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The Impact of Depreciation on Domestic Price Level of Bangladesh.

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Abstract
The paper empirically examines the impact of depreciation on domestic price level of Bangladesh. This study also examines the impact of exchange rates and external shocks on import prices, domestic producer and consumer prices for the economy of Bangladesh. The desire response function proposes that exchange rate pass through to consumer prices is the very high; followed by producer prices while exchange rate pass through to import prices is the lowest. There is strong evidence of a positive and significant association between the pass-through and the average inflation rate across the county and periods. Our findings also reveal the existence of bidirectional causality only for the case of nominal effective exchange rate and producer prices. The inflation rate, moreover, dominates other macroeconomic variables in explaining cross-regime differences in the pass-through.
Keywords: pass-through, inflation, exchange rate.var model**.**

1. Introduction

Bangladesh is an emerging country of the south Asian region that has been following the policy of fixed exchange rate with strict restriction on currency convertibility, which has been relaxed a few years ago. As reported in the Central Bank (Bangladesh Bank) annual reports Bangladesh has maintained a sustainable economic growth rate between 6 to 7 percents over past several years. The Exchange Rate is defined as the domestic price of a unit of foreign currency. The behavior of exchange rate is one of the unsolved issues of research to be dealt with. Exchange rate pass through is the percentage change in local currency import prices resulting from a percent change in the exchange rate between the export and importing countries. Exchange rate pass through can be either incomplete or complete and refers not only to the effect of exchange rate changes on consumer prices, investments and trade volumes. The extent and degree of exchange rate pass through points out the importance of exchange rate fluctuations on domestic price inflation and also the extent to which exchange rates and import prices influence domestic inflation.

The degree to which changes in the exchange rate pass through to prices is an important issue in debates about appropriate monetary and exchange rate policies. A low exchange rate pass-through is thought to provide greater freedom for pursuing an independent monetary policy and to make it easier to implement inflation targeting. There is no consensus, however, on the conditions that lead to a low pass-through. Traditional literature has been concerned with the exchange rate pass-through to import prices and has stressed the role of market power and price discrimination in international markets (pricing to market). This literature suggests that the import price pass-through (at the sectoral or aggregate level) is essentially determined by microeconomic factors (e.g., demand elasticities, market structure) that are exogenous to monetary policy.

The monetary policy in Bangladesh aims at stabilizing the domestic and external value of the currency and to foster economic growth. Therefore, the exchange rate pass-through to domestic wholesale and consumer prices is an important link in the process of monetary policy transmission. Since Bangladesh's economy has a considerable degree of openness to foreign trade, the domestic price level cannot remain immune to external price shocks i.e. exchange rate depreciation/appreciation and changes in import prices. Any appreciation or depreciation of the exchange rate will not only result in significant changes in the prices of imported finished goods but also imported inputs that affect the cost of the finished goods and services.

Theoretically, devaluation of home currency leads to an increase in import prices in terms of home currency. Following home country currency depreciation, price of imports in home country currency rises which in turn reduces the domestic demand for imports. In order to maintain the existing market shares, especially in the short run, exporters generally adjust their mark-ups. The higher the price elasticity of demand of a country lower will be the mark-up over production cost. This explains why exchange rate movements often do not bring about proportional change in import prices and pass-through is incomplete. Market segmentation is one of the possible reasons for incomplete pass-through, which allows imperfectly competitive firms to charge different prices for the same product in different export market. Pricing-to-market (PTM), thus, depends on the market power of the respective firm in the export market to a large extent. For instance, as Halpern and Koren (2007), find import prices are higher for products of firms with greater market power. However, in the long run permanent change in

nominal exchange rate may lead to complete adjustment in import prices, with pass-through being complete in the long run.

