Asset Commonality and Credit Expansion by Banks in Pakistan

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**ARTICLE DETAILS**

**ABSTRACT**

**Purpose:** Diversification by the majority of the banks in a system contribute to the progression of systemic risk on one hand and affects the lending behaviors of the banks on the other. Since lending behaviors of the banks directly affect the availability of credit to the non-financial sector, the situation may worsen, as a consequence of systemic risk. In this study, we examine the relationship between asset commonality and credit expansion by commercial banks in Pakistan.

**Design/Methodology/Approach:** We use post-global financial crisis data ranging from 2011-2020. A dynamic model is employed with a two-step system GMM technique to control for the problems of autocorrelation and endogeneity, as indicated by the pre-diagnostic tests.

**Findings:** Our results show that asset commonality significantly affects credit expansion by banks in Pakistan. Moreover, the direction of the relationship is negative implying that the asset commonality of the banks in Pakistan, induces banks on the individual level to contract credit to the non-financial sector.

**Implications/Originality/Value:** The findings are helpful for policymakers to devise and implement a prudent regulatory framework for the monetary sector, by not only targeting risk indicators of the financial sector but also keeping in view its repercussions to the real sector of the economy.

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**Introduction**

Existing literature on the contagion process to explain the failure of financial institutions during the global financial crisis (Gai et al., 2011) reveals that the interrelatedness of the financial institutions is a precondition for systemic risk to existing. The significance of systemic risk is
magnified since the repercussions of the financial turmoil are not confined to the financial sector alone but rather intrude into the real sector of the economy as well (UNDP, 2009). Subsequent to the global financial crisis, therefore, a flood of studies emerges on the subject of systemic risk (Vallascas & Keasey 2012; Weib et al., 2014; Strobl, 2016; Teply & Kvapilikova 2017), exploring the factors causing such risk and how these factors are associated to decisions in the financial as well as non-financial sectors. A strand of studies provides evidence that systemic risk stems from the funding maturity and asset commonality of financial firms. Hence, an important question facing policymakers, specifically after the financial crisis of 2008-09, is whether asset commonality (a measure of systemic risk) in the banks is related to credit expansion by these banks and what is the direction of this relationship if it really exists?

A weird fact about banks is that these are high leveraged entities and least constrained by any restrictions to further enhance their debt in the form of deposits. Furthermore, the banks are interconnected to each other owing to various types of bilateral and multilateral transactions. This interconnectedness of financial firms significantly contributes to the systemic risk of the financial sector (Paltalidis et al., 2015). Moreover, when the systemic costs are high, the banks should prefer diversification to mitigate the risk (Beale et al., 2011). The diversification in various classes of assets, may not be confined to any individual entity but rather spread to many if not all. This diversification escalates the likelihood of overlapped portfolios in the banking sector as a whole. The commonalities in the assets held by banks further intensify the fragility of the system (Ibragimor et al., 2011; Blei & Ergasher 2014).

Since banks are a dealer in finance and earn their profits either by lending (advance loans to the non-financial sector) or investing in other non-loan avenues. However, neither the risk and return nor liquidity associated with lending and investing options are identical. Investment in certain marketable securities is more liquid as compared to lending to the real sector. In fact, loans advanced to the non-financial sector of the economy are mostly illiquid in nature (Diamond & Rajan 2001). Thus, following the commonality of assets, the banks may reduce advances to the real sector, to keep liquidity intact, resulting in a general contraction of the credit in the market. Conversely, the banks may engage in aggressive behaviors and advance loans to maximize their profits, thereby directly contributing to credit expansion in the market.

Since this area is getting attention everywhere, a similar effort is due, to study the relationship in a developing country like Pakistan. This paper is, therefore, specifically intended to explore the relationship between asset commonality and credit expansion by commercial banks in Pakistan and whether this relationship is positive or negative.

The study is organized as follows. In the next section, hypotheses are developed after a brief review of the related literature. Section 3 comprises data sources and the methodology used to obtain empirical results. Results discussions are given in section 4, along with descriptive statistics, correlations, pre, and post-diagnostic tests. Section 5 concludes the findings. References are given at the end of the document.

