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RESEARCH PAPER

A Comparative Analysis of Inflation Determinants in Bangladesh, India, and Pakistan

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ABSTRACT

The main objective of the research study is to analyze the determinants of inflation in the following countries; Pakistan, Bangladesh, and India. The research study utilized the data set from 1980 to 2022. For the purpose of empirical analysis, ARDL auto regressive distributed lag is employed. The findings indicate that in Pakistan Exports, Money-Supply, Exchange-rate and Oil Rents positively significantly influence the Inflation. While GDP has a negative significant influence on inflation. In India, Exports, Money-supply and Oil rents positively significantly affect the inflation. In Bangladesh there is significant relationship between GDP, Oil Rents and inflation. While exchange-rate has negative significant impact on inflation. It is suggested that all three countries to invest in renewable energy sources to reduce the dependency on oil imports.

KEYWORDS ARDL, Exchange Rate, GDP, India, Inflation, Pakistan

Introduction

Inflation is known as a rise in the overall price level of goods and services in an economy over time. Being an ongoing and universal economic phenomenon, it continues to be a major worry for policymakers and economists across the world. Inflation makes people worse off by reducing their ability to purchasing from their earnings, lowering living standards, and increasing uncertainty in certain aspect of life Lipsey et al. (1982). Inflation can lead to income redistribution, affecting savers and debtors, and deteriorating purchasing power. For the macroeconomic management of emerging nations in particular, low inflation-rates are essential. It can decrease economic growth, reduce buying power, and have a detrimental effect on poverty according to (Khan & Gill, 2010).

Mainly there are two primary causes of inflation related to the supply side of the economy, and they are both related to the use of market power by entrepreneurship and labor unions. The first cause of inflation is the high wages that unions pay their workers; this is known as wage inflation. The second cause, known as profit inflation, is the high prices that business owners set for themselves is monopolistic industries; both forms of inflation arise in non- competitive markets (Bilgrami & Maryam, 2022; Osman et al, 2019; Das & Senapti, 2007).

It is argued that the inflation is a considerably more complicated process than merely a rise in the overall price levels Ellahi (2017). Understanding certain factors that influence inflation becomes crucial for policymakers and economists worldwide as each country deals with its own set of problems and opportunities. Three vibrant economies in South-Asia (Pakistan, Bangladesh and India) are the focus of this research study's comparative analysis of inflationary factors. Despite their shared history, culture, and geography, each of these nations has a unique economic environment shaped by a combination of governmental policies, structural characteristics, and outside factors.

Numerous studies have identified the factors determining inflation in South Asian countries (Dua & Goel, 2021; Kan & Gill, 2010; Arif & Ali, 2012; Uddin et al., 2014; Adil et al., 2021), revealing that inflation is country-specific and its determinants vary across nations (Bandra, 2011). However, the present study seeks to identify the factors that commonly influence inflation among these selected South Asian countries.

Pakistan, Bangladesh and India economic pasts are connected yet differed, each carrying the traces of colonial legacies, post- independence trajectories, and diverse policy frameworks. Following independence, these countries faced the challenges of nation-building, including land reforms, industrialization, and the formation of monetary systems (Osmani,2009). Different economic policies and approaches have shaped various economic landscapes over time, influencing the path and nature of inflation in each country.

The study seeks to understand the complex issue of inflation in Pakistan, Bangladesh and India, regardless of their historical links, to identify and understand the changes in economic-policy, and global variables that lead to varied inflation outcomes in these selected South-Asian economies by observing the data from 1980-2022. Secondly, study is to provide a comprehensive and comparative examination of the inflationary causes across these countries.

In general, this study seeks to eliminate the complex web of factors influencing inflation in Pakistan, Bangladesh, and India, providing a comparative perspective that expands our understanding of the dynamics and provides practical implications for policymakers struggling with the challenge of maintaining price stability in diverse economic contexts.

The present study consisted of introduction, followed by theoretical background and empirical literature review, the next section is data and methodology followed by results and discussion, and at the end conclusion and suggestions are mentioned.

Literature Review

Inflation is a considerably more complicated process than just a boost in the average level of prices. It is well known that low inflation is normal and acts as an accelerator for trade and the economy, whereas high inflation has a detrimental effect on both. Ellahi (2017). Its complexity makes it a topic of persistent interest for researchers, policymakers, and economists.

