

FOREIGN CAPITAL INFLOWS AND INCOME INEQUALITY IN PAKISTAN

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ABSTRACT

This study tries to include all foreign inflows variables and examine their impact on income inequality in Pakistan for the period of 1981 to 2018. ADF test was used to test the stationarity of the data, whereas Johansen co-integration test was employed to establish the cointegrating relation among the variables. Consequently, the findings reveal a long run equilibrium relation of income inequality and the independent variables. Moreover, vector error correction model (VECM) is estimated to find the long run and short run dynamics of the study. The results show that foreign capital inflows containing FDI, aid, debt and inflation have positive and significant effect on income inequality in the long run. While, remittances, GDP and trade openness have a negative and statistically significant impact on income inequality in the long run. In the short run, debt and foreign aid have negative, while inflation has positive and statistically significant effect on income inequality.

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1. INTRODUCTION

Capital inflows are the movement of capital resources to a country for investment, trade, or industrial production (Ezejiet *al*, 2015). It plays an important role for each national economy, whatever its level of development. Inflows are essential for supporting the sustainable development in developed countries while for developing countries it is used to improve the accumulation and pace of investment in order to generate conditions for enhanced economic growth. Capital inflows can support economic development in developing countries by providing them essential capital and technology, which will be used to exploit their local resources. Inflow increases the production capacity and decrease unemployment through efficient allocation of resources. In developing countries capital inflows plays a vital role because they are scarcity in capital, skilled labor and modern technology. Capital inflows may also have implications for the income distribution¹. During the surge period, profits are likely to plunge disproportionality on those agents who are better able to capitalize on these inflows, worsening the skewness of the distribution of income (Liu *et al*, 2020). For example, Furceri and Lounganj (2018) discover that episodes of capital account liberalization are linked with increased inequality as measured by Gini coefficients. Furceriet *al*, (2019) find cross-country data at the industry level and find same results. Furthermore, when reversals of inflows inevitably occur, their burdens are likely to fall disproportionately on the poor (de Haan and Sturm, 2016).

The relationship between foreign capital inflows and income inequality are limited in literature. The previous studies have investigated inflow variables separately and find various results. Regarding to foreign direct investment (Asteriou *et al*, 2014; Farhanet *al*, 2014; Ucaletet, 2014; Sharma and Abekah, 2017; Malindini, 2017) showed positive relationship between foreign direct investment and income inequality. In contrast, studies of (Mugeni, 2015; Msweli, 2015; Trinh, 2016; Herzeret *al*, 2014; Mihaylova, 2015) have found negative impact of FDI on income inequality. While, some researchers such as (TeVelde and Morrissey, 2004; Milanovic, 2002; Sylwester, 2005; Im and McLaren, 2015; Franco and Gerussi,

¹ Generally income distribution is claimed to "picture of which individuals receive how much income within a particular society". In economics, income distribution is how entire GDP of a nation being circulated among its populations (FoziaJamshed, 2016).

2013) argued that FDI has no significant impact on income inequality in the host country. Remittances have a significant source of external financing and have a substantial effect on income inequality. In the literature, remittances have ambiguous impact on income inequality. For example, the studies of (Adams *et al*, 2008; Anyanwu, 2011; Bouoiyour and Miftah, 2014; Mollers and Meyers, 2014; Koechlin and Leon, 2007) found a positive relation between remittances and income inequality. Whereas other researchers such as (Docquier *et al*, 2006; Acosta *et al*, 2006; Bruwn and Jiminez, 2007; Loritz, 2008; Ebeke and Goff, 2009; Taylor *et al*, 2009; Gubert *et al*, 2010; Moghal and Anwar, 2012; Margolis *et al*, 2013) found negative effect of remittances on income inequality, others have no significant impact (Yang and Martinez, 2005; Beyene, 2014).

