



Munich Personal RePEc Archive

## **Financial crises and economic growth in Pakistan: a time series analysis**

Azam, Rauf i and Batool, Iram and Imran, Rabia and Chani, Muhammad Irfan and Hunjra, Ahmed Imran and Jasra, Javed Mahmood

UIMS-PMAS- University of Arid Agriculture, Rawalpindi, Pakistan,  
Iqra University Islamabad Campus, Pakistan, National College of  
Business Administration Economics, Lahore, Pakistan

2010

Online at <https://mpra.ub.uni-muenchen.de/40691/>  
MPRA Paper No. 40691, posted 17 Aug 2012 09:19 UTC

## Financial Crises and Economic Growth in Pakistan: A Time Series Analysis

<sup>1</sup>Rauf-I-Azam, <sup>2</sup>Iram Batoool, <sup>1</sup>Rabia Imran, <sup>3</sup>Muhammad Irfan Chani,  
<sup>2</sup>Ahmed Imran Hunjra and <sup>2</sup>Javed Mahmood Jasra

<sup>1</sup>University Institute of Management Sciences  
University of Arid Agriculture, Rawalpindi, Pakistan  
<sup>2</sup>Iqra University Islamabad, Pakistan

<sup>3</sup>National College of Business Administration and Economics, Lahore, Pakistan

---

**Abstract:** The purpose of this research is to investigate causal relationship between economic growth and major indicators of financial crisis -- inflation rate, interest rate and the volume of foreign debt-- in Pakistan. This study also highlights the stability of the relationship between indicators of financial crisis and economic growth. The annual time series data ranging from 1972 to 2010 is used for the analysis. Johansen's co-integration test is used to check the stability of long run equilibrium relationship between the variables used in the study. The results indicate that is long run stable equilibrium relationship between economic growth and the three components of financial crisis in Pakistan. The estimates based on pair-wise Granger Causality test show that bidirectional causal relationship between economic growth and the each indicator of financial crisis considered in this study.

**Key words:** Macro economic variables %Economic growth %Co-Integration %Financial system

---

### INTRODUCTION

The word financial crisis is applied generally to a mixture of condition in which few financial organizations or assets rapidly lose the big division of their worth. The serious factor of the crises is inflation and debt deflation [1]. The economies who face crisis have pathetic banking systems and the majority are ongoing with a bit overestimated exchange rates (some but not all hooked). These are the common characteristics of financial crises. But the reasons and present look of these crises are quite different from the earlier event. The ordinary features are the facto exchange rate hooked to the dollar and the outcome is overestimation, big current account deficits and extreme private sector's foreign borrowing [2]. Types of financial crises: tentative hit on the exchange rate, financial panic through which a bank runs, crises induced by moral hazards, the appreciation of a debt is handed over followed by uncontrollable exercises, reducing foreign reserves and growth rates and increasing inflation [3].

In existing literature there are many characteristics of financial crises in the economy. These can be increase in inflation rates, stock market crash, the currency devaluation, the banking crisis, increase in the amount of foreign debt and decreasing foreign reserves of any economy or slow growth rates. The present financial crisis in the Pakistan critically shows the weakness of a loosened financial system. That also shows the challenge that the policymakers and regulators are facing with in an increasingly globalised, ever-changing world. The banking, other financial institutions, fund and asset management of huge firms in the West, for the meantime, they will come under the pressure from depositors and shareholders. At first the view was that the financial crisis that began in the USA and then extended to Europe would not seriously affect the economies of developing world. In the US majority developing countries were not closely related with the global financial system. However, on 6th October 2008 a lot of large developing countries saw record decline in their stock markets. The seriousness of the Pakistan can be checked from this statement by

SBP “the domestic financial system is now more open and horizontal to the outside shocks than ever before”. Financial crisis affected overall economy of Pakistan by creating poverty, high prices and impact on oil prices in the commodities market. As a result of financial crisis, Pakistan is facing decline in remittances, export earnings, FDI and foreign aid, leading to loss of employment and income. What are the main factors which can cause the crises and how financial crises can affect the economy?

The purpose of this research is to investigate causal relationship between economic growth and major indicators of financial crisis -- inflation rate, interest rate and the volume of foreign debt-- in Pakistan. The findings of this study may provide guidance for the achievement of target of sustained economic growth through controlling the inflation rates, interest rate, and increase in the amount of foreign debt.

**Research Theory:** The responsible factors of financial crises are interest rates, inflation rate and increase in the amount of foreign debt. [2] Kwack (2000) illustrated it as a quick exchange rate depreciation or sharp fall in international reserves. However a rise in foreign interest rates must increase interest payment on external debt and non-performing loans and on the other hand a huge current account surplus will decline the number of non-performing loans. The rate of inflation is also a main factor in financial crises. The inflation has negative relationship between inflation rate and banking sector development and stock market activities. As inflation increases in an economy it will decrease the lending capacity of bank because interest rate increases and borrower are reluctant to get money from bank and also with the increase in inflation the stock market activity also diminishes just because of the reason people are not interested in securities due to increased market prices of stocks and securities in the market. It is found that there is strong negative relationship between inflation and financial intermediary development.