Specifically, exchange rate movements can influence domestic prices through direct and indirect channels. In case of direct channel, exchange rate movements can affect domestic prices through changes in the price of imported finished goods and imported inputs. In general, when a currency depreciates it will result in higher import prices while lower import prices result from appreciation in price taker countries like Bangladesh. The potentially higher costs of imported raw material and capital goods associated with an exchange rate depreciation increase marginal costs and lead to higher prices of domestically produced goods. In case of indirect effect, the exchange rate depreciation affects the net exports which in turn influence the domestic prices through the change in aggregate demand, putting upward pressure on domestic prices. In addition, import-competing firms might increase prices in response to foreign competitor price increases in order to maintain profit margins. However, the extent and the speed of exchange rate pass-through depends on several factors such as market structure, pricing policies, general inflationary environment, involvement of non-tradables in the distribution of tradables, relative share of imports in WPI and CPI basket, etc.

The main aim of the study is thus to investigate the extent and degree of exchange rate pass through to prices at different distribution levels – from import prices, to producer prices up to consumer prices. The study further focuses on the existence and degree of causality between exchange rate and domestic prices and analyses the degree of exchange rate pass through to import, producer and consumer prices. Lastly, we assess the effect and importance of external shocks in explaining import and domestic prices in the Bangladesh's economy. A structural vector autoregressive (SVAR) model is estimated and the impulse response functions are used to calculate exchange rate pass through elasticity and also to analyze the effect of external shocks on import and domestic prices. Forecast error variance decomposition is equally obtained from the SVAR to examine the importance of external shocks in explaining import and domestic prices.

2. Review of literature

There is a substantial theoretical and empirical literature on the exchange rate pass-through to domestic producer and consumer prices, some of which has been surveyed in Goldberg and Knetter (1997). However, much of the literature has dealt with advanced economies. The studies on exchange rate pass-through can be broadly divided into three categories: (1) the first category comprises studies that focus on examining exchange rate pass-through into import prices for specific industries (for example, Feinberg, 1989, and Goldberg, 1995); (2) the second category includes studies that examine pass-through into aggregate import prices (for example, Hooper & Mann, 1989, and Campa & Goldberg, 2002); and (3) the third category of studies examines exchange rate pass-through into WPI and CPI (for example, McCarthy, 2000; Papell, 1994; Heng, 1999; and Kim, 1998). Earlier studies on the subject find out, in general, evidence of incomplete exchange rate pass-through1. For instance, Feenstra (1987) finds that the pass-through coefficient for US import prices of Japanese exports varying across products in the range from about 0.6 to unity. Campa and Goldberg (2002) show that OECD import prices in local currencies, on the average, reflect 60 percent of exchange rate fluctuations in the short run, and nearly 80 percent over the long run. A number of recent papers have shown that the degree of pass through has declined substantially since the 1990s. For instance, Marazzi et al. (2005) have found a steady decline in the exchange rate pass-through into US import prices during the 1990s. Krugman (1986) shows that PTM is a real phenomenon, but not universal; in particular, evidence on German export prices suggest stickiness being confined to machinery and transport equipment prices. The aggregate estimates in this paper suggest that 35 to 40 percent of the real appreciation of the dollar since 1980 has been absorbed by foreign exporters thus lessening the extent of import price rise in the US than in other markets. Incomplete pass-through is generally explained in the existing literature by the existence of trade barriers, transaction and transportation costs, market power and imperfect substitutability between domestic substitute and foreign products. To find out why exchange rate pass-through is incomplete, Dornbusch (1987) explains the adjustment of relative prices to exchange rate movements in an industrial organization approach by using various models. The approach is to explain price adjustment in terms of market concentration, product homogeneity and substitutability, and relative market shares of domestic and foreign firms. All the models in this analysis predict that appreciation leads to a decline in the price of imports. While in the case of homogenous goods domestic firms fully match the decline in price, the extent of decline in the relative price of differentiated imported brands depends on competition and on the relative number of home and foreign firms. In contrast, Feenstra, Gagnon and Knetter (1993) find that pass-through tends to be highest for high market shares with firms facing less competition and not experiencing a similar change in costs. However, Krugman (1986) stresses that dynamic models of imperfect competition are the best to explain exchange rate pass-through. The study explains the phenomenon in terms of supply dynamics resulting from the costs of rapidly adjusting the marketing and distribution infrastructure, and the demand dynamics resulting from the need of firms to invest in reputation. Ashok (2002) finds that the average pass-through is low and inflationary impact of exchange rate depreciation is absorbed at the intermediate stage of production in South Africa.

