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Inflation Dynamics, Globalization and Monetary Policy: Empirical Evidence from Selected South and Southeast Asian Countries

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Abstract

The present study investigated the impact of monetary policy and globalization on inflation. The study utilized an updated measure of globalization along with two other dimensions i.e., de facto and de jure measure of globalization to examine the nature of the globalization-inflation relationship. It measures the impact of monetary policy variables on inflation, ignoring random shocks as these are considered minor fractions for the inconsistency of the policy instruments. The study also used the Hodrick Prescott filter to calculate the domestic output gap to assess the notion that the changes in the domestic output gap are still relevant to inflation variations in the presence of globalization. Structural modeling of dynamic heterogeneous panel data estimation technique, which accounts for endogeneity and serial correlation issues has also been employed. The results of the study confirm that both global and domestic factors have significant and descriptive power for domestic inflation. Furthermore, the interest rate is found to be a major nominal anchor to affect inflation. The results of panel causality showed that there exists bidirectional causality from inflation to interest rate, while mixed results were found for analyzing monetary aggregates, exchange rate, globalization, and domestic output gap relationships.

Keywords: Globalization, Inflation, Monetary policy, Output gap

JEL Classification: F02, E31, E52, E32

1. Introduction

The closing decades of the past century witnessed the episode of an integrated socio-economic, political, and cross-cultural system, giving rise to a phenomenon known as globalization in today's world. These revolutionary developments introduced in the fields of transportation and information technology results in globalization. Globalization received a new impetus in the form of the internet revolution and better transportation. Furthermore, a considerable decline in

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the cost of communication and transportation apart from increasing the interaction among the various cultures of the world actualized the very notion of global markets.

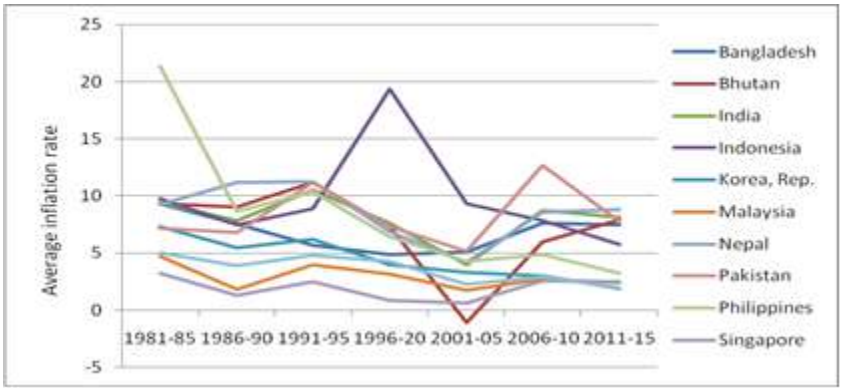
The changing patterns of monetary policy and increasing socio-economic global integration have been witnessed as the major unsettled issues during the previous decade. The suspected collapse of the money-inflation nexus, steadiness of money demand in several economies, and usefulness of the Phillips curve has ignited unending debates among researchers recently. All these issues do encompass some implications to carry out monetary policy in an integrated global environment.

The monetary authorities across the world use various variables and policy instruments to differentiate between different monetary policy regimes with the purpose to target the primary objective of steady prices. Besides this, several monetary determinants such as interest rate, credit rate, and exchange rate are employed by various economies around the globe to strengthen price stability and to avoid fluctuation in prices. In the present era, the instability of inflation has become prime contentions in many countries of the world (Islam, 2008).

This paper investigates the changing pattern of inflation and monetary policy within the sample of selected Asian countries. The trends of inflation in the countries under consideration as shown in Figure 1, can be perceived as volatile during the past 36 years. However, the trend has been declining over recent years due to global integration, liberalization, low international market prices, and improved supply of goods and services.

Recently, another influential factor i.e., globalization is a powerful force that has a considerable impact on the conduct of monetary policy. Hence, there is a profound room to reanalyze the monetary transmission mechanism in the light of the role played by globalization. This study further investigates the role of globalization as a major factor in driving the radical transformation in the behavior of monetary policy as shown in Figure 2 illustrates the average globalization trend in selected Asian Economies. This influential factor is (measured by varied techniques such as trade openness, financial openness, globalization index, etc.). We can compare the traditional channel of trade openness along with the latest KOF globalization index below in Figure 3 to highlight the trends regarding channels of openness in the sample of our selected countries.

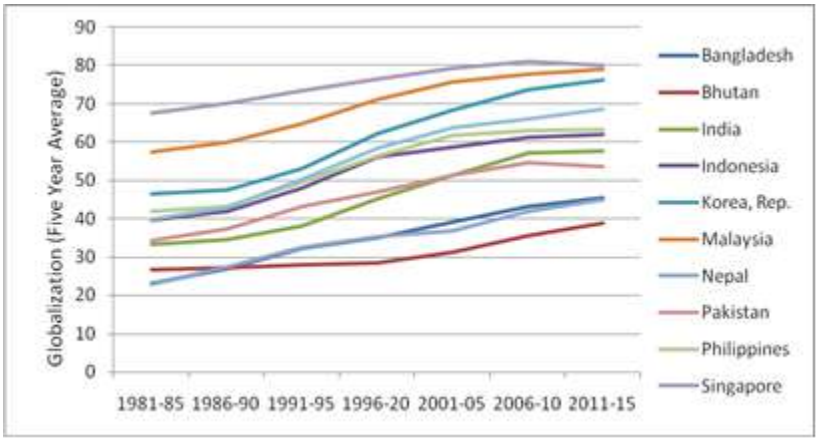
Figure 1: Trend in Average Inflation of Selected Countries



Source: Author's plot using statistics obtained from World Development Indicators (WDI).

