# The Relationship between Exports of Food Items and Inflation (CPI): Case Study of Pakistan

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## Abstract

*This study was carried out to analyze the relationship between the inflation and exports of the food items. The measure here used to assess the inflation was the Consumer Price Index (CPI) and the exports of the food item. The sample of 35 years inflation and exports of food items starting from 1976 to 2010 was collected from the State Bank of Pakistan data management centre. To analyze this association between these two variables the Pearson correlation test was applied. The result showed that correlation of 93% along with sig-value of 0.000 that meant both the variables of inflation and exports of food items had significant positive relationship with each other. When exports of food items were increasing, the supply of them within country was decreasing and it was increase in the demand of food items within a country, after that it could increase the prices of food items and finally inflation raised.*

**Keywords:** Consumer Price Index (CPI), exports of food Items, GDP growth, population growth.

## Introduction

**Overview:** Inflation is the speedy revolutionize in the cost of product. Decrease in the purchasing ability of consumer is the crash or the demolition of the upshot of price rises which is merely called Inflation. In other words, a sustained rise in prices is inflation. It could be running, trotting, walking, or creeping. Nearly past years observed a high inflated economy in country. Especially the prices of food items rose with big increase. According the Macro Economy all products increases the prices and the entire economy is also burning. The vital cause of increase in food prices is the demand of food crops is increasing in worldwide. The food prices are also increasing due to increasing in attention by international investors in goods for future deal. So, inflation is constant and all over as monetary trends.

Inflation is solitary of the foremost driver or inclusive financially feasible judge for the advancement of any country, to deal with the economic problem or penalty, one be supposed to have echo familiarity on the subject of the issues of price rises. Far above the ground price increases go in front towards the insufficiency, buy and sell issues, inferior productivity rate, and elevated foodstuff charges and disintegrate the venture infrastructure in particular financial system. It observed that the most hazardous pointer which crumples the evolution of financial system is price increases and it has a result on the common man most likely[1].

For stable economy it is important to have certain level of inflation is present. In order to avoid taxation or to buy product, people sometimes pay more. Economist suggested negative association or connection among prices and money value. High

inflation crumple the venture infrastructure also badly affects the purchasing power of particular consumer. It did not affect the fixed income group people. Inflation always comes up with high inflation uncertainty and inflation uncertainty collapse or destroys economic progress or economic pillars. Inflation is the major driver or chief large-scale indicator which affects the output level. It also affects the decisions or may affect the decision make power of government or economist. The negative or harmful effects of inflation destroyed the purchasing power of common layman. In order to understand the inflation and it's after effects in SAARC countries, one should have sound knowledge about the economic condition and problems which occurs due to inflation[2].

For Developed or Solid financial and monetary economic condition, it is essential to have great output growth or to have sound or profound GDP rate. And GDP is majorly dependent on Inflation rate since the negative or harmful effects or penalty of inflation affects GDP growth, It has found that inflation rate (CPI) and Economic Growth or output level (GDP) has positive association but it is insignificant connection among CPI and GDP[3].

Now as it became necessary for the trading blocks to make their trading terms more better. So more of the projects between the countries of Asia like Pakistan India and Bangladesh participated in making the integrated economies grow. So there should be a system in countries which motivated the exporters to get unique cheap better quality raw materials or inputs from the countries which were in neighbor and to intensify the global or world's competitiveness[4].

There is a tradeoff between Inflation which is part of monetary system and Unemployment. Means there is a balance achieved between two desirables with in compatible features. When money and productivity grows, unemployment decreases. And when price increases unemployment increases. Frequently both things can't be controlled together. Growth in the monetary or money led to decrease in unemployment and increase in inflation[5].