However, shocks to producer prices tend to have a considerable impact on consumer prices. He also found that pass-through is much higher for nominal rather than for real shocks. The findings of Leigh and Rossi (2002) are (i) the pass-through from the exchange rate to domestic prices continues for a year but is more intense in the first four months (ii) the pass through to WPI is more pronounced than CPI (iii) forecast of inflation based on estimates of the pass-through coefficient provides only partial information about the underlying price pressures. Rabanal and Schwartz (2001) show that after 18 months about two-thirds of the initial exchange rate shock is passed through to WPI and two-ninths to CPI in the case of Brazil, indicating that the pass-through to WPI is more pronounced as compared to the pass through to CPI. In line with the inflationary environment, monetary policy environment influences exchange rate pass through to domestic prices. From Devereux *et al*. (2004) model of endogenous exchange rate pass through, countries with successful policy of monetary stabilization are able to reduce the variance of their money growth and thus have low rates of exchange rate pass through. This is explained by foreign exporters who prefer to set their prices in that country's currency leading to the producer currency pricing case, thereby reducing the impact of exchange rate changes on the country's consumer price index. Low variability of monetary shocks reduces the predictive power of exchange rate in determining monetary shocks and this effect therefore suggests another reason for the pass through to be smaller under a low inflation environment (An 2006).

McCarthy (1999) indentifies openness as impacting on exchange rate pass through. The greater the degree of openness, the larger the pass through (Soto and Selaive 2003). Aggregate demand uncertainty where foreign firms cannot perfectly forecast gross domestic product or gross national product is another economic variable that affects exchange rate pass through (Mann 1986). The profit margins of foreign firms are exposed to demand shocks. Exporters usually alter the profit margins when aggregate demand shifts due to exchange rate fluctuations in an imperfectly competitive environment, thus reducing pass through. Thus pass through is likely to be lower in countries where aggregate demand is more volatile.

Evidence from a recent study in Nigeria to examine the link among depreciation, inflation and output revealed a mixed result of exchange rate depreciation on output- contractionary in the short term and expansionary in the intermediate and long term. These results tend to suggest that depreciation does not necessarily lead to output expansion, particularly in the short-run (Odusola and Akinlo, 2001). Similar observations were found in a study conducted in Bangladesh context which entailed depreciation as a source of reduction in the cost of intermediation reducing interest rate and thereby easing credit constraint (Hossain & Ahmed, 2009). Therefore, possible outcomes of currency depreciation are- firstly, in the goods market, an unexpected depreciation of the domestic currency will make imports more expensive than export, which will increase the demand for domestic products, increasing domestic output and price. Secondly, in the money market, an unexpected depreciation of the domestic currency, relative to its anticipated future value, prompts agents to hold more domestic currency and increases the interest rate, effects investment spending adversely and so does the aggregate demand leaving price level to rise. Thirdly, on the supply side, changes in the exchange rate, both anticipated and unanticipated, make imported intermediate goods costly, producers are inclined to decrease imports of intermediate goods, decreasing domestic output and increasing the cost of production and, hence, the aggregate price level (Kandil,2004). Accordingly, the effects of exchange rate fluctuation are highly debatable from its theoretical background.

The econometric approach (Sheehey, 1986; Edwards, 1989; Morley, 1992; Upadhyaya, 1999 and Bahmani-Oskooee and Miteza, 2006). This approach applies econometric methods to time series to investigate the effect of devaluations on output. Sheehey (1986) used cross section data from 16 Latin American countries and concluded that devaluations have contractionary effect on output. Morley (1992) also used cross section data from 28 developing countries and found support for contractionary devaluation hypothesis. Edwards (1989) used panel data regressions for 12 developing countries and found that devaluations are contractionary in the short-run. Upadhyaya (1999) applied cointegration and error correction modeling technique to data from 6 Asian countries and concluded that devaluations are contractionary for Pakistan and Thailand but neutral for India, Sri Lanka, Malaysia and Philippines in the long-run. Bahmani-Oskooee and Miteza (2006) applied panel unit root and panel cointegration techniques to annual data from 42 countries and concluded that in the long-run devaluations are contractionary in non-OECD countries.

