The Impact of New Banking Services on the Performance of Selected Banks, A Panel Data Model

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ABSTRACT

In recent years banking services have grown. This expansion of banking services increases the cost of banks and increases their income. The question is whether or not the overall profitability of banks has increased and new services has been positive overall impact. The aim of this paper is to investigate the impact of new banking services on profitability and performance of selected banks. I used regression models with OLS method and pooling (panel) data model. The purpose of this paper is to study the impact of new and innovative banking services on the performance and profitability of selected banks since 2000 to 2010. The selected sample consists of 19 banks, these banks selected in the banking industry from different countries. The dependent variable is an indicator of banks profitability. The results show that offering of new banking services have a positive effect on profitability and performance. Also entry of new banks with new and modern services causes to change in profitability.
Keywords: modern banking services, banks performance, profitability, regression analysis.
JEL: E0, G2, E

1. INTRODUCTION

In recent years, new banking services have been grown. This expansion led to increase the costs and increase the incomes by banks. From the perspective of cost-benefit analysis, it is necessary to examine whether the efficiency and profitability of the banking system is increased or not?

In this paper I want to investigate the performance of banks according to new banking services in selected banks. The aim of this paper is to investigate the impact of new banking services on profitability and performance of selected banks. In first model, I am looking to realize which variables explain return of assets (Roa) of selected banks with new services. In second model, I am looking to realize which variables explain margin profits of selected banks with new services. Finally by using regression model and selecting two kind of models (for return of assets and margin profits) I will test the hypothesis. the hypothesis are; 1) the new banking services has a positive effect on return of assets of selected banks. 2) the new banking services has a positive effects on margin profits of selected banks.

The difference between the proposed approach and the old methods is that Previous studies to evaluate a bank in one country by a single equation estimation, but this article is to examine and compare several banks from several countries by panel method. So the results of this paper are more general and inclusive.

The scientific contributions of this paper are: 1) Using regression and statistics approaches for testing the hypothesis. 2) Using the panel data model and comparing several banks in several countries. 3) Using a complete set of variables that affect the profitability of banks in models.

This research consists three steps. In the first section, by referring to the website of the leading banks and deriving the modern services of selected banks such as; new online purchasing shares through a bank, adjustable credit card, electronic signatures, financial projects to clients and so on, A comprehensive list of these services will be provided.

In the second section, by examining the banks performance indicators, we explain the return of assets and the return of equity.

The third section is to examine the relationship between the banks operations and services provided by banks. For testing the hypotheses we use regression analysis.

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REVIEW OF LITERATURES

John Mylonakis (2009) shows that the Greek bank customers satisfaction level is based on their own banks experiences and perceptions, as well as their buying behavior and attitudes towards banking products and services offered. The research was carried out on a random sample of 182 bank customers with the use of structured questionnaires. Research showed that the majority of bank customers are satisfied with the bank they cooperate with. Banking institutions have managed to differentiate their investment and savings portfolios by converting it from investment banking to commercial and retail banking.

Al-Shobaki, Fouad, and Al-Bashi (2010) show that the use of Total Quality Management (TQM) can be of great benefit to the Jordanian banks, as it will lead to an increase in the organization customer orientation and competitive edge. The paper will also investigate the relation between the application of TQM and the increase in the organization performance and efficiency.

Gregory T. Fraker (2006) shows that Economic Value Added (EVA) can be an important tool that bankers can use to measure and improve the financial performance of their bank. Since EVA takes the interest of the bank's shareholders into consideration, the use of EVA by bank management may lead to different decisions than if management relied solely on other measures.

Yansheng Zhanand Longyi Li (2009) show that to update the mode of banking services can broaden the field of financial services, and improve the quality and the efficiency of financial services. To achieve innovation model, it is necessary to improve the "Smile" services, personal mechanism and incentive mechanism. We should speed up the reform of financial supervision, improve the level of financial supervision in order to adapt to the development of the new banking services model and respond to changings in financial innovation. The banking industry should also accelerate the transformation of service delivery model to accelerate the pace of mixed services to enhance international competitiveness.

