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THE OPTIMUM MONETARY PREDICTORS DETERMINING ECONOMIC GROWTH IN PAKISTAN

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ABSTRACT

This purpose of this paper is to investigate the optimum monetary predictors that determine economic growth of Pakistan. Though a country may have mix of policy measure either fiscal or monetary but this study is focused on finding out the best and optimum predictors among several of mix blend. GDP growth rate is taken as dependent variable and Exchange Rate (EXR), Consumer Price Index (CPI), Worker Remittances; (WR), Interest Rate (INT), M2 money supply, Government Bank Borrowing (GBB) taken as independent variables. Secondary data has been used for analysis from 1980 to 2015. Augmented Dickey-Fuller tested for stationary and all variables found stationary at first difference. Multiple regression is followed as all the factors were found stationary at first difference. GBB and M2 found insignificant and EXR, CPI, INT and WR found significant in determining GDP. R-Squared found very strong. No sign of autocorrelation is found. This study is an addition to the literature of monetary policy and its implications. Worker Remittance, CPI and Exchange rate are suppose to be more in study because the theoretical basis and literature were proponent for M2, CPI GBB and FDI as predictors for economic growth. The result of the study is somewhat interesting and need to be researched more.

Keywords: Monetary Policy, GDP growth, Worker Remittance, CPI, Exchange Rate, Interest Rate

INTRODUCTION

The term growth is defined as persistent rise in national income and considered to be the sensitive to all macroeconomic indicator working in boundary. Growth in any economy deliver in result the expansion of economy and infrastructure, moreover growth definitely bring more employment, develop the social status, and influence the living style and standard of common man. It also accelerate the wheel of the economic activity and the pace of productive systems. The economic growth is also taken as measuring tool of many development indicators but in the same time this economic growth by itself is a result of many dynamic indicators and factor working in the fields. These factor may be fiscal and monetary both. Studies verify the important and significant of both fiscal and monetary factors in different time at different levels. Here this study is an attempt is not focusing on significant factor that influence growth but it focus on the best predictors that are relevant to monetary policy. In other words we are trying to establish predicting ability of factor rather than deterministic nature of the factors.

The process of growth is manifold, embedded with variety and different dimensions of the factors that lead to growth. The debate of determining economic growth is un-ended and inconclusive in nature. Rather putting efforts on emphasizing the factors that influences growth as said earlier it is very much complicated so here as said the focus is on only monetary predictors. Choudhry et al. (2012) mentioned as many classes of factors that lead to growth such as natural factors, economic factors, social factors and cultural factors. Economic factors further can be classified into fiscal and monetary factors. Fiscal factors includes majorly taxes, public expenditures, public debt, investment, and

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if one goes into more detail than infrastructural factors can also be included along with the legal structure and capital formation as well (Ciccarelli, Ortega & Velderrama, 2016). Public revenue definitely ensure growth if collected productively, more public expenditure also give pace and acceleration to economic growth. Investment through capital formation not only expands the economy and also provide strong bases for healthy economic activities. Legal structure provides complete and comprehensive code of conduct which is necessary for the smooth and controllable economic progress.

One can observe the relevant important of the factor in literature that give good pace to the economy. Fiscal measure as well as monetary measure both are dealt with zeal to bring the economy on the desirable tack. Literature in enriched with different kind of investigation how these dimensions play a vital role in determining the economy of GDP. Looking to the literature one can easily conclude that the monetary factors remain vital and having leading role in determining behavior in economic growth. As matter of discussion one may have number of monetary factors here as predictors but for precession we need little introduction of some factors.

