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E-Banking Impact on the Profit Margin of Banks in Iran

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Development of e-banking has empirically modified the structure and characters of banks' performance, efficiency, risk and challenges which have also been articulately recognized based on the international best practices. E-banking brazenly accelerates and restructures financial transactions via enhancing technology and expanding the banking services in comparison with conventional banking. Accordingly, online access to the banks' products, financial statements, payment services and even credit scoring has considerably improved banks-customers relationships in the context of lending and borrowing practice, deposit composition, investment opportunities, trade finance options as well as account management diversification. The impact of recent e-banking developments is statistically evaluated for Iran's banking network via Dynamic Panel Data approach. The findings highlight that the ratio of ATMs and Electronic Cards transactions to banks' assets negatively-significantly influence the profitability due to higher substitution ratio with the other payment instruments and maintenance cost. The ratio of online branch transactions to the banks' assets negatively-insignificantly affects the profitability owing to the rapid increase in the NPLs and loan/loss expenses which has consequently shrunk Shared Revenues over the past 10 years. SWIFT-branches have positively-significantly enhanced the banks internal-secured cash flow while contemporaneously improves fund efficiency, banks' services fees, and ultimately profit margin.

Keywords: E-Banking, Risk, Bank Soundness Indicators.
JEL Classification*:* G21, G23, G32, F34

1 Introduction

Electronic Banking (EB) is considered as a new vehicle for banking system to speed up and facilitate financial transactions and communications in both developed and developing economies which is drastically accelerated by the internet and the World Wide Web developments despite the global digital gap.

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The recent communication and electronic innovations tend to enhance the banking industry ability to augment banking products which are evidently-extensively associated with the virtual financial transactions in order to automate and facilitate the banks/customers' relationship. The E-banking has also complicated the banking pillars which should be simultaneously-continuously revised through ratifying appropriate rules and regulations, upgrading the supervisory measures and approaches, developing risk management principles, restructuring the banks services and framework as well as training human resources.

The E-banking is genuinely carried out by different sort of tools which have been constantly streamlining the institutional network among markets agents, customers and financial entities via developing the intelligent electronic devices such as computer, mobile phone and television-based platforms, Personal Digital Assistant (PDA), Automated Teller Machine (ATM), kiosk (Aladwani, 2001, Simpson, 2002), P.O.S, as well as Virtual Teller Machines (VTMs), since the mid-1990s (Daniel, 1999; Mols, 1998; Sathye, 1999).

E-banking provides a widespread spectrum of financial products and services to facilitate functional banking operations (corporate banking, commercial banking, investment banking, retail banking, specialized banking, development banking) for the beneficiary individual and legal entities (Basel Committee Report on Banking Supervision (1998)). Electronic transactions are technically considered as the most important driving force for the banking systems which remarkably-ostentatiously expedites financial transactions comprising lending, borrowing, deposit, investment, trade finance, as well as the provision of financial advisory services, account management for clients, online accessibility to the financial statements, payment services and even customers and project risk management.

Development of E-banking has empirically modified the structure and definition of performance, efficiency, risk and challenges of the financial and banking system which are articulately characterized based on the international best practices. Meanwhile, the impact of recent E-banking profound reforms is technically studied for the Iranian banking network via panel data approach as the relationship between the E-banking indicators and the prudential indices is statistically examined while utilizing the macroeconomic variables as control factors for the past few years.

In this study, the banks' profit margin are hypothetically influenced by the E-banking explanatory variables which include the value and volume of transactions, payment tools (ATM, P.O.S, virtual branches, online-branch,

debit cards, pin-pad) as well as balance sheet indicators such as the ratio of equity to Assets (CA), and the ratio of Current Assets to Total Assets (LATA). Moreover, two macro-financial determinants are also applied as supplementary-explanatory variables in the model including Stock Market Price (ST) and Foreign Exchange Rate (EXR).

