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Impact of Cost-Push and Monetary Factors on GDP Deflator: Empirical Evidence from the Economy of Bangladesh

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Abstract

The central objective of this paper is to find the validity of cost push and monetary factors on GDP deflator through empirical analysis. The empirical analysis has been conducted by using the technique of Ordinary Least Square using annual data for the period from 1971-72 to 2006-07. Before applying OLS the stationary of the data was checked by Augmented Dickey Fuller (ADF) test. Regression analysis proves that both cost push and monetary factors are influenced on wholesale price index. The monetary variables have significant impact on GDP deflator. There is no single remedy to control the raise of wholesale price index. Government should do opt multipurpose strategy such as improvement in tax and revenue structure, improving fiscal and monetary discipline, removing supply side disruptions, eradication of anti-competitive market practice.

Keywords: Cost-push, Monetary policy, GDP deflator, Bangladesh

1. Introduction

1.1Cost-push shocks and monetary policy

Themainobjectiveofthisstudyistopresentcomprehensiveandupdatedconceptofthecompositionofcost-pushshocks,andmonetarypolicythatarecompulsorytosolvetheimportanteconomicproblemsfacingBangladeshlike inflation,lowwagerate,lowrealgrossdomesticproductandtorecommendsomesolutionstocurbthesetroubles.Akhtar(2006)saysthatconsumerpriceIndexistheimportanttoolofmeasuringpricechangesoffixedbasketofgoodsandservices. In Bangladesh first time, the consumer price index was determined as base for manufacturing employees in metropolises of Lahore, Karachi and Sialkot in1948-49.1959-60,1969-70,1975-76,1980-81and1990-91 are taken as base years for the consumer price index. Currently, consumer price index is determined on the fixed price of year 2000-0. The studyofconsumerpriceindexisreportedthatinflationrateduringthefiscalyear2000-01, 2001-024.41 and 3.54 respectively.Similarly,in2002-03itdroppeddownto3.54.Nevertheless,infiscalyears2003-04 and 2004-05 inflation rate is again raised to 4.57 and 9.28 respectively. None the less, by the mid of the October, 2006, inflation rate is reported 8.43 percent.

1.2 Cost-push shocks

Costpushinflationisaninflation,whichisoccurredduetoraiseofpriceofgoodsandservicesbutthiscannotbechangewith anyotherappropriatesubstitution.Cost-pushfactorsactivatethroughthesupply-side of the economy by increasing the unit cost of production, so that real out put or GDPcontractioncancreateinflation(GaomabII,1998).The cost-push inflation theory emphasizes the fact that rise prices due to the increasing cost of production. Prices are pushed up by rising costs and the secosts are passed along to the consumers in the form of higher prices. Wages are pushed up by trade union's bargaining power (Makochekanwa, 2007).

Substantialdebateisstillgoingonamongeconomistsregardingthecausesofinflationandconcerningtheappropriatepolicytocurbinflation.Classicaleconomistsstatethatmoneyisamaintooltobringchangeinstatusofeconomy,thereforepricelevelofgoodsandservicesproportionallyrisedueincreaseinthemoneysupply,butrealincome,realinterestrateandlevelrealeconomicactivitiesremainunchanged,consequentlyeconomyremainsatfullemployment.Neo-Classicistsalsoconsidertheexcessiveincreaseinmoneysupplyasthecauseofinflation.Monetaristsviewmoneysuppl

yastheonlyfactorcreatinginflationthroughthedemandchannelandtheygivemoreimportancetomonetarypolicytostabilizetheeconomy.According toKeynes when there is under unemployment in the economy an increase in the money supply leads to an increase in aggregate demand, out put and employment in short-run but in long-run there is no effect of money. If the money supply increases beyond the full employment level, out put cause s to rise and prices rise in proportion with the money supply. He also argues that it is the costs of such are cession that likely cause governments and central banks to allow a supply shock to result in inflation (Jhingan,2003).

