Contribution of Financial Sector Development in Reducing Unemployment in Pakistan

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Received: August 9, 2011 Accepted: August 29, 2011 Published: January 1, 2012

doi:10.5539/ijef.v4n1p260 URL: http://dx.doi.org/10.5539/ijef.v4n1p260

Abstract

The study empirically investigated the long run relationship between financial sector development and unemployment in Pakistan, along with the direction of causality. Annual data used were from the period of 1973 to 2007. Auto Regressive Distributed Lag (ARDL) bound testing technique for cointegration was applied to estimate the long run relationship. A stable long run relationship was found between financial sector indicators and unemployment. Escalating money circulation in economy proved to have negative impact on employment rate as it increased the unemployment rate by 2.3 percent for aone percent increase in M2 minus currency in circulation/GDP. Increased Financial sector activities showed positive impact on reducing unemployment in short run as well as in the long run. Further, Granger causality test revealed the importance of credit disbursement to private sector in improving job opportunities and increasing employment rate.

Keywords: Financial development, Unemployment, Domestic credit, Causality, Error correction, Pakistan

1. Introduction

The financial sector occupies a crucial place in performing the development activities and acts as a catalyst to economic growth. Countries with developed banking sector and dynamic stock markets grow faster than the countries with lagged financial system (Levine, 1997). Development of the banking sector and the stock market are highly correlated with the economic development. The financial system provide information about potential investment (Beck et al. 2000) and has a key role in the modern economy for efficient and improved productivity in a country (Chiou, et al. 2008). On disruption of this key role the economy may suffer from economic problems like, unemployment, a persistent slide in industrial production and decrease in profits and consumers real incomes. The economy could be in danger, especially if policy measures are failed to correct the problem properly and quickly

(Orphanides, 2009). Historically financial sector turmoil and unemployment has a close link. During The Great Depression of 1929 - 1933, production declined by 25%, the price level fell below 30% and unemployment reached 25% of the labor force, and about 9000 banks closed operations (Bordo, 2000). The recent global financial crisis has plunged the industrialized countries into a severe recession giving rise to unemployment and indebtedness, the loss of hard won income and assets (Sasi, 2009). Recently the world has seen the wide spread unemployment due to the failure of financial system worldwide. So the main objectives of the study are to determine the role of financial sector in unemployment and check the direction of causality between financial sector development and unemployment in Pakistan.

2. Previous Studies

Historically, Bagehot (1873) and Schumpeter (1912) highlighted the role of the financial sector in economic development. Stock market liquidity and banking sector development indicators were found positively correlated with economic growth in both short run and long run scenario in most countries see {Levine and Zervos (1998); King and Levine (1993)}. A positive long-run effect of financial intermediation on output growth was also witnessed by Jalil and Ma (2008) and Khan et al. (2005 in Pakistan and China but for short-run mostly negative relationship existed. A positive economic scenario is promoted through absorption of benefits created by foreign direct investment {Hermes and Lensink (2003) and Alfaro et al. (2006)}. However political risk factors were affecting the relationship. Darrat et al. (2005) provided strong evidence about the strong relationship between growth volatility in the UAE and development of its financial sector in the long run. However, over the short-run association was insignificant. Likewise results were observed by Han (2009) in USA. According to him financial sector turmoil caused unemployment which negatively affected the financial affordability for basic needs such as a home, food, clothes, and medical care. In India over the period of 1951-2004 the underdeveloped financial systems caused income inequality, Ang (2008). In the Asian region and Philippines the financial crises most affected the employment opportunities of young workers, women migrant workers and employees of the small and medium enterprises Castillo (2009). Over the time many researchers focused on the topic of financial sector development and economic growth or development and some analyzed the influence of former on (un)employment indirectly through changes in FDI and income distribution .A little work is available on the direct relationship of financial sector development and unemployment so this study will help to fill this gap in research work.

3. Data and Econometric Model

The most important and critical requirement for the research is the provision of an accurate and consistent data along with an appropriate methodology. The annual time series data including several variables of financial sector and economic development over the period of (1973-2007) were taken from International Financial Statistics (IFS), World Development Report, World Bank, Pakistan Economic Survey different issues, Handbook of Statistics on Pakistan Economy (2005), State Bank of Pakistan (SBP), World Development Indicators (WDI) and Global Development finances.