The trend of inflation in the countries under consideration can be perceived as volatile however declining during the past 36 years which can be attributed to an integrated environment.

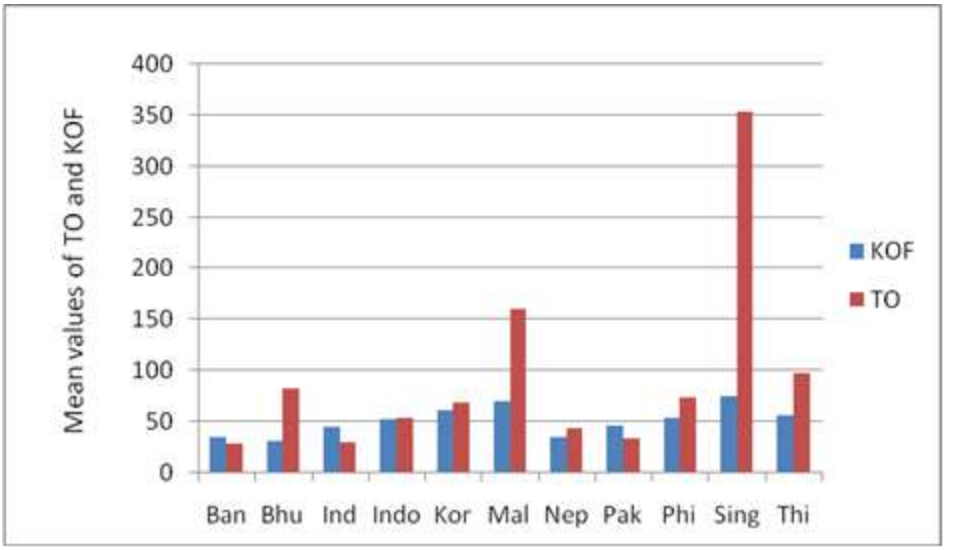
Figure 2: Trend in Average Globalization of Selected Countries



Source: Based on data from the updated KOF Index of Globalization (Gygli *et al*., 2019).

Figure 2 illustrates the average globalization trend in selected Asian Economies. It is quite apparent that globalization is increasing in the sample of our countries. Hence, we cannot ignore the impact of foreign variables on inflation.

Figure 3: Trade openness and Globalization Index (KOF)



Source: Computed by Author based on World Development Indicator database and updated KOF Index of Globalization (Gygli *et al*., 2019).

Figure 3 depicts that Malaysia followed by Singapore is the most open economy in terms of trade openness. While Malaysia, Korea, Singapore, Thailand and Philippines are ahead of other countries under investigation in terms of globalization.

The major intention to conduct this study is to explore the role of foreign factors in driving the radical transformation in the behavior of domestic monetary policy. It attempts to evaluate the inflation dynamics and behavior of monetary mechanism in the era of globalization in the selected sample of Asian countries. It seeks to add to the arguments on what suits them best for the monetary policymakers to attain the goal of price stability in an integrated environment. Hence, the basic intention of conducting this systematic investigation is to verify Romer's (1993) hypothesis that there exists an inverse relationship between inflation and openness. However, following [Poon and Tong, (2009)], and [Huseynov and Jamilov, (2013)] the study further considers the issue of the selection of the best nominal anchor in a globalized era.

Further bifurcation of the study includes a review of the literature in section 2, theoretical framework and methodology in section 3, empirical results and discussion in section 4, and conclusion and policy recommendations in section 5.

2. Literature Review

2.1. Empirical Evidence Based on Globalization and Inflation

The debate regarding the inflation-openness nexus got momentum since the influential paper by Romer (1993) which stated that increasing integration in terms of trade and financial openness is associated with lower inflation.

Openness has various measures as the evidence declared. The term globalization is a broader term used for openness that encompasses broader meaning and covers many aspects dealing with the open economy.

2.1.1. Analysis of Literature Regarding Single Country Studies

A critical review of the literature on inflation and globalization is conducted and segregated based on single and multi-country studies. In literature there exist many studies that used time-series data on the country level to explore the link between globalization and price hike.

Berument and Dougan (2003) investigated the influence of openness on the efficiency of monetary policy for Turkey. The study concluded that openness is the significant variable of monetary policy and monetary authorities must keep it in view while conducting monetary policies. Moreover, results revealed that openness and inflation were negatively related. On a similar pattern, Hanif and Batool (2006) examined the nature of inflation-openness trade-off in the case of the economy of Pakistan by applying regression analysis using the HAC estimator. The authors included only one traditional variable of openness and ignored other important variables as financial openness which is more relevant to inflation. Ahmad and Shahbaz (2007) examined the openness-inflation nexus for Pakistan. They applied advanced econometric estimation techniques such as co-integration and bounds testing procedure and concluded that trade liberalization could be favorable for a small developing economy. Munir and Kiani (2011) examined the inflation-openness relation in Pakistan and found contrasting results as compared to Romer (1993). Mukhtar (2012) analyzed the association of openness and inflation by revisiting the Romer's supposition for the economy of Pakistan. The empirical findings suggest an inverse long-run association between openness and inflation thereby validating (Romer, 1993). In another study, Rangkakulnuwat and Thurner (2017) assessed the "Romer's hypothesis" in the case of Thailand's economy by employing modeling procedure. The findings of the analysis revealed the presence of a long-period association between inflation and openness in congruence with "Romer's hypothesis".

