P-ISSN: 2709-6254	Journal of Development and Social Sciences	Oct-Dec 2023, Vol. 4, No. 4
O-ISSN:2709-6262	https://doi.org/10.47205/jdss.2023(4-IV)03	[23-42]

Journal of Development and Social Sciences
www.jdss.org.pk

RESEARCH PAPER

Conflicts and The Structure of Economy: A Case of Trade in Pakistan

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ABSTRACT

Trade and investment are considered crucial elements of long-run growth which along with other factors are also affected by conflicts. This study addresses this issue by taking both internal and external conflicts and its effects on trade. The ARDL approach used for the period of 1984 to 2016. External and internal conflicts both have a statistically significant and negative effect on exports. Government stability has positive effect on exports. Therefore, macroeconomic instability has a negative and statistically significant impact on exports. The law and order and ethnic tension do not have a statistically significant impact on exports. Democratic accountability and socioeconomic conditions also have statistically significant negative and positive impacts on exports, respectively. In the import model, government stability, ethnic tension, law and order, and democratic accountability do not impact imports. External conflict is statistically significant and positive for imports. External and internal conflicts have negative effects on trade (exports and imports) in other aspect of the globe. Therefore, socioeconomic conditions also have a statistically significant negative on imports. The empirical results support the theory of conflicts in Pakistan. Based on the findings, it is suggested that the government may design policies that ensure protection of economy from conflicts and smoothen the flow of trade.

KEYWORDS ARDL, Conflicts, Pakistan, Trade

Introduction

In this era of globalization, trade determine the long-run growth of a nation. Every economy desire to achieve this goal. The growth of developing economies depends on trade, and many economies have achieved long-run growth through trade. It not only increases individual welfare but also promotes the total welfare of a nation. The trade especially imports contribute positively to sustained economic growth over the long term. Trade brings in new technologies, managerial skills and expertise that may be lacking in the host state. This has the potential to result in heightened productivity and enhanced efficiency, which in turn stimulates economic growth. Trade can also create new job opportunities and increase the income of the domestic labor force, which can contribute to an increase in consumer spending and overall economic activity (Bitar et al., 2019). Trade is also playing a significant role in long-run growth determination. But unfortunately, Pakistan has been facing severe political instability since 1947 and the curse of terrorism since the 1980s. as well as since the past two decades, Pakistan has been facing climate change issues and natural disasters. Since the last ten years, Pakistan's exports have remained stagnant, ranging between $20 and $25 billion, which fallen by about 10.5%. On the other hand, China and India increased their share of world exports by 27.2% and 18.3%, respectively, in the same period. Bangladesh also registered a remarkable growth rate of 95.4%. Pakistan's exports have stagnated and imports are still rising, resulting in a massive trade-deficit. (Ministry of Commerce, 2021). In 2019, Pakistan's exports were 0.27%, while imports accounted for 3.51% of total exports and imports in South Asia, respectively (Masood et al., 2023). To conclude, trade is necessary for long-run growth. Both depend on the peaceful environment of the country. The massive investment generates trade, and high trade (especially high exports) attracts investors. The contribution of the study, AO and IO unit root tests, which studied trade in the case of Pakistan along with this particular time period.

In the third and fourth sessions, the previous study (literature review) and methodology were explained, and the discussion enlightened.

Literature Review

Mamoon and Murshed, (2010) If the reference is in the beginning of the sentence only year be in bracket revise all examined that, the trade reduce conflict between Pakistan and India. The data nature is time series and time period from 1950-2005. The econometric approach VECM used for cointegration estimation. The found that, conflict reduce trade vice versa. Therefore, the study suggested that, enhance trade and reduce disputes and also increase military expenditure and reduce growth. Josefine and Ulrika, (2014) studied that, reducing conflict and increasing trade a theoretical study was conducted between India and Pakistan. The studies based on liberal peace theory, and they found that, increase in trade between the two countries reduce conflict drastically. The study outcomes revealed the potential chance of conflict decline the activities of the war within conflicting states as well as adversely effects within the contiguous countries. Valentina et al. (2013), investigated that the intricate connection between trade and conflict was among the states. The data nature is panel and time period 1979 to 2000 and 134 countries. The study results shown that, a significant negative influence of conflict on trade. Notably, this adverse impact was observed to be more pronounced on exporting nations compared to their importing counterparts. These results also highlighted the nuanced relationship between geopolitical tensions and trade dynamics, lighted on the disproportionate repercussions that conflict can impose on nations heavily reliant on exports. (Qadri et al., 2020), studied that the effects of political instability on international investment and trade within Pakistan. The simple size consisted of 41 years from 1976 to 2016 and used the econometric approach ARDL used in this study. They discussed various forms of political instability in Pakistan, i.e., terrorism, ethnic and sectarian violence, and corruption. The study found that political stability attracts FDI and promotes international trade, and vice versa. Additionally, their research revealed that governmental policies help alleviate the adverse effects of political instability on international investment and trade. The political environment has a negative and significant impact on both international investment and trade. It is also suggested that the government maintain political stability and implement government policies. The hypothesis of this study,

H0: Conflict (external and internal) impact on trade.

Material and Methods

Data and variables description

In this study, we used 9 particular variables in each model: exports and imports are dependent variables), external conflict (EXTONF), internal conflict (INTCONF), government stability (GOVTS), macroeconomic instability (MINS), law and order (LO), ethnic tension (ET), and democratic accountability (DA) as independent variables in each model. Therefore, four models are employed in this particular study. Annual time series data used and data taken from the International Country Risk Guide (ICRG) and World Development Indicator (WDI) data bases. The data period covered 1984 to 2016. A number of studies used these variables in different areas (countries) of the world, i.e.,

Mathematical and Econometric models:

Model 1: Export =f (EXTCONF, INTCONF, GOVTS, MINS, LO, ET, DA) … (1)

Model 2: Import =f (EXTCONF, INTCONF, GOVTS, MINS, LO ET, DA) … (2)

Econometric model

$$\text{Export} = \beta_0 + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MINS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \varepsilon_t \ldots \quad (5)$$

$$Import = \beta_0 + \beta_{t1}EXTCONF + \beta_{t2}INTCONF + \beta_{t3}GOVTS + \beta_{t4}MINS + \beta_{t5}LO + \beta_{t6}ET + \beta_{t7}DA + \varepsilon_t \ldots \quad (6)$$