3.1 Description of the Variables

The selection of key variables to indicate the level of financial sector development is a very difficult task. There are so many alternative indicators that were used in various studies related to financial development.

Three indicators are selected from the banking sector and one proxy is developed to capture stock market development. The first indicator is the Ratio of M2 minus Currency in Circulation to Nominal GDP (MG). Previously many researchers used Ratio of M2 to GDP as an indicator of banking sector development like Levine (1997), Asteriou (2003), Shan (2002), and Masih (2008). This ratio reflects an extensive use of currency out side the banking system rather than an increase in bank deposits. Owing to this reason this measure appears to be less indicative of the financial dealings and transaction of the banking system. Now-a-days researchers are using the ratio of M2 minus currency in circulation to nominal GDP as a new variable of financial sector development; see {Abu-Bader et al. (2005), Dematriads and Hussen (1996), and Khan et al. (2005)}. Here M2 means total currency in circulation in the economy i.e. currency in the tills of scheduled banks, bank deposits with SBP, scheduled banks demand deposits and scheduled banks time deposits (Hand Book of Statistics, 2005). The second indicator of banking sector development is the Ratio of Domestic Credit to Private Sector to Nominal GDP (DCPS). This indicator measures the quality and quantity of the investment financed by the banking sector; used by many researchers as a proxy for financial sector development (see King and Levine (1993), Levine (1999), Abu-Bader and Abu-Oarn (2005), Beck, et al. (2000), Shandre et al. (2004), Emila and Alexander (2001), Shan (2002), Erdal and Hyougsoo (2007) and Acaravci and Ilhan (2007). Third indicator, Assets with the central bank to GDP ratio (ASBG) demonstrates the importance of over all financial services and the strength of financial system of a country. Average Market Capitalization to GDP ratio (AMC) is used as the indicator of development of stock exchange market;

expressing the value of shares of all the registered companies at stock market and country's financial and investment policy behavior (Beck et al.1999). Where as unemployment rate was used as dependent variable .Labels assigned to all the variables are given below.

LnMG = Log of M2 minus currency in circulation to GDP ratio.

LnAMC = Log of Average Market Capitalization to GDP ratio

LnDCPS = Log of domestic credit to private sector to GDP ratio

LnASBG = Log of assets with the State Bank of Pakistan to GDP ratio

LnUR = Log of unemployment rate

3.2 Stationarity Check

Stationarity is a key concept used in econometric theory for the time series data as according to Griffith et al. (2001) regressions between two non-stationary variables produce bogus results. Most time series show the increasing or decreasing tendency over the time. Any association between series depicting specific inclinations may turn out to have considerable results with high R2, but may not be authentic (Granger and Newbold, 1974). Stationary check is adopted through Dickey Fuller and Augmented Dickey Fuller test to avoid all these problems of the spurious regression results. A series which is stationary after being differenced once is said to be integrated of order 1 and was denoted by I (1). In general a series, that is stationary after being differenced n times is integrated of order n, denoted by I (n). A series, stationary without differencing, is said to be I (0) (Gujarati, 2003).

3.3 Cointegration

The concept of co-integration first given by Granger (1981) means if the linear combination of two non-stationary I (1) series, Y and X, are such that the residuals of the regression are stationary, errors have tendency to disappear and return to zero i.e. are I (0), then the variables are co integrated.

$$Y_t = \beta_0 + \beta_1 X_t + u_t \tag{1}$$

$$\mathbf{u}_{t} = \mathbf{Y}_{t} - \mathbf{\beta}_{0} - \mathbf{\beta}_{1} \mathbf{X}_{t} \tag{2}$$

$$\mathbf{u}_{t} = \mathbf{I}(0) \tag{3}$$

3.4 Model Specification

The auto regressive distributed (ARDL) bounds testing approach, developed by Pesaran et al. (2001) is applied to examine the cointegration relationship between financial sector development and unemployment and following model is used.

$$LnUR = \beta_0 + \beta_1 LnMG + \beta_2 LnAMC + \beta_3 LnDCPS + \beta_4 LnASBG + \varepsilon_t$$
(4)

All the variables were converted in to log form due to the following reasons.

