Contribution of Financial Sector Development in Reducing Unemployment in Pakistan

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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 a one 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 outside 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-Qarn (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.

\[ \text{LnMG} = \log \text{ of M2 minus currency in circulation to GDP ratio.} \]
\[ \text{LnAMC} = \log \text{ of Average Market Capitalization to GDP ratio} \]
\[ \text{LnDCPS} = \log \text{ of domestic credit to private sector to GDP ratio} \]
\[ \text{LnASBG} = \log \text{ of assets with the State Bank of Pakistan to GDP ratio} \]
\[ \text{LnUR} = \log \text{ of unemployment rate} \]

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.

\[ Y_t = \beta_0 + \beta_1 X_t + u_t \] (1)
\[ u_t = Y_t - \beta_0 - \beta_1 X_t \] (2)
\[ u_t = I(0) \] (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.

\[ \text{LnUR} = \beta_0 + \beta_1 \text{LnMG} + \beta_2 \text{LnAMC} + \beta_3 \text{LnDCPS} + \beta_4 \text{LnASBG} + \varepsilon_i \] (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.
The terms with the summation signs (in eq 5) represented the error correction dynamics (short run dynamics of the model), and the terms with \( \lambda \) sign showed the long run relationship. While \( \beta_0 \) was the drift component and \( \mu \) 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.

\[
\Delta \ln UR_t = \beta_0 + \sum_{i=1}^{3} \beta_{i1}\Delta \ln UR_{t-i} + \sum_{i=1}^{3} \beta_{i2}\Delta \ln MG_{t-i} + \sum_{i=1}^{3} \beta_{i3}\Delta \ln AMC_{t-i} \\
+ \sum_{i=1}^{3} \beta_{i4}\Delta \ln DCPS_{t-i} + \sum_{i=1}^{3} \beta_{i5}\Delta \ln ASBG_{t-i} + \lambda_{1}\ln UR_{t-1} \\
+ \lambda_{2}\ln MG_{t-1} + \lambda_{3}\ln AMC_{t-1} + \lambda_{4}\Delta \ln DCPS_{t-1} + \lambda_{5}\Delta \ln ASBG_{t-1} + \mu_t
\]  

(5)

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 without 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 than 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, the cointegration test was applied. The null hypothesis was that all the \( \lambda \)s 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 \( \lambda \)s 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 F-statistics (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 Table 3.

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


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


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

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test with a constant &amp; no trend</th>
<th>Test with a constant &amp; trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>LnMG</td>
<td>-0.796</td>
<td>-2.092</td>
</tr>
<tr>
<td>LnAMCG</td>
<td>0.996</td>
<td>-2.307</td>
</tr>
<tr>
<td>LnASBG</td>
<td>-1.080</td>
<td>-2.199</td>
</tr>
<tr>
<td>LnDCPS</td>
<td>-2.114</td>
<td>-2.265</td>
</tr>
<tr>
<td>LnUR</td>
<td>-2.037</td>
<td>-1.898</td>
</tr>
<tr>
<td>Critical value</td>
<td>-2.953</td>
<td>-3.551</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test with a constant and no trend</th>
<th>Test with a constant and trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLnMG</td>
<td>-5.497*</td>
<td>-5.448*</td>
</tr>
<tr>
<td>DLnAMCG</td>
<td>-5.680*</td>
<td>-5.708*</td>
</tr>
<tr>
<td>DLnASBG</td>
<td>-5.493*</td>
<td>-5.346*</td>
</tr>
<tr>
<td>DLnDCPS</td>
<td>-5.769*</td>
<td>-5.686*</td>
</tr>
<tr>
<td>DLnUR</td>
<td>-5.136*</td>
<td>-3.987*</td>
</tr>
<tr>
<td>Critical value</td>
<td>-2.956</td>
<td>-2.275*</td>
</tr>
</tbody>
</table>

