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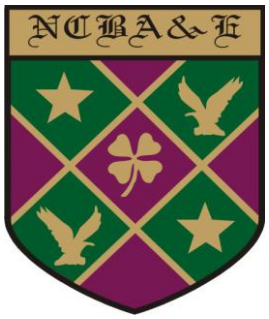

AUTONOMY OF CENTRAL BANKS AND ITS IMPACT ON GDP AND INFLATION IN ASIAN COUNTRIES

BY

KANEEZ AMNA FAYYAZ

MASTER OF PHILOSOPHY
IN
ECONOMICS

JULY, 2017

NATIONAL COLLEGE OF BUSINESS ADMINISTRATION AND ECONOMICS

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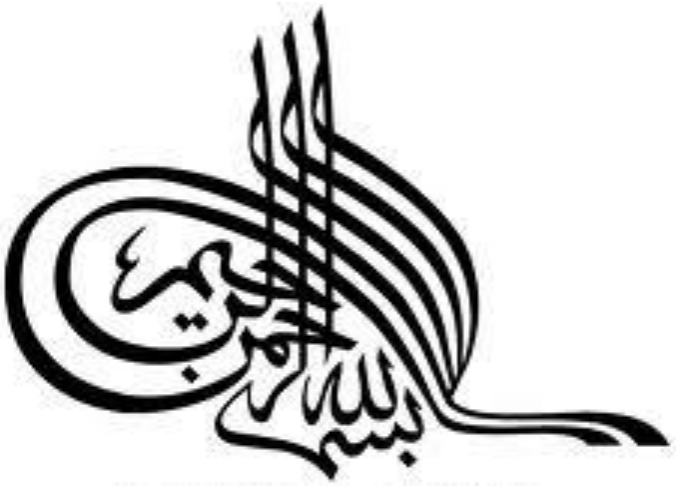

In the name of ALLAH,
The Most Beneficial,
The Most Merciful,

NATIONAL COLLEGE OF BUSINESS ADMINISTRATION AND ECONOMICS LAHORE

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Dissertation Committee:

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Chairman

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Member

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Member

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Rector
National College of Business Administration and Economics

DECLARATION

It is to declare that this research work as not been submitted for obtaining similar degree from any other university/college.

KANEEZ AMNA FAYYAZ
July, 2017

DEDICATED
TO

My Parents

&

My Teachers

ACKNOWLEDGEMENT

All praises and thanks to Allah Almighty who has blessed me with enough ability and competency to complete this research work. I feel deepest and heartiest gratitude for different personalities who have been very cooperative and helpful during the writing of this thesis.

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I owe a debt gratitude to my kind Supervisor, Dr. Sayyid Salman Rizavi, Hailey College of Commerce, University of the Punjab, Lahore, Prof. Dr. A.R. Chaudhary, Dean School of Social Sciences (NCBA&E), Lahore and Dr. Munir Ahmad, Rector (NCBA&E), Lahore.

Finally I would also like to thank my parents. They have always been supporting me and encouraging me with their best wishes.

RESEARCH COMPLETION CERTIFICATE

Certified that the research work contained in this thesis entitled **"Autonomy of Central Banks and Its Impact on GDP and Inflation in Asian Countries"** has been carried out and completed by **Kaneez Amna Fayyaz** under my supervision during her **M.Phil. Economics** Programme.

(Dr. Sayyid Salman Rizavi)
Supervisor

SUMMARY

This study examines the link among Central Bank Autonomy (CBA), GDP per capita and Inflation in 32 Asian countries for the year of 2014. For central bank autonomy, we have used two different indices termed as central bank economic autonomy (CBAE) and central bank political autonomy (CBAP). For construction of these indices, approach suggested by Prakash and Nathan (1997) has been used. Two Stage Least Square Method has been used for our empirical analysis. Our results show that CBAP has significant and positive effect on GDP per capita and CBAE. Hence Central Bank Political Autonomy has a crucial and significant role in the progress of economy.

LIST OF TABLES

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Central Bank Autonomy (CBA) is explained as the level of independence of the central banks to frame and implement the monetary policy without any interference. In other words, autonomy is defined when a central bank is allowed to work without any undue influence and central bank should be independent in decision making.

Conventional argument for central bank autonomy is to use the power to spend money (the government) should be segregated from the power to print money (the central bank). For stable economic environment and stimulation of economic growth, central bank autonomy has important role (Debelle and Fischer, 1994; Fischer, 1995; Cukierman, 1994; Eijffinger et al. 1996; De Haan and Kooi, 2000; Olya, 2000; Aklin and Kern, 2016; Garriqa, 2016). CBA has two different dimensions; first is political autonomy of central bank and second is economic autonomy of central bank (Arnone et al. 2006; Grilli et al. 1991).

Different studies have been conducted to investigate the relationship between central bank autonomy and different economic variables. The researchers have used different set of parameters for measuring CBA. Information regarding these parameters are generally derived from the statutes, charters and circulars of concerned central banks, updated on web sites of concerned banks (Bade Parkin, 1978, 1982, 1988; Grilli et al. 1991; Alesina, 1988; Alesina, 1993; Cukierman, 1992; Loungani and Nathaan 1997; Macro Aroni, 2006). CBA can have important implication for inflation and GDP. Moreover studies on measurements of CBA and its relationship with GDP and inflation in case of Asian countries are not very common. This study is conducted for the measurement of CBA and to investigate its impact on GDP and inflation in Asian countries. Methodology of Loungani and Nathaans (1997) for CBA measurement was followed because of its simplicity and the use of comprehensive parameters. A set of parameters as suggested by Loungani and Nthaan (1997) has been used for measurement of CBA for our study. CBA is segregated into political autonomy of central bank (CBAP) and second is economic autonomy of central bank (CBAE). For this purpose we have derived information from web sites of respective central banks of Asian countries.

1.2 RESEARCH QUESTION

This study intends to investigate the research question,

Does central bank autonomy (CBA) affect GDP and inflation in Asian countries?

1.3 OBJECTIVES

Objectives of this study are;

1. To measure the central bank autonomy for Asian countries
2. To consider the relationship of central bank autonomy with GDP and inflation in Asian countries.

