Impact of Electronic Payment System on the Profitability of Nepalese Commercial Banks

Sanila Basnet*

Abstract

This study examines the impact of electronic payment system on the profitability of Nepalese commercial banks. Return on assets (ROA) and return on equity (ROE) are the selected dependent variables. The selected independent variables are mobile banking, quick response code payment, automated teller machine, digital wallet, credit cards and point of sales. The study is based on primary and secondary data of 8 commercial banks with 130 respondents. To achieve the purpose of the study, structured questionnaire is prepared. Secondary data were collected from Banking and Financial Statistics published by Nepal Rastra Bank and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of electronic payment system on the profitability of Nepalese commercial banks.

The study showed that mobile banking has a positive relationship with return on assets and return on equity. It indicates that better the mobile banking services provided by banks, higher would be the return on assets and return on equity. Similarly, QR payment has a positive relationship with return on assets and return on equity. It indicates that more the payment through QR payment services, higher would be the return on assets and return on equity. Likewise, ATM banking has a positive relationship with return on assets and return on equity. It indicates that better the ATM services provided by the banks, higher would be the return on assets and return on equity. Further, digital wallet has a positive relationship with return on assets and return on equity. It indicates that higher the practices of digital wallet banking, higher would be the return on assets and return on equity. In addition, credit card has a positive relationship with return on assets and return on equity. It indicates that higher the number of payments through credit card, higher would be the return on assets and return on equity. Moreover, POS banking has a positive relationship with return on assets and return on equity. It indicates that practice of point of sales banking leads to increase in return on assets and return on equity.

Keywords: mobile banking, quick response code payment, automated teller machine, digital wallet, credit cards, point of sales, return on assets, return on equity

1. Introduction

Generally, the term 'electronic' in the E-Payment refers to the mode

* Mrs. Basnet is a Freelance Researcher, Kathmandu, Nepal. E-mail: sanilabasnet44@gmail.com

of payment which does not involve physical cash or money. In other words, any forms of cashless method which include amongst, bill payment using the automated teller machines (ATM), credit and debit cards, payments via the Internet and so forth. In Malaysia, several forms of E-Payment that are widely used and they include credit cards, debit cards, smartcards (such as, MEPS cash, Touch 'n Go, Maxis Fast Tap), e-wallet and payment via Automated-Teller machines (ATMs). E-Banking has made banking transactions easier around the World and it is fast gaining acceptance in Nigeria. Virtually almost all Banks in Nigeria have electronic Banking. E-Banking's greatest promise is timelier, more valuable information accessible to more people, at reduced cost of information access (DeYoung, 2005).

Brookshire *et al.* (2016) stated that consumers feel safer when trading cashless because consumers have greater trust in services that have been provided by a vendor thereby reducing the fear of the minimal risk. Similarly, Tazkiyyaturrohmah (2018) argued that existence of electronic money as a tool for modern financial transactions. E-banking is the use of electronic means to deliver banking services, mainly through the Internet. The term is also used to refer to ATMs, telephone banking, use of plastic money, mobile phone banking and electronic funds transfers. Electronic banking offers different online services like balance enquiry, request for cheque books, recording stop payment instructions, balance transfer instructions, account opening and other form of transitional banking services. Financial institutions have witnessed colossal dynamism over time. A terrific deal of transformation has been hugged in the field that has prompted the growth of money-related items, exercises and ranked structures that have to intensify and expanded the productivity of the monetary framework. Globally, financial organizations and financial systems are in the throes of changes caused by escalating globalization and deregulation. In the financial sectors, financial innovations such as mobile banking, internet banking, and Automated Teller Machine (ATM), Point of Sale Purchase (POS), and App store, mobile money, internet banking, agency banking are taking place at a massive fast place (Tunay *et al.,* 2015). However, the new existing financial institutions products made to customers is significant. The technology based applications such as mobile banking, internet banking, Automated Teller Machine (ATM), Point of Sale Purchase (POS), and App store provides clients of financial institutions imperative edge in the conveyance of subsisting products (Tam and Oliveira, 2016).

Agboola *et al.* (2019) investigated the influence of digitization on the

performance of commercial banks in Nigeria. The study revealed that there is a positive relationship between process of digitalization and performance of commercial banks. Similarly, Nwezeaku and Ugwueze (2016) examined the association between e-banking and the performance of commercial banks in Nigeria. The study showed that banks that implemented e-banking platforms posted good performances in terms of customer reachability. Likewise, Karimi and Oluoch (2019) analyzed the impact of bank innovations on the financial expansion of commercial banks in Kenya was explored. The study found that the most substantial impact on financial growth is caused by bank product innovation. Further, Mwatsika (2016) examined the impact of ATM banking performance on customer satisfaction with the bank in Malawi. The study found that performance of automated teller machine banking has 40 percent predictive capability of customer satisfaction with the bank. The study also found that despite influencing customer satisfaction with the bank, automated teller machine banking has no capability to attract customers to switch banks.

