

Political Instability: How Far It Impedes Macroeconomic Performance in Pakistan?

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Abstract

Political instability has been a much-debated topic in Pakistan's history since its inception. This paper examines the impact of political instability, during the period of 1985-2018, on macroeconomic performance of Pakistan. The political instability is proxied by 'percentage decline in annual tourist arrivals'. Foreign direct investment and trade are used as control variables. Long run relationship is found and it is statistically significant. Empirical results based on Johansen cointegration are estimated using fully modified ordinary least squares (FMOLS), Dynamic ordinary least squares (DOLS) and Conical Cointegration Regression (CCR). These confirm the negative relationship. Granger causality is also applied to show the cause-effect relationship which shows political instability as a cause of declining national income and foreign direct investment. This negative relation between political instability and macroeconomic performance exists both in short run and long run. Granger causality technique shows a Uni-causal relationship from political instability to national income. Recommendations based on empirical analysis are made in the end.

Key Words: Political instability, Macroeconomic performance, Foreign direct investment, Trade openness, Cointegration, Causality.

1. Introduction

Pakistan is one of the developing nations and remains at 152nd rank according to Human Development Report 2019 published by UNDP. It is blessed with ample natural and mineral resources which can be useful inputs to growth of the economy. However, observation and empirical evidence is contrary to it. For instance, Malik, Chaudhry & Hussain (2008) detected presence of 'Natural Resource Curse' and existence of mismanagement of human capital in Pakistan. The roots of mismanagement were found coming from mismanagement of political party in rule. One of the major constraints to the growth of Pakistan's economy is political instability, beside poor governance, weak institutions and conflicts with the neighboring country.

In Pakistan, recent political scenario has been full of drama. There have been external factors like terrorism and war against it, in addition to internal factors such as allegations of massive rigging of 2013 elections by Pakistan Tehreek-e-Insaf (PTI) and sit-in politics by PTI and Pakistan Awami Tehreek (PAT). After the disqualification of Nawaz Sharif, most recent of such stimuli are the rallies and protests by PPP, PMLN and other allies. Such has kept the political instability high in Pakistan as it has been in past. The political instability can be estimated by the fact that only one democratic government has completed its tenure during the 73-year political history of Pakistan. Which was led by 11th President of Pakistan, Asif Ali

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Zardari. Whereas, most of democratic governments were either weak or were politically corrupt and fell a prey to coup d'états by the military establishment in 1958, 1977 and 1999.

Table 1: Political History of Pakistan at a Glance

Period	Type of Rule	
1947 to 1958	Post-Independence government	(non-military)
1958 to 1971	→	Military-led government
1971 to 1977	Elected government	
1977 to 1988	→	Military-led government
1988 to 1999	Elected government	
1999 to 2008	→	Military-led government
2008 to 2013	Elected government*	
2013 to 2018	Elected government	
2018 till present	Elected government	
* The only democratic government to complete its tenure.		
Source: Authors' compilation.		

In Table 1, out of periodical eras, first 11 years were just the groundwork for the establishment of Pakistan. Since independence, Pakistan has 73 independence days. During its history, it has experienced military regime for around 33 years while in remaining 40 years, different forms of government were experimented. In these 40 years, the initial nine years were without any clear political structure (1947-1956). Throughout military regime in second era from 1958-71, forth from 1977-1988 and the sixth period from 1999-2008, high macroeconomic performance trends were detected and unfortunately following every military government, the elected regimes were not even able to uphold the economic development. On the contrary the economic situation became so much poor that occasionally the country was close to default.

Current times have brought newer forms of destabilizing forces in Pakistan political system. Concentration of these forces seem to be in terrorism and disagreements among political parties. Economic literature acknowledges the usefulness of political stability in the growth of a country in addition to economic factors like labor, capital and technology. Political instability, if prevailing, causes production to decline and economy ultimately suffers from weak macroeconomic performance. Policies of political parties in rule and functioning of institutions help in achieving desirable macroeconomic performance of a country. Therefore, political stability is a desired situation for a flourishing economy.

Acknowledging the relevance of political instability for macroeconomic performance, this paper assesses its pull-factor role.

2. Literature Review

Relevant literature is reviewed in this section. Fosu (1992) examined whether political instability has an adverse effect on economic growth or not. He has worked with evidence from Sub-Saharan Africa. Ordinary least squares (OLS) estimation technique has been applied to study the hypothesis of 31 countries of the mentioned region. The result showed that Sub-Saharan countries with higher political unrest tend to see approximately 1.1% decrease in the GDP growth annually. The data was taken from World Development Report which is published every year. The results also indicate that the value obtained could also be due to the reducing

marginal productivity of capital and exports, so if additional data was available, the result might have been otherwise. Empirically it has been proven that political instability does shake the overall economic growth of a nation.

Alesina & Perotti (1996) studied the effect political instability has on investment and, in turn, on economic growth. It states that income inequality gives birth to social unrest which discourages future investment. This leads to reduction in growth of a nation. Econometric tests like Hausman test, Breusch-Pagan Test, White's heteroskedasticity and White's Two-Stage Instrumental Variable Estimator were applied. Hausman Test at 10% level was insignificant. Our findings show us that income inequality raises political instability which reduces growth in the form of investment.