Unit Root Tests

The observations measured in order of time are called time series (time series refers to organizing and displaying statistical data in the order it occurred chronologically. Data collected over a period of time is termed as time series data). Its magnitude cannot be truly determined until it is observed. When we estimate any econometric model (OLS, ARDL, VECM, etc.), it is assumed that stationary of the specific data. Stationary means the fundamental assumption of OLS means variance and covariance are not violated (means not vary with the time). Due to four components most time series data is non-stationary: secular trend, seasonal, cyclical, and irregular variations (cause variations in time series data). However, stationary data is necessary for valid results and forecasting. Before applying any econometric technique, we check whether the assumption is violated or not. If the assumption is violated, then the result will be spurious. The spurious results are not suitable for policy implications or forecasting. Therefore, data must be stationary to give valid results and avoid spuriousness (Gujarati and Porter, 1999). So, non-stationary data is converted to stationary through various unit root tests (URTs). Auto-correlation is general problem when dealing time-series data (Nillson, 2009). The Durbin-Watson (DW) test is popular test which normally measures the basic diagnostic statistics. An auto-regressive model, however, can be used for correction. Therefore, omitting a significant variable or one or more significant lagged variables is the cause of the auto-correlation problem (Dougherty, 2007). The variability of a time series depends on time, and this characteristic is applicable to non-stationary series tend not to revert to the long-term deterministic trend (Glynn et al., 2007). Two non-stationary variables can separate from one another and lose their connection. This problem is commonly known as spurious regression (Phillips, 1986; Granger & Newbold, 2001). According to Newbold and Granger (1974), spurious regression signs occur when R^2>DW, residuals are non-stationary, and the t-statistics value is too high. The variables of a regression indicate non-stationary behaviour if the value of the DW-statistic for the auto-correlation is too small, the R^2-value is near 1, and the regressor variable is highly statistically significant even if it is not a cause of the regressand variable (Nilsson, 2009). In this particular study, extended unit root tests (special URT) were used by Elliott, Rothenberg Stock (ERS), and 1 and 2-structural break tests, Zivot-Andrew (ZA-test 1992) and Clemente-Montanes-Reyes (1998), which seized two approaches and allowed two potential endogenous breaks. In figure 1, describe time series analysis. It is separated into two parts: forecasting and dynamic modelling analysis. The forecasting analysis is further divided into two fragments: univariate and multivariate analyses. Dynamic models are generally divided into two forms: distributed lag models and auto-regressive models. In a distributed lag model, the lagged-term of explanatory series is included, while in auto-regressive models, the lagged-term of the endogenous series is included (Chaudhry et al., 2012). Therefore, in dynamic modelling analysis, most variable s hold cointegration or not. Thus, figures 2–8 show the different unit roots and a brief description of these tests.

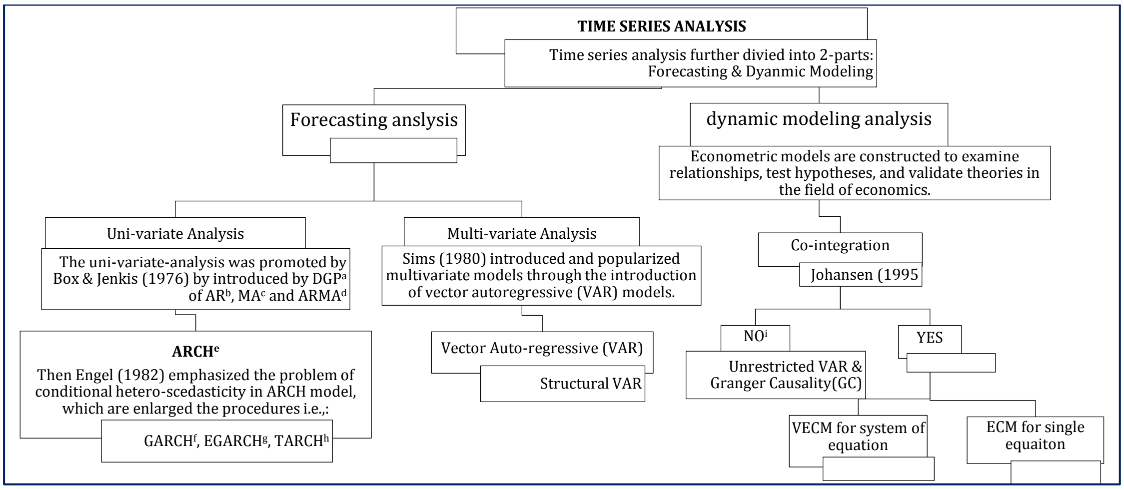


Figure 1. Time Series Analysis

a. Data-generating Process, ***b.*** Auto-Regressive (AR), ***c.*** Moving-Average (MA), ***d.*** ARMA, ***e.*** AR-conditional heteroscedasticity (ARCH), ***f.*** Generalized ARCH (GARCH), ***g.*** Exponential-GARCH, ***h.*** Threshold-ARCH, ***i.*** If no long-run association in specific economic series, then depend on Impulse response function (IRF) & GC

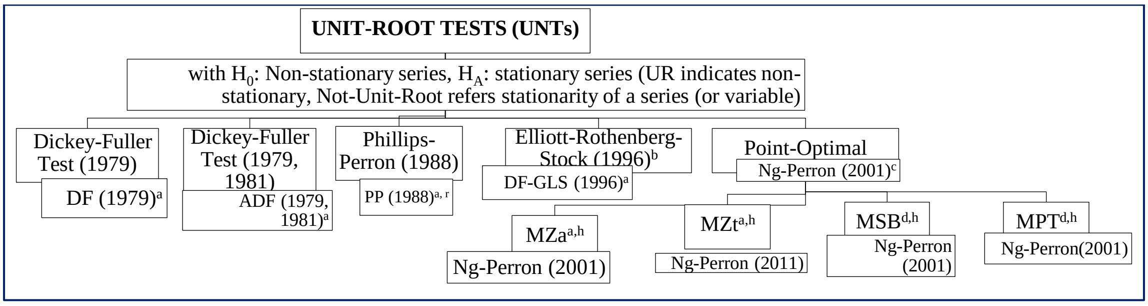


Figure 2 Unit Root Tests (with Out Structural Break (SB)