The role of foreign debt in today's financial crises is different from historical perspectives, in past the fiscal and monetary policies were main factors contributing towards financial crises. Banking trouble, today's currency crises and debt crises are interrelated phenomenon and are responsible for recent crises. The currency crises come due to two reasons: higher interest rates and mismatch of currencies. The concept of mismatch of currencies is new. By mismatch of currencies it means that if some country is in need of debt and asks other country to give loan then country can get loan in dollars euro or in yen. But not in his local currency and then for using this debt, country has to convert it into its

local currency. Only rigid currency debt is not the single reason for financial crises in any economy but other factors also work with that to create a drastic affect [4].

IMF created alternative or substitution to come out from this crisis and these are called as rescue packages and these packages were for those who affected the most, to recover the loss. Purpose of introducing these packages was to help countries to elude default. These packages were also expected to be helpful in re-establishing banking, currency and monetary systems' in Asia. Although IMF provided rescue packages but they had to face criticism as well and the biggest criticism of the IMF was targeted towards its response. Many countries were affected from this crisis. The US dollar became more expensive as compared to local currency. And many local businesses and governments realized that they are not able to pay their creditors [3].

During the period of recession, banking crisis relates with the liquidity to firms and to the provision of credit. The main focus is on the depth of financial systems that is ratio of private credit to GDP. The effect is more transparent in countries facing banking crises. The sector of 75<sup>th</sup> percentile of external dependence and located in the country with 75% of private credit to GDP would face 1.6% greater contraction in GDP during crises, than sector is dependent on 25% of external dependence and located in country at the 25% credit to GDP. This leads to overall decrease in GDP up to 3.5% during this period [1]. The overriding role played by the banks in emerging economies, such as the Asian countries, was mainly due to their information structure, which made it easier for firms to get bank loans than to go directly to the capital markets. It was specifically the stages of the cycle illustrated by strong growth and low inflation that can lay the basis for the increased financial instability and thus for the possibility that crises illustrated by the failure of banks and institutions occur with determination and chain effects in the sphere of production, in spite of whether the financial system is "influenced" by the government or political power [5].

Pakistani condition is yet to be decided because there is a drawback that at the time of writing, the information available is not complete and economic studies are not reliable and valid. In the period of 1995 economists started thinking of South East Asia crisis is similar to Latin type crisis and South East Asian countries had to face a miserable situation. One of the major reasons that indicate the situation is large current account deficits. The crisis became more serious when export was slowdown in the region and the blame can put on the dollar because dollar was appreciated against the yen, it

is partially because of specific development in major industries and partially because of the reason that China became a major competitor (Block, 2003). Reasons for financial instability in the economy are: Public has lost confidence on banking institutions [6].

**Research Model:** The following model is used in this study to check the relationship between outcomes of financial crisis like inflation, interest rate, foreign debt and economic growth.

$$GDP_t = \beta_0 + \beta_1 IR_t + \beta_2 CPI_t + \beta_3 FD_t + \mu_t \quad (1)$$

Where,

$GDP_t$  = Real Gross Domestic Product as a proxy variable for Economic growth in time t.

$IR_t$  = Interest rate measured by Discount rate in time t.

$CPI_t$  = Inflation rate measure on the basis of consumer price index in time t.

One the basis of model presented in equation (1) the following hypothesis can be formulated to test in the study.

**Methodology:** The secondary data was used in this study. The data has been obtained for the years 1972 to 2010 from website of business recorder. E-views was employed for analysis. To examine correlation between macro economic variables and Gross Domestic Product (GDP) augmented dickey fuller test of unit root, Johansen’s co-integration test and Granger-causality tests were put in. The study has examined the causal relationship between GDP and Interest rate, foreign debt and inflation. The tool was used to determine the causal relationship between GDP and Interest rate, foreign debt and inflation. Descriptive statistics, Unit Root Augmented Dickey Fuller (ADF) test suggested by [7,8], Johansen co-integration test proposed by [9,10] and Granger-causality test suggested by [11-13] were put in to analyze the data. The data on yearly basis was obtained from business

recorder’s web site for GDP, inflation, interest rate and foreign debt. To make out mean, median, standard deviation, skewness and kurtosis, the descriptive analyses were carried out via E-Views as a first step. Sequentially, to assess stationary of data and having virtuous analysis the unit root, ADF test was used. Then, to test out co-integration among and between the variables, Johansen’s co-integration test was used. To check the co integration between and among the variables. At the last stage, to gauge causal relationship between GDP and macro economic variables the Granger causality test was put in.