Ades & Chua (1997) unraveled how political instability in neighboring countries has an effect on the tourism of a country. The magnitude of this negative externality is similar in size to that of an equivalent increase in domestic political instability. Political instability has an adverse effect on the trade of a country. The numbers of tourist arrivals are lower in countries with high regional instability. Results of this article show that there is a negative spillover effect in tourism sector with political instable neighbors in the region. The data used in this article were from various sources. The tourist arrivals of various countries were from the respective tourism ministries. The study conducted by Alberto and Chua consist of 118 countries over a period of 1960-1985 but empirical analysis was done on 98 countries. The article showed that political instability in neighboring countries has a strong adverse effect on tourism of domestic country. Seddighi, Nuttalland & Theocharous (2000) built an empirical study of political instability. They argued that tourism is one of the emerging industries on the globe and it is sensitive as well. Political instability is exogenous factor which influence the tourists' perception. They analyzed the perception of the travel agents of main tourism generating countries as the representative of all the population. Delphi technique is used to measure the differences of different cultures with respect to the political instability. Most of the data is primary collected by questionnaire and statistical data is collected from World Tourism Organization (WTO) and National Tourism Organizations (NTOs). ANOVA is used as analytical tool to judge the hypothesis. The finding of this paper is that political instability has devastating effect on travel agent's perception of different cultural areas.

Asiedu (2002) compared the factors affecting FDI in UDCs with that in sub-Saharan Africa. His findings reveal that a higher return on investment and better infrastructure positively affects FDI inflows in non-SSA countries, but have no significant impact on FDI inflows in SSA. Trade openness was found to increase FDI inflows in SSA and non-SSA countries. It can be inferred from this research that policies of other regions should not be applied on Africa without considering their suitability.

Neumayer (2004) created a cross national link between the influence of political unrest and tourism of countries taken under consideration. The supposition that political instability has a negative effect of tourism sector of a nation is based on the quantitative studies. Eric uses estimation a fixed effect panel estimator and a dynamic generalized method of moment estimator. Both tests affirmed that political violence and discord in country adversely effects tourist arrivals. Eric used Compendium of Tourism Statistics to get the data on arrivals of tourists. He covers a period from 1977-2000. The data for political unrest, clashes and violence of elected countries is available from 1984-1995 on International Terrorism Attributes of Terrorist Events. The limitation of this article is that data was not completely available. Further study could be made on this article by analyzing the spillover effect of political unrest on neighboring countries of a region. One could also analyze the effect of non-political violence and crime in a country.

Mishra & Panda (2005) discuss the socio-political issues that lead to the downfall of tourism sector in South Asia. Socio political issues were divided into Global Socio-Political Risk and

Recognized Socio-Political Risk. The methodology used was through questionnaire in which Simon's Typology were used for variables. The result shows that Regionalized Risk has higher negative effect on profit than Globalized Risk. Promoters of tourism to a single region perceive lower globalized risk than those who promote various destination regions. The image of a nation in foreign countries affects the marketing strategies so as to attract tourist. Data was collected from October 2000 to January 2001. The data set was limited to only 4 months which is not sufficient. South Asian destination marketing planners should come up with effective strategies for a better performance so that these countries are perceived as 'tourist-friendly' and safe.

Busse & Hefeker (2007) explored the linkages among political risk, institutions, and foreign direct investment inflows for 83 developing countries covering 1984 to 2003. Their analysis focused on activities of multinational corporations. Findings showed that government stability, internal and external conflict, corruption and ethnic tensions, law and order, democratic accountability of government, and quality of bureaucracy are highly significant determinants of FDI inflows.

Xu, Selvarathinam & Li (2007) wrote that nations which lack peace within, cannot achieve economic development. They analyze how Sri Lanka's economy gets affected by the sociopolitical unrest it has to face. The methodologies applied to achieve results were based on ordinary least squares estimator. The result showed us that an excessive political instability reduced Sri Lankan economic growth rate by 32%, which was way much higher than the 17% economic growth achieved by increased human capital. The data used for this article was a period of 45 years from 1960-2005. This article shows that instead of military operations, peace within Sri Lanka; that is to stabilize the political situation; should be principal course of action for succeeding in expansion of its economy.

Yaya (2009) inspect that like other countries turkey has also geographical locations, political and cultural variety impression and economic strength. However, it faced a different form of terrorism in the way of growing tourism. In the study the researcher used the time series data and a unique technique which he used is transfer function to see the long run relationship between tourism and terrorism. Yaya took the required data from 1985 to 2006 from the Ministry of Culture and Tourism of Turkey. One assumption is used that all the tourists who travel to turkey are equally risk averse. The study shows that tourism has contributed a significant part in the GDP of turkey and terrorism has been putting a negative impact on the tourism in turkey but the effect is very small.

Qureshi, Ali & Khan (2010) examines the political condition of the country by dividing it in to different eras which shows high growth rates in military regimes instead of democratic era. They used the technique of ordinary least squares for the data from 1971 to 2008 and other econometric tools were used to inspect the link economic growth has with political unrest. The study shows that the political instability discourages the many economic factors like; unemployment, export growth, investment and overall growth of the country. It also discourages the tourists from international markets who enhance the economic activities in the country.