Bagudu *et al.* (2017) found a positive and substantial influence of mobile banking on the bank's profitability of commercial banks. Similarly, Njoroge *et al.* (2018) examined the impact of electronic banking on bank's profitability in Kenyan commercial banks: Case of Equity bank in its Nairobi Central Business District branches, Kenya. The study found that increase in internal banking products have positive impact on bank's profitability. Likewise, Mageto *et al.* (2017) revealed that perceived factors of cost, accessibility, and security in mobile payment technology exert a positive influence on the financial well-being of commercial banks. Further, Karimi and Oluoch (2019) observed the impact of bank innovations on the financial expansion of commercial banks in Kenya. The study indicated that product innovation in bank has a positive impact on bank's profitability. In addition, Rozhkova and Tozhihonov (2021) stated that electronic banking channels improve ease of doing banking transactions and customer satisfaction, on the other hand, it exhibits no significant association with the performance of the banks. Moreover, Sathye (2018) examined the impact of e-Banking on the performance and risk profile of Australian Credit Unions. The results revealed that e-banking innovations such as ATMs, telephone banking, the use of plastic money and mobile phone which directly affect the bank's profitability of organizations. Similarly, Nwezeaku and Ugwueze (2016) examined the association between e-banking and the performance of commercial banks in Nigeria. The study showed that e-banking platforms posted good performances in terms of

customer reachability.

Kwateng *et al.* (2019) examined the impact of internet banking on the performance of banking institutions in Ghana. The findings of the study indicated that the integration of internet banking into traditional banking methods has led to superior bank performance in Ghana. Similarly, Obadia and Kumungunyi (2022) examined the influence of mobile banking on bank's profitability of listed Tier one commercial banks in Kenya. The study found that mobile banking has a positive but an insignificant relationship with bank's profitability. The study also found that mobile banking security levels have negative but significant relationship with the bank's profitability of commercial banks. In addition, Bochaberi and Job (2021) assessed the mobile banking and bank's profitability of selected commercial banks in Kenya. The study found that mobile banking influences the bank's profitability of the four commercial banks in Kenya. The study also found that mobile banking is reliable to customers, enables the bank to reach the most unbanked people, is safe and affordable, it is efficient and increases the number of transactions in commercial banks. The study also found that mobile banking security does not have significant impact on bank's profitability of commercial banks. Moreover, Biwott *et al.* (2019) analyzed the impact of mobile banking on bank's profitability of small scale and medium enterprises. The study found that there is a negative relationship between cost of mobile banking services and bank's profitability.

Furthermore, Mageto *et al.* (2017) examined the impact of mobile banking on bank's profitability of commercial banks. The study found that perceived cost, perceived access and perceived security of mobile payments technology have significant influence on the bank's profitability of commercial banks. Similarly, Batchimeg (2017) investigated the impacts of profitability, growth, liquidity and capital structure on the bank's profitability. The study found that ROA has more determinants than ROE and return on sales (ROS). Likewise, Tong and Diaz (2017) investigated the important factors affecting capital structure decisions in Vietnamese commercial banks, and found that Vietnamese bank's asset size positively affects leverage, which means that the larger the asset of the bank, the more debt is incurred. Further, Anarfo (2015) revealed that ROA is negatively affected by leverage, because most of banks in the study prefer internal financing to reduce information asymmetry. In addition, Feng and Guo (2015) showed that the high debt ratio negatively affects bank's profitability. Moreover, Diaz and Hindro (2017) analyzed the profitability of Indonesian publicly-listed real estate companies. The study

found that the number of days account receivable has a negative impact on ROA for large and small companies, but it has no impact on medium sized firms. Likewise, Vatavu (2016) investigated the capital structure and its impact on the bank's profitability of Romanian companies. The study found that the capital structure determinants such as business risk, and tangibility have negative impact on ROA, and taxation level.

Domeher *et al.* (2014) examined the adoption of financial innovation in the Ghanaian banking industry. The study found that the ease of use for customers, compatibility with customer needs, the provision of information, and the level of customer education significantly influence the adoption of e-banking innovations. Similarly, Ozkaya *et al.* (2015) revealed that practical users outnumber experiencing users in QR code utilization, and there exists a positive correlation between QR code usage and ownership of electronic devices. Likewise, Cheruiyot (2016) examined the impact of internet banking on bank's profitability of commercial banks. The study found that internet banks are larger banks and have better operating efficiency ratios and profitability as compared to non-internet banks. Further, Mabrouk (2016) found out that first mover initiative in product innovation improves profitability while process initiative has a positive impact on profitability and efficiency. Banks that imitate are less profitable and less efficient than first movers.

In the context of Nepal, Pathak *et al.* (2022) examined the impact of internet banking service quality on customer satisfaction in Nepalese commercial banks. The study showed that speed of delivery, ease of use, reliability, privacy and security, enjoyment and control have positive impact on customer satisfaction in Nepalese commercial banks. Similarly, Khatiwada (2022) analyzed the impact of e-banking service quality on customer satisfaction in Nepalese commercial banks. The study revealed that internet security and privacy, website design, responsiveness, system availability and reliability have positive impact on customer satisfaction. However, the most important factor influencing customer satisfaction is Nepalese commercial banks is internet security and privacy followed by responsiveness. Further, Thapa (2016) revealed that customer satisfaction is positively influenced by various aspects of ATM services, including convenience, dependability, usability, and cost-impactiveness. In addition, Shakya (2016) indicated a strong correlation between customers' satisfaction with online banking (ROE) and key financial metrics such as return on assets (ROA).

The above discussion shows that empirical evidences vary greatly across the studies on the impact of electronic payment system on the profitability of

commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impact of electronic payment system on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of mobile banking, QR payment, ATM banking, digital wallet, credit cards, and POS terminals with bank's profitability of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on primary data where 130 respondents have been taken and secondary data which were gathered from 8 Nepalese commercial banks for the study period from 2012/13 to 2022/23, leading to a total of 88 observations. The main source of data includes Banking and Financial statistics published by Nepal Rastra Bank, and the annual report of respective banks. The study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with the study period and number of observations

S.N.	Name of the banks	No. of respondents
1.	Prabhu Bank Ltd.	16
2.	Himalayan Bank Ltd.	8
3.	Nabil Bank Ltd.	22
4.	Citizens Bank International Ltd.	17
5.	NIC Asia Bank Ltd.	38
6.	Sanima Bank Ltd.	8
7.	Prime Commercial Bank Ltd.	15
8.	Standard Chartered Bank Nepal Ltd.	6
Total number of respondents		**130**

Thus, the study is based on 130 observations.