The main objective of this paper is to estimate and analyze the responsiveness of Bangladesh's price level to exchange rate movements. The exercise is also to find out the differences in the degree of the exchange rate pass-through at the aggregate level as well as across some selected sectors. For the purpose, the analysis covers only non-oil imports into Bangladesh, which account for about 70 per cent of total imports in 2005-06. In specific, the present study analyses ERPT for imports of disaggregated product group including chemicals, machinery, transport equipments, metal manufactures and food processing. Fuel and mineral oils are excluded from this study as demand for these products are often price inelastic and thus exchange rate movements do not seem to play a major role in determining import prices movements.

3. Methodology

To examine the pass-through of exchange rate to domestic prices, this paper utilizes are cursive Vector Autoregressive (VAR) approach proposed by McCarthy (2006) which is a model of pricing along distribution chain -import, production and consumer –to track pass through from exchange rate fluctuations at each stage of the distribution chain. The model also considers supply, demand and exchange rate shocks. Furthermore, the model accounts for the reaction of the Central Bank to carry out monetary policy.

The supply shocks (ε_t^s) are identified from the dynamics of oil price inflation denomination in US dollars (π_t^{oil}). The proxy for demand shocks(ε_t^d) is the dynamics of output gap(t) in the country after accounting for the contemporaneous effect of the supply shock. Finally the exchange rate shocks(ε_t^e) are identified from the dynamics of exchange rate changes (Δe_t) after taking into account the contemporaneous effect of demand and supply shocks.

Inflation at each stage – import, producer and consumer – at time period *t*, is assumed to contain several components where the first component is the expected inflation at that stage based on available information at the end of the time period *t-1*. The next two components are the effect of period *t* domestic supply and demand shocks on inflation at that stage. The fourth component shows the effects of exchange rate shocks on inflation at that stage. Then the effects of the shocks of the previous stages of the chain are included and finally there is the stage's shock. The shocks at each stage can be considered as the changes in the pricing power and markups of firms at these stages.

. Finally, the Central Bank's reaction function is estimated where the short term interest rates (r_t) are related to the previously mentioned variables in the model and the money demand function relates money growth (Δm_t) to the other variables in the model.

The model is as follows:

$$\Pi_t^{oil}=E_{t-1}(\Pi_t^{oil}) + \varepsilon_t^s \quad (1)$$

$$t= E_{t-1}(t)+\alpha_1\varepsilon_t^s +\varepsilon_t^d \quad (2)$$

$$\Delta e_t=E_{t-1}(\Delta e_t) + b_1\varepsilon_t^s +b_2\varepsilon_t^d +\varepsilon_t^e \quad (3)$$

$$\Pi_t^m=E_{t-1}(\pi_t^m) +\alpha_1\varepsilon_t^s +\alpha_2\varepsilon_t^d +\alpha_3\varepsilon_t^e+\varepsilon_t^m \quad (4)$$

$$\Pi_t^p= E_{t-1}(\pi_t^p)+ \beta_1\varepsilon_t^s+ \beta_2\varepsilon_t^d + \beta_3\varepsilon_t^e+ \beta_4\varepsilon_t^m+\varepsilon_t^p \quad (5)$$

$$\Pi_t^c= E_{t-1}(\pi_t^c)+ \Upsilon_1\varepsilon_t^s+ \Upsilon_2\varepsilon_t^d + \Upsilon_3\varepsilon_t^e+ \Upsilon_4\varepsilon_t^m+\Upsilon_5\varepsilon_t^p+ \varepsilon_t^c \quad (6)$$

$$r_t= E_{t-1}(r_t)+ c_1\varepsilon_t^s+ c_2\varepsilon_t^d + c_3\varepsilon_t^e+ c_4\varepsilon_t^m+c_5\varepsilon_t^p+ c_6\varepsilon_t^c+ \varepsilon_t^{mp} \quad (7)$$

$$\Delta m_t= E_{t-1}(\Delta m_t)+ d_1\varepsilon_t^s+ d_2\varepsilon_t^d + d_3\varepsilon_t^e+ d_4\varepsilon_t^m+d_5\varepsilon_t^p+ d_6\varepsilon_t^c+d_7\varepsilon_t^{mp}+ \varepsilon_t^{md} \quad (8)$$

