

## Impact of Capital Inflows on Domestic Inflation: A Case Study of Pakistan

Shumaila Nazir<sup>1</sup>, Nadia Sarwar<sup>2</sup> and Sami Ullah<sup>3</sup>

<https://doi.org/10.62345/jads.2012.1.1.1>

### Abstract

*Inflation is a very important issue for an economy that's why several empirical and theoretical studies have been done on it in different time period. This study is an attempt to find out the impact of capital inflows on domestic inflation. The variables used in this study are export, foreign direct investment, remittances, and inflation. By using the data from 1980-2010, we use unit root test to check the stationary. Cointegration Test and Error Correction Mechanism (ECM) are used to check the long run and short run relationship of FDI, REM, EXP and inflation. The results show that all the variables are stationary at 1<sup>st</sup> difference and there is positive relationship between FDI, REM, EXP and inflation. The results of cointegrating equation show that there is long run and significant relationship. So the policy implication for the high inflation is that we should use the capital inflows like remittances not only increase the consumption but also to increase the investment that causes economic growth.*

**Keywords:** Capital inflows, Inflation, Cointegration, Error Correction Mechanism.

### Introduction

Globalization is the process in which economies, societies and culture have been interlinked through trade, transportation and communication. Various types of these flows are welcomed to bridge the gap between the domestic saving and investment that accelerate growth. The impact of these inflows on domestic financial indicators depends upon the process in which they move into an economy regarding their sustainability or unsustainability. Although this has happened universally, East Asia's evolving markets have been marked by greater capital inflows for numerous reasons. Firstly, many economies have improved significantly because most crisis-affected economies with risk premiums down. Secondly, there is an expectation that the dollar will depreciate so currencies in the region are undervalued against the United States (US) dollar. There is an expectation that the dollar will depreciate there is an expectation that the dollar will depreciate. Thirdly, several economies have released regulatory requirements on foreign portfolio inflows by liberalization of capital controls. All these factors have added to a strong increase in inflows into the region's stock, bond, and real estate markets, and these impacts, depending on local factors (Kim, S. 2008).

Capital flows play significant role in economic development but shortage of capital is a major problem for any economy especially in developing economies. It can increase through internal as well as external sources. Internal sources include savings, exports and external sources include loans, investments and grants that are related to government and foreign direct investment, portfolio investment, remittances etc are related to individuals.

<sup>1</sup> Graduate, Department of Economics, University of Gujrat

<sup>2</sup> Graduate, Department of Economics, University of Gujrat

<sup>3</sup> Lecturer of Economics, University of Gujrat (Corresponding Author) Email: [samiullah@uog.edu.pk](mailto:samiullah@uog.edu.pk)



As for inflation means a continuous increase in price level. Inflation has positive as well as negative effects on the economy and investment is mostly effected by it. If capital inflow increase there is a trend for the local currency to increase in value, decreasing the effectiveness of export industries, and possibly giving increase to inflation. Now, question arises, does there exist any strong relationship between inflation and foreign capital inflow? So different writers give different views about the relationship between foreign inflow and inflation like Kim, S. (2008) suggested that capital inflows have finally contributed to the asset price appreciation in this region, while capital inflow shocks describe a relatively small part of asset price fluctuations. Christopher Faight (2011) says capital inflow need not lead toward inflation and by Lawrence Agcaoili (2011) strong inflow into emerging markets including the Philippines could still be absorbed by the domestic economy without encouraging up inflation.

Two gap model focus on foreign exchange to finance import. By using foreign exchange capital inflow increases then currency value increase and ultimately give rise to inflation. Past studies explain that boom-bust cycle, generated by the periods of rapid inflow which follow the rapid capital outflow. Corsetti et al. (1998) recommends that the bases of the 1997/98 crisis depend upon the financial over-lending, banking problems, and the composition, maturity and size of capital inflows. Capital inflow can help domestic economy through various ways like portfolio inflows and remittances are important to support domestic economy move toward economic development. The objective of this paper is to find out how capital inflow effects the domestic inflation in case of Pakistan.