2.1.2. Analysis of Literature Regarding Multi-Country Studies

Most of the studies regarding the inflation-globalization nexus are subject to multi-country analysis. Iyoha (1973) examined the association of inflation and openness for 33 less developed economies. The findings of the multivariate exercise revealed that the openness variable possesses an inverse but significant relationship with inflation. In an influential study, Romer (1993) asserted that increasing global integration proxied by trade and financial openness is associated with lesser inflation. Ashra (2002) investigated the influence of integration on inflation in fifteen developing countries. The analysis applied the "Fixed and random effect" panel estimation procedure for the investigation. The findings of the analysis disclosed that the influence of integration on inflation is also determined by the condition and structure of the economy. Ball (2006) analyzed the association of openness and the rate of inflation. The data of 14 industrial countries with and without foreign output gap were used by focusing on variables such as inflation and output gaps. The study concluded that it was hard to support that the change in the slope and structure of the Phillips curve is attributed to integration. The analysis rejected the impact of integration on inflation. Mazumder (2017) examined the association of growing integration with inflation in "developing and emerging economies". They incorporated both global and domestic output gaps to assess the traditional and open-economy description of the Phillips curve for 189 developing economies. The findings of the study revealed mixed results about the influence of globalization on domestic inflation in the concerned countries.

2.2. Empirical Evidence Based on Inflation and Monetary Policy

Inflation is increasingly becoming a focus of attention for international forces and a vital concern for our society. It indicates that synchronized global policy among central banks is decisive to strengthen the economies. Some economists are of the view that inflation and short-run stabilization of the economy should be the sole concern of monetary policy, but others consider it as a long-term process and in the control of central banks [Bernanke, (2007) and Mishkin, (2007)]. The effectiveness of monetary policy in a low inflation environment has been challenged.

2.2.1. Evidence Based on Single Country Analysis

Khalid (2005) explored the factors of inflation for the adoption of inflation targeting concerning the economy of Pakistan. The findings of the analysis concluded that both foreign as well as domestic variables significantly contributed to inflation. Similarly, Chaudhry and Choudhary (2006) assessed the influence of

inflation targeting on Pakistan's economy. The results contradicted the New Classicals' and monetarists' views which suggested that monetary variables played a pivotal role in price stability. Another research carried out by Poon and Tong (2009) examined the effectiveness of inflation targeting in Malaysia. The results concluded that fluctuation in interest and exchange rate changes significantly contributed to the CPI in the short run but was insignificant with respect to money supply. Hence, it was suggested that inflation targeting may not be feasible for Malaysia because of its inherent economic formation and underdeveloped organizations. Yolanda (2017) investigated two-fold purposes by exploring the effect of major macroeconomic variables on inflation and the impact of inflation on human development and poverty. The conclusion from the study revealed that exchange rate, BI rate, gold prices and international oil Prices were significantly and positively related to inflation. In a recent study, Hayat and Hanif (2020) made a comparative analysis regarding the effectiveness of money versus interest channel in the case of the Economy of Pakistan. The study concluded that role of money must not be deemphasized while conducting monetary policy as the interest rate shows prize-puzzle.

2.2.2. Evidence Based on Cross-Country Analysis

Darrat (1986) investigated the validity of the monetarist approach to inflation for three North African developing countries i.e. Morocco, Tunisia, and Libya. The study found a direct correlation between money supply and inflation. Inoue (2005) examined the impact of inflation targeting and the exchange rate regime on inflation rate in 20 transition countries. The results of the study deduced that pegged exchange rate and inflation targeting policies were found effective in dampening inflation in transition countries. Deniz, Tekce and Yilmaz (2016) investigated the determinants of inflation such as money growth, real effective exchange rate, budget balance, GDP growth, real wages, and output gap for 34 OECD and 6 Non-OECD economies. The empirical results concluded that each central bank required a unique monetary policy rule depending upon the characteristics and structure of each economy.

The above-mentioned studies elaborated on the effect of openness and policy variables on inflation. It is concluded that these variables have a mixed impact on inflation. Some concluded the importance of domestic factors in curbing inflation while others considered foreign factors. Most of the previous studies depict that openness help in dampening inflation in economies and it must be considered as an important determinant of inflation while conducting monetary policies. Our study is an effort to bridge the gap and will intend to capture all possible

dimensions of the issue

3. Theoretical Framework and Methodology

Mazumdar (2017) and Deniz, Tekce and Yilmaz (2016) used the idea of Romer (1993) to examine the inflation-globalization nexus and they did establish the long run and short-run association between globalization and inflation. Furthermore, the de facto and de jure measure of globalization was not considered, and the previous models were subject to the issue of endogeneity.

