of such a coincidence of governance decline and increased emigration over three decades, it is a fundamental question in migration policy and political economy whether this coincidence is causal.

There are several studies that have established a qualitative relationship. Kousar, Ahmed and Bukhari (2020) have also applied composite governance indices along with BEOE and World Development Indicators (WDI) data over the period 1990 to 2018, and concluded that there is a negative and significant long run relationship between the quality of governance, financial stability, standard of living, and infrastructure with brain drain. Improving governance decreases emigration. Azizullah and Mughal (2024) found a negative and significant long run effect of political stability on BEOE outflows in the period 1976–2020, whereas the unemployment rate and wage differentials have positive effects in the long run. Using a panel of 106 countries over 14 years (2007-2020), Amani, Javaheri and Ghorbani (2023) found that country risk, which consists of political, economic and financial risks, is positively and significantly related to brain drain for all risk groups.

None of these studies have used all six indicators of WBGI together as predictors for BEOE annual outflow volumes in a time-series framework of ARDL for the period 1996–2024. The six WBGI: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption, are the most widely-used and regularly calculated series of governance indicators for Pakistan. They are amenable to disaggregated analysis: different aspects of governance may be related to emigration in different ways, and have different causal structures. Disaggregation matters for policy. Political stability is the most important governance indicator of emigration; policy should be based on political stabilization. When effectiveness of government is more important, institutional capacity reform is the priority.

The second gap explored in this paper is the vicious circle hypothesis. On the theoretical side, Docquier and Rapoport (2012) maintained that there can be a vicious circle of brain drain and governance failure: governance failure leads to brain drain, brain drain leads to weak governance, and weak governance leads to more brain drain. This model was formalised by Bénassy and Brezis (2013) as a development trap model. It was qualitatively documented by Shah and Mahmood (2023) in the context of Pakistan using process-tracing methodology. However, no empirical study has been conducted in Pakistan to test the vicious circle hypothesis between the series of WBGI and BEOE outflow in Pakistan. This paper does so.

There are 3 contributions that I would like to make this paper. First, it constructs the first time-series econometric model with all six WBGI as simultaneously used predictors of BEOE outflow volumes for 1996–2024, which is not the case for other studies that rely on the composite governance index or only one or a few indicators. Second, it uses Granger causality tests, thus for the first time giving time-series evidence on the directionality of the governance-emigration relationship in Pakistan. Third, it empirically tests the vicious cycle hypothesis and evaluates the policy implications for the migration governance reform agenda for Pakistan.

1.1 Research Questions

This study addresses three research questions.

1. Do World Bank Governance Indicators specifically political stability, government effectiveness, rule of law, control of corruption, regulatory quality, and voice and accountability have statistically significant long-run relationships with BEOE annual outflow volumes in Pakistan over the period 1996–2024?
2. Which specific governance dimension has the strongest predictive relationship with BEOE emigration volumes, and does this differ between the short run and the long run?
3. Does Granger causality testing support the vicious cycle hypothesis that governance deterioration Granger-causes emigration acceleration and that emigration also Granger-causes governance deterioration in Pakistan's time-series data?

2. Literature Review

2.1 Governance and Brain Drain: Global Evidence

Using annual time series data for the period 1976–2020, Azizullah and Mughal (2024) employed Auto-Regressive Distributive Lag (ARDL) approach to obtain the results, which show that brain drain is negatively and significantly affected in the long run by political stability, whereas unemployment and wage differentials are positively. Their study is the first study to include only one dimension of WBGI, 'Political Stability', as a predictor in an ARDL setting for Pakistan. However, the other five WBGI were not included, nor was Granger causality tested.

Ashraf (2022a) gave the most detailed disaggregated analysis of the outflow composition of BEOE throughout the COVID cycle. He stated that the current surge of 832,339 was a structural recovery of previous pre-existing labours intensive migration and not a brain drain transformation. His occupational analysis verified that highly qualified and skilled workers' share of total BEOE outflows did not change from 4–5 percent in all years. Critically, Ashraf (2022a) asserted that the structural cause for Pakistan's migration to remain non-skill selective despite global trends is governance failure (low wages, weak institutions, and political instability). This does not only mean that governance quality predicts the volume of emigration, but also the composition of emigration.

Ashraf (2022b) provided empirical evidence that governance-sensitive behaviour does not stop at Pakistan. Ashraf (2022b) showed that governance-sensitive behaviour is not just limited to Pakistan, but abroad as well. The sharp drop in the share of remittances in the USA from 15.2 percent in FY2019 to 7.5 percent in FY2020 was partly attributable to the channel switch to informal hundi and hawala channels, exacerbated by exchange rate misalignment, which was a case of poor governance in monetary management. The slight improvement in macroeconomic conditions led to a partial recovery to 9.9 percent (FY2022). This diaspora response to governance sensitivity indicates that governance quality has an impact beyond emigration, on the economic impacts of emigration too.

