The determinants of inflation

This research provides some interesting facts and phenomena. It has been observed that how inflation can be affected by different factors in the Pakistan economy. How monetary policy and others have impact on inflation. This study reveals some interesting concepts which usually been understood by general. This study covers the aspects in which research analyze that how aggregate demand and money supply can put impact on inflation. The study examine that whether or not by increasing aggregate demand and money supply, the price increase or vice versa. The aggregate demand and money supply used as independent variables and inflation as dependent variable, these all are scale variables. The statistical model apply in the study is Multi Linear Regression given in the SPSS.

Key Words: Aggregate Demand, Inflation, Money Supply

CHAPTER 1: INTRODUCTION

In this section, the researcher has briefly explained the literature based background of topic of the research, objective of research, methodology adopted in research, research questions followed by hypothesis which were tested in this research study.

Overview

In the field of economics and finance, inflation and the discount rate policy have very crucial role, discount rate is used as an instrument by Central bank of the country to control the money supply and also inflation. In economics rise in prices is basically known as Inflation or where the supply of increase but actually as we seen in the live situation that both increases side by side. The change in money supply has not been affected by output or the elasticity of output supply has decreasing and become to zero in the impact of money supply when true inflation begins. If inflation is just a general increase in prices as popular thinking has it, then why is it regarded as bad news? What kind of damages does it do? So that's why inflation is most important concern of people as Inflation has put strong impact on the life style of the people. Pakistan is facing the situation of increase in prices because of the increase in demand while on other hand supply respectively constant. To handle this phenomenon, state bank use discount rate as a tool to handle the money supply and demand. When they want to decrease the inflation, discount rate will increase which causes the decrease of money supply, so by doing this, supply will cope up with the demand of money. Currently if we viewed the situation of underdeveloped countries as well as the developed economies, both are suffer from this inflationary pressure. The whole world according to the current scenario dealing with the pressure of prices increasing phenomena, this is just because of different reason in which we seen that inflation rate was on higher side than the previous years and this also due to increasing unemployment situation, these things are difficult for all to handle the Inflation. So the aim of initializing this research is put focus on how Pakistani authorities taking steps to control the phenomena of inflation, so considering these, steps taken by Pakistani government are precise or not. By initializing these steps, Pakistani government will successful to lower down the prices or not. This study is helpful for under developing countries like Pakistan to understand that the factors which are aggregate demand and money supply have some impact on inflation or not. These factors would be the main determinants of inflation in Pakistan like economy or not which is under process towards prosperity.

Objective Of The Study

The main target of this research is look at the role of different factors and their impact on inflation in the Pakistan economy. How inflation is affected by the aggregate demand and money supply. The aggregate demand and money supply increase then these will have direct impact on inflation or not.

Problem Statement

It is very important to see the role of inflation in economic environment by all concern personnel. The economy of Pakistan has going towards upward trend from last few years, although there are yet some unsolved very important issues in the economy. The largest issue of the economy is the inflation. In this study, we try to look at the factors affecting inflation, its main causes in this economic scenario of Pakistan and there measures to handle or overcome these. As the core problem, authorities or concern personnel keen to know that how inflation rises and what determinants like money supply and aggregate demand actually have play strong role to maneuver the inflation. They also want to know that whether by increase in money supply, inflation rise or decrease due to reduction in money supply. It is also important to know that when aggregate demand increases, prices goes in upward direction or vice versa. This also knows able that inflation may be impact by money supply or aggregate demand individually or collectively.

Research Questions

The researcher has developed following research questions according to the statement of the problem:

Q1. Does increase in inflation is because of increase in Aggregate Demand?

Q2. Does increase in Money Supply cause to increase in Inflation?

Q3. Is there significant relationship between price increase and increase in money supply?

1. 5 Research Hypotheses

Considering the research questions of the study researcher have developed following hypothesis:

H1: inflation is increasing due to increase in money supply

H2: inflation is rising due to increase in aggregate demand

H3: there is no significant relationship between price increase and increase in money supply

Outline Of The Research

This research examines the impact of aggregate demand and money supply only on the inflation in the current scenario of Pakistan. In this study researcher would try to analyze a relationship among the factors (aggregate demand and money supply) and inflation.

CHAPTER 2: LITERATURE REVIEW

Our research is about determinants of inflation. The selected research papers are associated with the inflation; discuss how inflation affects the different economies and its causes. These researches which have been selected and studied for building our concepts about inflation and its impact on economy, were covering different issues of inflation happening in world economy, and as per requirement of need and problems. It also based on the different needs of different areas and the attitude of markets and economies of the host (researchers) objectives. The research is conduct when the problem is arises and defined then the researcher work starts and they study the issue and try to find some solutions and their remedies.