Memon, Shaikh & Memon (2011) explains the political instability from Pakistan's perspective. Authors notate it as a prerequisite for economic development, social integration, and supremacy of law. Authors give a description of direct effects of political stability on state building. Authors also try to explain causes and effects of political instability in Pakistan.

Aisen & Veiga (2013) empirically examine the impact of political instability on economic growth by employing system-GMM estimator on data of 169 countries from 1960 to 2004, Their findings are consistent with the expectations, i.e. inverse relationship. They further explain the mechanism of this relationship which suggests that political instability reduces by

rates of productivity growth and also of physical and human capital accumulation though by smaller proportion. This in turns lead to decline in economic growth.

Burger, Ianchovichina, & Rijkers (2015) analyze quarterly greenfield investment flows in to countries in the Middle East and North Africa and find relationship between reduced investment inflows in the non-resource tradable sectors. They attribute political instability as the key factor in this relationship.

More recently, Sweidan (2016) investigated the impact of political instability on economic growth of Jordan using the ARDL model for quantifying the long-term relationship. Williams (2017) analyzed the relationship FDI and economic growth in a simultaneous equation framework, constructing several dimensions of political instability and their differential effects on FDI and economic growth. Abdel-Latif, Elgohari, & Mohamed (2018) introduced corruption in the relationship between political instability and economic growth. They employed a panel VAR model on a dataset of 140 countries. Karnane & Quinn (2019) included ethnic fractionalization in the relationship between Political instability and economic growth. Authors used GMM on the data set of 157 countries to assess the indirect effect of ethnic fractionalization on political instability and hence economic growth. Pasha (2020) used high frequency data to apply GARCH model on a number of proxies for political instability including political assassinations, riots, insurrections and terrorism.

This work is built on the work of Memon et al., (2011) who provide a lucid explanation of political instability in Pakistan; however, the present study conducts the rigorous analysis using empirical data. Moreover, we borrow the proxy for political stability from Xu, Selvarathinam & Li (2007), and subject the data of Pakistan to a rigorous time series analysis including, stationarity tests Johansen cointegration, vector error correction mechanism, estimation of cointegration equation using FMOLS, DOLS & CCR and Granger causality tests.

3. Theoretical Framework

Political economy encompasses the interaction of economics, law and politics, and the way governmental bodies develop in unique public and economic system.¹ After 18th century, the term ‘political economy’ was linked with economics and politics. Interestingly, political economy merges Realist, Liberal, Marxian and Constructivist theories from political science. Starting from the 19th century, ‘economics’ or the study of the economy was changed to the term ‘political economy’.² A contemporary issue in political economy is ‘Political instability’ and its macroeconomic impact. It is a state in which a country gets deteriorated in its economic strength, political power, environmental, social and cultural amenities. People of the country and an administrative jurisdiction are not satisfied with the government policies and the current condition of the country. They face the uncertainty, restlessness, vulnerability and destruction. Political Instability has been an issue since old times. Aristotle considered that political instability is the result of the situation in which political power of a country fails to overcome the problem of the wealth distribution which results into unequal distribution of wealth among the rich and poor. In comparatively recent literature more focused instances of political instability and its economic relevance is found. Olson (1982) gave the theory related to stability

¹ Term, ‘political economy’ is constructed from the Greek words ‘polis’ (state) and ‘Oikonomos’ (economics: managing of household).

² Noted economists like Adam Smith, David Ricardo John Stuart Mill and Karl Marx laid the foundation for political economy in their writings. Adam Smith (known as the Father of Economics), in his famous book ‘An Inquiry into the Nature and Causes of the Wealth of Nations’ gives the concept of ‘Invisible Hand’ where individuals following their self-interest actually result in the general welfare of the whole society. David Ricardo wrote in his book ‘On Principles of Political Economy and Taxation’ about rent, which he argues, might rise as population increases. John Stuart Mill in ‘Principles of Political Economy with Some of their Applications to Social Philosophy’ (Mill, 1909), focuses on the linkage between social philosophy and political economy.

and growth in which he took the political stability as an independent variable. He asserted that war and terror and other destabilizing activities cause the instability in the country and it hinders growth contemporarily. On the other hand, the countries that consistently stabilized grow sharply but showed the declining trend over time. However, he did not discuss the 'destabilized economy' as explicit term but he examined that political instability declines the growth rate sharply. According to Hall & O'Sullivan (1996), political unrest as a situation in which conditions and mechanisms of governance and rule are challenged as to their political legitimacy by elements operating from outside of the normal operations of the political system.

3.1 Causes of Political Instability

Political instability is observed in form of civil war, crime riot, insurgency and other forms of sickening events. Analytically there are four factors. Firstly, the economic condition of the country can hamper the stability due to poor living standards and bad condition of the masses. This creates anger in masses towards the government. For this they arrange processions, strikes, shutter down commitments and walkouts. When the people of the country get frustrated, they destroy the government assets and property. And around the region a chaotic situation emerges which results in to political unrest and destabilization.