3.1. Model Specification

Following Deniz, Tekce and Yilmaz (2016), the model has been developed to investigate the effect of all the policy variables jointly in curbing the rate of inflation. The equation has been constructed to examine the role of some instruments simultaneously to evaluate which one must be targeted in an integrated environment to bring less volatility in inflation. The econometric form showing the relationship of inflation with other variables is given by:

$$INF_{it} = \beta_0 + \beta_1 MS_{it} + \beta_2 RIR_{it} + \beta_3 REER_{it} + \beta_4 OG_{it} + \beta_5 YD_{it} + \varepsilon_{it} \qquad (1)$$

INF =Inflation

MS= Money Supply

RIR=Real Interest Rate

REER=Real Exchange Rate

OG=Overall Globalization

YD= Domestic output gap

The literature that prevails on the issue predicts, to be β_1, $\beta_5 > 0$ and β_2, β_3, $\beta_4 < 0$ for equation (1). The subscripts "i and t" represent "cross-section and time-series" respectively; $\beta's$ show the values of coefficients for the equation; and ε are the indication of error terms.

Three measures of globalization have been incorporated i.e., overall globalization, globalization defacto and globalization dejure. The "KOF index of Globalization by the Swiss Institute for business cycle research" is provided on yearly basis and it is an extensive measure of globalization. The higher values of these indicators mention better globalization scores and increased integration among countries. So, we intend to utilize this comprehensive index in our study.

Panel Auto-Regressive Distributed Lag (ARDL) system of equations would be as follows

$$INF_{it} = \sum_{j=1}^{p} \alpha_{ij} INF_{i,t-j} + \sum_{j=1}^{q} \beta_{ij} X_{i,t-j} + W_i + \varepsilon_{it} \qquad (2)$$

Where subscript i represents the cross-sections (countries), i=1,2,3,…..11, and t indicate time duration. $X_{i,t-j}$ indicates all the explanatory variables which include domestic output gap, monetary policy variables, globalization index (Overall, Defacto and Dejure), w_i represents group-specific effect and the term ϵ_{it} is the white noise error term. A main attribute of cointegrated variables is that they rejoin to every deviation if any, from the long run. So we re-parameterize our aforementioned equation into error correction form using the ARDL (p,q) as below

$$\Delta INF_{it} = \sum_{j=1}^{p-1} \alpha_{ij} \Delta INF_{i,t-j} + \sum_{j=1}^{q-1} \beta_{ij} \Delta X_{i,t-j} + \varphi^i \left(INF_{i,t-1} - \{\Upsilon_o^i + \Upsilon_1^i X_{i,t-1}\} \right) + \varepsilon_{it} \qquad (3)$$

Where α and β represent short-run coefficients of lagged regressor and regress and variables. ϒ represent long-run coefficient the error correction parameter φ designate the speed of adjustment. Variables have no long-run association if φ = 0. Under the prior supposition that in case of any disturbance, variables will congregate reverse to their long period stability. So, it is expected that the error correction parameter should be statistically significant and contain an inverse symbol. Equation (3) will be estimated by three different estimators Mean Group, Pooled Mean Group and Dynamic Fixed Effect estimators.

The study employed the Levin-Lin- Chu (LLC) test to observe the existence of unit root. This restrictive test is more feasible for panels of moderate size (10<N<250 and 25<T<250). However, it has some limitations because it depends on cross-sectional independence assumption and hence is not applicable in cross-sectional correlation. These problems were solved by Pesaran et al., (2003). IPS test is dependent on less restrictive assumptions as compared to LLC. The null hypothesis of this test signifies that all the series contains a unit root against the alternative hypothesis. Residual serial correlation, heterogeneity of the dynamics, and error variance across groups are allowed by this test.

An ARDL model was employed for the cointegration process by using dynamic fixed effect, Mean and Pooled Mean group estimation procedure. To accomplish the cointegration task, the study employed three types of co-integration tests developed by Kao, Pedroni and Westerlund. By introducing the Mean Group

(MG) estimation procedure, the proposition of homogeneous coefficients is relaxed. The *"intercepts, slope coefficients and error variances"* are all permitted to be heterogeneous across cross-sections in the MG technique. Dynamic fixed effects estimator (DFE) is very analogous to the PMG estimator. This estimator also applies constraints on the slope coefficient and error variances to be identical across all the units of cross-sections in the longer time horizon. *"The DFE model further restricts the speed of adjustment coefficient and the short-run coefficient to be equal too"* (Samargandi et al., 2013). Pooled mean group estimator that allows short-run parameters, intercepts terms and error variances to vary across groups (as in MG estimator). However, it restrains the long-run coefficients to be equivalent in PMG estimation. One restriction of the PMG estimator is the identical β elements across cross-sections. Regardless of the order of integration, the long-run association can be estimated through the ARDL method of estimation according to Pesaran et al. (2003). Yet, Pesaran et al. (2003) proposed rejection of the ARDL estimation procedure if the level of integration among variables exceeds I (1). The choice of lag ARDL (1, 2, 2, 2, 2, 2) has been made by considering the AIC criterion based on the smallest value.

The study also used the Dumitrescu-Hurlin (2012) test that assumes of allowing all coefficients to be diverse across a panel. The test follows the assumption of normal asymptotic distribution and coefficients are permitted to vary individually across the panel.