The rest of the paper is organized as follows: Section 2 reviews the literature about the impact of E-banking on the macro-prudential measures and also bank business vast development. Section 3 discusses the comprehensive-complicated reforms over regulation and risk structure along with E-banking enlargement while characterizing the restrictions, advantages and disadvantages. The E-banking historical achievements are empirically presented in section 4 in the Iran's banking network. The methodology and model estimations are introduced in sections 5 and 6. Section 7 designates the concluding remarks.

2 Literature Review

The global online network development has remarkably accelerated the E-banking and E-commerce capacities in order to flourish the world financial and commercial transactions which are associated with an expansion in both volume and size (Harris and Spencer, 2002). Internet banking[1] is practically reflected by the new set of online banking intermediaries such as funds transfer, paying bills, viewing current and savings account balance, paying mortgages and purchasing financial instruments and certificates of deposits as well as risk management (Singhal & Padhmanbhan, 2008; Ahasanul et al., 2009). In this context, Internet banking also includes E–banking, E–payment[2], and online banking (Ozuru et al., 2010; Singhal & Padhmanbhan, 2008; Beer, 2006; Jun & Cai, 2001; IAMAI's Report on Online Banking, 2006).

Internet banking which streamlines the online access to the banks' services in light of lending/borrowing interest rates, checking and money managed account balances as well as loan qualification process is materialized into the real time bill payment, fund transfer in line with money management services

[1] The electronic vehicles, which are applied in Internet banking, such as e–mail, e– books, SMS, data base and mobile phones (Chaffey et al., 2006). Meanwhile, cell phone banking is potentially considered as a new driver to facilitate and expand future banking services (Fisher – French, 2007; Masocha et al., 2011).

[2] E–payment is technologically recognized as a means whereby banking businesses are functionally implemented via electronic processes including personal computers, telephones, fax machines, Internet card payments, cell phones and other electronic devices (Turban et al., 2006; Ozuru et al., 2010).

for the institutions(Khan et al., 2009; Singhal & Padhmanbhan, 2008). The E-banking also provides great opportunities to lubricate the banks and customers relationships, while improves the domestic and global online financial transactions safeties, banks' procedures, portfolio management timeliness, nimble surveillance, and risk management through availability of the huge valuable data storage and the complicated statistical techniques (Gonzalez et al., 2008; Singhal & Padhmanbhan, 2008; Brodie et al., 2007; Williamson, 2006; Beer, 2006; Cooper, 1997; IAMAI's Report on Online Banking, 2006, Joseph et al., 1999).

Although the theoretical views are scarce rather than the empirical ones, the recent sporadic studies have evidently indicated that the E-banking which is also categorized based on service, information set, communication tool kits and transactional sources have altered the banks costs and revenue composition so the efficiency and profitability improve more significantly than conventional banking. (Egland et al., 1998; Furst et al., 2000a, 2000b, 2002a, 2002b).

Sullivan (2000) also observed that electronic banks are somehow associated with higher operating expenses while contemporaneously offsetting with higher fee revenue. In this regard, a significant-positive relationship has been empirically recognized between Internet banks and profitability as the key performance indicator among 105 Italian banks (Hasan (2002)) providing that the banking system has been structurally developed based on variety of products and services (DeYoung 2001a, 2001b, 2001c, and 2005). Meanwhile, a sectorial survey on 72 Spanish commercial-multifunctional banks during 1994-2002, which utilize the Internet, have reflectively underlined more appropriate commission revenues, larger rate of return on assets and equities and lower expenses albeit the risk structure statistically remained unaffected (Hernando & Nieto, 2005).

Furthermore, the banking performance has been significantly enhanced by the accelerating internet services application in the Indian extended banking network (Malhotra & Singh, 2009) while evidently-steadily overwhelming the Internet banks over the non-Internet ones (Singhal & Padhmanbhan, 2008).