## RESULTS AND DISCUSSION

In this section, results derived from descriptive statistics, Augmented Dickey Fuller test, Johansen’s Co-integration test and Granger causality test are presented and discussed in detail.

Table 1 provides self-explanatory descriptive statistics analysis done through E-Views statistical software. IR has the mean of 14.09142 and standard deviation of 0.723578. CPI is having a mean of 4.495600 and standard deviation of 0.400074. FD is having a mean and standard deviation of 36.09611 and 9.347406 respectively. GDP is having a mean and standard of 3.841879 and 0.610092 respectively. CPI is negatively skewed and IR, FD and GDP are positively skewed. The value of Kurtosis and Jarque bera shows that data is reliable.

Augmented Dickey Fuller test has been applied to test the stationary status of the data using E-views software. Table 2 shows the all the variables are not stationary at log level but all are variables used in this study are stationary at 1st difference.

**Johansen’s Co-Integration Test:** Johansen’s co-integration test explains whether there is any effect between dependent variable and independent variables in short term or long-term period. The results of Johansen’s

Table 1: Descriptive Statistics

	IR	CPI	FD	GDP
Mean	14.09142	4.495600	36.09611	3.841879
Median	14.05302	4.563550	35.40000	3.947215
Maximum	15.38244	5.266052	56.00000	11.26948
Minimum	12.73862	3.764627	21.62500	3.048201
Std. Dev.	0.723578	0.400074	9.347406	0.610092
Skewness	0.003980	-.261617	0.406183	8.017622
Kurtosis	2.045673	2.339095	2.340096	3.276287
Jarque Bera	1.02453	1.26548	2.58466	2.45789

Table 2: Results of Augmented Dickey-Fuller Test

ADF Test Statistic - GDP	-11.38097	1% critical value	-3.4620
		5% critical value	-2.8750
		10% critical value	-2.5739
ADF Test Statistic - CPI	-4.416295	1% critical value	-3.4619
		5% critical value	-2.8749
		10% critical value	-2.5738
ADF Test Statistic - IR	-4.165506	1% critical value	-3.4619
		5% critical value	-2.8750
		10% critical value	-2.5738
ADF Test Statistic - FD	-5.718414	1% critical value	-3.4620
		5% critical value	-2.8749
		10% critical value	-2.5740

Table 3: Results of Johansen co-integration test:

Hypothesized No. of CE(s)				
H <sub>0</sub>	H <sub>1</sub>	Maximum Eigen Statistics	5% Critical Value	1% Critical Value
R = 0*	R\$1	136.7535	94.15	103.18
R#1*	R\$2	85.14638	68.52	76.07
R#2	R\$3	46.75957	47.21	54.46
R#3	R\$4	0.206056	3.76	6.65

\* denotes rejection of the hypothesis at the 0.05 (5%) level of significance.

Table 4: Results of pair wise Granger - Causality Tests of Macro economic variables and GDP.

Null hypothesis	Observations	Lags	F-Statistics	P. value
CPI does not Granger Cause GDP	38	2	4.3296	0.0499
GDP does not Granger Cause CPI			6.5908	0.0379
FD does not Granger Cause GDP	38	2	12.0666	0.0056
GDP does not Granger Cause FD			2.9502	0.0751
IR does not Granger Cause GDP	38	2	7.7264	0.0206
GDP does not Granger Cause IR			13.0446	0.0052

co-integration test are shown in Table 3, which depicts that inflation rate, interest rate and foreign debt are having co-integration and these results are consistent with [14,15]. The results show that there are two co-integrating vectors as for our first two null hypotheses of no co-integration critical value is less than calculated value of Maximum Eigen statistic at five percent level of significance and it's not true for the remaining two null hypotheses. So it is concluded that variables in long-run equilibrium based on Johansen's co-integration at 5% significance level.

Table 4 presents the results of granger causality test. The results show that GDP has causal relationship with all three indicators of financial crises in Pakistan as supported by previous work of [16]. A study carried out by [17] in Japan to find out the relationship between stock prices and GDP, established positive relationship between stock exchange prices and GDP.

## CONCLUSION AND RECOMMENDATIONS

**Conclusion:** The study analyzes the causal relationship between determinants of financial crises (CPI, FD, IR) and GDP in Pakistan. The determinants of financial crises were represented by Inflation (CPI), Interest rate and foreign debt (FD) and dependent variable is gross domestic product (GDP). This study concludes that IR has the mean of 14.09142 and standard deviation of 0.723578. CPI is having a mean of 4.495600 and standard deviation of 0.400074. FD is having a mean and standard deviation of 36.09611 and 9.347406 respectively. GDP is having a mean and standard of 3.841879 and 0.610092 respectively. This study also concludes that only Interest rate and foreign debts are having co-integration, whereas inflation and GDP is having no co integration between themselves. Interest rate is an essential device available to

Government to intervene in the financial system of the country. However, rising interest rates in the country depress stock returns and can result in higher cost of debt.