3.2. Data Sources

Statistics are gathered through various secondary sources. The data for dependent variable inflation is taken from World Development Indicator WDI. For the independent variables i.e. money supply, real interest rate, real exchange rate, globalization and output gap the data is taken from WDI, Drehar globalization index, Bruegel data set, International Financial Statistics (IFS) and World Economic Outlook (WEO) respectively.

4. Empirical Results and Discussion

The study investigates the inflation dynamics, globalization and monetary policy and makes use of yearly balanced panel data over the years from 1981-2016. The results of the empirical estimations are reported below.

Table 4.1: Panel Unit Root Test at Level

Variable	With Intercept		With Intercept and Trend	
	LL	IPS	LL	IPS
INF	-1.77*	-5.54*	-0.10*	-4.39*
MS	-6.46*	-6.47*	-6.43*	-5.85*
RIR	-3.28*	-4.82*	-2.68*	-3.93*
REER	-5.06*	-4.01*	-1.56**	0.49**
YD	-5.41*	-8.15*	-4.33	-6.44*
OG	-2.01*	2.42	4.55	4.37
OGDF	-2.58*	1.13	2.34	3.38
OGDJ	0.03	4.25	2.021	2.12

(*) and (**) show that test statistics are significant at 5% and 10% level, respectively.

Table 4.1 reveals the levels of stationarity of macroeconomic variables regarding South Asia and the Southeast Asian region. The study rejects the Null Hypothesis (non-stationarity) of the unit root test based on P-value (should be less than 0.05) and deduces that all the concerned variables are of mixed order of integration (based on test statistics summary). Hence, it fulfills the basic condition for applying panel ARDL.

Table 4.2: Panel Unit Root Test at First Difference

Variable	With Intercept		With Intercept and Trend	
	LL	IPS	LL	IPS
INF	-9.20*	-17.26*	-5.37*	-15.49*
MS	-13.33*	-17.83*	-10.52*	-16.25*
RIR	-13.41*	-15.95*	-13.26*	-14.30*
REER	-6.70*	-7.55*	-7.43*	-8.61*
YD	-12.43*	-13.63*	-10.39*	-11.73*
OG	-7.05*	-8.60*	-6.21*	-7.74*
OGDF	-9.68*	-9.86*	-9.21*	-9.29*
OGDJ	-6.55	-7.58*	-5.92*	-5.90*

(*) shows that test statistics are significant at the level of 5%.

4.1. Dynamic Heterogeneous Panel Estimation

The foremost step in conducting dynamic analysis is to observe the level of cointegration among variables.

Table 4.3 describes the results of the Pedroni, Kao and Westerlund residual-based panel cointegration procedure. Null hypothesis (absence of cointegration) is discarded for panel data based on reported probability values and the existence of cointegration is established. After estimating and establishing panel cointegration, the study has applied a dynamic panel ARDL estimation technique for measuring the coefficients of the variables.

Table 4.3: Cointegration (Dependent Variable is Inflation)

Models		Overall	Defacto	Dejure
Kao	Alternative Hypothesis: Cointegration is Present			
	T	-6.452(0.00)	-6.403 (0.00)	-6.577 (0.00)
	Alternative Hypothesis: Cointegration with Common AR Coefficients			
Pedroni	Pv	0.992 (0.161)	1.119 (0.132)	1.948 (0.010)
	Prho	-2.345 (0.00)	-2.236 (0.01)	-2.324(0.01)
	Ppp	-7.166 (0.00)	-6.701 (0.00)	-7.444(0.00)
	Padf	-3.349(0.00)	-3.004 (0.00)	-3.570 (0.00)
	Alternative Hypothesis: Cointegration with Individual AR Coefficients			
	Grho	-1.163(0.12)	-1.066 (0.14)	-1.167 (0.122)
	Gpp	-7.78 (0.00)	-7.407 (0.00)	-8.088 (0.00)
	Gadf	-3.432(0.00)	2.947(0.001)	-0.37 (0.35)
Westerlund	Alternative Hypothesis: Cointegration is Present			
	Gt	-4.95(0.00)	-4.85(0.00)	-4.93(0.00)
	Ga	19.96(0.023)	-19.89(0.02)	-19.60(0.31)
	Pt	-14.97(0.00)	-14.98(0.00)	-14.86(0.00)
	Pa	-19.97(0.00)	-19.91(0.00)	-19.25(0.00)

Note: Values reported in parenthesis are p values. Group statistics are denoted by Gt and Ga while panel statistics are denoted by Pt and Pa.