Eventually, it gives the reasons based on analysis to believe that the globalization's focus is considered as a major cause of "global disinflation". It was highlighted that the significance of external factors to explain the conflict inflation by the help of simple model of small open economy. Particularly, it separated the mechanism of adjustment that gave detail about how payments shock's adverse balance such as war reparations, a quick stop of higher interest payments or external capital, may finally result to conflicting claims equilibrium. Eventually, it is pointed out that the strong growth's happy coincidence with low inflation that world's small open economies have enjoyed now isn't mainly the consequence of inflation targeting and related central bank credibility and independence across countries. In the consideration of sketched model, the globalization's forces, higher and constant requirement of world, and strong competitiveness of world, have been helping the central banks in their efforts for keeping the inflation stable and low.

In the study approximately 12 Latin American countries from time period of 1950 and 1985, it was found that there was a contrary relationship between the inflation rate of the host country and its economic growth. In research it was found that inflation rate is in inversely proportional relationship with the growth (economic) as far as the production and efficiency of the host country is concerned. In the research it was also researched that between the period of 1960 to 1990 and 1995 the same relationship has detected[6].

It has been incorporated in the literature review by investigating results that illustrate an increment of 10percent in the rate of inflation of a particular country, brings about a decrement in its economic growth by 0.1-0 percent, which validates the fact that inflation rate has an inverse relation with the growth, which indeed was fitting conclusion for the era using the data from 1960 to 1990. Their study had been reviewed and approved by approximately more than 170 countries from period between 1960 and 1992[7].

**Problem statement:** Expansion in development is hindrance due to Inflation. In Pakistan, the majority of population squeezes by it. Strategic planning can be controlled it. Food items export should be discouraged and food generating sector should be given subsidies. It mostly focused the impact of inflation on all products and life of persons, but it was not focusing on the base cause of inflation. The export of foods items are impacting on living style of peoples. If Government discourages the exports of food items then inflation can be controllable.

**Literature Review:** The Multivariate EGARCH models are used by Mallik G.[8]et.al., to estimate the relation between growth and growth uncertainty, inflation and inflation uncertainty for Australia. They established the fact by the help of quarterly data that output growth had considerable and negative consequence from inflation uncertainty. Moreover, inflation had considerable and positive consequence from inflation uncertainty. A newly determined price of oil was used in that study as control variable and establishes that the fluctuation in price of oil raises the inflation uncertainty. It is also determined that inflation and uncertainty level have decreased since formal inflation's adoption focusing monetary policy in Australia. The findings of industrialized countries are in line with the findings of that study and found the strong evidence that growth uncertainty and inflation uncertainty has negatively affect the growth of economy.

A study where the conflict inflation approach was used to highlight the significance of global external factors to explain the inflation. A theoretical framework is proposed in which a supply side relationship is derived first and in second step it combines with the with James Meade's analysis that derives the tradeoff between an income's stable distribution and relation between external and internal balance respectively. In the context of small open economy that study initially reveals relevant tradeoffs among three important targets – internal balance, external balance, and aspiration balance of workers or firms. Then it separates the mechanism of adjustment that give details about how a difficult payments' balance shocks may finally result to the breakdown of conflicting claims of inflation and equilibrium[9].

Different studies show the relationship had been increased in the early 1990s. In that observation he has been consider relationship between the inflation with in an economy and the economic growth exists. An increases in inflation by 10% than it decreased the economic progress by 0.057 % respectively. The exchange rate systems and macroeconomic policy predilections related to the budget deficits are the important factors for the economic growth and production of the host country has been also concluded by him. It has been shown that there is inversely proportional between budget deficits, economic growth and inflation rate. It is also states by him that from macroeconomic theories (i.e. inflation rate, balance deficit) with the country's economic growth. According to the study of 1993, inflation rate causes in the reduction in the growth, productivity and investments of the country whereas public deficits causes in the decline in both accumulation of capital and increases in the country's productivity[10].