The paper investigates the association between inflation and output growth on the Turkish economy. The researcher used GARCH model in his study to investigate the relationship along with granger causality test. The variables used in this research were inflation, output growth, real and nominal uncertainty. The researcher emphasis was basically on the point that Turkish inflation was affected by output growth or not. The research covers the period from 1986 to 2007 and use monthly data of Turkish economy. In the study, by using GARCH, the researcher looks on conditional means and variances of inflation and output growth and covariance among each other. The researcher also used the BIC and AIC optimal lag-length algorithm. It took the consumer price index and industrial production index which used for price level and production output. Researcher took the log of CPI for obtaining inflation for the purpose of investigating the inflation and output growth relationship. The findings of the research include the sum of estimated inflation coefficients is -0. 042 and ARCH parameter is calculated as 0. 360 and 0. 426 for output growth and inflation equation respectively. GARCH parameter for output growth is 0. 234 and less than 1, so the ARCH parameters are greater than the GARCH parameters which present the view that short term effect are more than the long term effect. The researcher deduces the result that Turkish inflation is effected by output growth by nominal uncertainty channel. This research is important in its own for coming days because of the global economic crises, high level of output growth is induce by foreign capital will decline and this decline would increase the inflation in near future.

Further in literature review, we study the inflation targeting and core inflation, here researcher looks at the association of core inflation and inflation targeting used as monetary policy. Basically core inflation is " the measure of inflation in which food and energy prices are excluded". Real output of the economy has no real impact which be long run from the inflation rate or the changes in input prices developed by inflation rate (Quah and Vahey 1995; Eckstein 1981). The main emphasis of the research is the inflation in different countries. Policy makers don't want to include short term or temporary changes in inflation, so they wish to focus how these temporary changes exclude from inflation to able to get the real results. Core inflation is an idea that is use as measure the future inflation because it eliminates the temporary shocks those policy makers does not want to take in. The method used in this research was ordinary least square model and auto regressive model. Variables taken in the study were real GDP, CPI, trimmed mean (limited-influence estimator), the frequency of data used in the research range from 1980 to 1990 and early 2000 and the study sample was the data on quarterly basis of 12 countries. The study confirms that monetary policy has direct impact on core inflation (gives the forecast future inflation). Weighted average of both Trimmed mean and lagged inflation used empirically for the estimation of Core inflation. Two views drawn from this research were, first one is the inflation targeting has made the level of accommodation different for the central or reserve banks, although, inflation and non-inflation targeters after inflation targeting begins same. Secondly, since the early 1980s the public appears to believe that central banks of the countries are fairly non-accommodative and inflation targeting did not alter this perception.

The researcher examines the possible interaction of conditional means and variances by accommodating the lenient and interactive framework whose impact on real activity by uncertainty of inflation. The model used in this research MGARCH and variables used for the research were inflation, inflation uncertainty, price, GDP deflator and CPI. The data frequency ranges from 1966 to 1979 and 1966 to 2000 on yearly basis. The importance of research is due to global economic conditions, so that’s why others authors put their suggestion that the rate of investment which is decrease due to uncertainty of inflation is basically deter the long run contracts or by rising the option value which actually an irreversible investment. So that’s why reduction in allocation in price system efficiency is because of inflation uncertainty which basically integrated to the relative price variation increment. The researcher reexamines the effects of inflation volatility by integrating the identified variance with MGARCH. The researcher find that the multivariate GARCH and VAR is give the reasonable explanation of the data. The main findings of the research is that the inflation has significantly reduced by real economic activity during 1982 post era, the research also concludes that average shock to inflation uncertainty has try to reduce output growth. The reduction in volatility in inflation process is due to macroeconomics policies which likely to speed up the overall growth.

Furthermore; we studied the research on commodity prices, wages and U. S inflation in twentieth century which investigate the impact of primary commodity prices and wages on U. S inflation with respect to markup pricing. The methodology used in this research is Regression analysis and variables are inflation, markup pricing, primary commodity prices and wages. The researcher use annual data ranging from 1900 to 2001 of U. S economy. This researcher find that commodity prices and wages completely pass through into inflation of finished goods prices with both input have positive significant impact. So the rate of change U. S producer index have affected by these factors. The study deduce that aggregate demand growth has a negative affect on markup which further negatively impacted on finished goods inflation after controlling prices.

The other one is the food prices, expectation and inflation. The main emphasis of the researcher is on food prices plays a special role in the formation of consumers' expectations of inflation appears to be widely held by policy makers. The model used for this purpose is regression analysis and data used from 1950 to 1970 late on quarterly basis of United State. The variables used in the study were Food prices, rate of inflation, and wages of labor.

