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Is Internet Banking a determinant of Liquidity and Asset Quality? Empirical Evidence of Pakistan Banking Sector

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Abstract
In this paper, we investigate the effects of internet banking on the liquidity and asset quality of Pakistan banking sector overall, for the period of 2004 to 2013, quarterly. To evaluate the regression among the variables, SPSS has been used on the collected data for 46 operational banks in Pakistan. Though, results have enlightened that 1% increase in transaction via internet banking will lead toward more than 1% enhancement of liquidity and asset quality of banking sector in Pakistan. As liquidity and asset quality are components of CAMELS/ CAELS for measuring the performance of banking sector in Pakistan.
Keywords: Internet Banking, Liquidity, Asset Quality, Pakistan Banking Sector

1. Introduction

Information and communication technology (ICT) has in specific brought a strong paradigm move on the performance of banking sector to catch up the global development by improving the quality of services delivered to the customers and through the reduction in cost (Aliyu&Tasmin, 2012) Hence, because of the advancements in ICT, a wide range of value added products have been introduced in this sector like debit card, credit card, mobile banking, internet banking, ATM and many more which not only reduce the cost of transactions as compare to paper based transactions but also increased the piece of cake in the competitive market by providing following pillars of efficiency:

1.1 Convenience

Internet Banking is attracted because of the factor of convenience. As define by Birch and Young (1997), "convenience in transactions provides access to competitive returns and prices."

1.2 Choices variety

As defined by Tan &Teo (2000), "Internet banking permits customers with wide variety of choices to execute different banking transactions on the Internet via bank's web site" so the success of E-banking mostly depends on it.

1.3 Cost reduction

According to Evans and Schmalensee (2005), "Banks' profitability depends on various factors and one of them is cost reduction. For example the shift from checks to debit cards has lowered the transaction costs of processing and accelerated the clearing process".

1.4 Speedy payment

One of the foremost welfares of the electronic payment contrivance is to improve the rapidity of transporting payment between parties who are undertaking business

1.5 Security

Whitman &Mattord (2005) has defined security for online financial transactions as; "Security means protecting information and its vital components, including the electronic systems and hardware that are used, for storing and transmitting information." In online transactions, security is remained the appealing criteria for the customers to prefer it.

1.6 Accessibility

Customers can pay bills, transfer the funds from one account to other and make purchases 24/7.

Though the objective of our research is to testify mathematically the above described benefits associated with E-Banking especially specified with a product of internet banking by developing the integrated mathematical model. As the increase in transactions by internet banking, will bring significant impact on liquidity and asset quality of Pakistan banking industry along with other factors which effecting the liquidity and asset quality of banking sector such as Spread, Weighted averaged lending rate, Operating Performance, ratio of nonperforming loans to total advances and credit risk as well. To imply the integrated model over the period of 2004 to 2013 quarterly, the rest of study has been organized as follows: section 2 educates the literature review, section 3 will describe the methodology. Section 4 will enlighten the results and discussion about the findings along with correlation and data statistics while conclusion will be illustrated in section 5.

2. Related Work

From the year 2006 to onward, number of transactions through internet banking are growing in Pakistan which

has been demonstrated in figure 1 (State Bank of Pakistan, 2013). Therefore, following the aspiration of Pakistan banking sector under the supervision of state Bank of Pakistan to invest heavy resources for introducing internet banking which in itself incorporates risks such as strategic risk, reputational risk, legal risk and operational risk because banks let the external world to in its system, there is need to investigate that the launching of internet based products have any influence on the liquidity and asset quality of the overall banking sector indeed these both aspects are most important for the banking sector in any economy. Hence, in our study, we have focused on the relationship between internet banking and liquidity along with asset quality of Pakistan banking sector overall. Though, internet banking or online banking assists customers to accomplish financial transactions through safe website functioned by any bank or other entity (Demoulin, 2013). Such banks will provide this service to all its customers who owned accounts but it's up to the choice of customer to avail it or not (Lili Tao, 2013). In Pakistan, these services are provided in two forms such as "View only" and "transactional only". As in the first one, the customer cannot communicate with the banks in the sense of conducting any transaction but in the second one, it can be possible. Asset quality and liquidity of banks are two most important tools to measure their performance as part of CAELS/ CAMELS. Following are description about both asset quality and liquidity which have been defined in the whole study in perspective of Pakistan:

2.1 Asset Quality

Based on current practices, tends and economic conditions it is a function of existing and future likelihood of decline or increase in the quality of assets. Credit risk component and its management is observed and analysed by the examiner in order to ascertain appropriate rating of the Assets Quality. Other categories of risks are also considered including "interest rate", "liquidity", "strategic", and "compliance" which interrelated to the computation of credit risk of bank. While assessing the and considering the rating consideration is given to the quality and trends of the major assets. The financial condition of an entity is affected by other assets also like loans, real estate owned, investments or any other assets which can have adverse impact on it.

2.2 Liquidity

The process of evaluation, monitoring and controlling of balance sheet risks is called Assets Liability Management (ALM). A robust ALM mechanism integrates the strategic, net worth plans, earnings risks management. ALM primarily concerned with monitoring and mitigating interest rate risk and liquidity risk.

As per the best knowledge of researchers, our study is unique on the basis of following characteristics:

- As it is the first effort to develop the integrated mathematical model to search out the relation between asset qualities along with liquidity of Pakistan banking sector and internet banking. In the literature, there is no single study is till 2013, which has explored this relation ever which is as a separate topic by itself.
- It is accompanied with the future directions of research as well as a motivation for all financial institutes who have to or are in process of transforming from paper based to internet based transactions with customers, that this investment has a positive and significant impact on their liquidity and asset quality along with efficiency, customer satisfaction, speed in services delivery, convenience and many more.

3. Methodology

3.1. Population of Study

Population of this study has included all the banks operating in banking industry of Pakistan during the period under consideration. Total 46 banks have been listed as per their categories at June 30, 2013 by State Bank of Pakistan.

3.2. Sample of Study

To make the results more representative and comprehensive, Total 46 banks along with all Islamic bank branches operating by conventional banks are incorporated in the sample. Indeed 14 conventional banks are running out and out Islamic banking.

3.3 Time period of Study:

The study is conducting over the time period of December 2004 to June 2013. Hence to fetch the most appropriate results, data for internet banking and all other variables has been collected quarterly.

3.4. Data Collection:

As per the side of practical exposure, assistance from PSD (Payments Systems Department) of SBP (State Bank of Pakistan) has been seeking to get the data on all transactions through internet banking with the support of banks while for measuring the bank's performance, quarterly data issued by the statistics department with the collaboration of "Off-site Supervision & Enforcement Department, SBP has been taken into consideration.

3.5 Model Specification:

Internet is the root cause of success for globalization, its impact on life is obvious same as in banking sector. In our study, efforts are centered on finding the impact of internet banking on asset quality and liquidity of banking sector in Pakistan. Commonly the measures for profitability are ROA (Return on Assets), ROE (Return on Equity), Gross profit margin, Dividend pay-out ratio but in our study we have measured the performance of

banking sector while considering its asset quality and liquidity which are the most important components of CAELS/ CAMELS. Hence in this study, we follow a pragmatic model based on prior works by Demirguc and Huizinga (1999), Athanasoglou (2008) and Aburime (2008) in which ROA & ROE used a measure of performance in banking sector but after modifying it by replacing ROA, ROE by Liquidity and Asset Quality as measures of performance, following regression equation has been derived:

$$Y_t = \beta_0 + X_1\beta_1 + X_2\beta_2 \dots\dots\dots X_t\beta_t + \varepsilon_t$$

Wherein:
Y_t = Asset Quality, Liquidity
β_0 = X-intercept
X_t = Independent variables
β_1 , β_2 , β_3….β_t are incorporated as beta values
ε_t = Error term
t = Time period.
Following equations, we have been derived from the above equation:

Liquidity = β0+INTBβ1 + SDβ2+ +LRβ3+ NPLADVβ4 + INTRCSTβ5 + εt …… (1)

Asset Quality = β0+INTBβ1+CRβ2+ SDβ3+ OPβ4+ NPLADVβ5 + DEPTOASETβ6 + εt …. (2)

Wherein
INTB= Internet Banking
SD= Spread
LR= Lending Rate
NPLADV= Non performing loans to total advances ratio
INTRCST= Cost Intermediation
CR= Credit Risk
OP= Operating Performance
DEPTOASET= Deposit to total Assets Ratio

3.6 Identification of variables

Liquidity and asset quality are the dependent variables while the remaining (Operating Performance, Credit Risk, Spread, Lending Rate, Internet Banking Transactions, Non-Performing loans to advances, deposits to total assets and intermediation cost are independent variables which have been calculated from the financial statements of all banks as consolidated included in sample. While non-financial factors as customer satisfaction, efficiency, reputation, efficiency are taken as control variables.

4. Findings

4.1 Correlation: Liquidity & Asset Quality

Table 1 & 2 (See Appendix I) have demonstrating about the correlation among the dependent and independent variables. Indeed, the tables are also describing the relation among the variables for each other's at the standard of 1.

4.2 Descriptive Statistics: Liquidity & Asset Quality

Table 3 & 4 (See Appendix I) enlightens the values of mean, median, standard deviation, maximum, minimum and count for both models in perspective of liquidity as dependent variable and asset quality as well.

4.3 Regression Results: Liquidity

In table 5 (See Appendix II), the regression results as based on equation 1 have been explained in the table 5. The results of data analysis highlight the association between liquidity and selected variables. The result illustrates that overall explanatory power of the regression is good as R-squared value is more than 88% (0.887191) with the adjusted R-squared of 0.862667 for this equation. The value of Durban-Watson statistic more than 1.4 (1.430471) exhibits that there is least problem of autocorrelation. Furthermore, the zero probability of F-Statistic endorses that the overall model fitness is good. The coefficient with particular reference to our variable of interest such as Internet Banking (INTB), within 1% significance along with coefficient and probability of 13.77109, 0.0001 respectively , shows favourable impact of internet banking on the liquidity of overall banking sector in Pakistan, therefore, we can interpret that the variable is positively related with liquidity hence an increase in transactions via internet banking will lead toward an improvement in the performance of banking sector in Pakistan positively.

4.4 Regression Results: Asset Quality

In table 6 (See Appendix II), the results of data analysis highlight the association between asset quality and selected variables. The result illustrates that overall explanatory power of the regression is good as R-squared value is more than 99% (0.995421) with the adjusted R-squared of 0.994173 for this equation. The value of Durban-Watson statistic more than 1.3 (1.336008) exhibits that there is least problem of autocorrelation. Furthermore, the zero probability of F-Statistic endorses that the overall model fitness is good. The coefficient

with particular reference to our variable of interest such as Internet Banking (INTB) within 1% significance along with coefficient and probability of 1.736838, 0.0000 respectively , shows favourable impact of internet banking on the asset quality of overall banking sector in Pakistan, therefore, we can interpret that the variable is positively related with asset quality hence an increase in transactions via internet banking will lead toward an improvement in the performance of banking sector in Pakistan positively

5. Conclusion

The purpose of this study was to understand the significance of internet banking on the liquidity and asset quality of banking industry in Pakistan, and to which extend, it will be helpful to get the competitive edge over the rivals, whether Pakistani or globe banks. The study approves the pre-defined hypotheses in this model. The results demonstrating that 1% increase in the transactions via internet banking will lead toward more that 1% increase in the strength of liquidity and asset quality of whole banking sector in Pakistan specifically and overall for all other countries generally. As asset quality and liquidity have been taken as a measure of performance under the heading of CAELS and CAMELS. In all previous studies in the relation of performance and internet banking have been tested in the area of ROA (Return on Assets) and ROE (Return on Equity) but as in our study we used Asset quality and Liquidity as the measure of performance. Indeed, the significant results are not only benefited for banking sector of Pakistan but also for all those developing countries, which are transforming from paper based to internet based banking. The results of study are also a source of motivation for not only banks but also customers for getting speedy and secure transactions with a pace of comfort.