**Literature Review and Hypothesis Development**

We find mixed results while going through literature on expansion or contraction of credit by the banks, under conditions of uncertainty and high risk. Campello et al., (2011) document that an increase in the mark-ups during a crisis does not affect the average size of the available credit lines. However, smaller, private, and speculative firms utilize a larger part of their credit lines before and during crises. Another study by Ewert et al., (2000) reports that the banks charge high-interest premiums, from firms prone to higher default risk, as a tool to limit lending to such firms. In a study by Ippolito et al., (2016) Italian banks, subsequent to crises, are found to reduce their credit lines, in order to cope with their enhanced liquidity risks. Adachi-Sato and Vithessonthi
(2017) develop a theoretical model to elaborate on the bank’s behavior under systemic risk attributed to funding maturity and asset commonality. They suggest that given the probability of financial crises greater than zero, the banks may or may not internalize the cost of the crisis. When the banks do have an expectation to be bailed out, they do not bother to internalize the cost of a financial crisis and engage in extensive lending thereby expanding the credit for the non-financial sector. On the contrary, if the banks do not expect to be bailed out, they internalize the cost of the financial crisis. The funds become expensive and thus a contraction of credit in the economy is observed. Based on the discussion in this section we can postulate the following hypotheses.

H1: Asset commonality significantly affects credit expansion by the banks in Pakistan.  
H1(A): Asset commonality positively affects credit expansion by the banks in Pakistan.  
H1(B): Asset commonality negatively affects credit expansion by the banks in Pakistan.

Data and Methodology  
Data and Sample  
This study takes into consideration a period of ten years starting from the year 2011. A post-global financial crisis window is specifically selected to control for any potential biases owing to the crisis. We initially include all commercial banks listed on Pakistan Stock Exchange. The exclusion from the sample is made only on the ground of matching criteria or non-availability of data for one or more years over the data period. The foreign banks and Islamic banks, therefore, could not be included in the sample for want of matching characteristics. This leaves us with 18 commercial banks and a total of 180 observations in the final sample.

For our analysis, we need data at two levels. The bank-level data in respect of advances and deposits are taken from the audited balance sheets of the banks which are extracted from their annual reports and directly downloaded from the websites of respective banks, State Bank of Pakistan and Pakistan Stock Exchange. The data with regard to macroeconomic variables like GDP growth rate and interest rate is taken from World Development Indicators.

Variables of the Study  
The dependent variable of this study is credit expansion by the banks which is measured in terms of the ratio of gross advances to total assets. This construct is consistent with earlier studies (Malede, M. 2014).

Asset commonality is the explanatory variable of prime interest. Several measurements are available in the literature regarding this variable. However, in line with Allen et al., (2012), this study takes clustered asset structure of the banks as a measure of asset commonality which equals the inverse of the cross-sectional standard deviation of the share of total loans to total assets. This proxy is also used by Adachi-Sato & Vithessonthi (2017).

Deposits are the main source of funds for the banks and thus are heavily relied upon by them. An expansion in deposits is followed by an expansion in advances and vice versa. Deposits are, therefore, included in the model as a control variable and means and include total deposits and account whether current, saving, or fixed in nature. Deposits are measured as a fraction of total assets. The construct is also used by Olusanya et al., (2012); Malede, M. (2014).

GDP growth rate is employed in the equation as explanatory to control cyclical effects. Although various versions of GDP are available to calculate GDP growth rate the one used in this study is GDP at constant prices in local units. The growth rate is calculated by taking the difference between current year and the previous year’s GDP and then dividing it by the previous year’s value. This measure is also used by Dell’Ariccia & Marquez (2006).
Interest rate, another control variable, directly affects the revenues of the banks. A higher interest rate, on one hand induces banks to lend more, it enhances cost of funds for the borrowers at the same time. Thus, the variable may have a positive or negative impact on banks’ advances depending upon the fact which mechanism predominates. For our analysis, risk premium on lending rates is used a proxy of this variable as also used by Ewert et al., (2000).

**Model and Estimation Technique**

In order to examine the relationship between asset commonality and credit expansion by the bank’s, following equation is estimated.

\[
C_{\text{red}} \_E_{\text{x}} \_p_{\text{it}} = \beta_0 + \beta_1 C_{\text{red}} \_E_{\text{x}} \_p_{\text{i},t-1} + \beta_2 A_{\text{C}} \_t + \beta_3 D_{\text{eposits}} \_i \_t + \beta_3 G_{\text{D}} \_P \_G_{\text{R}} \_t + \beta_3 I_{\text{nterest}} \_t + \epsilon_{\text{it}}
\]  

(1)

In equation (1), \(C_{\text{red}} \_E_{\text{x}} \_p_{\text{it}}\) means credit expansion by the bank ‘i’ at time ‘t’; \(A_{\text{C}} \_t\) is the asset commonality of banks at time ‘t’; \(D_{\text{eposits}} \_i \_t\) are the total deposit of bank ‘i’ at time ‘t’; \(G_{\text{D}} \_P \_G_{\text{R}} \_t\) is the real GDP growth rate at time ‘t’ and \(I_{\text{nterest}} \_t\) is the risk premium on lending rates at time ‘t’. Credit expansion and deposits are normalized by total assets.