The quantity theory of money states that, a classical economic theory, the money-supply and prices rise at the same rate over an extended period of time. When interest-rates drop or taxes are reduced, consumers are more likely to purchase since they have easier access to money. As a result, they will react insensitively to price changes. As a result, the equilibrium price level will go upward and the aggregate-demand (AD) curve will shift to the right. Economists use the following equation to model the relation among money-supply and price levels:

$$MV = P.Q.$$

The above equation is a reconsideration of the monetarist theory, which holds that, given the Q and V constants, any increase in the money-supply will eventually raise price levels and lead to inflation. Moreover, Demand-driven inflation theory by Keynesians state that inflation can be result from imbalance between the aggregate demand and supply, which can be caused by higher government or consumer expenditures.

Research identifies that role of exchange rate and money supply has influencing impact on inflation. A study by Nasir et al. (2021), conclude that money-supply has positive relation with inflation in both short and long run. Furthermore, Iqbal et al. (2022) it is

investigated that, in long run money-supply (M2) has a positive while exchange-rate has a negative influence on inflation in case of Pakistan.

Hussain et al. (2022) found that, inflation is significantly impacted by crude oil prices and real effective exchange-rate. They further found that money-supply, gross fixed capital and exports are also positively influence inflation rate. Moreover, Chaudhry et al. (2021) examine that exports, money-supply and exchange-rate haves a positively significant impact on inflation.

The study findings by Ellahi (2017), demonstrate that money-supply has a significant negative impact on inflation whereas, national expenditure have positive effect on inflation-rate. Meanwhile GDP growth has a negative while imports of goods and services have a positive impact on inflation. However, the short run results are not significant. In another study by Hassan et al. (2016), examine that the effect of exchange-rate, exports and crude oil on inflation are highly significant.

According to the findings of Shah et al. (2014), it is indicated that the exports, imports and exchange-rate effect the inflation in Pakistan. Further conclude that, the higher the rise in money-supply, the higher increase in the inflation. The study by Ghumro and Memon (2015), identify that exchange-rate has a significant impact on inflation. 1% increase in exchange-rate result 2.12% increase in inflation. While money-supply also influence the inflation. 1% increases in money-supply increases the inflation by 0.16%. Further the study reveals that imports also pushes inflation up.

The study by Mohan and Balasubramanian (2015) analyzes that in both long-run and short-run there is a positive significant impact of exchange-rate on inflation. While, in short-term inflation and GDP per capita have a positive relationship. Whereas in the, long-run GDP does not affect inflation. Furthermore, money-supply is directly proportional to inflation-rate. In another research Sahadudheen and Scholar (2012), indicates that in long-run, there is a positively significant impact of GDP and board money on inflation. While, interest-rate and exchange-rate both have negative impact.

Saxena and Bhadauriya (2013) found that there is a positive relation between GDP and CPI. While, money-supply, crude oil prices and inflation are highly interdependent. Furthermore, a study by Behera (2016) identified that GDP and exchange-rate both have a one-way causal relationship with inflation. Further, the investigation by Sahoo and Sethi (2018) argue that imports, exports, FDI and inflation are co-integrated. The study's findings indicate that exports and inflation have a one-way relationship. Exports significantly impact inflation. Meanwhile, by influencing exchange-rate, inflation largely impact exports and imports.

Sultana et al. (2019) research argues that, in short-run inflation is not affected by money-supply but in long-run money-supply strongly influenced inflation. Furthermore, Khan (2019) discovered that increase in money-supply does not lead to inflation in Bangladesh. Moreover, the research by Islam et al. (2022), conclude that GDP growth, money-supply growth, import, and growing population all have a positive impact on inflation. While, Sultana and Firoj (2018) illustrate that the money-supply has little effect on inflation in the short-run. In the long-run the result shows a bi-directional causal relation between money-supply and inflation. Moreover, the study by Arif & Ali (2012) concluded that GDP, money-supply and imports had a favorable long-term impact on inflation. While exports have a detrimental impact on inflation.