Given the fact that technology development has gently reduced the operational functional cost, the banking network has focused on the computerization and automation in the past three decades as electronic and online banking deliveries have fulfilled both customers and bankers' expectations in the context of services quality and relationship procedures (Lamb et al., 2002; Larpsiri & Speece, 2004; Durkin & Howcroft, 2003; Ching, 2008; Masocha et al., 2011).

Information technology has taken important place in the future development of financial services, especially banking sector transition are affected more than any other financial provider groups. Increased use of mobile services and use of internet as a new distribution channel for banking transactions and international trading requires more attention towards e-banking security against fraudulent activities. The development and the increasing progress that is being experienced in the Information and Communication Technology have brought about a lot of changes in almost all facets of life. In the Banking Industry, it has been in the form of online banking, which is now replacing the traditional banking practice. Online banking has a lot of benefits which add value to customers' satisfaction in terms of better quality of service offerings and at the same time enable the banks gain more competitive advantage over other competitors. This paper discusses some challenges in an emerging economy.

The economy of most developing countries is cash driven; meaning that monetary transactions are basically made through the exchange of bank notes and coins for goods and services. However, this trend is now giving way to a modern and sophisticated payment system where the currency and notes are converted to data, which are in turn transmitted through the telephone lines and satellite transponders. This is as a result of rapid technological progress and development in the financial market (Ozuru et al., 2010; Johnson, 2005).There is faster delivery of information from the customer and service provider, thus Internet differentiated electronic banking system from the traditional banking operation (Singhal & Padhmanabhan, 2008; Salawu et al., 2007). This transfer process makes money to be carried in information storage medium such as cheques, credit cards, and electronic means than its pure cash form.

E–banking has thus become important channel to sell products and services; leading to a paradigm shift in marketing practices, resulting in high performance in the banking industry (Christopher et al., 2006; Brodie et al., 2007; Singhal & Padhmanabhan, 2008). The banking industry has been undergoing changes since the mid-1990s, in the form of innovative use of information technology and development in electronic commerce (Kalakota & Whinston, 1996). This development made e–banking as a threat to the traditional branch operations, despite the fact that electronic commerce is still developing and is rapidly changing (Harris & Spence, 2002; Turbin et al., 2002). According to Ozuru et al. (2010) "The importance of electronic payment system in any country can never be over emphasized, due to the

dramatic transformation in technological advancements that is being experienced by the global financial industry".

3 The E-banking Supervision Regulation and Risks

The Basel committee introduces several prudential requirements to monitor the E-payments in the global banking network through registration and maintenance of the banking transactions which necessarily include the beneficiary, applicant, consignees and consignors, bank orders, account information, all parties' address, recognition of third parties, and non-banks clients as well as all the suspicious international transactions information based on the Anti-Money Laundering and Financing Terrorism Acts.

Electronic banking, which has functionally enhanced banks' services, has considerably restructured the risk management procedures and mandates in the banking system in the context of risk assessment, control, monitoring as well as resolution. Besides the conventional risks[1], some specific risks are empirically announced for the E-banking, including risks of transfer, telecommunication, and cyber-attacks along with the international fraud.

3.1 Risk Assessment

Risk assessment is basically-individually introduced when the bank's business plan is primarily-articulately provided by the stakeholders in order to recognize the potential risk factors and opportunities which influence the banking operations. Although the risks should be specifically characterized at the beginning of the business, they are quantitatively-statistically-permanently measured in the course of operations in order to compute the expected cost of every single risk which is regularly taken into account through the adequate provisions and buffers. Recognition of risk factors is empirically discovered by the risk and market analysts based on the historical evidences as well as other banks experiences which are extracted in different episodes and economies.

Accordingly, the relative importance of risks is technically depended on the macroeconomic and institutional conditions as well as the frequency of incidence which are obviously varied among different economies and in time lapse. Furthermore, the assessment process determines the banks resiliency against different level of risks that are constantly exemplified in the context of shocks scenarios to predict adequate buffers as preventive and corrective promulgations. The banks should technically patronize some explanatory

[1] Liquidity, Credit, Operational, Legal, Systematic, Reputation and Market Risks.

indicators to highlight upcoming undesirable incidence along with designation of resolution package for addressing the contingent risks. The risk practitioners would specifically just react to those risks which are empirically recognized beyond the manifestation norms. Henceforth, they are well aware how and when to respond to the undesirable status via mobilizing the bank's resources for mitigating the risks' cost.