Babalola and Abiodun (2012) investigate the determinants of banks' profitability in Nigeria. In the process of their investigation, some factors which are significant impacts on return of assets (as an index of performance in the Nigerian banking industry) were considered. Their findings summarily show that, in the short run analysis, capital adequacy ratio is actually the determining factor for banks' profitability in Nigeria while in the long-run relationships; the size as well as the tangibility of the banks actually play out as the determining factor of performance.

Jiang, Tang, Law and Sze (2003)show that both bank-specific as well as macroeconomic factors are important determinants in the profitability of banks. With regard to macroeconomic factors, real GDP growth, inflation and real interest rates have a positive impact. Among bank-specific variables, operational efficiency and business diversification contribute to higher returns on assets, after controlling for differences in the credit quality of loans.

Bello and Dogarawa (2005) concluded that electronic banking in Nigeria is yet to create any significant impact on service delivery, which will consequently lead to improved customer satisfaction.

Model selection

The purpose of this paper is to study the impact of new and innovative banking services on the performance and profitability of selected banks since 2000 to 2010. The selected sample consists of 19 banks, these banks selected in the banking industry from different countries. Groups are divided into three categories: those that do not use modern banking services, recent recipients of new services and older recipients of new services.

The ratios of return to assets and return to equity, and profit margins selected as indexes. In this study independent variables are included overhead rates, the ratio of assets to deposits and the ratio of loans (debts) to assets. Regression analysis to test the impact of these services on the profitability of banks has been used.

The hypothesis of this study is "the using of modern banking services has a significant effect on bank profitability". Understanding the relationship between modern banking services and bank performance is an experimental procedure. Profitability ratios are the criteria that are used as benchmarks to evaluate the performance of banks. Bank profitability measures such as return on assets and return it by equity is defined.

In the table below, the variables used as criteria for performance evaluation has been mentioned in some studies.

Table(1)variables for performance evaluation in some studies

Author	period	year	The variable for performance evaluation
Zazzara and Ciciretti	1993-2001	2005	Average of Return of equity
,Hisar Campus	1996-2005	2008	profit margin
YenerAltunbas	1990-2002	2004	Average of return onassets
M. Kabir Hassan	1994-2001	2003	profit margin (BTP/TA)
Alejandro Micco	1995-2002	2004	Ownership, Demand Deposits relative to total deposits Share, Interest margin relative to loans plus deposits, Interest margin relative to total, assets, Non-Interest revenues relative to total assets, Overheads relative to total assets, Employment Relative to Total Assets, and Demand Deposits relative to total deposits
Abdel-Hameed M. Bashir	1993-98	2001	net non-interest margin (NIM)
SaovaneeChantapong	1995-2000	2003	net interest margin/total assets, non-interest income/total assets
Fadzlansufian	1992-2000	2011	Average of return onassets
MICHAEL L. MARLOW	1969-1979	1981	interest and dividends on savings accounts/savings accounts, average profitability (net income/total assets)
MedhatTarawaneh		2006	interest income
Ahmad Almazari		2011	Average of return onassets
Khizer Ali		2011	Average of return onassets
Muhammad Sidqu		2011	Average of return onassets,Returnon equity
AkramAlkhatib	2005-2010	2012	Average of return onassets
Pooja MALHOTRA	1998-2006	2009	Non-Performing Assets
SAIDOV ELYOR ILHOMOVICH	2004-2008	2009	Average of return onassets,Returnon equity
Nor Mazlina	2001 – 2006	2009	Average of return onassets
Tobias Olweny	2002-2008	2011	Average of return onassets
Mohammad Al-Smadi	2000-2010	2011	Returnon equity
Husni Ali Khrawish	2000-2009	2011	Average of return onassets,Returnon equity

I define Yit as The profitability of bank i in year t. The general form of the equation is as follows:

$$Y_{it} = \propto_0 + \propto_i lR_{mt} + \sum_{i=1}^{n} \beta_i X_{it} + \propto_{it} SERVICE_{it}^{j} + \varepsilon_{it}$$

As lR_{mt} is macroeconomic variables in mth country (where the mth bank is there) in year t, which is the lending rate, Services are dummy variable for new banking services, and X_{it} are explanatory variables such as: Total savings, Overhead rates, and debts rates.