Many economic series such as GDP show growth in approximately exponential terms, so the logarithm of the series grows approximately linearly. Standard deviation of many economic time series is approximately proportion to its level and standard deviation of the logarithm of the series is approximately constant. In either case it was useful to transform the series so that changes in the transformed series are proportional changes in original series {(Stock and Watson, 2004), (Loayza and Ranciere, 2006), (Chang, 2002), (Dritsakis, 2004)}.

3.5 Estimation Procedure

The study used Auto Regressive Distributed Lag (ARDL) bound testing approach to cointegration developed by Pesaran (2001). ARDL has many advantages over Johansen cointegration approach. It can be applied if the variables are of different order of integration, Variables may be I (0), I (1) or mutually co integrated (Pesaran and Pesaran, 1997). This approach performs better than Engle Granger or Johansen cointegration technique in small sample size and all the variables are considered as endogenous variables. A dynamic error correction model (ECM) can be derived from ARDL model with the help of simple linear transformation.

The auto regressive distributed lag approach to cointegration; a general to specific approach was applied to find the cointegration relationship between financial sector indicators development and unemployment rate through the following unrestricted error correction version of the ARDL model.

$$\begin{split} \Delta L n U R_{t} &= \beta_{0} + \sum_{i=1}^{3} \beta_{1i} \Delta L n U R_{t-i} + \sum_{i=1}^{3} \beta_{2i} \Delta L n M G_{t-i} + \sum_{i=1}^{3} \beta_{3i} \Delta L n A M C_{t-i} \\ &+ \sum_{i=1}^{3} \beta_{4i} \Delta L n D C P S_{t-i} + \sum_{i=1}^{3} \beta_{5i} \Delta L n A S B G_{t-i} + \lambda_{1} L n U R_{t-1} \\ &+ \lambda_{2} L n M G_{t-1} + \lambda_{3} L n A M C_{t-1} + \lambda_{4} L n D C P S_{t-1} + \lambda_{5} L n A S B G_{t-1} + \mu_{t} \end{split}$$
(5)

The terms with the summation signs (in eq 5) represented the error correction dynamics (short run dynamics of the model), and the terms with λ sign showed the long run relationship). While β 0 was the drift component and μ t the white noise error term. The null hypothesis was estimated through the help of F statistic showing the dispersion of data that was non normal. If computed F- statistic exceeds the upper critical value the null hypothesis of no long run relationship could be rejected regardless of whether the order of integration of the variables were I (0) or I (1). Similarly if calculated F- statistic fell below the lower critical value, the null hypothesis was not rejected. If calculated F- statistic fell between these two bounds the results would be inconclusive. When the long run relationship was established among the variables then there was an error correction representation.

So the following error correction model was estimated.

$$\Delta L \, n \, U \, R_{t} = \beta_{0} + \sum_{i=1}^{3} \beta_{1i} \Delta L \, n \, U \, R_{t-i} + \sum_{i=1}^{3} \beta_{2i} \Delta L \, n \, M \, G_{t-i} + \sum_{i=1}^{3} \beta_{3i} \Delta L \, n \, A \, M \, C_{t-i}$$

$$+ \sum_{i=1}^{3} \beta_{4i} \Delta L \, n \, D \, C \, P \, S_{t-i} + \sum_{i=1}^{3} \beta_{5i} \Delta L \, n \, A \, S \, B \, G_{t-i} + \alpha \, E \, C \, M_{t-1} + \mu_{t}$$

$$(6)$$

The error correction model results indicated the speed of adjustment back to long run disequilibria after a short run shocks. The ECM integrates the short-run coefficient with the long-run coefficient with out losing long-run information. Further Granger causality and stability check were applied.

4. Results of Empirical Estimation

The presence of non-stationarity in time series data usually provides fake regression results (Griffith et al, 2001). Thus, the first step in any time series empirical analysis was to test for presence of unit root to avoid the problem of inaccurate estimates.