Foreign aid has improving the poor segments of population in receiving countries. It can eradicate poverty and a tool for equal distribution of income. In the literature, it is recommended that foreign aid positive effect on income inequality (Bjornskov, 2010; Muhammad, 2011; Herzer and Nunnenkamp, 2012; Ali and Ahmad, 2013; Pham, 2015; Maria, 2017; Yousiet *et al*, 2018), on the other hand, a stream of researches like as (Layton and Nielson, 2008; Shafiullah, 2011; Saidon *et al*, 2013) argued negative effect of foreign aid on income inequality, while an empirical study of Chong *et al*, (2009) found that foreign aid does not have any significant effect on income inequality. External debt is a source that covers the gap between government spending and public revenue. It is used not only to support the budget, but also to promote investment in the recipient countries. In the literature (Akram, 2013) found external debt has a significant positive impact on income inequality. The result of (Deyshappriya, 2017) indicates no significant effect of external debt on income inequality.

Most studies have a point that they cannot use all the inflow variables in the regression models which can produce the problems of omitted variable bias and parameter inconsistency. Taking the literature into account, it is found that there is not a single study that has included all the inflow variables to determine their impact on income inequality. To achieve the objectives, the researchers used different study designs, time periods and analysis methods to find the effect of inflows on income inequality but other inconsistencies still existed such as spurious regression, heterogeneity, use of stock and flow variables and reliable data (Waheed, 2004). This study makes a significant contribution to economic growth studies in three essential ways. First, this paper incorporates individually all capital inflow variables containing net foreign direct investment, net official development assistance, net personal remittances and net foreign debt to examine their influence on income inequality together with their individual importance. Second, this study contributed by using the latest econometric techniques, including auto regressive distributed lag (ARDL) model. Third, this study examines the convergence of variables in the short-run using the error correction term. This study applied ARDL technique to analyze the short-run and long run impact of inflow variables on income inequality during the time span of 1980-2015. The main purpose of this study is to estimate the impact of capital inflow variables which are more effective to attain economic growth. Which aid may affect the distribution of income.

2. DATA AND METHOD

2.1 Data and Variables identification

We used annual time series data from 1980 to 2015. Data on Gini coefficient is taken from Standardized World Income Inequality (SWIID) version_8 described by Solt (2019). Net FDI inflow (% of GDP), remittances (% of GDP), Net ODA (% of GDP), GDP growth, Inflation (consumer prices annual %), trade openness (exports + imports, % of GDP) are taken from World Bank Development Indicators. While, data on External Debt has been taken from Economic survey of Pakistan (Various issues).

The detail of variables is given below.

2.1.1 Income Inequality

Income inequality is dependent variable in our model. GINI indicates the income inequality measured by Gini_disp. GINI index indicates an estimate of the inequality in equivalent household disposable income (after tax and transfers). Zero Gini index shows perfect equality, but an index of 100 indicates perfect inequality. Following the literature, we use Gini coefficient in this study as a measure of income inequality.

2.1.2 Foreign Direct Investment

FDI inflows generally considered to be an important key factor for economic growth and development of an economy. Sharma and Abekah, (2017) denoted that FDI contributed in promote of income inequality. On the other hand, Herzer *et al*, 2014 showed that FDI diminish income inequality. While, Im and McLaren, (2015) indicate that FDI not significant influence on income inequality. From the above literature, FDI inflows in our study allow us to revisit their impact on income inequality. So, we expect that FDI has negative relationship with income inequality.

2.1.3 Remittances

Remittances are a major source of external financial support for many emerging markets and developing economies. The literature on the correlation between remittances and income inequality is inconclusive; with some researchers find positive and other find negative or no significant effects.

2.1.4 Aid

Foreign aid is one of the components of inflow of external financing. It is a necessary and appropriate condition for the development of developing countries. Foreign aid reduces the foreign exchange gap, provides the access to modern technology and managerial skills. A lot of researches have illustrated that foreign aid has a negative effect on income inequality. However, some researchers have found positive effect of foreign aid on income inequality.