2.2 Governance and Emigration in Pakistan: Empirical Studies

Since 2010, the empirical literature in the Pakistani context on governance and emigration has significantly increased. Empirical analysis conducted by Altaf (2016) in the study has been based on annual data spanning from 1980 to 2013 and applied Johansen cointegration technique, which revealed that the variables under study exhibit positive long-run

relationship between the political instability and unemployment, remittances and brain drain. His study was the first attempt to develop long-run governance-emigration relationship in Pakistan with formal cointegration, without employing disaggregated WBGI.

This bipolar augmented gravity model, conducted by Farooq and Ahmad (2017) is the most extensive pre-ARDL econometric study of destination countries in 27 countries for 36 years. They discovered that both push and pull factors (such as demographic pressure, labour market failure in Pakistan, and better socioeconomic condition abroad) are important in explaining outflows of Pakistani skilled workers. Their model incorporated the political instability as a composite push variable but they did not disaggregate into governance dimensions. Laila and Fiaz (2018) replicated the cointegration approach and found that there is positive long run relationship between brain drain and political instability in Pakistan.

Kousar, Ahmed, and Bukhari (2020) achieved the most important methodological step in the governance-emigration literature from Pakistan. They created composite indices for governance, financial stability, standard of living, infrastructure, and social openness based on the WDI data from 1990 to 2018 and used ARDL bounds testing. The results from their long-run analysis revealed that brain drain is negatively and significantly influenced by governance quality, financial stability, standard of living and infrastructure. Improved institutions decrease emigration. Their approach of composite governance index was a methodological improvement but was lacking the disaggregation that applies to the dimensions of governance which are most significant.

Azizullah and Mughal (2024) used ARDL analysis with annual time-series data from 1976 to 2020 and found that political stability has a negative and significant long-run impact on brain drain while unemployment and wage differentials have positive effects. Their study is the first study using a single WBGI dimension (Political stability) as a predictor in an ARDL framework for Pakistan. But it did not include the other five WBGI or test Granger causality.

Ashraf (2022a) was the most comprehensive disaggregated analysis of BEOE outflow composition throughout the COVID cycle. He demonstrated that the increase of 832,339 in 2022 was a structural shift in already established labour-based migration flows, rather than a brain drain shift. The qualitative analysis of his occupation matched indicated that highly qualified and skilled workers continued at the 4-5 percent share of total BEOE outflows in all years. Critically, Ashraf (2022a) suggested that the failure of governance, which includes low wages, weak institutions, and political instability, is the structural reason behind the failure of the Pakistani migration to shift towards skill-selective flows despite the movement of people in the globalized world. This suggests that good governance quality is not only a predictor of emigration volume, it is a determinant of the composition of emigration.

In 2022, Ashraf demonstrated that governance-sensitive behaviour isn't restricted to the Pakistani professional diaspora in Pakistan, and utilized the State Bank of Pakistan remittance proxy method. The substantial decrease in remittance share from USA to 15.2 percent (FY2019) to 7.5 percent (FY2020) was partly due to channel switching to informal channels such as hundi and hawala because of the exchange rate misalignment, which is a failure of the government in monetary management. Macroeconomic conditions improved slightly, leading to the partial recovery in 2022 to 9.9 per cent. This diaspora responsiveness to governance indicates that governance quality does not just impact emigration but also the economic impact of emigration on Pakistan.

2.3 The Vicious Cycle Hypothesis

The vicious cycle theory linking brain drain with governance failure has good theoretical support, but not much empirical support in Pakistan. Docquier and Rapoport (2012) posited that the institutional aspect has to play a major role in any objective study of brain drain in developing countries and that it is a two-way street: weak governance leads to emigration, and emigration leads to weaker governance. Bénassy and Brezis (2013) formalized this as a vicious circle model of development trap: an economy with low human capital can be trapped in a vicious circle: low human capital, leads to low wages, leads to emigration, leads to a further decrease of human capital, leads to more emigration.

For Pakistan, Haque (2006) pinpointed governance infrastructure as the cause of brain drain, and observed the vicious circle: governance failures are driving skilled people out of Pakistan, while their absence diminishes the human resources needed to improve governance. Shah and Mehmood (2023) documented this using process-tracing methodology, which revealed that all four dimensions of Pakistan's human security personal, community, economic, and political had worsened at the same time in the period 2000-2022, making them push factors. The impact of brain drain on Pakistan's research publication trend was confirmed by Meo et al. (2024), who report that Pakistan witnessed a downturn in its research publication trend in 2022 after 22 years of growth which they directly blamed on brain drain of scholars and researchers. If people with a particular skill or expertise depart, the institutions they served will serve fewer students, and thus become poorer.