## Literature Review

Rashid, A. *et al.* (2010) consider the effects of capital inflows on domestic price level, monetary expansion and exchange rate volatility by using variables Real GDP Growth, National Saving, Inflation, Fiscal Deficit Credit to Private Sector, Public Debt, Weighted Avg. Lending Rate, Current Balance they apply linear and nonlinear co-integration and Granger causality tests and find that during the last 7 years there is a significant inflationary impact of capital inflows. The result propose that there is a requirement to accomplish the capital inflows in such a way that they should neither create an inflationary pressure in the economy nor fuel the exchange rate volatility.

Kim, S. *et al.* (2008) explored why a increase in capital inflows can increase asset price by using output, price level, capital inflows or portfolio inflows (as a ratio to trend GDP) stock price and land price. By using VAR model they find that the capital inflows have actually contributed to the asset price Appreciation in this region, while capital inflow shocks explain a relatively small part of asset price fluctuations.

Balderas J. Ulyses. *et al* (2005), investigated how remittances affect the distribution of relative consumer price changes and the overall inflation by using vector auto regression (VAR) and derive generalized impulse responses from the estimates of various specifications of the following unrestricted VAR model, and explain that remittances seem to have significant positive effect after 1994. Moreover, find that the positive association between inflation and RPV holds in the case of Mexico regardless of model specification and choice of sample period.

Erçakar, M.(2011) study observe the long-run relationship among GDP growth, foreign direct investment, trade and inflation (1970 and 2008), variables are GDP Growth, Foreign Direct Investment, Foreign Trade, Inflation and to the long run relationship between the GDP growth and macroeconomic variables apply ARDL and VECM define the long term relation. The findings show that there is only one co-integration relation among the variables. More, find that while foreign direct investment, inflation and trade surplus have positive and

statistically significant effect on GDP growth, import coverage of exports has a negative and statistically significant effect on GDP growth.

Mukhtar, T. (2010) reexamined the hypothesis of Romer (1993), holds for Pakistan which covers the period from 1960 to 2007. The (CPI), budget deficit, exchange rate, trade openness and GDP are variables and analysis is the first Unit Root Test (ADF), maximum likelihood co-integration technique, which tests both the existence and number of Co-integration vectors. And the empirical findings under the co integration test confirm the existence of Romer's hypothesis in Pakistan.

Farvaque, E.*et al.* (2009) paper carries evidence on the link between globalization and inflation the period is 27-year long, and sub-samples contain less than 27 countries, on the variables CPI, output gap, trade openness, export prices, and export prices. Applies OLS that lead to inconsistent estimates due to the presence of both fixed effects and to solve the endogeneity GMM method is used and the results for the pooled sample are show that firstly inflation is positively related with the cyclical variations in output and import price inflation and found a negative and significant connection between trade openness and export price inflation.

Dreher, A. (2003) investigates the relationship between the globalization and economic growth by using trade, foreign direct investment, portfolio investment, restrictions on trade and capital and pooled time-series cross-section regressions are conducted and apply all regressions estimated with OLS and GMM. The results show that globalization promotes highly significant growth.

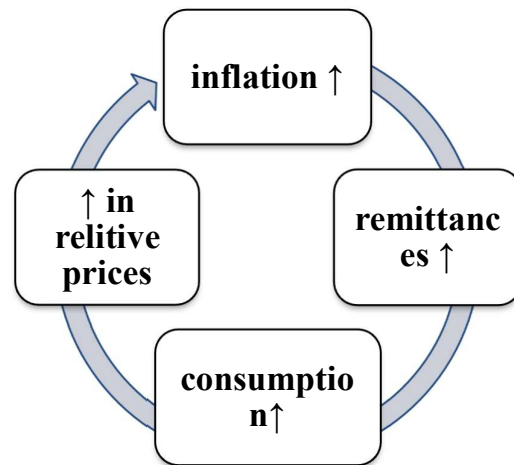
James, P. (2011) tries to minimizing or excluding food inflation in measures of core inflation, particularly in developing countries. By using food inflation, non food inflation, GDP per capita, CPI food and non food prices shocks variables find that eliminating food prices from core inflation may provide an incorrect picture of underlying inflation trends, especially in low income countries.