1.4 HYPOTHESES

For our study, the null hypotheses are as follows

H_{01}: CBAE has no relationship with GDP.
H_{02}: CBAP has no relationship with GDP.
H_{03}: CBAE has no relationship with inflation.
H_{04}: CBAP has no relationship with inflation.
H_{05}: CBAP does not affect CBAE.
H_{06}: CBAE does not affect CBAP.

1.5 CONTRIBUTION OF THE STUDY

Autonomy of Central Bank of a country plays a dynamic role in development of the economy. Studies on measurements of CBA and its relationship with GDP and inflation in case of Asian countries are not very common. This study is conducted for the measurement of CBA and to investigate its impact on GDP and inflation in Asian countries. CBA is segregated into political autonomy of central bank (CBAP) and economic autonomy of central bank (CBAE). Information about the parameters used in the construction of CBAP and CBAE has been derived information from web sites of central banks of Asian countries.

CHAPTER 2

LITERATURE REVIEW

The literature on CBA is voluminous (Eijffinger and de Haan, 1996; Berger et al. 2001). The literature shows the dynamic evidence on the importance of central bank autonomy.

Bade and Parkin (1988) provide the evidence of relationship between CBA and inflation. For empirical evidence authors used price stability, objectives of CBs and recruitments of board of directors as parameters.

Grilli et al. (1991) conclude that countries with strong autonomous central banks have low rate of inflation as compared with countries that have full control on their central banks. CBA is decomposed into political autonomy and economic autonomy. Here political autonomy is defined as how central bank shields their price stability against political power. The freedom to finalize size of lending and implication of interest rate is attached with the political independence of central bank. While monetary policy is attached with economic independence. We come to know that political and economic independence is closely related. As in case of borrowing government influence in determining the condition of lending from CB affects economic independence and simultaneously it damages CB political independence.

Kormendi and Meguire (1985) concluded that controlled inflation increases growth and vice versa. They selected data from period 1950-1977 and sample of 47 countries.

Burdekin and Willett (1995 and 1998) present relationship between inflation and CBA. Authors say that delegation of power relating to monetary policy formation has important role for central bank autonomy.

Cukkierman (1992) concludes that CB autonomy has strong relationship with inflation and political instability. According to author results in case of developing countries are different as compare to changes in developed areas.

Alesina and Summers (1993) concludes that there is strong relationship between CBA and inflation while CBA has no impact on GNP, unemployment and interest rate.

Posen (1993, 1995) concludes that financial sector affects central bank autonomy and inflation. Financial and political system of any country may affect CBA. Posen quotes that the only way to reduce inflation is financial operation activity in that country.

Barro and Gordon (1993) demonstrate relationship between exchange rate, integrity and CBA. Authors further conclude that concept of inflation is different from aversion from inflation.

McCallum (1995) shows some sort of criticism on the link between theoretical stuff and CBA measurement. McCallum declares some new dimensions about fundamentals of ideology of CBA in 1995 and that is considered one of the most cited criticisms. The first criticism is that if monetary policy is not bound for any specific target then monetary policy will go for unrestricted suboptimal balance. Policy makers for CBA must notify that pace of economic growth may be achieved by the elimination of incompatible policies. Another way to settle the issue is to avoid trade off among flexibility and commitment. Monetary policy is not considered as 'comprehensive and best solution' to tackle labor market issues. As referred to prominent line of research McCallum was not sure that central bank can attain reduced inflation in presence of labor market issues.

Balcerowicz and Gelb (1995) declare relationship between inflation and GDP. Authors say that in case of developing countries political support plays a major role to restructure institutional rules. Their work is based on study of says that Fisher and Modigliani (1978), Fisher (1994) and Briault (1995) authors.

Fisher (1993) provides the evidence that 10 % decline in inflation raises growth of GDP. Fisher selects 81 countries and time period is from 1961-1988.

Erickson et al. (1993) presented evidence about relationship between central bank autonomy and inflation. Authors concluded that high rate of inflation affect relationship between CBA inflation and.

Baro (1995) concludes that inflation significantly lessen the growth when it exceeds some limit. Researcher uses data from 100 countries, for time 1960-90.

Debelle and Fisher (1995) has dived CBA into goal independence and instrument independence. Authors recommends that for strong CBA there should be target oriented tasks of price stability rather than motto of price stability. Monetary policy should be based upon goal independence.

Eijffinger et al. (1996) have provided a relation between different levels of central bank independence and fluctuating market rates. For empirical evidence data from 10 countries OECD countries are used.

De Haan and Kooi (1997) conclude the relationship between CBA and inflation. They studied the influence of government on CBA and central bank control on monetary policy. Distinction between instrumental autonomy and objective autonomy is also focused here. They consider the powers that are assigned to central bank and linkage between monetary policy and price stability. Here an idea is strengthened that price stability is only objective of central bank autonomy. Authors select 21 countries of OECD and time period from 1972-1989.

Campillo and Miron (1997) provide evidence that CBA and foreign exchange have no influence on inflation variability. During research authors consider political scenario, trade imports plus exports, taxation level, inflation rates, developing countries, openness, GDP, political instability and income level.

Fuhrer (1997) confirms negative relation between real growth and central bank autonomy. Fisher says to control the inflation rate for strong monetary policy. The authorities with public support are more likely in favor of changes. He selects time period from 1980 -1990 on OECD countries.

Stella (1997 and 2003) concludes positive relation between high inflation and CB weakness. In this study indicators are central bank capital, transfer of remittance from government, inflation, price stability and central bank independence. Stella says price stability aim of central bank is hindered due to repeated financial losses. Monetary policy tasks are also affected due to limited operational autonomy and restrictions on financial sectors.

Fry (1998) finds out link between CB autonomy and fiscal impacts with respect to Fry uses rank correlation. At the stage of results for each country he estimates impacts on monetary policy system. Researcher says that CBs who define them as autonomous body they are not independent in reality. This shows that CB measurement depicts very minor information about independency. Lower size of budget deficit and lower tendency of financial monopoly at government end are attached with high growth and reduced inflation. So Fry nut shell conclusions are that mismanagement of monetary policies, heavy government deficits, wrong financial strategy and dependence on inflation tax may lower the level of CB autonomy. Pace of growth and CB autonomy depend upon strong fiscal policies. On parallel side competent and

influential monetary policy is an integral part of economic growth and CB autonomy especially in developing countries.

