

DOES DEMONETISATION IMPACTED ON THE CREDIT DEPLOYMENT STRATEGY AMONG THE PUBLIC AND PRIVATE SECTOR BANKS IN INDIA: A CANONICAL CORRELATION ANALYSIS

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Abstract: This study seeks to investigate the impact of demonetisation on deposit inflows and the disbursement of funds to assess the overall fund management strategy during and after the demonetisation period of the commercial banks in India. The sample data comprises of 10 banks, which includes 5 public sector banks and 5 private sector banks and covers a period of 14 quarters from June 2015 to Sept 2018. A Canonical correlation analysis has been used to measure the funds deployment strategy. The results of our study suggests that Public sector banks are more susceptible to manage the liquidity needs, as majority of their short-term deposits have been disbursed in long-term loans followed by long-term investments, but in the case of Private sector banks the disbursement has been made in the form of short-term loans out of long-term deposits, which signifies the Private sector banks prudential fund management strategy to encounter the future liquidity needs in general.

Keywords: Demonetisation, Asset-liability management, Canonical correlation, Indian Banks

I. INTRODUCTION

The role of a well-developed banking system in stimulating and sustaining a country's economic growth is well recognized. The banking sector plays a vital role in financial intermediation by mobilizing deposits and disbursing credits to various sectors of the economy. Therefore, the effective functioning of the banking sector, in turn, affects the performance and productivity of other sectors largely. The deployment strategy of banks remains a significant concern for the regulators, investors, public as well as the policymakers to monitor the overall performance of the financial status of the country as far as Indian banks are concerned, but the unusual growth of non-performing assets brings the attention of various regulators and researchers towards the effective fund management ability and the profit generation strategies of the banks around the

world in general and India in particular. Low cost high yield with low or moderate risk has become an alarming issue for decades, (Saibal, 2010) argued that higher credit growth leads to bank fragility which has to be monitored cautiously to avoid future consequences. The rapid pace of credit expansion has also raised several prudential risks which lead to degrading the financial soundness of the banking sector consecutively.

Demonetisation and Cash-flows in Indian Banks

The commercial banks accept deposits from public and institutions on which the banks pay reasonable interest. The bank grants loan from this amount and charges interest at a higher rate. These loans are generally granted to the traders, industrialists, farmers, and self-employed persons. The total bank deposit is one of the indicators that mirror the effectiveness with which the financial intermediaries mop up the savings available with the public. Since the deposits of the bank circulate as money, the creation of such deposit leads to a net increase in the money stock of the economy. Thus, credit creation indirectly increases the supply of money in the economy. Bank's lending and investment activities lead to changes in the quality of money in circulation, which in turn influence the nature and quality of production. The volume of total bank credit disbursed shows the extent to which the productive sector had availed itself of credit from the commercial banks and other financial intermediaries. The Credit Deposit (CD) ratio henceforth, is the proportion of loan-assets created by banks from the deposits received. The higher the ratio, lower the liquidity in the banks to manage the unprecedented requirement raised by the customers. CD ratio reveals the efficiency with which the commercial and financial intermediaries are tapping savings from the available sources and channelizing these to various productive activities of the economy. It is very important to have a strong financial system, which acts as an engine of growth and development for a fast developing economy. The importance of a sound financial system in mobilizing deposits and disbursing credit for productive utilization is well documented in several studies which will be quoted in the further part of the paper by considering the recent demonetisation into account.

In this regard, the Reserve Bank of India has started several prudential measures in the year 2015 to identify the stressed assets and formulated several strategies to recover the non-performing assets of the banks to strengthen the financial stability of the banking system at large. The recent demonetisation move of the government in India has experienced a huge cash inflow (liquidity) through the banking channel in the form of deposits, which is reported as an unusual growth in specific types of accounts usually marked by a low level of activity in the normal course of banking operations. As per the report (Mint-street Memo.1) released by the Reserve Bank of India, an excess deposits that accrued to the banking system due to the demonetisation to be in the range of ₹ 2.8-4.3 trillion. In addition to this a significant increase in 18 million new accounts has been opened in the Pradhan Mantri Jan-Dhan Yojana (PMJDY) put numerous questions upon the efficiency and deployment strategy of the banks in India needs to be examined (Bhupal & Indrajit, 2017). Banks not only contribute to economic growth but also render the opportunities to invest and save their money through several secured and unsecured mode of investment (Sufian & Habibullah, 2009), but that needs to comply the prudential norms rigorously.