Keynesian school of thought takes inflation in general but monetarist in particular takes it as monetary phenomena, they believe that the economic growth and price stability are linked close together as said by Cottrell (1994). Gilchrist and Zakrajsek (2015) also indicates the variation in inflation and its immense effect on growth. Faust and Wright (2013) argued inflation as main forecasting indicator for growth, he used CPI as a proxy for inflation. Pakistan has been sensitive in connection of price mechanism and its volatility. Rapid fluctuations in price level has always been a serious problem in Pakistan. In result of which entrepreneurial system faced lot of critical and miserable situations. Jalil, Tariq and Bibi (2014) worked in same paradigm in Pakistan for last decades and found inflation as sensitive factor in influencing economic activity and growth. In this study we are taking as predictor of economic growth. The next predictor is interest rate and no doubt the interest rate is leading factor in determining all financial markets, transactions and hens the underlined economic activity. Ahmad, Muhammad, Noman and Lakhan (2014) argued that the interest rate in Pakistan is considerable factor because the financial structure in Pakistan is said to be bank based. All investment decisions and financial market activity are very sensitive to interest rate particularly in Pakistan. Unfortunately just like inflation in Pakistan, interest rate has also not been stable in last decade. Stock market crash down in 2008 and flight of capital showed immense pressure not only on the growth of that time but it put lot of pressure on policy makers to cope with the future challenges. Bernanke (2003) emphasizes on careful look into the sensitiveness of interest rate especially in developing countries. Pakistan being a developing country along with its history of financial shocks is a strong case to be taken into consideration as case study in this frame. Oliver (2014) made also interest rate as case to be taken into study because if one see in Pakistan flight of capital resulted in vacuum of supply of money and people got intention toward portfolio investment rather putting their money in real market. The diversion of investor into financial market put a big question mark on fiscal targets and hens economic growth is compromised in later years of last decades below than 3 percent. Interest rate thus is our next predictor for economic growth in this study. Frankel (1987) prior noticed on the volatility of exchange rate and mismanagement of exchange rate resulted in economic instability.

Remittances as another predictor found very important source of foreign exchange and leading force of the pace of monetary inclusion into productive stream. Barajas et al. (2009) emphasizes on the impact of foreign remittances on the institutional structure and economic growth. Public borrowing from the banks is another leading factor influencing money flow in the economy. Infrastructural development particularly supposed to be taken as important factor in accelerating pace of economic growth. Pakistan has unpopular debt history where rising indebtedness is now seems major component and factor that hinder economic wheel.

In short there is a need felt to look into again and as said earlier is required to conclude the predictive role of monetary factor rather than having determining role. The expected finding may reveal some interesting outcome and facts but very contributive in decision making layer.

Problem Statement

Though literature is enriched with such kind of investigation but still it is required to look into the matter with a different snapshot isolating the best or optimum predictors in case of Pakistan with updated time series data. We are interested in magnifying the one two or more, what analysis suggest as optimum factor(s) which help in understanding present and future policies of stability and economic growth.

Research Questions

Above discussion tend toward the following questions that supposed to be answered

1. What are the optimum monetary factor that predict economic growth in Pakistan?
2. What are the appropriate measure of predictors that make a sound econometric model to identify the significant effects on economic growth in Pakistan?

Objectives of Research

Following objectives are designed for this study in relevance to title, literature, and statement of problem.

To investigate the optimum monetary factor that predict the economic growth of Pakistan.

To determine stable econometrics model that identify the appropriate measure as monetary predictors.

LITERATURE REVIEW

Literature is enriched as said in introduction about the determinants of GDP growth and more specifically aforementioned monetary factors. here we are interested in literature to highlight the arguments and opinions of different authors. Balogh and Streeten (2014) and Gala (2008) pointed out about exchange rate as important predictor for GAP growth and economic stability Rodrik (2008) concluded that the exchange rate is found significant determinant in developing countries rather in developed countries. Faini and DeMelo (2015) also mentioned significant effect of exchange rate on GDP particularly in developing countries but they stress on the fact that same hypothesis does not imply same for all developing counties. Levy-Yeyati and Sturzenegger (2001) also verifies the strong, significant but association between exchange rate and economic growth, higher exchange rate and devaluation of local currency opens the borders for the foreign investor and Foreign Direct Investment on the other side lower exchange rate increase the barrier and the incentives for foreign investors get shuttled.