Where Π_t^m, Π_t^p, and Π_t^c are import price, producer price and consumer price inflation respectively and ε_t^m, ε_t^p, ε_t^c are import price, producer price and consumer price shock respectively. ε_t^{mp} is the monetary policy shocks and ε_t^{md} is the money demand shock. $E_{t-1}(.)$ is the expectation of the variable based on the information set available at end of period t-1.

The variables used for the study spans from the first quarter of 2000 to the second quarter of 2011. Oil prices are obtained from the Bangladesh Bank and are the quarterly average of IPE Brent Oil in US dollars per barrel. The output gap is calculated as the deviation of the log of real gross domestic product from a quadratic trend. The nominal effective exchange rate is calculated as follows:

$$NEER_t = \sum_{i=1}^{10} w_{it}E_{it}$$

Where, $NEER_t$ is the quarterly nominal effective exchange rate at time t.

W_{it} is the quarterly weight of trading partners i in total trade at time t. The weight of the first ten trading partner which have the highest share in total trade is taken for the calculation of the nominal effective exchange rate.

The ten trading partners on average account for 70 per cent of total trade of Bangladesh.

E_{it} is the end of quarter exchange rate of trading partner i at time t.

The weights of trading partners are calculated using the following formula:

$$W_{it}=\frac{(M_{it+X_{it}})}{\sum_{i=1}^{n}(X_{it}+M_{it})} \qquad \sum_{i=1}^{n} w_{it} = 1$$

Where M_{it} is the quarterly import of the Bangladesh from country i at time t,X_{it} is the quarterly export of Bangladesh to country i at time t, $\Sigma_i^n{}_{=1}(X_{it} +M_{it})$ is quarterly total export plus imports from all trading partners at time t.

4. Expected Results

From the work of Bhundia (2002), Faruqee (2006) and Sek and Kapsalyamova (2008) among others, it can be expected that first exchange rate pass through to import prices is higher compared to exchange rate pass through to producer and consumer prices and second exchange rate pass through to producer prices is higher compared to exchange rate pass through to consumer prices. Thus the effect of an exchange rate shock declines along the distribution chain. Studies carried out by Bhundia (2002), Garcia and Restrepo (2001) and Rowland (2003) in developing countries indicate low exchange rate pass through in domestic prices. Although exchange rate pass through is different across countries but the main similarity is that exchange rate pass through to consumer prices

is the lowest compared to exchange rate pass through in producer and import prices. Such evidence has also been found in emerging countries like Brazil where Belaisch (2003) results indicate that exchange rate pass through to consumer price is 17 per cent after a year while around 100 per cent for wholesale prices.
The effect of external shocks in explaining consumer prices varies across countries where for the case of industrialized countries, McCarthy (2006) notes that external factors explain a fairly small proportion of the variance of domestic consumer prices while Bhundia (2002) shows that shocks to producer prices tend to have a considerable impact on consumer prices for the case of South Africa. In four of the East Asian economies selected by Sek and Kapsalyamova (2008), it was observed that import price shocks have a stronger effect than exchange rate shocks in determining domestic prices.