Unit root tests were applied on the original data series and results of the tests are reported in the table 1. Tabulated value of all the variables was less negative then the critical values. All the variables were found non-stationary at level therefore the unit root tests were applied on the first differenced time series. Results reported in table 2 showed that all the variables attained stationarity at first difference. After stationarity check, After stationarity check, the cointegration test was applied. The null hypothesis was that all the \(\lambda \) given in eq 5 are jointly equal to zero indicating no long run relationship between the financial sector development and unemployment rate. While an alternative hypothesis was that these \(\lambda\) are not jointly equal to zero indicating the long run relationship between variables. Variable addition test was applied to estimate the null hypothesis of no long run relationship between financial sector development and unemployment rate. F statistics was calculated through Microfit 4.1 software Log of unemployment rate (LnUR) was taken as dependent variable. It was observed that estimated value of Fstatistics (6.792) was greater than the upper bounds of the critical value (3.805) developed by Pesaran with an unrestricted intercept and no trend at 95 percent level(table 3). The null hypothesis of no long run relationship between the financial sector development and unemployment rate was failed to accept (rejected). It indicated that there existed a clear long run relationship between the variables of financial sector development and unemployment rate in Pakistan. Further the co integrating vectors were estimated through bound tests and all the variables utilized in the model were considered as dependent variable individually one after each other and results are presented in

The results of table 3 indicated the existence of relationship between financial sector development and unemployment rate. Therefore long run coefficients were estimated through ARDL model (1,2,3,1,2) and lags were selected based on Schwarz Bayesian Criterion (Table 4). All the variables except money in circulation/GDP indicated inverse relationship with unemployment rate in Pakistan. The Average market capitalization/ GDP for one percent increase reduced unemployment rate by 0.284 percent. (Un) employment in Pakistan (decreased) increased at the rate of 0.823 percent and 0.311 percent in long run; for one percent increase in distribution of credit to private sector/GDP and Assets with state bank/GDP. A one percent change in currency circulation/GDP ratio caused a 2.312 percent change in unemployment rate, in the same direction. An increased MG indicated that total currency

circulation escalated more rapidly than GDP. People were spending less and saving more and had more financial assets. It led to saving paradox that is more saving, less investment and more unemployment (Robel, 1997).

On existence the long run relationship the error correction model applied on eq.6. Error Correction Representation of ARDL (1,2,3,1,2) selected lags based on Schwarz Bayesian Criterion is given in table 5. The value of error correction coefficient was -0.750, statistically significant at the 5 percent level and had right sign. The estimated value of ECM suggested the speed of adjustment of the long run disequilibrium caused by the short run disturbance of the previous year with the feed back coefficient -0.750. The lagged values of M2 minus currency in circulation to GDP ratio and assets with the State Bank to GDP ratio were significant with negative sign consistent with theoretical aspects. The lagged term of credit to private sector/GDP also had negative sign but insignificant. The positive sign of lagged value of average market capitalization/ GDP indicated that in the short run it was causing increase in unemployment.

Granger Causality (Table 6) existed between both M2 minus currency in circulation/GDP and assets with the State Bank/GDP showed a unidirectional causality with unemployment rate. Whereas, bi- directional causality was found between credit to private sector to GDP ratio and unemployment rate, at 5 percent level of significance. The study applied the stability tests namely Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Square Recursive Residuals (CUSUMSQ). Graph of CUSUM and CUSUMSQ were within 5 percent of critical bands, indicated the stability of the model and confirmed the stable long run equilibrium relationships between financial sector variables and unemployment rate (Pesaran 1997), (Abu-Badar & Abu-Qarn,2005) and (Khan et al. 2008).

5. Conclusions

The study finds out the relationship between financial sector development and unemployment in Pakistan. Annual data were used from the period 1973 to 2007. The main objectives of the study were to analyze the long run relationship between financial sector development and unemployment and also to determine the direction of causality between financial sector indicators and unemployment. The study used unemployment rate as dependent variable Whereas, M2 minus currency in circulation to GDP ratio, Credit to private sector to GDP ratio, assets with the State Bank of Pakistan to GDP ratio and average market capitalization to GDP ratio were used as the proxies for financial sector development. Dickey Fuller and Augmented Dickey Fuller unit root tests were used to check the stationarity of each variable in the model. All the variables were found I (1). Auto Regressive Distributed Lag (ARDL) bounds testing technique to cointegration a stable cointegration relationship was found among the variables of financial sector and unemployment. Error Correction coefficient indicated a stable long run relationship between financial sector development and unemployment rate in Pakistan .