Secondly, political rivalries among the different political parties create the problem of political instability. When a country has different parliamentary parties then each wants to run the country according to its way. They have different approaches, goals and perception related to the country matters, which contradicts other political parties. Pakistan has also many political parties in its parliamentary system. When one party wants to implement a policy while other party disagrees, it can create the problem of uncertainty. Consequently, the competition with opponent party draws away the party leaders from their main purpose, such kind of issues disturb the parliamentary atmosphere and results in to political instability.

Thirdly, religious extremism can also play a negative role in raising the political instability in the country. The reason of suicide bombing is also because of this religious fundamentalism. Fourthly, political instability can be caused when a country is unable to utilize its limited resources and manpower and it relies on other countries. Foreign countries can then exploit the weaknesses of the dependent country via intervention and can cause political instability.

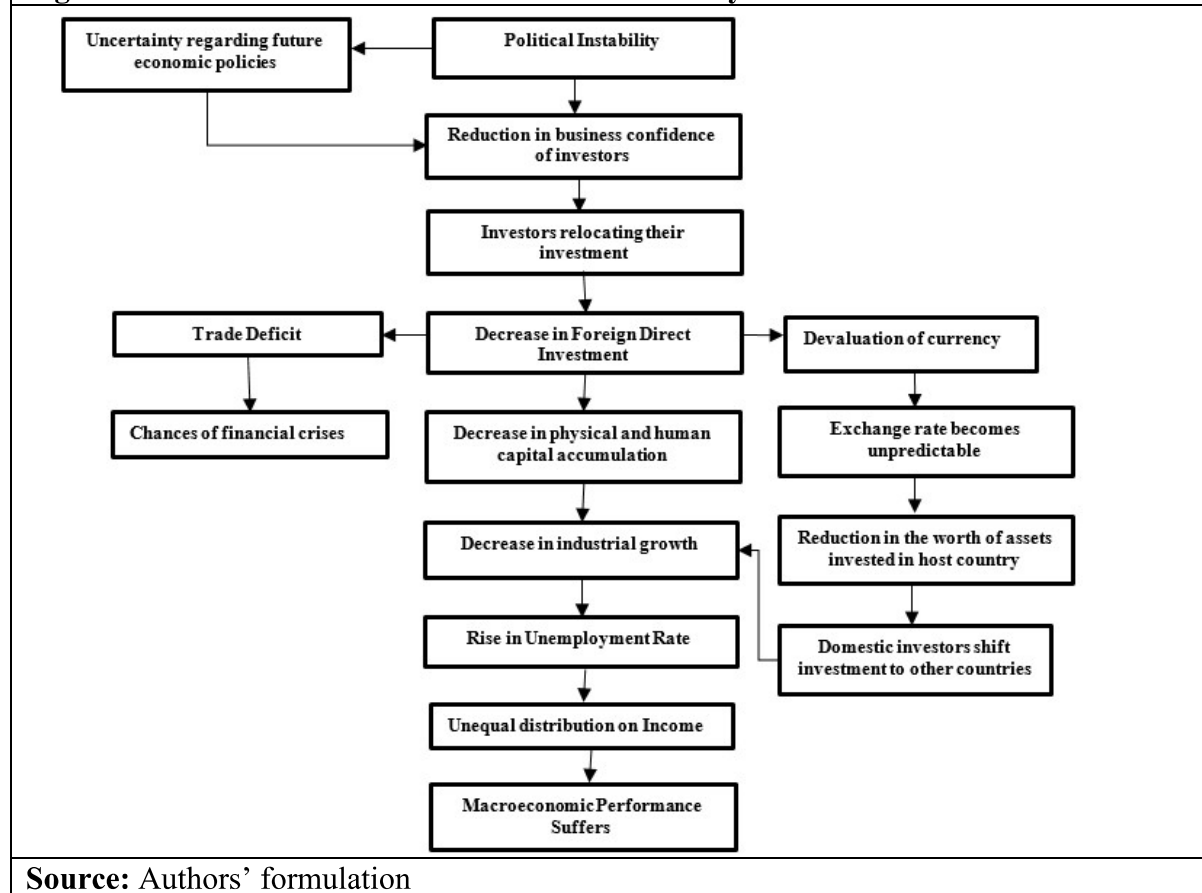
3.2 Political Instability in Pakistan

Pakistan is facing the problem of instability and destabilization. Pakistan is declared as a failed state and includes in the class of dangerous countries of the world, because of its terrorism issues during the last decade. The responsible factors are political unrest, war on terror, suicide attacks, target killing, drone attacks, disorder of law enforcement and other security issues.

After the September 11th, 2001 incident of World Trade Centre, Pakistan has become battle field for war against terror. Relationship with US and Afghanistan is one of the main causes that gives path to external factors which affect the stability of the country. Other incidents that have directly and indirectly led to political instability are war against Tehrik-e-Taliban in North Waziristan in 2006, operation of Lal Masjid in Islamabad in 2007, dismissal of Chief Justice of Pakistan in November 2007, assassination of Benazir Bhutto in December 2007, Blast in Islamabad Marriott hotel in 2008, militants' attacks on the Sri Lankan team in Lahore in 2009. In Table 1, national income and international trade show sudden fall during 2008. It can be attributed to the aftershocks of events mentioned above as well as due to shift from military rule to democratic government which usually creates a downward spike in trajectory of macro-economy. Though private and government investments also get negatively affected yet foreign direct investment is likely to shrink by a larger proportion (Mauro, 1993; Asiedu, 2002; Busse & Hefeker, 2007; Burger, Ianchovichina & Rijkers, 2015). Figure 1 depicts mechanism through

which political instability affects the macroeconomic performance. Political instability can have the direct and indirect effect on economy.