Akhand (1998) concludes that CBA has week relationship with four indices named as TOR of Cukierman (1992), NOR of CB governors that are not political, LVAW and VUL index of Cukierman. He clears that there is scarcity of practical study that may be able to support the relationship among growth and level of CB independence. His sample was of 62 countries from interval of 1960-1989.

Mangano (1998) concludes CBA has negative impact on inflation. The author use indicators named Grilli et al. (1991) and Cukierman (1992), legal index. Mango uses strategy of ranking in spite of absolute values. He selects 12 OECD countries for his comparisons and concludes that there is little link in rankings and then labels them as helpful variables for macroeconomic and GDP growth.

Crosby (1998) concludes that strong status of CB reduces inflation at no cost for growth.. Along with other results he concludes that no evidence exists to show relation between CB autonomy and political stability. Crosby says that autonomy is endogenous and gets support from financial sector. The new assertion by Crosby is statistically confirmed for a few advanced countries. Degree of CBs autonomy is linked with economic reforms and these economic reforms may influence inflation. We conclude his study that any delay in economic reforms related with monetary policy is not suitable for output fluctuations.

Cukierman and Lippi (1999) quote that CBA is affected due to varying levels of wages, unbalance of taxes and labor markets. A strong level of CB independence relates with decentralization of labor unions.. Low level of CBA depicts an evident relation is seen between inflation and labor market. While this relationship vanishes with growth in CB autonomy. Here data period 1980-1994 is selected from 19 OECD countries

Forder (1999) concludes relationship between central bank and inflation. Author declares that there is a chance of misrepresentation of autonomy at end of supposition of monetary institution. Forder working is strickedly tied with inflation activities. Authors realize that mode of reasonable measures is adopted by all researchers but no basic criterion is found for the adoption method of measurement. It is encouraged to talk on theoretical parameters to discuss about level of autonomy but for this no empirical proof is found. Here scholars clear relationship among low level of inflation and central bank

autonomy. And that act may be an effective analysis for the testing of autonomy.

Lybek (1999) concludes that political set up and CBA are cause roots of inflation. He uses monetary policy, instrumental autonomy, regulations, interest rates etc. as indicators. Author uses sample of 15 central banks in Baltic countries (Estonia, Latvia and Lithuania and on the eastern shores of Baltic Sea). His under review period is from 1995-1997. He says his index is correlated with index of EBRD that is European Bank for Reconstruction and Development for period of 1997. While both indices are used for measurement in financial area, working in emerging markets and trade reforms.

Oatley (1999) finds no relationship between economic variables and CBA. His research covers working on eight indicators of central bank autonomy. He says his objective is to consider control variables as well. Along with all other working Oatley considers openness and unemployment level as control variables. His sample is of 10 OECD countries and covered period is 1970-1990.

Blinder (1999) concludes that for strong CBA credibility and honesty aptitude are integral parts.. His study consists of 84 central banks and 53 economists that have been attached with NBER (National Bureau of Economic Research). Certain central bankers accepted that credibility helps in improvement for trade off (short term) among unemployment and inflation. Here Blinder quotes that any change that is in strategy should not affect credibility.

Posen (1998) concludes negative relationship between central bank autonomy and inflation. He uses integrity, price stability, policies of debt monetization, monetary policy targets, inflation and central bank autonomy as indicators. Posen argues that good strategy for fiscal policy may exert good impact on monetary policy and such combination will help to foster central bank autonomy. Author selects a sample of OECD countries for his empirical evidence.

Sylvester et al. (1998) concludes that strong CBA controls variance and mean of inflation study. They select 21 industrial countries and time period is 1972-1992.

De Haan and Kooi (2000) find negative relation between CBA and inflation variability. He considers 82 developing countries from period 1980-1989.

Sturm and de Haan (2001) concludes impact of CBA on TOR(term of change of governor of central bank) and inflation rate. For the study the data is consists of 97 developing countries and year is 1990.

Cukierman (2002) provides the evidence of impact of CBA on unemployment, sacrifice ratio, social welfare. Social welfare is regarded as a monotonic part of autonomy (Posen 1998; Gartner 1995; Fisher 1996; Debelle and Fisher, 1996). Author has not proved that greater central bank autonomy results into high level of unemployment.

Bindseil et al. (2004) authors declare many options for empirical findings. According to him the weakness of CBA is due to government strategies and that sector is unable to control budget deficits.

Arnone et al. (2006) have provided evidence that in almost all countries overall economic activities are linked with price stability and good governess. Researchers considered CB autonomy, conservatism and deflation cost. They affirm speedy inclination towards more central bank autonomy in OECD countries by updating of GMT index for central bank autonomy using data of 1992 to 2003.

Carlstrom and Fuerst (2006) provide evidence about liner relation between inflation and autonomy. They further quote that lower rate of inflation cannot be clearly explained by autonomy only.

Farvaque et al. (2009) provide evidence about impact of CBA relationship with inflation, GDP, openness and consumer price index. Cukierman legal index of CBA is used by Farvaque. The results depict that demographic effect on inflation are more than central bank autonomy effects on inflation. The selected time period is of 1960-1972 and 1973-1979 on 21 OECD countries.

Forrest and Kallstrom (2009) conclude that strong CBA helps to reduce inflation. Researchers use index of Bade and Pakin (1977) and index of Alesina and Sunners (1993) for 26 industrial countries for period 1988 to 2000.

Athanasios Anastasiou (2009) provides evidence about impact of CBA index on variability of real output growth and inflation. Author uses methodology of OLS (ordinary least squares) and multivariate regressions. His studies consists of period 1991-1998 and 1999-2006.

Olya (2000) concludes that high degree of autonomy results low inflation. He suggests that financial markets should be developed. He says these indicators affect inflation but do not affect economic growth. Data sample consists of 40 developing countries and period was 1980-2006.