Perkins (2001) wrote in detail in his book about the important and significance of inflation that how it plays vital role in economic progress. Smyth (1992, 1994) found inflation as negative and significant factor predicting economic growth but he also of the same opinion in his finding that it happen in developing countries. Ayyoub, Choudhry and Farooq (2011) also concluded in their study that inflation rate is significant and negative influence on economic growth. Inflation in fact put multiple kind of effect in economic structure. Rising prices on one hand put pressure on the masses but in controllable range it depicts healthy effect. Rising price in desirable range considered as running blood in veins but when inflation gets in uncontrollable range it put pressure on consumers and business class both. Bruno and Eeasterly (1998) mentioned that high inflation rate hinder the economic activity if it higher than desirable range and economic progress gets good signs when he inflation get decreased or comes in desirable range. Zubaidi and Soon (2014) accepted hypothesis in his analysis that inflation uncertainty has significant and negative effect on economic growth, same results are also produced by Narayan et al. (2009) and Ceccetti (2000) both studies argue that the inflation and economic growth has negative association but in they cite some studies concluded with mixed results as well. Mumtaz and Surico (2012) also argued for mixed effect of inflation on economic growth and as well as on employment. The debate is still on when price has rising trend it lowers the profits margin of corporate sector and they start in cost cut activities and in result business sector start downsizing and unemployment rises. Qayyum (2006) in his study for Pakistan has taken Monetary Condition Index (MCI) and he also suggested to estimate monetary indicators as batch more specifically to predict economic growth. Choudhry, Qamber and Farooq (2012) also argued the importance of inflation in the determination on national income.

The dominant behavior of monetary facto in leading economic growth and national income is explain by Khan and Schimmelpfennig (2006). Pakistan having dominating nature of its financial structure in leading financial development and economic growth, this fact compelled us to have keen look into design the model which can provide best and leading monetary predictors of national income. So far as the model is concerned most of the authors follows the linear model but Munir & Mansur (2009) did this in non-linear model and found significant and positive relationship along with empirical justification of non-linear relationship in between inflation and economic growth. In continuation of debate on non-linear relationship between inflation and economic growth Sergii (2009) evidently proved in Common-Wealth Independent States (CIS) during 2001 to 2008 that when inflation raised at certain level it harms national income, the threshold effect is also studied in Parasad and Leon (2010) through smooth transition model applied on 165 countries and found threshold level at 10 percent in comparison of Sergii (2009) who found 8 percent threshold level in CIS countries. Point to be noted is that in both studies that the threshold level is found high in developing and low income nations whereas in advanced counties it was found less This argument strengthen the view of non-linear relationship but as well as this argument also justify the scope and objective of this study in Pakistan. The reason behind the inclusion of inflation is two- fold, one the inflation is monetary factor and other is the volatile behavior of inflation particularly. Ayyoub et al. (2011) in their study found also a considerable but negative effect of inflation on economic growth. They are of the view that high inflation hurts economic growth and productive activities in the economy. They also suggested that Pakistan should keep its inflation below than 7 percent to avoid its negative impacts. Hussain (2005) resulted 9 percent as threshold inflation rate to avoid bad impact. Same results also concluded in Khan and Senhadji (2001). Shamim and Mortaza (2005) estimated significant and negative long run relationship between inflation and economic growth in Bangladesh. Qaisar, Nasir and Muhammad (2011) produced same results in SAARC counties.

In Pakistan where the financial structure is based on banks and financial institutions and monetary factor are found to be more sensitive and leading indicators of market capitalization and productive. Financial deepening may be affected by many factors. Omankhanlen (2011) found significant effect of exchange rate, inflation and FDI on economic growth. Exchange rate in his study is strongly associated with FDI which further effect on real sector growth and employment. Monetary policy dimension also give different result in different scenarios. Restricted monetary policy creates interest rate higher and investments and employment activities get restricted, this is done when inflation is seems higher than desired level. Easy monetary policy where interest rate is lessen and credit is enhanced in economy and in result productive activities are promoted and economic growth is projected to flourish (Blejer, Ize, Leone & Werlang, 2000).

Nigeria and Agu (2009) worked on the relationship between remittances and economic growth and they found positive and significant association between these factors. He pointed out that the existence of leakages of remittances proceeds through imports could be responsible for the weak nexus. Tomori and Adebiyi (2007) and Chukwuone et al (2007) using partial equilibrium framework and living standard survey in their respective studies of the effect of remittances on poverty levels argued that remittance is an important channel to alleviate poverty in developing countries.