Note: * indicating 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

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variables</th>
<th>Value of F statistics</th>
<th>Lags order</th>
</tr>
</thead>
<tbody>
<tr>
<td>LnMG</td>
<td>LnUR, LnAMC, LnDCPS, LnASBG</td>
<td>3.309</td>
<td>3</td>
</tr>
<tr>
<td>LnAMC</td>
<td>LnUR, LnMG, LnDCPS, LnASBG</td>
<td>0.997</td>
<td>3</td>
</tr>
<tr>
<td>LnDCPS</td>
<td>LnUR, LnMG, LnAMC, LnASBG</td>
<td>4.110*</td>
<td>3</td>
</tr>
<tr>
<td>LnASBG</td>
<td>LnUR, LnMG, LnDCPS, LnAMC</td>
<td>2.656</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: * indicating the cointegrating relationship.
### Table 4. Results of long run relationship between unemployment rate and financial sector development

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>LnMG</td>
<td>2.312*</td>
<td>0.310</td>
<td>7.434</td>
</tr>
<tr>
<td>LnAMC</td>
<td>-0.284*</td>
<td>0.068</td>
<td>-4.210</td>
</tr>
<tr>
<td>LnDCPS</td>
<td>-0.822*</td>
<td>0.344</td>
<td>-2.393</td>
</tr>
<tr>
<td>LnASBG</td>
<td>-0.312*</td>
<td>0.080</td>
<td>-2.393</td>
</tr>
<tr>
<td>INPT</td>
<td>17.381</td>
<td>2.130</td>
<td>8.159</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>dLnMG</td>
<td>0.646*</td>
<td>0.262</td>
<td>2.462</td>
</tr>
<tr>
<td>dLnMG1</td>
<td>-1.009*</td>
<td>0.284</td>
<td>-3.561</td>
</tr>
<tr>
<td>dLnAMC</td>
<td>0.191*</td>
<td>0.052</td>
<td>3.690</td>
</tr>
<tr>
<td>dLnAMC1</td>
<td>0.340*</td>
<td>0.087</td>
<td>3.899</td>
</tr>
<tr>
<td>dLnAMC2</td>
<td>0.206*</td>
<td>0.082</td>
<td>2.519</td>
</tr>
<tr>
<td>dLnDCPS</td>
<td>-0.212</td>
<td>0.271</td>
<td>-0.782</td>
</tr>
<tr>
<td>dLnASBG</td>
<td>0.122*</td>
<td>0.056</td>
<td>3.899</td>
</tr>
<tr>
<td>dINPT</td>
<td>13.035</td>
<td>2.586</td>
<td>5.040</td>
</tr>
<tr>
<td>ecm(-1)</td>
<td>-0.750</td>
<td>0.148</td>
<td>-5.053</td>
</tr>
</tbody>
</table>

R- Square 0.868

R- bar Square 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

<table>
<thead>
<tr>
<th>Direction of Causality</th>
<th>F-Statistics</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LnMG ← LnUR</td>
<td>3.655**</td>
<td>0.066</td>
</tr>
<tr>
<td>LnUR NO LnMG</td>
<td>0.001</td>
<td>0.977</td>
</tr>
<tr>
<td>LnAMC NO LnUR</td>
<td>0.522</td>
<td>0.477</td>
</tr>
<tr>
<td>LnUR NO LnAMC</td>
<td>0.119</td>
<td>0.733</td>
</tr>
<tr>
<td>LnDCPS ← LnUR</td>
<td>5.528*</td>
<td>0.025</td>
</tr>
<tr>
<td>LnUR ← LnDCPS</td>
<td>4.175*</td>
<td>0.050</td>
</tr>
<tr>
<td>LnASBG NO LnUR</td>
<td>0.414</td>
<td>0.525</td>
</tr>
<tr>
<td>LnUR ← LnASBG</td>
<td>7.516*</td>
<td>0.010</td>
</tr>
</tbody>
</table>

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