Dumiter (2011) analyzes relationship between CBA and economic performance using panel data. Conclusion of this study is that negative relationship is observed in case of developed countries while and no relationship between central bank autonomy and inflation exist for developing countries. Dumiter has introduced a new index for central bank measurement. During study indicators were CBA, inflation, output, unemployment, current account deficit and budget deficit.

Zadeh (2012) concludes a negative relation among central bank autonomy and economic growth. Author analyses impact of central bank autonomy on inflation by many dimensions. His sample data consists of 43 developing and industrial countries, data is from time period 1989 to 2000.

Kahleen Mc. (2011) records his doubt on inflationary issues and gives the solution to transfer critical issues of inflation to central banks. Author says it is the beauty of democratic society. To strengthen the central bank autonomy author stresses on the relationship between policy making strategy for economic output and democracy.

Aklin and Kern (2016) state that it is just a rhyme to use central bank autonomy institutional role as a guardian to secure macroeconomic stability. Authors object and challenge dynamic role of central bank autonomy as custodian of monetary policy. They regard that CBA involves the risk factors attached with financial market and central bank of autonomy systematically weakens the financial market.

Garriqa (2016) provides the evidence of relationship among inflation, CBA, growth and unemployment. Author uses the sample of 182 countries and time period is 1972-2012.

CHAPTER 3

THEORETICAL FRAMEWORK AND METHODOLOGY

3.1 THEORETICAL FRAMEWORK

Main objective of central bank is the maintenance of stable inflation, real growth of employment rate, stable financial market and to maintain interest rate etc. CBA referred that a central bank is allowed to work without any undue influence and central bank should be independent in decision making.

Central bank autonomy may affect macroeconomic stability. It may have an impact on economic indicators such as inflation and GDP per capita. Most of the studies derive information from statutes, charters, prudential rules and regulation of concerned central banks (Bade Parkin 1978, 1982, 1988; Grilli et al. 1991; Alesina 1988; Alesina Summers 1993; Cukierman 1992; Fry et al. 2000; Macro Aroni 2006).

Relationship between the CBA and different macro-economic variables have been analyzed by different researchers using regression (Grilli et al. 1991; de Haan and Van 'T Hag 1994; Cukierman 1993; Cukierman and Webb 1995; Grier and Grier 2004).

Different channels have been suggested in literature through which CBA can affect economic indicators. An autonomous central bank can influence interest rate more independently. In case of lowered interest rates more people take more loans. The result is that consumers causing the economy to grow increase in inflation by spending more money. Interest rate results inflation and on other hand it may affect investment as well. While investments stimulate economy and results are in form of positive impact on GDP per capita.

3.2 METHODOLOGY

For epmirical study of relationship of central bank atonomy with GDP and inflation, regression analysis has been used by different authors (Grilli et al. 1991; de Haan and Van 'T Hag 1994; Cukierman 1993; Cukierman and Webb 1995; Grier and Grier 2004).

Our study aims to find this relationship for the case of 32 Asian countries. For this purpose following econometric models have been used.

$$GDPPC_i = \alpha_1 + \beta_1 CBAE_i + \beta_2 CBAP_i + \beta_3 Inf_i + \in 1_i \quad (3.1)$$

$$GDPPC_i = \alpha_2 + \beta_4 CBAE_i + \beta_5 CBAP_i + \beta_6 Inf_i + \beta_7 GFCF_i + \in_{2i} \quad (3.2)$$

$$CBAP_i = \alpha_3 + \beta_8 CBAE_i + \beta_9 GDPPC_i + \beta_{10} Inf_i + \beta_{11} opennes_i + \in_{3i} \quad (3.3)$$

$$CBAE_i = \alpha_{4i} + \beta_{12} CBAE_i + \beta_{13} GDPPC_i + \beta_{14} Inf_i + \beta_{15} opennes_i + \in_{4i} \quad (3.4)$$

where

GDPPC = Domestic product in Real terms per capita (US Dollars)

CBAE = Central bank economic autonomy (calculated by the author)

CBAP = Central bank political autonomy (calculated by the author)

Inf = inflation

GFCF = gross fixed capital formation

i = cross sectional unit

α_1 = intercept of the model 3.1

α_2 = intercept of the model 3.2

α_3 = intercept of the model 3.3

α_4 = intercept of the model 3.4

β_1 = coefficient of CBAE in model 3.1

β_2 = coefficient of CBAE in model 3.1

β_3 = coefficient of CBAE in model 3.1

β_4 = coefficient of CBA E in model 3.2

β_5 = coefficient of CBAE in model 3.2

β_6 = coefficient of CBAE in model 3.2

β_7 = coefficient of CBAE in model 3.2

β_8 = coefficient of CBAE in model 3.3

β_9 = coefficient of CBAE in model 3.3

β_{10} = coefficient of CBAE in model 3.3

β_{11} = coefficient of CBAE in model 3.3

β_{12} = coefficient of CBAE in model 3.4

β_{13} = coefficient of CBAE in model 3.4

β_{14} = coefficient of CBAE in model 3.4

β_{15} = coefficient of CBA E in model 3.4

$\in_1$ = error term in model 3.1

$\in_2$ = error term in model 3.2

$\in_3$ = error term in model 3.3

$\in_4$ = error term in model 3.4

First two models 3.1 and 3.2 have been estimated by using simple OLS, whereas model 3.3 and 3.4 have been estimated by using 2sls due to the problem of simultaneously.

3.3 DESCRIPTION OF VARIABLES AND DATA SOURCES

Brief description of variables used in our models is given as follows;

3.3.1 Gross Domestic Product Per Capita (GDP)

GDP per capita in US $ has been used as dependent variable in our model 3.1. Data is from World Development Indicators, World Bank.

3.3.2 Inflation

Continuous increase in the general level of prices for goods and services is referred as inflation. Data is from World Development Indicators, World Bank and inflation is calculated by consumer price index (CPI).

3.3.3 Openness

Openness is country's total trade as a share to the country's GDP. Data is from world Development Indicators, World Bank.

