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Conducting Monetary Policy in South Asian Economies: An Investigation

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Monetary policy which until recently aimed at targeting monetary aggregates has quietly given way to adjusting interest rates. Most of the Central Banks now focus on money reaction function that directly targets inflation or price level. This paper examines the way monetary policy is being conducted in the four major South Asian economies, namely, Bangladesh, India, Pakistan and Sri Lanka. The analysis is based on a variant of the Taylor rule framework. Using quarterly data over the period 1990Q1 to 2012Q4, the study finds that the monetary authorities in India, Pakistan and Sri Lanka have accommodated some degree of inflationary pressure, whereas Bangladesh has continuously smoothened interest rate while setting its monetary policy. Besides pursuing a mild monetary policy stance against inflation, India, Pakistan and Sri Lanka are also giving importance to foreign interest rate and real exchange rate movements to justify their relevance in monetary policy setting. However, the same has not been found to be true for Bangladesh.

JEL Classification: E52, E58, E60
Keywords: Monetary Policy Rule, Central Banks, SAARC Countries

1. INTRODUCTION

It is now well established in the literature that the ultimate goal of monetary policy is to maximise social welfare by maintaining low inflation rates and a stable output gap [Blanchard (2006) and Ahmed and Malik (2011)]. Besides pursuing price stability and economic growth objectives, the monetary authority has to ensure stability of exchange rate and management of foreign exchange reserves in an effective manner to circumvent fiscal distractions.[1] Notwithstanding the clarity of these objectives, the entire effort of conducting an effective monetary policy is delicately poised as has been highlighted by Kydland and Prescott (1977). According to them, a purely discretionary policy setting leads to higher long run inflation—a clear evidence of time inconsistency problem

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[1]For example, "maintaining price stability while supporting the highest sustainable growth" is the stated objective of monetary policy pursued by the Bangladesh Bank [Bangladesh Bank (2006, p.1)]. The State Bank of Pakistan outlines its objective as "(to) regulate the monetary and credit system in Pakistan and to foster its growth in the best national interest with a view to securing monetary stability and fuller utilization of the country's productive resources" [Anwar (2012), pp. 2-3]. Similarly, the Reserve Bank of India also sets the objective of monetary policy as "maintain price stability and ensuring adequate flow of credit to the productive sector of the economy" [Bicchal (2011), p. 230].

[Mohanty and Klau (2004)]. In such a situation rule-based policy is advocated as an alternative strategy to avoid high inflation on the one hand and to lower variations in inflation and output gaps on the other [Islam and Uddin (2011)]. According to Wimanda, *et al.* (2012), such a policy also allows to assess the past behaviour of monetary policy, recommend current policy actions, and predict the future direction of monetary policy. In case of rule-based monetary policy, the Central Bank plays an active role to offset adverse shocks and stabilise the economy.

Following the seminal contribution of Taylor (1993), a large body of empirical literature concerning the optimal monetary policy has focused on the Taylor-type monetary policy rule using a variety of specifications. In simple terms, the monetary policy rule requires the Central Bank to adjust its short term nominal interest rate in response to changes in inflation rate and output gap [Molodtsova, *et al.* (2008)]. The Taylor rule predicts that Central Banks raise interest rate when inflation forecast exceeds its target level and when output gap is positive and vice versa [Bunzel and Enders (2010)]. These changes in the interest rate are expected to destabilise the financial markets through adverse impacts on consumption, domestic and foreign direct investments, exchange rates and foreign exchange reserves.

Going beyond the Taylor rule, the Central Banks also experiment with additional nominal targets assuming that they also influence inflation and output, either directly or indirectly [Jha (2006)]. For instance, the exchange rate target fixes the inflation rate for internationally traded goods and thus directly helps in controlling inflation. However, the main drawback is that this approach leads to a loss of independent monetary policy stance [Obsfeld and Rogoff (1996)]. On the other hand, while monetary targeting enables Central Banks to adjust their monetary policy to cope inflation with the domestic considerations, its effectiveness depends on uncertainties, lag structure and the stability of money demand function which usually remains unstable due to instability of velocity of money [Jha and Rath (2003); Islam and Uddin (2011)].[2] Finally, inflation targeting enables monetary authorities to directly respond to the shocks to the domestic economy. Inflation targeting is, therefore, more flexible strategy as short term deviations of inflation from its target level are acceptable and they do not necessarily translate into loss in credibility either. The inflation targeting is believed to improve accountability, Central Bank's credibility, and enhance transparency.

The empirical verification of monetary policy rule has been a favourite topic among researchers [see for example, Clarida, *et al.* (2000); Taylor (1993); Judd and Rudebusch (1998), among others]. For developing countries, particularly for the South Asian Association for Regional Cooperation (SAARC) countries, the empirical literature is relatively scarce. The reason could be that these economies have switched over to fully flexible exchange rate system only recently after a prolonged use of fixed/managed

[2]The presence of interest rate instrument primarily reflects velocity uncertainty—a major concern in many transition economies when money demand functions are unstable during a period of structural change and transformation of the economies. It can be argued that if velocity shocks are big, then the interest rate is a more suited instrument. However, if there is too much uncertainty in measuring the real interest rate owning to big shocks to investment or net exports, then monetary aggregate is the preferred instrument [Ghatak and Moore (2011)]. For example, a big fall in exports may lead to large depreciation in exchange rate and could necessitate a large rise in interest rate. Therefore, in the presence of interest rate volatility it is very difficult to measure equilibrium real interest rate. Hence, under interest rate rule uncertainty about the equilibrium real interest rate can translate in to policy errors [Ghatak and Moore (2011)].

floating exchange rate regimes [Yazgan and Yilmazkuday (2007)]. However, once these economies opted for the flexible exchange rate system, the only sound monetary policy option available to them for inflation targeting was the monetary policy rule [Taylor (1993, 2000)].[3] As a result, one finds adherence to inflation targeting regime along with the monetary policy rule.

Against this backdrop, the present paper is an attempt to assess the role of the Central Banks in conducting monetary policy by estimating a variant of the Taylor rule for four major SAARC countries, that is, Bangladesh, India, Pakistan and Sri Lanka using quarterly data over the period 1990Q1 to 2012Q4. The region has been selected for the simple reason that like many other developing countries, the South Asian economies have also introduced far-reaching financial sector reforms since 1990 onwards. We believe that the analysis of monetary policy has attained new importance after these reforms as the dependence of 'local' Central Banks on 'leading' Central Banks of the world has greatly increased. The evidence also suggests that due to external constraints, especially emanating from integration of international financial markets, the Central Banks of developing countries need to stabilise exchange rate movements in addition to inflation and output gap [Aleem and Lahiani (2011)]. In this scenario, a simple Taylor-type rule may not fully explain the optimal monetary policy because it not only ignores the dynamic feedback process but also assumes away policymakers' ability to react to the more fundamental causes behind the output gap and inflation [Choi and Wen (2010)]. It is argued that a model specification different from that of the developed economies may be needed to analyse the monetary policy response in the South Asian region.

The rest of the paper is organised as follows: Section 2 specifies a variant of the Taylor rule. Data and methodology are discussed in Section 3. Section 4 discusses empirical findings, while concluding remarks along with policy implications are given in final section.

2. SPECIFICATION OF MONETARY POLICY RULE

Incorporating recent theoretical developments, especially those related to propagation mechanism, we setup an augmented monetary policy reaction function. It incorporates foreign interest rate and real exchange rate movements in addition to inflation and output gap in the model specification. We start with the simple monetary policy reaction function, similar to one suggested by Taylor (1993). It assumes that the Central Bank set the target of short term nominal interest rate (i_t^*) during each period. In the baseline model, this target rate is assumed to depend on the inflation rate and real output gap. It is also assumed that short term nominal interest rate is the main operating policy instrument and the inflation rate and real output are the policy goals based on the implicit assumption that the Central Bank retains autonomy to conduct monetary policy. Following Taylor (1993), the baseline monetary policy reaction function can be written as follows:

$$i_t^* = \bar{i} + \beta(\pi_t - \pi_t^*) + \gamma y_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

[3]According to the IMF behavioural classification as of April 2011, information related to de jure exchange rate regime in the South Asia include: Bangladesh (Soft peg-crawl arrangements), India (floating), Pakistan (soft peg-stabilized arrangements), and Sri Lanka (soft peg-crawl arrangements). For further details [see Cavoli and Rajan (2013), p. 2; Rajan (2012), p. 55].

where $\bar{i}$ is the long run equilibrium nominal interest rate, π_t is the actual inflation rate, π^* is the target rate of inflation and y_t is the real output gap or percentage deviation of aggregate real output (y_t^d) from potential output (y_t^p) at time *t*. The parameters β and γ measure the sensitivity of interest rate to variations in inflation and the real output gap respectively.

This rule indicates that when actual inflation exceeds the target rate of inflation, the Central Bank would try to calm the future inflation down by raising the target interest rate until inflation returns to the target level.[4] For stability of this rule the reaction coefficient on inflation (β) has to be above unity. Then the aggregate demand function is negatively sloped with respect to the inflation rate. The coefficient of output gap (γ) in the reaction function depends on the slope of the aggregate supply curve and weight attached to the variability of output in the loss function [Mohanty and Klau (2004)].[5] The basic intuition of equation (1) is that the interest rate rule characterised by $\beta > 1$ implies aggressive responses of the monetary authorities to combat inflationary pressures. On the other hand, if $0 < \beta < 1$, the Central Bank raises the target interest rate if the increment is not enough to keep the real interest rate from falling. This policy rule accommodates inflationary shocks in which more attention is paid to the short term trade-off between inflation and real output gap. A similar logic can be applied to the output gap coefficient, that is, an aggressive response to the output gap is implied if $\gamma > 0$ and an accommodative response will be there otherwise. Since the target rate of inflation is assumed to be constant, denoting the equilibrium level of the real interest rate as $\bar{r}$ leads to $\bar{i} = \bar{r} + \pi^*$.[6] The underlying assumption is that the Central Bank may not adjust the interest rate to the target level instantaneously because a sudden policy reversal may undermine the market confidence. It usually takes some time to change the policy rate [Umezaki (2007)]. Therefore, we consider that actual observed interest rate (i_t) is partially adjusted to its target rate (i^*) as follows:[7]

$$i_t = (1-\rho) i_t^* + \rho i_{t-1} + v_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

[4]Similarly, when output is above its target level the Central Banks also raise interest rate till the rate of inflation is no longer above target.

[5]For example, a flat aggregate supply curve implies that a policy shock to reduce inflation will significantly increase output variability, suggesting relatively small coefficient [Mohanty and Klau (2004)].

[6]It assumed that equilibrium real interest rate ($\bar{r}$) is stationary and is determined by the non-monetary factors in the long run. Equilibrium real interest rate is also assumed to be constant and independent of monetary policy in the short run. Equilibrium real interest rate is the average real interest rate over the observed period, excluding the financial crisis period. In the original version, the intercept of the Taylor rule represents the sum of the equilibrium real interest rate and the inflation target and takes the value of 4, the inflation gap has the value 1.5, while the reaction coefficient on the output gap has the value of 0.5 [Pinkwart (2013); Osterholm (2005)].

[7]Lagged interest rate is introduced to capture inertia in optimal monetary policy [Hutchison, *et al.* (2010)]. One reason of partial adjustment could be high uncertainty about the model parameters and, therefore, the policymakers have to act upon partial information. Another reason could be that if markets have limited capacity to hedge against interest rate risk, sudden and large changes in interest rate could expose market participants to capital losses which might raise systemic financial risks. The other reasons could be avoiding reputation risks to the Central Banks from sudden reversals of interest rate directions [see Mohanty and Klau (2004); Goodhart (1999)]. Pinkwart (2013) noted that the inclusion of the lagged policy rate on the right hand side is often found to improve the fit to the data.

The partial adjustment parameter ρ lies in the interval [0;1] and v_t is independently and identically distributed (*iid*) random shock to the policy rate [Pinkwart (2013)]. The magnitude of the parameter ρ measures the degree of interest rate smoothing behaviour by modern Central Banks [Wimanda, *et al.* (2012); Pinkwart (2013)].[8] Equation (2) implies that the Central Bank adjusts its policy rate by a fraction (1–ρ) of its current target level. The gap between the current interest rate and the current target level can be represented by some linear combination of the one period lagged realised actual interest rate and its current target level. Combining Equation (1) and Equation (2) yields the following dynamic version of the monetary policy reaction function.

$$i_t = (1-\rho)\bar{i} + (1-\rho)\beta(\pi_t - \pi_t^*) + (1-\rho)\gamma y_t + \rho i_{t-1} + v_t \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Equation (3) can be written as:

$$i_t = (1-\rho)\alpha + (1-\rho)\beta\pi_t + (1-\rho)\gamma y_t + \rho i_{t-1} + v_t \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

Where $\alpha \cong \bar{r} - \beta\pi^*$, and $\bar{r}$ equilibrium real interest rate, i_t is the short run nominal interest rate which is used as monetary policy instrument Equation (4) implies that the interest rate (i_t) depends on the inflation rate and the output gap and plus its own lags. The target rate of inflation can be expressed as follows:

$$\pi^* = \frac{\bar{r} - \alpha}{\beta - 1} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4a)$$

The value of β indicates the Central Bank's stance against inflation. Equation (4) describes the interest rate setting behaviour of the monetary authority in the developed countries. However, it is inappropriate to assume that the monetary policy is largely determined by the domestic factors only. According to Ahmed and Malik (2011) and Aleem and Lahaini (2011) the simple Taylor rule is not enough to explain interest rate setting behaviour of the monetary authority. In fact, as indicated, the interest rate setting behaviour of the Central Banks in developing countries is heavily influenced by the monetary policy stance of the major Central Banks of the world due to greater integration of financial markets and high degree of capital mobility [Umezaki (2007)]. Frankel (1992) argued that many barriers to the international capital movement across countries have been dismantled following the deregulation of the domestic financial markets. South Asian countries have taken a number of measures to liberalise their financial system in the early 1990s. These liberalisation measures are expected to enhance the efficiency of domestic financial markets and to make it international competitive. Moosa and Bhatti (1997) argued that financial integration greatly affects the behaviour of exchange rate and interest rate across countries, which in turn have crucial implications for the domestic monetary authority to pursue independent monetary policy. They argued that the more integrated financial markets the limited will be the scope for pursuing independent monetary policy. Khan and Sajid (2007) found that SAARC interest rates are cointegrated with the United States interest rates in the long-run. However, they found

[8]Rudebusch (2002) notes that interest rate smoothing could be due to existence of persistent shocks in the economy or due to unobserved variables which are incorrectly omitted from the monetary policy reaction function.

low degree of financial market integration across countries within the SAARC region. In the wake of financial sector liberalisation, Chow, *et al*. (2014) acknowledged the role of foreign interest rates in domestic monetary policy setting. They argued that under free capital mobility domestic interest rates are determined by foreign interest rates. We believe that the Central Banks in the South Asian region give high priority to exchange rate stabilisation in addition to price stability.[9] The possibility of default risks increases manifold when exchange rate determination is left on the market forces. This is true because foreign trade in these countries is 'generally' invoiced in such currencies as the US dollar, the British Pound, and the Euro, therefore, abrupt fluctuations in real exchange rates hurt the confidence of exporters and importers, which in turn accelerates the inflationary pressure. The pass-through effect of exchange rate on inflation through import prices is the fastest channel from monetary policy to inflation. Since, SAARC countries are heavily dependent on international trade and domestic consumption has high import content and these economies are susceptible to imported inflation. It appears from the literature that in the process of inflation targeting, management of exchange rate play fundamental role in monetary policy framework, therefore its role cannot be ignored [Chow, *et al.* (2014)]. The Central Banks may also respond to real exchange rate movements because exchange rate shocks affect their ability in achieving inflation target. Minimising exchange rate volatility enhances credibility of the Central Banks and affects inflationary expectations [Chami, *et al.* (2007)]. Shrestha and Semmler (2015) and Chow, *et al.* (2014) noted that emerging market economies seem to suffer from fear of floating in case of exchange rate appreciation and fear of loss in case of decline in foreign exchange reserves due to lack of credibility of the monetary authority. Therefore, emerging market countries have adopting a Taylor rule.[10] Ball (1999) finds that inclusion of exchange rate in the monetary policy reaction function could improve macroeconomic

[9]This could be due to the fact that when exchange rate pass-through into domestic price is high then monetary authorities give special importance to exchange rate management through capital controls (intervention), debt swaps and other exchange rate linked instruments to stabilize exchange rate expectations. Ball (1999) points out that if adverse exchange rate shocks cause sudden withdrawal of foreign investment from the country, then increase in the interest rate may be an appropriate response to stabilize inflation and output. Furthermore, exchange rate depreciation will increases external demand and prices, a tight monetary policy will reduce domestic demand and stabilize inflation [Mohanty and Klau (2004)]. In case of emerging economies, exchange rate shocks tend to be large and persistent which creates risk of overshooting the inflation target and losses credibility of the Central Banks. Therefore, defending the domestic currency requires raising the interest rate which causes large output losses. On the other hand, to overcome the negative effects of exchange rate depreciation, many countries try to minimize exchange rate movements. In this situation, monetary policy is constraint and plays an accommodating role to achieve exchange rate stability. The main reason of negative effect could be due to the "origin sin hypothesis" which suggests that exchange rate depreciation are costly in countries where economic agents are unable to borrow long-term domestically and cannot borrow abroad in domestic currency and are forced to borrow in terms of foreign currency. In this case, currency exposures restrict the ability of monetary policy to accommodate negative terms-of-trade shocks through nominal depreciation and thus derive up interest rate [Baqueiro, *et al.* (2001)].

[10]Under the flexible exchange rate regime, monetary policy is independent of exchange rate policy because interest rate could set to achieve price stability, while at the same time nominal exchange rate could adjust to attain equilibrium in the external account. However, for small open economy like Pakistan which faces difficulties in letting the nominal exchange rate to adjust freely, an independent monetary policy may not be a feasible option. In this context, Calvo and Reinhart (2002) proposed the "fear of floating" and Eichengreen and Hausmann (1999) developed the "original sin" hypotheses. They argued that the advantages of a pure float are not attainable in emerging economies due to lack of institutional credibility. Therefore, these countries should adopt "hard peg" to solve the problem of credibility.

performance of monetary policy rule. He further argues that in pure inflation targeting regime ignoring the role of exchange rate is dangerous for open economy because it captures large fluctuations in inflation rate and real output.

In the light of the above, we redefine the monetary policy reaction function for the SAARC Countries which simultaneously incorporates both foreign interest rates (i^f) and real exchange rate movements (Δq_t) as follows:

$$i_t = (1-\rho)\alpha + (1-\rho)\beta\pi_t + (1-\rho)\gamma y_t + (1-\rho)\delta i_t^f + (1-\rho)\eta\Delta q_t + \rho\, i_{t-1} + v_t \quad \ldots \quad (5)$$

The real exchange rate movement is defined following the short-run variant of purchasing power parity (PPP) condition:

$$\Delta q_t = \Delta e_t + \pi_t^f + \pi_t^d \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5a)$$

Where e_t is the logarithmic value of nominal exchange rate and π^f and π^d represent foreign and domestic inflation, respectively. Using customary notation of Δ for first difference operator, an increase in Δq_t indicates depreciation of domestic currency. The Central Bank increases policy rate in response to a rise in the foreign interest rate if $\delta > 0$ and is assumed to cut down the policy rate in response to an appreciation of real exchange rate according to the Uncovered Interest rate Parity (UIP) condition. Furthermore, the Central Bank stabilises real exchange rate if $\eta > 0$.

With necessary substitutions in the monetary policy function (Equation 5) and inclusion of levels dummy (D_{08}) which takes the value one for 2007Q4 to 2008Q4 and zero otherwise to account for the effect of global financial crisis of 2007-08 on the monetary policy, Equation (5) can be rewritten as:

$$i_t = c_0 + c_1\pi_t + c_2 y_t + c_3 i_t^f + c_4\Delta q_t + c_5\, i_{t-1} + c_6 D_{08} + v_t \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

Where c_5 measures short-run effects and $c_i/(1- c_5)$ measures the long-run response of the Central Banks. The coefficients of inflation (c_1), output gap (c_2), and foreign interest rate (c_3) are expected to be positive, while the coefficient of lagged policy rate (c_5) is expected to take positive value and vary between zero and one because it would take more than one period for the actual policy rate to adjust to its desired level. The sign of c_4 is ambiguous because Central Banks may raise the policy rate in response to depreciation of the real exchange rate and lower the policy rate in response to appreciation of the real exchange rate [Hsing (2009)]. The policy rule given in Equation (6) differs from the standard Taylor rule because it incorporates variables including the real exchange rate movement and foreign interest rate besides the inflation rate and output gap.

We contend that the inclusion of foreign interest rate and real exchange rate in the policy reaction function will allow us to determine the degree of the monetary policy autonomy. If domestic factors remain significant even after the inclusion of foreign factors it would suggest that the Central Banks retain their autonomy in the conduct of monetary policy. If the foreign factors are insignificant, the Central Banks conducts its monetary policy based only on the domestic factors without any regard for foreign factors. If both domestic and foreign factors are significant in the monetary policy reaction function, then autonomous monetary policy based on domestic factors is not compatible, unless exchange rate depreciation and foreign interest rate are not taken into

account. In this case a hybrid monetary policy reaction function could be useful to pursue sustainability of the domestic currency together with price stability and output growth.[11]

3. DATA AND METHODOLOGY

3.1. The Data

Quarterly data for Bangladesh, India, Pakistan and Sri Lanka over the period 1990Q1 to 2012Q4 has been used for empirical analysis.[12] Even though the standard practice is to use of discount rate as monetary policy instrument but due to changed monetary policy stance over the years in the SAARC region, alternative proxies have been used in the present study. The justification is as follows.[13] There has been a shift from direct to indirect instruments of monetary policy in the region. Before 1990, SAARC countries have used cash-reserve ratio (CRR), directed credit programmes and statutory liquidity ratio (SLR) as instruments of monetary policy. However, after 1990 many countries in the region have started to float several interest rates in the financial markets and there is no consensus on the best measure of the monetary policy stance among these various interest rates. Given this lack of uniformity, we have used the 6-month Treasury bill rate as proxy for monetary policy stance for Pakistan and Sri Lanka.[14] It is considered as benchmark rate in the money market because majority of the Treasury bills have a maturity of 6-months. The same has not been used for Bangladesh and India due to non-availability of data on 6-month Treasury bill rate. Instead the deposit rate has been used for Bangladesh and the overnight call money rate is used as proxy of monetary policy instrument for India. Finally, the quarterly values of US Federal Funds rate are taken as proxy of foreign interest rate. The four-quarter inflation rate (π_t) is calculated as:

$$\pi_t = [\log(p_t) - \log(p_{t-4})] \times 100$$

Where p_t is consumer price index (CPI with 2000=100 as base year). Since quarterly data on real GDP were not available for all countries, we followed Goldstein and Khan (1976) methodology to construct these data. We have used the Hodrick-Prescott (HP) filter for the real GDP data to obtain potential output (y_t^p) which was then used to construct the output gap (y_t).[15] Real exchange rate (q_t) has been calculated as logarithmic values of bilateral nominal exchange rates plus logarithms of foreign prices minus logarithms of domestic price level for each country. Increase in q_t means depreciation. The US consumer price index (CPI with base year 2000=100) is taken as proxy of foreign price

[11]Clarida, *et al.* (1997, p. 21) argued that in such situation the monetary policy rate determined by the weighted average of the domestic and foreign factors.

[12]For Bangladesh data are available only from 1993Q3 to 2012Q4.

[13]Two reasons for using market interest rate as the dependent variable. First, the standard regression analysis requires a continuous variable, but the policy rate (discount rate) changes in discretionary steps. Secondly, policy rate is not always the appropriate variable to correctly signal the stance of the monetary policy [Pinkwart (2013)].

[14]For India some observations on Call Money rate are missing that were replaced by the values of discount rate because of insignificant difference between the two.