Figure 1: Mechanism of Effect of Political Instability on Macroeconomic Performance



4. Proposition

The objective of this paper is to examine the long-term effect of political instability on the macroeconomic performance of Pakistan. In doing so, following alternative hypothesis (H_A) shall be statistically scrutinized:

H_A : Political instability has the effect of decreasing national income in the long run with foreign direct investment and trade openness as the control variables.

5. Data Sources and Methodology

Political instability is a multidimensional issue and it is hard to find a perfect proxy for it. However, due to lack of data in time dimension we have resorted to a proxy, data for which is ample enough to form a time series of more than 30 years. Political instability is surrogated by a proxy variable with range from '0' to '10'. The variable is calculated by using the annual data of tourist arrivals.¹ Percentage change in annual tourist arrivals is estimated and the range of

¹ "International inbound tourists (overnight visitors) are the number of tourists who travel to a country other than that in which they have their usual residence, but outside their usual environment, for a period not exceeding 12 months and whose main purpose in visiting is other than an activity remunerated from within the country visited. When data on number of tourists are not available, the number of visitors, which includes tourists, same-day visitors, cruise passengers, and crew members, is shown instead. Sources and collection methods for arrivals differ across countries. In some cases, data are from border statistics (police, immigration, and the like) and supplemented by border surveys. In other cases, data are from tourism accommodation establishments. For some

this percentage change is then used to codify proxy of political instability. This methodology is borrowed from Xu, Selvarathinam & Li (2007). In order to avoid omitted variable bias, foreign direct investment and trade openness are used as control variables. Data of these variables is taken from various issues of Economic Survey of Pakistan and World Development Indicators (WDI). Data spans over the time period 1985-2018 for Pakistan. Including the variables in a function gives us the following functional form:

$$LNI_t = f(PII_t, FDI_t, TRD_t)$$

Where,

LNI = Natural logarithm of national income.

PII = Political instability index.

FDI = Foreign direct investment.

TRD = Trade openness as a percentage of GDP.

Subscript **t** shows that nature of data is time series. Unit of time is annual in nature.

6. Inferential Analysis

6.1 Stationarity Tests

For scrutinizing non-stationarity in a time series Augmented Dickey–Fuller test (ADF) test was purposed by Dickey & Fuller (1979). In order to check if the series carries one unit-root, the ADF test presents the following specification:

$$\Delta Y_t = \alpha + \beta T + \varphi Y_{t-1} + \sum_{i=1}^p \Delta Y_{t-i} + \varepsilon_t \quad (1)$$

where Y_t and ΔY_t are respectively the level and the first difference of the series, T is the time trend variable, and α , β , φ , ψ are parameters to be estimated. The p lagged difference terms are added in order to remove serial correlation in the residuals. The null hypothesis is $H_0: \varphi \neq 0$ and the alternative hypothesis is $H_1: \varphi = 0$. ε_t is the error term presenting zero mean and constant variance. First order integrated series can present stationary linear combinations $I(0)$. In these cases, we say variables are cointegrated. It means there is a long-run equilibrium linking the series, generating a kind of coordinated movement over time. In order to assess the existence of cointegration between $I(1)$ series, Engle and Granger (1987) proposed a regression between two non-stationary variables (Y_t, X_t) to check the error term integration order. If the error term is stationary one can assume the existence of cointegration. Thus:

$$Y_t = \alpha + \beta X_t + \mu_t \quad (2)$$

is an equation of cointegration, if μ_t is stationary. This condition can be evaluated through the ADF test.

Table 1: Augmented Dickey Fuller Test for Stationarity

ΔLNI	ΔPII	ΔFDI	ΔTRD
-4.793 ^a	-9.306 ^a	-4.137 ^a	-6.657 ^a

Note: ^a shows significance at 1%.

Table 1 shows unit root tests of the variables. It is observable in both types of tests that variables are stationary at first difference. Therefore, we can employ cointegration technique to find the long run relationship between the variables.

countries number of arrivals is limited to arrivals by air and for others to arrivals staying in hotels. Some countries include arrivals of nationals residing abroad while others do not. Caution should thus be used in comparing arrivals across countries. The data on inbound tourists denotes the annual rate of tourist arrivals and not rate of people traveling. Thus, a person who makes several trips to a country during a given period is counted each time as a new arrival” (The World Bank, 1944).