3.3.4 Gross Fixed Capital Formation (GFCP)

Gross fixed capital formation (GFCF) is explained as disposals of produced fixed assets minus the acquisition (including purchases of new or second-hand assets) and creation of assets by producers for their own use. (Data bank of World Bank) Data is from world Development Indicators, World Bank. Variable of GFCP has been used as a share of GDP.

3.3.5 Central Bank Autonomy (CBA)

Central Bank Autonomy (CBA) is the freedom of CB's to frame and implement the monetary policy for economic stability without any interference. We have used two dimensions of autonomy, which are central bank political autonomy (CBAP) and central bank economic autonomy (CBAE). For the construction of CBAE and CBAP we have collected information from web sites of respective central banks. A brief description of these two measures is as given below;

3.3.5.1 Central Bank Political Autonomy (CBAP)

Central bank political autonomy is an indicator of CBA from the political influence. It is related with the change of term of governor, appointment of executive board members and conflicts on monetary policy issues. Five different parameters have been used for measurement of CBAP (Table A2 in Appendix A). A set of questions as proposed by Parakash and Nathaan (1997) has been used to extract information from the statutes, charters, prudential rules and regulations of concerned central banks. Each 'yes' response to question 7, 8, 14 scores '1' point. Each 'no' response to

question 6 and question 6, 9-13 also scores ‘1’ point. For construction of CBAP index different weights are assigned to the CBAP parameters. Weights are 1/9, 1/9, 1/9, 1/9, 1/9, 1/9, 1/9, 1/9, 1/9 for parameters 6 to 14. Weights are multiplied with respective scores then after multiplication results are added for each country and CBA indices are constructed

3.3.5.2 Central Bank Economic Autonomy (CBAE)

The matters relating to the price objective, to control interest rate, direct financing to the government, implementation of monetary policies are covered in the of central bank economic autonomy. Five different parameters have been used for measurement of CBAE (Table A2 Appendix A). A set of questions as proposed by Parakash and Nathaan (1997) has been used to extract information from the statutes, charters, prudential rules and regulations of concerned central banks. Each ‘yes’ response to question 1, 2, 3, 4 scores ‘1’ point. Each ‘no’ response to question 5 also scores ‘1’ point. For construction of CBAE and CBAP indices different weights are assigned to the CBA E and CBA P parameters. For CBAE weights are 1/2, 1/8, 1/8, 1/8 and 1/8 (sum of all weights are 1) for parameters 1 to 5 respectively mentioned in Table A2 Appendix-A. Weights are multiplied with respective scores then after multiplication results are added for each country and CBAE and CBAP indices are constructed.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 EMPIRICAL RESULTS

This chapter contains the results of our regression analysis. We have used stata for empirical analysis. Our results show that central bank political autonomy (CBAP) is positively related with real GDP per capita and central bank economic autonomy (CBAE) does not have significant relationship with real GDP per capita. Central bank political autonomy (CBAP) is not affected by central bank economic autonomy (CBA E) but central bank political autonomy (CBA P) affects central bank economic autonomy (CBA E). We find no evidence on link between inflation and central bank economic as well as legal autonomy.

The results of model 3.1 has been presented in Table 4.1

Table 4.1
Relationship of CBA E, CBAP and GDP Per Capita

GDP	**Coef.**	**Std.Err**	**p>t**	**95% Conf. Interval**	
CBAP index	1.66***	.326	0.000	0.99	2.33
CBAE index	-1.95	.336	0.566	8.88	4.98
Inflation	.318***	.0927	0.002	1.28	.508
Cons	-.518	2.43	0.833	-5.53	.450
Source	**SS**	**Df**	**MS**		
Model	1.4141	3	.4714		
Residual	0.8188	24	.03410		
Total	2.2229	27	0.5055		
Number of observations = 28, F (3, 24) = 13.82, Probability > F = 0000, R^2 =0.6333, Adj R^2 = 0.5875, Root MSE = 1.8 *** Significant at .05 level					

In model 3.1 GDP per capita is the dependent variable and independent variables are Central Bank Political Autonomy (CBAP), Central Bank Economic Autonomy (CBAE) and inflation. The value of R^2 0.6333, it implies that our independent variables explain 63.33 % of the variability of our dependent variable. The value of adj R squared is 0.5875. F- Ratio tests whether the overall regression model is a good fit for the data. The output shows that independent variables inflation and Central Bank Political Autonomy / CBAP-index statistically significantly predict the dependent variable, F (3,24) = 13.82 we conclude that Central Bank Political Autonomy (CBAP index) has strong positive relationship with GDP per capita. Central Bank Economic Autonomy (CBAE) as no relationship with GDP per capita.

The results of model 3.2 has been presented in Table 4.2.

Table 4.2
Relationship of CBA E, CBAP, Gross Fixed Capital Formation with GDP Per Capita

GDP per capita	**Coef.**	**Std.Err**	**p>t**	**95% Conf. Interval**	
CBAP index	1.77***	0.829	0.049	3.54	.0069
CBAE index	-1.98	3.03	0.522	-8.43	4.47
Inflation	0.329***	0.088	0.002	0.140	0.517
GrossFixdCapitlF	7.347***	1.7134	.001	3.694	10.999
Cons	1.16	2.10	0.59	-3.32	5.63
Source	**SS**	**Df**	**MS**		
Model	1.84543	14	0.1318		
Residual	0.28553	15	0.0190		
Total	2.1399	19	0.1508		
We see number of observations is 20. F shows value of = 24.35, R^2 is .8666 with Probability >F = 0000 and Root MSE = 1.4 *** Significant at .05 level					

In model 3.2 GDP per capita is the dependent variable and independent variables are CBAP index, CBAE index, gross fixed capital and inflation. The value of .8333 that our independent variables explain 86.66 % of the variability of our dependent variable. The value of adj R squared is 0.8310. The F- ratio tests whether the overall regression model is a good fit for the

data. The output shows that independent variables inflation, gross fix capital formation and CBAP is statistically significantly predict the dependent variable, F(3,24) = .0034. We conclude that Inflation, Gross Fixed Capital Formation (GFCF) and Central Bank Political Autonomy (CBAP) is positively correlated with GDP per capita. While Central Bank Economic Autonomy (CBAE index) does not have significant relationship with GDP.