According to the study by Salma (2021), foreign exchange-rate has a positive and GDP has a negative but insignificant relation with inflation. While the research study further reveals that there is a significant positive correlation between broad money-supply, foreign direct investments, and trade balance and inflation. Meanwhile, the study by Aziz and Ahmed (2017), reveals that there is a significant positive effect of unemployment and

money-supply on inflation while exchange-rate have a significant negative impact on inflation. Furthermore, the investigation by Biswas (2023) concluded that money-supply has a considered significant effect on inflation. While the previous period's GDP and exchange-rate have a negative impact on current period inflation, these impacts are not statistically significant.

Considering the Bangladesh economy, Muktadir-Al-Mukit (2018) identified that the Bangladesh has experienced fluctuating levels of inflation over the years. The result indicates that there is a consistent long-run significant association between inflation and real GDP, money-supply, import, interest-rate, remittance, and exchange-rate. In another analysis by Muktadir-Al-Mukit and Shafiullah (2014) conclude that, imports have significantly positive while exports have significantly negative impact on inflation in both short-and long-run. They further argue that over the time, Bangladesh's economy has struggled with inflationary trends.

The review of literature provides a thorough overview of the determinants of inflation within each south Asian nation's i.e. Pakistan, India, and Bangladesh. Numerous studies have explored the relationship between the factors such as money-supply, imports, oil rents, exports, and exchange-rate and inflation, there remains a noticeable research gap that there is a few thorough studies have been conducted that systematically examine and contrast these three countries' inflation factors. The study aims to contribute to this gap by examining comparative analysis of determinants of inflation in these south Asian countries.

Material and Methods

Five macroeconomic variables are used to analyze and compare the inflation determinants in Pakistan, Bangladesh, and India. In this study, money-supply, GDP, oil rents, exports and exchange-rate are employed as independent factors, while inflation is used as the dependent variable. CPI is used as a measure of inflation. While exports, oil rents, and GDP are taken in annual growth rate. Broad money growth rate is use as a proxy of money-supply. Meanwhile the exchange-rate is taken in real terms.

Determinants of inflation are explored using secondary data in a comparative study between Pakistan, India, and Bangladesh. The data is collected from the World-Development Indicators (WDI) database for Pakistan, India, and Bangladesh from 1980 to 2022.

The model used in the study was constructed in accordance with economic theory and available literature aligned with the study by Osman, Ghada et al'. (2019). Pesaram et al. (2001). The macroeconomic variable specified which are considered to determine inflation, reflect the various characteristics of the Pakistan, India and Bangladesh economies.

$$CPI = f(EXP, GDP, ER, MS, OR)$$

$$CPI_t = \alpha + \beta_1 EXP_t + \beta_2 GDP_t + \beta_3 ER_t + \beta_4 MS_t + \beta_5 OR_t + \epsilon_t$$

Here *CPI* is the inflation rate, *EXP* indicates exports, *GDP* is growth in output, *ER* is the exchange-rate, *MS* is the money supply, *OR* is oil rents and ε is the error term.

The unit root test will be used in the study to check if variables are stationary or not. It will indicate whether variables are stationary at level, 1st difference or 2nd difference. On the basis of results, further co-integration technique will be selected to investigate long- run relationship between variables. Although, there are many measures to verify the stationarity, but this study used augmented dickey fuller test. At the 1%, 5%, or 10% level of significance, ADF indicates whether or not the variables are stationary on the 1st difference I(1).

$$Y_t = \rho y_{t-1} + u_t$$

The empirical framework of this research study has been estimated with time-series data method and ARDL methodology.

$$\Delta CPI = \alpha + \beta_1 EXP_{t-1} + \beta_2 GDP_{t-1} + \beta_3 ER_{t-1} + \beta_4 MS_{t-1} + \beta_5 OR_{t-1} + \sum_{i=0}^{p} \delta_{1i} \Delta CPI_{t-1} + \sum_{i=0}^{p} \delta_{2i} \Delta EXP_{t-1} + \sum_{i=0}^{p} \delta_{3i} \Delta GDP_{t-1} + \sum_{i=0}^{p} \delta_{4i} \Delta ER_{t-1} + \sum_{i=0}^{p} \delta_{5i} \Delta MS_{t-1} + \sum_{i=0}^{p} \delta_{6i} \Delta OR_{t-1} + \varepsilon_t$$

Δ represents the change in the time t, while E_t represent the white noise error-term. The intercept term is presented by the symbol α; the coefficients corresponding to the independent variables are represented by the symbols (1β - 5β).