An approach to analyze long run relationship is provided by Johansen and Juselius (1990). They suggested an alternative method which has been applied under the following specification:

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-i} + \beta X_t + \varepsilon_t \quad (3)$$

Where $\sum_{i=1}^p A_i - I$, $\Gamma_i = -\sum_{j=i+1}^p A_j$, Y_t is a vector of k non-stationary $I(1)$ variables, X_t is a vector of d deterministic variables and ε_t is a vector of random terms (zero mean and finite variance). The number of cointegration relations is represented by the rank of P coefficient matrix. The Johansen method relies on estimating the P matrix in an unrestricted form and testing whether it is possible to reject the imposed restrictions when reducing the rank of P . The maximum likelihood test, which checks the hypothesis of a maximum number of r cointegration vectors, is called the trace test. It should be highlighted that variables under cointegration analysis should present the same integration order. If one concludes that cointegration exists in (7), then there is at least one stationary variable that may be included in the model. This representation is known as Error Correction Model (ECM), specified as follows:

$$\Delta Y_t = \lambda + \sum_{i=1}^m \alpha_i \Delta Y_{t-i} + \sum_{j=1}^n \beta_j \Delta X_{t-j} + \phi Z_{t-1} + \varepsilon_t \quad (4)$$

Where λ is the constant term, α, β, ϕ are coefficients, m and n are the required number of lags to make the error term ε_t a white noise and Z_{t-1} is the cointegration vector ($Z_{t-1} = Y_{t-1} - \delta X_{t-1}$), where δ is a parameter to be estimated). In this case, Z_{t-1} works as an error correction term (ECT). The ECT provides valuable information about the short run dynamics between Y and X . In equation (8), all the terms are $I(0)$.

After investigating the unit roots of the variables, Johansen Cointegration test is applied to capture the long run relationship between the variables. The trace test is used for joint hypothesis and Max Eigen test for hypothesis of individual Eigen values. According to these tests, if the statistic value is greater than critical value with probability lesser than 5% then there exist a cointegration between the variables or vice versa. The result of cointegration test is presented in Table 2. The trace statistic results state that 6 cointegration vectors exist between our variables. While Max individual Eigen values show 2 cointegrating vectors between the variables. Both Trace Stat and Max Eigen value show an existence of long run equilibrium relationship.

Table 2: Johansen Cointegration Results.

Null Hypothesis	Trace Statistic	5% critical value
$r = 0$	60.815	47.21
$r = 1$	31.594	29.68
$r = 2$	9.1697	15.41
Null Hypothesis	Max Eigen Statistic	5% critical value
$r = 0$	29.220	27.07
$r = 1$	22.425	20.97
$r = 2$	9.000	14.07
r denotes the number of cointegrating vectors.		

Evidence of cointegration is found between *LNI* and the independent variables including *PII*. Trace and Maximal eigenvalue tests reveal the existence of '2' cointegrating vectors. In the following step the cointegrating equation(s) is estimated using regression analysis.

6.2 Cointegration Equation Estimation

Cointegrating equation is estimated using improved econometric methodologies, namely: fully modified ordinary least squares (FMOLS) of Phillips and Hansen (1990), dynamic ordinary

least squares (DOLS) technique of Stock and Watson (1993) and Conical Cointegration Regression (CCR) of Park (1992). These methodologies provide a check for the robustness of results and have the ability to produce reliable estimates in small sample sizes.

6.2.1 Fully Modified Ordinary Least Squares (FMOLS)

On the basis of VAR model results, cointegrating regression is estimated. In a situation, where the series are cointegrated at first difference ' $I(1)$ ', Fully modified ordinary least square (FMOLS) is suitable for estimation. FMOLS is attributed to Phillips and Hansen (1990) to provide optimal estimates of cointegrating regressions. FMOLS modifies least squares to explicate serial correlation effects and for the endogeneity in the regressors that arise from the existence of a cointegrating relationship.¹

$$\mathbf{X}_t = \hat{\Gamma}_{21} \mathbf{D}_{1t} + \hat{\Gamma}_{21} \mathbf{D}_{1t} + \hat{\epsilon}_t \quad (5)$$

or directly from the difference regressions:

$$\Delta \mathbf{X}_t = \hat{\Gamma}_{21} \Delta \mathbf{D}_{1t} + \hat{\Gamma}_{21} \Delta \mathbf{D}_{1t} + \hat{v}_t \quad (6)$$

Let $\hat{\Omega}$ and $\hat{\Lambda}$ be the long-run covariance matrices computed using the residuals $\hat{v}_t = (\hat{v}_{1t}, \hat{v}_{2t})'$. Then we may define the modified data

$$\mathbf{y}_t^* = \mathbf{y}_t - \hat{\omega}_{12} \hat{\Omega}_{22}^{-1} \hat{v}_t \quad (7)$$

An estimated bias correction term

$$\hat{\lambda}_{12}^* = \hat{\lambda}_{12} - \hat{\omega}_{12} \hat{\Omega}_{22}^{-1} \hat{\Lambda}_{22} \quad (8)$$

The FMOLS estimator is given by

$$\hat{\theta} = \begin{bmatrix} \hat{\beta} \\ \hat{\gamma}_1 \end{bmatrix} = (\sum_{t=1}^T \mathbf{Z}_t \mathbf{Z}_t')^{-1} \left(\sum_{t=1}^T \mathbf{Z}_t \mathbf{y}_t^* - T \begin{bmatrix} \hat{\lambda}_{12}^* \\ 0 \end{bmatrix} \right) \quad (9)$$

Where $\mathbf{Z}_t = (\mathbf{X}_t', \mathbf{D}_t')'$. The key to FMOLS estimation is the construction of long-run covariance matrix estimators $\hat{\Omega}$ and $\hat{\Lambda}$. Before describing the options available for computing $\hat{\Omega}$ and $\hat{\Lambda}$, it will be useful to define the scalar estimator.

$$\hat{\omega}_{1.2} = \hat{\omega}_{11} - \hat{\omega}_{12} \hat{\Omega}_{22}^{-1} \hat{\omega}_{21} \quad (10)$$

Which may be interpreted as the estimated long-run variance of $\mathbf{v}_{1t}$ conditional on $\mathbf{v}_{2t}$. We may, if desired, apply a degree-of-freedom correction to $\hat{\omega}_{1.2}$.