In the Long run credit to private sector to GDP ratio, assets with the State Bank to GDP ratio, and the average market capitalization to GDP ratio showed the positive effect on employment rate while M2 minus currency in circulation to GDP ratio had a positive effect on unemployment rate. In short run M2 minus currency in circulation/GDP, average market capitalization/GDP and assets with the State Bank/GDP, were significant with negative sign consistent with theoretical aspects. A bi-directional causality between the credit to private sector/GDP and unemployment rate implied that Unemployment rate can be arrested with the help credit disbursement to private sector leading to increase in private investment in the economy. Therefore priority should be given to private sector in credit disbursement decisions to increase the job opportunities and further enhance the pace of economic development. The study suggests that a well-developed financial sector is essential to economic development.

References

Abu-Bader, S., & Abu-Qarn, A. S. (2005). Financial Development and Economic Growth: The Egyptian Experience, Discussion paper no. 05-14, Monaster Center for Economic Research, department of Economics, Ben-Gurion Univ. of Negev P.O.Box 653, Beer sheva Israel 1-36.

Acaravci, A., Ilhan, O., & Acaravci, S.K. (2007). Finance and Growth Nexus: Evidence from Turkey. *International Research Journal of Finance and Economics*, 11, 30-40. [Online] Available: www.eurojournals.com/finance.htm

Alfaro, L., Chanda, A., Ozcan, S. K., & Sayek, S. (2006). How does foreign direct investment promote economic growth? Exploring the effects of financial markets on linkage. *EI Working Paper* No. 69. [Online] Available: www.hbs.edu/research/pdf/07-013.pdf, (August 9, 2011)

Ang, J. B. (2008). Finance and inequality: the case of India. Monash University, Department of Economics, Discussion paper 08/08, ISSN 1441-5429.

Asteriou, D., & Siriopoulos, C. (2003). The Role of Political Instability in Stock Market Development and Economic Growth: The Case of Greece, Economic Notes by Banca Monte dei Paschi di Siena SpA, 29, 3-2000, 355-374

Bagehot, W. (1873). A Description of Money Market with Currency Monopoly, Homewood. ILRichard, 1962.

Beck, T. Demirguc-Kunt, A. & Levine, R. (1999). A new data base on financial development and structure, *Policy Research Working Paper Series*, 2146, The World Bank.

Beck, T., Demirguc-Kunt, A., Levine, R., & Maksimovic, V. (2000). Financial Structure and Economic Development: Firm, Industry, and Country Evidence. *World Bank Working Paper*, No. 2423.

Bordo, M. D. (2007). Sound Money and Sound Financial Policy Rutgers University and NBER. Paper prepared in the conference, Anna Schwartz – The Policy Influence. American Enterprise Institute. Washington D.C. April 14, 2000

Castillo, J. P. (2009). The unemployment threat of the financial unemployment crisis. *Asia-Pacific Social Science Review*, 9,1, 41-46. http://dx.doi.org/10.3860/apssr.v9i1.1059

Chang, T. (2002). Financial development and economic growth in Mainland China: a note on testing demand-following or supply-leading hypothesis. *Applied Economics Letters*, 9, 869-873. http://dx.doi.org/10.1080/13504850210158962

Chiou, Wan-J. P., Lee, A.C., & Lee, C.F. (2008). *Stock return, risk, and legal environment around the world.* http://69.175.2.130/~finman/Reno/Papers/FMA 09 Return Law.pdf

Darrat, A. F, Abosedra, S.S., & Aly Hassan, Y. (2005). Assessing the Role of Financial Deepening in Business Cycles: The Experience of the United Arab Emirates. *Applied Financial economics*, 15,7,447-53.

Dematriads, P.O., & Hussen, K. A. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economics*, 51(2), 387-411

Dritsakis, N., & Adamopoulos, A. (2004). Financial Development and Economic Growth in Greece: An Empirical Investigation with Granger Causality Analysis. *International Economic Journal*, 18, 547-559. http://dx.doi.org/10.1080/1016873042000299981

Emilia A. M. & Alexander, R.W. J. (2001). Financial Sector Development and Economic Growth in New Zealand. *Applied Economics Letters*, 8, 545-549.