The results of model 3.3 and model 3.4 have been presented in Table 4.3. Using simultaneous estimation on CBAP and CBAE using 2sls;

Table 4.3
Relationship between CBA E and CBAP

Coef	Std.Err	T	P>t	P	95% Conf. Interval	
CBA P index						
CBA E index	.6698	.7365	0.91	0.369	-.819	2.158
GDP	2.33	0.116	0.20	0.842	-.211	0.258
Inflation	1.90	4.33	0.44	0.663	-6.85	.107
Openness	-5.15	0.189	-0.27	0.787	-0.434	0.331
Cons	.1052	0.549	0.19	0.849	-1.004	1.214
CBA E index						
CBAP index	.7418***	.3817	1.94	0.059	-.0296	1.513
GDP	-2.97	0.101	-0.29	0.770	-0.234	0.175
Inflation	.0098	.0084	1.17	0.248	-.0072	.0269
Openness	-1.74	2.64	-0.66	0.514	-7.09	3.61
_cons	.2552	.2246	1.14	0.262	-.1987	.7093
Equations	**Obs**	**Parms**	**RMSE**	**R sq**	**F test**	**P**
CBI-SIB index	25	1	0.124937	0.3225	0.83	.3686
CBI-DF index	25	2	.01069346	02482	3.43	.0423
*** Significant at .05 level						

Source is the author,
Endogenous variables: CBAP, CBAE, Exogenous variables: GDP, inflation, openness

In model 3.3 and 3.4 Central Bank Political Autonomy (CBAP) index is the dependent variable then independent variables are Central Bank Economic Autonomy (CBAE index), GDP, inflation and openness. When Central Bank Economic Autonomy (CBAE) index is dependent variable then independent variables are Bank Political Autonomy (CBAP index), GDP, Inflation and openness. P value of .059 shows the relation between Central Bank Political Autonomy (CBI-SIB index) and Central Bank Economic Autonomy (CBA index). The value of R^2 is 0.3225 and adjusted R^2 is 0.2482.

4.2 SUMMARY OF RESULTS OF THIS STUDY

This study has used data for 32 Asian countries for the year 2014 from World Bank Indicators. Summary of our results is presented in Table.

Table 4.4
Summary of Results

<table>
<tr><td colspan="5">SIMPLE REGRESSION METHOD:
$\mathrm{GDP} = \mathrm{CBAE} + \mathrm{CBAP} + \mathrm{Inflation}$
$\mathrm{GDP} = \mathrm{CBAE} + \mathrm{CBAP} + \mathrm{Inflation} + \mathrm{GFCF}$</td></tr>
<tr><td>Hypothesis</td><td>Dependent Variables</td><td>Independent Variables</td><td>Significant</td><td>Insignificant</td></tr>
<tr><td>1</td><td>GDP</td><td>$CBAE, CBAP$ Inflation</td><td>CBAP Inflation</td><td>CBAE, Inflation</td></tr>
<tr><td>Conclusion</td><td colspan="4">Real GDP has relation with Central Bank Political Autonomy (CBAP) and Real GDP has no relation with Central Bank economic Autonomy (CBA E).</td></tr>
<tr><td>2</td><td>GDP</td><td>$CBAE, CBAP$ Inflation, GFCF</td><td>CBAP Inflation, GFCF</td><td>CBAE</td></tr>
<tr><td>Conclusion</td><td colspan="4">We conclude that Inflation, Gross Fixed Capital Formation(GFCF) Central
Bank Political Autonomy (CBAP index) is positively related with GDP and Central Bank Economic Autonomy (CBAE index) does not have significant relationship with GDP.</td></tr>
<tr><td colspan="5">SIMULTANEOUS ESTIMATION on CBAP & CBAE using 2sls.
$CBAP\ index = \alpha 1 + \beta 1\ CBAE\ index + \beta 2\ GDP + \beta 3\ inflation + \beta 4\ openness$
$CBAE\ index = \alpha 2 + \beta 5\ CBAP\ index + \beta 6\ GDP + \beta\ 7 inflation + \beta 8\ Openness$</td></tr>
<tr><td>Hypothesis</td><td>Dependent Variables</td><td>Independent Variables</td><td>Significant</td><td>Insignificant</td></tr>
<tr><td>3</td><td>CBAP</td><td>CBAE, GDP, inflation, Openness</td><td>----</td><td>CBAE, GDP, inflation, Openness</td></tr>
<tr><td>Conclusion</td><td colspan="4">Central Bank Political Autonomy (CBAP) is not affected by Central Bank Economic Autonomy (CBAE) but Central Bank Political Autonomy (CBA P) affect Central Bank Economic Autonomy (CBA E).</td></tr>
<tr><td>4 and 5</td><td>CBAE</td><td>CBAP, GDP, Inflation, Openness</td><td>CBAP</td><td>GDP, Inflation, Openness</td></tr>
<tr><td>Conclusion</td><td colspan="4">Central Bank Political Autonomy (CBAP) is not affected by Central Bank Economic Autonomy (CBAE) but Central Bank Political Autonomy (CBAP) affect Central Bank Economic Autonomy (CBAE.) We find no evidence on link between inflation and autonomy.</td></tr>
</table>

CHAPTER 5

CONCLUSION

5.1 CONCLUSION

Our understanding is that enlarged central bank political autonomy tends to support economic growth. One idea is presented here that only political autonomy of central bank is vital for economic growth. In our research inflation shows no relation with autonomy of central bank. GDP per capita has relation with central bank political autonomy (CBAP) and GDP per capita has no relation with central bank economic autonomy (CBAE). We conclude that Inflation, Gross Fixed Capital Formation (GFCF) central bank political autonomy (CBAP) is positively related with GDP per capita and central bank economic autonomy (CBAE) is not significant so shows no relationship with GDP per capita. Central bank political autonomy (CBAP) is not affected by central bank economic autonomy (CBAE) but central bank political autonomy (CBAP) affects central bank economic autonomy (CBAE).