The ARDL (Auto-regressive Distributed lag) model will be utilized to evaluate the existence of the short- run and long-run associations between the inflation measure as Consumer price index (CPI), which is dependent, and remaining explanatory variables using time-series data spanning the years 1980 to 2022. The (Auto-regressive Distributed Lag) ARDL bound-test approach is a widely recognized model utilized to examine the long-term co-integration of variables. When identifying the long-run relation between the regressors, the ARDL bound-test process gives a set of bound values for the purely I(0) and I(1) or combination of both. When estimating the long-run coefficient using the regressors' accurate consistency estimations, this method is more credible than the conventional F and t statistic.

Results and Discussion

This section, offering a thorough description of the results and their following interpretation, comprises the central component of the study.

Firstly, ADF (Augmented dickey-fuller) test is used to check stationarity of the variables. Results are given below;

Table 1
Unit-root test

	Pakistan			India			Bangladesh		
Variables	level	1st Diff	Results	Level	1st diff	Results	level	1st diff	Results
Inflation	0.001	-	I(0)	0.013	-	I(0)	0.000	-	I(0)
Money-supply	0.002	-	I(0)	0.088	0.003	I(1)	0.000	-	I(0)
Exports	0.000	-	I(0)	0	-	I(0)	0.000	-	I(0)
GDP growth	0.001	-	I(0)	0	-	I(0)	0.000	-	I(0)
Exchange-rate	0.662	0.000	I(1)	0.046	-	I(0)	0.000	-	I(0)
oil rents	0.036	-	I(0)	0.116	0	I(1)	0.307	0	I(1)

The table 1 presents the unit-root estimation and found that in Pakistan inflation, money-supply Export, GDP, and oil rents are stationary at level while exchange-rate is stationary at 1st difference. In India inflation, Export, GDP, exchange-rate and oil rents are stationary at level while money-supply is stationary at 1st difference. In Bangladesh inflation, money-supply Export, GDP, and exchange-rate are stationary at level while oil rents is stationary at 1st difference.

Table 2
Descriptive statistic

	Pakistan				**India**				**Bangladesh**			
	Mean	**Maxi**	**Mini**	**Std.D**	**Mean**	**Maxi**	**Mini**	**Std.D**	**Mean**	**Maxi**	**Mini**	**Std.D**
Inflation	8.46	20.28	2.52	4.08	7.65	13.87	3.32	3.02	6.49	11.39	2.00	2.06
Exports	6.34	33.46	-15.0	11.0	9.43	31.39	-9.13	9.63	9.57	85.61	-31.76	17.48
Gdp	4.77	10.21	-1.27	2.20	5.90	9.62	-5.83	2.63	5.15	7.88	0.81	1.57
Exchange-rate	3.82	5.322	2.29	0.83	3.49	4.36	2.06	0.68	3.90	4.51	2.73	0.47

Money-supply	16.47	42.99	7.502	7.31	3.50	22.27	6.80	2.30	16.47	42.9	7.50	7.319
Oil rents	0.58	1.21	0.159	0.26	0.97	2.02	0.14	0.45	0.05	0.20	0.003	0.05

Table 2 represents the descriptive statistics of for several variables. These statistics include mean, maximum, minimum and standard deviation. Using these statistics, one may effectively summarize the characteristics of each variable.

The mean value represents the arithmetic average of the variables. The Pakistan's average inflation is 8.466, while, the India's mean inflation is 7.565, whereas, Bangladesh's mean inflation is 6.492, indicating that on average Bangladesh has a relatively low inflation-rate compared to Pakistan and India.

The maximum values represent that, Bangladesh's exports (85.613) relatively have the high maximum value. While, Pakistan's GDP (10.215) and exchange-rate (5.322) both has relatively high maximum value. Meanwhile, money-supply has high maximum value in both Pakistan (42.99) and Bangladesh (42.99). Whereas, India's oil rents (2.021) have relatively high maximum value.