4.2. Long Run Regression Results

Table 4.4 establishes the long-run relation between varied monetary anchors. The nature of the estimated relationship between money supply (MS) and inflation is direct and significant. Whenever the expansion in broad money supply is larger than that of the GDP of a country, it will generate inflation. This argument favors the monetarists' theory which asserts that money is the main determinant of an inflationary process (Qayyum, 2006). The numerical value obtained for the real interest rate (RIR) is significant in all the specifications during the selected period. Such results are also confirmed by Saleem, (2010). The coefficient of the real effective exchange rate (REER) is negatively related to the level of inflation. A rise in the real effective exchange rate (REER) denotes the appreciation of currency in effective terms. Moreover, when the currency depreciates in the case of a small open country, it results in escalating the rates of imported commodities and lessening the rates of local commodities for foreigners. The increased rates of imported items used in the production process enhance the cost of production of locally manufactured commodities, and hence the price level is negatively and significantly related to the exchange rate (Hyder and Shah, 2004). Measures of globalization, defacto and dejure, significantly affect inflation in the selected

economies. The coefficient of globalization highlights an inverse association with inflation and explains that a unit increase in globalization brings about 0.128, 0.142 and 0.104 unit decline in the level of inflation [Romer (1993), Kim and Beladi (2005), and Mukhtar, (2012)].

Table 4.4: Dynamic Heterogeneous Panel Long Run Results

Variable	Overall			Defacto			Dejure		
INF	**PMG**	**MG**	**DFE**	**PMG**	**MG**	**DFE**	**PMG**	**MG**	**DFE**
MS	0.054 [0.030] (0.071)	0.023 [0.056] (0.683)	0.041 [0.035] (0.241)	0.053 [0.031] (0.088)	0.033 [0.051] (0.519)	0.043 [0.036] (0.226)	0.035 [0.029] (0.237)	-0.007 [0.050] (0.892)	0.045 [0.035] (0.193)
RIR	-0.686 [0.077] (0.000)	-0.496 [0.177] (0.005)	-0.359 [0.079] (0.000)	-0.514 [0.074] (0.000)	-0.441 [0.199] (0.027)	-0.351 [0.080] (0.000)	-0.624 [0.078] (0.000)	-0.550 [0.181] (0.002)	-0.35 [0.080] (0.000)
REER	-0.073 [0.011] (0.000)	-0.076 [0.028] (0.006)	-0.033 [0.012] (0.005)	-0.069 [0.012] (0.000)	-0.068 [0.029] (0.018)	-0.037 [0.013] (0.003)	-0.076 [0.011] (0.000)	-0.0624 [0.027] (0.019)	-0.0274 [0.011] (0.013)
OG	-0.253 [0.031] (0.000)	-0.169 [0.062] (0.006)	-0.128 [0.033] (0.000)	-	-	-	-	-	-
OGDF	-	-	-	-0.199 [0.031] (0.000)	-0.110 [0.084] (0.165)	-0.142 [0.039] (0.000)	-	-	-
OGDJ	-	-	-	-	-	-	-0.246 [0.029] (0.000)	-0.137 [0.055] (0.014)	-0.103 [0.027] (0.000)
YD	0.264 [0.044] (0.000)	0.158 [0.161] (0.327)	0.230 [0.080] (0.004)	0.302 [0.051] (0.000)	0.127 [0.193] (0.510)	0.251 [0.083] (0.002)	0.0247 [0.054] (0.000)	0.071 [0.195] (0.717)	0.218 [0.081] (0.007)
Ect	-0.483 [0.065] (0.000)	-0.845 [0.052] (0.000)	-0.588 [0.050] (0.000)	-0.477 [0.061] (0.000)	-0.813 [0.051] (0.000)	-0.576 [0.049] (0.000)	-0.452 [0.064] (0.000)	-0.819 [0.062] (0.000)	-0.589 [0.050] (0.000)
Hausman Test	-	0.7525	0.0000	-	0.9436	0.0359	-	0.5539	0.000

Values in () show p values and in [] are standard errors. The values without brackets are coefficients.
The model is ARDL (1,1,1,1,1,1).

The findings confirm Romer's hypothesis and conclude an inverse association between inflation and openness in the selected countries. This implies that the long-established isolated position of the economies for the determination of domestic inflationary process has become invalid and incorporating openness or integration measures to the analysis has become inevitable. The error correction representation found an inverse relationship and it is statistically significant in the short-run analysis. This indicates that all the specifications will join equilibrium at

a moderate speed as the momentum of fine-tuning is found to be around sixty percent in each specification. Hausman test is demonstrating that DFE is consistent and an efficient estimation than MG and PMG estimation under the null hypothesis.

4.3. Panel Causality

The regression estimation procedures elaborate on the influence of relevant independent variables on the regressand for the short as well as for the long-run. The nature of causation among variables, in time series analysis, is extensively experimented with the Granger causality test. In the panel framework, the idea of causation is the latest and was presented by Dumitrescu and Hurlin (2012). It utilizes Wald and Z bar statistics to exhibit the nature of causation. The current study examined the nature of causation by engaging the entire variables to examine the causal association. The main intention of the research was to investigate causation from globalization to monetary policy and inflation. The results of bidirectional causality are reported in Table 4.5 (a) and 4.5 (b) below:

Table 4.5 (a): Panel Homogeneous Causality Test

Variable	INF		MS		RIR		REER	
	Prob.	Causality	Prob.	Causality	Prob.	Causality	Prob.	Causality
INF	-	-	0.838	No	0.000	Yes	0.003	Yes
MS	0.421	No	-	-	0.010	Yes	0.408	No
RIR	0.023	Yes	0.697	No	-	-	0.000	Yes
REER	0.383	No	0.376	No	0.000	Yes	-	-_
YD	0.000	Yes	0.057	Yes	0.006	Yes	0.251	No
OG	0.210	No	0.000	Yes	0.055	Yes	0.683	No
OGDF	0.447	No	0.131	No	0.594	Yes	0.876	No
OGDJ	0.303	No	0.000	Yes	0.035	Yes	0.247	No

The p<0.05 values in the table indicate significance at the 5% level.