The model

The model used in this study assumes that profitability of commercial banks depends upon electronic payment systems. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are mobile banking, quick response payment, automated teller machine, digital wallet, credit card, point of sales. Therefore, the model takes the following form:

$$ROA = \beta_0 + \beta_1 MB + \beta_2 QR + \beta_3 ATM + \beta_4 DW + \beta_5 CRDC + \beta_6 POS + \varepsilon_{it}$$

$$ROE = \beta_0 + \beta_1 MB + \beta_2 QR + \beta_3 ATM + \beta_4 DW + \beta_5 CRDC + \beta_6 POS + \varepsilon_{it}$$

Where,

ROA= Return on assets is measured as the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to average shareholders' equity, in percentage

MB = Mobile banking

QR = Quick response payment

ATM = Automated teller machine

DW = Digital wallet

CRDC = Credit card

POS = Point of sale

β_0 is constant and β_1 , β_2 , β_3 , β_4, β_5 and β_6 are the beta coefficients of the explanatory variables to be estimated.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Mobile banking

Kiplangat and Tibbs (2018) examined the financial innovations and bank's profitability of commercial banks. The study found a positive and significant influence of mobile banking on bank's profitability of commercial banks. Similarly, Gichungu and Oloko (2015) found that mobile banking, banking correspondents, and ATMs banking have positive impact on bank's profitability measured by return on assets. Likewise, Kisaka *et al.* (2015) found

that mobile banking has a positive impact on bank's profitability. Further, Kato *et al.* (2014) found a positive relationship between mobile banking and bank's profitability of commercial banks. In addition, Kathuo *et al.* (2015) found that banks that have adopted M-banking services have to a large extent increased customer outreach, and hence have improved bank's profitability. Similarly, Medyawati and Yunanto (2021) found that mobile banking and internet transactions have positive impact on profitability proxies by return on assets. Further, Too *et al.* (2016) investigated the impact of mobile banking on bank's profitability. The study revealed that there is a positive and significant relationship between mobile banking and bank's profitability of commercial banks. Based on it, this study develops the following hypothesis:

H_1: There is a positive relationship between mobile banking and bank's profitability.

QR payment

Chinwoke and Victor (2021) examined the nexus between financial innovation and financial intermediation in Nigeria's banking sector. The study revealed that digital banking has a positive but an insignificant impact on performance of commercial banks. Similarly, Dwivedi *et al.* (2021) analyzed the future of digital and social media marketing research: Perspectives and research propositions. The study found that the number of branches could have a positive impact on operational efficiency by increasing customer service through QR code. Likewise, Madzimure (2019) assessed the influence of strategic networks and logistics integration on firm performance among small and medium enterprises. The study showed that impactive use of QR code helps to improve the firm performance. Further, Chukwu and Molokwu (2022) examined the impacts of digital banking on the performance of commercial banks in Nigeria 2010-2019. The study found that digital banking has a positive and insignificant impact on the performance of commercial banks in Nigeria. In addition, Rebecca (2020) found that internet banking services have a positive and significant impact on banking performance. Similarly Abror and Trinanda (2019) found that mobile banking is a solution for practical transaction activities so that it can cause customer satisfaction in banking transactions leading banks profitability. Likewise, Eren (2022) found that information quality and system quality related to QR code and mobile payment have positive impact on bank's profitability. Further, Ibrahim *et al.* (2019) found that perceived usefulness, personal innovativeness, perceived ease of use, subjective norm, and perceived security emerged as significant factors influencing the intention to use QR mobile payment. Based on it, this

study develops the following hypothesis:

H_2: There is a positive relationship between QR code payment and bank's profitability.

ATM banking

Jegede (2014) investigated the impact of ATM banking on bank's profitability of commercial banks. The study revealed that deployment of ATM terminals have positive impact on bank's profitability measured by return on assets and return on equity. Similarly, Saluja and Wadhe (2015) revealed that there is a positive relationship between ATM banking and bank's profitability. Further, Esfehani and Sadeghi (2015) found that there is a positive impact of ATM on financial efficiency of banks. In addition, Harelimana (2018) analyzed the impact of mobile banking on bank's profitability. The study found that there is a positive relationship between ATM banking and the bank's profitability of commercial banks. Moreover, Eze and Egoro (2016) revealed that there is a positive and significant relationship between ATM banking and profitability of banks. Similarly, Le *et al.* (2020) revealed that the increase in number of automated teller machines (ATMs) terminals improves bank profitability. Likewise, Mutiso and Senelwa (2017) investigated the impact of automated teller machines on the return on assets of the listed commercial banks in Kenya. The study found that there is a positive correlation between automated teller machines and return on assets. Further, Mary *et al.* (2019) found that there is a strong positive relationship between ATM banking and bank's profitability. Based on it, this study develops the following hypothesis:

H_3: There is a positive relationship between ATM banking and bank's profitability.