Granger, C. W. J., & Newbold, P. (1974). Spurious regression in econometrics. *Journal of Econometrics*, 2,111-120. http://dx.doi.org/10.1016/0304-4076(74)90034-7

Griffiths, W. E., Hill, R. C., & Judge, G. G. (2001). *Learning and Practicing Econometrics*, New York: John Wiley & Sons, Inc.

Gujrati, D. N. (2004). Basic Econometrics (4th ed.). New York: The McGraw-Hill Companies.

Han, K.C. (2009). Unemployment, financial hardship, and savings in individual development accounts. *Journal of Poverty*, 13,4–95. http://dx.doi.org/10.1080/10875540802623484

Hermes, N., & Lensink, R. (2003). Foreign direct investment, financial development and economic growth. *The Journal of Development studies*, 40, 142-163.

Jalil, A., & Ma, Y. (2008). Financial development and economic growth: time series evidence from Pakistan and China. *Journal of Economic Cooperation*, 29, 2, 29-68.

Khan, M. A., Qayyum, A., & Sheikh, S. A. (2005). Financial development and economic growth: the case of Pakistan. *The Pakistan Development Review*, 44,4,819-837.

Khan, M. A. (2008). Financial Development and Economic Growth in Pakistan Evidence Based on Autoregressive Distributed Lag (ARDL) Approach. *South Asia Economic Journal*, 9, 2, 375-39. http://dx.doi.org/10.1177/139156140800900206

King, R. G., & Levine, R. (1993). Finance and Growth: Schumpeter Might be Right. *The Quarterly Journal of Economics*, 108, 3, 717-737.

Levine, R. (1997). Financial development and economic growth: views and agenda. *Journal of Economic Literature*, 35, 688-726.

Levine, R., & Zervos, S. (1998). Stock markets, banks and economic growth. *The American Economic Review*, 88, 3,537-558.

Loayza, N.V. & Ranciere, R. (2006). Financial Development, Financial Fragility, and Growth. *Journal of Money, Credit and Banking*, Blackwell Publishing, 38(4), 1051-1076, June.

Masih, M., Al-Elg, A. & Madani, H. (2007). Causality between financial development and economic growth: an

application of vector error correction and variance decomposition methods to Saudi Arabia. *Applied Economics*, 41,13,1691-1699. http://dx.doi.org/0.1080/00036840701320233

Pesaran, M. H., & B. Pesaran. (1997). *Microfit 4.0: Interactive Econometric Analysis*, Oxford: Oxford University Press.

Pesaran, M. H., Shin Y., & Smith, R.J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16, 289-326. http://dx.doi.org/10.1002/jae.616

Robles, S. B. (1997). Financial Efficiency and Economic Growth: The Case of Spain. *International Advances in Economic Research*, 3,4,333-351. http://dx.doi.org/10.1007/BF02295212

Sasi,K. (2009). The consequences of the global financial crisis, report committee on economic affairs and development, Finland, group of the European people's party, Doc.No. 11807

Schumpeter, J. (1912). *The Theory of Economic Development*, Harvard University Press. http://assembly.coe.int/Documents/WorkingDocs/Doc09/EDOC11807.pdf

Stock, J. H., & Watson, M.W. (2004). Introduction to Econometrics, Prentice Hall.

Shan, J. (2005). Does Financial Development 'lead' Economic Growth?: A Vector Auto-Regression Appraisal. *Applied Economics*, 37, 1353–1367.

Shandre, M. T., & James, A. B. J. (2004). Financial development and economic growth in Australia: An Empirical Analysis. *Empirical Economics*, 29, 247–260.