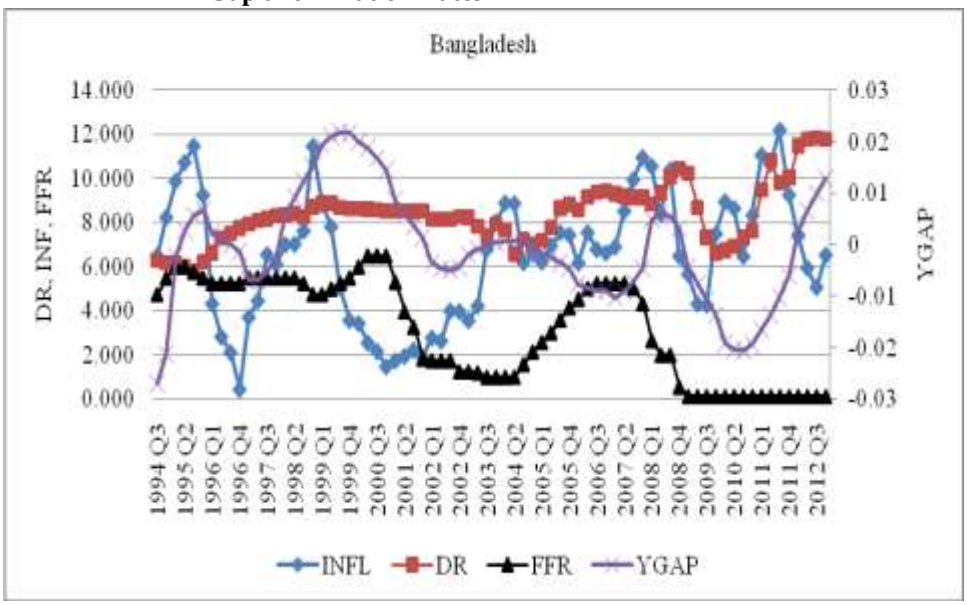
[15]One important characteristics of HP filter is that it is two sided and uses future information to compute the potential output.

level.[16] The real exchange rate depreciation is calculated as $\Delta q_t = (q_t = q_{t-4})$. All data series have been retrieved from the International Monetary Fund's international Financial Statistics (IFS) CD-ROM-2013.

3.2. Data Analysis

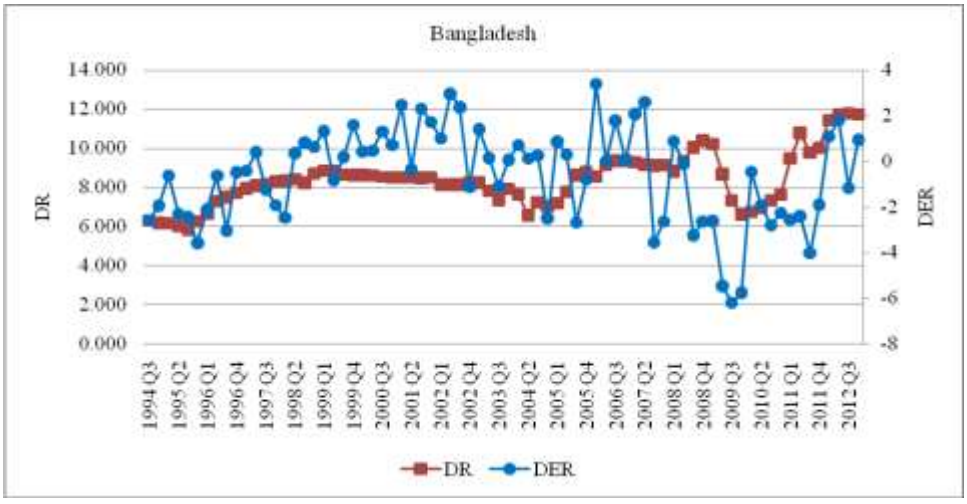
To understand the pattern of quarterly domestic interest rates, output gap, foreign interest rate and inflation rates in SAARC region, we plot data of each country in Figures 1. We observe that SAARC interest rates are volatile with respect to Federal Funds rate except for Bangladesh. This shows that financial markets in the SAARC region are dependent on the FED's monetary policy, particularly after 2000. An evidence of pro-cyclical co-movements between output gap and inflation rate is observed for all countries, which confirms that inflation increases with positive output gap. This could be due to demand pressure. Furthermore, output gap also remains negative during recession.[17] Except for Bangladesh, inflation seems to be positive with respect to policy interest rate for other countries. After 2004 Pakistan and Sri Lanka appeared to have adopted contractionary monetary policy measures, whereas India adopted contractionary monetary measures between 2006 and 2008. However, Indian and Bangladesh interest rate show a declining trend in post-2008 period.

Fig. 1. Trends of Domestic and Foreign Interest Rates, Output Gap and Inflation Rates



[16]A bilateral nominal exchange rate is the spot exchange rates of each country with respect to US dollar.

[17]According to the Taylor rule, monetary policy does not responds directly to inflation, and it also responds to the output gap which can be viewed as a measure of inflationary pressures. If actual real output falls below its natural level, the output gap is positive and the real interest rate falls, whereas if real output rises above its natural level, the output gap is negative and the real interest rate rises accordingly [Mankiw and Scarth (2008)].


Bangladesh
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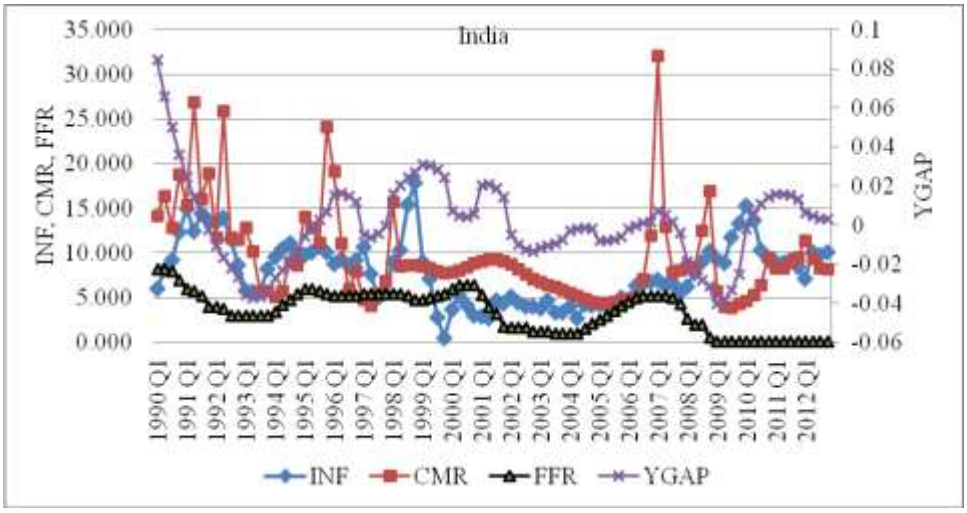
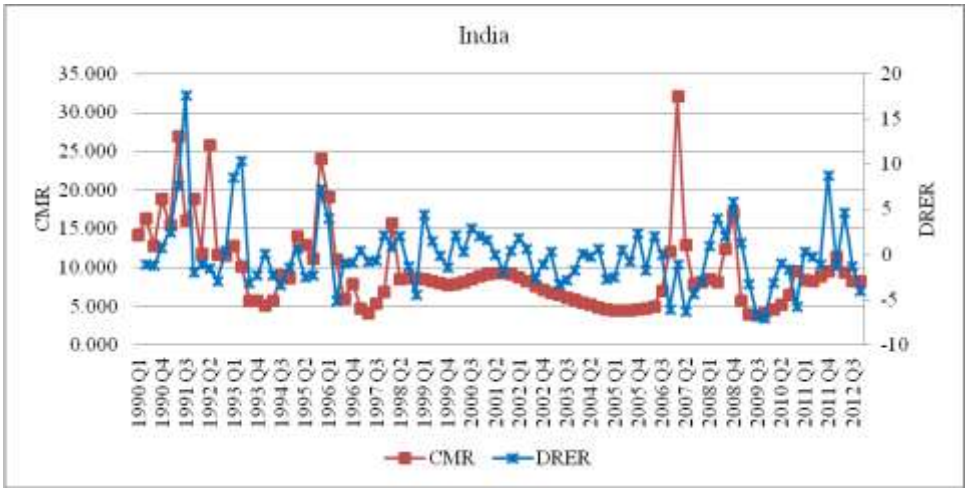

India
INF, CMR, FFR
YGAP
INF
CMR
FFR
YGAP


India
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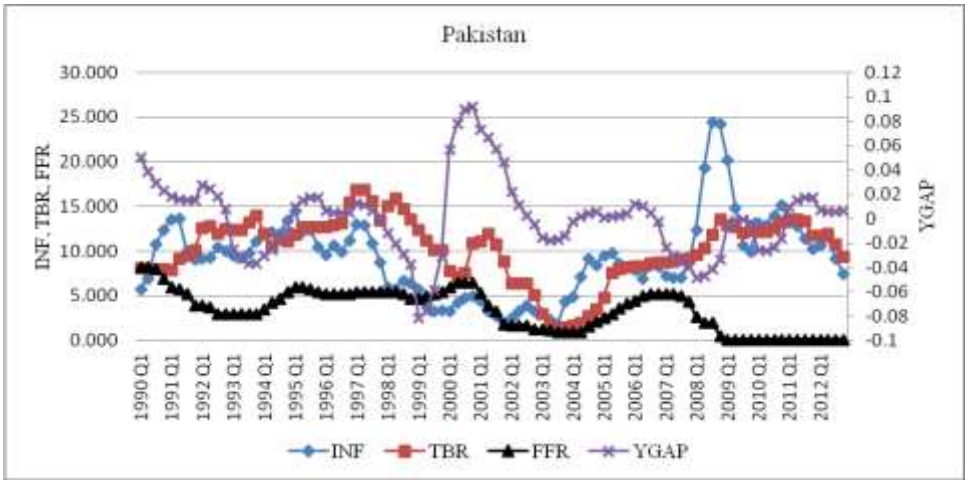
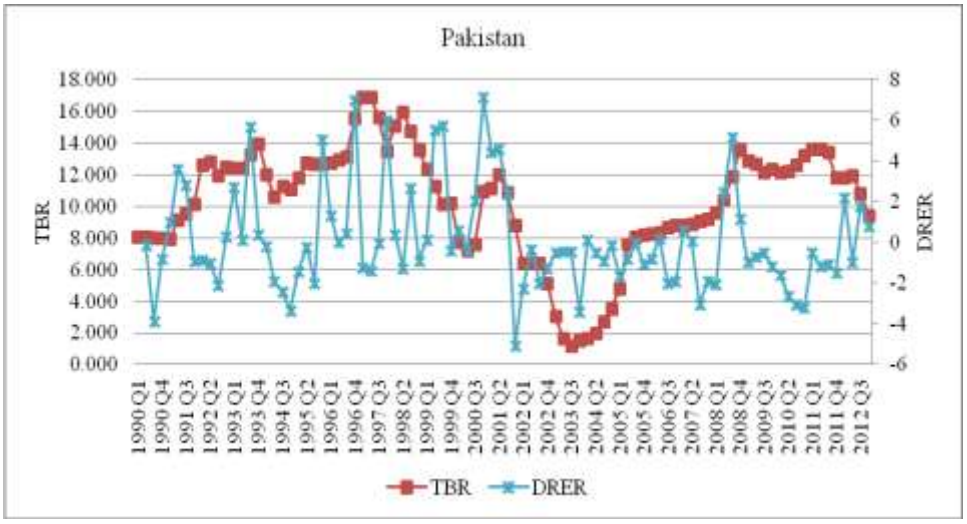

Pakistan
INF, TBR, FFR
YGAP
INF
TBR
FFR
YGAP


Pakistan
TBR
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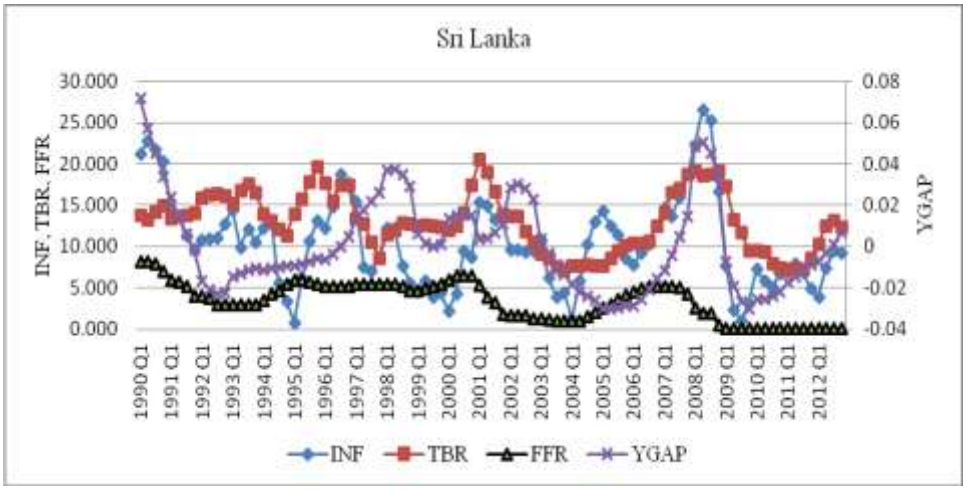
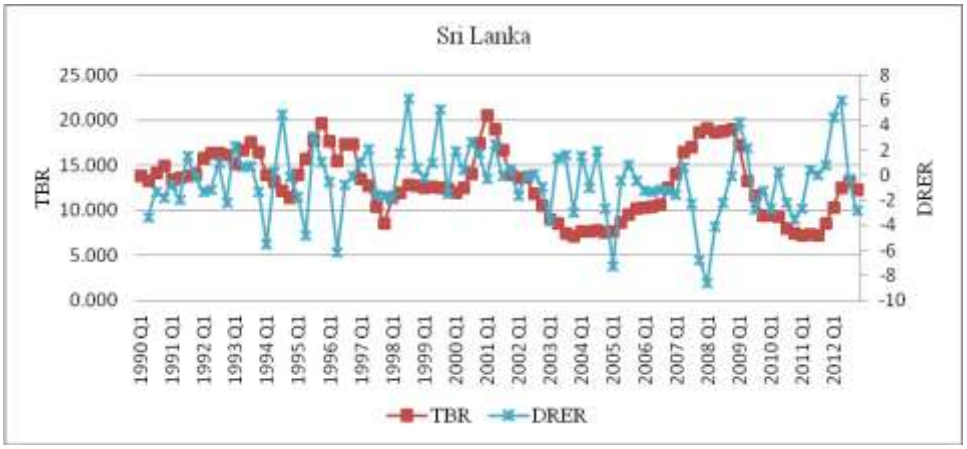

Sri Lanka
INF, TBR, FFR
YGAP
INF
TBR
FFR
YGAP



The real exchange rate movements suggest that exchange rates in South Asian region remain volatile during 1990-2012. However, Pakistani rupee exchange rate seems more volatile than the other South Asian exchange rates. Therefore, Bangladesh, India, Pakistan and Sri Lanka may target exchange rate together with the interest rate as an instrument of monetary policy to achieve output and price stability.

3.3. Correlation Analysis

The correlation between policy interest rate, inflation rate, output gap, foreign interest rate and exchange rate movements are depicted in Table 1.

Table 1

Correlation Analysis, 1990Q1-2012Q4

Variable	Bangladesh	India	Pakistan	Sri Lanka
Interest Rate-Inflation Rate	–0.11(–0.86)	0.33 (3.05)*	0.51(5.16)*	0.58 (6.17)*
Interest Rate-Output Gap	0.008 (0.006)	0.12 (1.02)	0.04 (0.32)	0.03 (0.29)
Interest Rate-Foreign Interest Rate	–0.06 (–0.44)	0.36 (3.35)*	0.30(2.74)*	0.33 (3.02)*
Interest Rate-Real Exchange Rate Depreciation	0.14(1.07)	0.34(3.17)*	0.31(2.89)*	–0.06(–0.50)

Note: Figure in brackets is the t-values. * indicate significant at the 1percent level of significance.

It is evident from the correlation results that there is no significant correlation observed between policy interest rate, inflation rate, output gap, foreign interest rate and real exchange rate depreciation for Bangladesh. However, in India and Pakistan except for output gap, there exists a significant correlation between interest rate, inflation rate, foreign interest rate and real exchange rate depreciation. Similarly, for Sri Lanka inflation and foreign interest rates are significantly correlated with reference to policy interest rate. However, output gap and real exchange rate depreciation remains insignificant. These results suggest that except for Bangladesh other countries might be following some form of the Taylor principle.

3.4. Methodology

The presence of lag dependent variable on the right hand side of the Equation (6) may create endogeneity problem, hence the Ordinary Least Squares (OLS) method remains inconsistent. This problem is mitigated by applying the Generalised Method of Moments (GMM) technique which uses instruments that are uncorrelated with the error term. These instruments isolate the components of the regressors that are correlated with error term. To explain further, let Z be the vector of instruments with $T \times l$ order of matrix and $l = 7$ are the number of regressors including constant. The orthogonal moment conditions for estimation of the parameters of Equation (6) using GMM is as follow:

$$\mathrm{E}(Z'v) = 0 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (7)$$

The GMM coefficients can be obtained by minimising the following GMM criterion function:

$$Q(\theta, y) = (y - \mathrm{X}\theta)'Z(Z'\Omega Z)^{-1}Z'(y - \mathrm{X}\theta) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (8)$$

Where Ω is variance-covariance matrix defined by $E(v'v) = \Omega$. The GMM criteria function is directly used to test for over-identifying restrictions. The two step GMM estimators are obtained as:

$$\hat{\theta} = (\mathrm{X}'Z(Z'\hat{\Omega}Z)^{-1}Z'^{-1}\mathrm{X}'Z(Z'\hat{\Omega}Z)^{-1}Z'y \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (9)$$

For time series data, the matrix Ω may contain non-zero off-diagonal elements to capture serial correlation. The GMM estimator then takes the following form:

$$\hat{\theta} = (\mathrm{X}'Z\hat{\Sigma}^{-1}Z'^{-1})\mathrm{X}'Z\hat{\Sigma}^{-1}Z'y \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (10)$$

We used lagged value of the regressors as instruments in GMM estimation and the validity of instruments, which we evaluate by computing the Sargan-Hansen J – test of over-identifying restrictions proposed by Newey and West (1987).[18] The rejection of the null hypothesis that instruments are orthogonal to errors would indicate that the estimates are inconsistent.

4. THE MONETARY POLICY RULE: EMPIRICAL ANALYSIS

4.1. Results of the Baseline Model

Initially we have estimated a variant of the baseline Taylor rule to examine whether or not Central Banks of SAARC countries follows the Taylor rule. Table 3 reports the results.[19]

[18] Lagged policy rate are not included in the list of instruments because they all are correlated with the residuals [Pinkwart (2013)].

[19] It is worth mentioning here that in order to apply OLS or GMM the variable must be stationary [see Pinkwart (2013)]. The results of extended variant of Taylor rule based on the OLS are reported in Tables 2A, 2B and 2C (see Appendix).

Table 3

Empirical Verification of Baseline Taylor Rule
Dependent Variable: i_t

Variables	Bangladesh	India	Pakistan	Sri Lanka
Constant	1.70	3.09	–0.29	0.24
	(1.64)	(2.16)*	(–0.62)	(0.38)
π_t	–0.004	0.12	0.09	0.12
	(–0.24)	(1.02)	(2.04)**	(2.05)*
y_t	–0.002	–0.08	0.11	0.19
	(–0.05)	(–0.47)	(2.28)**	(2.75)*
i_{t-1}	0.80	0.49	0.95	0.90
	(6.26)*	(2. 63)*	(20.77)*	(10.49)*
R^2	0.81	0.27	0.72	0.86
$\overline{R}^2$	0.80	0.24	0.71	0.85
J – statistic	3.24 [0.778]	8.09 [0.232]	1.89 [0.930]	8.56 [0.200]
Instrument rank		10	10	10

Note: Figures in parentheses are the t-values. *, ** and *** indicate significant at the 1 percent, 5 percent and 10 percent level of significance. Number in [.] are the p-values. Instruments are: $\pi_{t-1,\ t2\ \text{and}\ t-3}$, $y_{t-1,\ t-2\ \text{and}\ t-3,}$ and $Lrm_{t-1,\ t-2\ \text{and}\ t-3}$.

It is evident from the results that explanatory power of the estimated monetary policy rule seems to be reasonably good for Bangladesh, Pakistan and Sri Lanka, whereas the value of adjusted R^2 is relatively low for India. However, the estimated model does not suffer from misspecification. The Sargan-Hansen J-statistic confirms the validity of over-identifying instruments used in estimation.

It is observed from the results that the short-run coefficients of the estimated model are not in accordance with the values hypothesised by the Taylor rule.[20] The results clearly indicate that Central Banks of SAARC countries are not following the Taylor rule principle in conducting the monetary policy in the short-run, although the coefficients of inflation rate and output gap have the expected signs and statistically significant in the case of Pakistan and Sri Lanka. Thus, we conclude that the standard Taylor rule does not apply to the major SAARC countries in the short-run. On the other hand, the estimate indicates that the coefficients of the lagged interest rate are positive and statistically significant with high magnitudes and vary between 0.49 (India) and 0.95 (Pakistan). The coefficients on the lagged interest rate are 0.95 in Pakistan followed by Sri Lanka (0.90), Bangladesh (0.80) and India (0.49), implying that initial adjustment in the interest rate is only 5 percent in Pakistan, 10 percent in Sri Lanka, 20 percent in Bangladesh and 51 percent in India within one quarter. The degree of interest rate smoothing is high in Pakistan, Sri Lanka and Bangladesh. The main reason of high degree of interest rate smoothing could be the presence of financial crises, credit crunches and developments in commodity prices [Pinkwart (2013)]. This finding implies that standard Taylor rule may be useful only for interest rate smoothing rather than stabilising inflation rate and supply of output. This suggests that pursuance of interest rate

[20]Taylor (1993) predicted the monetary policy rule as: $i_t = \pi_t + 0.5y_t + 0.5(\pi_t - 2) + 2$. This rule assumed a constant real interest rate and long-run inflation target at 2 percent. However, as we set the real interest rate and inflation target equal to 2, the interest rate setting rule becomes: $i_t = 1 + 1.5\pi_t + o.5y_t$.

smoothing is an important objective of the monetary policy in these countries. Another important finding with respect to Pakistan and Sri Lanka is that the response of monetary policy to inflation exceeds than unity. The long-run coefficients of inflation in Pakistan and Sri Lanka are respectively 1.8 and 1.2, indicating that Central banks in these countries do not accommodating inflationary pressures.[21] The response coefficient of inflation is significantly greater than one in Pakistan and Sri Lanka which confirms stability condition for the Taylor rule. The long-run response of inflation to policy rate appears to be very weak and insignificant in India and Bangladesh, indicating perhaps their relatively higher inflation rates. The reason of this finding could be that the monetary authorities in India and Bangladesh may face some non-monetary policy price pressures in order to reduce the output costs [Mohanty and Klau (2004)]. The low and insignificance response of inflation rate to policy rate violates the stability condition for the Taylor rule. The response of output gap is negative and insignificant in the case of Bangladesh and India. One reason of this finding could be that a large chunk of real sector activities are not under the domain of monetary policy in these countries. The other reason could be that negative and insignificant output gap implies future declines in the inflation rate, which could destabilise the economy where the interest rate approaches to lower bound. Therefore, negative output gap generate a more rigorous response than the case when the gap exceeds the assumed target [Caglayan, *et al.* (2016)]. On the other hand, output gap seems to be positive and significant in the case of Pakistan and Sri Lanka which suggests that output exceeds the set target and demand pressure calls for the tight monetary policy in these countries, although the coefficient of output gap is less than 0.5. The long-run coefficients of output gap are respectively 2.2 and 1.9 in Pakistan and Sri Lanka suggesting that monetary authority also stabilises output besides in inflation in these countries in the long-run. Finally, in case of Pakistan the intercept term is negative but statistically insignificant. The negative sign of intercept term implies that either the real interest rate is negative or level of inflation target is high, that is, more than double of the real interest rate [Malik and Ahmed (2007)].

4.2. Results of Extended Taylor Rule

The results depicted in Table 3 suggest that simple monetary policy rule due to the Taylor (1993) is not appropriate to conduct monetary policy by major South Asian Central banks. It is now well established that in the era of globalisation with greater financial markets integration, the variants of the Taylor rule based on a closed economy framework perform poorly in an open economy unless they are modified to account for the movements in the exchange rates [Ball (1999); Caglyan, *et al.* (2016)]. Svensson (2000) argued that in an open economy setting there are various direct and indirect channels through which exchange rates can affect monetary policy and show that domestic inflation responds to foreign variables such as foreign inflation rate, exchange rate, foreign interest rate and shocks from the rest of the world [Caglyan, *et al.* (2016)]. In such circumstances, monetary policy in emerging economies may need to pursue multiple objectives such as economic growth, price stability, financial and exchange rate stability and had to pay more attention to the external constraint. Accordingly, Taylor (2001) and

[21]The long-run coefficient of inflation in Pakistan is equal to 0.09/1-0.95 and for Sri Lanka is 0.12/1-0.90.