Digital wallet

Digital wallet or commonly called the electronic wallet is an online payment method. Mswahili (2022) examined the impact of electronic banking on commercial banks' bank's profitability. The study found that there is a positive relationship between usage of mobile money and bank's profitability of bank. Similarly, Nuryasman and Warningsih (2021) investigated the determining factors of digital wallet usage. The study found that perceived usefulness has a positive influence on usage intentions. Similarly, Mbama and Ezepue (2018) stated that perceived value has a significant influence in increasing satisfaction and loyalty of m-banking services. Likewise, Alaeddin *et al.* (2018) revealed that there is a significant impact of user friendliness

with using the mobile wallet. In addition, Muhtasim *et al.* (2022) analyzed the customer satisfaction with digital wallet services: An analysis of security factors. The study found that there is a positive and significant relationship between digital wallet systems and the transaction speed. Based on it, this study develops the following hypothesis:

H_4: There is a positive relationship between digital wallet and bank's profitability.

Credit cards

Munyocho (2015) examined the relationship between banking technologies and bank's profitability. The study showed that there is a positive relationship between debit and credit cards on bank's profitability. Similarly, Oyemakara (2020) stated that credit card enables bank customers to process financial transaction at any point in time without having the need to visit the banking hall. Likewise, Okoro (2014) concluded that credit card is enhancing profitability and financial positions of banks. Further, Akhisar *et al.* (2015) investigated the impact of electronic-based banking services on the profitability. The study revealed that ratio of number of branches to number of ATM have positive and significant impact on banks' profitability in both developed and developing countries. In addition, Njoroge *et al.* (2018) examined the impact of electronic banking on bank's profitability in Kenyan commercial banks. The study found that there is a positive relationship between internet banking products and the bank's profitability of the commercial banks. Moreover, Trinh *et al*. (2020) asserted the determinants of consumers' intention to use credit card: A perspective of multifaceted perceived risk. The study showed that the intended use of credit cards is affected by perceived risk, followed by perceived usefulness, social influence and perceived ease of use in decreased ranking. Similarly, Yen *et al.* (2020) examined the factors contributing to credit card adoption among Malaysian consumers. The study revealed that alternative form of payment, credit card attributes and attitude towards credit card have significant impact towards credit card adoption experience. Based on it, this study develops the following hypothesis:

H_5: There is a positive relationship between credit cards and bank's profitability.

Point of sales terminals

POS banking is the point at which a customer makes a payment to the merchant in exchange for goods or after provision of a service. Morufu (2016) examined the impact of POS adoption by banks. The study showed a positive

and significant impact of POS banking on bank's profitability of commercial banks. Similarly, Le and Ngo (2020) found that increase in number of Point of Sales (POS) terminals improves bank profitability. Likewise, Saleem *et al.* (2019) found a significant relationship between POS and bank's profitability of Pakistani banks. In addition, Itah and Emmanuel (2014) revealed that POS banking is positively correlated to bank's profitability. Likewise, Vekya (2017) revealed that POS and ATM transaction have positive and significant influence on bank's profitability. However, Akhisar and Tunay (2017) examined the long-term relationship between internet banking and bank performance in Europe. The study found a negative relationship between POS banking and bank profitability. Based on it, this study develops the following hypothesis:

H_6: There is a positive relationship between point of sales terminals and bank's profitability.

3. Results and discussions

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with means and standard deviations have been computed, and the results are presented in Table 2.

Table 2

Kendell's Tau correlation coefficients matrix

This table presents Kendall's Tau coefficients between dependent variables and independent variables. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to average shareholders' equity, in percentage). The independent variables are MB (Mobile banking), QR (Quick Response payment), ATM (ATM banking), DW (Digital wallet), CRDC (Credit card) and POS (Point of sales terminals).

Variables	Mean	S.D.	ROA	ROE	MB	QR	ATM	DW	CRDC	POS
ROA	1.440	0.270	1							
ROE	13.420	2.450	0.165*	1						
MB	3.860	0.660	0.097	0.011	1					
QR	3.890	0.650	0.062	0.023	0.428**	1				
ATM	3.300	0.710	0.072	0.024	0.204**	0.232**	1			
DW	3.700	0.650	0.023	0.047	0.361**	0.478**	0.196**	1		
CRDC	3.470	0.600	0.058	0.096	0.214**	0.259**	0.335**	0.169*	1	
POS	3.600	0.640	0.169*	0.032	0.253**	0.256**	0.288**	0.290**	0.404**	1

Notes: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels, respectively.

Table 2 shows that mobile banking has a positive relationship with return on assets. It indicates that better the mobile banking services provided by banks, higher would be the return on assets. Similarly, QR payment has a positive relationship with return on assets. It indicates that more the payment through QR payment services, higher would be the return on assets. Likewise, ATM banking has a positive relationship with return on assets. It indicates that better the ATM services provided by the banks, higher would be the return on assets. Further, digital wallet has a positive relationship with return on assets. It indicates that higher the practices of digital wallet banking, higher would be the return on assets. In addition, credit card has a positive relationship with return on assets. It indicates that higher the number of payments through credit card, higher would be the return on assets. Moreover, POS banking has a positive relationship with return on assets. It indicates that practice of point of sales banking leads to increase in return on assets.

Similarly, mobile banking has a positive relationship with return on equity. It indicates that better the mobile banking services provided by banks, higher would be the return on equity. Similarly, QR payment has a positive relationship with return on equity. It indicates that more the payment through QR payment services, higher would be the return on equity. Likewise, ATM banking has a positive relationship with return on equity. It indicates that better the ATM services provided by the banks, higher would be the return on equity. Further, digital wallet has a positive relationship with return on equity. It indicates that higher the practices of digital wallet banking, higher would be the return on equity. In addition, credit card has a positive relationship with return on equity. It indicates that higher the number of payments through credit card, higher would be the return on equity. Moreover, POS banking has a positive relationship with return on equity. It indicates that practice of point of sales banking leads to increase in return on equity.

Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 3. More specifically, it shows the regression results of mobile banking, QR payment, ATM banking, digital wallet, credit cards, and point of sales on return on assets.

Table 3

Estimated regression results of mobile banking, QR payment, ATM banking, digital wallet, credit cards, and point of sales on return on assets

The results are based on 130 observations using linear regression model. The model is ROA = $\beta_0 + \beta_1 MB + \beta_2 QR + \beta_3 ATM + \beta_4 DW + \beta_5 CRDC + \beta_6 POS + \varepsilon_{it}$ where the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are MB (Mobile banking), QR (Quick Response payment), ATM (ATM banking), DW (Digital wallet), CRDC (Credit card) and POS (Point of sales terminals).

Model	Intercept	Regression coefficients of						Adj. R_bar^2	SEE	F-value
		MB	QR	ATM	DW	CRDC	POS			
1	1.498 (10.424)**	0.016 (0.428)						0.006	0.273	0.183
2	1.55 (10.647)**		0.029 (0.778)					0.003	0.273	0.605
3	1.511 (13.195)**			0.022 (0.651)				0.004	0.273	0.424
4	1.421 (10.224)**				0.005 (0.122)			0.008	0.273	0.015
5	1.416 (9.954)**					0.006 (0.154)		0.008	0.273	0.024
6	1.544 (11.205)**						0.031 (0.785)	0.003	0.273	0.616
7	1.541 (9.772)**	0.007 (0.144)	0.034 (0.663)					0.011	0.274	0.311
8	1.558 (9.469)**	0.012 (0.203)	0.029 (0.552)	0.014 (0.369)				0.018	0.275	0.251
9	1.531 (9.159)**	0.005 (0.102)	0.052 (0.905)	0.019 (0.495)	0.053 (0.969)			0.018	0.275	0.423
10	1.485 (8.213)**	0.008 (0.144)	0.058 (0.991)	0.028 (0.673)	0.052 (0.944)	0.031 (0.646)		0.023	0.275	0.42
11	1.528 (8.269)**	0.003 (0.058)	0.062 (1.054)	0.025 (0.605)	0.067 (1.179)	0.055 (1.047)	0.054 (1.101)	0.021	0.275	0.553

Notes:

i. Figures in parenthesis are t-values.
ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
iii. Return on assets is the dependent variable.

Table 3 shows that the beta coefficients for mobile banking are positive with return on assets. It indicates that mobile banking has a positive impact on return on assets. This finding is consistent with the findings of Kiplangat and Tibbs (2018). Similarly, the beta coefficients for QR payments are positive with return on assets. It indicates that QR payments has a positive impact on return on assets. This finding is consistent with the findings of Dwivedi *et al.* (2021). Likewise, the beta coefficients for ATM banking are positive with return on assets. It indicates that ATM banking has a positive impact on return on assets. This finding is consistent with the findings of Jegede (2014). Further, the beta coefficients for digital wallet are positive with return on assets. It indicates that digital wallet has a positive impact on return on assets. This finding is consistent with the findings of Mswahili (2022). In addition, the beta coefficients for credit cards are positive with return on assets. It indicates that credit cards have positive impact on return on assets. This finding is consistent with the findings of Oyemakara (2020). Moreover, the

beta coefficients for point of sales banking are positive with return on assets. It indicates that point of sales banking has a positive impact on return on assets. This finding is consistent with the findings of Morufu (2016).

Table 4 shows the estimated regression results of mobile banking, QR payment, ATM banking, digital wallet, credit cards, and point of sales on return on equity.

Table 4

Estimated regression results of mobile banking, QR payment, ATM banking, digital wallet, credit cards, and point of sales on return on equity

The results are based on 130 observations using linear regression model. The model is ROE = $\beta_0 + \beta_1 MB + \beta_2 QR + \beta_3 ATM + \beta_4 DW + \beta_5 CRDC + \beta_6 POS + \varepsilon_{it}$ where the dependent variable is ROE (Return on equity as measured by the ratio of net income to average shareholders' equity, in percentage). The independent variables are MB (Mobile banking), QR (Quick Response payment), ATM (ATM banking), DW (Digital wallet), CRDC (Credit card) and POS (Point of sales terminals).

Model	Intercept	Regression coefficients of						Adj. R_bar^2	SEE	F-value
		MB	QR	ATM	DW	CRDC	POS			
1	13.467 (10.417)**	0.011 (0.035)						0.008	2.457	0.001
2	13.246 (10.105)**		0.045 (0.136)					0.008	2.457	0.019
3	13.588 (13.185)**			0.051 (0.164)				0.008	2.457	0.027
4	12.334 (9.904)**				0.295 (0.888)			0.002	2.449	0.788
5	12.361 (9.694)**					0.306 (0.844)		0.002	2.450	0.713
6	13.904 (11.205)**						0.134 (0.035)	0.007	2.455	0.155
7	13.342 (9.392)**	0.083 (0.175)	0.121 (0.027)					0.015	2.466	0.025
8	13.431 (9.062)**	0.063 (0.135)	0.126 (0.265)	0.077 (0.222)				0.023	2.475	0.033
9	13.106 (9.731)**	0.248 (0.511)	0.146 (0.28)	0.136 (0.388)	0.619 (1.253)			0.018	2.470	0.417
10	12.505 (7.712)**	0.281 (0.574)	0.223 (0.425)	0.251 (0.678)	0.603 (1.218)	0.423 (0.979)		0.019	2.470	0.525
11	12.937 (7.818)**	0.232 (0.477)	0.262 (0.498)	0.222 (0.602)	0.753 (1.482)	0.669 (1.412)	0.548 (1.248)	0.014	2.465	0.699

Notes:

i. Figures in parenthesis are t-values.
ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
iii. Return on equity is the dependent variable.