5.2 POLICY RECOMMENDATIONS

We recommend that establishment of central bank autonomy is an institutional reform that should be implemented with good strategy. We put forward that responsibility must be a vital tool to speed up the progress CB performance. Here we recommend that all institutions should be held accountable for their proceedings. For strong CBA unbiased appointment of independent central bankers and the weight on inflation is in the encouragement. All this is important to reduce inflation and for the short-run trade-offs between inflation and GDP.

Depending on our conclusion we award value to political autonomy of central bank. Parameters of political autonomy demand fair appointment of governor, proper completion of his tenure, proper resolution on conflicts on monetary policies and restrain influence of government on Central Bank monetary authority. Hard and fast rules must be developed that may support autonomy of central banks. Prudential rules and regulations of central banks must be evaluated periodically and changes must be based upon concerned country economic conditions. Transparency, should also the one of the prime responsibility of central banks. General public should have easy access to the documents monetary policies. Comprehensive publication of the agenda of meetings on the monetary issues must be responsibility of the management.

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APPENDIX-A

Table A1
Name of Countries Included in Our Analysis

Sr.No.	Country / Sr. Question
1	BAHRAIN
2	BANGLADESH
3	BHUTAN
4	BRUNEI
5	CHINA
6	CYPRUS
7	GEORGIA
8	INDIA
9	INDONESIA
10	IRAN
11	IRAQ
12	JAPAN
13	JORDAN
14	KUWAIT
15	MALAYSIA
16	MALDIVES
17	MONGOLIA
18	MYANMAR
19	NEPAL
20	OMAN
21	PAKISTAN
22	PHILIPPINES
23	QATAR
24	RUSSIA
25	SAUDI ARABIA
26	SRI LANKA
27	THAILAND
28	TIMOR-LESTE
29	TURKEY
30	UNITED ARAB EMIRATES
31	VIETNAM
32	YEMEN

Table A2
Questions for Restructuring of Index

Sr. No.	Test Questions
Independence in Choosing Goals	
1.	Does the central bank law stipulate price stability as the central macroeconomic objective of the central banks?
Economic Independence	
2.	Does the central bank control the "instruments" of monetary policy? ("Instruments" are (i) open-market operations (ii) reserve requirements, (iii) discount rates)
3.	Is there any binding legal limit imposed on the direct financing of the government by the central bank?
4.	Is the government allowed to receive any direct financing from the central bank?
5.	Is the central bank subject to government directives in the execution of monetary policy?
Political Independence	
6.	Can the governor of the central bank be dismissed by the executive branch or the parliament if there is conflict regarding monetary policy?
7.	Does the term of office of the central bank governor exceed the election cycle?
8.	Does the term of office of central bank board members exceed the election cycle?
9.	Is the governor appointed by the executive branch?
10.	Are any of the other central bank board members appointed by the executive branch?
11.	Is the number of central bank board members appointed by the executive greater than the number appointed by other bodies?
12.	Does a government official or representative sit on the central bank board?
13.	Does a government official or representative sit on the central bank board with a vote?

Source of information: Prakash and Nathan (1997)

Table A3
Calculation of CBAE and CBAP

S#	Country / Sr. Question	CBAE						CBAP									
		1	02	03	04	05	CBA E index	06	07	08	09	10	11	12	13	14	CBA P index
1	Bahrain	1	1	0	0	1	0.76	0	0	1	0	1	0	0	1	0	0.44
2	Bangladesh	1	1	0	1	1	0.89	1	0	0	1	1	0	0	1	0	0.55
3	Bhutan	1	1	0	1	1	0.89	1	0	1	0	0	0	1	1	0	0.77
4	Brunei	1	0	0	1	1	0.76	1	1	1	0	0	0	1	1	0	0.77
5	China	1	0	0	0	1	0.63	0	1	0	1	0	0	1	1	0	0.55
6	Cyprus	1	0	0	0	1	0.76	1	1	1	1	0	0	1	1	0	0.77
7	Georgia	1	0	0	0	1	0.76	0	1	1	0	1	1	1	1	0	0.55
8	India	1	1	0	1	1	0.76	1	1	1	1	1	1	1	1	0	0.66
9	Indonesia	1	1	0	O	1	0.89	1	1	1	1	1	1	0	1	0	0.88
10	Iran	1	1	0	1	0	0.76	1	1	1	0	1	1	0	1	0	0.77
11	Iraq	1	1	0	1	0	0.76	0	1	0	1	0	0	1	1	0	0.66
12	Japan	1	1	0	1	1	0.89	1	1	1	1	1	1	1	1	0	0.77
13	Jordan	1	0	0	1	1	0.76	1	1	1	1	1	0	1	1	0	0.77
14	Kuwait	1	0	0	1	1	0.76	1	1	0	1	1	0	1	1	0	0.66
15	Malaysia	1	0	0	0	1	0.63	1	0	0	1	1	0	1	1	0	0.44
16	Maldives	1	0	0	0	1	0.76	1	1	0	1	0	1	1	1	0	0.55
17	Mongolia	1	0	0	1	0	0.63	0	1	0	1	1	1	1	1	0	0.55
18	Myanmar	1	0	0	0	1	0.63	0	1	1	1	1	1	0	1	0	0.44
19	Nepal	1	0	0	0	1	0.63	1	1	1	1	1	1	1	1	0	0.66
20	Oman	1	1	0	1	0	0.63	0	1	1	0	1	1	0	1	0	0.55
21	Pakistan	1	1	0	0	1	0.76	0	0	0	1	1	1	0	1	0	0.33
22	Philippines	1	1	0	0	0	0.63	0	1	1	1	1	1	0	1	0	0.55
23	Qatar	1	1	0	0	0	0.63	0	0	1	1	1	1	1	1	0	0.55
24	Russia	1	1	0	0	1	0.76	1	0	0	1	1	0	0	1	0	0.44
25	Saudi Arabia	1	0	0	0	0	0.50	1	1	0	1	1	1	1	1	0	0.55
26	Sri Lanka	1	1	0	1	1	0.89	1	0	1	0	1	1	0	1	0	0.66
27	Thailand	1	1	0	1	0	0.63	0	0	1	1	0	0	1	1	0	0.66
28	Timor-Leste	1	1	0	1	1	0,50	0	0	0	1	0	0	0	1	0	0.44
29	Turkey	1	1	0	1	1	0.89	1	1	1	0	0	1	1	1	0	0.88
30	United Arab Emirates	1	0	0	0	0	0.50	1	1	0	1	1	1	1	1	0	0.55
31	Vietnam	1	1	0	0	0	0.76	0	1	1	1	0	1	1	1	0	0.66
32	Yemen	1	0	0	1	1	0.76	1	1	1	0	1	1	0	1	0	0.66
Wt to in CBA E		1/2	1/8	1/8	1/8	1/8		0	0	0	0	0	0	0	0	0	
Wt to q in CBA P		0	0	0	0	0		1/9	1/9	1/9	1/9	1/9	1/9	1/9	1/9	1/9	