Saleem, N. (2010) the objective of this paper is to assess the conditions for inflation targeting in Pakistan. The variables are interest rate, output gap, CPI, money rate, GDP and by applying VAR conclude that inflation is monetary and that the central bank can control inflation in Pakistan using the interest rate as a nominal anchor.

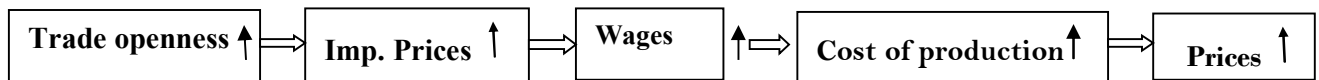
Gupta, R. (2005) analyzed the effects of financial liberalization on inflation. By using the monetary and endogenous growth, dynamic general equilibrium model of a small open semi-industrialized economy, high reserve ratio, serving as the source of financial repression and applied the model on four countries data that are Greece, Italy, Spain and Portugal. The results indicate a positive and statistical significant association between inflation and financial repression.

### **Theoretical Framework**

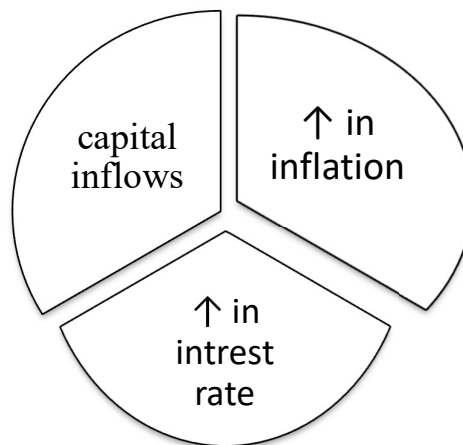
A theoretical framework guides any research study, determining what things researcher have going to measure, and what statistical relationships you have to look for.



These shifts in demand combined with price elasticities of supply then may imply disproportionate changes in relative prices. This is likely to increase the dispersion of relative price changes. Furthermore, remittances may raise overall inflation through their direct and indirect effects on aggregate demand. If remittances have implications for distribution of relative prices (or price changes) then we would expect a positive relationship of RPV not only with inflation but also with remittances, Balderas J. U. et al (2005).

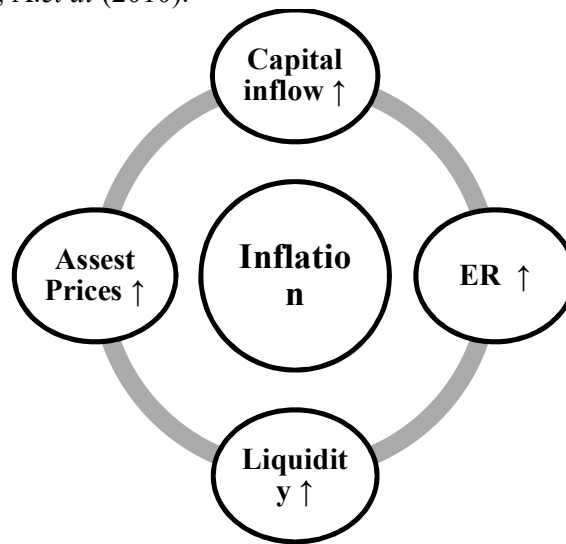


First, capital inflows have a direct impact on inflation through import prices. With the different economies say, the low cost and the high cost economies, the flow of low cost imports dampens the inflation in the high cost countries. The countries that have a high cost of production due to high wages and import prices of raw material that are used to produce goods and services. And due to high cost of production the producer increase the price of that good, Erçakar, M. (2011).



