A Causality Analysis of Foreign Inflows in Pakistan

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Abstract
The objective of the study is to investigate the cause and effect relationships among foreign inflows of Pakistan using time series data from 1972 to 2015. The results are estimated using Descriptive statistics, correlations and granger causality test. The study concludes strong evidence of correlation among foreign inflows (Exports, External Debt, Foreign Aid, Imports, and Worker Remittances) of Pakistan. Bi-directional causality is established between External Debt and Exports; Imports and Foreign Direct Investment.
Keywords: Exports, External Debt, Foreign Aid, Imports, Worker Remittances, Foreign Direct Investment

1. Introduction
Foreign Inflows play an important role in accelerating the Economic Development of any economy. Foreign inflows are External Debt, Foreign Aid, Foreign Direct Investment, Worker Remittances, Exports and Trade Openness. The economies are severely in need of such type of inflows when domestic savings are insufficient to fulfill investment spending within given resources. Lower investment ultimately puts opposite pressure on the economy. Considering importance of these inflows, various studies have been conducted and this issue has still been debatable in developing economies like Pakistan especially.

Ali et al. (2014) confirmed significant influence of FDI on investment. Foreign capital hampered export promotion (Stoneman, 1975). Chenery (1966), Khan and Rahim (1993) and Shabbir and Mahmood (1992) found positive effect of foreign capital on economic growth in low income developing countries. Shabbir and Mahmood (1992) concluded inverse relation of foreign capital on national saving of Pakistan. Balderas and Hiranya (2005) examined positive linkage of remittances with inflation. Dreher (2003) explained globalization as accelerating factor of growth. Umoh et al. (2012) considered foreign direct investment as one of the significant factors in augmenting domestic savings for more capital accumulation. Ayanwale (2007) exhibited direct link between FDI – economic stability to Nigeria.

The above discussion highlights importance of foreign inflows briefly. Keeping in view, the study is aimed at analyzing the cause and effect relationship of Foreign Inflows in Pakistan. The study is organized as brief introduction is provided in section 1, 2nd section is about literature review, 3rd section discusses data and methodology, results are described in section 4, the whole discussion is concluded in section 5 and lastly references are given.

2. Literature Review
A lot of research studies have already been conducted in this area of research. This section mentions some empirical studies and their main findings.

Lopez (2004) analyzed the liberalization of foreign direct investment (FDI) in Mexico since the late-1980s, and its relationships with exports and imports. Time series data was used from 1994-2000. Granger causality technique was applied among imports, exports and FDI, it was suggested that imports were demanded mainly to provide inputs for domestic and exports, and to include technology to foster Economic development.

Xian and Xing (2008) analyzed the impact of FDI on the exports of Vietnam with gravity equations. The study concluded positive impact of real GDP and FDI on Exports using regression technique. It was found that FDI had significantly improved Vietnam's exports to its source countries.

Zhang (2005) attempted to close the gap by inspecting the issue with the Chinese industrial data. The

study showed that FDI certainly had a positive impact on Chinese exports. Time series data was used from 1978 to 2004. The study found positive relationship with Capital, Economies of scale and negative relationship with wage rate using regression technique.

Kumar (2012) investigated the concept and theories of FDI to emphasize the need of Exports in developing countries. Using data from 1991 to 2010, the study concluded that FDI had a positive impact on India's export boom; its effects were much larger than those of domestic Capital. FDI improved the productivity growth through various means.

Gu et al. (2008) examined export performance of the recipient countries as a case study of China. The study discovered that FDI, Exchange Rate, Domestic investment, wage and world demand had positive relation with exports.

Rubio and Munoz (1999) analyzed the empirical relationship between outward FDI and exports for the Spanish case at a macroeconomic level. Time series data was used from 1977 to 1992. In this study, Granger causality technique was used. The complementary relationship was found between outward FDI and Exports.

Khalil and Hussain (2013) explored the impact of foreign direct investment on Pakistan's overall exports in a relation with FDI for the period 1971-2009. Time series data was used from 1971 to 2009. FDI, growth rate and relative price level were positive while exchange rate and world gross domestic product were negative with exports.

Ukeje and Obiechina (2013) investigated impact of the workers' Remittances on economic growth in Nigeria. Time series data was used from 1970 to 2010. The study found FDI, Export and Exchange Rate as positively related with GDP.

Akayleh (2011) developed a new methodology to estimate the effect of Remittances on growth by adjusting for all the possible econometric problems. Time series data was used from 1997 to 2006. There was found significant relationship of private Consumptions, investment, Government Expenditure and Net Exports with workers' Remittances.