II. REVIEW OF LITERATURE

Ronald and Drew (1992) in their study revealed that there is a positive relationship exists in between the changes in risk and capital in a large sample of banks. Allen and Robert (1997) argued that there is a positive interrelation exists in between the loan disbursement and bank efficiency. Cost efficiency may be an important indicator for future loans and bank problems in the future. Abhiman and Saibal(2000) in their study found that large banks increased their ratio of capital to risk-weighted assets less than other banks. Regulatory pressure is also found to have a negative and significant impact on the ratio of capital to risk-weighted assets. Saumitra (2002) in his paper examined that Indian public sector banks are facing a triple jeopardy i.e losing market share, squeezed profitability, and weak balance sheet which in turn affects the growth and profitability has to be cautiously analyzed. Bashir (2003) in his study revealed that high capital-to-asset and loan-to-asset ratios lead to higher profitability. The results also indicate that foreign-owned banks are likely to be profitable and the macroeconomic conditions impact the performance measures positively. Ali and Mohammad (2003) in their study explored that collateral should be based on potential credit worthiness of borrowers, elimination of credit subsidies and no new loan facility to previous loan defaulters will increase the bank profitability and eliminates the credit risk of the banks. Nitin and Puneet(2008) have revealed that the foreign bank group has exhibited the best credit-deposit ratio, whereas some attention is still required in the case of public sector banks. It is also revealed that the ratio of rural-urban offices has a positive impact on CD ratio. Ahmad et al. (2008) in their study has claimed that a strong positive link between regulatory capital and bank management's risk-taking behavior exists in the banks of a developing economy.

They have argued that the 2007-08 financial crisis was based on the heavy risk lending which leads to liquidity and capital erosion issue. Abhiman and Saibal(2009) in their paper found that a close relationship is observed between efficiency and soundness as determined by bank's capital adequacy ratio and the profit efficient banks are those that have, on an average, less non-performing loans. Saibal(2010) in his paper claimed that higher credit growth amplifies bank fragility. He has also examined that credit growth has been rapid in State-owned and de novo private banks. Deger and Adem(2011) in their study suggest that banks can improve their profitability by increasing bank size and non-interest income, decreasing credit to asset ratio. In addition, a higher real interest rate can lead to higher bank profitability. Satyajit and Avijit(2015) in their paper found out that net interest margin and capital adequacy ratio exhibit negative and significant impact on gross non-performing advances (GNPA) ratio of Indian PSBs. Saibal(2015) in his paper strongly argued that Macro prudential policy(MPP) regulations targeted on provisions are relatively more effective in limiting credit expansion. When considered in conjunction with bank ownership. MPPs are effective in curbing loan extension to targeted sectors. Ali(2016) in his paper investigates that bank's profitability is significantly affected by its internal determinants while external determinants are insignificant. Puspa et al. (2016) in their study revealed that the real credit growth fell substantially (relative to average) by about 8 percent points from pre- to post-crisis periods, and that average banking regulation and supervision strengthens after a crisis. Bhupal & Indrajit (2017) has analyzed Excess deposits accrued to the banking

system due to demonetisation are in the range of 2.8-4.3 trillion. They have also revealed that recent demonetisation has gained the excess deposits growth in several types of accounts needs to be examined.

III. OBJECTIVE OF THE STUDY

To analyze the impact of demonetisation on deposit inflows and its disbursement to create loans and advances of the Commercial banks in India.

IV. HYPOTHESIS OF THE STUDY

H₀₁: There is no significance difference in the fund disbursement strategy between the public and private sector banks in India.

H_{a1}: There is a significance difference in the fund disbursement strategy between the public and private sector banks in India.

H₀₂: There no significance difference in the fund disbursement strategy among the public and private sector banks in India.

H_{a2}: There is a significance difference in the fund disbursement strategy among the public and private sector banks in India.

V. DATA AND METHODOLOGY

The study comprises of 10 Scheduled Commercial Banks operating in India. The data was considered from April 2015 to Sept 2018 and divide into three buckets such as April 2015 to Sept 2016 (Pre-demonetisation), Oct 2016 to March 2017 (Demonetisation) and April 2017 to Sept 2018 (Post-demonetisation) into account. The sample Consisting of five public sector banks such as, State Bank of India, Bank of Baroda, Union Bank of India, Punjab National Bank and Canara Bank and five private sector banks such as, HDFC Bank, ICICI Bank, AXIS Bank, Kotak Mahindra Bank and Indusind Bank. The banks were selected on the basis of market capitalization. Financial variables were mainly collected from the Bloomberg database and from the database of Centre for Monitoring Indian Economy (CMIE) also. The data was cross verified with the information available in annual financial statements of the sample banks to confirm the accuracy.