The researcher investigates relationship of money growth, output growth and inflation. For this purpose, data of 81 countries used covering period from 1980-1993. The M2 growth rates (average) used to explain the cross-section inflation rates. The co-efficient of M2 growth are strikingly close to one where inflation and money growth high. Through study, it identify that these countries whose money growth and inflation relatively low. The estimated co-efficient of money growth was only 0. 69, so a less complete explanation of inflation offers by quantity theory. Growth of Money GDP was nearly and consistent with monetary neutrality the research forms on money growth, output growth and inflation as key variables. The model, quantity theory is a mostly used model of inflation but not for those where long-run found low. The researcher found during its study that real GDP growth can be used to mitigate inflation. For this, some variables those are exogenous forces like growth in technological progress, physical capital information and human capital. Through this study, researcher found that role of real GDP growth and money as determinants of inflation. Further in our literature review, we study another perspective of inflation on economy. By studying this paper, we found that hoe inflation process affect the economy in different ways and different variables of inflation. High and persistent inflation of this kind is labeled chronic inflation (Beckerman 1992). The researcher developed an error correction model to analyses the relationship of dynamics and long run determinants of chronic inflation. In this paper, researcher uses the Johansen procedure to test the integration in the foreign exchange markets and money. The study reveals that the oil prices, interest rate, output and money dynamically affects the domestic inflation which determined by exchange rate and foreign prices in long run. The researcher deduces that increase in inflation was transmitted to next period’s inflation where price has a positive co-efficient. So the study reveals that the increase in overall inflation was due to an increase in oil price or in money growth, and also due to increase in rate of devaluation of the exchange rate increase while output growth goes up, the inflation decreases.

Another aspect has been studied to understand the relationship between inflation and growth. Here researcher investigates the matter which is growth and threshold effect of inflation's existence. The research findings reveal that for industrial countries, threshold reveals of inflation at 1-3 percent and for developing countries at 11-12 percent, where now growth of inflation was estimated. The researcher also points out that the relationship between inflation and growth was negative and significant when inflation rates above the threshold level. The researcher used data of 140 developing and industrialized countries covering time period 1980-1998. Statiscally, the threshold level of inflation consider significant at 1 percent or less.

The research is about relation between assets return and inflation in large developed economies, data of 41 national markets including time series and cross-section of expected return. The researcher deduces that negative time series relation between realized asset return and realized inflation. This negative relation appears when returns of long horizon were examined. The researcher also examine that inflation hedge do not serve by equity returns country by country. So when seeing relation between co-relation of asset returns and inflation, in low inflation states that high, world and U. S equity market were more co-related with returns of emerging markets. This shows that there was very little difference between volatility of low and high inflation states in emerging and developed. The results of the study reveal that inflation can be a national equity attitude. Researcher found that differences in inflation states can be differentiate expected returns and have stringer impact to differentiate the volatility in different economies. The differences in inflation rates was explain 31 percent of variation in average returns and 59 percent volatility of cross-section in same market across the 41 countries.

Here researcher analyzes the effects of high and uncertain inflation. Data used of forty four countries and covering period of twenty years. Researcher deduce that uncertainly has a strong impact on inflation across countries, relation, while in some cases, there are some relation exist between inflation and uncertainty within country relation, but not so strong within 44 countries, 18 of these were industrialized and remaining were developed.

Researcher used Okun’s hypothesis to test the rationality of the data. Researcher deduce that positive significant co-relation exist cross-country wise, while co-relation was weak within country. So result shows that 15 countries have a positive significant coefficient which was at least one. This paper analyzes the dominant factors, which affect the inflation in Nigeria. Researcher used error correction model of inflation process which based on money market equilibrium conditions. Data used covering period from 1985 to1995.

Researcher examines devaluation of the naira and agro climate conditions. Researcher found that depreciation of naira on inflation has been affected significantly by monetary and fiscal policies. The result shown the prices increased through devaluation although these counteracted by proper implementation of policies. Researcher also found that a tight policy major reduces the impact of devaluation on domestic prices during mid 80’s. While in early 90’s devaluation magnifies the impact on inflation during excessive expansionary policies. The rate of inflation has been influenced by agro climate conditions and this has major impact on overall movements in prices.