3.2 Risk Control

The risk assessment process underscores the micro and macro-risks outlook for banks which is simultaneously controlled through enhancing safety benchmarks, streamlining the domestic communications, improving the financial products, and strengthening the banks' fragility against external service providers including the Internet Service Providers (ISPs). The control mechanism consists of a wide variety of functions such as safeguarding measures, internal controls, domestic surveillance, data trustworthiness, and timely financial reports. The E-banking is apparently exposed to the cyber-attacks and should be protected by the implementation of secured telecommunication network among banks, NTSC, users, and application stores. The security measures are basically introduced at the software and hardware instruments such has data encryption, digital certificate, firewalls, antivirus controls, using a PIN, and also the regulatory-supplementary procedures.

Management and human skills are both considered as crucial trigger to enhance internal and external communications between staffs and customers. In this context, the control departments which include the IT, internal auditing, domestic surveillance, inspections as well as risk management give permanent timely feedback to the CEOs and managers in order to underline the shortcomings and contingent risks in case the organization’s communication is forcefully lubricated based on the functions and regulations.

3.3 Risk Monitoring

The banks financial transactions are practically examined in the context of assets and liabilities articles which should be regularly managed by the Asset/Liability Committee (ALCO) and Risk Committee (RC). The ALCO and RC committees which periodically adopt the risk limits based on the supervisory benchmarks authorize the credit and investment departments to accept the permitted risks while compulsorily monitoring for stakeholders.

Meanwhile, the electronic transactions should be also processed relied upon the risk limits by the risk management and IT analysts in order to monitor

the cyber or accounting errors as well as instant risk position. Furthermore, a server would be established in order to save and categorize all the financial statements, transactions, errors, risk reports, customers and markets' information as well as the dissipating financial imbalances for the board members and employees.

3.4 Challenges of Risk Management in the E-Banking

Although the E-banking enhances the banks' financial and non-financial products and services in a more competitive business environment, it is also influenced by some new set of challenges which are prominently margined in developing economies including digital gap, fraud and cyber-attacks, breaking into the accounts statements, and telecommunication shortcomings. In the meantime, the transactions which have been rapidly escalated in light of size, frequency, volume, and error cost over the past two decades are hardly-effectively-timely examined by the risk and IT analysts. Undoubtedly, the human skills should be remarkably improved to fulfill the new functions of banks.

The constant technology development has inevitably necessitated to continuously investing in software, hardware as well as human skills given the fact that the E-banking is technology intensive. Therefore, the banks should forcefully vary the financial and non-financial products and services instead of persistent raising the banks non-shared revenues and fees. Ultimately, the bank which is able to preserve the balance between technology development and innovative products is considered as a vital institution. Otherwise, it unavoidably confront with the huge challenges in a competitive business environment and cost-intensive technology.

The E-banking is required to outsource some of the technical functions which are securely supplied by the Internet Services Providers (ISPs), telecommunication entities, program developers, technology institutions as well as application stores, control interface, and storage companies. The supplier entities are functionally-regularly overseen by the supervisory body in the context of license condition, security control, data protection, standard procedures, customers' privacy, and the other microprudential rules.

4 Empirical Evidence

The financial transactions which are practically examined by the ATM and E-branches are assumed as a proxy of E-banking in this study given the data shortage in the Iran E-banking network.