Empirical Methodology

Canonical Correlation analysis has been performed to analyse the relationship between the two sets of variables employed in this study. This is a multivariate statistical technique that has been used to assess the correlation between each set of assets and each set of liabilities. Hotelling (1935) has developed and described the mathematics of canonical correlation. The main objective of the canonical correlation is to identify the latent variables (which are not directly observed) and also, exhibits the significant relationship between two sets of variables. The result of this output narrates how well the variates on either side relate to their own set of measured variables.

The basic functional form study model is represented as: $A = A_1 * (\text{Loans and advances}) + A_2 * (\text{Investments}) + A_3 * (\text{Fixed assets})$ and $L = L_1 * (\text{Share Capital}) + L_2 * (\text{Deposits}) + L_3 * (\text{Borrowings})$

VI. DESCRIPTION OF THE VARIABLES

The list of selected variables and their description is presented in Table-1. Variables for this study are classified into dependent and independent based on the classifications on the assets and liabilities item on the balance sheet of the selected banks into account.

Table 1: Summary Description of the variables

Nature of variables	Name of the variables	Description of the Variables
Dependent Variables	Loans and Advances	Term loans, Cash Credits, Overdrafts and Bills purchased
	Investments	Long-term and Short term Investments (both SLR and non SLR)
	Fixed Assets	Fixed Assets and Other Assets
Independent Variables	Share Capital	Shares called up and paid up capital
	Deposits	Saving bank deposits and Demand deposits
	Borrowings	From RBI, other banks, other financial institutions both from India and abroad

Source: Authors.

VII. EMPIRICAL ANALYSIS AND RESULTS

Test of Normality of the variables

Table 2 and 3 reports the normality test of the dependent and the independent variables analysed for the study. The primary objective of any study is that the data should be normal, hence the Shapiro - Wilk test of normality has been performed for all the variables of both public and the private sector banks. On conducting of the test it was observed that all the variables are having significant p-values (i.e $p > 0.05$), that indicates the variables are having normally distributed. Thus the normalised data has been considered for the further analysis of the study.

Table 2: Results of Shapiro-Wilk test of normality of the Public Sector Banks

Shapiro-Wilk test Statistics										
Public Sector Banks	SBI		BOB		Union Bank of India		PNB		CANARA	
	Statistics	Sig.	Statistics	Sig.	Statistics	Sig.	Statistics	Sig.	Statistics	Sig.
Loans and Advances	0.864	0.064	0.969	0.87	0.92	0.22	0.966	0.82	0.717	0.23
Investments	0.935	0.360	0.867	0.200	0.700	0.074	0.851	0.320	0.828	0.061
Fixed Assets	0.889	0.077	0.943	0.458	0.891	0.084	0.943	0.462	0.973	0.914
Capital	0.751	0.200	0.744	0.055	0.511	0.134	0.829	0.052	0.858	0.068
Deposits	0.838	0.200	0.878	0.061	0.876	0.641	0.928	0.282	0.945	0.485
Borrowings	0.816	0.082	0.510	0.200	0.975	0.932	0.560	0.200	0.791	0.401

Source: Authors.

Note : Significance values are above 5% level.

Table 3: Results of Shapiro-Wilk test of normality of the Private Sector Banks

Shapiro-Wilk test Statistics										
Pvt. Sector Banks	HDFC		ICICI		AXIS		KMB		INDUSIND	
	Statistics	Sig.	Statistics	Sig.	Statistics	Sig.	Statistics	Sig.	Statistics	Sig.
Loans and Advances	0.956	0.652	0.882	0.062	0.915	0.184	0.963	0.776	0.948	0.525
Investments	0.901	0.115	0.844	0.124	0.971	0.895	0.792	0.421	0.953	0.611
Fixed Assets	0.958	0.692	0.881	0.060	0.910	0.156	0.960	0.715	0.946	0.494
Capital	0.864	0.200	0.486	0.174	0.486	0.174	0.656	0.208	0.669	0.200
Deposits	0.957	0.676	0.906	0.136	0.953	0.611	0.871	0.199	0.923	0.242
Borrowings	0.916	0.190	0.909	0.152	0.956	0.664	0.927	0.273	0.947	0.510

(a) Canonical Correlation Analysis

Table 4 presents the standardised canonical correlation function of coefficients for the five public sector banks with one set of assets and one set of liabilities into account. In particular the results reveals that, in State Bank of India, Bank of Baroda and Union Bank of India the relevant criterion variables were primarily loans and advances with investments being secondary. With regard to predictor variables the primary contributors were deposits with borrowings as secondary contributor. The predictive variables were positively related with the criterion set of variables. This explains that SBI, BOB and Union Bank of India deposits were being disbursed primarily on loans and advances.