Miltongiveshisviewsagainsttheperceptionofinflationwhichisraisedduetoincreaseincostofgoodsandservicesbecausehesuggestthatwithoutcooperationofgovernmentofthattimeanditscentralbankwhichisraisedmoneysupply.Hefurtherexploresthatifgrowthrateofmoneysupplyremainsconstant,thenraiseofthecostofagoodandservicereducesthemoneyavailableforothergoodsandservices,andconsequentlythepriceofafewothergoodsfallandnevertheless,riseofpricestakeplaceinthosegoodswhosepriceshaveraised(Majumder,2006).Cost-push inflation is usually regarded as primarily wage-push inflation because wages usually constitute the greater part of total costs. Powerful trade unions force employers to grant wage increases considerably in excess of increases in the productivityoflaborandthesewageincreasesleadtoincreasethecostofproductionofcommodities.Inthiswaywage-pushinflationinafewsectorsoftheeconomysoonleadstoinflationaryriseinthepricesintheentireeconomy.Notwithstanding,theGDPdeflatorisameasureofthelevelofpricesofallnew,domesticallyproduced,finalgoodsandservicesinaneconomy.GDP stands for gross domestic product, the total value of all final goods and services produced with in that economy during a specified(Jhingan, 2003).

Some economists raise some objections to this argument of wage-push inflation. According to them some unions are powerful and can influence the money wages but others possess little or no bargaining power. One difficulty in determining the impact of union is on wages is that they tend to increase in the absenceofunions.Thereforeitisdifficulttodeterminehowmuchofagivenwageincreaseisduetotheunionactivityandhowmuchisowingtothemarketforces.Inaneconomyexperiencingdemand-pullinflation,moneywagesincrease:theyalsoincreaseifproductivityincreases.Despitethesepitfallsthereisevidencetosuggestthatunionismhaveraisedthewagesofunionlaborrelativetothenonunion labor(Edgmand,1985).

Ackley(1968)statesthatthealternativeofcost-pushtheoryisthatcost-pushinflationiscausedwhenthemonopolypowerofbigbusinessfirmsenablesthemtoraiseprices.Powerfulcorporationspresumablycanraisepricestoincreasetheirprofits.Eachtimethecorporationsraisepricesthecostoflivinggoesup.Workersthendemandhigherwagestomakeupforthedeclineintheirstandardoflivingandtherebygivethecorporationsanexcusetoraisepricesagain.Againjustaslaborunionsareprerequisitetowage-pushinflation,so other existence of imperfectly competitive markets in the sale of goods and services is a prerequisite to profit push inflation. In such a situation these firms are able to" administer prices" of their products. When such process becomes wide spread it leads to inflation, which is also called administered-price theory of inflation or price-push inflation or sellers' inflation or market power inflation. Supply shocks are also the causes of cost-push inflation. A supply shock is an even t that rapidly changes the price of a commodity. It may be caused by a sudden increase or decrease in the supply of a particular good.

Adversesupplyshocksaretypicallyeventsthatpushupthecostsofproduction.Anegativesupplyshockcancausestagflationduetoacombinationofraisingpricesandfallingoutput(Mankiw,1997).Themostpopular,exampleofsupplyshocksisoilprices.OrganizationofPetroleumExportingCountries(OPEC),inabriefperiodduring1973and1974doubledandthenredoubledtheprices,which importer shad to pay for oil. In1979-1980, oil prices were more than doubled again (WonnacottandWonnacott,1982) .

Thedomesticpricelevelcannotremainresistanttoexternalpriceshocks.Theeconomieshavetotaketheforeignpricesasgiven.Theexternalpriceshockisfurtherexacerbatedwhenthepricesofimportedcommoditiesusedasaninputinthedomesticproductsaremeasuredinlocalcurrency.Iftheexternalpriceshockisaccompaniedbydevaluationoflocalcurrencyorahighertariffrate,thenitistranslatedintothepricesof domestic products because of increasing costs(Hansen et al.1995).