This research examines that issue of nonlinear effects of inflation on economic growth. Researcher founds that the economic growth relative to inflation has a significant structural break. This structural break was established when inflation was at 8 percent. Growth does not more on slightly affected by inflation below that rate. Data used in this research covering period from 1950 to 1980. While the growth has been significantly affect by inflation when inflation rate was above 8 percent. The research also examines the fact which explains that the effect of inflation on growth estimated was biased by factor of these, when structural break was ignored. So when structural break was considered, economic growth increases by factor of these by the estimated affect of inflation. This means that estimated affect of inflation has shown significant base when structural break exists. By this phenomenon, researcher deduces that when average annual rate of inflation was 8 percent, the point of structural break was estimated to occur. This also deduce that economic growth had not been affected or slightly positive affected when inflation was low, while on other side, economic growth has significantly negatively affected by inflation when it was high.

Further in literature review, we studied the theoretical relationship between the size of capital stock and in economy and rate of inflation. This research reveals the fact that shows how capital stock in an economy affected by inflation. The researcher presents some time serious evidence. Researchers used VAR model for thirty four countries. The study reveals the facts which investigate by researchers were that majority of countries had not affect capital stock significantly by inflation process statically. Capital stock affected while inflation not to be super neutral, the co-efficient were positive and capital stock less affected. The researcher use data which comprise private and public capital. The public capital financed by revenues partly, which could lead positive relation between inflation and capital stock. Garber (1982) has argued that some of the transition costs after the German hyper inflation were due to the fact that private investment was no longer subsidized out of seignior age revenues. Researcher found that behavior of government could lead positive relation. The researcher deduces that across country differences in the relationship between inflation and capital stock produced by tax authorities through their different treatments of depreciation and nominal interest deductibility.

Further in our understanding about inflation and its causes, we study the issue which examines high trend inflation countries predicted by sticky price models based on menu cost. The researcher used country specific approach to see how output affected by demand’s smaller impact and less persistent output fluctuations. The researcher used two stage estimation methodologies to examine the issue. Data used in this research comprise 51 countries covering period of 1950-1996. The researcher found from his research that output fluctuations would be persistence while short run impact effects perceived through price stickiness. In this paper, study reveals menu cost model of price stickiness which predicts the high trend inflation should lead to smaller impacts effect of nominal demand shocks (Ball et al. 1988) and less persistence in output fluctuations (Kiley 2000)

Through two stage approach, using international data both studies find support.

Researcher investigate that the output persistence within countries has affected trend inflation. The researcher deduce that hyper inflation emerge in those countries of high average inflation. Researchers found the strong support that inflation with high trend has lower impact within countries, so that output persistence in individual country not affected by trend inflation. That means important source of short run impact effects could be price stickiness.

Furthermore, the role of money demand and money supply which determines the potential of inflation. In Switzerland at beginning of eighties, upward movement of price level was seen. The main issue to conduct this research was that through determining the growth of monetary base, monetary aggregate growth can be controlled. The role of the price level as the equilibrating valuable in the money market can be understood by considering an individual and market experiment (Laidler, 1985). Data used from 1980 to 1987. The main target of the paper is to find out how price levels stabilize over a long term horizon. So rise in income has to maintain pace with money supply in growing economy, the growth of output equal to money stock which expanded at output rate. The researcher using econometrical evidence suggest that price level with a growth trend of M1 that is lower then the potential income growth. The study describe that inflation rate of one present means M1 growth was one percent which greater than the base line. The empirical analysis of the study shows that fluctuations of the price level incur from movements of interest rates. So variation in nominate interest was due to inflationary expectations changes. The study explains that constant arte of secular consistent with nominal money stock. It means money growth unchanged with the demand. So that why the smoother price level will result with steady money growth. On other hand, changes in marginal productivity of capital which affect the real interest were due to technical progress, government deficit change in tax rate. The researcher deduces that such shocks can be put their impact on economy like Swiss. So that's why monetary policy has an important role to detect and react against these real factors which affect interest rate. Reaction of monetary policy means money supply by reduced the impact of such factors those cause to increase the interest and vice versa.

CHAPTER 3: RESEARCH METHODOLOGY

In this chapter, researcher has discussed method of data collection, sampling technique, sample size, instrument of data collection, content validity of instrument, reliability of the instrument and researched model developed.

3. 1 Method of Data Collection

Normally data is taken from the specific method and techniques through the questionnaires or through observation. But in this case we take the data from other sources which is already been used and also bias less. Data is used as the secondary data, which is collected electronically from the website of State Bank of Pakistan and other websites. The yearly inflation rate (CPI) of Pakistan is taken from the official web site of Sate Bank of Pakistan and also the yearly data of GDP as aggregate demand and M2 as Money Supply. The study adopts qualitative and quantitative paradigms. The study uses mixed method design with chi-square and correlation as quantitative mode of inquiry, and ground theory as qualitative mode of inquiry.