Table 4 shows that the beta coefficients for mobile banking are positive with return on equity. It indicates that mobile banking has a positive impact on return on equity. This finding is consistent with the findings of Gichungu and Oloko (2015). Similarly, the beta coefficients for QR payments are positive

with return on equity. It indicates that QR payments has a positive impact on return on equity. This finding is consistent with the findings of Abror and Trinanda (2019). Likewise, the beta coefficients for ATM banking are positive with return on equity. It indicates that ATM banking has a positive impact on return on equity. This finding is consistent with the findings of Mutiso *et al.* (2017). Further, the beta coefficients for digital wallet are positive with return on equity. It indicates that digital wallet has a positive impact on return on equity. This finding is consistent with the findings of Muhtasim *et al.* (2022). In addition, the beta coefficients for credit cards are positive with return on equity. It indicates that credit cards have positive impact on return on equity. This finding is consistent with the findings of Akhisar *et al.* (2015). Moreover, the beta coefficients for point of sales banking are positive with return on equity. It indicates that point of sales banking has a positive impact on return on equity. This finding is consistent with the findings of Vekya (2017).

4. Summary and conclusion

Generally, the term 'electronic' in the E-Payment refers to the mode of payment which does not involve physical cash or money. In other words, any forms of cashless method which include amongst, bill payment using the automated teller machines (ATM), credit and debit cards, payments via the Internet and so forth. In Malaysia, several forms of E-Payment that are widely used and they include credit cards, debit cards, smartcards (such as, MEPS cash, Touch 'n Go, Maxis Fast Tap), e-wallet and payment via Automated-Teller machines (ATMs). E-Banking has made banking transactions easier around the World and it is fast gaining acceptance in Nigeria. Virtually almost all Banks in Nigeria have electronic banking. E-Banking's greatest promise is timelier, more valuable information accessible to more people, at reduced cost of information access.

The study attempts to examine the impact of electronic payment system on the profitability of Nepalese commercial banks. The study is based on secondary data of 8 commercial banks of Nepal and primary data also be used as 130 respondents from different banks.

The major conclusion of this study is that mobile banking, QR payment, ATM banking, digital wallet, credit cards, and point of sales have positive relationship with return on assets and return on equity. It indicates that higher the use of mobile banking, QR payment, ATM banking, digital wallet, credit cards, and point of sales, higher would be the return on assets and return on equity. Likewise, the study also concluded that point of sales banking followed

by QR payment is the most influencing factor that explains the changes in the return on asset of Nepalese commercial banks. Similarly, the study also concluded that credit cards followed by digital wallet is the most influencing factor that explains the changes in return on equity in the context of Nepalese commercial banks.

References

Ablyazov, T., and V. Asaul, 2018. On competitive potential of organization under conditions of new industrial base formation. *Journal of Management and Technology* 44(2), 1-8.

Abror, A., R. E. Marta, and O. Trinanda, 2019. Pengaruh customer engagement terhadap loyalitas nasabah dengan kepuasan pelanggan sebagai variabel intervening (study Kasus Pada Bank Bri unit Belimbing Padang). *Jurnal Ecogen* 2(2), 156-164.

Agboola, M. G., K. A. Awobajo, S. O. Oluwatobi, M. O. Akinbode, M. O. Fagbohun, U. C. Esse, and C. M. Betek, 2019. Effect of digitalization on the performance of commercial banks in Nigeria. *Journal of Science* 3(1), 1-8.

Akhisar, I., and K. B. Tunay, 2017. Long-term relationship between internet banking and bank performance in Europe. *Eurasian Econometrics, Statistics and Empirical Economics Journal,* 6(5), 74-88.

Akhisar, I., K. B. Tunay, and N. Tunay, 2015. The effects of innovations on bank performance: The case of electronic banking services. *Journal of Social and Behavioral Sciences* 19(5), 369-375.

Alaeddin, O., R. Altounjy, Z. Zainudin, and F. Kamarudin, 2018. From physical to digital: Investigating consumer behavior of switching to mobile wallet. *Journal of Management Studies* 17(2), 18-30.

Anarfo, E. B., 2015. Capital structure and bank performance–evidence from Sub-Sahara Africa. *European Journal of Accounting Auditing and Finance Research* 3(3), 1-20.

Bagudu, H. D., M. Khan, and A. H. Roslan, 2017. The effect of mobile banking on the performance of commercial banks in Nigeria. *International Research Journal of Management, IT and Social Sciences* 4(2), 71-76.

Batchimeg, B., 2017. Bank's profitability determinants of organizations the case of Mongolian companies. *Journal of Competitiveness* 9(3) 1-153.

Biwott, I. C., E. Tanui, and C. Ayuma (2019). Effect of mobile banking on bank's profitability of commercial banks in Eldoret Town, Kenya. *Asian Journal of Computer and Information Systems* 1(2), 62-74.

Bochaberi, O. E. S., and O. Job, 2021. Mobile banking and bank's profitability of selected commercial banks in Kenya. *International Research Journal of Business and Strategic Management* 2(1), 79-94.

Brookshire, R., M. A. Harris, and A. G. Chin, 2016. Identifying factors influencing

consumers' intent to install mobile applications. *International Journal of Information Management* 36(3), 441-450.