Hsing (2009) have incorporating the exchange rate and foreign interest rate in the monetary policy reaction function. Filosa (2001) finds that most Central Banks in emerging market economies react strongly to exchange rates. Mohanty and Klau (2004) reported that Central Banks in emerging markets tend to look beyond inflation and output, and focus on other objectives such as exchange rate changes. Similarly, Lubik and Schorfheide (2007) and Adolfson, *et al.* (2008) show that exchange rate movements affect Central Bank behaviour. Furthermore, Umezaki (2007) demonstrated that international capital mobility also affect domestic monetary policy. It is appropriate to assume that foreign interest rate affect SAARC interest rates through interest rate arbitrage. Therefore, we have estimated the extended version of the Taylor rule specified by Equation (6). The empirical analysis in the ensuing paragraph is on GMM results reported in Tables 4 to 5.[22] It is evident from the results that the explanatory power of the extended model has been reasonably good for Bangladesh, Pakistan and Sri Lanka, whereas for India the value of adjusted R^2 is relatively low. The estimated equations do not show any evidence of misspecification. The Sargan-Hansen J-test accepts the null hypothesis of over-identifying instruments. This implies that the instruments are appropriately selected. We start with the outcome for Bangladesh (Table 4).

Table 4

Empirical Verification of an Extended Taylor Rule
Dependent Variable: i_t

	Bangladesh			India		
Variables	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Constant	0.83	0.48	–0.66	6.86	0.80	2.37
	(0.62)	(0.55)	(–0.55)	(3.54)*	(0.82)	(3.49)*
π_t	0.05	0.03	0.04	0.36	0.07	0.43
	(0.43)	(0.90)	(0.42)	(1.89)***	(0.82)	(9.54)*
y_t	–0.03	0.06	0.05	0.24	–0.44	0.18
	(–0.24)	(1.24)	(0.58)	(0.78)	(–2.77)*	(2.02)*
Δq_t	3.15	–	–1.32	22.45	–	8.78
	(0.29)		(–0.17)	(2.73)*		(5.97)*
i_t^f	–	0.07	0.06	–	0.74	0.25
		(2.72)*	(1.00)		(3.16)*	(2.23)*
i_{t-1}	0.88	0.89	1.03	–0.08	0.48	0.27
	(5.13)*	(9.47)*	(7.63)*	(–0.31)	(3.78)*	(8.38)*
D_{08}	–0.55	0.36	–0.24	–0.96	4.43	–1.54
	(–0.35)	(0.87)	(–0.35)	(–0.22)	(2.11)*	(–2.04)*
R^2	0.75	0.85	0.80	0.09	0.33	0.28
$\overline{R}^2$	0.72	0.84	0.78	0.02	0.29	0.22
J–statistic	3.45	5.84	13.37	4.61	8.54	98.37
	[0.841]	[0.558]	[0.147]	[0.707]	[0.287]	[0.000]
Instrument Rank	13	13	16	13	13	17

See note below Table 3. Instruments are: $\pi_{t-1,t-2 and t-3}, y_{t-1,t-2 \, and t-3}, i^f_{t-1,t-2 and t-3}, \Delta q_{t-1.t-2 and t-3}$ and $Lrm_{t-1,t-2 and t-3}$

[22] Since we are interested to determine the impact of exchange rate depreciation and foreign interest rate on monetary policy, therefore, we are much concentrated on model 3 in Tables 4 and 5.

The results reveal that for Bangladesh the coefficients of inflation and output gap possess expected positive signs but they are statistically insignificant in all specifications. This is not surprising because the Bangladesh Bank does not follow the Taylor rule principle in setting interest rate. Since its independence, the Bangladesh Bank has been conducting monetary policy with significant discretion. Islam and Uddin (2011) have argued that the Bangladesh Bank is still using broad money as intermediate target and reserve money as the operating target. Unstable broad money supply growth and inflation instability undermine the credibility of the monetary authorities and dilute the impact of monetary policy. Furthermore, the Bangladesh Bank did not gain much independence in terms of monetary policy formulation and implementation due to fiscal dominance. The Bangladesh Bank maintains that inflation targeting is not yet appropriate because the interest rate channel of monetary policy transmission mechanism is not well developed [Hossain (2010)].

Real exchange rate depreciation is also insignificant in the monetary policy reaction function. This implies that Bangladesh monetary authority do not react to real exchange rate movements. In model 2 (Table 4), foreign interest rate appears to be statistically significant, implying the Bangladesh monetary authority reacts to foreign monetary policy although the response is too weak. However, it turns out to be insignificant when both real exchange rate depreciation and foreign interest rate are added in the estimation (model 3). The coefficient of interest rate lagged by one quarter exerts significant effect on monetary policy instrument in all specifications. However, the coefficient on the lagged interest rate is 1.03 (model 3), which implies that the initial adjustment in interest rate is only –0.03 percent and the degree of interest rate smoothing is 1.03 percent. Finally, it is argued that Bangladesh follow lax monetary policy with short-run and long-run coefficients of inflation rate, real output gap and real exchange rate movements are not significantly different from zero. In this context, Hossain (2010, p. 576) argued that "there is lack of transparency of the design and conduct of monetary policy in Bangladesh. Inflation targeting does not necessarily achieve credibility in an uncertain inflationary environment when a Central Bank claim bad luck, adverse shocks and extenuating circumstances in missing the inflation target, which can ultimately undermine a Central Bank's credibility". Finally, to capture the response of Bangladesh Bank to global financial crisis, a dummy variable that takes value one for 2007Q3 to 2008Q4 and zero otherwise has been introduced. The result suggests that global financial crisis has transmitted no significant impact on Bangladesh monetary policy.

The results obtained for India suggest that inflation rate; foreign interest rate and exchange rate depreciation produces significant positive effect on monetary policy rate in all specifications. However, the size of the coefficients changes significantly when real exchange rate depreciation and foreign interest rate included in estimation. The positive and statistically significant coefficient of inflation implies that the Reserve Bank of India (RBI) has consistently strived to stabilise inflationary movements over the sample period 1990-2012. The less than unitary coefficient of inflation suggests that RBI increased the policy interest rate by 0.43 basis points in response to a 1percent rise in the inflation. However, less than unity coefficient of inflation violates the stability condition for the Taylor rule in the short-run. Similarly, real output gap is positive and statistically significant. This suggests that the monetary authority in India increased the policy

interest rate by 0.18 basis points in response to a one unit rise in output gap.[23] However, the coefficient with respect to output gap is smaller than the coefficient of inflation rate which suggests that the aggregate supply curve in India is inelastic. This may indicate that inflation in India is governed by the cost push factor. This may also be due to inadequacy of the measure of output gap as Mohanty and Klau (2004) have rightly noted that estimating potential output is difficult as supply side shocks in emerging economies are relatively larger than that of developed economies. Despite these concerns, the results of present study are, nonetheless, consistent with the earlier findings of Hutchison, *et al.* (2010), Hutchison, *et al.* (2013) and Singh (2010).

The coefficient of real exchange rate depreciation is although greater than unity for all cases, it turns out to be significant in the monetary policy reaction function. This implies that exchange rate plays a dominant role in the monetary policy setting in India. Ball (1999) argued that inflation targeting without explicit attention to the exchange rate is dangerous in an open economy, because large fluctuations in exchange rate affect output as well as inflation through import price channel. Large movements in capital flows and exchange rates force the RBI to intervene in the foreign exchange market to ensure orderly conditions in the foreign exchange market and prevent excessive exchange rate volatility that can induce further spirals [Gokran (2012); Patra and Kapur (2012)].[24] The main instrument of the RBI to smooth excessive exchange rate volatility has been active capital account management along with interventions in the foreign exchange markets [Mohan and Kapur (2009); Patra and Kapur (2012)].[25] However, large and significant coefficient of exchange rate signals the effectiveness of exchange rate channel of monetary policy. Mohanty and Klau (2004) find that central banks in emerging economies tend to focus on exchange rate stabilising besides inflation and output gap.[26] Jha (2008) noted that even though price stability, output growth, reduction of exchange rate volatility, and financial stability are the monetary policy goals of the RBI, but none of these are fully under its direct control. The dominance of exchange rate changes in the monetary policy reaction function does indicate that exchange rate stabilisation in inflation targeting is a preferred policy choice for India. Mishra and Mishra (2012) have also hinted towards this based on similar results for India.

Regarding foreign interest rate, the result reveals that an increase in the foreign interest rate will generate depreciation of the real exchange rate, which in turn putting upward pressure on inflation rate and hence on the domestic interest rates [Caglayan, *et al.*

[23] Positive increases in the output gap represent a rise in actual output relative to potential output.

[24] In 2006 committee on full convertibility of capital account firmly recommended to the RBI that RBI should maintain a monitoring band of +/- 5 percent around the real effective exchange rate and should intervene as and when the real effective exchange rate moved outside this band [RBI (2006)].

[25] The RBI adopted multiple indicator approach in 1998 to maintain (i) a stable inflation environment, (ii) appropriate liquidity conditions to accelerate economic growth, (iii) maintain orderly conditions in the foreign exchange market to avoid excessive volatility in the exchange rate, and (iv) stable interest rate [RBI (2002); Jha (2008)].

[26]It is important to note that reaction of the exchange rate to an interest rate shocks depend on the nature of exchange rate regime and the degree of trade openness of an economy. In a flexible exchange rate regime, the exchange rate reacts more pronouncedly to an interest rate shocks. However, if exchange rate is pegged and heavily managed, it will not respond to an interest rate shocks [Aleem (2010)]. However, India still placed many qualitative restrictions on the trade and capital flows.

(2016)].[27] The result suggests that an increase of 100 basis points in the US Federal Funds rate is associated with an increase of 25 basis points in the policy rate per quarter in India.[28] This suggests that Indian monetary policy is significantly influenced by international events, especially from the US monetary policy actions. Though, this result confirms relatively weak degree of financial markets integration between India and the rest of the world.

The response coefficient of lagged policy rate is positive and significant in model 2 and model 3. However, the lagged coefficient of policy rate is 0.27 in model 3 indicating a relatively low degree of interest rate smoothing with initial adjustment in interest rate is 73 percent per quarter. The long-run coefficients on inflation rate and output gap respectively are 0.59 and 0.25, which suggests that in long-run a unit increases in inflation rate lead to raise interest rate by 0.59 basis points and output gap by 0.25. These finding are inconsistent and violates long-run stability condition for the Taylor principle. Finally, our finding reveals that the effect of global financial crisis of 2007-08 is negative and statistically significant which suggest that the RBI reacts to global financial crisis passively by loosening of domestic monetary policy.

In case of Pakistan, the results are generally consistent with economic theory (Table 5). The coefficient of inflation rate is positive and larger than output gap in all cases which implies that the State Bank of Pakistan (SBP) has given more weight to inflation stabilisation than output. However, the coefficient of inflation rate is less than unity (0.19) which suggests that the SBP has accommodated inflationary pressures by increasing nominal interest rate by 0.19 basis points in response to 1 percent increase in inflation rate in the short-run. The coefficient of output gap suggests that a one percent deviation of actual output from its long run sustainable level would raise policy rate by 0.12 percent. This variable is significant at the 5 percent level. The result pertaining to real exchange rate implies that a one percent depreciation of real exchange rate increases monetary policy rate by more than 3 percent. This result confirms strong integration of domestic financial markets in Pakistan. Khan and Ahmed (2011) found that real exchange rate seemed to be a dominant source of variation in output and inflation in Pakistan. Foreign interest rate enters in the monetary policy reaction function with positive sign and it is statistically significant which confirms that the domestic financial markets are now relatively more integrated with the rest of the world due to a series of financial sector reforms since early 1990s. The coefficient of lagged policy rate is 0.86 which confirms a high degree of interest rate smoothing with adjustment in interest rate is only 14 percent per quarter. The long-run coefficient of inflation and output gap are 1.36 and 0.86 which confirms the stability of the Taylor rule in the long-run.

On the whole, the results of present study are consistent with the earlier findings of Ahmed and Malik (2011) and Aleem and Lahiani (2011). The coefficient of D_{08} which corresponds to global financial crisis of 2007-08 is negative and significant which is quite odd given that the domestic financial sector was not seriously influenced by the global financial crisis and as such did not require loosening of the monetary policy stance.

[27]The real UIP condition implies that a rise in the foreign interest rate will lead to an appreciation in the real exchange rate ($q_{t+1}^{e} - q_t < 0$). Given expected foreign inflation rate (π_{t+1}^{e*}), an expected appreciation will be generated by an increase in domestic inflation (π_{t+1}^{e}) and exerting an upward pressure on domestic interest rate. Hence, through this channel an increase in foreign interest rate will have a positive impact on domestic interest rate [Caglayan, *et al.* (2016)].

[28] In model 2, the coefficient of foreign interest rate is 0.74.

Table 5

Empirical Verification of an Extended Taylor Rule
Dependent Variable: i_t

	Pakistan			Sri Lanka		
Variables	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Constant	–0.001	–0.70	–0.55	–1.27	–0.64	0.58
	(–0.002)	(–2.07)**	(–2.86)*	(–1.25)	(–0.66)	(3.94)*
π_t	0.17	0.14	0.19	0.40	0.18	0.28
	(2.14)*	(2.74)*	(9.15)*	(4.81)*	(0.56)	(13.16)*
y_t	0.11	0.10	0.12	0.28	0.10	0.25
	(2.18)*	(2.03)*	(12.85)*	(2.55)*	(0.86)	(6.99)*
Δq_t	3.79	–	3.45	0.39	–	3.45
	(1.48)		(2.73)*	(0.26)		(6.36)*
i_t^f	–	0.13	0.10	–	0.29	0.11
		(1.84)*	(3.32)*		(1.82)*	(2.93)*
i_{t-1}	0.86	0.90	0.86	0.84	0.85	0.75
	(10.53)*	(16.42)*	(47.20)*	(12.09)*	(11.78)*	(48.65)*
D_{08}	–1.05	0.21	–0.94	–4.51	–1.10	–1.34
	(–0.66)	(0.29)	(–1.80)**	(–2.16)*	(–0.42)	(–3.38)*
R^2	0.75	0.74	0.75	0.79	0.86	0.86
$\overline{R}^2$	0.73	0.72	0.73	0.78	0.85	0.85
$J-$statistic	2.55	4.61	11.77	6.46	4.71	17.32
	[0.923]	[0.707]	[0.227]	[0.488]	[0.695]	[0.185]
Instrument Rank	13	13	16	13	13	20

See note below Table 4. Instruments are: $\pi_{t-1,t-2\ and\ t-3}, y_{t-1,t-2\ and t-3}, i^f_{t-1,t-2 and t-3}, \Delta q_{t-1.t-2 and t-3}$ and $Lrm_{t-1,t-2 and t-3}$

The empirical results for Sri Lanka (Table 5) reveal that the coefficient of inflation rate, output gap, foreign interest rate and real exchange rate depreciation and lagged interest rate enter the monetary policy reaction function with expected positive sign in all specifications. It is interesting to note that in case of Sri Lanka the coefficients of inflation rate, output gap, foreign interest rate and real exchange rate depreciation are statistically significant (see model 3). The coefficient of inflation rate is positive but less than unity (i.e. 0.27) suggesting that the Central Bank of Sri Lanka (CBSL) increases policy rate by 0.27 basis points when there is one percent increase in inflation in Sri Lanka. This finding clearly indicates that CBSL does not following the Taylor rule in the short-run. The reason could be that in Sri Lanka formal financial system is dominated by the commercial banks and the monetary authority mainly focuses on the demand for and supply of reserve money [CBSL (2010)]. As a result, monetary policy instruments, such as interest rate and open market operations are used to achieve monetary targets. Bernanke and Gertler (1995) argue that dominance of commercial banks and information asymmetries leads dominance of credit channels in transmission mechanism of monetary policy rather than the interest rate channels. The positive and significant coefficient of output gap implies that the CBSL stabilises real economic activity besides the price

stability. Real exchange rate depreciation enters in the monetary policy reaction function with positive sign and statistically significant which verifies a dominant role of real exchange rate in the monetary policy in Sri Lanka. The positive and significant coefficient of foreign interest rate implies that Sri Lankan financial markets are integrated with the rest of the world and its monetary policy is dependent of monetary policies of the developed countries. Therefore, it appears that Sri Lankan monetary authority significantly react to changes in foreign interest rate. The coefficient on lagged dependent variables is 0.75 which show that there is high degree of interest rate smoothing in monetary policy instrument by the CBSL. The variable that represents external shock (D_{08}) remains negative and significant in the monetary policy in Sri Lanka. This implies that domestic policy interest rate depresses in the wake of external shocks. In the long-run, the coefficients of inflation and output gap equals 1.12 and 1.00 which confirms the stability condition for the Taylor rule.

4.3. Discussion of Results

The empirical findings of this study confirm that over the years the Taylor principle has not been pursued in its entirety in India, Pakistan, and Sri Lanka as the Central Banks in these countries have not adequately reacted to inflationary pressures.[29] The reason for this weak support for the Taylor rule may lie in model uncertainty, fear of financial market disruption, and/ or the fear of loss of credibility due to sudden policy reversals [Carare and Tchaidze (2005)]. This weakness in monetary policy response may have encouraged inflation rate to be significantly influenced by large movements of interest rates after the introduction of financial sector reforms in the region. In all probability the regional Central Banks may have accommodated some of the non-monetary price pressures to reduce output costs [Coorey, *et al.* (1998); Pujal and Griffiths (1998)] emanating from factors such as the use of contemporaneous reaction function, ignoring the normal lags associated with the operation of monetary policy, use of call money rate/ treasury bill rate as a proxy of policy rate [Patra and Kapur (2012)], use of industrial output as activity variable rather than overall GNP/ GDP, and finally, the relative fiscal dominance in regional economies due to less than full independence of respective Central Banks.

Earlier studies have confirmed that the stability of monetary policy rule depends on the underlying structure of the economy [Moura and de Carvalho (2010)]. Bullard and Mitra (2001) and Woodford (2003) have stressed upon the importance of output gap coefficient along with the coefficient of inflation. In addition, they also consider firm's intertemporal discount factor and the slope of the new-Keynesian Phillips curve as relevant parameters. Thus, within a broader perspective, the smaller than unity inflation coefficient does not necessarily means failure of Central Banks to apply the Taylor principle [Moura and de Carvalho (2010)]. Viewed holistically, one may therefore argue that the RBI, the SBP, and the CBSL have shown some commitment to stabilise inflation.

It is worth mentioning here that the coefficient on output gap remains positive and significant for India, Pakistan and Sri Lanka, which implies that monetary authorities in these countries are emphasise more on the underlying demand pressure

[29]Taylor principle predicts that for the stability of macroeconomic system, the coefficient of inflation should be greater than unity.

in setting interest rates. The insignificant coefficient of output gap for the case of Bangladesh implies that monetary policy has no effect on the real output [Jakab, *et al.* (2006); Vonnak (2007)]. Thus, the RBI, SBP and CBSL may focus more on inflation and output stabilisation.

The positive and significant response of monetary policy to foreign interest rate for India, Pakistan and Sri Lanka suggests that monetary policy of major SAARC countries is largely influenced by the leading economies of the world, particularly the US monetary policy. However, the estimates of foreign interest rate are less than unity suggesting that the interest rate arbitrage has not been working fully—an indication of limited international capital mobility to these countries. This result also indicates weak linkages between domestic financial markets of the SAARC countries and the rest of the world because domestic capital markets are not sufficiently developed.

In an effort to understand whether the monetary authority uses interest rate instrument to lean against exchange rate movements, the coefficient of real exchange rate depreciation was introduced in the model specification. The positive and significant coefficient for India, Pakistan and Sri Lanka imply that these economies use interest rate as an instrument to defend the values of their respective currencies. Since the real exchange rate depreciation appears in the monetary policy reaction function with positive and greater than unity coefficient, it is clear that exchange rate is being used as an alternative instrument of monetary policy to control inflation. Finally, the response of SAARC countries to global financial crisis of 2008 seems to be minimal and mixed.

5. CONCLUSIONS AND POLICY IMPLICATIONS

In recent years there is growing interest for adopting inflation targeting policy in most of the emerging economies. The adoption of alternative monetary policy strategy nonetheless requires necessary understanding as to how monetary policy shocks are absorbed by key macroeconomic variables. In this context, the present study has developed a link between monetary policy rate, real output gap, inflation rate, real exchange rate movements and foreign interest rate to investigate monetary policy stance in Bangladesh, India, Pakistan and Sri Lanka, the leading countries of SAARC using quarterly data for the period 1990Q1-2012Q4. Our results have found a weak support of the Taylor rule in India, Pakistan and Sri Lanka. Bangladesh appears to have adopted interest rate smoothing policy. These finding implies that simple Taylor rule may not be enough to conduct monetary policy in these countries. We augment the simple Taylor rule by foreign interest rate and real exchange rate depreciation and the results reveal that inflation rate, output gap, foreign interest rate and real exchange rate significantly influencing the monetary policy rate. It appears from the results that monetary authorities in India, Pakistan and Sri Lanka have taken accommodating stance of monetary policy towards price shocks. However, in these countries there exists a strong response of the interest rate to exchange rate movements. This reflects that Central Banks in these countries stabilising the exchange rate by the use of monetary policy instruments. The findings of present study have important policy implications. First, there is a need to stabilise real output besides inflation. Second, foreign interest rate is found to be a significant factor in

monetary policy setting in India, Pakistan and Sri Lanka which implies that monetary policy in these countries is partially dependent on the FED's monetary policy actions.[30] Hence, monetary policy in these countries requires the inclusion of Federal Funds rate in the monetary policy reaction function to absorb external shocks. It is well documented that inclusion of the relevant external variables in the monetary policy specification and controlling for external shocks may reduces the biases. Therefore, there is a need to augment monetary policy reaction function by the inclusion of foreign interest rate. Third, exchange rate changes appear to be most significant and dominant factor in the monetary policy function which supports the effectiveness of exchange rate channel in the transmission mechanism. Therefore, it is suggested that India, Pakistan and Sri Lanka may target exchange rate together with the interest rate to stabilise output and inflation. Fourth, sudden shocks, such as global financial crisis do affect domestic economies, therefore, the respective monetary authorities may need to strengthen their shock absorptive capacity. To this end, further regulations may be needed to improve the efficiency of domestic financial markets. Fifthly, besides domestic factor, external factors such as foreign interest rate and exchange rate influences domestic monetary policy in the major SAARC countries. Therefore, these economies may have to specify broader monetary policy reaction functions by considering foreign interest rate and exchange rate movements. Finally, performance of the Taylor rule could be improved by augmenting some other variables in the monetary policy reaction function such as asset prices, private sector credit, foreign exchange reserves, foreign output gap, expectations and oil price volatility. It is worth mentioning here that parameters of the augmented Taylor rule may changes when one employs a different specification. On the whole, this study provides interesting evidence on the historical conduct of monetary policy in the SAARC countries, preparing for the adoption of alternative monetary policy strategy to tackle unanticipated inflationary fluctuations.

[30] In response of various financial crisis and recession, the FED reduced overnight Federal Funds rate target to a range between zero and 25 basis points in December 2008. The Federal Open Market Operation Committee (FOMC) lowered the interest rate on reserves to 25 basis points and the Federal Funds rate has traded close to, but still below, the rate on excess reserves. Through the FED introduced a corridor system. In such system, the target for the Federal Funds rate would be typically set within the corridor established by the discount rate at the ceiling and the interest rate on excess reserves at the floor. Through this system FED adopted highly accommodative monetary policy stance unit 2015 [Kahn (2010)].