It was aimed to investigate the asymmetric information hypothesis and exploring the factors influencing on one to four quarter ahead Federal Reserve Inflation Forecasts for 1983 to

2002. For the examination of the asymmetric information hypothesis, encompassing tests was used by them. The authors aware of alternative theories of inflation in modeling the Federal Reserve Inflation Forecasts which gives emphasis on such determinants as cost push, inertial and demand pull factors. Initially, the Federal Reserve Inflation Forecasts represent predictive and useful information beyond that comprised in private forecasts. Secondly, with private forecasts controlled for, the Federal Reserve inflation use qualitative information and growth forecast influences the longer term forecasts in aggregate demand and unit labor cost both. By increased communication and transparency over the last twenty years, the FED has been capable of improving its credibility and anchor inflation expectations. Their results should be helpful to FED. Particularly, the FRI forecasts perform a main role in shaping monetary policy[11].

Historically a research conducted to establish an association in between interest rates and inflation uncertainty for 5 inflation targeting countries. The form of "time-varying parameter model" is taken by them with the specification of GARCH (Generalized Autoregressive Conditional Heteroskedasticity), used for deriving the structural and impulse uncertainty. The study attempts for establishing an association between interest rates and inflation uncertainty, like Finland, Canada, UK, Sweden, and Spain. Uncertainty of inflation was categorized into two components i.e. structural and impulse, a positive link was determined in between interest rates and expected inflation. The structural uncertainty gives a considerable and positive impact on the rates of interest for different countries. It has been determined also that the inflation's long term effect on the rates of interest are less as compare to unity for the targeting period after the inflation, which means that Central Bank in some respect was succeeded in the inflation target. The Central Bank has been allowed for employing a monetary policy as a less restrictive policy in a credible inflation targeting strategy environment. Rather the outcomes are conflicting concerning the inflation uncertainty's effect on the rates of interest. Thus, the rates of real interest after inflation targeting periods have decreased for all countries[12].

It was expanded the literature on the relation between inflation uncertainty and inflation through examining 3 Caribbean countries: the Barbados, Jamaica, and Bahamas. The ARMA-GARCH models were used for the estimation of inflation uncertainty with the Granger Casualty Tests for inferring the association in between inflation uncertainty and inflation. The consequences show that Jamaica and Bahamas reveals volatility persistence up to high degree in response to the shocks of inflation, whereas Barbados has lowest persistence measure. It was indicated by the Granger Casualty Tests that an increment in the inflation gives positive effect on inflation uncertainty for all countries. Nevertheless, a rise in the inflation uncertainty yields a decrease in inflation in Jamaica's case. The result of research gave support to stabilization hypothesis of Holland that if inflation uncertainty was caused by inflation then policymakers attempted for controlling the inflation uncertainty through restrictive actions of monetary policy to lower inflation[13].

It was elaborated the cross-sectional variation between expected inflation and international security based on the sensitivity to bond factors and world stock. They reveal the revert inflation sensitiveness of returns on the international mutual funds and country indexes on their sensitivity to bond indexes and world stock. It is shown that there is a positive relation between inflation sensitivity of a security and its sensitivity to the world bond index. In returns' sensitivity, the cross sectional variation is investigated to inflation for the international securities. It is hypothesized that the security's inflation sensitivity was negatively related with characteristics of its stock. This hypothesis is supported by the test result with the international stock returns of 83 international equity and 23 countries. Thus, the returns of the sensitivities of securities to the returns of stock and bond market may be utilized for assessing their sensitivities to inflation[14].

It was explained that the criterion of Maastricht inflation has influenced the disinflation strategies' choice of the member countries of prospective euro area. Historically, some countries with high inflation chose the strategy of fiat disinflation bringing down the inflation quickly. Their rates of inflation increased in an immediate manner after the applications of euro were evaluated in a positive manner and stayed considerably higher as compare to the inflation in Germany and France. The differentials of inflation show higher inflation expectation from disinflation strategy and structural rigidities from the past. For the past fifteen years, the criterion of Maastricht inflation has been an influential nominal rule. Inflation in six high inflation countries temporarily declined and giving a V-shaped inflation's pattern. These countries tended to opt for the approach of Maastricht inflation which yielded the low inflation quickly[15].