The list of selected banks which include new banking services are as below:

Table2:banks with new banking services

country	year of using the modern services	Name	#
UK	2000	Clydesdale Bank	1
UK	2002	Barclays Bank	2
Sweden	2000	Nordea Bank	3
Netherland	1999	Rabobank	4
Netherland	1999	Fortis Bank	5
Netherland	1997	SNS Bank	6
Spain	2000	Banco Popular	7
Spain	1998	Banco de Sabadell	8
Spain	2000	Rabobank	9
Spain	2000	Fortis Bank	10
Turkey	2000	DenizBank	11
Italy	2002	Unicredito	12
Italy	2002	Capitalia	13
Italy	2001	Intesa	14
Italy	2003	BanchePopolari Unite	15
France	1997	BNP Paribas	16
France	2003	SociétéGénérale	17
Germany	1994	Deutsche Bank	18
Germany	1995	Commerzbank	19

The procedure for model selection

In first step, by using Eviews software, I will estimate the random-effects model. This kind of model assumes that the dataset being analyzed consists of a hierarchy of different populations whose differences relate to that hierarchy. In econometrics, random effects models are used in the analysis of hierarchical or panel data when one assumes no fixed effects (i.e. no individual effects). The fixed effects model is a special case of the random effects model. Contrast this to the biostatistics definitions, as biostatisticians respectively refer to the population-average and subject-specific effects as "fixed" and "random" effects.

In second step, I will use F limer test for choosing between pooling model and fixed effect model. In pooling model, period and cross section deleted in equation. I will find the preferred model by this test.

In third step, I will use hausman test for choosing the preferred model between fixed effect and random effect. The random effect model assumes that the dataset being analyzed consists of a hierarchy of different populations whose differences relate to that hierarchy. In econometrics, random effects models are used in the analysis of hierarchical or panel data when one assumes no fixed effects (i.e. no individual effects).

Finally, by selecting the best model, I will interpret the results and assumptions of best model.

The first model estimation

In this model, I am looking to realize which variables explain return of assets (Roa) of selected banks with new services.

First of all, I use unit root test for variables. Table 3 shows the results of stationary test as below:

Table 3: Levin, Lin and Chu test of stationary

Variable	LLC Statistics	Prob.
ROA	-8.30	0.000
Lending_rate	-10.92	0.000
Loan_assets	-3.57	0.000
Margin	-4.48	0.000
Overhead	-7.82	0.000
Total_deposits	-6.02	0.000

As table shows, all variables are stationary and we can estimate the model by OLS method.

As shown in table 4, test results of F limer indicates that the model should run base on pooling data. So I estimate my model according to pooling and show the results in table 5.

Table 4: F limer test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.082603	(18,144)	1.0000
Cross-section Chi-square	1.756579	18	1.0000

Table 5: First model estimation results
Dependent Variable: ROA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013637	0.003092	-4.410594	0.0000
OVERHEAD	0.007036	0.000955	7.366111	0.0000
LENDING_RATE	-0.000163	0.000161	-1.013751	0.3122
LOAN_ASSETS	0.009189	0.001895	4.850246	0.0000
SERVICE1	0.009088	0.002667	3.407796	0.0008
SERVICE2	-0.005430	0.001110	-4.890075	0.0000
SERVICE3	0.003759	0.000704	5.335828	0.0000
TOTAL_DEPOSITS	-0.006525	0.001895	-3.443464	0.0007
AR(1)	0.758411	0.030539	24.83419	0.0000
R-squared	0.926367	Mean dependent var		0.008135
Adjusted R-squared	0.922731	S.D. dependent var		0.005629
S.E. of regression	0.001565	Akaike info criterion		-10.03107
Sum squared resid	0.000397	Schwarz criterion		-9.865724
Log likelihood	866.6569	Hannan-Quinn criter.		-9.963982
F-statistic	254.7635	Durbin-Watson stat		2.046707
Prob(F-statistic)	0.000000			

The dependent variable is the return of assets of selected banks, and the independent variables are; Overhead ratio which is the ratio of operating cost divided by net tax able income and other operating income, LENDING_RATE which is lending rates of selected banks, LOAN_ASSETS which is loan ratio of selected banks, TOTAL_DEPOSITS which is total deposits of selected banks, and services which are dummy variables for time of starting to offer new services by selected banks.