Although panel datasets are superior to time series and cross-sectional datasets, at the same time these datasets are prone to the issues of serial correlation, heteroscedasticity and, endogeneity which limits the option range for estimations techniques for longitudinal datasets. In the presence of these econometric problems Ordinary Least Squares, fixed effect/random effect models, instrumental variable approach and even difference GMM are not appropriate. This leads to the use of System GMM which can handle these econometric problems and produce efficient estimates (Gaud et al., 2005). The existing literature on our study indicates the prevalence of these issues, therefore pre-diagnostic testing of the data is necessary to proceed with further estimation of the model. Stata (software package) is used for analysis.

**Empirical Results**

As discussed above, the formal estimation of the model is to be preceded by certain tools for screening the data. Hence, descriptive statistics, correlations matrix, and pre-diagnostics are presented before switching to regression results.

**Descriptive Statistics**

Table 1 below, gives the values of mean, and standard deviation in addition to the minimum and maximum values of the variables.

| Variables               | Mean Value | Standard Deviation | Minimum Value | Maximum Value |
|-------------------------|------------|--------------------|---------------|---------------|
| Credit Expansion        | 0.4277     | 0.0991             | 0.1521        | 0.7223        |
| Asset Commonality (SRISK) | 10.7068    | 1.4357             | 8.5945        | 13.0285       |
| Deposits                | 0.7347     | 0.0883             | 0.3410        | 0.9464        |
| GDP Growth              | 3.7184     | 2.0744             | -0.9354       | 5.8364        |
| Interest Rate           | 1.7970     | 1.1826             | -1.0577       | 3.0376        |

It can be observed that, on average, 42% of the total assets held by the banks are in the form of loans and advances. A mean value of 10 in respect of asset commonality, suggests that banks’ assets in a particular year tend to vary by about 10 percent, on average. Recalling that this variable is an inverse of the cross-sectional standard deviation, a higher value means a higher
degree of asset commonality and vice versa. The Real GDP growth rate stays around 3.7% on average, except for the year 2020, when the growth rate was negative as expressed by its minimum value. The mean value of the interest rate indicates that the risk premium on the lending rate stands at around 1.8% in the economy, during the sample period.

**Correlations**

Table 2 signifies correlations among variables constituting Equation (1). The table shows a moderate degree of correlations among variables thereby eliminating the threat of multicollinearity.

| Variables                  | (1)  | (2)  | (3)  | (4)  | (5)  |
|---------------------------|------|------|------|------|------|
| (1) Credit Expansion      | 1    |      |      |      |      |
| (2) Asset Commonality (SRISK) | -0.245 | 1    |      |      |      |
| (3) Deposits              | 0.255| -0.151| 1    |      |      |
| (4) GDP Growth            | 0.028| 0.014| -0.035| 1    |      |
| (5) Interest Rate         | -0.198| 0.181| 0.019| 0.329| 1    |

**Pre-Diagnostics for GMM**

Durbin test and Wu Hausman test are employed to examine the presence of endogeneity. The null of the tests states that variables are exogenous, and the model is not subject to the issue of endogeneity. Rejection of the null at 1% (indicated by the corresponding p-values), however, indicates the presence of endogeneity.

The last row of Table 3, the Wooldridge test, provide statistical evidence for the presence of first-order autocorrelation.

| Test Name        | Null of the Test                | Test-stat | P-Value |
|------------------|---------------------------------|-----------|---------|
| Durbin           | Variables are exogenous         | 14.063    | 0.000   |
| Wu-Hausman       | Variables are exogenous         | 14.734    | 0.000   |
| Wooldridge       | No first-order autocorrelation  | 38.817    | 0.000   |

Based on the discussion in the previous sections and the results of pre-diagnostic analysis, this study employs System GMM to arrive at the results.