Regarding inflation and equity price, the capital inflows have positive impact on them if foreign capital surge caused by an exogenous growth in productivity of domestic capital or/and by declining interest rate in foreign money markets, while it will be put downward

pressure on domestic inflation and equity prices as well when flows due an upward move in demand curve, Rashid, A.*et al* (2010).



Capital inflows can help domestic economies in various ways: portfolio inflows or more generally capital inflows can help finance domestic investment and contribute to long-run economic growth. Foreign portfolio inflows can provide a better opportunity for local capital market development, generally providing increased liquidity and price recovery mechanisms. However, large capital inflows may also produce undesirable macroeconomic effects. The initial period of capital inflows is often characterized by real exchange rate increase, domestic credit expansion, booming consumption and/or investment, and asset price bubbles. Over time, the process tends to reverse itself: real exchange rate increase weakens the current account and reduces the attractiveness of domestic assets to foreign investors. Net capital inflows turn into net outflows, and boom turns to bust, with adverse consequences for local asset prices and, often, the real economy (Kim, S. *et al.* (2008).

#### Methodology and Data:

The variables used in this study impact of capital inflow on domestic inflation in Pakistan are exports of goods and services (EXP), foreign direct investment (FDI), remittances (REM), inflation (INF). The sample period covers annual data from 1980 to 2010. All the relevant data is obtained from World Bank. The GDP deflator (on the basis of 2005) is used as price deflator for all nominal series to deflate the inflationary effect and make it real. All the variables are given in log form.

$$INF = f(EXP, FDI, REM)$$

Where

INF = Inflation

FDI = Foreign Direct Investment

EXP = Export

REM = Remittances

After compilation of data on above mentioned variables from International Financial Statistics (IFS) of International Monetary Fund, different time series techniques have been used for analysis of study findings. The first step is to check the stationarity of data by Augmented Dickey Fuller/ Dickey Fuller test which shows the presence of unit root in the data. If all the variables are integrated of order one then we move toward long run association among the variables with the help of cointegration analysis, but if some variables are integrated of order zero and order one then we move toward autoregressive distributed lag model (ARDL). After analysis of long run association between study variables, in the last step we can easily find stability or short run speed of adjustment among variables of the model by applying vector error correction model (ECM).

## Results and Discussions

**Table 1: Unit Root Test for Pakistan**

|                  | Level          |                | First Difference |                |
|------------------|----------------|----------------|------------------|----------------|
|                  | Test Statistic | Critical Value | Test Statistic   | Critical Value |
| <b>Log(INF)</b>  | 0.15714        | -1.952910      | -5.897106        | -1.953381      |
| <b>Log(REXP)</b> | -1.2218996     | -1.952910      | -3.74866         | -1.952910      |
| <b>Log(RFDI)</b> | -0.309935      | -1.952473      | -4.8145437       | -1.952910      |
| <b>Log(RREM)</b> | -1.080367      | -1.952473      | -3.174407        | -3.004861      |

All the variables in this study are tested for stationarity using the Augmented Ducky Fuller test statistics. The results are presented in Table 1 shows that all variables are non-stationary in their levels of series, but stationary in their first difference of the series at 5% level of significance. So all the variables are integrated of order one or I (1).

**Table2: Unrestricted Cointegration Rank Test (Trace)**

| Null Alternative        | $r=0$<br>$r \geq 1$ | $r \leq 1$<br>$r \geq 2$ | $r \leq 2$<br>$r \geq 3$ | $r \leq 3$<br>$r = 3$ |
|-------------------------|---------------------|--------------------------|--------------------------|-----------------------|
| <b>Trace Statistics</b> | 67.69028            | 24.3750                  | 6.011758                 | 1.336224              |
| <b>Eigen Value</b>      | 0.787109            | 0.480989                 | 0.153786                 | 0.046601              |
| <b>Critical Value</b>   | 47.85613            | 29.79707                 | 15.49471                 | 3.841466              |
| <b>Probability</b>      | 0.0003              | 0.1850                   | 0.6942                   | 0.2477                |