Table 1. Results of Unit Root Test of the Variables at Level

	Test with a consta	Test with a constant & no trend		Test with a constant & trend	
Variables	DF	ADF	DF	ADF	
LnMG	-0.796	-0.783	-2.092	-2.224	
LnAMCG	0.996	0.197	-2.307	-2.234	
LnASBG	-1.080	-1.040	-2.199	-2.243	
LnDCPS	-2.114	-2.740	-2.265	-2.873	
LnUR	-2.037	-2.039	-1.898	-2.264	
Critical value	-2.953		-3.551		

Table 2. Results of Unit Root Test of the Variables at First Difference Level

	Test with a constant and no trend		Test with a constant and trend	
Variables	DF	ADF	DF	ADF
DLnMG	-5.497*	-4.389*	-5.448*	-4.356*
DLnAMCG	-5.680*	-3.625*	-5.708*	-3.654*
DLnASBG	-5.493*	-4.082*	-5.346*	-3.913*
DLnDCPS	-5.769*	-5.514*	-5.686*	-5.380*
DLnUR	-5.136*	-3.534*	-3.987*	-2.275*
Critical value	-2.956		-3.556	<u>-</u>

Note: * indicated the stationarity of the variables at 5% level of significance.

Table 3. Results of the Bounds Tests on Changing the Positions of Independent and Dependent Variables

Dependent variable	Independent variables	Value of F tatistics	Lags order
LnMG	LnUR, LnAMC, LnDCPS, LnASBG	3.309	3
LnAMC	LnUR, LnMG, LnDCPS, LnASBG	0.997	3
LnDCPS	LnUR, LnMG, LnAMC, LnASBG	4.110*	3
LnASBG	LnUR, LnMG, LnDCPS, LnAMC	2.656	2

Note: * indicating the cointegrating relationship.

Table 4. Results of long run relationship between unemployment rate and financial sector development

Independent Variables	Coefficient	Standard Error	T-Ratio
LnMG	2.312*	0.310	7.434
LnAMC	-0.284*	0.068	-4.210
LnDCPS	-0.822*	0.344	-2.393
LnASBG	-0.312*	0.080	-2.393
INPT	17.381	2.130	8.159

Note: * indicated 5 percent level of significance.

Table 5. Error Correction Representation of ARDL (1,2,3,1,2) selected lags based on Schwarz Bayesian Criterion. Dependent variable was log of unemployment rate

Explanatory variables	Coefficient	Standard Error	T-Ratio	
dLnMG	0.646*	0.262	2.462	
dLnMG1	-1.009*	0.284	-3.561	
dLnAMC	0.191*	0.052	3.690	
dLnAMC1	0.340*	0.087	3.899	
dLnAMC2	0.206*	0.082	2.519	
dLnDCPS	-0.212	0.271	-0.782	
dLnASBG	-0.099**	0.056	-1.762	
dLnASBG1	0.122*	0.051	2.410	
dINPT	13.035	2.586	5.040	
ecm(-1)	-0.750	0.148	-5.053	
R- Square	0.868			
R- bar Square	0.772	0.772		
DW statistics	2.383			

Note: * and ** indicated 5 percent and 10 percent level of significance respectively.

Table 6. Results of Granger Causality Test

Direction of Causality			F-Statistics	Probability
LnMG	-	LnUR	3.655**	0.066
LnUR	NO	LnMG	0.001	0.977
LnAMC	NO	LnUR	0.522	0.477
LnUR	NO	LnAMC	0.119	0.733
LnDCPS		→ LnUR	5.528*	0.025
LnUR		LnDCPS	4.175*	0.050
LnASBG	NO	LnUR	0.414	0.525
LnUR		──→ LnASBG	7.516*	0.010

Note: * and ** indicated 5 percent and 10 percent level of significant respectively.

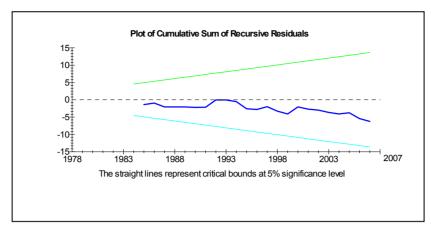


Figure 1. Graphs of Cumulative Sum of Recursive Residuals (CUSUM)

Unemployment rate was used as dependent variable

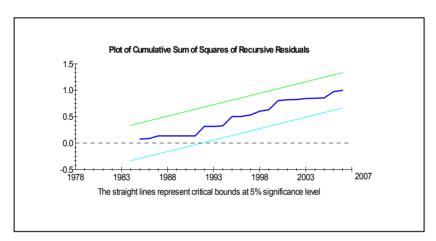


Figure 2. Plot of CUSMSQ Recursive residuals showing stability of Model