**Regression Results**

Table 4 summarizes the regression results, estimated using a two-step system GMM as discussed in the previous discussions. Results are obtained by estimating Equation (1) given above.

| Variables                  | Coefficient (t-stat) |
|---------------------------|----------------------|
| Credit Expansion (t-1)    | 0.854*** (6.77)      |
| Asset Commonality (SRISK) | -0.013*** (-3.87)    |
| Deposits                  | 0.100* (2.08)        |
### Table 1: Regression Results

| Variable          | Coefficient | t-Value | P-Value |
|-------------------|-------------|---------|---------|
| GDP Growth        | 0.016***    | (3.97)  |         |
| Interest Rate     | -0.012***   | (-3.85) |         |
| F-Stat (P-Value)  | 11264.32    | (0.000) |         |
| Time Dummy        | Yes         |         |         |
| AR (1)            | -2.86       | (0.004) |         |
| AR (2)            | -1.08       | (0.280) |         |
| Sargan-Stat       | 7.56        | (0.182) |         |
| Hansen-Stat       | 5.22        | (0.389) |         |
| No. of Observations | 162        |         |         |
| No. of Instruments | 16         |         |         |
| No. of Groups     | 18          |         |         |

**Note:** The results shown in this table are derived from the estimation of Equation (1) where credit expansion by banks is regressed on asset commonality (a measure of systemic risk) and other control variables. The dependent variable (credit expansion) is measured by the ratio of gross advances by the banks to their total assets. Two-step System GMM is used to estimate the coefficients. t-stats are given in the parenthesis. Superscripts ***, **, * demonstrate the significance of the relationships at 1%, 5% and 10% levels respectively.

A statistically significant coefficient of the lagged dependent variable demonstrates the dynamic nature of the model which indicates that credit expansion by the banks is significantly affected by their previous behaviours. Moreover, the positive sign indicates the momentous expansion of credit by banks. These findings are consistent with the earlier studies (Pramono et al., 2015) that have used dynamic models.

Asset commonality, the main variable of the study, is also found statistically significant finding in respect of this variable is that the sign of the variable is negative which suggests that banks managers are not indulged in lending behaviours that are characterized by the problem of aggressive moral hazard. In other words, the bank managers do not finance the projects by deteriorating the standards of extending loans. This reluctance may either be quantitative, by means of fixing lending quotas, or qualitative, in the form of the strictness of the lending terms and conditions. The results reinforce the findings of previous studies (Paligorova & Santos 2016; Ippolito et al., 2016).

The coefficients of GDP are also significant and reinforce earlier findings (Dell’Ariccia & Marquez 2006; Podpiera, A.P. 2007; Vazakidis & Adamopoulos 2009; Mukhanyi, M. 2016). This ensures that economic growth stimulates credit expansion necessary for the initiation of investment activities. The coefficient of interest rate is found significantly negative indicating the predominance of the reluctance of borrowers to borrow high-cost funds. The results support the evidence found in the literature (Podpiera, A.P. 2007; Abd Karim et al., 2007; Abdul Karim et al., 2011).

### Post Diagnostics

The lower panel of Table 4 bears statistics implying the appropriateness of the model. The significant value of AR (1) indicates evidence for the rejection of the null hypothesis of no autocorrelation among error terms in the first difference, whereas the insignificant value of AR
(2) indicates that error terms are not correlated in the level regressions. The value of Sargan-stat is insignificant thereby accepting the null of valid instruments. The validity of the instruments is also endorsed by the insignificant value of Hansen-stat. Literature suggests that if the instruments are greater than the number of cross sections then the model may be overfitted. However, in our case, the instruments are below the number of cross sections (as expressed by the table) thus eliminating the possibility of having an over-fitted model. A significant value of the F-stat indicates the appropriateness of the model.

**Conclusion**

In this paper, we examined the effect of asset commonality on credit expansion by the commercial banks in Pakistan. Using data from 18 banks over the period 2011-2020, the study finds a significant relationship between banks’ asset commonality and credit expansion. Moreover, the direction of the relationship is negative, that is, as the bank tends to hold common assets, the banks on the individual level tend to contract credit to the non-financial sector. This behavior of the banks has significant implications. When the banks curtail their advances and depend more on earning money from other investment opportunities, this leads to a shortage of investable funds for non-financial business firms leading to a potential economic recession. This requires caveats on the part of the government and the regulatory authorities to smoothen the economic environment by introducing prudent policy measures by not only targeting risk indicators of the financial sector but also keeping in view its repercussions to the real sector of the economy.

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