The study further revealed that for the PNB and the Canara Bank the relevant criterion variables were primarily investments with loans and advances being secondary. With regard to predictor variables the primary contributors were deposits with borrowings as secondary contributor. The predictive variables were positively related with the criterion set of variables. This explains that PNB and Canara bank deposits were being disbursed primarily on investments.

Table 4: Canonical Correlation results of Public Sector Banks

(One set of Assets with another set of liabilities)

Test Statistics of Canonical coefficients						
	SBI	BOB	Union Bank of India	PNB	CANARA	Overall
Canonical Loadings: Dependent Variable						
Loans and Advances	-0.988	-0.703	-0.984	-0.908	-0.544	-0.882
Investments	-0.797	-0.527	-0.788	-0.999	-0.997	-0.420
Fixed Assets	-0.603	-0.525	-0.680	-0.387	-0.142	-0.396

Canonical Loadings: Independent Variable						
Capital	-0.467	-0.500	-0.410	-0.752	-0.672	-0.419
Deposits	-0.989	-0.815	-0.992	-0.949	-0.975	-0.927
Borrowings	-0.953	-0.745	-0.653	-0.914	-0.819	-0.389
Redundancy value						
Assets	0.780	0.586	0.527	0.658	0.437	0.830
Liabilities	0.701	0.620	0.467	0.578	0.670	0.902
Significance value						
Wilk's Lambda	0.000	0.000	0.000	0.000	0.000	0.000
Squared Canonical Correlations (Rc^2)	0.936	0.995	0.996	0.949	0.997	0.998

Source: Authors.

In continuation to the analysis and results the Table 5 reports the standardised canonical correlation function of coefficients of the five private sector banks considered for the study. The results reveal that for all the five private sector banks such as, HDFC, ICICI, AXIS, KMB and INDUSIND bank the relevant criterion variables were primarily loans and advances with investments being secondary. With regard to predictor variables the primary contributors were deposits with borrowings as secondary contributor. The predictive variables were positively related with the criterion set of variables. This explains that selective private sector banks deposits were being disbursed primarily on loans and advances.

Table 5: Canonical Correlation results of Private Sector Banks

(One set of Assets with another set of liabilities)

Test Statistics of Canonical coefficients						
	HDFC	ICICI	AXIS	KMB	INDUSIND	Overall
Canonical Loadings: Dependent Variable						
Loans and Advances	-0.990	-0.998	-0.989	-0.999	-0.999	-0.999
Investments	-0.472	-0.675	-0.932	-0.998	-0.968	-0.896
Fixed Assets	-0.018	-0.339	-0.137	-0.795	-0.653	-0.557
Canonical Loadings: Independent Variable						
Capital	-0.912	-0.404	-0.988	-0.883	-0.677	-0.826
Deposits	-0.997	-0.988	-0.989	-0.998	-0.993	-0.996
Borrowings	-0.932	-0.523	-0.949	-0.914	-0.834	-0.855
Redundancy value						
Assets	0.734	0.523	0.669	0.877	0.807	0.934
Liabilities	0.898	0.470	0.952	0.870	0.714	0.678
Significance value						
Wilk's Lambda	0.000	0.000	0.000	0.000	0.000	0.000
Squared Canonical Correlations (Rc^2)	0.866	0.997	0.951	0.999	0.999	0.998

Source: Authors.

Table 6 reports the standardised canonical correlation function of coefficients for the five public sector banks with one set of detailed classifications of assets and another set of detailed classification of liabilities into account. In particular the results reveal that, in State Bank of India, Bank of Baroda and Canara bank the relevant criterion variables were primarily short-term loans with short-term investments being secondary and for the Union Bank of India and the PNB the short-term investments and the long-term investments act as a criterion variable. With regard to predictor variables the primary contributors were long-term deposits for SBI, Union Bank of India AND Canara bank and for the BOB and PNB the short-term deposits are the primary contributor. The predictive variables were positively related with the criterion set of variables.