APPENDIX

Table 2A

Empirical Verification of an Extended Taylor Rule (OLS Results)

Bangladesh

$$i_t = 0.853 + 0.004\pi_t + 0.0002 y_t + 0.026 i_t^f - 1.623\Delta q_t + 1.307 i_{t-1} - 0.428 i_{t-2}$$
$$(2.235)^{*}\ (0.225)\quad (0.006)\quad (0.948)\quad (-0.883)\quad (7.411)^{*}\ (-2.339)^{**}$$
$$R^2 = 0.88 \qquad \bar{R}^2 = 0.87 \qquad F = 71.17[0.000] \qquad ADF = -7.777^{*}$$

India

$$i_t = 1.705 + 0.255\pi_t + 0.046 y_t + 0.473 i_t^f + 9.512\Delta q_t + 0.402 i_{t-1}$$
$$(1.727)\ (1.814)^{**}\ (0.236)\quad (2.143)^{**}\ (1.178)\quad (4.760)^{*}$$
$$R^2 = 0.36 \qquad \bar{R}^2 = 0.31 \qquad F = 7.83[0.000] \qquad ADF = -8.829^{*}$$

Pakistan

$$i_t = 0.271\pi_t + 0.178 y_t + 0.163 i_t^f + 0.090\Delta q_t + 0.391 i_{t-1} + 0.312 i_{t-2}$$
$$(3.493)^{*}\ (1.546)\quad (1.990)^{**}\ (2.587)^{*}\quad (2.039)^{**}\quad (2.311)^{*}$$
$$R^2 = 0.80 \qquad \bar{R}^2 = 0.79 \qquad ADF = -9.422*$$

Sri Lanka

$$i_t = 1.056 + 0.097\pi_t + 0.091 y_t + 0.180 i_t^f + 1.037\Delta q_t + 1.136 i_{t-1} - 0.336 i_{t-2}$$
$$(2.120)\ (2.637)^{*}\ (1.904)^{**}\ (2.406)^{*}\quad (1.837)^{**}\quad (11.160)^{*}\ (-3.863)^{*}$$
$$R^2 = 0.89 \qquad \bar{R}^2 = 0.88 \qquad F = 95.60[0.000] \qquad ADF = -8.544^{*}$$

Note: Figures in parentheses are the t-values. *, ** and *** indicate significant at the 1 percent, 5 percent and 10 percent level of significance. ADF is unit root test applied on the residuals obtained from the estimated equations for each country. Critical values are tabulated by Hamilton (1994).

Table 2B

Misspecification Test Statistics

Country	AR 1–5 Test	ARCH 1–4 Test	Normality Test	Hetero Test	Hetero-X Test	RESET Test
Bangladesh	1.611	2.723	8.706	2.681	1.355	0.297
	[0.177]	[0.038]*	[0.013]*	[0.006]*	[0.194]	[0.745]
India	0.300	0.154	96.601	1.075	0.744	4.402
	[0.911]	[0.961]	[0.000]*	[0.395]	[0.769]	[0.016]*
Pakistan	1.155	3.655	28.761	1.193	1.677	0.030
	[0.340]	[0.009]*	[0.000]*	[0.305]	[0.055]	[0.971]
Sri Lanka	1.415	2.954	3.259	1.200	1.139	1.247
	[0.230]	[0.026]*	[0.196]	[0.300]	[0.337]	[0.294]

Note: Residuals diagnostics include AR (error autocorrelation) test, Autoregressive conditional Heteroscedasticity (ARCH), the Normality of the Distribution of the Residuals, Heteroscedasticity (Hetero test and Hetero-X test) and Functional Form (RESET Test). * indicate significant at the 1 percent level and [.] indicates p-values.

Table 2C

Augmented Dickey-Fuller (ADF) Unit Root Test

Country	Specification	Series	ADF at Levels	ADF at First Difference	Decision
Bangladesh	C	i_t	–3.623 (1)*	–5.035 (0)*	I (0)
	C	π_t	–4.110 (2)*	–5.563 (3)*	I (0)
	C	y_t	–3.030 (4)*	–7.971 (2)*	I (0)
	C	i_t^f	–2.205 (2)***	–3.297 (3)*	I (0)
	C	Δq_t	–3.164 (3)*	–11.11 (1)*	I (0)
India	C	i_t	–4.609 (0)*	–9.628 (0)*	I (0)
	C	π_t	–3.124 (1)*	–7.493 (3)*	I (0)
	C	y_t	–2.882 (1)***	–9.659 (1)*	I (0)
	C	i_t^f	–2.205 (2)***	–3.297 (3)*	I (0)
	C	Δq_t	–7.592 (0)*	–6.982 (4)*	I (0)
Pakistan	C	i_t	–2.582 (0)***	–11.82 (0)*	I (0)
	C	π_t	–2.963 (1)**	–4.692 (0)*.	I (0)
	C	y_t	–5.260 (1)*	–6.354 (3)*	I (0)
	C	i_t^f	–2.205 (2)***	–3.297 (3)*	I (0)
	C	Δq_t	–3.506 (2)*	–7.175 (3)*	I (0)
Sri Lanka	C	i_t	–3.040 (1)*	–5.340 (0)*	I (0)
	C	π_t	–4.100 (1)*	–3.770 (4)*	I (0)
	C	y_t	–4.171 (1)*	–7.966 (1)*	I (0)
	C	i_t^f	–2.205 (2)***	–3.297 (3)*	I (0)
	C	Δq_t	–9.135 (1)*	–7.762 (4)*	I (0)

Note: C stands for intercept; numbers in brackets are the optimal lags. *, ** and *** indicates significant at the 1 percent, 5 percent and 10 percent level of significance. ADF-test is carried out using OxMatrics-6.0 Software. Critical values for ADF are: –3.52, –2.90 and –2.58 for 1 percent, 5 percent and 10 percent respectively.

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The Determinants of Pakistan Exports of Textile: An Integrated Demand and Supply Approach

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The determinants of demand and supply of textile and clothing exports of Pakistan are examined for seven major trading partners (US, UK, Canada, Italy, France, Japan and Spain) over the period 1972 to 2013. The simultaneous equation model is estimated by Generalised Method of Moment to handle simultaneous equation bias and for consistent and more precise estimates classical Empirical Bayes technique is applied. The results reveal that income of trading partners and devaluation policy has important and significant role in explaining exports performance of textile and clothing of Pakistan. As regards the supply side, the relative prices and capacity variable are important in determining the textile and clothing exports, however, the real wages have significant but small effect on textile and clothing exports supply. The removal of quantitative restrictions fails to provide incentives to the suppliers. The high income elasticity for the demand suggests that focus should be on raising the factors which can help in expansion of textile and clothing products in local market and marked countries.

Keywords: Textile and Clothing Exports of Pakistan, Simultaneous Equations, Real Effective Exchange Rate, Agreement on Textile and Clothing

1. INTRODUCTION

The exports from the developing countries are considered as an important contributor to their economic growth [Lewis (1980)]. The high growth achieved by some developing countries for example Korea, Taiwan and Singapore is partially due to adoption of export promotion strategies that increased their manufacturing exports. Their successful experiences have encouraged other developing countries to adopt export-led growth policy. The empirical literature suggests that both demand and supply side factors have their role in the determination of country's exports performance. The demand of exports is determined mainly by income of trading partners and competitive position of exporting country[1] and the supply of exports by the relative prices (i.e. ratio of export price to the domestic price of the product), domestic production capacity and wage rate [Virmani (1991); Hasan and Khan (1994); Atique and Ahmad (2003); Roy (2009)]. However, the policy factors also play significant role in boosting export performance. This reveals that export performance of any country is determined by both price and non-price factors.

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Authors' Note: The errors and omissions are authors' sole responsibility.

[1]It is represented by export price relative to the competitor's price [Riedel (1988)] and also to the world price [Hasan and Khan (1994)].

The current study has selected textile and clothing sector to analyse determinants of exports as it is the major industrial sector of Pakistan. It contributes around 46 percent in manufacturing output, accounts about 60 percent to export earnings and absorb approximately 39 percent of manufacturing labour force [*Economic Survey of Pakistan* (2012-13)]. Textile and clothing industries of Pakistan produce all types of products ranging from raw material processing (cotton yarn and other products) to the finished products (cloths, carpets and other industrial textile). Textile sector supplies major input (cotton) to clothing industry, furniture and car industries. Pakistan's climate is suitable for the production of important inputs (cotton and wool) for textile and clothing industry. Pakistan has been involved traditionally in the production and trade of raw material during early stages and was unable to take advantage of using these inputs in production of value added products. Although textile and clothing sector of Pakistan is very important at national level but its share in world exports is very small. Trade in textile and clothing sector has been subject to quota restrictions from importing countries (EU and USA etc) during period 1974-1994 in the form of bilateral trade agreement Multi Fiber Agreement (MFA) and then Agreement on Textile and Clothing (ATC).[2] Due to the devastating effects of restriction of MFA, it was decided in Uruguay Round (UR) 1994 to bring trade in textile and clothing sector under General Agreement on Tariffs and Trade (GATT) rules. ATC replaced MFA on January 1, 1995 and trade in textile and clothing sector started functioning under World Trade Organisation (WTO) agreement. Member countries were given ten years period to integrate textile and clothing trade in four phases to remove non-tariff restriction and to adjust for new phase of trade. ATC also focused on the removal of other non-MFA barriers that were not acceptable by the general GATT rules. This fact highlights the need to see the impact of removal of quota restrictions on the exports of textile and clothing in case of Pakistan.

The other motivation to undertake this study is that a change in the structure of textile and clothing trade have occurred during last few years which significantly influenced the magnitude and structure of textile and clothing industry and exports. This includes change in the consumers' expenditures pattern, decrease in protection in international market and increased share of developing countries in the world textile and clothing exports. Therefore, proper understanding of demand and supply side determinants of this important sector is required. As suggested in the literature both the demand and supply side determinants are equally important in explaining a country's export performance [Reidel, *et al.* (1988); Roy (1991, 2002) etc.]. However, there is no consensus of views available which could determine the relative importance of demand and supply side factors for developing countries like Pakistan. In addition, most of the studies have focused on aggregate exports whereas it is more beneficial to highlight the factors that determine sector wise export performance. This encourages to estimate factors that affect the demand and supply of the textile and clothing exports of Pakistan that is major contributor (more than 60 percent) in total exports. Further, simultaneous equations model have been specified to incorporate endogeniety problem for textile and clothing exports demand and supply. Seven major trading partners (US, UK, Canada, Italy, France, Japan and Spain) are selected for the analysis of disintegrated textile and clothing exports. Another contribution of this study is addition of dummy variable to

[2]See Textile Vision 2005 for further details.

examine the impact of removal of MFA restrictions on textile and clothing exports growth.

The main objective is to analyse the impact of demand and supply side determinants on textile and clothing exports of Pakistan.[3] The study also evaluates the relative importance of demand and supply side factors in export performance of textile and clothing products. The study examines that real devaluation of domestic currency as compared to other competitors' currency helps to accelerate exports performance in Pakistan textile exports or not. The study also investigates that whether the removal of MFA restrictions encourages domestic suppliers to expand their exports supply or not. The advantage of using GMM is that it takes into account the endogeneity problem present in the model and provides consistent estimates. Lag explanatory variables are used as instruments. Small sample sizes raise the possibility of getting biased and imprecise estimates with classical estimation techniques. This leads to use Empirical Bayesian technique that generates more efficient and precise estimates by adding valid information in the form of prior knowledge about the form of density.

The study is organised as follows. After the introduction, a brief overview of textile and clothing sector is presented in section two. Sections three presents the relevant literature for the exports determinant. Methodology and data sources are discussed in section four. The discussion and analysis of the results are given in section five and last section concludes the study.

2. SOME SALIENT FEATURES OF PAKISTAN'S TEXTILE EXPORTS

The textile and clothing sector is a major contributor to the growth of Pakistan's economy. Table 2.1 shows that the share of the textile sector (67.39 percent) is greater than the clothing sector (32.60 percent) in the total exports of Pakistan. However, the pattern in world textile and clothing exports is different. The share of clothing in exports is greater at 60.05 percent compared to textiles at 39.94 percent.

Table 2.1

Textile and Clothing Exports 2013

US$ billion

	World	% Share	Pakistan	% Share
Textile	306.0	39.94	9.3	67.39
Clothing	360.0	60.05	4.5	32.60
Total	766.0		13.8	

Source: Pakistan Economic Survey 2014-15.

Table 2.2 illustrate that Pakistan is facing major competition from China with share in world exports of 15.63 percent in 2001 increasing to 37.41 percent in 2014. Whereas share of Pakistan in the world's textile and clothing exports has increased from 1.95 percent in 2001 to 2.15 percent in 2005. Afterwards, its share in world market starts declining to 1.76 percent in 2014.

[3]The work in progress was published as working paper [Latif and Javid (2013)].

Table 2.2

Comparison of Pakistan's Textile and Clothing Exports with Asia

US$ million

Countries / Years	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
World	342226	358082	406173	454850	481882	529197	587133	613841	528384	606946	713421	703087	763748	797355
Bangladesh	5238	5314	6067	6893	7595	9812	9739	12762	12778	16118	21112	21422	25762	26945
Share in World Exports (%)	1.48	1.49	1.52	1.58	1.85	1.66	2.08	2.42	2.66	2.96	3.05	3.37	3.38	1.48
China	53475	61864	78961	95284	115213	144057	171552	185772	167088	206691	248185	255052	283982	298269
Share in World Exports (%)	15.63	17.28	19.44	20.95	23.91	27.22	29.22	30.26	31.62	34.05	34.79	36.28	37.18	37.41
India	11011	11645	12750	14332	17070	18444	19547	21340	21116	24062	30012	29276	32959	36082
Share in World Exports (%)	3.22	3.25	3.14	3.15	3.54	3.49	3.33	3.48	4.00	3.96	4.21	4.16	4.32	4.53
Pakistan	6661	7018	8521	9151	10691	11376	11177	11092	9867	11778	13632	12919	13890	14068
Share in World Exports (%)	1.95	1.96	2.10	2.01	2.22	2.15	1.90	1.81	1.87	1.94	1.91	1.84	1.82	1.76

Source: World Trade Organisation (WTO).

The percentage share and growth rate of major textile and clothing export categories with respect to total exports (1972-2010) are reported in Table 2.3. Share and growth rate of raw cotton has showed decreasing trend over review period. The exports of readymade garments have continuously increased over the last four decades and have 19.04 percent contribution in total exports. Other categories shows mixed trend in percentage share and growth rate.

Table 2.3

Concentration of Exports[4]

	1972-1980		1981-1990		1991-2000		2001-08	
	%Share	Growth	% Share	Growth	% Share	Growth	% Share	Growth
Raw Cotton	8.76	23.03	12.80	8.35	3.00	-6.06	0.51	-11.81
Cotton Waste	0.19	-4.83	0.26	304.21	0.67	5.03	0.31	1.08
Cotton Yarn	12.53	0.62	10.71	77.40	16.60	10.80	8.79	3.65
Cotton Thread	0.42	14.01	0.20	-3.56	0.04	-1.31	0.01	74.79
Cotton Cloth	12.99	11.72	10.67	40.20	13.50	27.34	12.22	13.57
Synthetic Textile	0.49	-0.65	3.60	25.81	6.57	20.35	3.41	-2.51
Readymade Garments	2.27	81.70	7.99	182.49	16.66	36.00	19.04	13.11

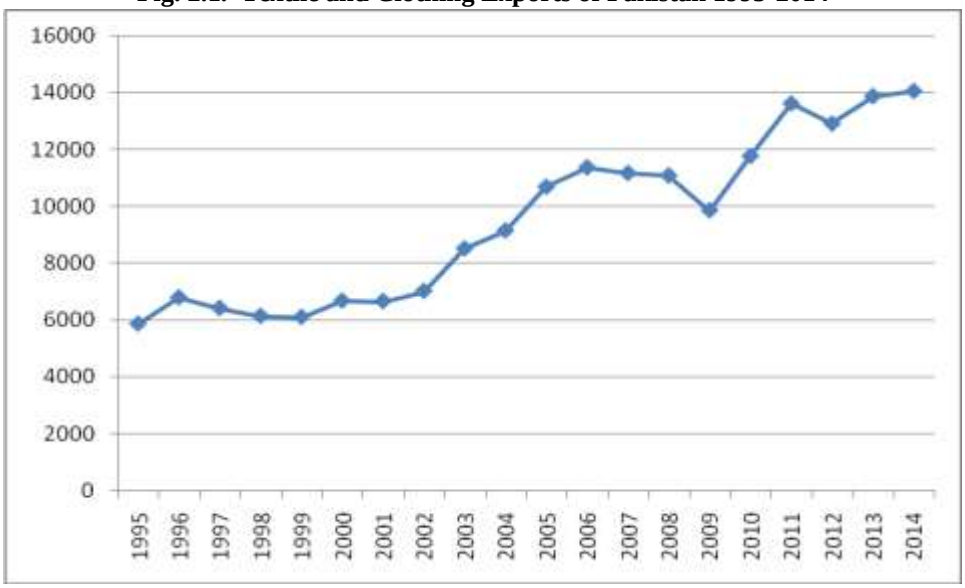
Source: Statistical Supplement and Economic survey of Pakistan.

The textile and clothing exports from developing countries remained constrained by the Multi-Fibre Agreement (MFA) from 1974-94 whose main purpose was to protect the textile and clothing industries of the developed countries. Pakistan's major buyers (EU and USA) imposed quota restriction on 15 and 39 categories respectively [Textile Vision (2005)]. It was expected that the removal of quantitative restrictions would bring significant improvement in textile and clothing exports of Pakistan [Khan and Mahmood (1996), Ingco and Winters (1995) and Trela and Whalley (1990)]. But there was no significant improvement even after 19 years of the quota abolishing regime. It is obvious that only those countries will survive in the post quota regimes which can perform well in the presence of quantitative restrictions such as China [Malik (2000)]. The analysis of

[4]Due to the problem of data availability in similar pattern for 1972-2010, this table consists of few components not all textile exports categories.

data given in Table 2.3 and Figure 2.1 shows that the decision to end non-tariff barriers has not been very beneficial for Pakistan in the face of tough competition from other developing countries. One of the reason of negative effect might be due to the fact that some of the units have shifted to Bangladesh.

Fig. 2.1. Textile and Clothing Exports of Pakistan 1995-2014



Source: WTO.

Fig. 2.2. Share of Textile Exports of Pakistan in Different Periods

(During the specified period, share of textile exports in total exports is more than 50 percent, any change in textile exports bring change in total exports. Because of data limitations, study use relative prices of exports as a proxy for relative prices of textile exports.)

The principal buyers of textile and clothing exports of Pakistan in two fiscal years 2007-08 and 2008-09 are discussed in Table 2.4. The major share of Pakistan's textile goods was exported to USA followed by UK during the last two fiscal years. The share of the remaining countries has either decreased or has been constant which clearly shows Pakistan's inability to expand its textile exports more than 50 percent of which remains tied to five countries only.

Table 2.4

Principal Buyers of Textile and Clothing Exports from Pakistan

US$ Million

	2007-08 (Textile and Clothing Exports)		2008-09 (Textile and Clothing Exports)	
Countries	Value	Percentage in Total	Value	Percentage in Total
USA	3,303,455	31.2	2,925,545	30.6
UK	783,749	7.4	678,592	7.1
GERMANY	598,549	5.7	547,440	5.7
CHINA	368,437	3.5	457,414	4.8
ITALY	471,616	4.5	385,168	4
BANGLADESH	255,319	2.4	334,342	3.5
SPAIN	422,085	4	327,980	3.4
UAE	379,852	3.6	324,872	3.4
BELGIUM	319,601	3	321,600	3.4
TURKEY	331,915	3.1	304,380	3.2
NETHERLANDS	352,777	3.3	293,778	3.41
HONG KONG	397,900	3.8	282,674	3
FRANCE	260,659	2.5	228,946	2.4
SAUDI ARABIA	135,919	1.3	169,618	1.8
SOUTH AFRICA	200,604	1.9	136,218	1.4
CANADA	149,197	1.4	132,530	1.4
PORTUGAL	150,139	1.4	113,480	1.2
SRI LANKA	127,023	1.2	105,405	1.1
SOUTH KOREA	91,041	0.9	91,182	1
AUSTRALIA	95,123	0.9	84,768	0.9
REST WORLD	1,376,857	13	1,318,458	13.8
TOTAL	10,571,817	100	9,564,390	100

Source: APTMA.

3. LITERATURE REVIEW

A large body of empirical literature has already analysed the factors upon which demand and supply of export depends. After the inception of World Trade Organisations (WTO) that interest for academicians, world market researchers and policy makers. In this section, a brief review of some of the relevant analysis in the same area is presented.

Earlier Less Developing Countries (LDCs) mainly exported primary goods to developed countries and these exports promote growth in these counties. Empirical evidence has shown that value addition is necessary to get the policy of devaluation of currency fails to improve the trade balance in LDCs on the one hand [Lewis (1980); Riedel (1988)]. On the other hand the policy shift from import substitution strategies to

the exports growth strategies has led to reduce the reliance on primary goods exports and increase in share of manufacturing exports. As a result the competitive position of LDCs has also changed. However, more reliance on markets in developed countries for exports growth is still an important issue that needs to be addressed. The manufacturing export growth of LDCs is more than proportionate to the economic growth in the developed countries, which clearly indicates that the growth is also dependent upon the supply side factors [Riedel (1984)].

As regards the literature on export demand, it is believed that the demand for export from lower developing countries is not only highly income elastic but also low price elastic. Studies on emerging economies (Hong Kong, Singapore and South Korea) have found contradictory results to this view [Riedel (1988)]. The income of trading partners is expected to have positive impact on the performance of exports. For analysis different parameters have been used in literature to represent the world demand.[5] Riedel (1988) finds low income elasticity of export demand for agriculture and non-agricultural exports demand of Hong Kong having large share in world market, and variation in the economic activity in the world market has minor effect on performance of exports. The developing countries can maintain their export growth in the world markets on the bases of prices, resources and healthier domestic economic conditions [Malik (2000)].

Vermani (1991) has reported less elastic coefficient of world exports for India, Narayan and Narayan (2004) for Fiji and Hassan and Khan (1994) for Pakistan primary exports. Although demand for primary goods is predictable but increase in economic activity in trading partners cannot bring significant improvement in exports of these commodities. Mustafa and Nishat (2004) find positive relationship between income of India, Malaysia, New Zealand, UK, US and exports of Pakistan, whereas, negative relationship exists between similar variables for other trading partners like Australia, Bangladesh and Singapore. It reflects that exports of Pakistan are considered inferior in later countries. There are some studies that find more income elastic export demands. Goldstein and Khan (1978) find exports of seven developed countries out of total eight are more elastic to change as compared to the income of rest of the world, whereas, income elasticity of exports demand for US is found to be less than unity.

Roy (1991, 2002, 2007) show world income has an important role in determination of exports growth for Bangladesh and India. Goldar (1989) shows that positive change in the income of importing countries tends to accelerate growth of India's engineering exports. Vermani (1991) has also found similar results for manufacturing exports demand of India in short-run and long-run processes. Rijesh (2007) has used world exports of capital goods to represent world demand for Indian machine tools and find similar results like the above mentioned studies. The relationship of the world demand to exports of Pakistan with different measures for world demand is found positive; Hassan and Khan (1994) use world GDP index; Akhtar and Malik (2000) income of four trading partners in comparison studies; Atique and Ahmed (2003) index of industrial production; Aurangzeb et al (2005) adjusted GDP with the index of industrial production of trade partners and Zada (2012) use GDP of ten trading partners for analysis.

The domestic prices of exports, as compared to the index of export prices of different exporting countries is used to show the competitive position of the country

[5]World exports, world GDP, weighted average of trading partners real income and world imports etc.

among other suppliers. Arize (1999) documents that increase in competitors' price has significant positive influence on exports growth of Singapore because her exports are good substitute to competitor's exports. Naryan and Naryan (2004) report similar results for competitor's exports price from Fiji. Zada (2012) finds negative relationship between own-price and exports growth for group of ten trading partners. Real Effective Exchange Rate has also been used in literature to represent competitive position of the country. The devaluation of currency proves that an effective policy measure to increase the production of tradable goods and to accelerate export performance is required. Developing countries like Bangladesh have already adopted this policy measures to liberalise and improve exports growth. The depreciation of currency also reduces anti export bias and provides incentives to the export to be more competitive in the world market [Hassan and Khan (1994); Ahmed (2000)].

Arize (1999) has deduced that exchange rate policy has an effective role in export growth of Singapore, Goldar (1989), Vermani (1991), Roy (2002) and Rijesh (2007) for India and Roy (1991) for Bangladesh exports. According to Hassan and Khan (1994) and Akhtar and Malik (2000) devaluation plays an important role to boost export growth of Pakistan for both primary and manufactured goods. Other view is that exchange rate adjustment policy cannot help to improve export growth in case of low price elasticity of export demand. Other non-price factors affecting the market also play an important role in improvement of exports growth for example by introducing new items in international market and by supplying high quality fashion products [Malik (2000); Akhtar and Malik (2000)]. According to the Vermani (1991), depreciation is not helpful in increasing primary exports of India and Malik (2000) and Atique and Ahmed (2003) for Pakistan's textile export. Aurangzeb, *et al.* (2005) reveal that exchange rate adjustment policy adversely affects the export growth.