In this model, Roa (return of assets) of selected banks is dependent variable. The results in Table 5 confirms the original hypothesis which new banking services have significant coefficient and significant effect on Roa of selected banks (services as dummy variables). Also the coefficients of total deposits, overhead and loan assets are significant, but the coefficient of lending rate is not significant.

The coefficient of determination, denoted R^2, is equal to 0.92 which means the independent variables explain about 92 percent of Roa changes.

The second model estimation

In this model, I am looking to realize which variables explain margin profits of selected banks with new services.

As shown in table 6, F limer and Hausman tests show that the second model is fixed effect model (panel).

Table 6: F Limer and Hausman tests of second model

Effects Test	Statistic	d.f.	Prob.
Cross-section F	10.854109	(18,164)	0.0000
Cross-section Chi-square	149.054448	18	0.0000
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	7	1.0000

So I estimate my model according to fixed effect model and show the results in table 7.

Table 7: Second model estimation results
Dependent Variable: Margin

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.005105	0.005834	-0.875046	0.3830
OVERHEAD	0.000651	0.000752	0.865733	0.3881
LENDING_RATE	-0.000807	0.000241	-3.353137	0.0010
LOAN_ASSETS	0.016183	0.002055	7.873651	0.0000
SERVICE1	0.011067	0.005400	2.049465	0.0422
SERVICE2	-0.009515	0.001909	-4.984182	0.0000
SERVICE3	0.004814	0.000931	5.169471	0.0000
TOTAL_DEPOSITS	0.002593	0.001843	1.406998	0.1616
AR(1)	0.618990	0.029576	20.92903	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.978851	Mean dependent var		0.023446
Adjusted R-squared	0.975032	S.D. dependent var		0.011648
S.E. of regression	0.001941	Sum squared resid		0.000542
F-statistic	256.3383	Durbin-Watson stat		2.316787
Prob(F-statistic)	0.000000			

Graph 1; The actual and fitted of Margin by second model estimation
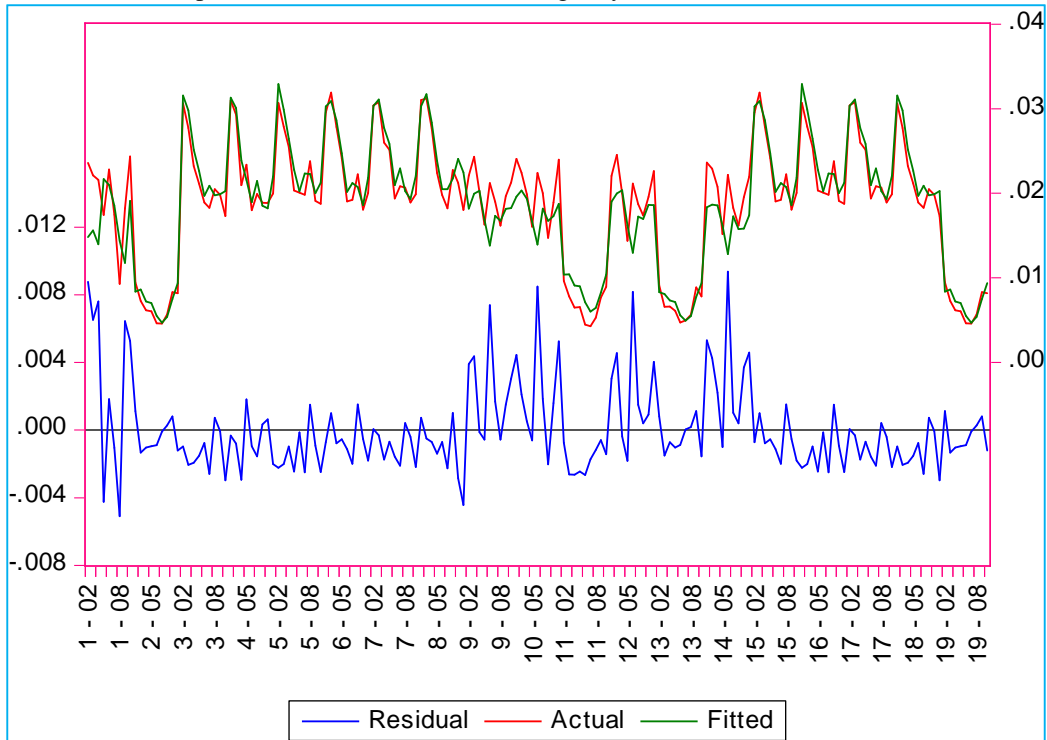
The coefficient of all explanatory variables, except overhead, are significant and the hypothesis confirmed.