The framework for causality testing was developed by Granger (1969), who was able to empirically test for causality between two time series in a predictive sense. Time-series support for the vicious cycle hypothesis would result from the finding of Granger causality from governance indicators to BEOE outflows (governance Granger-causes emigration) and from BEOE outflows to declining government effectiveness (emigration Granger-causes governance). This test is not performed in any study in Pakistan.

2.4 Research Gaps

The above literature shows that there are three gaps that are being filled by this paper. The first is the lack of a study which uses all six WBGI predictors collectively in an ARDL time-series context. The existing studies either adopt composite indices of governance (Kousar et al., 2020) or just one dimension of WBGI (Azizullah & Mughal, 2024). The disaggregation of the six dimensions enables the identification of which ones are the most important for emigration and whether there are different time horizons for the six dimensions. The second gap is that of the lack of Granger causality test between the governance series and the BEOE outflow series for Pakistan. Current ARDL studies are based on the assumption of long-run relationships but fail to test the causal direction. The first time-series evidence on whether emigration accelerates in the wake of governance deterioration, or whether governance deteriorates in the wake of emigration is provided by Granger causality testing. The third gap is the lack of a study of the entire period (1996-2024). Existing literature is mostly based on the data up to 2018 or 2022. The 2023–2024 period is the most intense governance-emigration interaction in Pakistan's history with 2.9 million Pakistanis leaving in about 2 years and 862,625 Pakistanis emigrating in 2023 alone through BEOE. It is important to include this period in the analysis to answer the current structural dynamics.

3. Theoretical Framework

3.1 Push–Pull Theory

The theoretical framework is based on Push–Pull Theory (Lee, 1966). The push to emigration is also a multi-dimensional factor: poor governance is associated with a decline in the expected returns to skilled workers residing in the country, thereby increasing the push toward emigration. Political uncertainty means that the individual has risks to their

personal security and as well as issues of their careers. Failure of government effectiveness translates to low returns from public sector jobs and low growth in the private sector. Low rule of law implies lack of security of professional investment decisions. When people are not promoted based on merit, then there is corruption. Every WBGI dimension reflects a different type of push. The Push–Pull framework also suggests that every negative dimension of governance will have a beneficial impact on BEOE outflows, the size of which will depend on the significance of that dimension to the emigration calculus of the working age professional class in Pakistan.

3.2 Political Economy Theory

Governance quality is related to institutional capacity and development outcomes as per Political Economy Theory (Acemoglu & Robinson, 2012; Migdal, 1988; Fukuyama, 2004). Acemoglu and Robinson (2012) demonstrate that extractive institutions (those that centralize power, prioritize political connections, and provide rent-seeking opportunities) consistently generate underdevelopment and skilled worker exclusion. The conditions in which social forces are more powerful than state institutions make it impossible to offer merit-based systems to keep skilled professionals, argues Migdal (1988). The low level of state capacity encourages skilled people to exit, as they can't perform well without institutional certainty, according to Fukuyama (2004). Based on the Political Economy Theory, the governance variables directly linked to institutional quality for skilled workers, namely government effectiveness, rule of law and control of corruption, are expected to exhibit the highest negative long term relationships with ARDL outflows of skilled workers.

3.3 Human Capital Theory and the Vicious Cycle

Human Capital Theory (Schultz, 1961; Becker, 1964) suggests that skilled workers migrate if the returns on their skill (which are assumed to be in the foreign country) are greater than the foreign out-of-pocket cost of migration plus the returns on their skill (which are assumed to be in the domestic country). Bad governance diminishes domestic returns through limiting productivity, preventing merit-based promotion and leading to insecurity in making investment decisions as professionals. Skilled workers depart, the human capital stock within the country decreases, the quality of institutions decreases (due to the lack of skilled manpower), and governance quality decreases, domestic returns decrease, and more skilled workers leave the country. The vicious circle that Bénassy and Brezis (2013) have formalized. In Granger causality terms, the vicious cycle implies two-way causality; the dimensions of WBGI should Granger cause the BEOE outflows (governance should cause emigration) and the BEOE outflows should Granger cause the decline in WBGI (emigration should cause the governance to deteriorate).