For a long time, the literature has been presented on export performance majorly focusing on the single equation export demand model by considering export supply infinite elastic [Houthakker and Magee (1969)]. Later on, it appears that supply side factors also play important role in export growth, ignoring these factors generates spurious results. Non-price factors on supply side play crucial role in the improvement of comparative advantage in all sectors including textile and clothing. Role of supply side is stronger than the demand side in the product diversification [Riedel (1988); Goldar (1989); Malik (2000)].

The rise in exports price more than that of the domestic price leads to boost exports supply. Therefore, relative prices are important determinants of exports supply. Goldstein and Khan (1978), Lundborg (1981), Ahmed (2000) Havrila and Gunawardana (2006), Roy (2002) and Rijesh (2007) find that the relative prices have significant and positive impact on growth of textile exports. Atique and Ahmed (2003) report that relative price is not very important determinant for exports supply of Pakistan. Some other studies have revealed positive and significant impact of domestic capacity on exports supply. Hassan and Khan (1994) and Atique and Ahmad (2003) have used GDP of Pakistan for domestic capacity and find that it is very effective measure to accelerate manufacturing exports. Alternatively, Roy (2002) Roy (2007), Havrila and Gunawardana (2006), The cost of production is captured by different variables in supply equation for example wage rate, unit labour cost and import of inputs [Muscatelli, *et al.* (1992);

Atique and Ahmed (2003) and Zada (2012)]. According to Muscatelli, *et al.* (1992), unit labour cost played important role to boost exports supply of Hong Kong. Atique and Ahmed (2003) predict that decrease in wage rate and increase in production capacity together can improve exports supply from Pakistan. Amzonas and Barros (1993) also find similar estimates by using domestic real wage for the manufacturing exports supply of Brazil.

The above review of previous studies suggests it would be interesting to find the relative importance of demand and supply side factors in determination of textile and clothing exports for Pakistan. Textile and clothing sector has a major contribution in total exports, therefore, to improve exports potential, more margin exists in this sector. No study has provided comprehensive methodology and detailed analysis of this sector. Purpose of this study is to fill this gap and to provide in-depth analysis for the most important textile and clothing sector of Pakistan.

4. METHODOLOGY AND DATA

The present study has adopted the methodology to specify the export demand and supply side equations simultaneously following Goldstein and Khan (1978) and Muscatelli, *et al.* (1992). The domestically produced goods and imported foreign goods are assumed to be imperfect substitutes of each other in this model. Under the imperfect substitute model, the exports demand is assumed to be depending on the relative prices and income levels of the trading partners [Lundborg (1981); Goldstein and Khan (1978) and Abbott and Vita (2002)]. The textile and clothing exports demand is specified in log linear functional form as:

$$TCX_t^d = \alpha_0 + \alpha_1 REER_t + \alpha_2 WGDP_t + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4.1)$$

Where TCX^d in Equation (4.1) represents demand for textile and clothing exports of Pakistan. *WGDP* is defined as GDP of the trading partners, represents foreign demand for the exports. *REER* is the export weighted Real Effective Exchange Rate[6] and it is used to capture the competitive position of Pakistan [Hassan and Khan (1994); Malik (2000); Atique and Ahmed (2003); Ahmed (2000); Roy (2009)]. The elasticity of textile and clothing export demand with respect to REER is expected to be negative because the devaluation of domestic currency as compared to foreign currency will make the textile and clothing exports cheaper in the world market. The elasticity of textile and clothing export demand with respect to world demand is expected to be positive. The economic condition of trading partners is also an important determinant of textile and clothing exports and this study uses GDP of the trading partners as proxy for economic activity of the world. This will show growth in the economy of trading partners and absorption of the textile and clothing products of Pakistan in these economies.

The export supply function is specified with logarithmic transformation as follows.

$$TCX_t^s = \beta_0 + \beta_1 RP_t + \beta_2 WG_t + \beta_3 GDP_t + \beta_4 D + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad (4.2)$$

[6]Different studies used different exchange rate (nominal and real), in this study REER is used because it includes exports weights with partners and calculation of REER is given in appendix.

Where TCX^s in Equation (4.2) represents textile and clothing exports supply, *RP* is the relative price of textile exports (UVI_{pak}/CPI_{pak} unit value index of exports of Pakistan divided by consumer price index). *WG* is the domestic real wage in the textile sector. It is used as a proxy for the cost of production in the textile sector [Muscatelli, *et al.* (1992); Amazonas and Barros (1993); Atique and Ahmed (2003)]. GDP of Pakistan is used as proxy for domestic production capacity of the economy and D is the dummy variable that captures the effect of the removal of bilateral trade restriction from 1994.[7]

The elasticity of relative price is expected to be positive in the supply equation of the textile and clothing exports. The high exports prices relative to the domestic price of products will lead to increase the benefits of selling in foreign markets. Due to data constraints, the relative prices of total exports are used as a proxy for the textile and clothing exports price and the share of textile and clothing exports is more than 50 percent of total exports during specified period. Share of textile and clothing exports was increased to 70-80 percent during the period 1992-2002. Therefore, any significant change in textile and clothing exports will bring larger change in total exports. Due to this, in the study the relative prices of exports are used as a proxy for the relative price of textile and clothing exports. The relative prices are represented by the unit value of exports to the domestic prices (Consumer Price Index (CPI)), base year for both indices is 2000. Following Goldstein and Khan (1985), Atique and Ahmad (2000) CPI is used here to represent domestic prices.[8]

Nominal wages of textile sector deflated by CPI of Pakistan represent the cost of production of textile and clothing exports. Pakistan is a developing country and most of the production activities are taken place in unorganised mill sector using labour intensive techniques. Especially, in clothing where sewing cannot be processed without labour. Muscatelli, *et al.* (1992), use index of nominal wage of manufacturing, Atique and Ahmad (2003) take wage rate per worker to represent cost of production for Pakistan's exports. GDP represents the economic position of exporting country and .GDP is expected to have positive influence on the exports of textile and clothing. Hasan and Khan (1994) and other studies have also used the GDP of Pakistan as a proxy for the scale of production.[9]

Changes in policy regarding textile and clothing exports at international or national level have direct impact on its export performance. It was decided in the Uruguay Round to remove quota restrictions under ATC in four phases (1st Jan. 1995, 1st Jan 1998, 1st Jan 2002 and 1st Jan 2005). It was expected that larger market access will provide incentive for domestic producers to increase level of production. Therefore, dummy variable D has been introduced in the textile and clothing exports supply equation to check influence of this trade policy. D is assigned zero for period 1974-1994 and one otherwise.

There are two endogenous variables in the demand and supply equations. One is textile and clothing exports and other is domestic prices and to handle endogeniety

[7]Dummy is introduced in supply side equation instead of demand side equation because only USA and EU impose restrictions and manufacturers were producing under the pressure of trade restrictions.

[8]Muscatelli (1992), Akhtar and Malik (2000), Roy (2009), and Zada (2012) have used the Whole Sale Price Index (WPI).

[9]Ahmad (2000) have used Predicted values of real GDP, Virmani (1991) and Akhtar and Malik (2000) have used real GDP.

Equations (1) and (2) are estimated simultaneously, assuming textile and clothing exports demand and supply equal to total exports. The instrumental variable technique Generalised Method of Moment (GMM) is employed.[10] The sample size is not quite large, therefore, for more consistency and precision Empirical Bayesian technique is used to estimate system of equations. Additional information in the form of prior density is used in the model that helps in acquiring precise and proper estimates. Hence, Empirical Bayes is believed to provide better results in the case of small sample [Casella (1985) and Casella (1992)].

4.1. Data Description and Sample Size

Annual data has been used for the period 1972-2013 for seven trading partners. Selected countries for the sample are United States, United Kingdom, Canada, Italy, France, Japan and Spain. The country selection criteria is more than 1 percent share in Pakistan's exports. The data for GDP has been taken from the World Development Indicators (WDI). The Data for exports prices, CPI and exchange rate has been taken from International Financial Statistics (IFS). The data for textile wage rate has been taken from the International Labour Organisation (ILO). The data for textile and clothing exports have been taken from United Nations Commodity Trade Statistics Database (UN COMTRADE). Data from the UN COMTRADE is extracted according to SITC Rev. 1.

5. EMPIRICAL RESULTS

The demand and supply equations of exports are estimated simultaneously by Generalised Method of Moments and lag of independent variables is used as instruments. For more precision Empirical Bayes estimates are also applied.

GMM estimates using lag explanatory variables as instruments for the demand of textile and clothing exports are given in Table 5.1. The results for Gross Domestic Product show that growth in the trading partners' income has the expected positive and significant impact on Pakistan's exports' demand which is elastic with respect to the trading partners' GDP in all cases except for Japan, UK, and USA. The lowest value of income elasticity is for UK i.e. 0.84 while the highest is for Spain i.e. 1.91. Therefore, the result indicates that improvement in world economic conditions will help to boost textile and clothing exports of Pakistan. These results are confirmed by the findings of Goldar (1989), Hasan and khan (1994), Akhtar and Malik (2000), Atique and Ahmad (2003) and Auragzeb et al (2005) Rijesh (2007) Zada (2012) indicating that increase in income of trading partners leads to increase textile and clothing exports of Pakistan. The textile and clothing exports demand is found to be much responsive to Real Effective Exchange Rate indicating that the real devaluation of Pakistan currency leads to increase in the textile and clothing exports demand. The Real Effective Exchange Rate depicts variation in real exchange rate. Textile and clothing exports' demand is quite responsive to REER. The estimated coefficients for Spain, UK and US are greater than unity, while the rest are less than unity. Coefficients across the countries appear to have their expected positive signs ranging

[10]Lags of independent variables are used as instruments.

from 0.71 to 1.37. The impact of REER is larger for Spain i.e. 1.37 percent followed by UK 1.18 percent; the lowest is 0.71 percent for Japan. The REER elasticity of textile and clothing exports' demand is 1.11 percent for USA, 0.96 percent for Canada and 0.88 percent for Italy and 0.86 percent for France. The positive sign of devaluation coefficient reflects improvement in the competitiveness of our textile and clothing exports. The positive and significant coefficient indicates that real devaluation of Pakistan rupee against all trading partner's currencies leads to increase in textile and clothing demand from Pakistan. The results indicate that the real devaluation of rupee is very helpful in increasing the textile and clothing exports. The significant and large coefficient of REER is also reported by Goldar (1989) for India. The study finds devaluation an effective measure to boost engineering exports demand from India. Virmani (1991) also finds manufacturing exports demand for India relatively more responsive to devaluation. Ahmad (2000) has observed the exports' performance of Bangladesh and has reported that real devaluation of domestic currency leads to increase in the competitiveness of exports. It can be noted that their estimates are very close to our estimates i.e. 0.96. Contrary to the findings of the present study, Atique and Ahmad (2003) find significant and small elasticity of devaluation for Pakistan's exports demand, the size of the coefficient is 0.39. In a similar way, Malik (2000) finds devaluation insignificant and less effective to increase textile exports demand from Pakistan. The textile and clothing exports' demand from Pakistan is elastic to change in prices; therefore, price effects have strong and important role in boosting the exports' demand.

Table 5.1

Results of Determinants of Demand of Textile and Clothing Exports by GMM

$$TCX_t^d = \alpha_0 + \alpha_1 REER_t + \alpha_2 WGDP_t + \varepsilon_t$$

Trading Partners	Constant	Real Effective Exchange Rate	WGDP	R^2
USA	-4.67	1.11	0.93	0.95
	(3.05)*	(2.48) **	(3.39) *	
UK	-3.55	1.18	0.84	0.86
	(6.83)*	(2.49)	(6.44)* *	
Canada	-4.35	0.96	1.09	0.93
	(6.50) *	(6.63) *	(9.58) *	
Italy	-2.73	0.88	1.23	0.93
	(1.53)	(2.27)**	(9.48) *	
France	-4.13	0.86	1.08	0.94
	(3.87)*	(3.79)	(7.15)*	
Japan	-2.63	0.71	0.93	0.96
	(6.83)*	(3.83)*	(9.44) *	
Spain	-5.24	1.37	1.91	0.96
	(1.01)	(2.78) *	(2.51)**	

Note: The t-ratios are given in parenthesis, (*), (**) and (***) represents 1 percent, 5 percent and 10 percent significance respectively.

Table 5.2

Results of Determinants of Supply of Textile and Clothing Exports by GMM

$$TCX_t^s = \beta_0 + \beta_1 RP_t + \beta_2 WG_t + \beta_3 GDP_t + \beta_4 D + \varepsilon_t$$

Trading Partners	*Constant*	Relative Price of Textile Exports	Domestic Wage	Domestic GDP	Dummy for Removal of MFA Restriction	R^2
USA	–2.41	4.41	–0.60	1.07	–0.21	
	(1.24)	(2.06)**	(1.82)***	(2.59)**	(0.82)	0.69
UK	–2.49	5.31	–0.06	1.05	–0.15	
	(–1.46)	(1.82) ***	(0.15)	(2.79) *	(0.35)	0.79
Canada	–2.52	4.23	–0.86	0.96	–0.58	0.78
	(–2.46) **	(2.12) **	(1.77)***	(4.27) *	(–1.98) **	
Italy	–2.48	7.43	–0.35	0.98	–0.10	0.91
	(1.16) *	(2.74) **	(0.63)	(2.13)* *	(0.25)	
France	–1.52	4.01	–0.03	0.72	0.02	0.78
	(1.81)***	(5.69) *	(0.14)	(4.02)*	(0.15)	
Japan	–1.64	5.53	–0.46	0.91	–1.16	0.37
	(0.69)	(4.66) *	(0.62)	(1.80) ***	(2.80)**	
Spain	–3.82	2.19	–1.48	1.01	0.29	0.77
	(–2.01) ***	(1.18)	(1.90) ***	(2.38) **	(0.50)	

Note: t-ratios are given in parenthesis, (*), (**), and (***) represents 1 percent, 5 percent and 10 percent significance.

The GMM estimates for the supply side equation of the textile and clothing exports are given in Table 5.2. Relative prices have expected positive and significant influence on the textile and clothing exports to all trading partners except for Spain where they are more responsive to change in real devaluation on demand side than the relative prices on the supply side. The result shows that the textile and clothing exports of Pakistan are more elastic to change in relative prices across countries. The coefficient of the relative price variable is found to be greater than unity. The highest relative price elasticity is 7.43 for Italy and the lowest is 2.19 for Spain. This shows that export prices have substantial role in determining the exports supply as compared to the domestic prices of the exportable goods. Therefore, increase in export prices11 compared to domestic prices will encourage manufacturers to increase textile and clothing exports of Pakistan. Zada (2012) also found similar results. Goldstein and Khan (1987) have examined exports supply elasticities with respect to relative price for seven European countries. Havrila and Gunawardana (2006) have estimated the relative price elasticity for textile exports supply of Australia and report long run elasticity of 1.83.

Textile and clothing exports seem less responsive to change in real wages. It shows that decrease in real wage of textile sector without increasing productive capacity cannot improve performance of the same sector. The negative sign of wage variable reflects that due to high wages the textile and cotton industry is adversely affected. This effect might also account for the movement of this export industry to other countries, however, coefficients for US, Canada and Spain are found significant at 10 percent and

Atique and Ahmad (2003) have come up with the same results. The size of the estimated coefficient is also small and this result implies that though the supply of Pakistan's textile and clothing exports increases with decrease in real wages but it is not very responsive. It shows that decrease in real wages in the textile sector without corresponding increase in productive capacity cannot improve the performance of the same sector. It means cuts in real wage are not effective in boosting textile and clothing exports.

Few estimates of exports supply elasticity with respect to real wages are available in literature to compare the results of this study with. Muscatelli, *et al.* (1992) have used the index of nominal wage of manufacturing sector and estimated relatively large response of –1.48 for Hong Kong. Atique and Ahmad (2003) have used wage rate per worker as a proxy for the cost of production.

They have obtained significant and negative exports supply (for Pakistan) response with respect to wages of –0.70. This is very close to our results. Amazonas and Barros (1993) report negative and significant response of Brazilian manufacturing exports to change in real wage of –0.83.

The GDP of Pakistan are employed to explain the production capacity of the domestic economy. This variable has the expected positive and significant impact on exports to all trading partners. The range of elasticity is 0.72 (lowest) for France and 1.07 (highest) for USA. The results show that GDP is an important determinant of this sector's exports supply for Pakistan. Growth in domestic economy will encourage manufacturers to produce and export textiles and clothing products. Virmani (1991) reports significant and positive relationship between GDP (manufacturing) and export supply of manufacturing product for India, where the magnitude of coefficient is 0.75. In the same way, Atique and Ahmad (2003) have computed income elasticity of exports supply for Pakistan and have found significant and positive coefficient of 3.67. Zada (2012) finds significant and positive income elasticity of exports supply for 11 trading partners, where the range of the coefficient is from 0.02 to 0.36. The estimated coefficient of the dummy variable has an unexpected negative sign for six out of eight trading partners. All coefficients are insignificant except for Canada and Japan and these estimates are small except for Japan. The response of Pakistan's textile and clothing exports supply to the liberalisation agreement (ATC) is not according to expectation. The trade in textile and clothing sector was supposed to operate freely after 2005, but results reveal a different story and indicate that trade liberalisation is unable to boost the exports supply and may even worsen the performance. There are other hurdles which lead to low textile and clothing exports performance;

(i) After removal of quantitative restriction, Pakistan has to face strict competition from
(ii) countries like China, South Korea and India in the form of quality and price;
(iii) supply side deficiencies i.e. technological backwardness and lack of skilled labour force are responsible for less productive capacity. From policy point of view appropriate steps were not taken to benefit from the abolition of the quota restrictions regime.

Empirical Bayes is applied that gives consistent estimates as compare to GMM for small sample size. Improvement in the Empirical Bayes estimates over GMM estimates is

because of addition of prior information in the model. Empirical Bayes estimates for the textile and clothing exports demand are reported in Table 5.3. The results shows that improvement in the world economic conditions will help to boost textile and clothing exports of Pakistan. There is less variation in income coefficient across countries as compare to GMM counterpart. Goldstein and Khan (1978), Virmani (1991), Muscatelli *et al.* (1992), Rijesh (2007) find positive and significant income elasticity of exports demand that are in confirmation with these results. Textile and clothing exports demand elasticities with respect to the REER range from 0.85 to 0.91 which is in confirmation with Akhtar and Malik (2000). The results indicate that real devaluation of rupee is very helpful in increasing the textile and clothing exports therefore, price and non-price factors i.e. product diversification and improvement in quality are equally important.

Table 5.3

Determinants of Demand of Textile and Clothing Exports by Empirical Bayes

$$TCX_t^d = \alpha_0 + \alpha_1 REER_t + \alpha_2 WGDP_t + \varepsilon_t$$

Trading Partners	Constant	Real Effective Exchange Rate	WGDP
USA	-3.26	0.89	1.02
	(-12.18)*	(9.49) *	(19.49) *
UK	-3.31	0.90	0.99
	(13.93)	(9.78) *	(19.07) *
Canada	-3.40	0.91	1.03
	(13.70)	(11.56) **	(18.51) *
Italy	-3.24	0.89	1.05
	(12.25)	(9.74) *	(21.42) *
France	-3.30	0.89	1.02
	(12.73)	(10.20) **	(20.54) *
Japan	-3.05	0.85	1.01
	(13.88)	(10.18) ***	(21.43) *
Spain	-3.26	0.91	1.02
	(12.19)	(9.83) **	(19.39) *

Note: t-ratios are given in parenthesis, (*), (**) and (***) represents 1 percent, 5 percent and 10 percent significance.

Table 5.4 shows the results of Empirical Bayes estimates for textile and clothing exports supply of Pakistan. Improvement in the precision of these estimates over GMM estimates is noticeable. Result shows that our textile and clothing exports of Pakistan are more elastic to change in relative prices across countries and that impact of relative prices on textile and clothing exports supply is almost similar for all trading partners. Therefore, increase in exports prices[11] as compare to domestic prices will encourage manufacturers to increase textile and clothing exports of Pakistan. The supply of Pakistan's textile and clothing exports increases with decrease in real wage. Muscatelli, *et al.* (1992), Atique and

[11]Exports price is used as a proxy for textile and clothing exports, see relative prices in explanation of variables for more details.

Ahmad (2003) and Amazonas and Barros (1993) come up with similar findings. GDP has expected positive relationship with textile and clothing exports supply of Pakistan. Results show that GDP is an important determinant of textile and clothing exports supply for Pakistan and difference in elasticities across counties is fairly small as compare to GMM estimates. Virmani (1991), Atique and Ahmad (2003) results are in line with these findings.

Table 5.4

Determinants of Supply of Textile and Clothing Exports by Empirical Bayes

$$TCX_t^S = \beta_0 + \beta_1 RP_t + \beta_2 WG_t + \beta_3 GDP_t + \beta_4 D + \varepsilon_t$$

Trading Partners	Constant	Relative Price of Textile Exports	Domestic Wage	Domestic GDP	Dummy for Removal of MFA Restriction
	–2.51	5.47	–0.42	0.97	–0.36
USA	(–4.01) *	(11.79) *	(1.99) **	(7.19) *	(2.96) **
	–2.51	5.65	–0.32	0.97	–0.37
UK	(–4.18) *	(11.38) *	(–1.65) ***	(7.52) *	(–2.91) **
	–2.52	5.58	–0.48	0.96	–0.42
Canada	(–4.62) *	(11.41) *	(–2.37) **	(8.19) *	(–3.49) *
	–2.51	6.20	–0.39	0.97	–0.34
Italy	(–4.21) *	(14.78) *	(–1.89) ***	(7.62) *	(–2.81) **
	–2.48	5.50	–0.39	0,95	–0.34
France	(–3.93) *	(11.49) *	(–1.77) **	(7.08) *	(–2.85) **
	–2.44	5.65	–0.41	0.96	–0.51
Japan	(–3.98) *	(11.77) *	(–1.92) **	(7.32) *	(–4.18) *
	–2.65	5.42	–0.41	0.97	–0.36
Spain	(–4.35) *	(11.15) *	(–1.90) **	(7.39) *	(–2.75) **

Note: t-ratios are given in parenthesis, (*), (**) and (***) represents 1 percent, 5 percent and 10 percent significance.

Coefficient of dummy variable is negative and significant for all countries; size of estimates is also small. Variation in estimated coefficient across countries is small as compare to GMM estimates; it lies between 0.34 and 0.51. Response of Pakistan's textile and clothing exports supply to the liberalisation agreement (ATC) is not according to expectation. It leads to the fact that removal of quantitative restriction is unable to boost textile and clothing exports supply, it even worsen the performance. There are other hurdles which lead to low textile and clothing exports performance. First, after removal of quantitative restriction, Pakistan has to face strict competition from countries i.e. China, South Korea, India in the form of quality and price. Second, supply side deficiencies i.e. technological backwardness and lack of skilled labour force are responsible for less productive capacity.

The results for the textile and clothing exports demand and supply equations are obtained by applying GMM and Empirical Bayesian techniques. The results support that both techniques almost lead to same findings. These results are in conformity with most of the earlier findings for other developing countries in general and for Pakistan in particular as mentioned in the above discussion.

6. CONCLUSIONS AND IMPLICATIONS

In the present study, the demand and supply determinants for Pakistan's textile and clothing exports are investigated for the period 1972-2013. The demand side determinants are REER and GDP of trading partners, whereas, supply side defines relative prices, real wages and GDP of Pakistan. This study finds a high income elasticity of textile and clothing exports demand and that world demand is major source of textile and clothing exports demand from Pakistan. The significant coefficient of REER indicates that devaluation of Pakistan currency with respect to the trading partner's currency is an effective measure to increase long-run textile and clothing exports growth. On the supply side, relative prices have significant impact and the rise in exports prices more than domestic prices provides incentives to the domestic producers. The real wages represent increase in cost which leads to decrease in textile and clothing exports supply. High income elasticity on the supply side indicates that domestic capacity of the economy plays important role in the textile and clothing exports supply.