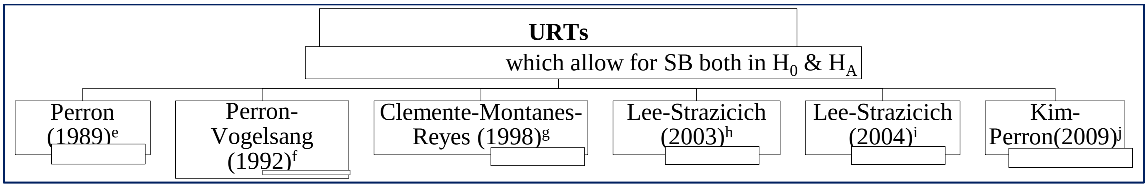


Figure 3 UNTs with SB both H_0 & H_a

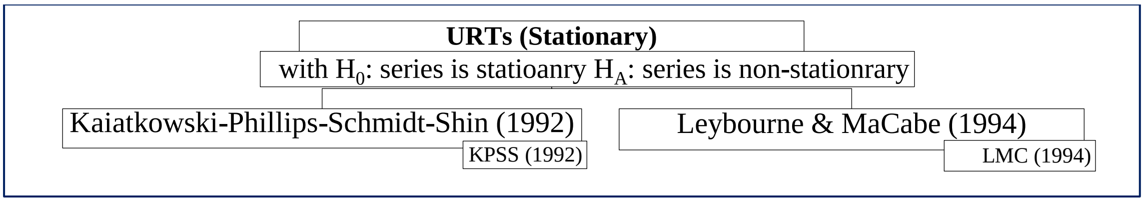


Figure 4 UNTs KPSS & LMC

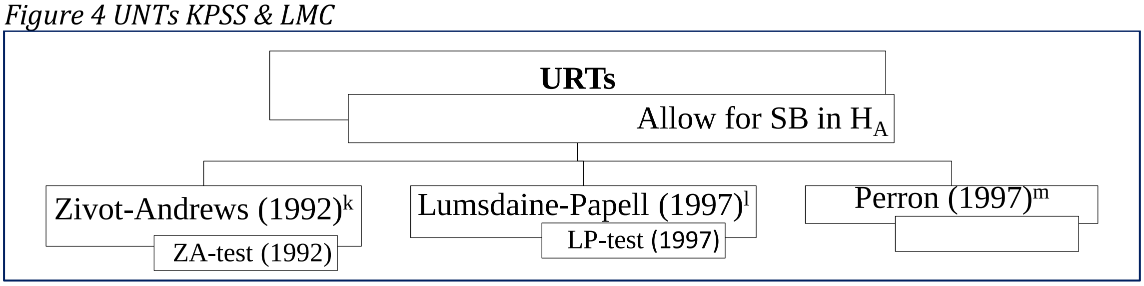


Figure 5 URTs allow SB in H_A

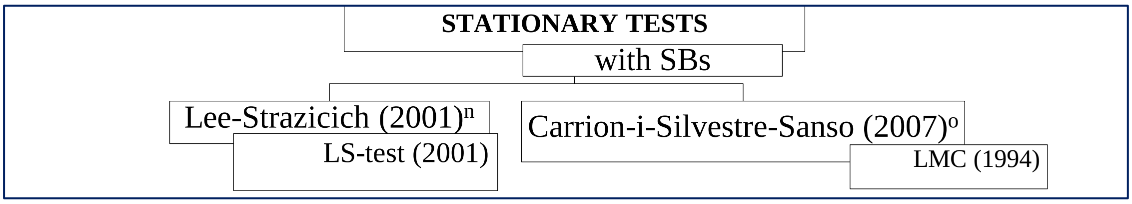


Figure 6 UNTs LS & LMC with SBs

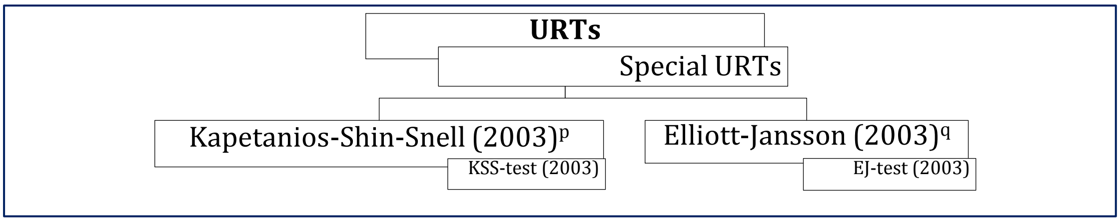


Figure 7 Special URTs

a. The ***H₀: series has unit-root*** ***H$_A$: series has stationary.*** ***b.*** E-view shows the point-optimal test along with Elliott-Rothenberg-Stock [Elliott-Rothenberg-Stock Point-Optimal. In 2011, Lyocsa et al., it mentioned as a separate test and associated with Ng-Perron (Lyocsa et al., 2011). ***c.*** The Ng-perron test [Point-Optimal test] further divided into four statistics MZa, MZt, MSB and MPT. The H_0 of MZa and MZt similar ADF & PP, while MSB & MPT against ADF & PP but resembling KPSS (1992) test. ***d.*** H_0 of KPSS, ***H_0: series non-stationery and H_A: against series has not stationary [unit-root].*** Decision: LM-$_{statistics}$ < C.V, variable stationary, while LM-$_{statistics}$ > C.V, variable non-stationary. ***e.*** Dates-of-beaks (Tb) are exogenously definite. The **H_0:** series non-stationary with SB, **H_A:** series is not-unit root with a SB. The models of 3-SB were measured. a) a change in the series' level, B) a change in the (linear) trend's slope, and C) a simultaneous change in the trend's level and slope. In current works on URTs models considered A & C. additionally, one should assume an additive outlier model (AO model) if the SB happens swiftly, and an innovation outlier model (IO model) if it happens quickly. The instrument of the SBs is specified in the two models. A basic illustrated of a model with two AO is: $yt = \beta_0 + \beta_1 DU_{t,1} + \beta_2 DU_{t,2} + \varepsilon_t,\ the\ DU_t$ is shows Dummy-variable (DV) with $DU_t = 1\ for\ t > TB + 1, and\ 0\ elsewhere, where\ Tb$. In this context, an illustration of an IO model might be:$yt = \beta_0 + \varphi_1 DT_{t,1} + \varphi_2 DT_{t,2} + \beta_1 DU_{t,1} + \beta_2 DU_{t,2} + \rho_{yt-1} + \varepsilon_t$, where $DT_t\ is\ DV$ with $DT_t = 1\ if\ t = Tb + 1\ and\ 0\ elsewhere\ and\ |\rho| < 1$. ***F.*** The dates of breaks are set by nature. Endogenous structural break detection is possible with some other tests that use structural breaks. ***G.*** Only non-trending series (an AO & IO models) are measured by Clemente et al., (1998). ***H_0: variable- non-stationary with 2-SBs*, H_A: variable is stationary with 2-SBs.*** ***H.*** Models A and C are taken into consideration by Lee-Strazicich (2001, 2003, and 2004). According to their methodology, Lee-Strazicich (2003, and 2004) conclude that, both tests irrespective of SB, is due to the stationary nature of the series regardless of potential UN related to SB. ***H_0: series non-stationary, H_A: series not-unit-root with 2-SBs (***two-Structural Breaks***).*** ***i. H_0: variable (***In null & alternative hypothesis, variable = series***) has non-stationary with 1-SB (***One-Structural Break***), H_A: variable-stationary with 1-SB***. J. H_0: variable has non-stationary with a SB, H_A: variable is stationary with a SB. K. H_0: variable has non-stationary, H_A: variable is stationary with 1-SB. L. H_0: variable has non-stationary, H_A: variable is stationary with 2-SBs in trend. M. H_0: Variable is stationary, H_A: variable is not-unit root with a SB. N.*** H_0: variable is not-unit root with a SB, H_A: variable has UR. ***0.*** H_0: Series stationary with 2-SBs, H_A: Series UR. ***P. H_0: series non-stationary, H_A: Series is stationary***, Exponential Smooth Transition Autoregressive method. ***q.*** Test employes non-unit-root covariates, for a case see Amara-Papell (2006), ***H_0: variable is non-stationary, H_A: variable is stationary.*** ***r.*** PP is non-parametric test (methodology).

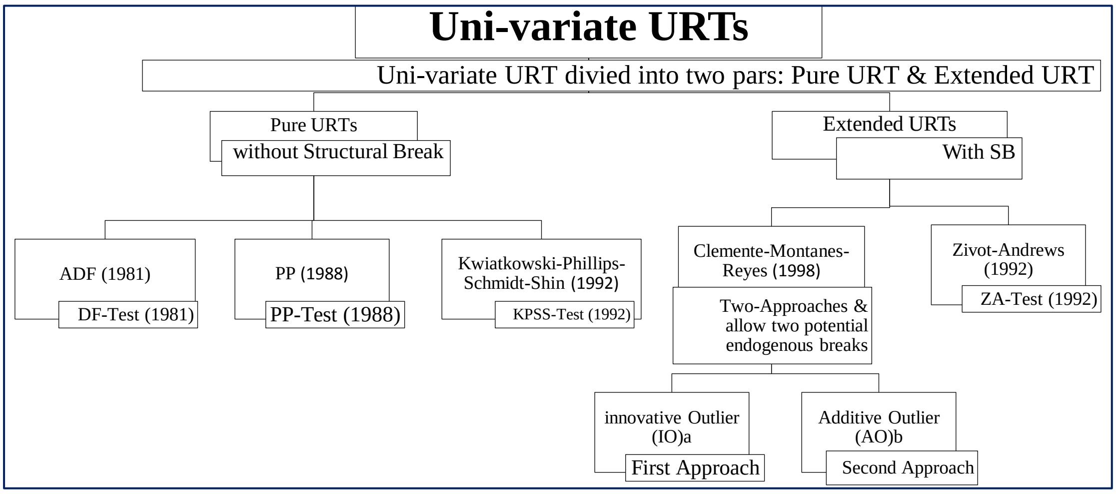


Figure 8, Uni-variate URTs
a. Suddenly change occurred; b. Grandly change happened.