The minimum value indicates that Bangladesh's inflation and oil rents have relatively low minimum value and exports has negative minimum value, indicate the loss. Meanwhile, India's GDP, money-supply and exchange-rate have the relatively low minimum value.

Table 3
Diagnosis test

	PAKISTAN	**INDIA**	**BANGLADESH**
R^2	0.984	0.742	0.833
Adj R^2	0.942	0.660	0.658
Durbin Watson	2.239	2.205	2.062
Serial-correlation LM test F-Stats Prob Chi-Square	1.631 0.102	1.074 0.229	1.378 0.208
Normality test Jarque Bera prob	2.003 0.130	3.252 0.196	0.895 0.638
Ramsey Reset Test T-Stats prob	1.002 0.322	1.329 0.192	0.679 0.501

Table 3 presents the diagnosis test results. Pakistan's R^2 (0.984) indicates that 98.4% variation in Pakistan's inflation is due to explanatory variables. While, India's R^2 (0.742) indicates that 74.2% variation in India's inflation is due to explanatory variables. Further, Bangladesh's R^2 (0.833) indicates that 83.3% variation in Bangladesh's inflation is due to explanatory variables.

The Durbin-Watson value is around 2 indicates no Auto correlation in any of the model. Further serial correlation LM test confirm the no serial correlation. Furthermore, Jarque Bera indicates whether data is normality distributed or not. The probability values of normality test indicate that overall data is normality distributed.

Ramsey reset test is to check if there is any misspecification in the models. The probability values indicates that models are accurately represent there is no misspecification.

Table 4
Bound test

Pakistan			**India**			**Bangladesh**		
Significance	I(0)	I(1)	Significance	I(0)	I(1)	Significance	I(0)	I(1)
10%	2.08	3	10%	2.08	3	10%	2.08	3
5%	2.39	3.38	5%	2.39	3.38	5%	2.39	3.38

1%	3.06	4.15	1%	3.06	4.15	1%	3.06	4.15
F-Statistic 9.887			F-Statistic 4.804			F-Statistic 4.772		

The table 4 presents the results of bound test of ARDL which shows that model for each country is significant at 1%. Long-run relationship between variables exists. In short, the results suggest for each country co-intergradation between variables exists.

Table 5
Long-Run Estimations

Dependent variable: inflation			
Variable	**Pakistan**	**India**	**Bangladesh**
Exports	0.944***	0.457*	-0.040
	(0.070)	(0.237)	(0.046)
Gdp	-1.738***	0.162	1.642**
	(0.078)	(0.846)	(0.721)
Exchange-rate	4.152***	0.939	-8.667***
	(0.435)	(2.365)	(2.373)
Money-supply	0.122***	0.000**	0.000
	(0.024)	(0.000)	(0.109)
Oil rents	3.010***	9.594***	43.292***
	(0.745)	(3.924)	(11.07)

*Significant at 10%, **Significant at 5% & ***Significant at 1%

The table 5 presents the long run results for Pakistan, India, and Bangladesh. The Results demonstrate that in Pakistan, there is a positive significant impact of exports on inflation. When a country's ability to produce goods and services is approaching its maximum capacity, a sudden increase in exports can strain its resources. This can increase the aggregate demand for resources which may increase the price, lead to inflationary pressure. While, Hussain, Faridi and Hussain (2022) also argue that there is a positive relationship between exports and inflation rate in Pakistan. Meanwhile, GDP has a significant negative impact on inflation. Ellahi (2017) also conclude that inflation is negatively impacted by GDP growth in Pakistan. GDP and inflation are inversely related, indicating that an increase in GDP will raise the production, which in turn increases the supply of goods, so prices will decrease. Whereas, the findings show that there is positive significant relationship between exchange-rate and inflation. Chaudhry, Iqbal et al. (2021) also analyzed that exchange-rate haves a positively significant impact on inflation. When a country's currency falls in value (exchange-rate increase) the cost of buying products in foreign currency rises. Import cost increases can contribute to higher costs for a wide range of goods, contributing to inflation. The result also indicates that money-supply has a positive significant influenced on inflation. The quantity theory of money states that when velocity and the amount of goods and services are mostly constant, an increase in the money-supply will cause a corresponding rise in the price level, or inflation. While, according to Nasir et al., (2021) money-supply and inflation are positively correlated over the short and long run in Pakistan. Moreover, Inflation is significantly positively impacted by oil prices. Qasim et al., (2021) also argue that oil prices have a statistically significant impact on inflation-rate. An essential component of many products and services is oil. Businesses' cost of production goes up when the prices of oil rises. Inflation is driven up by higher production costs, which frequently result in higher final good and services prices. This process is called cost-push inflation.