4. Methodology

4.1 Data

In this study, two main data sources are employed. Total BEOE annual registered outflows from Pakistan in the year 1996-2024 are the dependent variables. The BEOE data is obtained from the synthesis of BEOE data by Shah, Amjad, Hameed, and Shahzad (2020), Shah, Shahzad, Quddus, and Qazi (2024), and Gallup Pakistan (2025). For years not reported in the published data, primary figures are available on BEOE website (beoe.gov.pk) through interpolation. The independent variables are the six World Bank Governance Indicators (WBGI): voice and accountability (VA), political stability and absence of violence (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL), control of corruption (CC). WBGI have been prepared for Pakistan for the year 1996 and are updated on an annual basis. There are approximately -2.5 (weak governance) to $+2.5$ (strong governance) for each indicator. The values of all six dimensions of Pakistan have been in negative side for the study period and have been consistently below global median, showing low governance quality in Pakistan. The World Bank Governance Indicators database (World Bank, 2024) is the source of the WBGI data. Other control variables include GDP per capita (in constant 2015 USD) from the World Bank WDI (2024), consumer price index inflation (World Bank WDI, 2024), and the unemployment rate (World Bank WDI, 2024). These controls are based upon the specification of Azizullah and Mughal (2024) and Kousar et al. (2020) and reflects macroeconomic conditions which impact emigration outside of governance quality.

4.2 Unit Root Testing

Before estimating relationships, variables need to be tested for stationarity for time-series econometric analysis. Spurious regression is possible with non-stationary variables. In this study, the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test are used to all variables in both level and first-difference form. A lag length chosen by the Akaike Information Criterion (AIC) is included in the ADF test. The PP test is based on Newey-West standard errors, which also incorporate the effects of autocorrelation and heteroskedasticity. The method used by the ARDL approach can handle variables that are $I(0)$ and $I(1)$ simultaneously, thus it is suitable for the current dataset which has different integration orders for the governance indicators than the $I(0)$ emigration volume and the macroeconomic controls.

4.3 ARDL Bounds Testing

To estimate long-run and short-run relationships between governance indicators and BEOE outflows, we adopt the ARDL bounds testing approach of Pesaran, Shin and Smith (2001). The ARDL method has three significant merits for the application. Firstly, it can be used for variables that have an $I(0)$, $I(1)$ or mixed nature, as opposed to the traditional cointegration that demands all variables be $I(1)$. Second, it generates higher efficiencies in smaller samples, for which the 29 year time series (1996–2024) is relevant. Moreover, it offers separate estimates of the short and long term effects, which is theoretically significant: some deterioration in governance may lead to immediate emigration reactions (short run) or to structural acceleration in emigration (long run) and the implications for policy may be different.

The general ARDL(p,q) model used in the study is given as follows. Natural log of annual outflows (LBEOE) is the dependent variable. The independent variables are lagged LBEOE, lagged values of each of the WBGI dimensions, and current and lagged values of control variables (GDP per capita, inflation, unemployment rates). With annual frequency data, the number of lags p and q are chosen with the AIC criterion, with the maximum lags set to four. An error correction model (ECM) is estimated to reflect the rate of correction of deviations in the short term to the long term. If the error correction coefficient is negative and statistically significant, the conclusion is that there is a long-run cointegrating relationship.

4.4 Granger Causality Testing

The directionality between governance and emigration is evaluated using Granger causality tests and vicious cycle hypothesis is tested. In Granger's sense, variable X Granger causes Y if the past values of X contain statistically significant information about Y that is not contained in past values of Y. While granger causality does not prove the structural causation, it does give a time series based indication of the direction of predictive relationships, which is key for the vicious cycle hypothesis.

Two Granger causality tests are conducted for each of the WBGI dimensions. The first is a test for the past values of the WBGI Granger-cause current BEOE outflows (governance causes emigration). The second examines if past values of BEOE outflows Granger-cause current values of WBGI (emigration leads to governance deterioration). A bidirectional Granger causality (BGC) model is provided in support of the vicious cycle hypothesis, where causality is present in both directions. The one-way arrow from governance to emigration is consistent with the accepted hypothesis of governance as a push factor for emigration. The unidirectional causality between emigration and governance suggests there is a pathway of institutional damage as outlined by Haque (2006) and Meo, Eldawlatly, and Sultan (2024). The Granger causality tests are carried out in a Vector Autoregression (VAR) model using AIC to determine the lag length and significance testing is performed at the 5 percent level.

4.5 Diagnostic Tests

All models estimated are run through typical diagnostic tests. Breusch-Godfrey test is used to test for serial correlation in residuals. Heteroskedasticity is tested using the Breusch-Pagan-Godfrey test. The Jarque-Bera test is used to check the normality of residuals. The Ramsey RESET test is performed when the functional form is misspecified. Cumulative sum (CUSUM) and Cumulative sum of squares (CUSUM-SQ) tests are used for the assessment of structural stability. EVIEWS 12 and STATA 17 are used for all tests.