Figure 8, demonstrates an additive and innovative outlier. (Perron & Vogelsang, 1992) and (Perron, 1997) are proposed and allow for two different methods of SBs, called the AO and IO tests. The AO and IO are sort of outliers that happen in time series data. An additive outlier is a type of outlier that happens when there is a temporary and swift shock in data. It agrees a break in the beta (slope or coefficient). AO can be caused by factors such as earthquakes, sudden changes in the weather, etc. Besides, IO is also a type of outlier that occurs when a gradual change in time series variance (Nilsson, 2009). The IO can be caused by factors such as changes in the original process that generates that data or changes in the measurement instrument used to collect the data. (Glynn et al., 2007)

Lags Selection Criteria

In time series data like stationarity or non-stationarity, the lag selection criteria are also a fundamental step that confirms whether the particular model(s) is or are not specified. It holds a strong position, particularly in time series. In time series data through an appropriate lag to give a suitable prediction. Mostly, 1 or 2 lags are used for a year's period (annual data), while 8 lags are suitable for quarterly data. It is not a first-and-hard rule, but commonly 6, 12, or 24 lags are assumed acceptable for monthly data (Wooldridge, 2015, p. 658). In the case of AIC, the lowest value is considered an appropriate or acceptable value (Liew 2004). Now, the question arises: which one is considered the best criteria? If the sample size is equal or exceed ($n \geq 120$), the SIC is better as compared to other criteria (Asghar and Abid 2007). Therefore, FPE and AIC have the maximum probability of accurate estimate with a sample size of 60 or < 60, whereas HQC has a suitable sample size of 60 or $n > 60$ (Liew, 2004; Asghar and Abid, 2007). All criteria are estimated to have the highest probability given the small sample size of 30 (Ashar and Abid, 2007). Therefore, Simiyu and Ngile's (2015) studied an optimal-lag-selection technique is practical, but it not agrees on an appropriate pattern to select the proper optimal lag. In time series data, 4 to 5 lags can be taken (Shabbir et al., 2020). The number of lags is also not proper. According to Kostyannikova (2012), the selection of a proper lag is significant for valuable information, but choosing too many lags is not appropriate for modellers. By using SIC and AIC, the autocorrelation is not eliminated, which raises the required lags to eliminate the issue of serial correlation. For time series data, two lags are proper (Shabbir et al., 2020).

Auto-Regressive Distributed Lag (ARDL) model

Pesaran and Shin (1995) introduced ARDL techniques, which were subsequently refined and expanded upon in later works (Pesaran et al., 1996, 2001; Pesaran, 1997). This approach became famous due to its number of econometric advantages compared to other co-integration approaches. The ARDL technique is correspondingly noble, if entire series are co-integrated at I(0) or I(1), or even if variables are probable in stationary at level and first order. This traditional approach was not acceptable (Pesaran, 1997). Hence, if series co-integrating at I(0) and I(1), but not a single variable is co-integrating at I (2), then the ARDL model is employed (Gul and Wahab, 2020). The ARDL approach to co-integration offers a strong outcome, and in the case of sample size, the long-run coefficient is more reliable than the traditional co-integrating approach. (Pesaran et al., 2001). This approach permits variables to have varying optimal lags, a feature no achievable with alternative methods. Moreover, it uses a single reduced structure equation to determines both long- and short-term association among series. (Pesaran and Shin, 1995). The ECM is an econometric approach for estimating the relationship between time series variables that share a long-term equilibrium. This model encompasses both short and long-term equilibrium in variable relationships. The "Error correction" pertains to adjusting current disequilibrium based on past deviations. A positive coefficient signifies divergence, while a negative one indicates convergence. An ECT value 1 is refers complete adjustment within the period, whereas an ECT value 0.5 indicates yearly adjustment. The ECT value is zero indicates no adjustment or absence of long-term relationship.

$$\begin{aligned}\Delta \mathrm{EXPORTt} = {} & \beta_0 + \sum\beta_{11}\Delta EXPORT_{t-i} + \sum\beta_{12}\Delta EXTCONF_{t-i} + \sum\beta_{13}\Delta INTCONF_{t-i} \\ & + \sum\beta_{14} GOVTS_{t-i} + \sum\beta_{15}\Delta MS_{t-i} + \sum\beta_{16}\Delta LO_{t-i} + \sum\beta_{17}\Delta ET_{t-i} \\ & + \sum\beta_{18}\Delta DA_{t-i} + {} + \eta 11\mathrm{EXTCONFt} - \mathrm{i} + \eta 12\mathrm{INTCONFt} - \mathrm{i} + \eta 13\Delta\mathrm{GOVTSt} \\ & - \mathrm{i} + \eta 14\Delta\mathrm{MSt} - \mathrm{i} + \eta 15\Delta\mathrm{LOt} - \mathrm{i} + \eta 16\Delta\mathrm{ETt} - \mathrm{i} + \eta 17\Delta\mathrm{DAt} - \mathrm{i} + aECMt \\ & - i + \varepsilon_t \ldots (9)\end{aligned}$$

$$\begin{aligned}\Delta IMPORT_t = {} & \beta_0 + \sum\beta_{11}\Delta IMPORT_{t-i}\sum\beta_{12}\Delta EXTCONF_{t-i} + \sum\beta_{13}\Delta INTCONF_{t-i} \\ & + \sum\beta_{14} GOVTS_{t-i}\sum\beta_{15}\Delta MS_{t-i} + \sum\beta_{16}\Delta LO_{t-i} + \sum\beta_{17}\Delta ET_{t-i} + \sum\beta_{18}\Delta DA_{t-i} \\ & + {} + \eta 11\mathrm{EXTCONFt} - \mathrm{i} + \eta 12\mathrm{INTCONFt} - \mathrm{i} + \eta 13\Delta\mathrm{GOVTSt} - \mathrm{i} + \eta 14\Delta\mathrm{MSt} \\ & - \mathrm{i} + \eta 15\Delta\mathrm{LOt} - \mathrm{i} + \eta 16\Delta\mathrm{ETt} - \mathrm{i} + \eta 17\Delta\mathrm{DAt} - \mathrm{i} + aECMt - i + \varepsilon_t \ldots (10)\end{aligned}$$

where Δ represents the I(1) operative; β_{01} is the intercept or term of constant; and β_{11}, ..., β_{17} indicates the short-term coefficients; η_{11} ..., $_{17}$ is coefficient of the long-term and ε_{t-1} indicates the error term of the of models 1 and 2, respectively. To find the cointegration (long run association) whether exists or not in specific series. Thus, test H_0 (H_0: $\beta_1=\beta_2=\beta_3=\beta_4=\beta_5=\beta_6=\beta_7=0$, or no cointegration) and H_A: $\beta_1\neq\beta_2\neq\beta_3\neq\beta_4\neq\beta_5\neq\beta_6\neq\beta_7\neq0$ (H_A: cointegration) by calculated F-statistics developed by Pesaran et al. (2001) and modified by Narayan (2005). The computed F-statistic is contrasted with the upper and lower critical values, provided by Pesaran et al., (2001). If the calculated F-value surpasses the upper critical value, the H_0 is rejected, regardless of whether the series are I(0) or I(1). Following the advice of Pesaran et al., (2001), confirming cointegration presence leads to estimating the ECM and the two bounds' values. thus, If $F_{\text{calculated value}}$<LCB, then the variable is stationary at I(0), in this case, no co-integration is possible.