Table 4.5 (b): Panel Homogeneous Causality Test

Variable	YD		OG		OGDF		OGDJ	
	Prob.	Causality	Prob.	Causality	Prob.	Causality	Prob.	Causality
INF	0.123	No	0.653	No	0.500	No	0.783	No
MS	0.127	No	0.065	yes	0.083	Yes	0.56	No
RIR	0.577	No	0.894	No	0.354	No	0.987	No
REER	0.346	No	0.000	yes	0.000	Yes	0.000	yes
YD	-	-	0.000	yes	0.000	Yes	0.000	yes
OG	0.270	No	-	-	-	-	-	-
OGDF	0.311	No	-	-	-	-	-	-
OGDJ	0.983	No	-	-	-	-	-	-

The p<0.05 values in the table indicate significance at the 5% level.

Table 4.5 reveals the findings of the panel Homogeneous test of causality. The bi-directional causality is confirmed between the rate of interest and inflation rate which states interest rate and inflation rate simultaneously affect each other and can be identified as a major monetary policy instrument to be targeted for price stability.

5. Conclusion

The core task of this research was to investigate the implication of varied monetary policy instruments and different measures of globalization for inflation in the selected sample of countries and observed that liberalization policies play an effective role in reducing inflation. The estimation results indicated that monetary strategy was efficient during a long-time duration in controlling inflation while the role of globalization was also significant in all the specifications. Hence, contractionary monetary policy can help in curbing inflation. In the nutshell, it was indicated that the interest rate can be used as a nominal tool as it held an expected significant impact on inflation. Furthermore, globalization is a significant contributor to the inflation of a country. So, while conducting monetary policy the external impact on inflation could not be ignored.

In short, this research elucidated that the achievement of smooth and continuing economic growth depends on the situation which is essential to curb fluctuation in the inflation rate. The expansion in the money supply generates inflation. The monetary authorities can handle the problem of inflation by adopting a strict monetary policy. Besides this, they may use the instrument of interest rate to control price instability. Furthermore, exchange rate depreciation as a monetary strategy instrument significantly affected the inflation rate in the right direction but with a weak coefficient. In the long run, inflation targeting can be pursued by considering the interest rate as a nominal tool as disequilibrium in the inflation rate from its path of equilibrium would converge in the recent year. This indicates that the price hike is a monetary phenomenon. Hence, the other intermediate options available for monetary authorities is to use interest rate along with other policy variables as a policy tool to achieve the goals of price stability and stable economic growth.

Furthermore, globalization is found to be a significant contributor to the inflation of a country. It helps in increasing production efficiencies, proper use of capacities and enhancing foreign investment. Hence, while conducting monetary policy the external impact on inflation could not be ignored.

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Appendix I

Table: Dynamic Heterogeneous Panel Short Run Results of Error Correction Representation

	Overall			Defacto			Dejure		
Coefficients	Estimates [std. Error] (P-value)	Estimates [std. Error] (P-value)	Estimates [std. Error] (P-value)	Estimates [std. Error] (P-value)	Estimates [std. Error] (P-value)	Estimates [std. Error] (P-value)	Estimates [std. Error] (P-value)	Estimates [std. Error] (P-value)	Estimates [std. Error] (P-value)
	PMG	MG	DFE	PMG	MG	DFE	PMG	MG	DFE
Ect	-0.4827 [0.0652] (0.000)	-0.8450 [0.0518] (0.000)	-0.5880 [0.0501] (0.000)	-0.4774 [0.0618] (0.000)	-0.8134 [0.0513] (0.000)	-0.5761 [0.0495] (0.000)	-0.4516 [0.0642] (0.000)	-0.8193 [0.0617] (0.000)	-0.5898 [0.0504] (0.000)
D1(MS)	-0.0126 [0.0266] (0.582)	-0.0146 [0.0387] (0.705)	-0.0110 [0.0267] (0.681)	-0.0322 [0.0146] (0.028)	-0.0078 [0.0376] (0.835)	-0.0121 [0.0267] (0.650)	-0.0030 [0.0284] (0.915)	0.0234 [0.0333] (0.482)	-0.0131 [0.0267] (0.622)
D2(MS)	0.0033 [0.0104] (0.751)	0.0027 [0.0121] (0.824)	-0.0037 [0.0124] (0.764)	0.0110 [0.0124] (0.376)	-0.0037 [0.0106] (0.728)	-0.0031 [0.0124] (0.801)	0.0019 [0.0118] (0.873)	-0.0097 [0.0134] (0.469)	-0.0031 [0.0124] (0.804)
D1(RIR)	0.1432 [0.1033] (0.166)	0.2513 [0.1949] (0.197)	-0.0559 [0.0749] (0.455)	0.0441 [0.1117] (0.693)	0.1771 [0.2223] (0.426)	-0.0628 [0.0749] (0.401)	0.0867 [0.0186] (0.425)	0.2813 [0.1724] (0.103)	-0.0587 [0.0751] (0.435)
D2(RIR)	-0.0753 [0.0577] (0.192)	-0.0984 [0.0817] (0.228)	0.0313 [0.0357] (0.380)	-0.0397 [0.0628] (0.527)	-0.0776 [0.0923] (0.400)	-0.0331 [0.0358] (0.354)	-0.0583 [0.0546] (0.285)	-0.1071 [0.0668] (0.000)	0.0343 [0.0358] (0.366)
D1(REER)	-0.0391 [0.0489] (0.424)	0.0696 [0.0788] (0.377)	-0.0245 [0.0230] (0.288)	-0.0617 [0.0410] (0.132)	0.0548 [0.0838] (0.514)	-0.0266 [0.0234] (0.254)	-0.0248 [0.0467] (0.596)	0.0575 [0.0711] (0.418)	-0.0261 [0.0229] (0.256)
D2(REER)	0.0275 [0.0406] (0.498)	-0.0397 [0.0347] (0.227)	0.0176 [0.0169] (0.298)	0.0366 [0.0394] (0.352)	-0.0409 [0.0381] (0.283)	0.0189 [0.0171] (0.270)	0.0208 [0.0420] (0.620)	-0.0306 [0.0294] (0.299)	-0.0177 [0.0170] (0.299)
D1(OG)	0.1457 [0.2948] (0.621)	0.2029 [0.2822] (0.472)	0.0552 [0.1519] (0.716)						
D2(OGDF)				-0.0855 [0.0718] (0.234)	-0.0316 [0.1105] (0.775)	-0.0474 [0.0715] (0.507)			
D1(OGDJ)							0.1067 [0.1755] (0.543)	0.3092 [0.1477] (0.036)	0.0061 [0.1348] (0.964)
D2(OGDJ)							-0.0061 [0.1460] (0.967)	-0.1943 [0.1101] (0.078)	0.0153 [0.0980] (0.876)