On analysis of co-integration between determinants of financial crises and GDP, it was found that only interest rate and foreign debt are having co-integration with GDP. They have co integration with GDP at 5% significance level. This study also explains that GDP has relationship between all macro economic variables used in this study except FD.

**Recommendations:** This research aims to identify the effect of changes in economic variables on GDP. On the basis of the results of the study and subsequent conclusion, following are some of the recommendations for the stakeholders of the capital market in Pakistan and some suggestions for the further research in this area. Interest in the country is controlled and regulated by the State Bank of Pakistan (SBP) as constituent of monetary policy framework. The expansion in interest rate in the economy is negatively affecting the GDP. So, SBP should carefully monitor the interest rate in order to get optimal benefit of this monetary instrument.

Therefore, Government should maintain an appropriate rate of interest in the country that will help and motivate investors to grab investment opportunities. Escalating inflation in the country is not only adversely affecting the GDP; it is also resulting in higher consumption and lower savings among the individuals. The mounting prices of essentials in the country deter availability of resources for investment purposes. The stability of prices is required to encourage individual and institutional investors and to provide them a conclusive environment for the investment.

## REFERENCES

1. Caprio, G. and D. Klingebiel, 2003. Episodes of Systemic and Borderline Financial Crises. World Bank database, Washington, D.C.: The World Bank.
2. Kwack, S.Y., 2000. An Empirical Analysis of Factors Determining the Financial Crises in Asia. *J. Asian Economics*, 11: 195-206.
3. Diamond, D.W. and R. G. Rajah, 2001. Banks, Short-Term Debt and Financial Crises: Theory, Policy Implications and Applications. *Carnegie-Rochester Conference Series on Public Policy*, 54: 37-71.
4. Meissner, C.M. and M.D. Brodo, 2006. The Role of Foreign Currency Debt in Financial Crises: 1880-1913 versus 1972-1997. *Journal of Banking and Finance*, 30: 3299-3329.
5. Sau, L., 2009. Banking, Information and Financial Instability in Asia. *J. Post Keynesian Economics*, 25: 493-513.
6. Yun-Hwan Kim, 2001. The Asian Crisis, Private Sector Saving and Policy Implications. *J. Asian Economics*, 12: 331-35.
7. Dickey, D.A. and W.A. Fuller, 1979. Distribution of the Estimation for Autoregressive Time Series with Unit Root. *J. the American Statistical Association*, 74: 427-431.
8. Dickey, D.A. and W.A. Fuller, 1981. Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica*, 49(4): 1057-1072.
9. Johansen, S., 1988. Statistical Analysis of Co-integrating Vectors. *J. Economic Dynamics and Control*, 12(2-3): 231-254.
10. Johansen, S., 1991. Estimation and Hypothesis Testing of Co-integration Vectors in Gaussian Vector Autoregressive Models. *Econometrica*, 59(6): 1551-1580.
11. Granger, C.W.J., 1986. Developments in the Study of Cointegrated Economic Variables. *Oxford Bulletin of Economics and Statistics*, 48(3): 213-28.
12. Engle, R. and C. Granger, 1987. Co-integration and Error Correction: Representation, Estimation and Testing. *Econometrica*, 55(2): 251-276.
13. Shirtcliff, E.A., D.A. Granger, E.B. Schwartz, M.J. Curran, A. Booth and W.H. Overman, 2000. Assessing Estradiol in Biobehavioral Studies Using Saliva and Blood Spots: Simple Radioimmunoassay Protocols, Reliability and Comparative Validity. *Hormones and Behavior*, 38(2): 137-47.
14. Hunjra, A.I., M. Azam, G.S.K. Niazi, B.Z. Butt, K.U. Rehman and R.I. Azam, 2011. Risk and Return Relationship in Stock Market and Commodity Prices: A Comprehensive Study of Pakistani Markets. *World Applied Sciences J.*, 13(3): 470-481.
15. Azam, M., H. Khan, A. I. Hunjra, H.M. Ahmad and M.I. Chani, 2011. Institutions, macro-economic policy and foreign direct investment: South Asian countries case. *African J. Business Management*, 5(11): 4306-4313.

16. Chani, M.I., Z. Pervaiz and A.R. Chaudhary, 2011. Determination of Import Demand in Pakistan: The Role of Expenditure Components, *Theoretical and Applied Economics*, 18(8): 93-110.
17. Mukherjee, T. and A. Naka, 1995. Dynamic Linkage between Macroeconomic Variables and the Japanese Stock Market: An Application of a Vector Error Correction Model, *J. Financial Res.*, 18: 223-37.