Source of information: Author's calculations by following the methodology of is taken from work of Prakash Loungani and Nathan Sheets (1997) and by extracting information from respective central banks of countries.

Table A4
Central Banks Data Info

Information regarding these parameters are derived from the statutes, charters and circulars of concerned central banks, updated on web sites of concerned banks, as below;

Sr.No.	Country	
1	BAHRAIN	www.cbb.gov.bh
2	BANGLADESH	www.bb.org.bd
3	BHUTAN	www.rma.org.bt
4	BRUNEI	www.bis.org/country/bn.htm
5	CHINA	www.cbc.gov.tw
6	CYPRUS	www.centralbank.gov.cy
7	GEORGIA	www.nbg.gov.ge
8	India	www.centralbank.net.in
9	INDONESIA	www.bi.go.id
10	IRAN	www.cbi.ir
11	IRAQ	www.cbi.iq
12	JAPAN	www.boj.or.jp
13	JORDAN	www.cbj.gov.jo
14	KUWAIT	www.cbk.gov.kw
15	MALAYSIA	www.bnm.gov.my
16	MALDIVES	www.mma.gov.mv
17	MONGOLIA	www.mongolbank.mn/eng
18	MYANMAR	www.cbm.gov.mm
19	NEPAL	www.nrb.org.np
20	OMAN	www.cbo-oman.org
21	PAKISTAN	www.sbp.org.pk
22	PHILIPPINES	www.bsp.gov.ph
23	QATAR	www.qcb.gov.qa
24	RUSSIA	www.cbr.ru/eng
25	SAUDI ARABIA	www.saudinf.com
26	SRI LANKA	www.cbsl.gov.lk
27	THAILAND	www.bot.or.th
28	TIMOR-LESTE	www.bancocentral.tl
29	TURKEY	www.tcmb.gov.tr
30	UNITED ARAB EMIRATES	www.centralbank.ae
31	VIETNAM	www.sbv.gov.vn
32	YEMEN	www.centralbank.gov.ye
33	INFLATION	IBRD-IDA as on December 2014
34	GFCF	IBRD-IDA as on December 2014
35	GDP	IBRD-IDA as on December 2014
36	INFLATION	IBRD-IDA as on December 2014

Table A5
Data of Variables

S#	Country	CBAE index	CBA P index	Inflation	Real GDP for 2014	Gross Fixed Capital Formation Constant Us $	Openness
1	**Bahrain**	0.76	0.44	2.7	---	4821808511	750065
2	**Bangladesh**	0.89	0.55	7	13436744000000	42425167973	78976778
3	**Bhutan**	0.89	0.77	8.2	119545800000	968573748	404127
4	**Brunei**	0.76	0.77	-0.2	-----	----	203304
5	**China**	0.63	0.55	2	63613873246030	378826732991	80649851
6	**Cyprus**	0.76	0.77	-1.4	17506270000	2662717877	613733
7	**Georgia**	0.76	0.55	3.1	29186956000	-----	2017915
8	**Indonesia**	0.76	0.66	6.4	1054269350000000	305346673506	12406112
9	**India**	0.89	0.88	6.4	125412081273533	674274956676	49696013
10	**Iran**	0.76	0.77	17.2	1103366600000000	98776429534	27133460
11	**Iraq**	0.76	0.66	2.2	260601000000000	-----	8686537
12	**Japan**	0.89	0.77	2.7	487500800000000	119622995658	65302348
13	**Jordon**	0.76	0.77	2.9	25437117300	7612183296	1771679
14	**Kuwait**	0.76	0.66	2.9	46564100000	------	1992954
15	**Malaysia**	0.63	0.44	3.1	1106580000000	82044197946	13300027
16	**Maldives**	0.76	0.55	2.1	47124000000	-----	195149
17	**Mongolia**	0.63	0.55	13	21844250326546	-----	-----
18	**Myanmar**	0.63	0.44	5.5	63323000000000	-----	30217049
19	**Nepal**	0.63	0.66	8.4	1941624000000	4009556464	15584793
20	**Oman**	0.63	0.55	1	31450800000	22151625487	2215647
21	**Pakistan**	0.76	0.33	7.2	25068059000000	22151625487	65361409
22	**Philippines**	0.63	0.55	4.1	12642736000000	53327812966	43807158
23	**Qatar**	0.63	0.55	3.1	764797000000	-----	1593886
24	**Russia**	0.76	0.44	7.8	71406399199400	374786107574	76754167
25	**Saudi Arabia**	0.50	0.55	2.7	2826869000000	177798666666	12134929
26	**Sri Lanka**	0.89	0.66	3.3	10291581000000	19135688036	8576325
27	**Thailand**	0.63	0.66	1.9	13148601000000	91350956238	40055849
28	**Timor-Leste**	0,50	0.44	0.4	1417000000	------	264426
29	**Turkey**	0.89	0.88	8.9	1747362376500	163550731806	27778482
30	**United Arabs**	0.50	0.55	2.4	1466985000000	90694253750	6302492
31	**Vietnam**	0.76	0.66	4.1	393785600000000	40894386067	54206654
32	**Yemen**	0.76	0.66	11	----	-----	-----