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Appendix I

Table 1 Correlation: Liquidity

	SPREAD	NPLADV	INTRCST	WALR	INTB
SPREAD	1.000				
NPLADV	0.055	1.000			
INTRCST	0.714	0.529	1.000		
WALR	0.822	0.435	0.920	1.000	
INTB	-0.015	0.709	0.427	0.467	1.000

Table 2 Correlation: Asset Quality

	INTB	SPREAD	OPINST	NPLADV	DEPTOASET	CRDRSK	INFRATIO
INTB	1.000						
SPREAD	-0.015	1.000					
OPINST	-0.171	-0.014	1.000				
NPLADV	0.709	0.055	-0.193	1.000			
DEPTOASET	-0.138	-0.520	-0.059	0.054	1.000		
CRDRSK	0.456	-0.036	0.016	0.819	0.116	1.000	
INFRATION	0.769	-0.029	-0.191	0.975	0.054	0.869	1.000

Table 3 Descriptive Statistics: Liquidity

Variables	Mean	Median	Standard Deviation	Minimum	Maximum	Count
Spread	6.49	6.65	0.54	4.79	7.24	35
NPLADV	3.54	3.73	1.59	0.68	6.42	35
INTRCST	3.251	3.37	0.32	2.65	3.71	35
WALR	11.16	11.54	1.84	6.08	13.83	35
INTB	0.53	0.36	0.45	0	1.57	35

Table 4 Descriptive Statistics: Asset Quality

Variables	Mean	Median	Standard Deviation	Minimum	Maximum	Count
INTB	0.53	0.36	0.45	0.00	1.58	35.00
SPRESD	6.49	6.65	0.54	4.79	7.24	35.00
OPINAST	1.01	0.97	0.50	0.32	1.99	35.00
NPLADV	3.54	3.73	1.59	0.68	6.42	35.00
DEPTOASET	75.61	75.39	1.53	3.06	78.75	35.00

Appendix II

Table 5 Regression Results: Liquidity

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	45.37962	13.20844	3.435654	0.0023
SPREAD	1.868987	2.733744	0.683673	0.5010
NPLADV	0.432867	0.626726	0.690679	0.4967
INTRCST	-19.81451	5.169027	-3.833315	0.0009
WALR	2.908231	1.638844	1.774563	0.0892
INTB	13.77109	2.802972	4.913034	0.0001
R-Squared	0.887191	Mean dependent var.		36.29862
Adjusted R-squared	0.862667	S.D. dependent var.		6.180401
S.E. of regression	2.290361	Akaike info criterion		4.677288
Sum squared resid.	120.6524	Schwarz criterion		4.960177
Log likelihood	-61.82067	Durbin-Watson stat		1.430471
F-statistic	36.17682	Prob(F-statistic)		0.000000

Table 6 Regression Results: Asset Quality

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.557346	3.496786	1.589273	0.1263
CRDRSK	1.396309	0.143322	9.742432	0.0000
SPREAD	-0.243538	0.242734	-1.003313	0.3266
OPINAST	-0.280232	0.111037	-2.523777	0.0193
NPLADV	1.141348	0.076240	14.97039	0.0000
DEPTOASET	-0.046498	0.045180	-1.029174	0.3146
INTB	1.736838	0.324800	5.347401	0.0000
R-squared	0.995421	Mean dependent var.		11.82172
Adjusted R-squared	0.994173	S.D. dependent var.		3.473834
S.E. of regression	0.265185	Akaike info criterion		0.389729
Sum squared resid	1.547111	Schwarz criterion		0.719766
Log likelihood	1.348924	Durbin-Watson stat		1.336008
F-statistic	797.1369	Prob(F-statistic)		0.000000