6.2.2 Dynamic Ordinary Least Square (DOLS)

Dynamic Ordinary Least Squares (DOLS) is attributed to Saikkonen (1991) and Stock & Watson (1993). DOLS is a simple approach to constructing an asymptotically efficient estimator that eliminates the feedback in the cointegrating system. Technically speaking, DOLS involves augmenting the cointegrating regression with lags and leads of so that the resulting cointegrating equation error term is orthogonal to the entire history of the stochastic regressor innovations:

$$\mathbf{y}_t = \mathbf{X}_t' \boldsymbol{\beta} + \mathbf{D}_{1t}' \boldsymbol{\gamma}_1 + \sum_{j=-q}^r \Delta \mathbf{X}_{t+j}' \boldsymbol{\delta} + \mathbf{v}_{1t} \quad (11)$$

Under the assumption that adding q lags and r leads of the differenced regressors soaks up all of the long-run correlation between $\mathbf{v}_{1t}$ and $\mathbf{v}_{2t}$, least-squares estimates of $\boldsymbol{\theta} = (\boldsymbol{\beta}', \boldsymbol{\gamma}')'$ have the same asymptotic distribution as those obtained from FMOLS and Conical Cointegration Regression (CCR).

An estimator of the asymptotic variance matrix of $\hat{\theta}$ may be computed by computing the usual ordinary least squares coefficient covariance, but replacing the usual estimator for the residual

¹ See Phillips and Hansen (1990) and Hansen (1995) for details.

variance of $\mathbf{u}_{1t}$ with an estimator of the long-run variance of the residuals. Alternately, you could compute a robust HAC estimator of the coefficient covariance matrix.

6.2.3 Conical Cointegration Regression (CCR)

The CCR estimator is based on a transformation of the variables in the cointegrating regression that removes the second-order bias of the OLS estimator in the general case. The long-run covariance matrix can be written as:

$$\Omega = \lim_{n \rightarrow \infty} \frac{1}{n} E (\sum_{t=1}^n \mathbf{u}_t) (\sum_{t=1}^n \mathbf{u}_t)' = \begin{bmatrix} \Omega_{11} & \Omega_{12} \\ \Omega_{21} & \Omega_{22} \end{bmatrix} \quad (12)$$

The matrix Ω can be represented as the following sum:

$$\Omega = \Sigma + \Gamma + \Gamma' \quad (13)$$

where

$$\Sigma = \lim_{n \rightarrow \infty} \frac{1}{n} \sum_{t=1}^n E(\mathbf{u}_t \mathbf{u}_t') \quad (14)$$

$$\Gamma = \lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^{n-1} \sum_{t=k+1}^n E(\mathbf{u}_t \mathbf{u}_{t-k}') \quad (15)$$

$$\Lambda = \Sigma + \Gamma = (\Lambda_1, \Lambda_2) = \begin{bmatrix} \Lambda_{11} & \Lambda_{12} \\ \Lambda_{21} & \Lambda_{22} \end{bmatrix} \quad (16)$$

The transformed series is obtained as:

$$\mathbf{y}_{2t}^* = \mathbf{y}_{2t} - (\Sigma^{-1} \Lambda_2)' \mathbf{u}_t \quad (17)$$

$$\mathbf{y}_{1t}^* = \mathbf{y}_{1t} - \left(\Sigma^{-1} \Lambda_2 \beta + (0, \Omega_{12} \Omega_{22}^{-1})' \right)' \mathbf{u}_t \quad (18)$$

The canonical cointegration regression takes the following form:

$$\mathbf{y}_{1t}^* = \beta' \mathbf{y}_{2t}^* + \mathbf{u}_{1t}^* \quad (19)$$

Where

$$\mathbf{u}_{1t}^* = \mathbf{u}_{1t} - \Omega_{12} \Omega_{22}^{-1} \mathbf{u}_{2t} \quad (20)$$

Therefore, in this context the OLS estimator of (23) is asymptotically equivalent to the ML estimator. The reason is that the transformation of the variables eliminates asymptotically the endogeneity caused by the long-run correlation of $\mathbf{y}_{1t}$ and $\mathbf{y}_{2t}$. In addition, (24) shows how the transformation of the variables eradicates the asymptotic bias due to the possible cross correlation between $\mathbf{u}_{1t}$ and $\mathbf{u}_{2t}$.