Chinwoke, E. R., and O. I. Victor, 2021. Nexus between financial innovation and financial intermediation in Nigeria's banking sector. *Nexus* 4(3), 162-179.

Chukwu, K. O., and S. R. Molokwu, 2022. Effects of digital banking on the performance of commercial banks in Nigeria 2010-2019. *International Journal of Multidisciplinary Research and Analysis* 5(2), 133-148.

DeYoung, R., 2005. The performance of internet-based business models: Evidence from the banking industry. *The Journal of Business* 78(3), 893-948.

Diaz, J. F. T., and M. C. T. Hindro, 2017. Factors affecting the profitability of Indonesian real estate publicly listed companies. *Asian Journal of Finance and Accounting* 9(1), 396-428.

Domeher, D., J. M. Frimpong, and T. Appiah, 2014. Adoption of financial innovation in the Ghanaian banking industry. *African review of Economics and Finance* 6(2), 88-114.

Dwivedi, Y. K., E. Ismagilova, D. L. Hughes, J. Carlson, R. Filieri, J. Jacobson, and Y. Wang, 2021. Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management* 59(1), 102-116.

Eren, B. A., 2022. QR code m-payment from a customer experience perspective. *Journal of Financial Services Marketing* 29(8), 106-121.

Esfehani, B. H., and M. Sadeghi, 2017. The effect of automatic teller machines on efficiency of banks. *Journal of Business Management* 19(03), 07-15.

Eze, G. P., and S. Egoro, 2016. Electronic banking and profitability of commercial banks in Nigeria. *Journal of Finance and Economic Research* 3(1), 202-222.

Feng, Y., and Y. Guo, 2015. The relationship between capital structure and bank's profitability of China's real estate listed companies. *Journal of Finance and Economics* 3(4), 72-76.

Gichungu, Z. N., and M. A. Oloko, 2015. Relationship between bank innovations and bank's profitability of commercial banks in Kenya. *International Journal of Education and Research* 3(5), 443-456.

Harelimana, J. B., 2018. The Role of electronic payment system on the bank's profitability of financial institutions in Rwanda. *Journal of Management and Business Research: Finance,* 18(1), 1-19.

Ibrahim, M. H., S. R. Hussin, and S. H. Hussin, 2019. Factors influencing Malaysian consumers' intention to use Quick Response (QR) mobile payment. *Jurnal Pengurusan* 5(7), 22-37.

Itah, A. J., and E. E. Emmanuel, 2014. Impact of cashless banking on banks' profitability (Evidence from Nigeria). *Asian Journal of Finance and Accounting* 6(2), 362-376.

Jegede C. A., 2014. Effects of automated teller machine on the performance of

Nigerian banks. *American Journal of Applied Mathematics and Statistics* 2(1), 40-46.

Karimi, C. W., and O. Oluoch, 2019. Effect of bank innovations on financial growth of commercial banks in Kenya. *International Journal of Social Sciences and Information Technology* 5(5), 1-261.

Kathuo, S., G. Rotich, and W. Anyango, 2015. Effect of mobile banking on the bank's profitability of banking institutions in Kenya. *Strategic Journal of Business and Change Management* 2(98), 1440-1457.

Kato, G. K., W. I. Otuya, J. D. Owunza, and J. A. Nato, 2014. Mobile banking and performance of commercial banks in Kenya. *International Journal of Current Research* 6(12), 10670-10674.

Khatiwada, N. R., 2022. Impact of e-banking service quality on customer satisfaction of Nepalese commercial banks. *Nepalese Journal of Finance* 9(4), 36-47.

Kiplangat, K. D., and C. Tibbs, 2018. Financial innovations and bank's profitability of commercial Banks. *International Journal of Innovative Research and Development* 7(5), 36-41.

Kisaka, S. E., G. M. Ndii, M. Muriki, and A. K. Muio, 2015. The relationship between mobile banking deepening and bank's profitability of commercial banks in Kenya. *Research Journal of Finance and Accounting* 6(10), 156-172.

Kwateng, O. K., E. E. Osei-Wusu, and K. Amanor, 2020. Exploring the effect of online banking on bank performance using data envelopment analysis. *An International Journal* 27(1), 137-165.

Le, T. D., and T. Ngo, 2020. The determinants of bank profitability: A cross-country analysis. *Central Bank Review* 20(2), 65-73.

Mabrouk, A., 2016. The impact of financial innovation on interest rate spread in the Tunisian banking industry. *International Research Journal of Applied Finance* 7(6), 72-89.

Madzimure, J., 2019. The influence of strategic networks and logistics integration on firm performance among small and medium enterprises. *The Southern African Journal of Entrepreneurship and Small Business Management* 11(1), 1-7.

Mageto, I., M. W. Muturi, and M. W. Abuga, 2017. Effect of mobile banking on bank's profitability of commercial banks. *International Journal of Recent Research in Commerce Economics and Management* 4(1), 116-125.

Mary, O., and F. O. Isola, 2019. Effect of E-banking on bank's profitability of listed commercial banks in Kenya. *Global Scientific Journals* 7(1), 722-738.

Mbama, C. I., P. Ezepue, L. Alboul, and M. Beer, 2018. Digital banking, customer experience and bank's profitability: UK bank managers' perceptions. *Journal of Research in Interactive Marketing* 12(4), 432-451.