D1(YD)	-0.1380 [0.1183] (0.243)	-0.2643 [0.1827] (0.148)	-0.0817 [0.0761] (0.283	-0.1246 [0.1076] (0.247)	-0.2036 [0.1812] (0.261)	-0.0792 [0.0760] (0.298)	-0.1736 [0.1080] (0.108)	-0.2325 [0.1850] (0.209)	-0.0819 [0.0770] (0.288)
D2(YD)	0.0435 [0.0792] (0.582)	0.1094 [0.0901] (0.225)	-0.0325 [0.0489] (0.506)	0.0337 [0.0687] (0.624)	0.0874 [0.1043] (0.402)	-0.0344 [0.0490] (0.483)	0.0636 [0.1006] (0.582)	0.0806 [0.1015] (0.427)	-0.0316 [0.0489] (0.518)
Constant	13.8768 [2.0045] (0.000)	20.6803 [4.4583] (0.000)	9.9489 [1.8333] (0.000)	11.8767 [1.5166] (0.000)	17.0802 [5.4176] (0.002)	10.5403 [2.0960] (0.000)	12.8233 [1.9536] (0.000)	18.3754 [4.3493] (0.000)	8.7791 [1.5632] (0.000)
D1(OGDF)				0.1680 [0.1336] (0.209)	0.0839 [0.1997] (0.674)	0.1017 [0.1074] (0.343)			
D2(OGDF)				-0.0855 [0.0718] (0.234)	-0.0316 [0.1105] (0.775)	-0.0474 [0.0715] (0.507)			
D1(OGDJ)							0.1067 [0.1755] (0.543)	0.3092 [0.1477] (0.036)	0.0061 [0.1348] (0.964)
D2(OGDJ)							-0.0061 [0.1460] (0.967)	-0.1943 [0.1101] (0.078)	0.0153 [0.0980] (0.876)
D1(YD)	-0.1380 [0.1183] (0.243)	-0.2643 [0.1827] (0.148)	-0.0817 [0.0761] (0.283	-0.1246 [0.1076] (0.247)	-0.2036 [0.1812] (0.261)	-0.0792 [0.0760] (0.298)	-0.1736 [0.1080] (0.108)	-0.2325 [0.1850] (0.209)	-0.0819 [0.0770] (0.288)
D2(YD)	0.0435 [0.0792] (0.582)	0.1094 [0.0901] (0.225)	-0.0325 [0.0489] (0.506)	0.0337 [0.0687] (0.624)	0.0874 [0.1043] (0.402)	-0.0344 [0.0490] (0.483)	0.0636 [0.1006] (0.582)	0.0806 [0.1015] (0.427)	-0.0316 [0.0489] (0.518)
Constant	13.8768 [2.0045] (0.000)	20.6803 [4.4583] (0.000)	9.9489 [1.8333] (0.000)	11.8767 [1.5166] (0.000)	17.0802 [5.4176] (0.002)	10.5403 [2.0960] (0.000)	12.8233 [1.9536] (0.000)	18.3754 [4.3493] (0.000)	8.7791 [1.5632] (0.000)

The table reports short-run effects (SR). Hausman test is indicating that DFE is consistent and efficient estimation than MG and PMG estimation. The lag structure is ARDL (1, 2, 2, 2, 2, 2) and the order of variables is Money Supply, Real interest rate, Real Effective exchange rate, Globalization (Overall, Defacto and Dejure measure), and domestic output gap. Source: computed by the author