**Table 3: Unrestricted Cointegration Rank Test (Maximum Eigen value)**

| Null<br>Alternative      | $r=0$<br>$r \geq 1$ | $r \leq 1$<br>$r \geq 2$ | $r \leq 2$<br>$r \geq 3$ | $r \leq 3$<br>$r = 3$ |
|--------------------------|---------------------|--------------------------|--------------------------|-----------------------|
| <b>Max-Eigen</b>         | 43.31525            | 18.36327                 | 4.675534                 | 1.336224              |
| <b>Statistics Eigen</b>  | 0.787109            | 0.480989                 | 0.153786                 | 0.046601              |
| <b>Value Critical</b>    | 27.58434            | 21.13162                 | 14.26460                 | 3.841466              |
| <b>Value Probability</b> | 0.0002              | 0.1168                   | 0.7821                   | 0.2477                |

The next step is to test whether the stationary variables are cointegrated or not. Two criterion, Trace statistics and Eigen value are used for cointegration test at 5% level of significance which is presented in Table 2 and Table 3. Result shows that there is one cointegrating equation for inflation, exports, foreign direct investment and remittances because the test value is greater than critical value and this also confirms the long run association between all variables of the study. Results of cointegrating equation show that there is positive relationship for inflation and capital inflows mean if capital inflows like foreign direct investment export and remittances are going to increase than inflation also increase and if inflows are decrease than inflation also decrease.

$$\text{LINF} = 6.76 + 1.31 \text{ LREXP} + 0.42 \text{ LRFDI} + 0.08 \text{ LRREM}$$

$$\begin{array}{ccc} (0.14557) & (0.03853) & (0.04345) \\ [-9.01734] & [-10.9253] & [-1.80898] \end{array}$$

Standard errors in ( ) & t-statistics in [ ]

This equation shows that if there is one unit change in EXP cause 0.420 unit change in inflation and if there is one unit change in FDI cause 1.313 unit change in inflation and if there is one unit change in REM cause 0.0786 unit change in inflation. These results are significant at 5 percent level of significance. There is positive relationship between inflation and capital inflow.

**Table 4: Error Correction Mechanism (ECM) Model**

|                | D(LINF)                               | D(LFDI)                             | D(LEXP)                               | D(LREM)                               |
|----------------|---------------------------------------|-------------------------------------|---------------------------------------|---------------------------------------|
| Constant       | 0.103561<br>(0.07991)<br>[ 1.29603]   | 0.121585<br>(0.08416)<br>[ 1.44466] | -0.012155<br>(0.01761)<br>[ -0.69016] | -0.780409<br>(0.43956)<br>[ -1.77542] |
| ECM(-1)        | -0.302604<br>(0.34487)<br>[ -0.87743] | 0.717678<br>(0.36324)<br>[ 1.97576] | -0.075439<br>(0.07601)<br>[ -0.99243] | -5.745516<br>(1.89714)<br>[ -3.02851] |
| R <sup>2</sup> | 0.24                                  | 0.37                                | 0.41                                  | 0.44                                  |
| S.E of Equ     | 0.3918                                | 0.4126                              | 0.0863                                | 2.1553                                |
| F statistics   | 1.40                                  | 2.58                                | 3.07                                  | 3.59                                  |

Note: Values in parentheses show standard error while values in [ ] shows t-values at the 5% level of significance.



As discussed above that there is cointegration between the variables, so the next step is to test for the direction of causality using the error correction model. So, in order to check the stability of the model we have estimated error correction model. The results of ECM model are presented in Table 4. The results indicate that the error correction term for INF growth bears the correct sign i.e. it is negative and statistically insignificant. It indicates convergence towards equilibrium position in case of any disequilibrium situation. The co-efficient EXP also has the negative signs and is convergent toward equilibrium point and remittances have negative sign which show the convergence toward the equilibrium. But the coefficient of error correction term for FDI bears the sign i.e. positive it shows divergent from the equilibrium level. Rashid, A.*et al* (2010) and Kim, S. *et al* (2008) studies also support the result that the positive relationship between capital inflow and inflation.