Medyawati, H., and M. Yunanto, 2021. Determining firm value in the Indonesian banking sub-sector. *Economics and Business Quarterly Reviews* 4(2), 68-78

Morufu, O., 2016. E-payments adoption and profitability performance of deposits money banks in Nigeria. *International Journal of Information Technology* 4(3), 1-9.

Mswahili, A., 2022. Factors for acceptance and use of mobile money interoperability services. *The Journal of Informatics* 2(1), 1-21.

Muhtasim, D. A., S. Y. Tan, M. A. Hassan, M. I. Pavel, and S. Susmit, 2022. Customer satisfaction with digital wallet services: an analysis of security factors. *Int. J. Adv. Comput. Sci. Appl* 13(1), 195-206.

Munyocho, L. N., 2015. Relationship between banking technologies on the bank's profitability of commercial banks in Kenya. *The Journal of Economics, Commerce and Management* 3(11), 28-38.

Mutiso, C., and A. W. Senelwa, 2017. Effect of automated teller machines on the return on assets of the listed commercial banks in Kenya. *Journal of Business and Management* 19(10), 86-91.

Mwatsika, C., 2016. Impact of ATM banking performance on customer satisfaction with the bank in Malawi. *International Journal of Business and Economics Research* 5(1), 1-9.

Njoroge, M. N., and F. Mugambi, 2018. Effect of electronic banking on bank's profitability in Kenyan commercial banks. *International Academic Journal of Economics and Finance* 3(2), 197-215.

Nuryasman, M. N., and S. Warningsih, 2021. Determining factors of digital wallet usage. *Journal of Management* 25(2), 271-289.

Nwezeaku, N. C., and A. C. Ugwueze, 2016. E-banking and commercial bank performance in Nigeria: An integration and causality approach. *International Journal of e-Education, e-Business, e-Management and e-Learning* 6(3), 175.

Obadia, R., and S. Kumungunyi, 2022. Influence of mobile banking on bank's profitability of listed tier 1 commercial banks in Kenya. *International Research Journal of Economics and Finance* 4(2), 256-267.

Okoro, A. S., 2014. Impact of electronic banking instruments on the intermediation efficiency of the Nigerian economy. *International Journal of Accounting Research* 42(14), 1-8.

Oyemakara, M. I. H., 2020. An investigation into the challenges faced by users of electronic payment platforms of Nigerian banks in rivers state, Nigeria. *European Journal of Social Sciences Studies* 5(5), 45-150.

Ozkaya, E., H. E. Ozkaya, J. Roxas, F. Bryant, and D. Whitson, 2015. Factors affecting consumer usage of QR codes. *Journal of Direct, Data and Digital Marketing Practice* 16(3), 209-224.

Pathak, K., J. Chataut, and K. Adhikari, 2022. Impact of internet banking service quality on customer satisfaction of Nepalese commercial banks. *Nepalese Journal of Economic* 6(1), 135-147.

Saleem, Z. U., I. Akhter, I. Baber, D. Bashir, and S. A. Haider, 2019. Impact of cashless

banking on profitability in banking industry of Pakistan. *Journal of Global Scientific* 7(3), 70-79.

Saluja, M. S., and T. Wadhe, 2015. Impact of e-banking on profitability of commercial banks in India. *International Journal in Management and Social Science* 3(2), 478-483.

Sathye, M., 2018. The impact of internet banking on performance and risk profile: An evidence from Australian credit unions. *The Journal of International Banking Regulation* 2(1), 789-895.

Shakya, A., 2016. Impact of online banking on customer satisfaction and firm performance in Nepalese commercial banks. *Nepalese Journal of Management* 3(1), 32.

Tam, C., and T. Oliveira, 2016. Understanding the impact of m-banking on individual performance. *Computers in Human Behavior* 61(1), 233-244.

Tazkiyyaturrohmah, R., 2018. The existence of electronic money as a tool for modern financial transactions. *Muslim Heritage* 3(1), 1-18.

Thapa, A., 2016. ATM service quality and customer satisfaction in Nepalese commercial banks. *Nepalese Journal of Business* 3(4), 92-98.

Tong, T. T., and J. F. T. Diaz, 2017. Determinants of banks' capital structure: Evidence from Vietnamese commercial banks. *Asian Journal of Finance and Accounting* 9(1), 261-284.

Too, V. K., C. Ayuma, and K. Ambrose, 2016. Effects of mobile banking on the bank's profitability of commercial banks in Kapsabet (Kenya): A case of selected banks in Kapsabet town. *IOSR Journal of Business and Management* 18(10), 37-48.

Trinh, H. N., H. H. Tran, and D. H. Q. Vuong, 2020. Determinants of consumers' intention to use credit card: a perspective of multifaceted perceived risk. *Asian Journal of Economics and Banking* 4(3), 105-120.

Tunay, K. B., I. Akhisar, and N. Tunay, 2015. The effects of innovations on bank performance: The case of electronic banking services. *Procedia-Social and Behavioral Sciences* 19(5), 369-375.

Vatavu, S., 2016. Non-linear panel data analysis for capital structure and its impact on profitability. *The Review of Finance and Banking* 8(1), 21-36.

Vekya, J. M., 2017. Impact of electronic banking on the profitability of commercial banks in Kenya. *Journal of Technology and Systems* 1(1), 18-39.

Yang, S., Z. Li, Y. Ma, and X. Chen, 2018. Does electronic banking really improve bank performance? Evidence in China. *International Journal of Economics and Finance* 10(2), 82-94.

Yen, Y. Y., S. D. Pillay, and S. Ramasamy, 2020. Factors contributing to credit card adoption among Malaysian consumers. *International Journal of Scientific and Technology Research* 9(1), 153-159.