Textile and clothing exports from Pakistan remained stagnant during the first five years of Agreement of Textile and Clothing (ATC) 1994-2005, after that there is positive turn and exports growth is observed [Latif and Javid (2013)]. Change in composition of textile and clothing exports from primary to manufactured products is supported by several demand and supply side factors. The findings of the present study suggest that textile and clothing exports growth rely on both demand and supply side factors. Pakistan has entered in more competitive phase after the removal of MFA restrictions through ATC. To survive in this competitive environment producers need to adopt new techniques for the production of high value added products i.e. readymade garments and cloths. Exporters should go for 'demand of market oriented strategies' by the production of high quality fashion cloths and explore new markets for exports. The results also support that devaluation is helpful in the improvement of long run textile and clothing exports because other exporters (Bangladesh and India)[12] are adopting same policy. Devaluation can be effective when combined with exports of high quality products and diversification in exports market.

On the supply side, significant and large magnitude of relative prices has important implications. Price incentives encourage domestic producers to increase exports supply. Government needs to provide infrastructure facilities and duty free imports of inputs to encourage textile and clothing producers. Spinning sector holds major share in total investment and as a result, share of cotton yarn is equally high in production and exports. There is need to focus on converting good quality yarn in the value added categories i.e. cloth and readymade garments. Organised mill sector also requires to be encouraged to produce good quality fabric.

Major share of fabrics is produced with cotton in Pakistan but demand for man-made fibre is increasing at international level. Textile and clothing producers need to increase synthetic fibre content in textile and clothing production. Emerging economies; China, Hong Kong and South Korea have achieved high growth targets in international market through relying more on domestic supply side factors. Incentives are needed to be provided to the producers in the form of low energy cost and easy capital availability, mere reduction in wage rate cannot entirely improve the production of textile and clothing.

[12]Ahmed (2000) and Roy (2003, 2007).

This study examines the determinants of overall textile and clothing exports. Components of textile and clothing (raw cotton, cotton yarn, cotton cloth, readymade garments, synthetic textile etc.) exports are not considered because of unavailability of data on each variable. For the future research, this study can be extended to by taking account of all components of textile and clothing.

APPENDIX 1

CALCULATION OF REAL EFFECTIVE EXCHANGE RATE

$$REER_{it} = \frac{\alpha_i E_{it} p_{it}^*}{p_j}$$

Here, *REER* shows the bilateral real exchange rate. *Eit* is the nominal exchange rate between country i and Pakistan currency which has been taken from various issues of Economic Survey. αi stands for trade weights and represents the share of trading partner exports in total textile and clothing exports of Pakistan. p_{it}^* is the Whole Sale Price Index of partner *I*; it is used here to represent the price of tradable commodities. *Pj* is Consumer Price Index of home country (Pakistan), it represents the price of non-tradable goods.

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Do Inflation Expectations Matter for Inflation Forecastability: Evidence from Pakistan

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We empirically investigate if the incorporation of inflation expectations helps improve the forecasting performance of a suite of univariate inflation models. Since inflation forecasts are instrumental to the conduct of an effective monetary policy, any possible improvement in the inflation forecastability may tend to enhance the effectiveness of monetary policy—by providing forward guidance both to the monetary authority and the market to effectively anchor inflation expectations. Our results are robust across specifications of our baseline models, sample sizes and forecast horizons. The introduction of inflation expectations, whether contemporaneously or with a 6-months lead improves the predictive ability—both in-sample and out-of-sample for 6 and 12-month horizons. Deterioration however is observed for a 3-month horizon, which point towards the weak representation of the expectations data for a 3-month horizon.

JEL Classification: E31, E37
Keywords: Inflation-expectations, Forecast-performance, Pakistan.

1. INTRODUCTION

In this paper we empirically examine if incorporation of the measure of inflation expectations improves forecasting performance of the suite of our baseline univariate inflation models, which are consistent with the univariate models of Kapetanios, *et al*. (2007) and Ogunc, *et al*. (2013). This investigation is important because the central banks across the globe are increasingly providing forward guidance to the public in order to enhance the effectiveness of monetary policy—as it helps efficiently anchor inflation expectations. Since the central monetary authority of the country, the State Bank of Pakistan (SBP) envisions implementation of the flexible inflation targeting as a high level goal in its strategic plan for 2016–2020, it is crucial to forecast inflation as accurately as possible. Under such a framework, accurate inflation forecasts greatly help the policy makers to formulate and conduct monetary policy effectively by successfully anchoring inflation expectations. Inflation expectations play a vital role in the forecasting models and the central banks are constantly making efforts to incorporate future expectations into a range of models to make it compatible with the theory—as the theory assumes

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rationality on part of the public. Often ample resources are advocated to supplement the forecast performance by collecting real time data on market expectations. Usually demand side surveys are conducted to collect and compile the economic expectations of various stakeholders and the resultant series are used in time series estimations for forecasting. Since the SBP and Institute of Business Administration (IBA) has recently started collecting information on market expectations through a nation-wide consumer confidence (CCS) survey from January 2012, the use of its overall inflation expectations index (IEI) may possibly improve the forecast performance of our proposed benchmark univariate inflation models.

It is pertinent to mention that although there is a huge empirical literature on Pakistan's monetary policy largely focused on exploring the determinants of inflation in Pakistan, little or no attention could be diverted to improve the inflation forecastability especially in terms of the potential role of inflation expectations.[1] To the best of our knowledge, no study in the context of Pakistan—theoretical or empirical has attempted to investigate into the role of inflation expectations either towards improvement or deterioration of inflation forecasts. For example, empirically Bokil and Schimmelpfennig (2005) attempted to give their own models that may possibly be used for forecasting inflation. They conducted their forecasting exercise based on three major models (i) the leading indicator model (LIM), (ii) ARIMA and (iii) a VAR model, and compared the results of all the three models to be able to conclude in favour of the use of one particular model for the central forecast. Bokhari and Feridun (2006) aimed at modelling various indicators of inflation such as SPI, WPI, CPI and GDP deflator through various specifications of ARIMA and VAR models for inflation forecasting. Haider and Hanif (2009) attempted to forecast inflation by using artificial neural networks (ANN) and compared its forecast performance with conventional univariate time series models. Riaz (2012) evaluated forecast efficiency of food price inflation and consumer price index by using rationality criterion of forecasts—while recently Hanif and Malik (2015) evaluated the forecast performance of different multivariate models against univariate models across low, moderate and high inflation regimes.

Unlike the work cited above, in the current paper, we specifically try to explore if the inclusion of inflation expectations into the set of our univariate inflation models improve their in-sample and out-of-sample predictive ability for three different shot-term horizons. For this purpose we first introduce a set of univariate baseline inflation models and try to determine the improvement (or deterioration) in the forecasting performance of these models in two steps. In the first step, we estimate these univariate models and observe their in-sample and out-of-sample forecasting performance over three short-term scenarios of 3, 6 and 12 months through the Root Mean Square Error (RMSE).[2] The

[1]See for example, Serfraz and Anwar (2009); Haider and Khan (2007); Khan and Gill (2007); Chaudhary and Ahmad (1996) and Ahmad and Ram (1991) among others.

[2]Forecast-assessment tests can broadly be categorised as the tests of forecast accuracy and the tests of forecast rationality namely weak, sufficient, strong and strict rationality. In the former case normally the distance between the forecasts and the outturns is taken into account while in the latter case the assessment is made on the basis whether the forecast errors are zero [Kapetanios, *et al.* (2007)]. We focus on the former where a number of formulas can be used such as sum of forecast errors, the sum of absolute errors, the sum of squared errors, Theil's U-statistic and the RMSE. We use the most widely used RMSE criterion for the purpose of forecasts-evaluation.

RMSEs obtained in the first step are then used as benchmarks for comparison with the corresponding RMSEs obtained after the introduction of the inflation expectations indicator into our models—both contemporaneously and with a six months lead. To be precise, if $RMSE_{IEI} < RMSE_{BASE,}$ we consider it an improvement in the forecast ability of the models.

Our results are robust across model specifications, sample sizes and horizons and show that the inflation expectations as measured by the survey expectations indicator deteriorates the predictive ability of the baseline univariate inflation models for a 3-month horizon—while significantly improve it for 6 and 12-month horizons. We further observe that by and large the incorporation of expectations contemporaneously yield better results than its incorporation with a 6-month lead.

The remainder of the paper is organised as follows. Section 2 specifies the baseline univariate inflation models. Section 3 highlights the data and conducts a preliminary analysis of the relationship between inflation and inflation expectations. Section 4 discusses the results and conducts the robustness checks while Section 5 draws the conclusion.

2. METHODOLOGY–SPECIFICATION OF THE UNIVARIATE BASELINE INFLATION MODELS

For the purpose of assessment of forecast performance, consistent with Kapetanios, *et al*. (2007) we specify a range of univariate baseline inflation models with increasing degree of complexity. For example, we start from a simple unconditional mean inflation model and end up with ARIMA model. These models are given as under.

2.1. Unconditional Mean Model (UM)

To start with, the unconditional mean inflation model is expressed as:

$$\pi_t = \alpha + \varepsilon_t.$$

The final model, after incorporation of dummies for seasonal factors (see Ahmad and Ashfaq, 2015 for evidence of seasonality in Pakistan) is given as:

$$\pi_t = \alpha + \sum_{i=1}^{12} \gamma_i SD_i + \varepsilon_t, \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

where π_t is the log change in consumer price index (CPI) and SD represents the monthly seasonal dummies. It is the same for the next two models.

2.2. Random Walk with Drift (RWD) Model

The RWD is given by the expressions as:

$$\pi_t = \alpha + \pi_{t-1} + \varepsilon_t.$$

While accounting for the seasonal factors, the final model takes the following form:

$$\pi_t = \alpha + \pi_{t-1} + \sum_{i=1}^{12} \gamma_i SD_i + \varepsilon_t. \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

2.3. Random Walk with Drift and Trend (RWDT) Model

Here we introduce the trend component to the RWD model such that

$$\pi_t = \alpha + \pi_{t-1} + \tau t + \varepsilon_t,$$

where t denotes the time trend. After adjusting for seasonality, the final model is expressed as:

$$\pi_t = \alpha + \pi_{t-1} + \tau\, t + \sum_{i=1}^{12} \gamma_i SD_i + \varepsilon_t. \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

2.4. Autoregressive (AR) Model

This model represents the time series generated by passing the white noise through a recursive linear filter. The output of such filter at time t is a weighted sum of 'p' previous values of the filter output. The integer parameter p is called the order of the AR-model. The AR-model of a random process y_t at time t is defined by the following expression:

$$y_t = \sum_{i=1}^{p} a_i \,.\, y_{t-i} + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

where $a_1, a_2, \ldots, a_m$ are the coefficients of the recursive filter and ε_t represent white noise errors.

2.5. Moving Average (MA) Model

Contrary to the AR model, this model is generated by passing the white noise through a non-recursive linear filter. A moving average model of a random process y_t at time t is defined as:

$$y_t = \sum_{i=0}^{q} b_i \,.\, x_{t-i} + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

where $b_1, b_2, \ldots, b_n$ are the coefficients of the non-recursive filter; q is order of the MA model, x_t are the elements of the (input) and ε_t are the white noise errors.

2.6. Integrated Autoregressive Moving Average (ARIMA) Model

This model represents the time series that is generated by passing white noise through a recursive as well as a non-recursive linear filter, consecutively. In other words, the ARIMA model is a combination of an autoregressive (AR) model and a moving average (MA) model. The order of the ARIMA model at time t is described by two integers (p, q), that are the orders of the AR and MA parts, respectively. The general expression for an ARMA-process y_t is the following:

$$y_t = \sum_{i=1}^{p} a_i \,.\, y_{t-i} + \sum_{i=0}^{q} b_i \,.\, x_{t-i} + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

where 'p' is the order of the AR-part of the ARMA model; $a_1, a_2, \ldots, a_p$ are the coefficients of the AR-part of the model (recursive linear filter); q is the order of the MA-part of the ARMA model; $b_1, b_2, \ldots, b_q$ are the coefficients of the MA-part of the model (of the non-recursive linear filter); x_t are the elements of the (input) white noise and ε_t is white noise error term.

3. DATA AND THE RELATIONSHIP BETWEEN INFLATION EXPECTATIONS AND OBSERVED INFLATION

The main sources of our data are the Pakistan Bureau of Statistics (PBS), SBP and IBA. Monthly CPI data is obtained from the PBS for the period covering July, 2002 to July, 2015 depending on the availability of a consistent data series. We use the 6-months ahead IEI data from the CSS carried out jointly by the SBP and IBA. This survey covers 1800 households from all over Pakistan contacted through fixed line telephones. After every alternate month the households are asked as to how they expect the prices in general will be over the next six months.[3] These qualitative responses are then quantified and used to construct prices expectations index, which is available from January, 2012 onwards at the SBP website. We use this index as the measure of six months ahead inflation expectations. Unlike other Asian countries such as China, India, Bangladesh and Korea where data on inflation expectations is collected every month (see Kim and Lee, 2012), the IEI is available only for alternate month. Therefore in order to have a consistent monthly data series, we filled the alternate monthly gaps through interpolation—by averaging the two adjacent data points before and after the missing value. A bird eye view of the key features of the data can be had from Table 1.

Table 1

Descriptive Stats of the Data

	CPI-Index	Inflation Expectations Index
Mean	184.8	92.2
Median	188.7	93.3
Maximum	201.6	100.0
Minimum	162.6	80.9
Std. Dev.	12.3	5.2
Observations	43.0	43.0

As far as the stationarity properties of the data are concerned, it is important to mention that both the inflation and IEI series are expressed in log form and their first difference is stationary (Table 1a).

Table 1a

Stationarity Properties of the Variables

	ADF		PP	
Variables	Level	First Difference	Level	First Difference
π	[0.81]	[0.00]***	[0.87]	[0.00]***
IEI	[1.00]	[0.00]***	[0.88]	[0.00]***

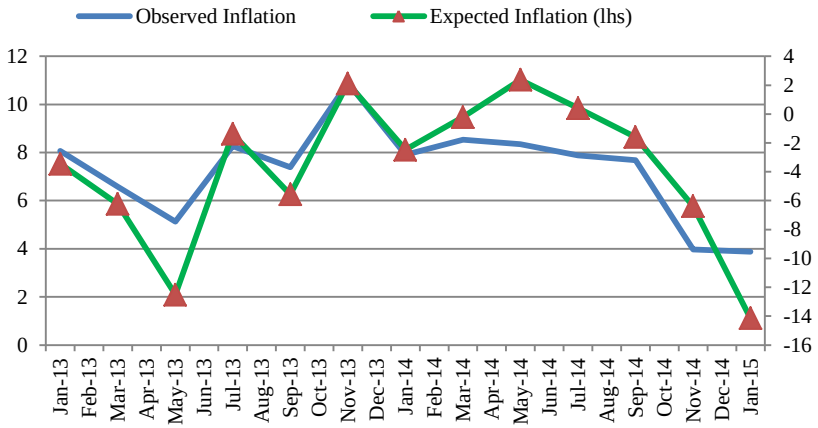
This table reports the *P*-values of the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests. ***, ** and * indicate that the series are stationary at the 1 percent, 5 percent and 10 percent level of significance, respectively.

[3]The exact question is "How do you expect that prices in general will develop over the next six months from now? (a) go down significantly, (b) go down marginally, (c) no change, (d) go up marginally, (e) go up significantly and (f) do not know.

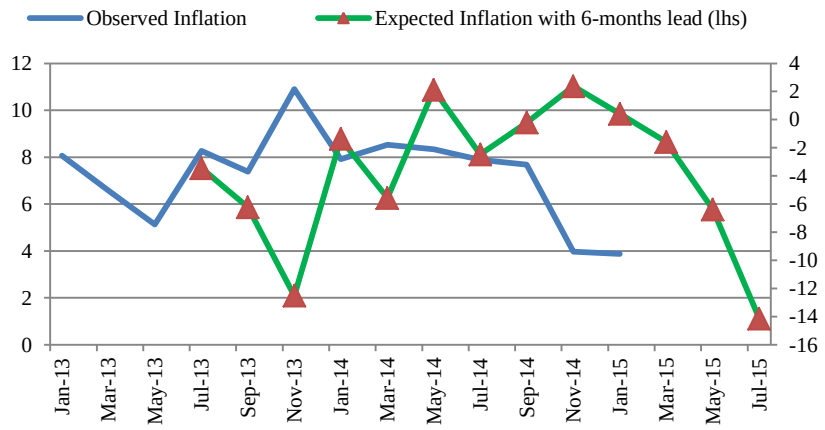
An important issue to highlight here is that the pertinent question in the survey contemplates the six months ahead expected inflation, however, the changes in the IEI seems to co-move with contemporaneous inflation (Figure 1, Panel A).[4] The relationship between the observed inflation and the expected inflation with a six month lead may not be corroborated to make a perfect sense because they instead seem to reflect a theoretically inconsistent inverse relationship (Figure 1, Panel B).

Fig. 1. Observed and Expected Inflation

Panel A: Contempopraneous Relationship



Panel B: Relationship with a 6-Months Lead

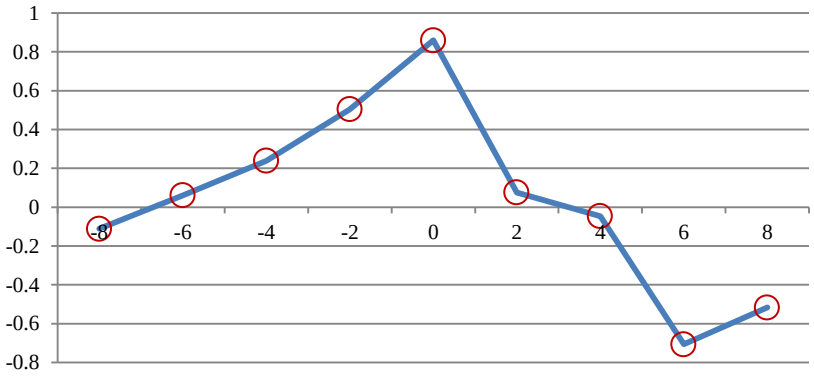


These relationships may also be confirmed by the comparison of correlations between observed and expected inflation both contemporaneously and with different leads and lags (Figure 2). For example, the contemporaneous correlation (at zero lag) is

[4]This is consistent with the findings of Kim and Lee (2012) for other Asian countries such as India, Bangladesh, Sri Lanka and so forth.

both positive and highest with a correlation coefficient of 0.86. The correlation coefficient with a 6 months lead of the expected inflation nonetheless is –0.76. This indicates that inflation expectations are more adaptive rather than forward looking.

Fig. 2. Cross-correlation between Expected Inflation and Lag (-) / Lead (+) of Actual Inflation



4. RESULTS AND ROBUSTNESS CHECK

4.1. Results

In order to assess if the inclusion of inflation expectations improve the forecast performance of our specified univariate baseline inflation models ranging from Equation 1 through Equation 6, we first estimated their RMSEs both in-sample and out-of-sample for different horizons 3, 6, and 12 months.[5] The coefficient estimates of the baseline models are produced in Table 2 whereas the results for the corresponding models after incorporation of the expectations variable are given in Table 3 and 4. If $RMSE_{IEI} < RMSE_{BASE,}$ the IEI adds to the forecastability of the models and vice versa.

In line with lead-lag analysis, inflation expectations with six months lead turns out to be insignificant. Less educated households with little knowledge about the structure of economy and large informal sector may be possible reasons for such behaviour. As a result, households mainly formulate their expectations about inflation based on current and past inflation.[6] It is important to note that the baseline models (both before and after incorporation of the IEI) pass the key diagnostic tests for serial correlation, homoscedasticity and normality (Table 5). In the second step, after incorporation of the IEI indicator to our baseline models, we estimated the respective RMSEs for comparison with the RMSEs of the baseline models in order to observe any possible improvement (deterioration) across horizons and models. The results on the RMSEs are presented and discussed in the subsequent sub-sections.

[5] It is important to mention that before estimation the important steps of identification, estimation and diagnostics were conducted. These results however are not reported to save space and may be obtained from any of the authors upon request.

[6] To this effect, we used inflation expectations without lead, which turned out to be significant in all the models (Table 3).

Table 2

Baseline Models' Results

Dependent Variable is Δ_t																				
Models	C	PD	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	Trend	SAR(3)	SAR(6)	SAR(12)	SMA(3)	SMA(4)	SMA(6)	SMA(12)
UM	-0.003	0.019	0.013	0.002	0.009	0.015	0.008	0.005	0.018	0.009	0.008	0.006	0.001								
	[0.20]	[0.00]	[0.00]	[0.362]	[0.002]	[0.00]	[0.00]	[0.06]	[0.00]	[0.00]	[0.01]	[0.37]	[0.76]								
RWD	0.086	0.011	0.016	0.003	0.014	0.021	0.010	0.011	0.018	0.017	0.011	0.016	0.009								
	[0.00]	[0.02]	[0.00]	[0.38]	[0.00]	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]								
RWDT	0.078	0.011	0.016	0.003	0.014	0.021	0.010	0.011	0.018	0.017	0.011	0.016	0.009	0.00							
	[0.48]	[0.03]	[0.00]	[0.38]	[0.00]	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]	[0.93]							
AR	0.005	0.014													0.220		0.206				
	[0.02]	[0.05]													[0.10]		[0.15]				
MA	0.007	0.015																0.312			0.267
	[0.00]	[0.12]																[0.01]			[0.06]
ARIMA	0.006	0.014														0.549	0.404		0.150	-0.672	
	[0.11]	[0.01]														[0.01]	[0.01]		[0.25]	[0.01]	

Where Δ_t is the log change in consumer price index (CPI), S1 to S11 represent monthly seasonal dummies, PD is the dummy of 2008 oil price shock and values in parenthesis are p-values. The character S before AR and MA, for example, SAR represent seasonally adjusted.

Table 3

Models' Results Using Inflation Expectations (contemporaneous)

Dependent Variable is π_t																				
Models	C	π^e	PD	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	Trend	SAR(3)	SAR(6)	SAR(12)	SMA(6)	SMA(12)
UM	-0.255	0.056	0.015	0.011	-0.002	0.009	0.017	0.009	0.007	0.015	0.008	0.003	0.009	0.002						
	[0.00]	[0.00]	[0.00]	[0.02]	[0.70]	[0.05]	[0.00]	[0.05]	[0.09]	[0.00]	[0.08]	[0.58]	[0.06]	[0.61]						
RWD	-0.141	0.035	0.013	0.016	0.004	0.015	0.022	0.011	0.012	0.018	0.017	0.011	0.015	0.009						
	[0.30]	[0.09]	[0.01]	[0.00]	[0.28]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]						
RWDT	-0.130	0.080	0.011	0.015	0.003	0.014	0.021	0.011	0.011	0.017	0.017	0.010	0.015	0.009	0.001					
	[0.32]	[0.01]	[0.02]	[0.00]	[0.39]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]	[0.00]	[0.01]	[0.05]					
AR	-0.267	0.061	0.015													0.147		0.376		
	[0.02]	[0.01]	[0.00]													[0.32]		[0.02]		
MA	-0.184	0.042	0.012																	0.864
	[0.01]	[0.01]	[0.01]																	[0.00]
ARIMA	-0.325	0.074	0.0151															0.77	-0.05	-0.883
	[0.00]	[0.00]	[0.00]															[0.00]	[0.34]	[0.00]

Where π_t is the log change in consumer price index (CPI), π^e is the log of inflation expectation index for survey data, S1 to S11 represents monthly seasonal dummies, PD is the dummy of 2008 oil price shock and values in parenthesis are p-values. The character S before AR and MA, for example, SAR represent seasonally adjusted.