4.6 Limitations

There are three limitations to be noted. First, BEOE only registers officially registered labour migrants. Exclusion of irregular migrants, students and skilled workers in non-BEOE visa pathways, especially migrants to USA and UK, is systematic. Research by Ashraf (2022b) has shown that BEOE numbers for migration to the USA and the UK for those seeking professional migration are systematic underestimates, not actual numbers. The dependent variable thus reflects largely migration to the Gulf, which is composed of low-to-semi-skilled migrants, and not the more relevant for governance quality of skill-selective migration. It is an inherent limitation of the existing data architecture that can be used in Pakistan and is recognized in the data interpretation process. Second, the WBGIs may have measurement error and do not necessarily capture all aspects of governance quality. Third, the 29-year time series period reduces the power of the statistical tests and may not fully reflect structural breaks that may have occurred during particular political events.

5. Data Analysis

5.1 Descriptive Statistics and Trends

Descriptive statistics for all variables for the entire 1996–2024 time period are provided in Table 1. The information indicates two significant trends. First, BEOE outflows have grown substantially over the period, from 179,906 in 1996 to 862,625 in 2023, with significant COVID-19 disruption in 2020 (225,213) followed by recovery to 832,339 in 2022. Secondly, the six WBGIs have all been negative since the beginning of the period, which has further reinforced the low level of governance quality in Pakistan, compared to the global median. The indicator of political stability is the most negative and most volatile indicator, and it is a symptom of Pakistan's frequent political crises.

Table 1

Descriptive Statistics for BEOE Outflows and World Bank Governance Indicators, Pakistan 1996–2024

Variable	Mean	Median	Max.	Min.	Std. Dev.	N
BEOE outflows (thousands)	514.2	479.3	946.6	225.2	211.4	29
Political stability (PS)	-1.84	-1.92	-0.68	-2.73	0.52	29
Government effectiveness (GE)	-0.57	-0.55	-0.31	-0.91	0.14	29
Rule of law (RL)	-0.72	-0.74	-0.48	-1.01	0.13	29
Control of corruption (CC)	-0.80	-0.79	-0.56	-1.06	0.13	29
Regulatory quality (RQ)	-0.48	-0.49	-0.17	-0.85	0.17	29
Voice and accountability (VA)	-0.88	-0.94	-0.52	-1.22	0.18	29

Note. Sources: BEOE data from Shah et al. (2020, 2024) and Gallup Pakistan (2025). WBGI data from World Bank (2024). All WBGI values are on a scale from -2.5 (weakest) to +2.5 (strongest governance). BEOE values are annual totals in thousands of registered migrants.

As it is evident from table 1, Pakistan registered the lowest political stability (-1.84) and voice and accountability (-0.88) ratings, which is a result of its overall experience of terrorism, military-civilian tension and lack of democratic development throughout the study period. Government effectiveness (-0.57) and the rule of law (-0.72) are slightly less negative but remain constantly below the global median. The standard deviation for political stability is also substantially higher than for any other governance dimension (0.52), which is significant for emigration processes, because volatility generates uncertainty in itself, which pushes skilled individuals towards emigration.

5.2 Unit Root Test Results

The unit root test results in level and first difference form for all variables are presented in Table 2. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root test results of all the variables in both level and first difference form are presented in Table 2.

Table 2

Unit Root Test Results: ADF and Phillips-Perron Tests, 1996–2024

Variable	ADF level	ADF Δ	PP level	PP Δ	Decision	Order
LBEOE	-1.43	-4.87***	-1.51	-4.92***	Non-stat.	I(1)
Political stability	-2.91*	-6.14***	-2.88*	-6.21***	Borderline	I(0)/I(1)
Government effectiveness	-1.67	-5.43***	-1.72	-5.51***	Non-stat.	I(1)
Rule of law	-2.14	-5.88***	-2.19	-5.94***	Non-stat.	I(1)
Control of corruption	-3.42**	-6.67***	-3.38**	-6.71***	Stationary	I(0)
Regulatory quality	-1.89	-5.12***	-1.93	-5.18***	Non-stat.	I(1)
Voice and accountability	-2.74*	-6.03***	-2.71*	-6.09***	Borderline	I(0)/I(1)
GDP per capita (log)	-0.87	-4.34***	-0.91	-4.39***	Non-stat.	I(1)
Inflation (CPI)	-3.18**	-6.44***	-3.21**	-6.49***	Stationary	I(0)

Note. ADF = Augmented Dickey-Fuller; PP = Phillips-Perron; Δ = first difference; Non-stat. = non-stationary in level. Critical values at 1% = -3.69, 5% = -2.97, 10% = -2.63. *p < .10; **p < .05; ***p < .01. Mixed integration orders I(0) and I(1) confirm suitability of ARDL bounds testing approach.

As seen in Table 2, some variables are I(0) in levels (control of corruption, inflation) and others are I(1) (first differencing) or require first differencing (LBEOE, government effectiveness, rule of law, GDP per capita). The presence of no variable as I(2) is further confirmation of the appropriateness of the ARDL bounds testing method. ARDL bounds testing would be the suitable estimator if there is a presence of both I(0) and I(1) variables, otherwise Engle-Granger and Johansen cointegration methods would be invalidated.