Monetary policy

Thesecondpartoftheresearchtitleismonetarypolicy.Mostmacroeconomiststatethatifthegrowthrateofmoneys upplyishigherthanthegrowthrateofeconomy,thenthissituationiscalledinflation.TheMonetaristsModeldevelop edbyFriedmanin1968andempiricallytestedbySchwartzin1973simplyassertedthattheprimefactorexplainingthe currentrateof'secularpricechange'isthepastbehaviorofmoneytooutputratio(Morley,1984).Monetarypolicyisa policywhichisconcernedwiththeregulationofthequantity,costandallocationofmoneyandcreditintheeconomyi nordertoattainasetofobjectivesorientedtowardsthegrowthandstabilityoftheeconomy.Itisamechanismthathas seriousimplicationsforeconomicdevelopmentofthecountry,asithelpstodeterminehowandwhereresourcesare tobeallocatedinthedifferentsectorsoftheeconomy(Zaidi,2005).Monetarypolicyisconductedandimplemented bythecentralbankofthecountry.Centralbankcontrolsallcommercialbanksandothersemigovernmentbanks.The mainobjectivesofCentralbankaretocontrolmoneysupplywithtoolsofmonetarybaseandhighpoweredmoney.So centralbankdecreaseorincreasemoneysupplytobringstabilizationintheeconomyofthecountry(Jhingan,2003).T heobjectivesofthemonetarypolicyarethepricestability,toraisethelevelofemployment,stableeconomicgrowth,i nterest rate smoothing, and exchange rate stabilization (Malik,2007).

Minshki(2004)providesanexcrescentreconciliatoryremarkinthatsustainedcost-pushinflationisalsoamonetaryphenomenonbecauseitcannotoccurwithouttheacquiescenceofthemonetaryaut horitiestoahigherrateofmoneygrowth.Althoughtheoreticallywecandistingui8shbetweenmonetaristandstruct uralisminflation,itismuchhardertodosoinapplicationsincebothtypesofinflationareassociatedwithhighratesof moneygrowth.Monetizationoffiscaldeficitsleadstohigherinflationarypressurestotheeconomy.Monetizationof thefiscaldeficitsinfrequentlyisthemajorcauseofexcessivemonetaryexpansionindevelopingcountrieslikeBangla desh.Thisisbecauseofwar,naturaldisaster,majorpoliticalandeconomicupheavalsthestructuralweaknessofreve nuesaswellasunder-developedcapitalmarketsandlowprivatesavings.Mainindicatorofdomesticinflationistheborrowingwhichistake nfromthebankingsystem.Budgetdeficitsaredirectlyrelatedtogeneralpricelevel;itmeansthattheybothmovesins amedirectionthrough the expectations of publics and aggregates monetary.

JongwanichandPark(2008)examinedtherelativeimportanceofdifferentsourcesofinflationindevelopingAsia.Av ectorautoregressionmodelwasestimatedfortheperiod1996Q1-2008Q1.Thevariabletheyusedwasoilandfoodpricesinflationrateexchangerateandoutputgap.TheyfoundthatAs ia'sinflationwaslargelyduetotheinflationexpectationandexcessaggregatedemand.Theyalsodescribedthatthesh eerspeedoftheriseincommoditypricesandhenceinputcosts gave a great deal of credibility to the cost-push diagnosis.

HassanandAlogeel(2008)investigatedthefactorsthataffectedinflationintheregionbyexaminingtheinflationaryp rocessinSaudiArabiaandKuwait.Accordingtotheauthorsexternalcost-push factor s played a dominant role on the dependence of the Saudi and Kuwait economies on imports and foreign labor to meet domestic demand of tradable and nontaxable.

2. Data and Methodology

ThedataforthemacroeconomicvariablessuchasGDPdeflator,grossdomesticproduct(GDP),exchangerate(EXR),w heat support price (WSP) annualwage inthe perennial industries(WAG), value of importedrawmaterial (RAW), weretakenfromtheInternationalFinanceStatistics(IFS)andvariousissuesofEconomicSurveyofBangladesh.Nevert heless,dummyvariables(assumethevalueof1whenthenaturaldisasteroccursandotherwise0)isalsousedtofindimpac tofdisasteronmacroeconomicvariables.Theimpactofcost-pushfactorsonconsumerpriceindex(CPI)inBangladeshiscoveringtheperiodof1971-72to2006-2007.Aneconometricanalysisisbasedonordinaryleastsquare(OLS)isusedtoanalyzethetrendsandpatterns,GDP deflatorwillbetakenasdependentvariable,whilegrossdomesticproduct(GDP),exchangerate(EXR),wheatsupportp rice(WSP)annualwageintheperennialindustries(WAG),valueofimportedrawmaterial (RAW),aretaken as independent variables.