The results show that in India, there is a positive significant relationship between exports and inflation. As exports tends to increase the inflation also increases. While an increase in exports frequently results in national currency strengthening, it may not always happen right once or in a noticeable way. The price of imported inputs for companies focused on exports may increase if the currency does not strengthen, thus raising inflation. According to Sahoo and Sethi (2018) exports and inflation have a one-way link. Inflation is

heavily impacted by exports. Further, the finding indicates that GDP positively effects inflation but not significantly. Global influences may also have an impact on GDP growth. If the global economy experiences a boom at the same time, there may be a spike in demand for commodities, which would raises prices. Mohan and Balasubramanian (2015) also argue that there is no significant impact of GDP on inflation in long run. Moreover, Exchange-rate increases leads to increase in inflation. When a country's currency falls in value, the cost of buying products in foreign currency rises. Import cost increases can contribute to higher costs for a wide range of goods, contributing to inflation. Mohan and Balasubramanian (2015) also conclude that there is a positive significant impact of exchange-rate on inflation. Moreover, the result indicates that money-supply has a positive significant impact on inflation. As the increase in money-supply leads to increase the consumer expenditure and demand which leads to higher inflation. Whereas, Sahadudheen and Scholar (2012) also conclude that broad money have a significant effect on inflation. Further, the findings show that Increase in oil prices leads to increase inflation. Oil is the main element of transportation cost. Transportation expenses for products go up when oil prices increase. Businesses might charge customers for a variety of goods by passing on these higher transportation expenses. Saxena and Bhadauriya (2013) also analyze that crude oil prices and inflation are highly interdependent.

The results show, that exports negatively impact the inflation in Bangladesh. Increase in exports leads to rises global competition. So, business decided to reduce costs, particularly labor costs. If this results in domestically reduced wages, it may affect domestic demand (income decreases demand for good decreases) and reduce the inflationary pressure. Muktadir-Al-Mukit and Shafiullah (2014) also established that exports have a negative impact on inflation in Bangladesh. Same results are explored by Arif & Ali (2012). While, in Bangladesh there is positive relationship between GDP and inflation. This relationship is also statistically significant. Cost-push inflation may result from economic expansion that is accompanied by an increase in production costs. As, if the labor cost or raw material demand increases, this may result in increased wages and input costs for firms, which result in higher prices of products. Arif & Ali (2012) also analyze that GDP has a positive influence on inflation in long run. Muktadir-Al-Mukit (2018) also argues that real GDP and inflation have a stable and significant long-run relationship. Further, findings show that increase in exchange rate, inflation tends to decrease. Exchange-rate has a negative significant impact on inflation. Fluctuations in monetary policy by central banks are one-way policymakers can react to fluctuations in the exchange-rate. A central bank may increase interest-rates in order to reduce inflationary pressures, if currency depreciation is perceived as a threat to inflation. Meanwhile, Aziz and Ahmed(2017) also argue that the exchange-rate has a negative effect on inflation but this effect is not significant. Moreover, results show that increase in money-supply leads to increase the inflation but not significantly. The liquidity of the economy is improved by an increase in the money-supply. Individuals are more likely to spend, as they have excess money available. This will lead to an increase in aggregate demand so the prices increase. Increase in money-supply boost the economic growth and in return prices push up. Islam et al. (2022) also explore that money-supply positively impacts the inflation in Bangladesh. Furthermore, results show that oil prices highly impact the inflation. There is a positively significant relationship between oil prices and inflation. Zakaria et al.' (2021) study's results indicate that global oil price shock has a favorable, long-lasting impact on inflation in south Asian nations. For many industries, like manufacturing and transportation, oil is a significant source of energy. Increase in oil prices result in higher production costs that affect the commodity pricing as well as higher costs for transport that affect the overall price of good.