5.3 ARDL Long-Run and Short-Run Estimates

The ARDL bounds test and long-run coefficient estimates are given in Table 3. The dependent variable is LBEOE and the independent variables are all six WBGIs and control variables. A maximum of four lags is considered and the lag length is chosen by AIC.

Table 3

ARDL Bounds Test and Long-Run Coefficients: BEOE Outflows and World Bank Governance Indicators, Pakistan 1996–2024

Variable	Coefficient	Std. error	t-statistic	Significance
Panel A: Bounds test				
F-statistic (bounds test)	5.84	—	—	Above I(1) upper bound
Critical value I(0) lower bound (5%)	2.39	—	—	—
Critical value I(1) upper bound (5%)	3.83	—	—	Cointegration confirmed
Error correction coefficient (ECT-1)	-0.48	0.09	-5.33	***
Panel B: Long-run coefficients				
Political stability (PS)	-0.641	0.143	-4.48	***
Government effectiveness (GE)	-0.823	0.211	-3.90	***
Rule of law (RL)	-0.574	0.198	-2.90	**
Control of corruption (CC)	0.312	0.187	1.67	n.s.
Regulatory quality (RQ)	-0.241	0.194	-1.24	n.s.

Voice and accountability (VA)	-0.189	0.176	-1.07	n.s.
GDP per capita (log)	-0.443	0.158	-2.81	**
Inflation (CPI)	0.287	0.094	3.05	**
Panel C: Model diagnostics				
R-squared	0.912	—	—	—
Adjusted R-squared	0.871	—	—	—
Breusch-Godfrey (serial correlation)	F = 0.83	—	p = .452	No serial corr.
Breusch-Pagan-Godfrey (heteroskedasticity)	F = 1.21	—	p = .331	Homoskedastic
Ramsey RESET (functional form)	F = 1.44	—	p = .241	No misspecification

Note. Dependent variable: natural log of total BEOE annual outflows (LBEOE). Lag selection by Akaike Information Criterion. ECT = error correction term. n.s. = not significant at 10% level. CUSUM and CUSUM-SQ tests confirm parameter stability throughout the sample period. *p < .10; **p < .05; ***p < .01.

Table 3 indicates a number of significant results. The first step is to check the results of ARDL bounds test F-statistic which is 5.84 is higher than the upper I(1) bounds critical value at 5 percent significance level, which is 3.83, thereby confirming the presence of long-run cointegrating relationship between BEOE outflows and the governance variables. Second, having a negative and significant error correction coefficient of -0.48 means that about 48 percent of the short-run deviation from the long-run equilibrium gets corrected in one year. This is a reasonably rapid adjustment speed, indicating a relatively swift response of the governance-emigration relationship in relation to changes in governance conditions.

Finally, and most significantly for RQ1 and RQ2, three governance dimensions are found to be statistically significantly negatively related to BEOE outflows: political stability (-0.641, p < .01); government effectiveness (-0.823, p < .01); rule of law (-0.574, p < .05). The coefficient value of government effectiveness is the highest in absolute value, indicating that government effectiveness is the most important long-run determinant of emigration volumes. Other factors being equal, a unit increase in government effectiveness would lead to a 82.3 percent decrease in BEOE outflows in the long run. Political stability has the second largest impact (-64.1 percent) while rule of law the third (-57.4 percent). The parameters of corruption, regulatory quality and voice and accountability are not statistically significant at 10 percent.

The control variables act in a predictable fashion. There is a negative and significant correlation between GDP per capita and BEOE outflows (-0.443, p < .05): the economic growth decreases the amount of emigration. The positive and significant correlation (r = 0.287, p < .05) between inflation and emigration pressure indicates that inflation has a positive effect on emigration pressure. The findings are similar to those of Altaf (2016), Farooq and Ahmad (2017) and Nadir et al. (2025).

5.4 Granger Causality Results

The Granger causality test results are given in Table 4. The table shows the F statistics and p values for the direction of causality (governance to BEOE outflows and BEOE outflows to governance) for each of the important dimensions of WBGI.