2.1.5 Debt

External debt reveals the indebtedness of the economy. The larger the external debt and very low repaying capacity positively influence the income inequality. The effect of external debt on income inequality is ambiguous. The studies of (You and Dutt, 1996; Akram, 2013;) indicated that external debt have a positive significant impact on income inequality, while studies of (Floden, 2001; Chatzouz, 2014; Deyshappriya, 2017) showed negative effect, and (Prechel, 1985) has found insignificant impact of external debt on income inequality.

2.1.6 GDP Growth

The relationship between economic growth and income inequality has been widely debated in the literature². Economic growth leads to increase income inequality in a country if people cannot enjoy its fruits equally. Alternatively, economic growth has reduced income inequality if there are better policies on income distribution and labour absorbing economic growth (Leibbrand, 2018). Basic research on the association between economic growth and income inequality has begun in 1955 when it was published by Simon Kuznet. The result of their study showed that income inequality rises in the early stages of development and then reduces during development. Thus we will expect negative relationship between economic growth and income inequality.

2.1.7 Inflation

In ordinary term, inflation would mean a process of rising prices, measured by the consumer price index that can be fixed or changed at specific intervals in an economy. The relation between inflation and income inequality is much discussed. Various empirical researches have shown that inflation has positive effect on income inequality, whereas other studies have found a negative correlation between inflation and income inequality. Therefore, we expect that inflation will be negative relation with income inequality.

2.1.8 Trade openness

The openness of economy may affect distribution of income. According to Ohlin's model (1933), trade could reduce wage inequality because it would allow the developing countries to focus on less skilled-labor activities. Leamer (1994) indicated that trade openness creates severe impact on increasing income inequality in developing countries; whereas Reuveny and Li (2003) argued that trade openness decreases income inequality. Franco and Gerussi (2013) studied the association between trade openness and income inequality and revealed that openness decreases income inequality. From the above literature, we choose trade openness in this study to analyze the effect of trade openness on income inequality. Therefore, we expect a negative relation between trade openness and income inequality.

2.2 Unit Root

Most economic variables are non-stationary, but are stationary after the first difference (Nelson and Plosser, 1982). If variables are not stationary, the result of regression of these non-stationary variables will be spurious (Granger and Newbold, 1974). Additionally, Asteriou and Hall (2007) find that most of macroeconomic time series are trending and therefore non-stationary present in most cases. It is therefore crucial to find the order of integration to avoid the occurrence of spurious regression. A time series characteristic of every single variable is also examined under a univariate study by applying the ADF test for unit root. In this study ADF test is used on each series at level and first difference with intercept and, intercept and trend. The null hypothesis of ADF test is that the series are non-stationary. If the null hypothesis is rejected it is

²A stream of literature available on the impact of economic growth and income inequality. Some studies found positive relationship such as (e.g. Lundberg and Squire, 2003; Rubin and Segal, 2015; Wahiba and Weriemmi, 2014), while other find negative relationship (e.g. Majumdar and Partidge, 2009; Nssim, 2007).

concluded that the series is stationary. If all the time series are non-stationary and become stationary after first difference then they are cointegrated, so there is a long run relationship exists among the variables (Granger, 1986).

2.3 Johansen Cointegration Test

We have employed Johansen Cointegration test because Johansen Cointegration test can be used if there is three or more than three variables in the model. Similarly, Engel and Grangir (1987) method is used on a model including two variables. While, Johanson (1988) introduced Vector Autoregressive (VAR) model to explain the long run relationship between the variables. Johanson and Juslius (1990) extended further the VAR model. The procedure of maximum likelihood tests on the number of co-integrating vectors had been introduced by Johanson (1988) and Johanson and Juslius (1990). Johansen co-integration process is VAR of order p as bellow:

$$Y_t = \delta + \beta_1 Y_{t-1} + \dots + \beta_p Y_{t-p} + \varepsilon_t \quad t = 1, \dots, T \quad (1)$$