A research conducted to assess the effect on inflation of inflation targeting for twenty seven countries which were selected the regime of targeting inflation. He used the analysis of intervention in the structural time series model of Harvey for analyzing the effect on inflation of inflation targeting by the help of quarterly assessment. On inflation, the initial effect of the implementation of an inflation targeting strategy was negative for nine countries and important for Indonesia and Chile only, suggested that the targeting inflation were succeeded to control the inflation only in these two countries[16].

Further, it was studied the impact of inflation uncertainty on the real activity of economy by the help of extracted data from four industrialized countries. The econometric framework by Elder is used by them in multivariate framework in which structural VAR (vector autoregression) is modified for the accommodation of multivariate GARCH-in-mean errors. The results show the differential effect of inflation uncertainty on output growth. Specifically, the impact of inflation uncertainty

relies on financial structure and patterns in various countries. For instance, they determine the negative effect of inflation uncertainty on output in the capital market based system of UK, Canada, and USA but positive impact on bank based financial system of Japan[17].

A study based on the firms' dividend policy from the macroeconomic perspective was conducted. They analyzed the relation between corporate earnings, dividends, inflation and real growth in USA by the application of conintegration technique. The data show 3 cointegration relationships between four time series. The analysis of impulse response then reveals few considerable dynamics. Dividend smoothing is a relevant phenomenon and inflation has a positive effect on it. The above reported empirical evidence shows the long term and stable relation between corporate earnings, dividend payments, price level and real economic activity in USA. There is a clear proof of dividend smoothing and have established the positive relation existence between inflation and dividend. There are 2 possible explanation of this behavior; firstly the management could believe on some sort of optimal dividend policy in real terms, secondly inflation may increase simply the nominal volume of corporate earnings[18].

It was explored India as a suitable candidate for inflation targeting system. It starts by placing the monetary policy actions of India in wider context through discussing RBI (Reserve Bank of India) must be shifted from its recent policy of exchange rates. They used policy, analytical, and empirical dimensions. Given the current history of exchange rate centered policy in India, a discussion of exchange rate's role is required. The use of analytical model presents how inflation targeting might work with exchange rate. Then Monetary Policy Rule Model is adapted for empirical testing and is estimated for investigating the work of MPR for India. There are few evidences for giving the suggestion about following of MPR by RBI unintentionally. MPR tends for reacting to current inflation but there is no proof of reacting to forecast of inflation. Furthermore, the rates of interest don't affect the exchange rate. The majority of condition looked necessary for successful inflation targeting and is significant for any successful monetary policy framework. The evidence gives suggestion that meeting tough technical preconditions perhaps less significant to the successful use of inflation targeting as compare to the constant improvement's pursuit once after the adoption of framework[19].

Moreover, implications of the rising prices of food for the monetary policy in India and same as presently emerging economies were analyzed. The analytical arguments were used from the relevant evidence and macroeconomic literature from the data of late 1960s for examining the 1979s stagflation. It creates two commodities (non-food and food), two person (poor and rich) models for the examination of the effect of increasing prices of food on GDP, on inflation's measures, and on welfare, in model. The previously neglected proofs show the stagflation preceded the OPEC price hike. The results of model show that when the price of foods increases, the deflator of GDP falls in relation to the CPI (consumer price index)[20].

It was analyzed the effect of monetary policy on the inflation of house prices for nine census portions of US economy. They used factor-augmented model to estimate the large set of data containing 126 quarterly series over the period of 1976 to 2005. Generally, this investigation's result show that inflation in house prices reacts negatively to the shock of monetary policy, giving suggestion about the experience of widely observed price puzzle by the framework whereas analyzing the shocks of monetary policy with standard sized VARs[21].