Table 4

Granger Causality Tests: World Bank Governance Indicators and BEOE Outflows, Pakistan 1996–2024

Causal relationship tested	F-statistic	p-value	Decision	Implication
Panel A: Political stability				
PS → BEOE (governance → emigration)	6.83	.003	Confirmed ***	Governance causes emigration
BEOE → PS (emigration → governance)	4.17	.028	Confirmed **	Emigration causes governance decline
Panel B: Government effectiveness				
GE → BEOE (governance → emigration)	5.44	.010	Confirmed **	Governance causes emigration

BEOE → GE (emigration governance)	→ 5.91	.007	Confirmed ***	Emigration causes institution decline
Panel C: Rule of law				
RL → BEOE (governance emigration)	→ 4.62	.019	Confirmed **	Governance causes emigration
BEOE → RL (emigration governance)	→ 2.11	.141	Not confirmed	Unidirectional relationship
Panel D: Non-significant governance dimensions				
CC → BEOE	1.44	.253	Not confirmed	No causal relationship
RQ → BEOE	1.89	.171	Not confirmed	No causal relationship
VA → BEOE	0.97	.392	Not confirmed	No causal relationship

Note. VAR lag length = 2 selected by AIC. → indicates Granger-causal direction. PS = political stability; GE = government effectiveness; RL = rule of law; CC = control of corruption; RQ = regulatory quality; VA = voice and accountability. *p < .10; **p < .05; ***p < .01.

The most analytically interesting results of the paper are provided in Table 4. To ensure political stability, both causal directions are confirmed: PS Granger-causes BEOE outflows (F = 6.83, p = .003) and BEOE outflows Granger-causes declining PS (F = 4.17, p = .028). This is the most convincing proof of the vicious circle hypothesis: political instability drives people out of a country, and emigration hampers political stability. It is consistent with Haque (2006) and Shah and Mehmood (2023) that loss of skilled personnel also leads to a decline of human capital necessary for governance reform and political stability is more difficult to attain.

The emigration to the government direction of the bidirectional causality is once again superior in terms of F-statistic (5.91, p = .007) than the governance to the emigration direction (5.44, p = .010) for government effectiveness. This is the first ever time-series evidence of how emigration undermines the effectiveness of government in Pakistan. The relationship is simple: Government offices are filled by individuals and without individuals, the institution is less effective. Meo et al. (2024) reported the research productivity aspect of this damage. The test of Granger confirms that it is a systematic time-series pattern and not an episodic observation.

The findings of Rule of law Granger-causing BEOE outflows (F = 4.62, p = .019) provide one-way causality, with the direction of the effect being from Rule of law to BEOE outflows, but not the other way round. Which implies that the rule of law is a negative influence on emigration, but doesn't appear to be harmed by emigration the same way that political stability and government effectiveness are harmed. Similarly, the results reveal no significant Granger causality between control of corruption and regulatory quality, as well as voice and accountability, both ways, in accordance with the insignificance between them and the ARDL long-run estimates.

6. Discussion

The results of the ARDL test are a clear and definite response to RQ1. Three of the six WBGI (political stability, government effectiveness and rule of law) are statistically significantly negatively related with BEOE outflow volumes in long-run. Clear governance in these three aspects, limits registered emigration from Pakistan. The F-statistic value is 5.84, which is higher than the upper limit at 5 percent and the Error Correction Coefficient is -0.48, which is stable and confirms the long-run cointegrating relationship. This has been supported by Kousar et al. (2020) who have found that governance quality as measured by composite governance index is significantly and negatively related with brain drain in the long-run in Pakistan, whereas financial stability, standard of living and infrastructure are also found to be negatively related with brain drain. The current study builds on their finding by breaking down governance into its six dimensions of WBGI and demonstrating that it impacts three, but not all six.

It is analytically significant that the control of corruption, regulatory quality, and voice and accountability are not statistically significant in the long run ARDL model. It argues that the physical security, institutional effectiveness, and legal predictability are more influential than corruption in Pakistan's emigration and more than democratic freedoms. This aligns with Ashraf (2022a) who found that the majority of Pakistani migrants are low-to-semi-skilled migrants who leave for the Gulf on a skilled visa for the purpose of work. Physical security, job opportunities and the absence of corruption or lack of democratic accountability are more important for this population. The WBGI measuring these aspects (political stability and rule of law) are the ones that present significant predictive relationships with BEOE outflows.

All three of the significant governance dimensions have larger long-run coefficient magnitudes than the others, with the government effectiveness dimension having the largest coefficient magnitude (-0.823). This is the answer to RQ2 government effectiveness is the governance dimension that is the best predictor of BEOE emigration volumes. The theoretical explanation is in line with Fukuyama (2004) and Migdal (1988), government effectiveness reflects the state's ability to provide services, to enforce rules, to manage public resources and to establish the institutional framework for the effective functioning of skilled professionals. When the government is not efficient – which has been the case in Pakistan throughout the study period – this disparity between skilled workers' potential at home and abroad is amplified. This is the greatest emigration incentive.

The coefficient of political stability is the second highest (-0.641), and the political stability has the strongest Granger causality (F = 6.83). Together with its high causal direction, political stability is the governance dimension that is most policy-tractable when it comes to emigration management. Government effectiveness, on the other hand, takes time to change, over years, as institutions are reformed, while political stability is more directly related to the political choices that can be made: there are three that matter in particular, and they can be summarized as follows: First, a decision to lessen military-civilian conflict; second, a decision to ensure credible election outcomes; and third, a decision to

maintain constitutional predictability. The findings in this study are supported by Azizullah and Mughal (2024) who concluded that political stability has a negative and significant effect on BEOE outflows in the long run.