In the above equation Y_t indicate a vector $p \times 1$ of the time series $I(1)$, and β 's are the estimated parameters, ε is noise term and δ is constant vector. Co-integration procedure using error correction identification to differentiate between stationary by linear combination and differentiation as:

$$\Delta Y_t = \delta + \gamma_1 \Delta Y_{t-1} + \dots + \gamma_k \Delta Y_{t-k} + \ddot{\gamma} Y_{t-k} + \varepsilon_t \quad (2)$$

The rank of $\ddot{\gamma}$ denotes numbers of co-integrating vectors and the number of linear combination of Y_t to be stationarity. Johansen cointegration estimate two tests statistic, Trace statistic and Max-eigenvalue statistic to discover the numbers of cointegrating vectors. If time series are integrated by same order, this show a long run relationship exists in the series. We are using Johansen co-integration model of the assumption of no deterministic trend in the data.

3. EMPIRICAL RESULTS

3.1 Descriptive Statistics

Table 1 presents the description of dependent and independent variables used in this study. The mean and median values of all the variables are same and the values of Skewness are close to zero. Additionally, kurtosis of AID and FDI is more than 3 implying that the data of these variables is not normally distributed.

Table 1: Descriptive Statistics

	GINI	FDI	REMIT	AID	DEBT	GDP	INFL	TO
Mean	34.21389	0.914172	4.948058	1.741792	1672.056	4.874964	8.373405	33.13735
Median	34.30000	0.619590	4.656728	1.588771	1066.000	4.839699	7.882675	33.22749
Maximum	34.50000	3.668323	10.24763	4.549648	5188.000	10.21570	20.28612	38.49932
Minimum	33.60000	0.102667	1.310692	0.611286	86.00000	1.014396	2.529328	25.36343
Std. Dev.	0.263116	0.833798	2.307422	0.799537	1703.284	2.098465	3.821109	3.145702
Skewness	-0.639579	2.079280	0.360996	1.206623	0.979958	0.244356	0.656350	-0.596158
Kurtosis	2.351054	6.734321	2.231204	5.288356	2.604783	2.733848	3.793978	3.002300
Jarque-Bera	3.086061	46.85816	1.668480	16.59050	5.996195	0.464513	3.530371	2.132432
Probability	0.213732	0.000000	0.434204	0.000250	0.049882	0.792743	0.171155	0.344309
Sum	1231.700	32.91020	178.1301	62.70451	60194.00	175.4987	301.4426	1192.945
Sum Sq. Dev.	2.423056	24.33268	186.3468	22.37408	1.02E+08	154.1244	511.0306	346.3404
Observations	36	36	36	36	36	36	36	36

Note: author's own estimates

3.2 Correlation Matrix and Variance inflation factors

Table 2 present correlation matrix, while table 3 indicates results of variance inflation factors of all the variables in our model. Correlation matrix and variance inflation factors are used to detect multicollinearity among the variables. In table 2 the correlation coefficients shows no multicollinearity problem is exist, similarly in table 3 the values of VIF of all the variables in column-3 are less than 10 that confirm the result of table 2.

Table 2: Correlation Matrix

	GINI	FDI	REMIT	AID	DEBT	GDP	INFL	TO
GINI	1.000000							
FDI	-0.138064	1.000000						
REMIT	0.755985	-0.368001	1.000000					
AID	0.480877	-0.399975	0.451696	1.000000				
DEBT	-0.174665	0.225487	0.012009	-0.490080	1.000000			
GDP	0.533850	-0.245170	0.441852	0.513919	-0.439298	1.000000		
INFL	0.142543	0.378056	-0.096470	-0.036144	0.091861	-0.205438	1.000000	
TO	0.240861	0.167246	-0.013929	0.128052	-0.363561	0.019259	0.600247	1.000000

Note: author's own estimates

Table 3: Variance inflation factors

Table present results of Variance Inflation Factors			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
FDI	0.001537	3.397049	1.518962
REMIT	0.000236	10.22901	1.785205
AID	0.002240	11.97521	2.036094
DEBT	5.62E-10	4.617171	2.318786
INFL	0.000103	12.71787	2.141330
GDP	0.000286	11.73449	1.791242
TO	0.000160	259.2472	2.251597
C	0.167103	244.3721	NA

Note: author' own estimates

3.3 Stationarity test

Augmented Dickey Fuller was used to test the stationarity in the series. The data of all variables are observed with intercept, intercept and trend. The results show that all the variables are stationary at first difference with both intercept and, intercept and trend. The results of ADF first difference demonstrate that all variables are stationary at 1% and 5% significant level I(1). It implies to the determination of cointegration relationship among the variables.