1. If $F_{\text{calculated value}}$>UCB, then series at stationary I(1), in this case, co-integration is probable.
2. If LCB<$F_{\text{calculated value}}$ >UCB, the test called inconclusive. In such cases, the ECT is suggested as a pathway for further exploration and testing of cointegration

Diagnostic Statistics

Multicollinearity

Frisch was the first to introduce the term multicollinearity (1934). Multicollinearity occurs whenever an explanatory variable is very correlated (80% or 0.80) with one or more of the other independent variables (Gujarati, 2003). Someone mentioned the value of 90% in the social sciences (Kim, 2019). All other things being equal, a regression coefficient's statistical significance is less likely to be reached if its standard error is high (Allen, 1997). The issue of multicollinearity also checks through VIF. VIF_k is the coefficient of determination of the regression on all other independent variables (Greene, 2003, p. 57). VIF demonstrates how the existence of multicollinearity increases an estimator's variance. will be close to zero, and VIF will be close to unity if there is no multicollinearity. As method one, VIF methods will be close to 0, and VIF will be close to unity if there is no multicollinearity. Tolerance (TOL) is the opposite of VIF. TOL will be extremely low if VIF_k is extremely high. The terms VIF and TOL are used interchangeably in the literature (Gujarati 2003, p. 353). Multicollinearity may not be a big problem if $VIF\text{-}_{value}$ is <10.e., TOL is greater than 0.1), if $VIF\text{-}_{value}$>10 > 10, the problem exists, but some authors use the more conservative rule that $VIF\text{-}_{value}$ is <5. Therefore, in the case of a logistic regression model (concerning a weaker model), the $VIF_{\text{-}value}$>2.5 problem exists. However, O'Brien (2007) argues that this generalization ought to be evaluated in the context of the situation, taking into account the variables that have an effect on the variance of regression coefficients. O'Brien argued that a $VIF\text{-}_{value}$ of 10 or even 40 or higher does not necessitate the use of ridge regressions, the elimination of some variables, or a single index to treat multicollinearity. A $VIF\text{-}_{value}$ >10 indicates a multicollinearity issue (*Neter et al., 1989)*. To conclude, summarize the upstairs details in the below table 1.

Table 1
VIF value

VIF-value	Reference
$VIF_{\text{-}value}$ >10*	(Shrestha, 2020)
$VIF_{\text{-}value}$ >5* or $VIF_{\text{-}value}$ <10*	(Gareth et al., 2013)
$VIF_{\text{-}value}$ >5 is indication and $VIF_{\text{-}value}$ >10 serious problem*	(O'brien, 2007)
$VIF_{\text{-}value}$ ≥ 2.5 refers considerable	(Johnston et al., 2018)

*Presents the multicellularity issue.

Serial correlation

In 1921, G. U. Yule brought to attention the issue of serial correlation (Yule et al., 2011), and a new chapter opened for contemporary statisticians (Bartlett, 1935) showed that the conventional significance tests are invalidated when subsequent observations are not independent of one another. There are many tests to check the issue of serial correlation, the most popular being Durbin-Watson (1950) and the correlation effect. Serial correlation measures the degree to which the current value of a variable is related to its past values. Serial correlation can be measured using a statistical technique called the autocorrelation function (ACF). The positive value refers to +ve correlation, and the negative value refers to -ve correlation. Autocorrelation is not a serious issue. If the DW statistic value is close to 2 (Durbin & Watson, 1950), The acceptable range of DW statistics is 1.8 < DW < 2.2 (Benchimol, 2010). In a number of studies, the acceptable range of DW is 1.5 <DW< 2.5. (Imran, 2013). The Lagrange multiplier test established by Breusch (1978) and Godfrey (1978) is a more practical and widely applicable test for serial correlation (Hong, 2010).

Heteroskedasticity

The statistical term heteroscedasticity refers to the unequal variance of errors in a regression model (Harvey, 1976). In a regression analysis, heteroscedasticity occurs when the variability of the dependent variable changes as a function of one or more independent variables. The primary methods are heteroscedasticity reliable standard errors (Eicker, 1967; Huber, 1967; White, 1980), also known as White-Standard-Errors, Huber-White-Standard-Errors, Robust-Standard-Errors, Sandwich-Estimators, etc., which fundamentally identify the existence of non-constant variance and suggest an alternative method to estimate the variance of the sample regression coefficients. The heteroscedasticity is detected through formal and informal methods. An informal method consists of visual inspection of residual plots, while a formal approach studies various tests like the Goldfeld-Quandt test (1965), the Glejser test (1969), the Breusch-Pagan-Godfrey test (1979), the Park test (1980), and the White test (1980). Therefore, using another regression model that can handle heteroscedasticity, such as Weighted-Least-Squares or Generalized-Least-Squares.

Normality

Econometricians and statisticians have developed many tests for normality, i.e., Kolmogorov-Smirnov (K-S) test (1948), Shapiro-Wilk (1965), Jarque-Bera (JB-test) (Jarque-Bera, 1980), Anderson-Darling (1952), and Kuiper test (1960), Q-Q plot, P-P plot, and histogram. In this study, JB-test was applied (Jarque and Bera 1980; Bera and Jarque 1981; Jarque and Bera 1987). The Central Limit Theorem states that, if simple size ≥100, violation of normality is not a main problem (Ghasemi & Zahediasl, 2012). Therefore, the S-W test is the most suitable approach when the sample size <50 while the simple size (n≥50) the K-S will use. The H_0 of both the test (S-W and K-S) series (data) is normal distributed. therefore, when P-value is >0.05, we accept H_0 (Mishra et al., 2019). According to Jarque and Bera, "classical regression analyses assume the serial independence of regression residuals, homoscedasticity, and normality."

Stability test

In the seminal work of Brown et al. (1975), both the CUSUM and CUSUM of squares tests for linear regression model coefficient constancy over time depend on recursive residuals, that is, independent N (O, 0.2) under the null hypothesis. Therefore, they are perfect ingredients for all kinds of tests. Whereas the CUSUM of squares test has been extended to include OLS residuals (McCabe & Harrison, 1980). The CUSUM test depends on the cumulative sum of recursive residuals built on the initial set of n-observations (total observation). It is plotted against the breakpoints and updated recursively. If the CUSUM statistic plot (shown by two straight lines whose equations are provided by Brown et al. (1975, s. 2.3) remains within the %5 significance level, then coefficient estimates are said to be stable. The same technique is applied to perform the CUSUMSQ, which depends on the squared recursive residuals.