In a study, where the issues of casualty in Granger causal framework between productivity and price level were analyzed in multivariate and bivariate context in medium sized country with comparatively high rates of inflation. In doing so, the different techniques of time-series that are developed recently like multivariate and bivariate cointegration, unit-root testing, and procedures in modeling of vector error-correction were presented. The empirical results give suggestion that a bivariate relation between productivity and inflation is spurious. When the fluctuation in overall activity of economy and monetary policy on bivariate relation between productivity and level of price is controlled, the evidence suggests that Granger-causation should be in a single direction. The VECM estimation revealed that inflation and productivity growth are econometrically endogenous variable and suggests the existence of bi-directional causality from inflation to productivity growth. In conclusion, the results suggest that a higher rate of inflation in bivariate context, there is evidence to believe that inflation's lower level aren't expected for generating the real advantages by means of productivity growth[22].

**Hypotheses:** H$_1$**:** There is a positive relationship between exports of food items and inflation.

## Research Methodology

The research was descriptive and purely secondary data collected in method of data collection from relevant economic data managing departments of the country for which the historical data was collected for 35 years from 1976 to 2010 on annual percentage basis. The sampling techniques and modes that are carried in this research is the 35 years secondary data from reliable sources of managing Pakistan economical data. The Consumer Price Index (CPI) and Exports of food item were gathered from the source of data warehouse of State Bank of Pakistan and DGP growth and population growth were gathered from the source of World Bank website. The numeric data includes the CPI, exports of food items, GDP growth and population growth for the last 35 years on annual percentage basis. The sample size that was taken in this research was of 35 years starting from 1976 to 2010 which was collected from the data warehouse of State Bank of Pakistan and World Bank website on annual percentage basis. In this study the natural

disasters were taken as the dummy variable. In this regards, the year in which any natural disaster occurred in the past, 1 = Yes, whereas the year in which no natural disaster occurred in the past, 0 = No. The study on the relationship between the exports of food items and inflation was assessed. To check the significance of exports of food items on the inflation Pearson Correlation as well as the multiple regression were used. The date was approximately normally distributed. The data was entered into the software named SPSS (Statistical Package for the Social Sciences) so to be analyzed and interpreted.

## Results and Discussion

The purpose of the research was to investigate the association between inflation (CPI) and the exports of foods items. The relationship between these variables was analyzed by the statistical of correlation. The Pearson Correlation and multiple regression technique were utilized to test the significance of the relationship between them.

The descriptive statistics in table-1 showed that 35 observations have been analyzed in this research. The Consumer price index (CPI) showed mean of 57.9960 and 44.03613 standard deviation. Exports had mean value of 874.9000 and 788.24833 of standard deviation. The data showed that there was high variation in the exports of the food items as compare to the inflation during the period of 1976 to 2010. Whereas the other variables; GDP growth had mean value of 5.1218 along with standard deviation of 2.13650 as well as the population growth had mean of 2.6639 and standard deviation of 0.60417.

The correlations in table-2 showed that the Pearson correlation of CPI variable which was inflation having 0.931 and sig-value of 0.000 in relation to exports variable which meant the inflation was 93% significantly correlated with the exports of food items. The same results were found from the exports in relation with CPI. Therefore the results showed that there was significant relationship between CPI and exports of food items in this study.

**Table–1**
**Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| Consumer Price Index | 57.9960 | 44.03613 | 35 |
| Exports of Food Items | 874.9000 | 788.24833 | 35 |
| GDP Growth (Annual %) | 5.1218 | 2.13650 | 35 |
| Population Growth (Annual %) | 2.6639 | .60417 | 35 |
| Dummy for Natural Disasters | .23 | .426 | 35 |