Table 4: ADF test

	Level		First Difference	
	Intercept	Intercept and Trend	Intercept	Intercept and Trend
Gini	-1.77163	-1.51829	-4.39213***	-4.45331***
FDI	-2.09206	-2.40584	-3.81481***	-3.78017**
Remittances	-1.57552	-1.50432	-4.38076**	-5.41121***
Aid	-2.58750	-3.19716	-6.23161***	-6.22622***
Debt	0.63682	-1.59718	-3.48768**	-3.85305**
GDP	-1.97281	-2.34311	-7.69677***	-7.67505***
Inflation	-2.65268	-2.61453	-6.79587***	-6.68264***
TO	-2.21443	-2.43598	-6.59866***	-6.50902***

Note: author' own estimates

***, ** shows significance level at 1% and 5% respectively

3.4 Optimal Lag Length

Before applying Johansen cointegration test, the first step is to select the length of lag for co-integration based on the Akaike information criterion (AIC) and Schwarz information criterion (SC) by use of vector autoregressive test (VAR) as shown by table 5. Akaike information criterion (AIC) and Schwarz information criterion (SC) have confirmed 2 is the appropriate lag length.

Table 5: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-639.1605	NA	4710865.	38.06826	38.42741	38.19074
1	-428.5745	309.6852	939.9650	29.44556	32.67785*	30.54786
2	-335.6222	92.95235*	339.8014*	27.74248*	33.84792	29.82461*

* shows lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Note: author' own estimates

3.5 Results of Johansen Cointegration tests

The results of Trace statistic and Max-eigenvalue statistic presented in table 6. The results show that trace statistic of 6 co-integrated vectors significance at 5 % level but the Max-eigenvalue statistic also confirmed the same results. The Johansen co-integration recommend that income inequality and foreign capital inflows variables namely FDI, remittances, foreign aid and external debt, GDP growth, inflation and trade openness moving together in the long run. This denotes the variables are co-integrated. We precede next to find the long run relation between the aforementioned variables by using vector error correction model.

Table 6: Johansen Cointegration tests results

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value 0.5	P-value**
None *	0.998820	476.3122	159.5297	0.0000
At most 1 *	0.896335	253.8074	125.6154	0.0000
At most 2 *	0.826238	179.0100	95.75366	0.0000
At most 3 *	0.765833	121.2578	69.81889	0.0000
At most 4 *	0.714614	73.35099	47.85613	0.0000
At most 5 *	0.480459	31.97183	29.79707	0.0276
At most 6	0.255272	10.36314	15.49471	0.2538
At most 7	0.019113	0.636848	3.841466	0.4249
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value 0.5	P-value**
None *	0.998820	222.5047	51.35261	0.0001
At most 1 *	0.896335	74.79745	47.22132	0.0000
At most 2 *	0.826238	57.75223	41.06757	0.0002
At most 3 *	0.765833	47.90677	32.87677	0.0006
At most 4 *	0.714614	41.37915	28.58334	0.0005
At most 5 *	0.480459	21.60870	22.03162	0.0428
At most 6	0.255272	9.726291	13.26560	0.2305
At most 7	0.019113	0.636848	3.741466	0.4249