Ahmed (2010) analyzed an impact of migrant workers' Remittances on economic growth of Bangladesh. Time series data was used from 1995 to 2006. Regression technique was used and found positive relationship of domestic investment and Exports while negative relationship of workers' Remittances with GDP.

Mohamed (2009) presented the effects of workers' remittance on economic growth in a sample of 7 remittance-receiving MENA countries. It was concluded that Remittances, human capital were positive while income, government consumption and inflation were negative with GDP per capita growth.

Lloyd et al. (2001) investigated the impact of aid on growth in Ghana using time series data from 1970 to 1979. Co integration test was applied and found significant relationship of exports, Investment and foreign aid with private Consumption.

Munemo et al. (2006) examined long run relationship between exports performance and foreign aid in developing countries. Per capita aid, imported Capital, population, tele-density, per capita Income was positively related with exports.

Zarzoso et al. (2010) analyzed model of trade to investigate the link between foreign aid and exports in recipient countries using data from 1988 to 2007. The study revealed negative impact of exports and Exchange Rate while positive impact of Income with foreign aid.

Kang et. al (2010) studied the dynamic response of exports, imports and per capita GDP growth to a global aid shock. Positive relationship of real Exchange Rate, exports and GDP per capita were realized with global Aid shock.

3. Data and Methodology
3.1 Data
To analyze causality among foreign inflows, the study utilizes time series data from 1972 to 2015. Data has been taken from official websites like World development indicators (WDI), Hand book of Statistics on Pakistan's Economy and Economic survey of Pakistan 2014-15 The study considers Exports, Imports, Trade Openness, External Debt, Foreign Direct Investment and Workers Remittances as foreign inflows of Pakistan. The units of measurement for Exports, Imports, External Debt, Foreign Direct Investment and Workers Remittances are million rupees while , Trade Openness is index.

3.2 Methodology
The granger causality Test for the case of two variables Y_t and X_t, involves following steps as the estimation of the following VAR model;

$$Yt = a_1 + \sum_{t=1}^{p} b_i X_{t-i} + \sum_{j=1}^{q} r_t Y_{t-j} + e_1$$

$$X_t = a_2 + \sum_{i=1}^{p} c_t Y_{t-1} + \sum_{j=1}^{q} d_j X_{t-j} + e_2$$

Where, it is assumed that both e_1 and e_2 are uncorrelated white noise error terms.

4. Results and Discussion

Table 1 shows descriptive statistics of the variables used in the study. On the average, external debt of Pakistan is 92.33 millions rupees, exports are 683 billion rupees, foreign aid is 69.90 billion rupees, foreign direct investment is 5.39 trillion rupees, imports are 980 billion rupees, and worker remittances are 27.20 trillion rupees. External debt, exports, foreign aid, foreign direct investment, imports, trade and worker remittances are positively skewed.

Table 1: Descriptive Statistics

Variables	Mean	Median	Skewness	Kurtosis
External Debt (M)	92.23	17.24	1.79	5.04
Exports (B)	683.00	236.00	1.61	4.49
Foreign Aid (B)	69.90	31.00	1.35	3.64
Foreign Direct Investment (T)	5.39	1.08	2.00	6.27
Imports (B)	980.00	298.00	1.70	4.68
Trade Openness	33.49	33.40	-0.15	2.49
Worker Remittances (T)	27.20	4.30	2.22	6.95

Table 2 reveals that Exports and External Debt; Foreign Aid and External Debt; Imports and External Debt; Worker Remittances and External Debt; Foreign Aid and Exports; Worker Remittances and Exports; Imports and Foreign Aid; Worker Remittances and Foreign Aid; Worker Remittances and Imports are highly correlated with each other. Moderate correlation is examined among FDI and External Debt; FDI and Exports; FDI and Foreign Aid; Imports and FDI. There are low correlations among Trade Openness and External Debt; Trade Openness and Exports; Trade Openness and Foreign Aid; Trade Openness and FDI; Trade Openness and Imports; Worker Remittances and Trade Openness.

Table 2: Correlations

Correlation Probability	External Debt	Exports	Foreign Aid	FDI	Imports	Trade Openness	Worker Remittances
External Debt	1.00						
Exports	0.99	1.00					
	0.00						
Foreign Aid	0.91	0.93	1.00				
	0.00	0.00					
Foreign Direct investment	0.56	0.62	0.67	1.00			
	0.00	0.00	0.00				
Imports	0.99	0.99	0.91	0.63	1		
	0.00	0.00	0.00	0.00			
Trade Openness	-0.18	-0.14	-0.14	0.02	-0.11	1	
	0.24	0.37	0.37	0.92	0.45		
Worker Remittances	0.98	0.97	0.86	0.50	0.97	-0.15	1
	0.00	0.00	0.00	0.00	0.00	0.31	

Table 3 presents estimates to show cause and effect relationships among foreign inflows of Pakistan. Two dimensional causal relationship is found between External Debt and Exports; Imports and Foreign Direct Investment. It shows that higher external debt may be a cause of rising exports of Pakistan. On the other side, export is also leading to higher external debt. Imports may be a cause of higher foreign direct investment and FDI may lead to higher imports of Pakistan.