Udah (2011) showed that remittances affect economic performance in Nigeria through its interaction with human capital and technology diffusion. In addition, he argued that government capital expenditure on economic and social services is equally important in accelerating the pace of economic growth and development. Similarly, Quartey (2005) found positive and significant relationship between economic growth and remittance. In developing country like Pakistan remittance plays important role because in developing countries tax to GDP ratio is not healthy remittances on the other hand plays as healer some time for economic deficiency.

Leone-Ledesma and Piracha (2006) found positive and proactive role of remittances in they also concluded that institutional reforms and environment are also important predictor of economic growth. Fayissa, Nisah and Tadasse (2008) and Jongwanich (2007) also verify the strong and significant association between worker remittances. Lewis (2015) mentioned M2 money supply and interest rate as strong predictors of economic growth, rising M2 supply promotes more employment and productive activities in economy. Chow (2015) studied for China as found money supply as strong determinant of economic growth. Valickova, Havranek and Horvath (2015) emphasized on financial deepening and interest rate they considered important tool to attract or release money flow into the economy. The debate is here now interesting that rising money supply depicts high rate of inflation, now high inflation as discussed earlier has negative impact on economic growth, while on the other hand more money supply in considered as oxygen for productive activity. Answer to this confusion is already came into our discussion that if inflation crosses the threshold level than it creates problem otherwise inflation in derisible range consider healthy sign for growth.

In globalization of recent time open markets are emerging and along with pure financial indicator fiscal measure are also seems important but here we are only concerned with monetary factor and that is internal public borrowing, more specifically government bank borrowing Miiler, Kim and Holmes (2015) worked on public borrowing and Eberhardt and Presbitero (2015) also verifies the public borrowing as important determinant of economic growth.

RESEARCH METHODOLOGY

Hence the data is secondary and time series it requires stationary check first then an appropriate multiple regression model will be chosen. Stepwise regression would be followed as we want to get closer to the optimum monetary factors because there is least chance of insignificance of any factor but here we are interested to best and optimum predictors. Data is taken from 1980-2015.

DATA ANALYSIS

Descriptive

Descriptive shows the mean, standard deviation, and other facts the theme behind is to see how standard deviation strengthen the mean. The descriptive are snapshot of variable their means and standard deviation. Most of the time descriptive suggest sufficient information in building the model and a literary look into the facts.

Looking at glance M2 has mean as 42.73 but with smaller standard deviations 3.22 as compare to its mean which shows the consistency in the factors over the long period of time. Were all other factors have larger standard deviation and gives a glimpse of high degree variations in the factors and that in results M2 seems not having any regressing strength in determining GDP.

	GDP	EXR	GBB	M2	CPI	WR
Mean	87.82	46.47354	31.19	42.73378	8.558194	4.74
Median	57.62	43.07910	30.10	42.12246	8.078781	2.49
Std. Dev.	70.43	29.36617	16.92	3.227055	3.723165	4.91
Skewness	1.084838	0.474122	0.635874	0.349331	0.710851	1.662974
Kurtosis	2.812919	2.013641	2.464696	1.962367	3.946819	4.614520
Jarque-Bera	7.113738	2.808106	2.855839	2.347217	4.376556	20.50290
Probability	0.028528	0.245600	0.239807	0.309249	0.112110	0.000035

Jarque-Bera test is used for the normality but here normality does not matter at all otherwise GDP and worker remittance are found not normal and all other variables are found normal.

Correlation

Here in following table we analyze correlation coefficient of each pair of factors and if we take rule of thumb than here also M2 has very little correlation -0.152 with GDP which again minimize the regressing characteristic of factor over GDP. In same connection CPI has 0.261 which is also not healthy and it seems too with little predicting power for GDP otherwise all other factor are having strong correlations with GDP such as EXR with 0946, GBB with 0.953, INT with 0.757 and WR with 0.946 which is strong case of having effect on GDP.