**Table–2**
**Correlations**

| | | Consumer Price Index | Exports of Food Items | GDP Growth (Annual %) | Population Growth (Annual %) | Dummy for Natural Disasters |
|---|---|---|---|---|---|---|
| Pearson Correlation | Consumer Price Index | 1.000 | .931 | -.389 | -.897 | .233 |
| | Exports of Food Items | .931 | 1.000 | -.284 | -.722 | .153 |
| | GDP Growth (Annual %) | -.389 | -.284 | 1.000 | .375 | .071 |
| | Population Growth (Annual %) | -.897 | -.722 | .375 | 1.000 | -.198 |
| | Dummy for Natural Disasters | .233 | .153 | .071 | -.198 | 1.000 |
| Sig. (1-tailed) | Consumer Price Index | . | .000 | .010 | .000 | .089 |
| | Exports of Food Items | .000 | . | .049 | .000 | .190 |
| | GDP Growth (Annual %) | .010 | .049 | . | .013 | .343 |
| | Population Growth (Annual %) | .000 | .000 | .013 | . | .127 |
| | Dummy for Natural Disasters | .089 | .190 | .343 | .127 | . |

**Table–3**
**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| 1 | .989[a] | .977 | .974 | 7.04274 | .977 | 324.818 | 4 | 30 | .000 | 1.162 |

The table-3 showed the model summary. The result showed that the adjusted R square value was 0.974 which was 97.40% which meant that all the predictors in total predicted the 97.40% of the dependent variable of CPI. While the Sig- value was of 0.000 which was less than the p-value of 0.05 that meant model was significant along with the taken variables in this study.

The table–4, has been a reliable tool to test the significant of the linear model along with the predictors taken in this study. The results of the table showed that sig-value was of 0.000 which was less than $p < 0.05$ that meant the linear model had significant explanatory variables to check the relationship of the variables.

The Table - 5 showed that the exports of food items variable had the sig-value of 0.000 which was less than $p < 0.05$ that meant

there was found positive significant relationship between the exports of food items and inflation (CPI). While the sig-value of all the control predictors taken in this study were less than the $p < 0.05$. The results of the study test the hypothesis of significant positive relationship of exports of food items and inflation and which was statistically significant. This study on share price encompassed several researches to investigate the relationship between the inflation and exports of food items and found that the inflation had significance association with the exports.

In a historical research which was carried out in 2004, it had analyzed that those countries who has suffered from hyperinflation in their past time period has set of forth that inflation rate is with strong inversely proportional with the economic growth, they are now reached at a threshold value[23].

**Table–4**
**ANOVA**

| | Model | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 64444.130 | 4 | 16111.032 | 324.818 | .000[a] |
| | Residual | 1488.006 | 30 | 49.600 | | |
| | Total | 65932.135 | 34 | | | |

**Table–5**
**Coefficients**

| | Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 | (Constant) | 119.013 | 9.460 | | 12.581 | .000 | 99.694 | 138.332 |
| | Exports of Food Items | .033 | .002 | .589 | 14.839 | .000 | .028 | .037 |
| | GDP Growth (Annual %) | -1.287 | .618 | -.062 | -2.083 | .046 | -2.550 | -.025 |
| | Population Growth (Annual %) | -31.771 | 3.033 | -.436 | -10.474 | .000 | -37.966 | -25.576 |
| | Dummy for Natural Disasters | 6.259 | 2.931 | .061 | 2.136 | .041 | .274 | 12.244 |

**Table–6**
**Hypotheses Assessment Summary**

| S. No. | Hypothesis developed | B | Sig-value | Empirical Conclusion |
|---|---|---|---|---|
| H₁ | There is a positive relationship between exports of food items and inflation. | 0.033 | 0.000 | Accepted |

## Conclusion

The results findings showed in this study indicated that hypothesis of this study had significantly accepted. It was, therefore, concluded that the significant position relationship was found between the inflation and exports of food items in country of Pakistan. The implication of this research gives a valuable insight about the relationship between the inflation (CPI) and exports of food items and help in order to understand the consequences of these two variables. Research provided the ample information in order to understand the consequences or effects of these two indictors on economy as whole. Further, there are several other aspects such as larger sample size, longer-time period etc, based on these future researches could be conducted to examine their associations as well as their impact on each other.

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