Trace test specifies 6 co-integrating egn(s) at the 0.05 level

*reveals rejection of hypothesis at 0.05 level

**Mackinnon-Haug-Michelis (1999) p-values

3.6 Results of long-run impact of capital inflows on income inequality

Table 7 showed VECM long run results. FDI is our first foreign capital inflows variable; the coefficient of foreign direct investment (i.e. FDI) has positive and significant effect on income inequality at 1% level of significance. A 1% increase in FDI inflows led to increase the income inequality by 0.26%. FDI inflows are considered for fulfilling the resource gap between desire funds and accessible domestic resources. These inflows also make it possible to transfer managerial skills and new technology to the host country. This transfer of knowledge, skills and new technology will improve the labor productivity in recipient countries (Todaro and Smith, 2005). The impact of FDI on income inequality depends on the sector wise distribution and economic policies implemented in the country (Te Velde and Morrissey, 2003). FDI inflow towards skill-intensive sectors increases the relative position of skilled workers and thus leads to increase wage inequality. Foreign firms are equipped by advance technology, more productive production methods, and more innovative business. Foreign firms provide workforce with access to specialized training and general education, make the skilled-labor productive that increase the wage gap between skilled and unskilled labors.

In addition, the inflow of FDI from industrialized countries can have negative effects on the growth of developing economies. If the host economy adopts additional protection policies, it is a magnet for FDI inflow; it can decrease the competition and growth in host countries. Even the reversal flows of profit funds from the host country can decrease the economic growth in the long run. Shekhet *et al.*, (2011) said that FDI has negative relationship with economic growth of Pakistan. The reversal flows of profit funds and withdrawal of labor and financial resources from the host economy slow down the economic growth of the economy and leads to an increase in income inequality. Remittances are our second foreign capital inflows variable that has a negative and statistically significant influence on income inequality. A 1% increase in inflows of remittances reducing income inequality by 4.2%. Remittances generally decrease inequality in countries where passport cost, less skilled migrants and distance are relatively less. Remittances should improve the income and consumption levels of the low and middle income recipient households, thereby reducing overall level of inequality (Anwar and Mughal, 2012). Pakistan can maximize the benefits of remittances inflows first, by prioritizing the importance to its human capital development as developed countries are increasingly pursue skill-selective immigration policies and close the door for unskilled or semi-skilled labor. Second, by improving the access and quality of banking services available to remittance receiving households for saving to be effectively channelized toward more productive investments. Third, domestic remittances also seem to be efficient toward decreasing poverty. Remittance can promote economic stability, improved creditworthiness and larger access to foreign capital that can increase economic growth and reduce income inequality. The extent that remittances are a major and stable source of foreign exchange that helps to prevent sudden current account reversals during periods of economic instability and ease the inflow of new investments (Bugamelli and Paterno, 2006).

Our third foreign capital inflows variable is Official development assistance, which has a positive sign and is statistically significant at 1%. It suggests that aid increases income inequality in Pakistan. The coefficient elasticity is

0.58331 indicating that 1% increase in aid led to increase 58% Gini coefficient (proxy for income inequality) of Pakistan. Although foreign aid may be profitable to the development of recipient country but dependence on aid, makes the dependency of the economy on external sources, increase the way toward corruption and also distresses economic management severely. The increasing effect of external aid on income inequality may be due to the low productivity of aid flows. The inflows of aid towards the non-industrial expenditures can have had a negative effect on economic growth (Ishfaq and Ahmad, 2005; Javed and Qayum, 2011), thus lead to increased income inequality. In addition, unexpected aid inflows and inappropriate policies may lead to increase the inequality in Pakistan. Pakistan economy received more aid during the military rule than in democratic periods. Aid inflows into Pakistan have been found to be adjusted to the financial and technical interests of donors rather than to the needs of Pakistan's economy (Javed and Qayum, 2011). The easy availability of aid has led to diversion of foreign aid into non-industrial activities, the waste of aid money in the urban sector resulting in inadequate allocation of resources. The tax system of the economy not only helps the government to generate income, but it can also be a means for the equal distribution of income. Smoothly, availability of foreign aid and foreign loans kept the government away from the choice of tough policies such as imposing substantial taxes of consumption and income due to the elite ruling class in Pakistan.