6.2.4 Comparison of the Cointegration Regression Estimates

Estimates of cointegration equation using different techniques is becoming popular in recent time series literature, see for example, Mehmood & Shahid (2014) and Mehmood, Shahid & Younas (2013). These results are summarized in Table 3:

Table 3. Comparison of Cointegration Regression Estimates, FMOLS, DOLS & CCR				
Variables	Estimation Technique			
	OLS	FMOLS	DOLS	CCR
<i>PII</i>	-0.1604 ^a (0.0366)	-0.1667 ^b (0.0745)	-0.1134 (0.0665)	-0.1551 ^a (0.0532)
<i>FDI</i>	0.3162 ^a (0.0667)	0.4191 ^a (0.1078)	0.5546 ^a (0.1075)	0.4226 ^a (0.0968)
<i>TRD</i>	-0.0132 (0.0175)	-0.0276 (0.0267)	-0.0461 (0.0275)	-0.0355 (0.0322)
<i>R</i> ²	0.7715	0.7280	0.9243	0.7205
<i>R</i> ²	0.7494	0.7008	0.8765	0.6926
Note: ^a and ^b show statistical significance at 1% and 5%, respectively.				

Use of fully modified OLS allows overcoming the problem of autocorrelation. Results of all FMOLS estimation technique for cointegrating regression confirm a negative relationship between *LNI* and *PII* which is found to be positive and significant. *R*² and adjusted *R*² (*R*²)

have tight ranges which are from 0.7205 to 0.9243 and from 0.6926 to 0.8765, respectively. These values show high explained variation. Moreover, both FDI also enters the regression with a positive sign and statistically significance at 1%. While TRD remains statistically insignificant with a negative sign. Such is expected due to unfavorable terms of trade of Pakistan in international trade. The purpose of these estimations is to check the robustness of the results of cointegration equations, see for instance, Mehmood & Shahid (2014) and Mehmood, Shahid, & Younas (2013). In all four techniques of estimation (OLS, FMOL, DOLS and CCR), **PII** remains as per expectations (negatively related) with acceptable level of statistical significance.

6.3 Post Estimation Tests for Normality and Autocorrelation

Table 4 shows a couple of residuals-based tests. Residual diagnostic tests of normality and autocorrelation. For normality, the value of Jarque Bera is applied which has **p-value** of **0.84**, it shows insignificance. Lagrange-multiplier test is applied to detect autocorrelation. Its **p-value** is **0.86** which also shows insignificance. Hence there is no serious problem of normality and autocorrelation in the model.

Table 4: Checking the Presence of Normality and Autocorrelation		
Test	p-value	Conclusion
Jarque-Bera	0.84	Normality of residuals
Lagrange-multiplier	0.86	No autocorrelation

6.4 What Causes What?

Results of Granger causality, in Table 5, show that political instability index (**PII**) causes national income (**LNI**) to decrease. This result basically is affirmation of the objective set in this paper. However, reverse causality, from **LNI** to **PII** does not exist. This result is also intuitive, since any increase in national income, usually, does not have direct effect on political instability. **PII** is also found to have causal effect on **FDI** and **TRD**. The reverse causality is also present, since an increase in foreign direct investment and international trade is accompanied with growing confidence of foreign investors and traders in stability of country under consideration. Consequently, one can expect mitigation of political instability in that country, which is in this case is Pakistan.

Table 5: Granger Causality Test Results			
Null Hypothesis	χ^2-Statistic	p-value	Remarks
$PII \Rightarrow LNI$	12.655	0.013	Uni-causal relationship
$LNI \nRightarrow PII$	6.0285	0.197	
$PII \Rightarrow FDI$	29.335	0.000	Bi-causal relationship
$FDI \Rightarrow PII$	10.560	0.032	
$PII \Rightarrow TRD$	42.584	0.000	Bi-causal relationship
$TRD \Rightarrow PII$	35.636	0.000	

7. Concluding Remarks

This paper investigates the long run causal relationship between political instability and macroeconomic performance in Pakistan. Findings of this paper show that political instability negatively affects macroeconomic performance in the long run. These findings are in lines with Xu, Selvarathinam & Li (2007) and Aisen & Veiga (2013). The results are statistically robust and strengthen their findings. Control variables with international foundation, i.e. instance FDI and trade openness also help to solidify the results in this paper by avoiding omitted variable bias. The causality also confirms the detrimental effect of political instability on macroeconomic performance.

Results highlight the need for care in safe guarding the political stability by monitoring local forces like opposition attempts to hinder the smooth working of party in rule. This practice should be discouraged to allow smooth implementation of manifesto of political party in rule and hence to allow better economic performance. External forces like hidden motives of neighboring and supporting countries can also affect political instability in Pakistan. There is general consensus that Pakistan currently is a target of many international forces for their self-interests.

Strict measures are also required by the government to handle the law and order situation in country to avoid riots and sit-ins. Above all government should also perform well so dissatisfaction among masses may not arise in the form of agitation. Both government and opposition are responsible for maintaining political stability. More specifically, government should focus on delivery of services and opposition on constructive criticism. Within government machinery a separate and responsible department can be established to monitor the forces which might cause political instability.

For future research, such work can be extended to a number of countries with different social structures. We also suggest to investigate the effect of political instability on the other macroeconomic variables like budget deficits, external debt accumulation, employment and investment among others.

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