5. Empirical Results and Discussion

We first test the hypothesis that a time series contains a unit root and thus follows a random walk process. The implication of this test is to determine whether the VAR model should be estimated in the level or first difference form. To test for unit roots, we use augmented Dicky-Fuller (ADF) test. The unit root tests indicate that all variables are stationary except the short term interest rate variable which is in our case t-bills yield is found to be integrated of order one. Given the autoregressive nature of the model, the lag order is determined using the maximum likelihood ratio and also such that there is no autocorrelation among residuals. The likelihood ratio results indicate the inclusion of 3 lags. To determine whether there is a cointegrating relationship among the variables the Johansen (1995) test is applied. Although evidence of cointegration for rank 3 is found, it is ignored as no long run relationship among the variables is studied.
The diagnostic tests on the structural VAR indicate no autocorrelations among residuals, residuals are normally distributed and the model is stable as the characteristic roots have a modulus less than one and all eigen values lie inside the unit circle. The granger causality test undertaken to examine the existence of causality from exchange rates to imports and domestic prices and vice versa and also from imports prices to domestic prices and vice versa indicates that there is bidirectional causality in one case where producer prices granger cause nominal effective exchange rate and vice versa while it is found none of the variables; nominal effective exchange rate, import and producer prices granger cause consumer prices. An exchange rate shock at time zero of 9.48 per cent (calculated from the change in exchange rate equation) leads to a fall in the nominal effective exchange rate, indicating an appreciation of the exchange rate. It is thus expected that the negative exchange rate shock will lead to a fall in import, producer and consumer price inflation.
An exchange rate shock leads to a fall (as expected) in import prices, although the impact on import prices in not immediately felt. At time zero the effect of the exchange rate shock on import price is 0.71 per cent, in three quarters it is -0.25 per cent and the cumulative effect increases further to -0.34 per cent in six quarters and by the end of the 12 quarters, the exchange rate shock leads to a decrease in import price of -1.10 per cent. The exchange rate shock has the expected impact on producer prices where the instant impact leads to a fall in producer prices of -0.17 per cent and increases to -0.32 per cent and -0.87 per cent by the end of three and six quarters respectively. The cumulative impact increases to -1.52 per cent by the nine quarters while over the 12 quarters the effect of the exchange rate shock increases to -1.39 per cent. The exchange rate shock has a negative impact on consumer prices where at time zero consumer prices fall by -0.55 per cent and maintain its downward trend. In the case of consumer prices the effect of an exchange rate shock is much higher compared to import and producer prices where by six quarters consumer prices have fallen by -1.27 per cent and over three years the cumulative impact on consumer prices is -2.36 per cent. Exchange rate pass through is incomplete in the three price indices. However, the behaviour of the indices differs. In the case of import prices, the initial pass through elasticity is negative, implying that there is no immediate impact of an exchange rate change on import prices. Over 3 quarters, the pass through increases to around 1.92 per cent and to 3.12 per cent in 6 quarters following the initial exchange rate shock. By the end of 12 quarters the exchange rate pass through to import prices is 11.83 per cent. Thus in the short term (3 quarters) exchange rate pass through is low, while in the long term (over 3 years) exchange rate pass through increases slightly. It can be observed that exchange rate shocks have little impact on import prices both in the short and long term.
To better understand the reasons behind the low exchange rate pass through to import prices, it is important to know the sources of Bangladeshi import. Bangladeshi imports are from three main countries namely; the European Union, India and China and these countries accounts respectively for 23.24 per cent, 23.43 per cent and 22.57per cent of the total imported goods for the year 2009. Another important aspect is that the major imports in 2009 were machinery and transport equipment, food and live animals, manufactured goods classified chiefly by material and mineral fuels, lubricants and related products. Most of the imported machinery and transport equipment are from the European Union, China and Japan. A large proportion of imported food and live animals are from Europe and Australia. The sources of main imports are India and China where price is expected to be low given the cheap labour available in these countries. In addition, low quality products are imported from China and this further explains the low import prices.