The coefficient of determination, denoted R^2, is equal to 0.978 which means the independent variables explain about 97.8 percent of Margin profits changes. Also graph one shows the goodness of fit, and actual and fitted values of the dependent variable every close together.

Conclusions

The aim of this paper is to investigate the impact of new banking services on profitability and performance of selected banks. I used regression models with OLS method and panel data. The dependent variable is an indicator of banks Profitability. In first model, I am looking to realize which variables explain return of assets (Roa) of selected banks with new services. Test results of F limer indicates that the model should run base on pooling data. The results confirms the original hypothesis which new banking services have significant coefficient and significant effect on Roa of 19 selected banks. Also the coefficients of total deposits, overhead and loan assets are significant, but the coefficient of lending rate is not significant. The coefficient of determination, denoted R^2, is equal to 0.92 which means the independent variables explain about 92 percent of Roa changes.

In second model, I am looking to realize which variables explain margin profits of selected banks with new services. Tests results of F limer and Hausman show that the second model is fixed effect model (panel). The results confirms the original hypothesis which new banking services have significant coefficient and significant effect on margin profits of 19 selected banks. The coefficient of all explanatory variables, except overhead, are significant and the hypothesis confirmed. The coefficient of determination, denoted R^2, is equal to 0.978 which means the independent variables explain about 97.8 percent of Margin profits changes.

REFERENCES

1.Yansheng Zhang, Longyi Li (2009), Study on Balanced Scorecard of Commercial Bank in Performance Management System, Proceedings of the 2009 International Symposium on Web Information Systems and Applications (WISA'09), Nanchang, P. R. China, pp. 206-209.

2.Ahmad Bello, Dogarawa, The Impact of E-banking on Customer Satisfaction in Nigeria (2010), MPRA Paper No. 23200, posted 10.

3. Gregory T. Fraker (2006), Using Economic Value Added (EVA) to Measure and Improve Bank Performance, Paper Writing Contest RMA – Arizona Chapter.

4.BABALOLA, YisauAbiodun (2012), The Determinants of Bank's Profitability in Nigeria, Journal of Money, Investment and Banking, EuroJournals Publishing, Inc.

5. Salman D. Al-Shobaki a, Rami H. Fouad b, Adnan Al-Bashir b (2010), The Implementation of Total Quality Management (TQM) for The Banking Sector in Jordan, Jordan Journal of Mechanical and Industrial Engineering, Volume 4, Number 2.

6.JohnMylonakis (2009), Bank satisfaction factors and loyalty: a survey of the Greek bank customers, Innovative Marketing, Volume 5, Issue 1.

7. Tang, Eve Law and Angela Sze (2003), The Profitability of the Banking Sector in Hong Kong, Hong Kong Monetary Authority Quarterly Bulletin September 2003.

8.Lassar, W.M., Manolis, C. and Winsor, R.D. (2000). Service quality perspectives and satisfaction in private banking, Journal of Services Marketing, Vol. 14, No. 3, pp. 244-271.

9.Drake, L. and Hall, M.J.B. (2003), Efficiency in Japanese Banking An empirical analysis, Journal of Banking and Finance, 27,891-917.

10. Tobias Olweny and Themba Mamba Shipho (2011), Effects Of BankingSectoral Factors On The Profitability Of Commercial Banks In Kenya, Economics and Finance Review Vol. 1(5) pp. 01 – 30, July.