Table 4

Models' Results Using Inflation Expectations (six months lead)

Dependent Variable is $_t$																				
Models	C	e_{+6}	PD	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	Trend	SAR(3)	SAR(6)	SAR(12)	SMA(6)	SMA(12)
UM	-0.103	0.014	0.022	0.011	-0.002	0.008	0.016	0.007	0.007	0.015	0.009	0.005	0.011	0.004						
	[0.30]	[0.02]	[0.31]	[0.04]	[0.77]	[0.12]	[0.00]	[0.17]	[0.18]	[0.00]	[0.10]	[0.42]	[0.06]	[0.48]						
RWD	0.204	-0.020	0.010	0.016	0.003	0.015	0.021	0.010	0.011	0.018	0.018	0.012	0.016	0.009						
	[0.16]	[0.41]	[0.04]	[0.00]	[0.36]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]						
RWDT	0.192	-0.039	0.011	0.017	0.004	0.016	0.022	0.011	0.012	0.018	0.018	0.012	0.016	0.009	0.000					
	[0.19]	[0.23]	[0.03]	[0.00]	[0.27]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]	[0.38]					
AR	0.056	-0.011	0.014													0.236		0.347		
	[0.67]	[0.70]	[0.00]													[0.11]		[0.04]		
MA	0.035	-0.007	0.011																	0.865
	[0.72]	[0.76]	[0.00]																	[0.00]
ARIMA	0.166	-0.039	0.015															0.787	-0.047	-0.905
	[0.23]	[0.21]	[0.01]															[0.00]	[0.36]	[0.00]

Where $_t$ is the log change in consumer price index (CPI), e_{+6} is the log of inflation expectation index with 6-months lead for survey data, S1 to S11 represent monthly seasonal dummies, PD is the dummy of 2008 oil price shock and values in parenthesis are p-values. The character S before AR and MA, for example, SAR represent seasonally adjusted.

Table 5

Diagnostics Tests of the Models (P-Values)

	UM	RWD	RWDT	AR	MA	ARIMA
Benchmark Models						
Serial Correlation	[0.45]	[0.18]	[0.30]	[0.96]	[0.1]	[0.54]
Heteroskedasticity	[0.40]	[0.93]	[0.97]	[0.55]	[0.53]	[0.11]
Normality	[0.35]	[0.81]	[0.59]	[0.38]	[0.56]	[0.68]
Models with Survey Expectations						
Serial Correlation	[0.46]	[0.12]	[0.1]	[0.96]	[0.29]	[0.27]
Heteroskedasticity	[0.40]	[0.74]	[0.72]	[0.67]	[0.92]	[0.10]
Normality	[0.36]	[0.65]	[0.54]	[0.38]	[0.32]	[0.46]

The tests for serial correlation, heteroscedasticity and normality are Breusch-Godfrey Serial Correlation LM Test, White Test and Jarque Berra, respectively.

4.1.1. *In-sample Forecast Performance (Short-sample)*

As a starting point, we estimate all the univariate benchmark models using a short-sample period starting from January, 2012 to July, 2015 as the survey data for expectations is available only for the mentioned period. After estimating the benchmark inflation models, in order to observe the in-sample forecast performance we estimated their RMSEs (both using 6-month lead and no-lead of IEI) for the three different horizons. These RMSEs are then used as benchmarks for comparison with the respective RMSEs after inclusion of the expectations indicator IEI to the models. The results are presented in Table 6.

Table 6

In Sample Forecast

	UM	RWD	RWDT	AR	MA	ARIMA
Root Mean Squared Error (3-months ahead forecast)						
Benchmark	0.69	0.08	0.49	0.77	0.79	0.47
Survey Expectations (6-months lead)	0.67	0.47	0.73	0.78	0.76	0.50
Survey Expectations (Contemporaneous)	1.67	1.40	0.71	1.97	1.98	1.62
Root Mean Squared Error (6-months ahead forecast)						
Benchmark	3.91	2.67	2.17	3.95	3.96	3.66
Survey Expectations (6-months lead)	3.79	2.27	2.03	3.87	3.85	3.56
Survey Expectations (Contemporaneous)	3.27	2.97	1.41	3.67	3.70	3.39
Root Mean Squared Error (12-months ahead forecast)						
Benchmark	6.15	3.60	3.07	6.70	6.69	6.34
Survey Expectations	5.86	2.90	2.75	6.50	6.49	6.08
Survey Expectations (Contemporaneous)	3.50	3.15	1.30	4.41	4.53	4.34

Note: The estimation period is from January 2012 to July 2015.

Since a lower value of the RMSEs reflects an improvement in the forecast performance of the model whereas a larger value indicates deterioration—after the introduction of the expectations, the forecasting performance of our baseline models significantly and consistently enhances for the 6 and 12-month horizons whether inflation expectations are incorporated contemporaneously or with a 6-month lead [(Table 6, Col (a)-Col (f)]. The results for a 3-month horizon largely show deterioration for most of the models. This deterioration is likely because the IEI fundamentally contemplates the extent of the expected price-movements for the next six months.

4.1.2. *Out-of-sample Forecast Performance (Short-sample)*

In order to check for the possible improvement in the out-of-sample forecast predictive ability of our baseline inflation models due to the introduction of the IEI, we first drop the respective observations for 3, 6 and 12 months, and estimate the RMSEs accordingly for the baseline models. We then introduce the IEI into the baseline models with a 6-month lead and repeat the process to obtain the corresponding RMSEs.[7] The results are presented in Table 7 indicating a slight improvement in most of the models for the 6 months horizon. However majority of the models for the 3 months and 12 months horizon do not witness any improvement. This might be due to the short sample size of the data.

Table 7

Out of Sample Forecast

	UM	RWD	RWDT	AR	MA	ARIMA
Root Mean Squared Error (3-months ahead forecast)						
Benchmark	0.67	1.39	0.81	0.70	0.70	0.86
Survey Expectations	0.90	1.27	1.83	1.79	1.35	2.23
Root Mean Squared Error (6-months ahead forecast)						
Benchmark	2.47	1.54	3.31	1.98	1.99	2.83
Survey Expectations	2.59	1.97	6.42	1.86	1.81	2.38
Root Mean Squared Error (12-months ahead forecast)						
Benchmark	8.67	10.50	9.40	8.46	8.15	7.96
Survey Expectations	10.56	9.38	9.27	9.69	9.07	8.78

Note: The estimation period is from January 2012 to July 2014.

4.2. Robustness Check

Since the span of our data set of expectations variable is not long enough, we fixed the values of our IEI indicator at 100 from July, 2002 until December, 2011 as we don't have survey data for this period. Nonetheless, we contemplate that this exercise would allow us to take into account more information than that of our previous estimation period and would serve as a robustness check on the results we obtained earlier.

[7]The RMSEs in order to assess the out-of-sample forecast using IEI contemporaneously may not be obtained due to limited data.

4.2.1. *In-sample Forecast Performance (Extended Sample)*

The results of our baseline models estimated with extended data sets from the July, 2002 to July, 2015 are presented in Table 8–9. The findings here also indicate that incorporation of the survey measure of expectations significantly improves the forecast performance almost across all the models for a 6 and 12-month horizon as compared to the 3-month horizon. The improvement observed using IEI contemporaneously is significantly higher than is observed for using IEI with a 6-month lead.

4.2.2. *Out-of-Sample Forecast Performance (6-months Lag, Extended Sample)*

Like the significant improvement in the in-sample forecast predictability, the introduction of the IEI into the extended sample considerably improves even the out-of-sample forecast capability of the univariate models. For example the RMSEs have declined for most of the models for almost all the three horizons (Table 9).

Table 8

In Sample Forecast

	UM	*RWD*	*RWDT*	*AR*	*MA*	*ARIMA*
Root Mean Squared Error (3-months ahead forecast)						
Benchmark	1.95	2.30	2.44	1.67	1.43	1.74
Survey Expectations (6-months lead)	1.60	1.85	1.92	1.40	1.00	1.38
Survey Expectations (contemporaneous)	2.13	2.59	2.80	2.17	1.89	2.25
Root Mean Squared Error (6-months ahead forecast)						
Benchmark	5.26	5.05	5.31	5.93	4.91	5.20
Survey Expectations (6-months lead)	4.38	3.97	4.00	4.58	4.30	4.74
Survey Expectations (contemporaneous)	3.71	3.41	3.49	3.41	3.34	3.60
Root Mean Squared Error (12-months ahead forecast)						
Benchmark	9.47	8.65	9.16	10.30	8.41	9.30
Survey Expectations (6-months lead)	7.23	6.37	6.51	7.42	7.20	7.85
Survey Expectations (contemporaneous)	5.11	3.72	3.60	3.95	4.14	4.23

Note: The estimation period is from July 2002 to July 2015.

Table 9

Out of Sample Forecast

	UM	*RWD*	*RWDT*	*AR*	*MA*	*ARIMA*
Root Mean Squared Error (3-months ahead forecast)						
Benchmark	2.00	3.03	3.65	1.86	1.69	2.35
Survey Expectations	2.97	2.84	3.27	2.00	1.71	2.00
Root Mean Squared Error (6-months ahead forecast)						
Benchmark	5.42	6.47	7.53	6.31	5.30	6.51
Survey Expectations	7.29	6.05	6.70	5.89	5.73	6.09
Root Mean Squared Error (12-months ahead forecast)						
Benchmark	9.32	10.70	12.40	11.06	9.02	12.06
Survey Expectations	13.07	10.42	11.46	10.27	10.27	10.83

Note: The estimation period is from July 2002 to July 2014.

4.2.3. Impulse Response Analysis

As another robustness-check we conducted impulse response analysis using a simple bivariate VAR model both for short and extended data. The results from this

analysis also confirm that a shock to the expectations does not translate well to the observed inflation for the short-sample but significantly translates when the sample is extended (Figure 3, Panel A–B).

Fig. 3. Panel A: Accumulated Response of Actual Inflation to One S.D Shock to Inflation Expectations (Short-sample)

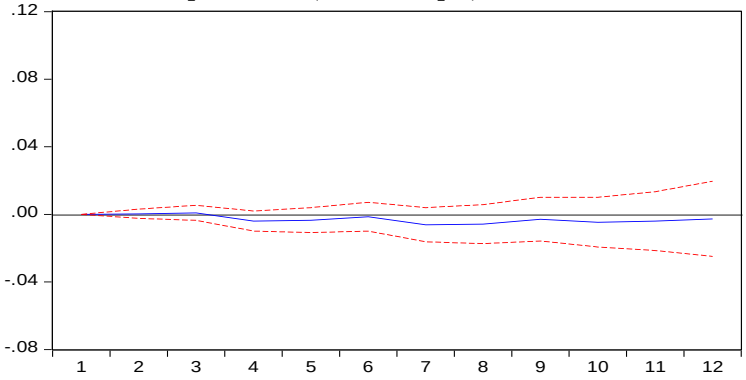
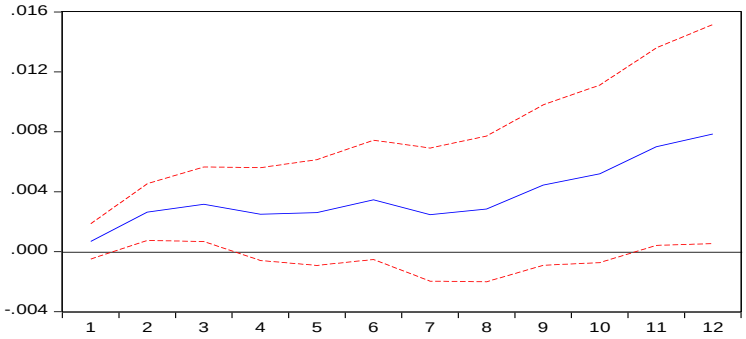


Fig. 3. Panel B: Accumulated Response of Actual Inflation to One S.D Shock to Inflation Expectations (Extended-sample)



5. CONCLUSION

In this paper we attempted to empirically explore if the introduction of inflation expectations indicator adds to the forecasting performance of our baseline inflation models. For the purpose we used a survey-based measure, which largely represents the households' expectations about the inflation over a six month horizon. Since the survey data is limited as the process of its collection has been started lately, we also extended the data set backward to account for more information that otherwise might be useful, and may also serve as robustness check.

Using 6 univariate baseline models for three different short-term forecast horizons of 3, 6 and 12 months, we found mixed results. On one hand, the introduction of expectations indicator to our baseline models significantly improve their in-sample and out-of-sample predictive ability for 6 and 12-month horizons and may therefore be advisable for the SBP to take into account the public's expectations for forecasting purposes. On the other hand, the predictive ability for a 3-month horizon is deteriorated.

A plausible reason for this could be the fact that the relevant survey questions enquire only about 6-months ahead expected inflation. This reduces the usefulness of IEI in terms of forecasting inflation for a 3-month time.

A word of caution nonetheless should also be followed that these results are robust only in the context of univariate inflation bias models. Whether the IEI equally improves forecasting performance for 6 and 12-months horizons in case of multivariate baseline models is an area yet to be explored.

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Impact of Macroeconomic Variables on Capital Structure Choice: A Case of Textile Industry of Pakistan

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The financing decision of a firm is influenced by both internal (firm specific) and external (macroeconomic) factors. However, most of the empirical investigations have focus on internal factors whereas the impact of macroeconomic variables on capital structure decisions is somewhat under researched particularly in the context of developing countries. The aim of the study is to analyse the impact of macroeconomic variables on the capital structure decisions of all listed textile firms in Pakistan for the period 2004-2013. Panel data regression (fixed effects model) was used to estimate the effect of macroeconomic variables on capital structure. The findings of the study reveal that public debt, exchange rates and interest rates are negatively related whereas corporate taxes, stock market development, inflation rate and GDP growth rate are positively related with economic leverage. Moreover, the relationship of corporate taxes, stock market development and exchange rates is significant with the economic leverage.

JEL Classification: E44, E52, E62, F31, G32
Keywords: Capital Structure, Interest Rates, Inflation, Public Debt, Exchange Rates, GDP Growth Rate, Stock Market Development, Pakistan

1. INTRODUCTION

Financing a modern day business with the appropriate mix of securities is considered to be extremely important for the long-term success and survival of the business. Finding the appropriate mix of securities to finance new investments will increase the value of the firm whereas poor financing decisions will lead to loss in firm value. Hence, it is important to understand that due care must be given while making financial decisions because there are several internal and external factors that affect the speed and adjustment of capital structure. Internal factors are firm-specific and can be controlled by the management of the firm whereas macroeconomic factors are beyond the control of the management of the firm. However, the importance of these two types of factors cannot be overlooked as far as their influence on capital structures is concerned. Information regarding the level, direction and power of their impact about these factors will help organisations make better financing decision in order to ensure long-term survival and growth.

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In the academic literature, we find several theories that explain the behaviour of the firms as far as their preference for financing mode. Among these theories, Trade-off theory, pecking order theory and off late market timing theory is widely applied by researchers in their empirical investigations. Trade-off theory that stemmed from the original Modigliani-Miller (1958) irrelevance theorem assumes that the firm trades off the cost and benefit associated debt and equity financing and finds an optimal capital structure while taking into consideration the advantages of tax shields, agency costs and bankruptcy costs. Pecking order theory presented by Myers and Majluf (1984), on the other hand, based on asymmetric information between firm managers and investors, assumes that firms follow an order while making their financing decisions. Firms prefer internal funds over external funds. Hence, retained earnings get a preference over debt and equity and debt over equity in situations where retained earnings are not sufficient enough to meet the financial requirements of the firm. Market timing theory presented by Baker and Wurgler (2002) assumes that firm time their issues in particular equity issues. Firm will issue new stock when the price of the company's stock is considered to be overvalued and buy back stock when the stock price is considered to be undervalued. These theories and other capital structure theories are helpful not only in understanding the nature of corporate capital structure but also in identifying potential factors both internal and external that could influence capital structure decisions.

Empirically, numerous studies both in developed and developing countries have attempted to explore the determinants of capital structure. These studies identified key internal factors that have a significant influence on the capital structure decisions of the firms. Among these factors are: profitability [Dincergok and Yalciner (2011); Keshtkar, Valipour, and Javanmard (2012) and etc.), asset tangibility [Bastos, Nakamura, and Basso (2009); Nguyen and Wu (2011)], growth opportunities [Titman and Wessels (1988); Daskalakis and Psillaki (2008); Kouki and Said (2012)], non-debt tax shields [Kouki and Said (2012); Lim (2012)], firm size [Hanousek and Shamshur (2011); Nguyen and Wu (2011); Lim (2012)]. The relationship of these factors with corporate capital structure varies from negative to positive depending on the structure of debt and country specific factors.

In more recent studies, researchers have focused on exploring the relationship between external factors and its influence on capital structure decisions of the firm. There is general agreement among researchers that the financing decision of the firm cannot be made in isolation as both internal as well as external factors has significant influence while making such decision. Based on empirical evidence, we find that there is a relationship between external factors, commonly referred to as macroeconomic factors in empirical studies and capital structure. Studies from Booth, *et al.* (2001), Gujarel (2006), Bopkin (2009), Dincergok and Yalciner, (2011), Mokhova and Zinecker, (2014) etc. suggests that there is a significant relationship between macroeconomic factors and corporate capital structure.

Pakistan is one of the leading manufacturers of textile goods in world and is a major contributor to the economy. Currently it contributes nearly 52 percent to country's exports. However, the industry is going through challenging times over the past few years. The poor law and order situation, energy crisis, rising cost of raw material and production cost and lack of modern equipment's and R & D institutions have significantly contributed to the decline of textile sector. Moreover stiff competition in the

international markets particularly from India, Bangladesh and China has also added to the declining share of textile exports in international markets. The proportion of external financing in the capital structure of textile firm has come down from 51 percent on average in 2009 to 41 percent on average in 2013 thus showing the preference for internal financing.

The aim of this paper is to explore the impact of macroeconomic variables on the corporate capital structure of listed firms in textile industry of Pakistan. Since the external environment is beyond the control of the management, therefore, changes in interest rates, inflation rates, exchange rates, tax rates etc. may affect firms negatively as well as positively depending on the nature and direction of changes in these important macroeconomic variables. Additionally, exchange rates, an important macroeconomic determinant particularly in the context of textile industry as export earnings are denominated in foreign currency has been overlooked while measuring the influence of macroeconomic variables on capital structure. Liberalisation and integration of international financial markets makes exchange rates an important factor that must be considered while making financing decisions because exchanges rates affect the cost of financing, domestic interest rates, inflation rates etc. Currently, business environment in Pakistan is very challenging as the economy is experiencing lower growth due energy crisis, high interest and inflation rates, poor law and order situation etc. Hence, it was important to find out how macroeconomic variables influence firms financial decisions in this challenging environment.

2. LITERATURE REVIEW

The influence of macroeconomic variables on capital structure decisions has been widely investigated by researchers. One of the most commonly used macroeconomic variables in capital structure studies is GDP growth rate [Bokpin (2009); Dincergok and Yalciner (2011); Camara (2012) etc.]. The findings of their study revealed that there is strong negative relation between corporate capital structure and GDP growth rate. Their findings support the pecking order hypothesis i.e. internal funds are preferred over external funds because in periods of economic growth, firm profitability is expected to rise thus allowing firms to use internally generated earnings to finance future investments. On the contrary, studies from Daslalakis and Psillakis (2008), Hanosuek and Shamshur (2011), Baltaci and Ayaydin (2014) etc. found out that there is a statistically significant and positive relationship between GDP growth rate and capital structure.

Another important macroeconomic factor that has been used in empirical investigations is interest rate. Interest rates have also been widely used in empirical investigations. Changes in interest rates affect the leveraging of the firm. Leverage level of firms are expected to rise with increase in interest rates because there will be tax shield advantages to exploit, at the same time some firms may reduce their financial leverage with rise in interest rates in order to reduce bankruptcy costs. Studies from Graham and Harvey (2001) and Drobetz, Pensa and Wanzenried (2006), Henderson Jedadesh and Weisbach (2006) found out that there is a negative relationship between interest rates and capital structure whereas Bopkin (2009) suggest that there is a positive relationship between interest rates and capital structure.Empirical investigations suggest that there is mixed evidence as far as the influence on the inflation rate and capital structure is

concerned. Since interest rates are indexed to inflation, therefore inflation rates become an important factor that must be considered. Studies from Dammon (1988) and Bastos, *et al.* (2009) suggest that inflation rate do not influence the capital structure decisions of the firm. However, studies from Sett and Sarkhel (2010) and Hanousek and Shamshur (2011) suggest a positive whereas Booth, Aivazian and Demeriguc-Kunt (2001) and Gujarel (2006) suggest a negative relationship between inflation and capital structure. Rising inflation rates leads to increase in interest rates which allows firm exploit more tax savings but at the same time increases financial risk leading to potential bankruptcy costs.

Influence of corporate taxes is also ambiguous as studies from Byoun (2008) and Antoniou, Guney and Paudyal (2008) suggests that debt ratios and taxes are inversely related whereas Moore and Ruane (2005) and Huizinga, Laeven and Nicodeme (2008) argued that the relationship is positive and significant also. Modigliani and Miller (1963) in extension to their earlier work argued that in presence of corporate taxes, the value of the firm can be increased by altering the capital structure. The used of debt results in tax savings but up to a certain limit after which cost of debt outweighs the benefit of debt. In the presence of financial leverage, rise in corporate taxes increases the tax savings of the firm and hence allows firms to borrow more.

Stock markets play an important role in meeting the financial requirements of the firm. Developed financial markets not only reduce the cost of financing but also provide access to firms to borrow funds. Listed firms have to meet strict criteria before they get listed on the stock exchange. This improves the quality of information available about the firm and also helps in monitoring and controlling the firm. As a result, the availability of quality information about firm reduces its overall risk level and may find it easier to raise funds through the stock market. Firm level leverage is high in countries where stock markets are developed or in the developing phase [Gajurel (2006); Dincergok and Yalciner (2011)], at the same time, Sett and Sarkhel (2010) suggest that there is negative relationship between stock market development and capital structure.

Borrowing by the government to meet budgetary deficits from local market affects the supply of funds to the private sector particularly in developing countries where saving rates are comparatively low. Mokhova and Zinecker (2014) in study on European economies found out inverse relationship between public debt and capital structure. However, Dincergok and Yalciner (2011) concluded that public debt is positively related to capital structure.

Lastly, changes in exchange rates can significantly affect the earnings as well as the cost of foreign currency denominated debt. Changes in exchange rates affect domestic interest rates as well as earnings of companies particularly those that are directly involved in business with international markets. Calvo (2001), Eichengreen (2005) and Cavoli and Rajan (2005) argued that devaluations leads to decline in output due to lower aggregate demand which may result in widespread bankruptcies.

To conclude, generally most of the empirical studies in developing countries have focused on GDP growth rates, interest rates, taxes etc. whereas we find very limited studies particularly in Pakistan that have used public debt and exchange rates as variables influencing financing decisions. Therefore this study will add to the already limited literature particularly in the context of public debt, stock market development and exchange rates and will provide meaningful insights with respect to their impact on firm financing decision.

Based on the literature review mentioned above particularly in the context of developing countries, we expect the following relationship between macro-economic variables and capital structure for this study.

Table 1

Expected Relationship between Macroeconomic Variables and Capital Structure

Variable	Expected Relationship
GDP Growth Rate	Positive
Public Debt	Negative
Real Interest rate	Positive
Stock Market Development	Positive
Corporate Taxes	Positive
Exchange rates	Negative

3. DATA AND METHODOLOGY

Data for this study was collected from secondary sources. Data concerning macroeconomic variables and firm level variables was collected from World Bank database and State Bank of Pakistan. Last ten years data was used in this study from 2004-2013. The sample consisted of all listed firms (textile industry) in KSE. Only those firms were considered that remained listed in the last ten years. Firms listed for less than ten years were removed from the final sample. The final sample comprised of 154 firms.

During the process of data collection it was found out that some of the data for firm level variables was missing. In literature we find variety of techniques used to handle missing data such as complete case analysis, available case analysis, single imputation, multiple imputations etc. Considering the merits and demerits of each technique, multiple imputations were used to handle missing data. In this technique possible estimates are generated for the missing value and then the average of these estimates is used as the estimated value for missing data. Therefore, in order to find estimates for missing values five separate data sets were generated. After analysing these datasets, the expected estimate of each missing value was added together in order to get the average value from these estimates. Schafer (1997) argued that in order to get an unbiased estimate for missing value, five data sets are enough.

The skewness value of economic leverage and corporate taxes was high which indicated that the data for these two variables is skewed. In order to ensure normal distribution for these two variables, log transformations were applied.

Macroeconomic variables used in this study are real interest rates (RIR), corporate taxes (CT), GDP growth rate (GDPR), exchange rate (EXG), public debt (PD) and stock market development (SMD). The dependent variable capital structure choice (leverage) was measured as economic leverage (LEV). Real interest rates was measured as lending rates lessinflation measured through GDP deflator[1] [ECB (2001); Oxelheim and

[1]Inflation can be measured in a number of ways i.e. Consumer Price Index (CPI), GDP deflator etc. CPI considers the prices of baskets of goods for measuring inflation whereas GDP deflator considers the prices of all goods while measuring inflation. Since real interest rate is nominal interest rate less inflation, therefore, in this study inflation rate was measured through GDP deflator.