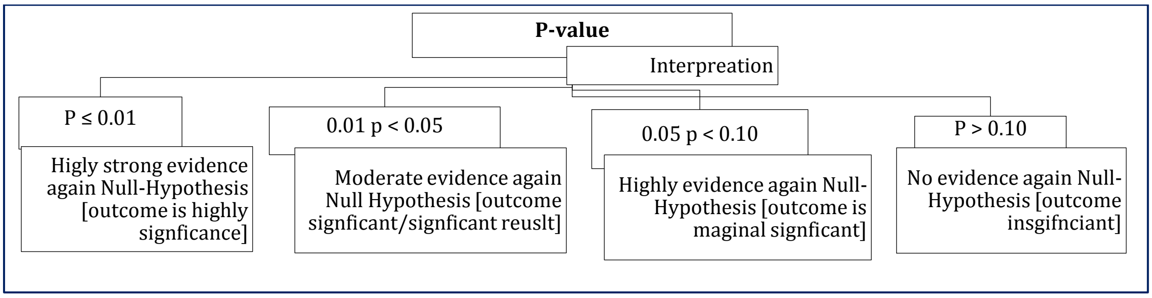


Figure 9. P-Value's Interpretation, statistically significant and Term of Interpretation

Table 2
Statistical' significance of p-value

p-value	Decision	Term
P ≥0.05	Insignificant or not significant	Insignificant
0.05 > p ≥ 0.01	Significant	Significant
0.01 > p ≥ 0.001	Very/ highly significant	Decisive
P < 0.01	Extremely significant	Conclusive

Figure 9, shows the p-value, its interpretation and level of significance. Significance means the independent variables cause or effect of the dependent variables or not. Generally, scholars use the 5% level who developed by Fisher.

In econometrics data set, we select which technique it determines the level of stationary. if all series stationary at I (0), then used OLS. If whole model (all series) is stationary at I (1), the use Co-integration and in case of mixed order used ARDL. When cointegration exists then use ECM or VECM, while no exist use VAR model.

Results and Discussion

Break is an irregular shock that has perpetual effect on time series data. So, if the break is not explicitly accounted or check it through conventional tests (ADF and PP), then wrongly describes the data and results will spurious. Thus, econometricians developed different structural break-unit-root-tests (SB-URTs) like, Zivot-Andrews, Chow and Clements URTs. In this study adopted Clements URTs.

Table 3
Unit-Root with Two Endogenous structural breaks: Clemente-Montanes-Reyes Test (AO Model)

Variable	Min-t-in-level	Break Points	Min-t-in-1st difference	Break-points	Outcomes
GOVTS	-3.277*	1994, 2006	-5.559*	1988, 1998	I (1)
SOCICOND	-2.953*	2002, 2005	-5.875*	1988, 1999	I (1)
INTCONF	-5.481	1995, 2001	-8.262	1992, 1996	I (1)
EXTCONF	-1.131	1995, 1997	-7.413	1996, 1998	I (1)
MS	-4.446	1999, 2007	-8.465	1987, 1998	I (1)
LO	-5.691	1995, 1997	-2.811	1992, 1995	I (0)
ET	-2.752	1995, 2004	-8.899	1992, 2003	I (1)
DA	-2.656	2001, 2011	-9.335	1995, 1998	I (1)
Imports	-4.739	1990, 2002	-7.006	2001, 2005	I (1)
Export	-3.319	1989, 2002	-6.574	2002, 2007	I (1)

H_0: *variable- non-stationary with 2-SBs,* H_A: *variable is stationary with 2-SBs, Min.t is the minimum t-stat. calculated, at 5% C.V. for 2 breaks: -5.490,* Min.t stat. calculated value < *5% C.V. for 2 breaks = accept H0,* Min.t stat. calculated value > *5% C.V. for 2 breaks = reject H0 & accept HA*

Table 4
Unit-Root with Two Endogenous structural breaks: Clemente-Montanes-Reyes Test (IO Model)

Variable	**Min-t-in-level**	**Break Points**	**Min-t-in-1st difference**	**Break-points**	**Outcomes**
GOVTS	-3.596	1994, 2005	-6.297	1989, 2000	I (1)
SOCICOND	-4.436	1999, 2004	-7.162	1989, 2000	I (1)
INTCONF	-5.511	1991, 1997	-8.101	1991, 1993	I (0)
EXTCONF	0.953	1991, 1996	-6.708	1991, 1993	I (1)
MS	-3.986	1998, 2004	-6.601	1988, 1999	I (1)
LO	-6.774	1988, 1992	-6.198	1992, 1996	I (0)
ET	-15.817	1992, 2003	-2.360	1993, 2004	I (0)
DA	-3.899	1996, 2008	-6.168	1997, 1999	I (1)
Imports	-5.092	1989, 2001	-6.856	200, 2006	I (1)
Export	-3.852	1990, 2003	-5.575	2003, 2008	I (1)

Recall that sudden and quick change occurs in AO and breaks the slope, while slow and gradual change happens in IO and breaks the intercept and slope. The majority of series are stationary at I (1), while law and order stationary at I (0). In spite of the breaks in government stability, socioeconomic conditions, internal and external conflicts, macroeconomic instability, ethnic tension, democratic accountability, imports, and exports, the H0 of the unit root cannot be rejected in the IO or AO model. The data shows Pakistan faces the same number of problems as in the 1990s, 2000s, and 2010s. In the 1990s, The

1990s are one of the darkest decades (or eras) in Pakistan's economic history. The growth of all sectors has declined after the 1980, and it was slightly upgrading in the 2000 decade (Rizvi, 1999) The government tried to control these inappropriate situations but unfortunately failed to stop them. As a result, the same conditions will affect the next decade. In a nutshell, these three decades economic, social, and politically were worse in the history of Pakistan than other decades. A 15-year perspective (1988–2003) developed a broad-based socioeconomic framework under the 7th five-year plan. Of the total incremental points, around 23.6% of GDP, 23.8% of travel expenses, 26.2% of imports, and 21% of income would be achieved under this plan. In total, the incremental yield goals were exceeded by more than 74% (Anwar et al., 2017, p-228).

Table 5
Lag-Selection-Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
$\boldsymbol{Export = \beta_0 + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \beta_{t8}\text{SC} + \varepsilon_t}$						
0	-274.4787	NA	2.910342	18.09540	18.37294	18.18587
1	-151.5520	190.3381*	0.011192*	12.48722	14.43005*	13.12054*
2	-114.6000	42.91193	**0.013971**	**12.42581***	16.03391	13.60196
$\boldsymbol{Import = \beta_0 + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \varepsilon_t}$						
0	-1058.304	NA	6.503844	68.85829	69.27461	68.99400
1	-848.6408	284.0592	2.004502	60.55747	64.72066	61.91456
2	-708.1373	108.7769*	**2.000124***	**56.71854***	64.62859*	59.29702*

Table 5 displays the outcomes of the lag-selection criteria for the aforementioned model. Mostly, time series data hold lags of 1 or 2. Our study also selected lag 2 for each model. Besides, on the basis of time, we selected AIC (lowest value considered best) and FPE because our time period is <60. Therefore, if n = 30 or 35, all criteria are appropriate. Our data set is 33 years. Thus, selected AIC and FPE criteria are suitable (when n =30 or n = 35, all criteria are suitable).