Uni-variate causal relationships are moving from External debt to Foreign Aid, External debt to FDI,

Trade Openness to External Debt, Worker Remittances to External Debt, Exports to Foreign Aid, Exports to FDI, Foreign Aid to FDI, Imports to FDI, Foreign Aid to Worker Remittances, Worker Remittances to FDI, and Trade Openness to Worker Remittances of Pakistan.

The study finds no causality among Imports and External Debt, Worker Remittances and Exports, Trade Openness and Foreign Aid, Trade Openness and FDI, and Worker Remittances and Imports of Pakistan.

Table 3: Causality test

Cause and Effect Relations	F-Statistic	Probability
External Debt ↔ Exports	6.86376	0.0029
	3.21067	0.0518
Foreign Aid ← External Debt	0.24732	0.7822
	7.49858	0.0018
Foreign Direct Investment ← External Debt	1.24036	0.3010
	65.0277	0.0000
Imports – External Debt	1.49888	0.2366
	1.01951	0.3707
Trade Openness → External Debt	5.50949	0.0080
	0.17487	0.8403
Worker Remittances → External Debt	3.53364	0.0394
	1.37163	0.2663
Foreign Aid ← Exports	0.03554	0.9651
	6.99084	0.0027
Foreign Direct Investment ← Exports	1.98238	0.1521
	84.1883	0.0000
Worker Remittances − Exports	0.76162	0.4741
	1.39949	0.2595
Foreign Direct Investment ← Foreign Aid	0.18574	0.8313
	35.3390	0.0000
Imports → Foreign Aid	14.4000	0.0000
	0.39885	0.6739
Trade Openness – Foreign Aid	1.46093	0.2451
	0.46880	0.6294
Worker Remittances ← Foreign Aid	0.46464	0.6320
	4.34339	0.0202
Imports ↔ Foreign Direct Investment	53.3648	0.0000
	4.58884	0.0166
Trade Openness – Foreign Direct Investment	1.18125	0.3182
	0.80721	0.4538
Worker Remittances → Foreign Direct Investment	15.0149	0.0000
	0.14372	0.8666
Worker Remittances – Imports	0.15466	0.8573
	2.11894	0.1345
Worker Remittances ← Trade Openness	0.07133	0.9313
	4.03518	0.0260

5. Conclusions

Foreign Inflows play a vital role in the economic development. So that this study considers to examine cause and effect relationships among indicators of foreign Inflows like Exports, Imports, Trade Openness, Foreign Aid, External Debt, Foreign direct investment and worker remittances. Time series data is collected from Pakistan's economy during 1972 to 2015 using few reliable sources of WDI, Handbook of Statistics and Economic Survey of Pakistan.

Average values of external debt, exports, foreign aid, foreign direct investment, imports, and worker remittances are 92.33 million, 683 billion, 69.90 billion, 5.39 trillion, 980 billion and 27.20 trillion rupees. Strong correlations are examined among Exports and External Debt; Foreign Aid and External Debt; Imports and External Debt; Worker Remittances and External Debt; Foreign Aid and Exports; Worker Remittances and Exports; Imports and Foreign Aid; Worker Remittances and Foreign Aid; Worker Remittances and Imports.

The findings of the study are based on descriptive statistics, correlations and granger causality tests. The study concludes that there is having strong cause and effect relationship among foreign inflows of Pakistan.

Two dimensional causal relationship is found between External Debt and Exports; Imports and Foreign Direct Investment. Uni-variate causal relationships are moving from External debt to Foreign Aid, External debt to FDI, Trade Openness to External Debt, Worker Remittances to External Debt, Exports to Foreign Aid, Exports to FDI, Foreign Aid to FDI, Imports to FDI, Foreign Aid to Worker Remittances, Worker Remittances to FDI, and Trade Openness to Worker Remittances of Pakistan. The study finds no causality among Imports and External Debt, Worker Remittances and Exports, Trade Openness and Foreign Aid, Trade Openness and FDI, and Worker Remittances and Imports of Pakistan.

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