External debt is our fourth foreign capital inflows variable. External debt has a positive and significant relationship with GINI coefficient showing that an increase in external debt will lead to widening income inequality. This is due to the fact that for years Pakistan tends to finance its fiscal deficit by resort of external loans. What it makes worse is that instead of financing development spending, external debt has used mostly to finance current expenditures (defense, interest payments etc) and has raised the distress of poor. Moreover, government used debt for other government expenditures (such as interest payments on outstanding debt) would induce debt to a greater impact on inequality. The results of control variables indicates the negative sign of GDP shows that this variable has decreasing impact on income inequality implying that increase in GDP growth would help to decrease the income inequality in Pakistan. GDP growth increases as a result of employment growth and rise in average productivity that will help the economy to achieve low level of income inequality. Okun's law has suggested in economic theory that achieving higher GDP growth could lead to increase in employment. The rapid growth of the economy has resulted in an increase in productivity in the low-wage sector than in higher-wage sector, which in turn will help reduce income inequality. Higher growth will also raise the level of total income, thereby increasing consumption and saving in the economy. Consumption will directly raise aggregate demand and accelerate growth. Higher saving will help increasing the level of investment by increasing the economy's productive capacity (capital stock) in the long run.

Inflation has a positive and statistically significant effect on GINI coefficient. This implies that 1% increase in inflation widen the income inequality gap in Pakistan by 0.027 % during the study period. Inflation reducing the purchasing power of poor and falling the real value of government aids that are not often indexed to inflation (Yue, 2011; Saimi-Namini and Hudson, 2019). Trade openness has a negative sign and is statistically significant at 1%. It implies that one % increase in trade openness would lead to a 0.033 % decline in income inequality. The negative impact of trade openness on income inequality in the long run supports the argument of openness modernization. Trade openness towards the global economy would increase competition, enhance efficiency in resource allocation, improve economic growth and lead to better income distribution. Thus our result is similar to the findings of (Tsai, 1995; Reuveny *et al*, 2003; Wu and Hsu, 2012; Pham, 2015; Liu *et al*, 2020)

Table 7: VECM Long-Run Impact of Capital inflows on Income Inequality

Dependent Variable: Gini				
Variable	Coefficient	Std. Error	t-statistic	p-value
C	33.23673	0.408782	81.30677	0.0000
FDI	0.26441	0.02956	8.94514	0.0000
Remit	-0.04297	0.00902	4.76428	0.0000
Aid	0.583319	0.05344	10.9161	0.0000
Debt	0.0000716	0.00001	7.08884	0.0000
GDP	-0.127015	0.01473	8.62549	0.0000
Inflation	0.027877	0.00516	5.40360	0.0000
TO	-0.033899	0.00447	7.58857	0.0000

Note: author's own estimates

3.7 Short-Run Impact of Capital inflows on Income Inequality

The short run impact of capital inflow on income inequality is shown by table 8. The value of cointeq-1 is negative -0.4717 and statistically significant at 1%. This shows that any deviation from short run in gini coefficient is corrected by 47% on each year in the long run. The coefficient of debt is negative and statistically significant at 5% in the short run, while inflation has positive and statistically significant at 5% in the short run (Table 8).

Table 8: Short-Run Impact of Capital inflows on Income Inequality

Dependent Variable: Gini				
Variable	Coefficient	Std.Error	t-statistic	p-value
C	0.073320	0.02498	2.93535	0.0012
CointEq1	-0.471771	0.12953	-3.64227	0.0004
D(FDI(-1))	-0.075536	0.05702	-1.32470	0.2028
D(FDI(-2))	-0.042537	0.06777	-0.62765	0.5386
D(REMIT(-1))	-0.012720	0.02398	-0.53043	0.9294
D(REMIT(-2))	-0.007152	0.02472	-0.28937	0.2101
D(AID(-1))	-0.078733	0.05720	-1.37636	0.1713
D(AID(-2))	-0.053851	0.03089	-1.74332	0.0839
D(DEBT(-1))	-0.000217	0.000094	-2.31426	0.0224
D(DEBT(-2))	-0.000298	0.00011	-2.78405	0.0062
D(GDP GRWTH (-1))	0.011964	0.00863	1.38566	0.1684
D(GDP GRWTH(-2))	0.008702	0.00760	1.14460	0.2547
D(INFL(-1))	0.014659	0.00604	2.42842	0.0167
D(INFL(-2))	0.013386	0.00714	1.87349	0.0635
D(TO(-1))	-0.0000966	0.00903	-0.01070	0.9915
D(TO(-2))	-0.009109	0.00921	-0.98905	0.3246
R-squared	0.725476			
F-statistic	21.42843			
Prob(F-statistic)	0.000003			