Table 6
Error correction mechanism estimations

dependent variable: inflation			
	Pakistan	India	Bangladesh

Δ(Inflation (-1))	-0.089 (0.084)	-0.002 (0.125)	0.433** (0.156)
Δ(Export)	0.087** (0.024725)	0.234 (0.117)	-0.004 (0.848)
Δ(GDP)	-1.140*** (0.175)	-0.433*** (0.099)	-0.037 (0.000)
Δ(Exchange-rate)	-1.140*** (4.269)	1.112 (6.877357)	-12.339 (10.013)
Δ(Money-supply)	-0.197*** (0.034)	0.000 (0.000)	-0.004 (0.042)
Δ (Oli rents)	2.054 (1.097)	-5.949*** (1.021)	43.374*** (9.946)
ECM (-1)*	-0.700*** (0.098)	-0.398*** (0.060)	-0.777*** (0.153)

*Significant at 10%, **Significant at 5% & ***Significant at 1%

The table 6 presents the Error correction model results of ARDL. The ECM represents the short-term adjustment towards long term. ECM value should be between -1 to 0 and must be significant. For Pakistan the co-integrated vector is -0.700 and significant at 1%. While for India the co-integrated vector is -0.398 and significant at 1%. Further, for the co-integrated vector is -0.777 and significant at 1%. This means that the speed of short-term adjustment towards long term is fast in Pakistan and Bangladesh then India.

Conclusion

In this study, the comparative analysis of inflation in Pakistan, India, and Bangladesh has highlighted the variables affecting these countries' respective economies. To examine the determinants of inflation the time series data during the time period 1980 to 2022 is collected from WDI database. Inflation as measured by CPI is employed as a dependent variable.

In Pakistan, exports, GDP, money-supply, exchange-rate, and oil rents significantly impact the inflation rate of Pakistan. Exports and inflation are positively relation, because Pakistan's export earnings, especially from textiles, have a big impact on inflation since rising exports boost demand, which in turn pull up price. Money-supply also has as positive impact, the factors that determine the impact of the money-supply on inflation in Pakistan include government spending, credit availability, and fiscal policies which can result in increased demand and inflationary pressures. Exchange-rate also positively affects inflation, due to Pakistan dependence on imports for basic necessities and raw materials, Pakistan may experience Cost-Push inflation, which would raise domestic prices for imported products. Oil rents and inflation are positively related, change in oil rents impacts Pakistan's inflation by affecting import bills which affect production and transportation costs. However, GDP and inflation has a negative relationship. GDP and inflation are inversely related, indicating that an increase in GDP will raise the production, which in turn increases the supply of goods, so prices will decrease.

In India, exports, money-supply, and oil rents positively significantly impact inflation rate of India. Exports may boost demand for a currency, which could result in an increase in value or a decrease in inflation. However, poor central bank management can lead to a rise in the money-supply, which may increase inflation. Further, if the money-supply rises while the production of goods and services remains constant, inflationary pressures may arises due to the increased demand for those goods and services. Furthermore, India may experience Cost-push inflation due to its reliance on oil imports, where the increasing oil rents push up transportation and manufacturing costs, leading to higher final prices.

In Bangladesh, exports and exchange-rate has a significant negative impact on inflation. Exports may raise the currency demand, decrease inflation and positively impact economic health by making imports cheaper and reducing inflationary pressure. Further, if the central bank can efficiently regulate the exchange rate it may reduce the inflation. However, oil rents have a positively significant influence on inflation rate of Bangladesh. Bangladesh is the one of the major oil importer, so increase or decrease in oil prices can have an immediate effect on the cost of living. Rising oil costs typically result in higher overall prices, which fuel inflation.

Recommendations

Addressing inflation is largely dependent on several factors, including export diversification, controlling inflation expectations, and effectively implementing monetary policy. The Pakistani government or policy makers should prioritize funding renewable energy projects and fostering the development of new businesses in order to preserve long-term stability. Monetary authority has a significant role in this as well.

The Indian government should prioritize maintaining decision-making transparency and encouraging collaboration between the fiscal and monetary policies in order to reduce inflation and foster stability.

However, Policymakers in Bangladesh need to push companies to invest in renewable energy sources and sustainable practices and technology. To further ensure stability, it is suggested to follow a proactive exchange rate management plan.

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