Table 6: Canonical Correlation results of Public Sector Banks

(Several categories of assets with categories of deposits)

Test Statistics of Canonical coefficients						
	SBI	BOB	Union Bank of India	PNB	CANARA	Overall
Canonical Loadings: Dependent Variable						
Long-term Loans	-0.712	-0.393	-0.651	-0.907	0.545	-0.996
Short-term Loans	-0.988	0.742	0.782	-0.392	-0.997	-0.270
Long-term Investments	-0.516	0.438	-0.029	-0.944	-0.427	-0.883
Short-term Investments	-0.797	0.494	0.982	-0.205	0.582	-0.740
Fixed Assets	-0.694	-0.534	-0.426	-0.349	-0.374	-0.574
Canonical Loadings: Independent Variable						
Long-term Deposits	-0.988	-0.911	0.992	-0.875	0.975	-0.899
Short-term Deposits	-0.474	-0.991	0.649	-0.917	0.623	-0.998
Redundancy test						
Assets	0.719	0.695	0.497	0.699	0.426	0.830
Liabilities	0.600	0.615	0.698	0.423	0.669	0.902
Significance test						
Wilk's Lambda	0.000	0.000	0.000	0.000	0.000	0.000
Squared Canonical Correlations (R_c^2)	0.936	0.995	0.996	0.770	0.997	0.998

Source: Authors.

In continuation to the analysis and results, the Table 7 reports the standardised canonical correlation function of coefficients of the five private sector banks considered for the study. The results reveal that, in HDFC, AXIS and KMB the relevant criterion variables were primarily Long-term Loans and in ICICI bank and Indusind bank the criterion variables were primarily long-term investments.

With regard to predictor variables the primary contributors were Long-term Deposits for HDFC, ICICI and for the AXIS, KMB and Indusind bank the Short-term Deposits acts as a primary contributor. The predictive variables were positively related with the criterion set of variables. This explains that HDFC Long-term Deposits were being disbursed primarily on Long-term Loans.

Table 7: Canonical Correlation results of Private Sector Banks

(Several categories of assets with categories of deposits)

Test Statistics of Canonical coefficients						
	HDFC	ICICI	AXIS	KMB	INDUSIND	Overall
Canonical Loadings: Dependent Variable						
Long-term Loans	-0.991	-0.676	-0.989	-0.999	-0.997	-0.843
Short-term Loans	-0.870	-0.012	-0.598	-0.598	-0.924	-0.999
Long term Investments	-0.389	-0.998	-0.242	-0.667	-0.999	-0.955
Short term Investments	-0.470	-0.879	-0.657	-0.872	-0.764	-0.754
Fixed Assets	-0.865	-0.716	-0.038	-0.743	-0.433	-0.343
Canonical Loadings: Independent Variable						
Long-term Deposits	-0.997	-0.985	-0.948	-0.883	-0.677	-0.996
Short-term Deposits	-0.913	-0.516	-0.989	-0.997	-0.995	-0.851
Redundancy test						
Assets	0.720	0.489	0.584	0.799	0.757	0.905
Liabilities	0.913	0.617	0.938	0.886	0.723	0.858
Significance test						
Wilk's Lambda	0.000	0.000	0.000	0.000	0.000	0.000
Squared Canonical Correlations (Rc^2)	0.866	0.997	0.991	0.999	0.999	0.997

Source: Authors.

VIII. SUMMARY OF THE STUDY

The study is basically revealed the deposit disbursement strategy of the selective public and private sector banks in India. In the case of public sector banks, the short-term deposits are being disbursed to create long-term loans and advances and in the case of private sector banks long-term deposits are being disbursed to create short-term loans and advances, that indicates short-term deposits which attracts low rate of interest channelizes to create long-term loans which are comparatively high rate of interest, but are more susceptible for the banks to meet the immediate requirements in the future. In the case of private sector banks it is different, that a long-term deposit which attracts adequately higher rate of interest channelizes to create short-term loans. That exemplifies the prudent fund disbursement strategy of the private banks to meet the future requirements in a nutshell.

IX. CONCLUSION

The empirical findings of the study can be concluded that, the deployment strategy of inflows i.e. deposits differs from banks to banks in each bank category, i.e. Long-term Loans followed by long-term investments. The detailed observation of the study revealed that in public sector bank group most of the banks such as, SBI, BOB and CANARA are following the deployment strategy such as Short-term Loans out of the Long-term Deposits and the PNB and Union Bank of India which follows long-term investments than Long-term Loans and Short-term Loans. In the case of private sector banks group, HDFC bank, AXIS bank and KMB are following the same deposit deployment strategy such as Long-term Loans followed by Short-term Loans and Short term Investments, but in the case of ICICI bank and INDUSIND bank the deployment strategy were different from another banks in the same group as they have deployed in the funds more in long-term investments followed by short-term investments and Long-term Loans. In a nutshell it can be concluded that the public sector banks are more vulnerable to face liquidity crunch in the future as majority of their short-term deposits were being deployed in Long-term Loans which will fetch more time to payback in return to manage the immediate liquidity needs. In the case of private sector banks majority of their long-term deposits were being disbursed in the form of Short-term Loans, which indicates their prudent funds disbursement strategy by considering the future consequences into account of deposit inflows at the time of demonetisation.

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