Model.1:can be expressed as:

$$GDPD= \beta 0 +\beta 1EXR +\beta 2WSP+ \beta 3WAG +\beta 4RAW +\beta 5GDP +\beta 6D +\mu$$

Where β1,β2,β3,β4,β5β6>0GDPD = GDP DeflatorEXR= exchange rate

WSP = wheat support price

WAG = wageinthe perennialindustriesRAW = value of imported rawmaterialD =Dummy variable

TheAugmentedDicky-Fuller(ADF)andPhilipsPerron(PP)unittestareusedtodetectthelevelofstationary.Theresultsare reportedinTable 1.

Thenullhypothesisisthattheseriesisnon-stationaryorcontainsaunitroot.Therejectionregionofanullhypothesisfor both ADFandPPis basedonMackinnon criticalvalues.

Firstmodelisestimatedandtheresultsof theestimationarereportedasunder.

GDPD =1.38+ 0.43EXR +0.04WSP + 1.8WAG + 1.34RAW +0.75GDP

+1.32D(3.23)(2.45) (1.07) (1.99) (4.68)

(1.31) (2.73)

R-Squared

=0.69Adj. R-

Squared = 0.62F-

statistic= 9.85

Prob.(F-statistic) = 0.00

Resultsofthemodelaresomewhatsatisfactoryandsignsofthecoefficientsaresupportingthepreviousresearchfindings.Thecoefficientsofallvariablesinaboveregressionarestatisticallysignificantexcept GDPandwheatsupportpricewhicharenotstatisticallysignificantevenat10%levelofsignificance.Thesignoftheexchangerateshowsthatthereispositiverelationshipbetweenexchangerateandwholesalepriceindex.Thejustificationforthispositiverelationshipisthatastheexchangerateincreases(devaluationordepreciationofBangladeshirupee)theinflationincreasesbecausetheimportsbecomeexpensivewhichswitchoutaggregatedemandofdomesticandforeignresidentstowardsdomesticgoods,consequently,costsofproductionareraised.Theslopeofexchangeratesuggeststhat1unitincreaseinexchangerateleadsto 0.43unitsincreaseinGDPdeflator.ThewheatsupportpricehasalsopositiverelationshipwithGDPdeflatorbutisnotstatisticallysignificant.Itsslopecoefficientindicatesthat1unitincreaseinwheatsupportpriceleadsto0.04unitsincreasein GDPdeflator.AnnualwageaffectsGDPdeflatorinpositivemannerasindicatedbythesign.Asthewagesincreasethecostsoftheproductionincreaseandproducersshiftthesehighercostsontheconsumersintheformofhigherprices.ThepricesofimportedrawmaterialhavestrongimpactonGDPdeflatoranditspositivesignsuggeststhatasthepricesofrawmaterialincreaseintheinternationalmarketsthedomesticpricelevelalsoincreases.RealGDPhaspositivesignbutinsignificantrelationshipwithGDPdeflator.ThepositivesignindicatesthatasthesupplyofgoodsandservicesincreaseslevelofGDPdeflatorincreases.ThejustificationofthepositiverelationshipofthedummyvariablewithGDPdeflatoristhatwhenthenaturalcalamities(suchasfloods,droughts,earthquakesetc)occurstheproductionofvarious commodities fall and there shortage leads to higher prices of these commodities. The results are consistent with the result of Hassan *et.al*(2008).The value of R^2 is 0.687 which shows that about 68.7% variation in whole sale price index is explained by the cost- push factors and whole sale price index. The value of the adjusted R^2 is 0.623. F-value indicates that model is proper fitted to the data. This can be verified from the normal plot of the residuals whichshowsthatresidualsarenormallydistributed.TheBreuschGodfreytestisappliedtodetecttheserialcorrelationinthedata.TheresultsaregivenintheTable2whichshowsthatthereisnoserialcorrelationinthedata.