Wihlborg (2008)], corporate taxes was measured as tax expense divided profit before taxation, public debt was measured as public debt as percentage of GDP, market capitalisation ratio was used as a measured of stock market development. For measuring GDP growth rate and exchange rates annual GDP growth rate and average exchange rate was used and lastly, economic leverage was measured through return on equity divided by return on assets.

3.1. Estimated Model

Panel data regression was used to measure the influence of macroeconomic variables on the choice of capital structure in listed firms of textile industry of Pakistan. Panel data present several advantages over other estimation techniques such as it provides more informative data, variability, efficiency, degrees of freedom and less collinearity among explanatory variables. In financial studies using annualised data such as ours, panel data is extremely important as it offers large number of data points to the researcher [Hiaso (1986)]. Furthermore, the use of panel data is more useful in detecting and measuring effects that cannot be observed in pure time series or pure cross section data [Baltagi (1995)]. The empirical model used to estimate the relationship between macroeconomic variables and capital structure is given bellow:

$$LEV_{it} = \alpha_0 + \beta_1 GDPR_{it} + \beta_2 INR_{it} + \beta_3 IR_{it} + \beta_4 CT_{it} + \beta_5 EXG_{it} + \beta_6 PD_{it} + \beta_7 SMD_{it} + \mu_{it}$$

In literature, we find two common panel data models that are being used by researchers. They are: random effects model and fixed effects model. The difference between the two models is that random effects model assumes that the intercept of each firm is a random drawing from a much larger population with constant mean value whereas fixed effects models assumes that each firm differs in its intercept term. Fixed effects model is more appropriate in cases where the panel is balance as is in our case. Random effects model, on the other hand, might be appropriated in cases where the sample contains limited observations of the existing cross-sectional units [Gujarati (2004)]. Though it looks like fixed effects is more appropriate for our study, but the final decision on the estimation model was based on Hausman test. Hausman test (1978) is a specification test which helps us determined which model is more appropriate; random effects or fixed effects. The test basically assesses the consistency of an estimator when compared with a less efficient estimator that is already known to be consistent. The results from Hausman test suggest that fixed effects model is more appropriate for our study.

Correlated Random Effects - Hausman Test

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	104.6750	6	0.0010

Since we are applying panel regression, they are several aspects like multicollineraity and heteroscedasticity that must be considered while running regression. Table 2 presents the correlational matrix of variables whereas Table 3 presents variance inflation factors of variables used in this study. Values from Table 3 suggest that multicollinearity is not an issue in our study. Multicollinearity exists when two more independent variables in a regression equation are moderately or highly correlated. The existence of multicollinearity results in high R^2, insignificant t-values, large variances and co-variances thus making precise estimation difficult. Multicollinearity is not a problem if the VIF value is less than 10 [Gujarati (2004)]. One of the key assumptions of regression model is that the variances or error term must be equal across all observations. Heteroscedasticity occurs when the variance of error term is not equal across all observations and can invalidate our tests of significance that were based on the assumption that error term in the regression model is uncorrelated and constant. In order to address the issues of heteroscedasticity, white cross section test was used and to overcome the problem of unequal variances, the model was estimated by assigning estimated Generalised Least Squares (EGLS) weights (cross-sectional) of the balanced panel where a single observation for each firm constituted a cross-section.

Table 2

Correlation Matrix

	LEV	CT	RIR	GDP	SMD	PD	EXG
LEV	1.000						
CT	0.174	1.000					
RIR	-0.025	-0.044	1.000				
GDP	0.141	-0.159	0.072	1.000			
SMD	0.155	-0.078	0.142	0.664	1.000		
PD	-0.003	-0.136	0.268	0.363	-0.236	1.000	
EXG	-0.148	0.005	0.299	-0.435	-0.696	0.181	1.000

Table 3

Variance Inflation Factors

Variable	VIF
CT	1.042
GDP	4.959
RIR	2.317
SMD	8.754
PD	3.389
EXG	3.411

3.2. Descriptive Statistics

Table 4

Descriptive Statistics of Variables

	LEV	CT	GDP	RIR	SMD	PD	EXG
Mean	0.571	0.223	4.510	0.180	0.262	0.614	75.715
Median	0.426	-0.282	4.400	0.900	0.213	0.611	76.018
Maximum	3.307	2.580	7.700	7.900	0.461	0.683	101.510
Minimum	–1.880	–2.089	1.600	–8.100	0.138	0.549	58.329
Std. Dev.	0.927	1.192	2.156	4.992	0.106	0.036	15.063
Skewness	1.086	0.373	0.085	–0.273	0.703	0.084	0.238
Kurtosis	6.402	1.562	1.570	1.870	2.136	2.734	1.613
Jarque-Bera	1255.662	168.462	133.005	101.029	174.767	6.373	138.003
Probability	0.000	0.000	0.000	0.000	0.000	0.041	0.000
Observations	1540	1540	1540	1540	1540	1540	1540

The above table present the descriptive statistics of the variables. The mean value of economic leverage is 0.571 whereas the standard deviation which shows the dispersion from mean is 0.927. The mean value of corporate taxes is 0.223 whereas the standard deviation is 1.192. Mean value of GDP is 4.51 whereas the standard deviation is 2.156. Mean value of real interest rate is 0.180 whereas the standard deviation is 4.992. The mean value of stock market development is 0.262 whereas the standard deviation is 0.106.The mean value of public debt is 0.614 whereas the standard deviation of public debt 0.036. Lastly, mean value of exchange rate is 75.715 whereas the standard deviation is 15.063. The skewness values of all variables are within the range of a normal distribution.

4. EMPIRICAL RESULTS

The empirical results obtained from this study suggest that corporate taxes, GDP growth rate, stock market development and exchange rate have a statistically significant relationship with economic leverage in the textile industry of Pakistan. Corporate taxes, GDP growth rate and stock market development are positively related whereas exchange rate is negatively related to economic leverage. The use of debt offers tax shield advantages to the firm. Increase in tax rates presents more tax savings for the firm. Hence, leverage levels of firm tend to rise with increase in tax rates and fall with decline in tax rates. Studies from De Jong et al. (2008), Sayeed (2011) also finds statistically significant and positive relationship between corporate taxes and leverage.

Table 5

Expected and Actual Relationship between Macroeconomic Variables and Economic Leverage

Variable	Expected Relationship	Actual Relationship
GDP Growth Rate	Positive	Positive
Public Debt	Negative	Negative
Real Interest rate	Positive	Negative
Stock Market Development	Positive	Positive
Corporate Taxes	Positive	Positive
Exchange rates	Negative	Negative

Developed financial markets play an important role in the meeting the financing needs of the firm. They not only reduce the cost of financing but also provide access to funds. Furthermore, stock markets help in improving the quality of information, monitoring and control of the firm which makes it is easier for the firm to borrow from external sources as well as allow lenders to lend to creditworthy firms. In case of developing financial markets Demirguc-Kunt and Maksimovic (1996) argued that leverage ratios of firms tend to rise as stock market develops. Since Pakistan is a developing economy and the financial markets are in the developing stage, firms are more inclined to use stock market to raise funds from external sources.

Table 6

Dependent Variable: LEV
Method: Panel EGLS (Cross-section weights)
Sample: 2004 2013
Periods included: 10
Cross-sections included: 154
Total panel (balanced) observations: 1540
Linear estimation after one-step weighting matrix
White cross-section standard errors and covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.777	0.269	2.892	0.004
CT	0.027	0.007	3.824	0.000
RIR	–0.002	0.002	–0.937	0.349
PD	–0.033	0.352	–0.095	0.925
SMD	0.480	0.191	2.521	0.012
GDP	0.024	0.008	3.171	0.002
EXG	–0.006	0.001	–7.895	0.000
	Effects Specification			
	Cross-section fixed (dummy variables)			
R-squared	0.749	F-statistic		25.921
S.E. of regression	0.664	Prob(F-statistic)		0.000

The positive relationship between GDP growth rate and economic leverage indicate that leverage level of firms tends to rise as the economy grows. Growth opportunities for firms rise in periods of economic growth thus leading to increase in firm level leverage and declines when the economy is in recession [Yeh and Roca (2010)]. Majority of the firm's particularly small and medium size firms may not have sufficient internally generated funds to exploit these profitable opportunities; hence they resort to borrowing from external sources.

Changes in exchange rates influence domestic economy and firms in a number of ways. Firms that are directly involved in borrowing from international markets or dealing with international markets for business are exposed to exchange rate risk. The cost of foreign currency denominated debt rises with the fall in the value of home currency thus increases financial risk and the potential cost of bankruptcies. Additionally, devaluation increases the cost of imports which leads to increase in production cost and decline in firm revenues. Lastly, exchange rates influence domestic interest rates. Domestic interest rise with the fall in value of home currency thus making it difficult for firms to borrow due to increased financial risk. Pakistan, for the last decade or so has experience significant loss in the value of its currency. Pakistani Rupee has lost its value by more than 60 percent since 2008. As a result, inflation, domestic interest rates have gone up considerably thus discouraging firms to borrow.

Additionally, the depreciation of Pakistani rupee should have resulted in a positive effect on sales of textile products in the international markets due to cheap prices but the falling value of home currency has led to rise in inflation domestically thus leading to increased raw material prices and cost or production. The withdrawal of subsidies on electricity and gas to the manufacturing sector from the government has also contributed to rising production costs of textile firms thus limiting the capacity of textile firms to fully exploit the benefits devaluation.

We find a statistically weak relationship between real interest rate, public debt and economic leverage. Both real interest rate and public debt are negatively related to economic leverage.We expected a positive relationship between real interest rates and economic leverage because rise in interest rates offers more tax savings to firm. However, the actual relationship is contrary to our expectations. Possible explanation for this can be that interest rates in Pakistan are comparatively high and firms may be reluctant to borrow at these high rates because the cost of financial distress outweighs the benefits of debt. Henderson, *et al.* (2006) and Antoniou, *et al.* (2008) also found out negative association between interest rates and leverage and explained that firms prefer to borrow when the rates are lower and vice versa. As far as public debt is concerned, the decision to borrow from the local market leaves very little funds to be used by the private sector. Hence, rise in domestic debt has a negative effect on private sector borrowing.

5. LIMITATIONS OF THE STUDY

Due to data availability constraints the study was limited only to listed firms of textile industry of Pakistan and non-listed textile firms were ignored in this study. However, non-listed firms may give meaningful insights about macroeconomic variables and their influence on capital structure. Furthermore, the study was limited to only one sector of KSE. In future other sectors of KSE should also be investigated as far as the influences of macroeconomic variables on capital structure decisions are concerned.

6. POLICY IMPLICATIONS

The aim of the study was investigate the influence of macroeconomic variables on capital structure in textile industry of Pakistan. The findings of the study revealed that there is a significant relationship between corporate taxes, GDP growth rate, stock market development, exchange rates and economic leverage. The economic environment is

uncertain in Pakistan as the economy is plagued by energy crisis, law and order situation etc. In order to ensure long-term growth in economy, government should undertake necessary measures that will stabilise the economy, ensure the development of financial markets and develop economic policies that will help stabilise exchange rates as these are important factors that influence the financial decisions of the firm. Additionally, the findings of the study will help corporate managers in making long-term financing decisions while considering the potential impact that these macroeconomic variables can have on their financing decisions and their impact on the overall performance of the firm.

7. CONCLUSION

To conclude, since the focus of the study was explore the effect of macroeconomic factors on the capital structure decisions of the firms listed in textile industry of Pakistan, the findings of the study revealed that macroeconomic variables do influence the capital structure decisions of the firm. GDP growth rate, corporate taxes and stock market development are positively related to economic leverage whereas interest rate, public debt and exchange rates are negatively related to economic leverage. The relationship between GDP growth rates corporate taxes and economic leverage supports the trade-off theory. Furthermore, the relationship of corporate taxes, GDP growth rates, exchange rates and stock market development is statistically significant whereas the remaining variables had a weak relationship with economic leverage.

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Book Review

Neil Wilcock and Corina Scholz. *Hartmut Elsenhans and a Critique of Capitalism. Conversations on Theory and Policy Implications*. London, U.K.: Palgrave Macmillan, UK. 2016. xii+184 pages. €84.99 (Hard Bound).

After the Second World War, the world was practically divided into two competing economic systems, capitalism and socialism. This ideological competition extended to the socio-political realm, and became the basis of the cold wars from the late 1940s to early 1990s. The events in Russia in the early to mid-20th century presented socialism as a real contender, if not a complete alternative to capitalism. With its increasing influence in many countries, not just in Russia's neighbourhood but also in the continents far across, socialism emerged as the dominant thought, leading to what became to be referred to as the socialist bloc. But then came the collapse of the USSR in early 1990s and the whole socialist thought came to be questioned. In socialist China, introduction of reforms with a capitalist bent further questioned the practicability and success of socialism, while reforms in the Indian economic system encouraged the proponents of capitalism to declare victory. Adoption of capitalist ideals by purely or quasi-socialist countries stamped the superiority of capitalism.

The spread of capitalist ideals in countries across the world saw a renewed interest in re-visiting the system's nature, origins, strengths, weaknesses and adaptability, resulting in a number of publications giving a new insight into capitalism. Writings of Hartmut Elsenhans—self-professed capitalist whose writings are difficult to be endorsed by capitalists or even the non-capitalists—are a good example in this regard. Elsenhans presents a complex understanding of the capitalist theory having perspectives of history, sociology and political economy. He presents a discourse that cannot be understood without a clear comprehension of both neoclassical and Marxist economics. This makes for an interesting mix but his writings have never been easy to understand, partly because of the complexity of ideas and also due to the way they are expressed. Thanks are due to Neil Wilcock and Corina Scholz for this book that helps us understand Elsenhans's rather intriguing understanding of capitalism.

Based on a series of interviews with Elsenhans, the book brings to us his thoughts on wide-ranging theories and their policy implications. These include his explanation of rent, marginality, under-development, globalisation, under-consumption, nongovernmental organisations, European Union and Eurozone, social movements, and last but not the least his thoughts on capitalism. A chapter each is dedicated to the above-mentioned themes in the book. And then there is this last chapter that encompasses all that is left in the preceding chapters and talks about environment, tax evasion and even spirituality.

The current book consolidates what Elsenhans talks about in his copious writings over the years. These writings include books authored or co-authored by Elsenhans as well as his contributions in edited volumes. Some of the English titles are, "*The Transformation of Politicised Religion: From Zealots into Leaders*" (2015), "*Bureaucratic, Societal, and Ethical Transformation of the Former East Germany*" (2004), "*Globalisation Between A Convoy Model and An Underconsumptionist Threat*" (2006), "*Saving Capitalism from the Capitalists: World Capitalism and Global History*".[1] (2003), "*Development and Underdevelopment: The History, Economics, and Politics of North-South Relations*" (1991), and "*Governing Development Across Cultures: Challenges and Dilemmas of an Emerging Sub-Discipline in Political Science*" (2006).

Elsenhans's views are complex and understanding them can be overwhelming for the reader. The book is in no way meant for bedtime reading, but is surely one for those who are interested in economic theory and the debate on capitalism. Having the advantage of working across many countries in Europe, Asia and Africa, including France, Germany, Pakistan, India, Bangladesh, Senegal and Algeria, Elsenhans's writing have a global perspective and go beyond subscribing to the routine Western explanation of world issues.

Going through the views presented in this book, via the interviews conducted by Wilcock and Scholz, it would not be wrong to assume that Elsenhans wants to achieve socialist ideals through capitalism. He theorises the left-right debate with a totally new, and definitely controversial, perspective by linking capitalism to labour empowerment. To him labour empowerment is the capacity to have negotiating power over the employers. For this to happen, Elsenhans argues for an economy having abundant employment opportunities so to create a scarcity of labour. This scarcity in a capitalist system would empower labour by offering options if the existing employer does not fulfil the demanded remuneration. For this to happen, Elsenhans argues, there is a need for mass consumption. For a capitalist system to flourish it does not only need markets to support income and profits but also high levels of consumption. He links this mass consumption with labour empowerment and believes that it supports the functioning of the free market.

To Elsenhans, empowerment of labour is a pre-requisite for capitalism, something which the capitalists would not like to do, and are more likely to indulge in rent-seeking behaviour instead. He believes that for capitalism to survive it has to be saved from the capitalists and visualises a role for the state here. According to Elsenhans, a state—a democratic state to be more precise—should compensate for the gap between consumption and investment, something which would keep the economy going. It is ideas like these that make his views liable to critique from both sides of the economic ideology. The leftists contest his benevolent portrayal of capitalism while the capitalists dispute the role of the state in economy. Elsenhans explains this conflicting critique in the foreword of this book in the following words:

[1]Hartmut Elsenhans is not alone in arguing to save capitalism from the capitalist. Among others Raghuram G. Rajan and Luigi Zingales (2003) wrote a book with partly the same title, *Saving Capitalism from Capitalists: Unleashing the Power of Financial Markets to Create Wealth and Spread Opportunity*. Their focus is on the financial markets but they too, like Elsenhans, argue about an active role of government in the market, violating the traditional arguments forwarded by those on the left and right of the ideological divide.

My theory, which insists on capitalism being dependent on the empowerment of labour, is not popular with those in mainstream discourses. Ironically, the conservative supporters of capitalism do not appreciate a relatively favourable evaluation of capitalism if it opposes their more basic goal of reducing the share of labour in total production. They do not want to stabilise capitalism, but expand its exploitative capability. They defend the necessity of increasing exploitation in order to maintain competitiveness. In addition, mainstream adherents of capitalism realise my critique of anticapitalist positions is based on a Marxist mode of thinking, albeit with significant departures. For the so-called Marxist orthodoxy, using Marxism in order to repudiate violent revolution and enact permanent reform within capitalism as not only a possibility, but also necessary for the system's survival is anathema. The renegades of Marxist orthodoxy are bigger obstacles than the open supporters of current capitalism. (p. ix)

Going through the chapters one cannot help but perceive Elsenhans as a contrarian. It is for this reason he is considered by some as a '*turbo capitalist*' and by others a '*far-leftist*' (p. 9). He has different definitions to most of the existing terms and it is for this reason Wilcock and Scholz begin each chapter with the definition of the term as envisaged by Elsenhans. It is not as if this complexity is not acknowledged by Elsenhans himself. He confesses it when he says, "[*m*]*y theory can comprise many of these things – Marxism, Keynesianism, neoclassical economics – but not just adding it, but putting them in a very special argument. And that is why many people oppose me.*" (p. 9). Based on this complexity and range of his thought, the book is organised in two halves. The first one delving on the theoretical and economic part of Elsenhans's view and the second on the more general socio-political issues.

Without spoiling the curiosity of the readers who would pick this book up let us have a quick look at some of the unique views maintained by Elsenhans, the views that make him an outsider to the mainstream academic circles irrespective of their orientation. Profit, arguably the end goal of capitalism, is conceived by Elsenhans as a special form of surplus resulting from the difference between taxes and rent, and depending on investment spending. To him profit involves disempowerment of the privileged and empowerment of the labour. Regarding accumulation and growth of consumption Elsenhans believes that positive net investment hinges on increasing mass incomes. Contrary to profit is rent which he defines as the surplus achieved through political means and not used for mass consumption. To him rent is another type of surplus, which acts as a means for growth, and "[*r*]*ent is appropriated through political guarantees, whereas profit is earned on markets under the condition of competition"* (p. 7).

The way Elsenhans theorises marginality, under-development, under-consumption and globalisation are also distinctive. For instance, marginality is a key concept in his economic thought that links development and the transition to capitalism. He believes that marginality exists when part of the population cannot produce as much as they need to survive. They are unproductive as it would cost more to employ them than what they are capable of producing. Survival of this population depends on transfers or else they would starve, and these transfers are entrenched in the pre-capitalist notion of solidarity, like from the large family. This makes Elsenhans conclude that marginality is not only a technical construct but also a social construct. In the absence of such solidarity, marginal people would not survive and resultantly there would be no marginality.

One of the important themes in the second part of the book is the emergence of the non-governmental sector. Elsenhans dismisses the role of the non-governmental organisations (NGOs) in tackling under-development. He sees NGOs as formed on the same rent-based economic doctrine, and not on any notion of benevolence. This entails acquiring rent in their societies of origin and at the international level, including the United Nations, government aid allocations and private donors. He believes that, "[*t*]*he donor–recipient relationship forces the NGO to adhere to the power structure of the West to receive funds*" (p. 107). He considers that the disenchantment with NGOs is due to their bureaucratisation, dominance of the middle-class perspective, and following of the mandate set by the international donors. Elsenhans does not question the intentions of NGOs but considers them as doing nothing vis-à-vis development. He, in fact, believes that they are "*actually acting as a hindrance in achieving it as they occupy political spaces that crowd out alternatives"* (p. 107).

The topics covered in this book are too numerous to be included here and are left to the readers to explore. As stated earlier, though Wilcock and Scholz have tried to put Elsenhans complex theorising in an as organised and reader-friendly form as possible, it is not an easy book to comprehend. A substantive prior knowledge of economic thought and theory is required to navigate through the views expressed by Elsenhans in these interviews or else the readers would find themselves caught in a mental labyrinth with no way out. The book should be read with a clear head and, more importantly, without any pre-conceived notions. No matter what your orientation is regarding social and economic thought, you would agree with him at some places and vehemently disagree at others. That probably is the charm of Hartmut Elsenhans views, and hence this book. Views that combine Marxism, Keynesianism and neoclassical economics are bound to be complex, and at times confusing, but they very well can be part of the solution to the world's problems. Who knows until someone tries. Elsenhans is doing his part, are others ready to cross their ideologically demarcated boundaries? Going through this book can be a first step towards it.

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Shorter Notice

Jorge Martinez-Vazquez and Musharraf Rasool Cyan (Eds.). *The Role of Taxation in Pakistan's Revival*. Karachi: Oxford University Press. 2014. xxii+612 pages. Pak Rupees 1,500.

The book is specifically focused on the issue of taxation and its role in Pakistan's economic revival. It contains history of taxes in Pakistan, reforms proposed in different eras, and reasons for implementing certain taxes as well as reasons for abolishing certain taxes. In short, it comprehensively covers all the aspects of taxation in Pakistan. The book describes several issues of lower taxation in Pakistan in detail. It also compares taxation structure and policies with other countries. While comparing with several other countries, the book identifies several shortcomings in the system of tax collection in Pakistan. Among several issues, underground economy, tax evasion, bad tax administration, are identified as the main issues. The ultimate solution to generate higher revenues from taxation, according to the book, is reforms. Each chapter, along with identifying the problem, gives solutions to rectify the problem for every type of tax. The book contains nine chapters starting with the introduction of the taxation structure in Pakistan. The chapter raises issues of buoyancy, equity, efficiency and tax administration. The second chapter starts with the snapshot of Pakistan's economy, followed by the biggest problem of individual taxation, i.e., narrow tax base and exemption of several sectors from various taxes. Although, the idea of exemption is to increase profitability in different sector, it is ultimately used for tax evasion. Overall, this chapter reviews the major taxes in Pakistan, along with their performance and implementation. Special attention is given to the corporate taxes and business incentives in Chapter 3. It also covers the problem of exemption resulting in lower revenues, along with the discussion of several other issues. It also spells out distorting behaviour of corporate taxes and suggests reforms to correct it. Chapter 4 discusses different tax provisions in the global economy such as double tax agreements, trade agreements, transfer pricing etc. The concept of tax incidence, modelling of incidence, and incidence in Pakistan is discussed in Chapter 5. This chapter gives important information about the incidence of taxes on different income deciles, which gives interesting results regarding if we have anti-poor taxation system. One of the important aspects of tax gaps is discussed in Chapter 6. In this chapter, the gaps in different taxes in Pakistan are calculated explicitly. According the estimates, it is 45 percent; 65 percent in direct taxes and 35 percent in indirect taxes. Interestingly, it shows that there is no tax gap for non-salaried class and salaried class is paying twice the income tax in the form of withholding tax. The important issues of property taxes, underutilised land, and agricultural income tax are

explained in Chapter 7. Potential of several provincial taxes, which have gained importance after the 18th amendment, is explained in Chapter 8. This chapter, apart from agricultural income tax and other land and property taxes, elucidates several issues and solutions to increase provincial taxes. In the end, based on problems and solutions discussed in each chapter, several short- and medium-term reforms are given in Chapter 9. One of the main drawbacks of the book is that several research reports and articles are not cited. Other than that, the book is an important contribution to the issue of taxation in Pakistan. (*M. Ali Kemal*).