Table 6
Short Run coefficients

Variable	Model 1	Coefficient	Model 2	Coefficient
D (EXP (-1))	**Export =β0+β1EXTCON+β2INTCO + β3GOVTS+β4MS+ β5LO+β6ET+ β7DA+β8SC+ ε**	-0.85 [-5.83]	**Import =β0+ β1EXTCON+β2INTCO+β3GOVTS+β4MS+β5LO+β6ET+β7DA +β8SC + ε**	
D (IMPORT (-1))				-0.24 [-1.27]
		-		
D (EXCON)		0.14 [5.82]		0.08 [2.29]
D (EXCON (-1))		-0.10 [-6.90]		0.03 [1.65]
D (INCONF)		-0.04 [-2.16]		-0.16 [-4.58]
D (INCON (-1))		-0.04 [-3.09]		-
D (GOVTS)		0.00 [1.06]		0.02 [1.57]
D (GOVTS (-1))		-		0.04 [3.31]
D (MS)		0.01 [3.78]		-0.02 [-3.39]
D (MS (-1))		0.01 [5.14]		0.01 [2.53]
D (LO)		-0.30 [-5.92]		0.09 [1.57]
D (LO (-1))		0.16 [5.18]		-
D (ET)		-0.03 [-2.97]		0.03 [2.04]
D (ET (-1))		-0.09 [-6.14]		
D (DA)		-0.01 [-1.07]		-0.03 [-1.35]
D (DA (-1))		0.04 [3.86]		-
D (SC)		0.08 [4.76]		-0.01 [-0.41]
D (SC (-1))		0.16 [8.35]		
CointEq (-1))		**-0.03 [-10.6]**		**-0.51 [-2.80]**

Table 6 shows the ECM value of four particular values. In model 1, the ECM value is negative -0.03 and significant (t-statistics >1.96, alluded p<0.05, and model is significant) which is refers convergence toward equilibrium. The ECM values of model 1 -0.03 [-10.6], while -0.51 [-2.80], significant (t-statistics values of all model is exceed 1.96). here significant means short-run equilibrium towards long-run equilibrium in particular time period.

Table 7
Long run Coefficient

Variable	Model 1	Coefficient	Model 2	Coefficient
EXTCON	Export $=\beta_0+\beta_1$EXTCON+ + β_3GOVTS+ β_4MS+ β_5LO+ β_6ET+ β_7DA+ β_8SC+ ε	-1.7589 [1.8538]	Import $=\beta_0+\beta_1$EXTCON+ β_2INTCO + β_3GOVTS+ β_4MS+ β_5LO+β_6ET+β_7DA+ β_8SC + ε	0.24032 [2.6869]
INTCON		-0.3404 [-3.3978]		-0.31403 [-2.4423]
GOVTS		2.6051 [3.1000]		0.04080 [1.4063]
MS		-0.8959 [-2.3907]		0.07691 [2.2929]
LO		0.1901 [0.3516]		0.02034 [0.1869]
ET		-0.1921 [-0.3999]		0.07296 [1.6118]
DA		-0.4051 [-3.3597]		-0.06604 [-1.5889]
SC		5.1114 [2.7789]		-0.16652 [-1.9639]
C		-		-

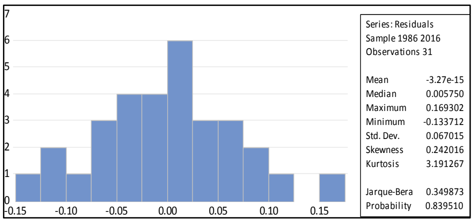
Table 7 displays the result of the long-run-coefficients of a particular model. External and internal conflicts both have a statistically significant and -ve effect on exports. Government stability is an essential source of exports. Government stability has +ve effect on exports. Macroeconomic stability is also necessary for high exports. In the case of Pakistan, macroeconomic instability has a negative and statistically significant impact on exports. Pakistan has been facing macroeconomic instability since 1947. So, when 1 unit increases macroeconomic instability, it results in a -0.89 USD decline in exports. In this particular model, law and order and ethnic tension do not have a statistically significant impact on exports. Democratic accountability and socioeconomic conditions also have statistically significant negative and positive impacts on exports, respectively. A number of factors determine the exports of a nation like Pakistan. but the particular factors directly and indirectly affect positive and negative exports from Pakistan. Exports and imports are preliminary factors that determine the growth and prosperity of a nation. In the import model, government stability, ethnic tension, law and order, and democratic accountability do not impact imports. External conflict is statistically significant and positive for imports. External and internal conflicts have negative effects on trade (exports and imports) in other aspect of the globe. But, in the case of Pakistan, as external conflicts increase, imports also increase (Jafarzaheh & Shuguan, 2021). Pakistan also trades with the major economies (economic superpower economies). Thus, the closer the ties with one, the greater the trade with another major economy. while internal conflict decreases imports. Macroeconomic instability increases in a state, domestic industry is destroyed, and imports increase.

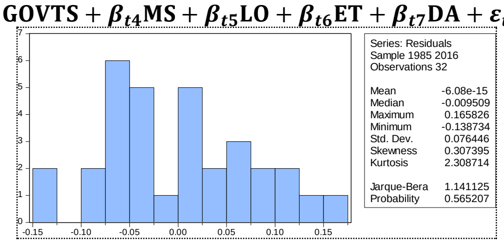
Table 8
Bound-test

$\boldsymbol{Export}=\boldsymbol{\beta_0}+\boldsymbol{\beta_{t1}}\textbf{EXTCONF}+\boldsymbol{\beta_{t2}}\textbf{INTCONF}+\boldsymbol{\beta_{t3}}\textbf{GOVTS}+\boldsymbol{\beta_{t4}}\textbf{MS}+\boldsymbol{\beta_{t5}}\textbf{LO}+\boldsymbol{\beta_{t6}}\textbf{ET}+\boldsymbol{\beta_{t7}}\textbf{DA}+\boldsymbol{\beta_{t8}}\textbf{SC}+\boldsymbol{\varepsilon_t}$		
F-Bounds-Test	**H0:** No levels relationship, **HA:** Levels relationship	
K [8]	F-statistics [5.441531]	Cointegration [Yes]
Significance [5%]	Lower-Bound [1.91]	Upper-Bound [3.11]
$\boldsymbol{Import}=\boldsymbol{\beta_0}+\boldsymbol{\beta_{t1}}\textbf{EXTCONF}+\boldsymbol{\beta_{t2}}\textbf{INTCONF}+\boldsymbol{\beta_{t3}}\textbf{GOVTS}+\boldsymbol{\beta_{t4}}\textbf{MS}+\boldsymbol{\beta_{t5}}\textbf{LO}+\boldsymbol{\beta_{t6}}\textbf{ET}+\boldsymbol{\beta_{t7}}\textbf{DA}+\boldsymbol{\varepsilon_t}$		
K [8]	F-statistics [3.941379]	Cointegration [Yes]
Significance [5%]	Lower-Bound [2.55]	Upper-Bound [3.68]
The I (0) am 3.31. 2.98 and 2.38 and the value of upper-bound is 4.63, 4.16 and 3.45 at 1%, 2.5% & 10% respectively.		

Table 8 displays the outcomes of bound tests for the four particular models. In model 1, the F. statistics$_{\text{-calculated-value}}$ is 5.441531, which is > UCB, meaning that cointegration or long-run association exist as assumed variables. In the case of model 2, the F. statistics.calculated-value is also higher than UCB (3.941379>3.68), which means cointegration holds the mentioned variables. To conclude, in both models hold long-run associations among particular series.

$$\boldsymbol{Export + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \beta_{t8}\text{SC} + \varepsilon_t}$$
$$\boldsymbol{Import = \beta_0 + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \varepsilon_t}$$





In this figure [11 and 12], the JB-statistics prob. Value is 0.0839510 (>0.05); in this case, we accept H_0 and reject H_A, and our H_0: The model is normal-distributed. So, our model is normally distributed. In the above two figures, show the prob. Value of JB-statistics. The prob.value of JB-statistics is >0.05 means accept H_0 and H_0 the model is normal. Besides, the Prob.value of JB-statistics < 0.05, so reject H_0 and accept H_A and H_A: the model is not normal distributed. In both figures, the Prob.value of JBs-statistics is > 0.05, meaning that both models are normally distributed.