Note: author's own estimates

3.8 Diagnostic tests

For reliable results, numerous diagnostic tests have been conducted. For example, for heteroscedastic Breusch-Pagan-Godfrey, for serial correlation Breusch-Godfrey LM Test, for normality Jarque-Bera tests a shown in table. The p-values of all the tests are insignificant indicating that the residuals are normal and the estimates are free from serial correlation and heteroscedasticity.

Table 9: Results of Diagnostic tests

Test		
Heteroskedasticity Test	Breusch-Pagan-Godfrey	8.577085 (0.2845)
Serial Correlation	Breusch-Godfrey LM Test:	2.75432 (0.3876)
Test for Normality	Jarque-Bera Statistic	0.02525 (0.9874)

Note: author's own estimates

The study used Cumulative recursive sum of residual (CUSUM) test for stability of parameters in the short run and long run. If the plots of CUSUM and CUSUMSQ lies in the two straight lines at 5% significant level, then the estimated coefficient are stable. As the following figure shows that our estimated coefficients are stable.

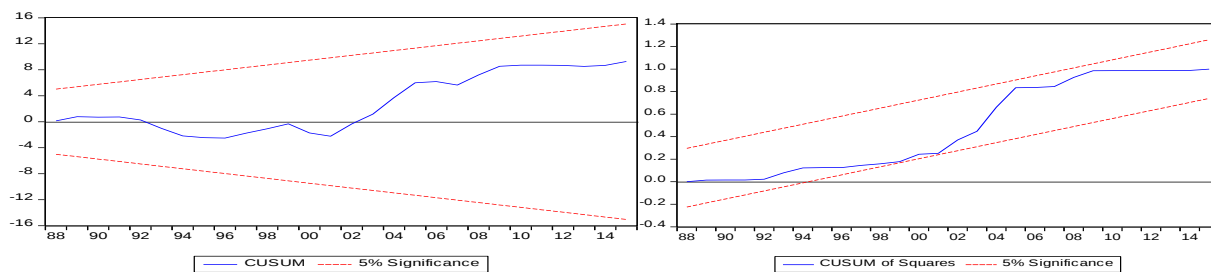


Fig.1. CUSUM and CUSUMSQ Tests

4. CONCLUSION AND POLICY IMPLICATION

The aim of this study is to examine the impact of foreign capital inflows on income inequality in Pakistan by using the time series data for the period of 1981-2018. The result of Johansen co-integration test show that income inequality and foreign capital inflows variables namely FDI, remittances, foreign aid and external debt, GDP growth, inflation and trade openness move together in the long run. The findings reveal that foreign capital inflows containing FDI, aid, debt and inflation have positive and significant effect on income inequality in the long run. While, remittances, GDP and trade openness have a negative and statistically significant impact on income inequality in the long run. In the short run, debt and

foreign aid are negative, while inflation has positive and statistically significant effect on income inequality. These results provide policy implications to improve the contribution of capital inflows in distribution of income in Pakistan. The government needed to provide sound macroeconomic policies containing fiscal and monetary policies to reduce the detrimental effect of FDI, aid and external debt on distribution of income. The negative effect of remittances suggests that Pakistan government should provide opportunities for sustainable investment to citizens from the diaspora in order to have a beneficial impact of such inflows. There is also a need to reduce the dependence on foreign aid and debt of the economy. A future research is needed by using firm level data to find income inequality at sectoral level.

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