	GDP	GBB	EXR	INT	CPI	M2	WR
GDP	1						
GBB	0.952	1					
EXR	0.946	0.978	1				
INT	0.757	0.707	0.653	1			
CPI	0.261	0.218	0.133	0.537	1		
M2	-0.152	-0.079	-0.059	-0.131	-0.061	1	
WR	0.946	0.851	0.836	0.684	0.182	-0.275	1

Unit root test

In the following table the results of stationary test is stated. Augmented Dicky Fuller test conducted and can be seen that all variables are stationary at first difference**.**

Variables	Prob (level)	Prob.(first diff)
CPI	0.1616	0.0000
WR	1.0000	0.0075
M2	0.2772	0.0004
INT	0.4870	0.0001
LnGBB	0.1266	0..0016
LnEXR	0.9059	0.0211
LnGDP	0.8145	0.0002
GDP	0.9985	0.0009

Here in the ADF table one can see we have taken the log of GBB, EXR and GDP. The log of GDP is taken due to have coefficient to produce ration in percentage change in GDP which represent the growth of GDP. Log of EXR and GBB is taken because to avoid the stationarity on second difference. Now in table we can see that the all required factors are stationary at first difference so there is no problem of different levels of stationarity. Here we can go for multiple linear regression for analysis and to see the predicting character of independent variables.

Regression Outcome

In the following regression results are presented. Here we have all variables are stationary at same level as I (1) therefore we can go for multiple regression results avoiding dynamic association of lag variables and trend terms. Following model is established as regression model

$$\Delta LnGDP = \beta_0 + \beta_1 \Delta LnExr + \beta_2 \Delta LnGbb + \beta_3 \Delta CPI + \beta_4 \Delta M2 + \Delta\beta_5 \Delta Int + \beta_1 \Delta WR + e$$

B1 and β2 shows the elasticity of Exchange rate and government bank borrowing on GDP where rest of βs shows the unit effect of relative factor on GDP. The result according to the model above is given in following table

Dependent Variable: ΔLGDP
Method: Least Squares
Date: 11/19/17 Time: 13:43
Sample: 1980 2015
Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔLNEXR	0.892182	0.159426	5.596197	0.0000
ΔLNGBB	-0.233756	0.206339	-1.132869	0.2665
ΔCPI	0.016561	0.006322	2.619706	0.0139
ΔM2	0.006951	0.006089	1.141436	0.2630
ΔINT	0.029050	0.011084	2.620896	0.0138
ΔWR	4.58E-11	6.12E-12	7.490803	0.0000
C	26.38484	4.370277	6.037338	0.0000
R-squared	0.984881	Mean dependent var		24.91007
Adjusted R-squared	0.981753	S.D. dependent var		0.758890
S.E. of regression	0.102513	Akaike info criterion		-1.544988
Sum squared resid	0.304759	Schwarz criterion		-1.237082
Log likelihood	34.80978	Hannan-Quinn criter.		-1.437520
F-statistic	314.8473	Durbin-Watson stat		1.271106
Prob(F-statistic)	0.000000			

we can see in results that the M2 has not significant effect on GDP so as with the case of GBB which is also not found significant exchange rate which is quite aligned with proposition in descriptive statics therefore rest of analysis for these factor us useless. Coefficient of Exchange rate shows less elastic behavior of Exchange rate that is 0.89 and found significant, CPI, interest rate, and worker remittance are also found significant and has unit effect on GDP. Model has high R-Square that is 0.98 which shows strong model fit. Significant F ratio that is 314.84 justify the overall significance of model. Durbin-Watson stats as 1.27 which lies in between lower and upper bound of DW limits which are 0.988 and 1.588 respectively so here is no explicit sign of autocorrelation.

FINDING AND DISCUSSION

The results have shown the expected results positive effect of exchange rate on GDP shows when exchange rate gets high it promotes growth but with less elastic effect. CPI, interest rate and worker remittance also has positive effect on GDP. High the CPI indicates higher the Growth in GDP that nullified the concept that in the long run Pakistan has inflation affected country. Higher the interest rate also shown the positive effect on GDP strengthen the concept that Pakistan as said in intro is having bank based financial structure have gained by raising interest rate and in return the GDP got pace. Worker remittance is considered as important tool of capital inflow onto the economy and hens proved to be so. M2 and Government bank borrowing found insignificant in predicting GDP but here one has to take into account the appropriate proxy for the variable as a remedy of this problem which is not the scope here in this study.

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