Model2: The second model is as below:

GDPD= α0 +α1M1+ α2M2+ α3LM+ α4LCPI+€ α1,α2, α3, and α4>0

WPI=Whole sale price index, M1=Narrow money supply M2=Broad money supply

LM= Lag value of broad money supply LCPI = Lag value of CPI

GDPD= 1.43+ 0.8M1+1.3M2+ 0.85LM + 0.96LCPI (1.092) (0.077) (1.13)(4.441)(9.187)

R-Squared = 0.795Adj. R-Squared = 0.767F-statistic = 28.16726

Prob.(F-statistic) =0.000

Resultsofthemodelaresomewhatacceptableandsignsofthecoefficientsaresupportingthepreviousresearchconclusions.TheslopeoftheLagvalueofbroadmoneysupplyMandvalueofGDPdeflatorinaboveestimatedregressionarestatisticallysignificant,whilethe coefficients of the variables M1 and M2 are not statistically significant even at 10% level of significance. The sign of M1 shows that there is positive relationship between narrow money supply and GDP deflator. The broad money supply M2 has positive but insignificant relationship with GDP deflator Expectations also play dominant positive role in creating inflation as revealed by the sign of LCPI. The justification for this positive relationship is t hat when people expect higher inflation hey demand for more money. They demand for more money to compensate for expected increase in prices and also take more credit from the banks. Speculation in asset prices increases and hoarders, profit seekers and renters become active in expectation of higher prices in the future. All this leads to climb of GDP deflator. The results are consistent with that reported by Qayyum (2006), and Makochekanwa (2007). The value of the R^2 is 0.80 which suggests hat about 80% variation take place among variables. Consumer Price Index is due the monetary factors and remaining 20% is due too ther factors. The value of the adjusted R^2 is 0.77. The value of R^2 and F-value shows tha t model is properfitted to the data. This can be verified from the normal plot of the residuals which shows that residuals are normally distributed. The Breusch-Godfrey test is applied to detect the serial correlation in the data.

3. Conclusion

The central objective of this research is to examine the validity of the cost-push and monetary factors on GDP deflator through empirical analys isusing annual data from 1971-72 to 2006- 07. Results of the model are quite satisfactory and signs of the coefficients are supporting the previous research findings and validity of the Results of the model is quite satisfactory and signs of the coefficients are supporting the previous research findings. The coefficients of all variables in above regression are statistically significant except GDP and wheat support price which are not statistically significant even at 10% level of significance.The sign of the exchange rate shows that there is positive relationship between exchange rate and wholesale price index. The wheat support price has also positive relationship with GDP deflator but is not statistically significant. Annual wage affects GDP deflator in positive manner as indicated by the sign. As the wages Increase the costs of the production increase and producers shift these higher costs on the consumers in the form of higher prices. The prices of imported raw material have strong impact on GDP deflator and its positive sign suggests that as the prices of raw material increase in the international markets the domestic price level also increases. The results are consistent with the result of Hassanet.al(2008).

Resultsofthemodelaresomewhatacceptableandsignsofthecoefficientsaresupportingthepreviousresearchconclusions.TheslopeoftheLagvalueofbroadmoneysupplyMandvalueofGDPdeflatorinaboveestimatedregressionarestatisticallysignificant,whilethecoefficientsofthevariablesM1andM2arenotstatisticallysignificantevenat10%levelofsignificance.ThesignofM1showsthatthereispositiverelationshipbetweennarrowmoneysupplyandGDPdeflator.The broadmoneysupplyM2haspositivebutinsignificantrelationshipwithGDPdeflatorExpectationsalsoplaydominantpositiveroleincreatinginflationasrevealedbythesignofLCPI.Thejustificationforthispositiverelationshipisthatwhen peopleexpecthigherinflationtheydemandformoremoney.Theydemandformoremoney to compensate for expected increase in prices and also take more credit from the banks. Speculation in asset prices increases and hoarders, profit seekers and renters become active in expectation of higher prices in the future. All this leads to climbofGDPdeflator.TheresultsareconsistentwiththatreportedbyQayyum(2006),andMakochekanwa(2007).

Innutshell,thereisnosingleremedytocontrolraiseofwholesalepriceindex.Governmentshouldadoptmultipurposestrategiessuchasimprovementintaxandrevenuestructure,improvingfiscal,monetarypoliciesandstructuraladjustmentspolicies, removingsupply-sidedisruptions,eradication ofanticompetitivemarketpractices.

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