Table 8
BG Serial Correlation-LM-Test

$\boldsymbol{Export = \beta_0 + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \beta_{t8}\text{SC} + \varepsilon_t}$			
F-statstic	1.242651	Probability F (1,13)	0.2851
Obs*R^2	2.704707	Prob. $\chi 2$ (1)	0.2001
$\boldsymbol{Import = \beta_0 + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \varepsilon_t}$			
F-statistic	2.384487	Probability F (1,20)	0.1382
Obs*R^2	3.408771	Prob. $\chi 2$ (1)	0.0649
H_0: No Serial-Correlation, H_A: Serial-Correlation			

Table 8 indicates the value of the serial correlation of the aforementioned models. The Prob. $\chi 2$ is across the model is >0.05. H_0: no serial correlation, while H_A: serial correlation exists in the model. Now that Prob. $\chi 2$ is >0.05, accept H_0 and model free from the issue of serial correlation.

Table 9
Heteroskedasticity Test: BPG

$\boldsymbol{Export = \beta_0 + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \beta_{t8}\text{SC} + \varepsilon_t}$			
F.statstic	1.306528	Prob F(1,13)	0.3106
Obs*R^2	18.56606	Prob $\chi 2$ (16)	0.2918>0.05, accept H_0:
Scaled explained SS	4.148754	Prob $\chi 2$ (16)	0.9986
$\boldsymbol{Import = \beta_0 + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \varepsilon_t}$			
F. statistic	0.561921	Prob F (7,25)	0.7793
Obs*R^2	4.486289	Prob $\chi 2$ (7)	0.7224>0.05, accept H_0:
Scaled explained SS	1.199109	Prob. $\chi 2$ (7)	0.0915
H_0: Homoskedasticity; H_A: Heteroskedasticity			

Table 9 displays the outcomes of the heteroskedasticity. Heteroskedasticity means that the variance of the errors in a regression model is not constant crosswise values of the regressor variables. The error term has a constant variance, means violates the assumptions of linear regression, namely that the. If the p-value is < 0.05, then accept H_0 and H_0: homoscedasticity; if P > 0.05, reject H_0 and accept Ha and H_A: heteroskedasticity. The problem of hetero-scedasticity is not desirable or acceptable in any model. In the above table, the Prob. $\chi 2$-values of 0.2918, and 0.7224, are greater than 0.05 for models 1 and 2, respectively. The prob. $\chi 2$-value is >0.05, so accept H0, which means no heteroscedasticity in our models.

Stablity Test Cusum Test

$$Export = \beta_0 + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \beta_{t8}\text{SC} + \varepsilon_t$$

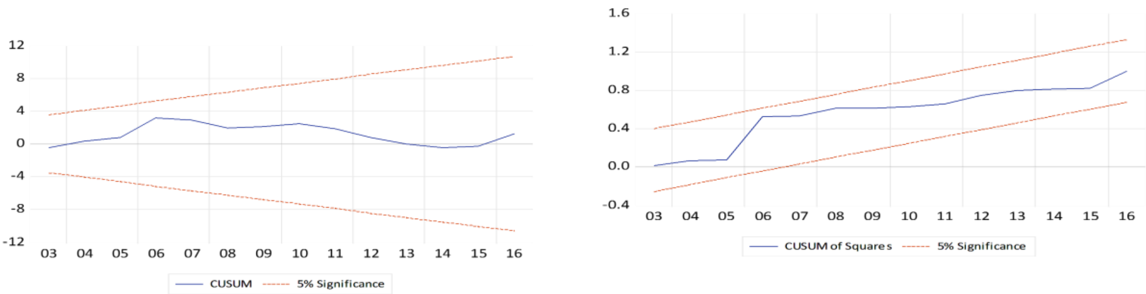


Figure 13 & 14, (CUSUMQ-test)

$$Import = \beta_0 + \beta_{t1}\text{EXTCONF} + \beta_{t2}\text{INTCONF} + \beta_{t3}\text{GOVTS} + \beta_{t4}\text{MS} + \beta_{t5}\text{LO} + \beta_{t6}\text{ET} + \beta_{t7}\text{DA} + \varepsilon_t$$

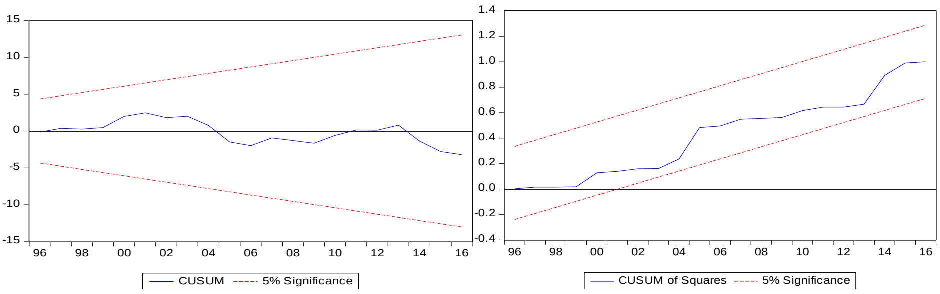


Figure 15 & 16

Figures 13 to 16 show the outcomes of the CUSUM and CUSUMQ tests. In each plot, the red line portrays the significant level at 5%, while the blue line of each model is inside the red line. When the blue line lies between the red line and the blue line, it means the model holds long-run stability among the projected variables. In the current study, all blue lines are within the red line, meaning that entire models hold long-run stability.

Table 10
Multicellularity & VIF for all models

Model. 1	Variable	Centered VIF	Model. 2	Variable	Centered VIF
Export =β_0+ β_1EXTCON+ β_2INTCO+ β_3GOVTS+ β_4MS+ β_5LO+ β_6ET+ β_7DA+ ε	EXTCON	3.73<10	Import =β_0+ β_1EXTCON+β_2INTCO+ β_3GOVTS+ β_4MS+ β_5LO+β_6ET+β_7DA+ ε	EXTCON	3.09<10
	INTCON	4.18<10		INTCON	4.55<10
	GOVTS	6.59<10		GOVTS	5.44<10
	LO	7.10<10		LO	1.58<10
	ET	6.38<10		ET	7.39<10
	DA	3.58<10		DA	1.83<10
	SC	2.88<10		SC	2.37<10
	MS	7.96<10		MS	3.43<10
	C	NA		C	NA

Table 4 demonstrations the VIF $_{values}$ of the four explicit models. In this study, we adopted a VIF $_{value}$ of 10. In all the above models, the VIF $_{value}$ <10 and means no multicellularity issues exist. So, the model is free from the issue.

Conclusion and Recommendation

Most developing countries, but not all countries, are facing the same issues and problems. Someone faces a critical issue. Like Pakistan, it has faced the curse of terrorism and political instability for the last four decades. Particular factors, i.e., external and internal conflicts, macroeconomic instability and government stability, ethnic tensions, democratic accountability, law and order, and socioeconomic conditions, affect Pakistan's trade. In all models, most variables have a long-run association and a short-run equilibrium towards the long-run. In all models, the explanatory variables have a statistically negative or positive effect on the regressand variable. Besides, some variables do not affect trade in Pakistan. It does not mean it cannot affect other countries in the world. Therefore, all the models are free of any diagnostic tests. The current study suggests the government developed amicable relations with neighboring countries to reduce external and internal threats (conflicts). In addition, the government adopts unbiased policies that help reduce or eliminate political instability. Political instability of Pakistan is the root cause of other issues, if it is not removed, Pakistan will face worse conditions than today.

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