Exchange rate pass- through to producer prices is positive at time zero and increases to 4.10 per cent over 3 quarters following the initial exchange rate shock and over 9 quarters exchange rate pass through to producer prices amounts to 16.37 per cent, which is the highest pass through over three years. Over 12 quarters exchange rate pass through to producer prices fall slightly to reach 15.17 per cent. Exchange rate shocks have an important impact on producer prices where in the short term exchange rate pass through is 4.10 per cent while in the longer term the pass through is 15.13 per cent. The exchange rate pass through to producer prices is explained by the fact that imports consist of machinery and transport equipment, manufactured goods classified chiefly by materials and mineral fuels, lubricants and related products which are mainly used for production by domestic manufacturing firms. Thus exchange rate changes are likely to have an impact on the price of these imported goods which leads to an increase in the producer price. Exchange rate pass through to consumer prices is considerably higher compared to the other two price indices. An exchange rate change at time zero leads to an increase in consumer prices by 5.66 per cent. Pass through in the 3 and 6 quarters after the initial shock is 9.68 per cent and 13.48 per cent respectively. The pass through effect to consumer prices is 25.17 per cent after three years. Consumer prices are thus more impacted by exchange rate shocks where the short term exchange rate pass through is 9.3 per cent and 24.27er cent in the long term. Therefore, exchange rate shocks have the largest impact on consumer prices followed by producer prices and the lowest impact is felt on import prices.

Changes in exchange rate are found to have the largest impact on consumer prices. The fact that Bangladesh of the food products, exchange rate changes have important implications on the price of foodstuffs. A higher exchange rate pass through to consumer prices can equally be explained by the change is exchange rate regime from managed float to a flexible system where the Central Bank intervenes in the market only to smooth out fluctuations rather than to maintain the value of the rupee against other currencies within a range. Thus exchange rate changes have an impact on consumer prices. Bangladesh source scarce economy, consumer goods are imported and thus despite rising prices, local consumers will still buy imported consumer goods which are not produced domestically. Thus, an exchange rate depreciation which increases import prices will cause importers to pass the high import prices to consumers in the form of higher prices.

6. Conclusion

This study inspects the degree and scope of exchange rate pass through to import and domestic prices and also the effect of outside shocks such as oil price shocks and import price shocks on domestic prices. So as to understand which shock better explains the variance in import and domestic prices, the forecast error variance decomposition of each price index have equally been studied. Another investigation carried out in this study is on the existence and degree of causality from exchange rate to domestic and import prices and vice versa. Using a structural VAR model that incorporates a distribution chain, the results from granger causality test indicate that bidirectional causality exist is one case where producer price granger causes nominal effective exchange rate and vice versa while in other cases unidirectional causality is found. It is equally found that nominal effective exchange rate, import and producer prices do not granger cause consumer prices.

The desire response functions of the structural VAR are used to compute exchange rate pass through flexibility and the results indicate that exchange rate pass through to consumer prices is highest and not complete. The second larger impact of an exchange rate shock is felt on producer prices and the smallest on import prices. Therefore pass through increases as one goes along the distribution chain. The findings especially for the case of consumer and import prices are not in line with other studies. But this can be explained by the fact that main sources of imports being China and Pakistan, lower import prices can be expected given the cheap labour and the low quality products from China. Moreover, the pricing to market practice can explain the low pass through to import prices. As far as consumer prices are concerned the reason behind the high pass through is the dependence of households' consumption on imported consumer goods where most of them are not subsidized. The increasing cost of living in Bangladesh and the change in the exchange rate regime can also explain the high pass through in consumer prices.

Externals shocks equally have an effect on import and domestic prices. The results suggest that oil price shocks have a larger impact on import prices compared to producer and consumer prices while import price shocks have a larger influence on producer prices. The examination of external shocks in explaining the variance in the price indices pointed out that the variance of import and producer prices are explained mainly by oil price shock while for the case of consumer prices, import prices explain most of its variance. External shocks thus play an important role in the Bangladeshi economy where by prices are exposed to external shocks. The study can be useful for policy makers such as Central Bank, in controlling the price level in Bangladesh. The indication that exchange rate pass through to consumer prices is highest but still incomplete implies that domestic policies such as monetary policy have a significant role in controlling consumer price inflation. Given that import price shocks have an important impact on producer prices, managing inflation at the level of imports could be effective to reduce producer price inflation. Exploring the relative importance of these factors in determining the pass-through to CPI (or to certain components of CPI) would be an interesting topic for future research. Moreover, the

variance of consumer prices is explained mainly by import prices. Thus, managing inflation at import level and the monitoring of pricing technique by importers can contribute in reducing consumer price inflation.

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