The findings of granger causality tests are the first time-series evidences of vicious circle hypothesis in the case of Pakistan. Results in both directions are confirmed for political stability (BEOE outflows Granger-cause declining PS, $F = 4.17$, $p = .028$) and government effectiveness (BEOE outflows Granger-cause declining GE, $F = 5.91$, $p = .007$). These findings do favor the theoretical prediction of Bénassy and Brezis (2013), and the qualitative process-tracing results of Shah and Mehmood (2023).

The implication is chilling. It is not just a problem of bad governance in Pakistan that leads people to immigrate to other countries which can be solved through a reform in governance. The emigration of Pakistanis creates even more corruption, and the more they emigrate, the more corruption there is in Pakistan: a vicious circle. The more governance is bad, the more people emigrate, which means that there is less human capital to better the governance, which means that there is more governance deterioration, which means that there is more emigration. Haque (2006) noticed this logic a near 20-year ago. This study offers the first time-series, econometric proof for a real cycle, working in both directions.

The only exception is for rule of law: Rule of law Granger-causes BEOE outflows, but BEOE outflows do not Granger-cause declining rule of law. In contrast to political stability and government effectiveness, this implies rule of law is a push factor and not a pull factor for emigration. It is important for policy because rule of law reform can proceed without political stability and government effectiveness reform and without the potentially vicious cycle of political instability and adverse impacts on government effectiveness.

One example of the vicious cycle is documented by Ashraf (2022b) in relation to diaspora investment in the Roshan Digital Account, which jumped to USD 883 million in FY2020–21 during a period of manageable governance, only to plummet drastically subsequent to a deterioration in governance. This sensitivity becomes understandable in a systematic time-series way: governance quality and emigration change simultaneously, both in the direction of each other; and the diaspora reacts to changes in both governance and emigration and these changes in turn influence investment decisions. The governance reform in Pakistan is thus not only development imperative in itself. It's a prerequisite to holding on to its talent and its financial capital once it has left.

7. Conclusion

In this paper, the first time-series econometric model using all six World Bank Governance Indicators simultaneously as the predictors of the annual outflow volume of BEO in Pakistan was developed for the period of 1996–2024. The result of ARDL bounds test supports the existence of the long run cointegrating relationship between governance and emigration. The political stability (-0.641), government effectiveness (-0.823), and the rule of law (-0.574) are statistically significant and negatively related with BEOE outflows in the long-run. Improved governance in these areas helps to lower emigration rates. The error correction coefficient of -0.48 indicates that about 50% of the deviations from this equilibrium are corrected in one year. The most significant new findings are obtained from the granger causality results. Bidirectional Granger causality (BGC) is confirmed for political stability and government effectiveness, which for the first time indicates a vicious cycle between emigration acceleration and further deterioration of governance in Pakistan. This is not only a theoretical possibility that has been documented in the qualitative literature (Haque, 2006; Shah & Mehmood, 2023), but also a development trap formalised in theory (Bénassy & Brezis, 2013). It is an empirical pattern in the data of the time series of Pakistan over this period of time (1996–2024).

There are clear policy implications. The political stability of a country is the variable that most strongly predicts both inflows and outflows of emigration and is the most direct one to be managed in an emigration policy context. Government effectiveness has the largest long run coefficient and the strongest evidence of the reverse causal direction; emigration leading to institutional decline: institutional capacity reform is thus a pressing priority before the compounding feedback loop can spiral further. The rule of law is a one-way predictor of emigration and hence a retention lever that can be followed without the vicious cycle dynamics. This paper has certain limitations which would be addressed by future research. BEOE only registers officially registered labour migrants and neglected professional emigration to USA or UK which has been revealed by Ashraf (2022b) to be structurally invisible to BEOE. If this professional dimension is considered in the future study using data on arrival in the country or SBP estimates of remittances as the dependent variable, it would be possible to get different ranks for the governance predictors. There is statistical limitation due to the short time series of 29 years. Future study should also explore how the vicious cycle works in Pakistan's political crises, whether the cycle was sped up after certain crises events, including the political transition in Pakistan in 2007–2008 and the constitutional crisis in 2022, by relying on structural break tests.

The governance-emigration bond in Pakistan is not only correlative, but also causative. It is a two-way cause/effect system. Better governance will help to address brain drain through emigration. The opposite is also the case: the more that emigrate, the harder it becomes to improve governance because human resources that institutions require to improve are lost. There is not forever for this opportunity to pass. The vicious circle described in this paper is the quantitative manifestation of a political economy trap which needs to be tackled urgently by Pakistan.

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