3. 2 Sample Design

Sample is taken as the yearly basis to test the correlation between inflation and aggregate demand. We use the yearly data instead of monthly because the GDP is not available on monthly basis. In this research we will use purposive sampling technique, because we will collect data only from Banks (SBP), some business journals, government sources. The data having very high number of observations which is helpful to use MLR model of SPSS.

3. 3 Sample size

Sample is the 41 number of observation, which is taken on yearly basis and the data of 41 years covering the time period from 1970 to 2010. This is healthy number of observations in any data to take the result on multi linear regression model (MLR)

N= 41

The data used in this research is reliable and bias less, because it is taken directly from the consult authorities which assure the accuracy of data. The data firstly was taken of 10 years on the monthly basis but later we summaries it to see the significant and clear impact of aggregate demand and money supply on inflation, then we take the yearly data of all the variables.

3. 4 Research model developed

This study is focuses on the issue of inflation. Here we try to look what are those factors which can put impact or create influence on the inflation in the economy of Pakistan. For this purpose we take two independent variables which are GDP as aggregate demand and money supply and a response or dependent variable which is inflation as CPI. We took 41 years data for this study on yearly basis, so we can take a brief analysis on the phenomena of inflation. How it can be manageable in the current situation and how actually these factors can affect inflation in the Pakistan economy as real determinant of inflation. To test the hypothesis, we use multiple linear regressions MLR as statistical tool, for this we check that data is normal or not, is there any linearity among the data and the data or variables are serially correlated. We check these through different statistical means which shown in appendix. Here we see that the data is not linear and there is high autocorrelation or serial correlation exists. So for this, we use log transformation to make data linear and reduce the correlation within the data to test our research hypothesis, we take logs of our predictors and response or dependent variables. We see still there is some non-linearity exists, and then we take difference of the variables (regressively) along with log transformation. We try to analyze the relation between GDP, MS and Inflation. By taking difference and log transformation, we apply the linear regression and still main assumption of the MLR not view, the autocorrelation removed and linearity exist but data become non-normal. We use different combination of variables to develop a fit model to test our research hypothesis. Lastly we come up with the model which we consider to use to test our research hypothesis and its findings discuss in the coming chapter. The equation used in our study

Ln_dif_ Inf = Î±+ Î²1 Ln_dif _gdp + Î²2 Ln_dif_ms +Îµ

Here in this equation

Ln_dif_Inf = shows the response or dependent variable after taking log transformation with difference of values.

Î± (alpha) = Constant term

Ln_dif_gdp = shows the independent variable after taking log transformation with difference of values.

Ln_dif_ms = shows the independent variable after taking log transformation with difference of values.

and = referred to as partial regression coefficient.

3. 5 Statistical Technique

The Multi linear regression is used to conclude the result of data, because two variables are used as independent variable and one variable as dependent to observation and the scale data is used. One inflation and others are independent GDP as aggregate, M2 as Money Supply. So Multi Linear Regression is better option to evaluate the data being taken.

Regression analysis is used to test the hypothesis and ANNOVA is used to see the variance. Due to expected presence of two predictors and the dependent variable most probably " Multi Linear Regression" is used to study the impact of MS and AD on Inflation.

Linear regression is very easy to interpretation of result and to assess the result of given data. Regression developed the graphical presentation of two variables which are taken in research as data, the linear regression shows one variable on X axis and the other one variable on Y axis. The correlation of both variables can easily justify on the basis of slope line which is presenting the relation of two variables.

CHAPTER 4: DATA ANALYSIS & RESULTS

To test the hypothesis, we use MLR with two predictors and one response variables to see the impact of aggregate demand and money supply on inflation. After apply the tool, we got the results which shows us different point of view than the researcher develop to initialize this study. The researcher wants to see that

H1: inflation is increasing due to increase in money supply

H2: inflation is rising due to increase in aggregate demand

H3: there is no significant relationship between price increase and increase in money supply

Making data linear and remove autocorrelation within the data by log transformation along with taking difference in values, we get the result in which the model summary table shows R, R Square and Adjusted R Square is round about 28%, 8% and 3% respectively, the purpose of seeing R values (correlation coefficients) which lies between 0 and 1, here the R is around 0. 28 which shows the small positive correlation between the variables. The R Square coefficient of determination) is about . 08 or 8% which describe or explain the 8% variability in the data, if R Square equal to zero means, no variance exists. Here in the research the R Square is 0. 08 which is near to zero, so we can say that there is almost very low variance in the data explain by model. As research study use two independent variables, so adjusted R Square is more impor