### Conclusion and Recommendations

Inflation is a very important issue for an economy that's why several empirical and theoretical studies have been done on it in different time period. This study is an attempt to find out the impact of capital inflows on domestic inflation by using the time series data of all variables from 1980-2010, we firstly apply unit root test to check the stationary and found that all the variables are stationary of order one. Then we apply co-integration test which shows that there is long run and significant relationship between study variables. In the last step we apply Error Correction Mechanism (ECM) are used to check the short run speed of adjustment and overall stability of this model relationship.

On the basis of empirical findings of this study, some policy suggestions are as under:

- We should use the capital inflows like remittances not only increase the consumption but also the increase the investment that cause to economic growth.
- According to export point of view, exporter should increase their exports after the fulfillment of domestic needs. If they do exports without considering the domestic needs than there would be domestically shortage ( $D > S$ ) and the prices would goes up.
- The tariff on the exports of industrial products is helpful to control exchange rate which hold inflation in limit. It is also beneficial to fulfill domestic demand.
- FDI creates the burden on exchange rate which causes to deprecation of currency and increase the inflation. So Government should stabilize the exchange rate.

### References

- Ahn, Y.S. (1997). The Determinants of Various Types of Capital Flows and the Degree of Capital Mobility in Developing Countries: Ph.D. Dissertation, Claremont Graduate school, California.
- Ahn, Y.S., Adj, S.S., & Thomas d. w. (1998). The Effects of Inflation and Exchange rate Policies on Direct Investment to Developing Countries: International Economic Journal 95, 12.
- Balderas J. U., & Hiranya, K. N. I. (2005). Remittances, Relative Price Variability and Inflation in Mexico.
- Borio, C., & Filardo, A. (2006). Globalisation and inflation: New cross-country evidence on the global determinants of domestic inflation: Bank for International Settlements.
- Dreher, A. (2003). Does globalization affect growth?: University of Mannheim. L7, 3-5, D-68131 Mannheim, Germany.
- Edwards, Sebastian. (1991), Capital Flows, Foreign Direct Investment and Debt Equity Swaps in Developing Countries: NBER Working Paper, No. 3497.
- Erçakar, M. (2011). Growth, Foreign Direct Investment, Trade and Inflation: An Empirical Application on Turkey: EuroJournals Publishing.



- Farvaque, E., & Sarfaraz, A. (2009). Is Asia different? New Evidence on the Globalization – Inflation Nexus:
- Gupta, R. (2005). Financial Liberalization and Inflationary Dynamics: An Open Economy Analysis: Department of Economics. University of Connecticut.
- Kim, S., & Yang, D. (2008). The Impact of Capital Inflows on Emerging East Asian Economies: Is Too Much Money Chasing Too Little Good? Office of Regional Economic Integration: Asian Developmental Bank.
- Milani, F. (2007). Global slack and domestic inflation rates:a structural investigation for g-7 countries: University of California, Irvine.
- Mukhtar, T. (2010). Does Trade Openness Reduce Inflation? Empirical Evidence from Pakistan: The Lahore Journal of Economics 15 : 2.
- Rashid, A., & Husain, F. (2010). Capital Inflows, Inflation and Exchange Rate Volatility: An Investigation for Linear and Nonlinear Causal Linkages: International Islamic University, Islamabad and Pakistan Institute of Development Economic.
- Sayek, S. (2009). Foreign Direct Investment and Inflation: Theory and Evidence, Southern Economic Journal, 76(2), pp 419-43.
- Saleem, N. (2008). Measuring Volatility of Inflation in Pakistan: The Lahore Journal of Economics 13: 2.
- Sarfaraz, A., & Farvaque, E. (2009). Is Asia different? New Evidence on the Globalization – Inflation Nexus.