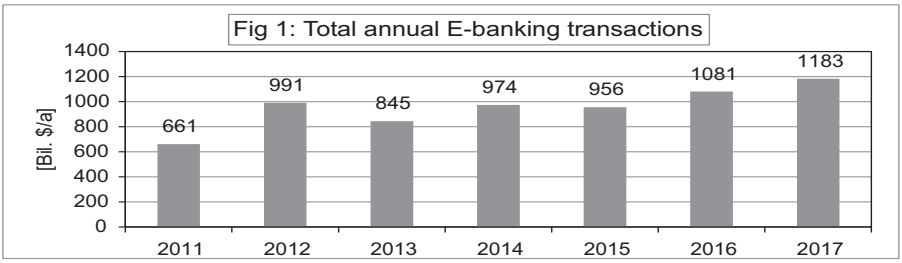

Figure 1. Total Annual E-Banking Transactions. *Data Source:* Central Bank of Iran

The E-banking transactions have significantly-annually increased by 10.2 percent as the transactions value reach 1183 billion USD in 2017 compared with 661 billion USD in 2011 (Figure 1) which highlights the key role of E-banking in the financial and non-financial transactions as well as families life style. In this context, the ratio of E-banking transactions to GDP is also improved from 123 percent to 298 percent during 2011-17 (Figure 2) while it is contemporaneously-positively expected to accelerate GDP growth due to the synergy between E-banking and output growth.

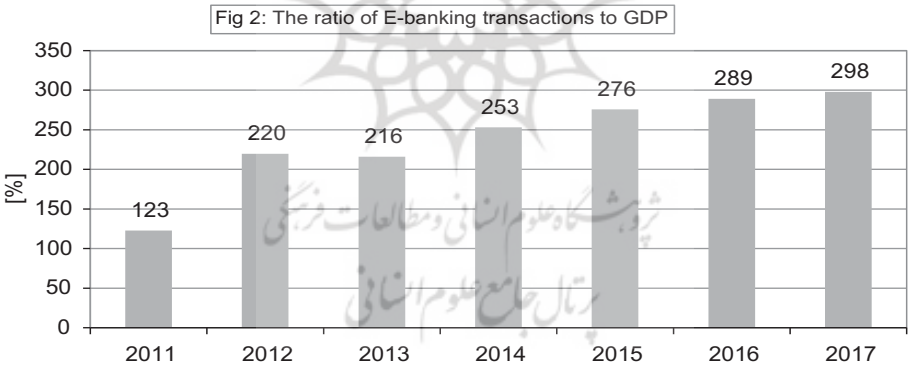

Figure 2. The Ratio of E-Banking Transactions to GDP. *Data Source:* Central Bank of Iran

Similarly, the ratio of E-banking transactions to broad money is boosted to 296 in 2017 (Figure 3) which simultaneously-consequently leads to an upsurge in banks earnings given the stability of banks soundness indicators.

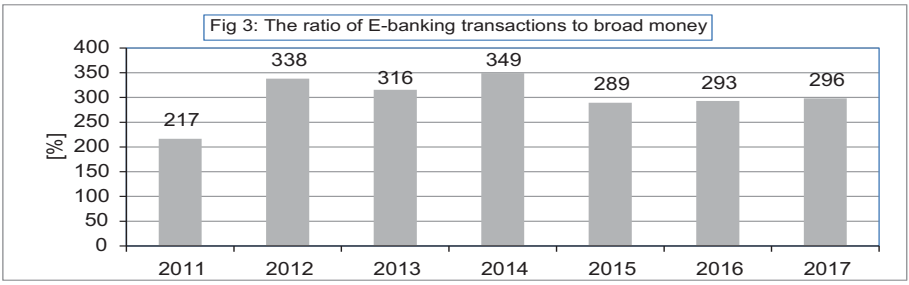

Figure 3. The Ratio of E-Banking Transactions to Broad Money. *Data Source:* Central Bank of Iran

Accordingly, the ATM and branch-based transactions constantly increased by average-annual growth at about 30 and 26 percent during 2011-17 as the ATM and branch-based transactions boosted at 16.5 and 8.8 thousand-trillion Rials in 2017 (Figure 4). Meanwhile, Figure (5) underscores the average-annual transaction of every single ATM and branch over the past 7 years. The average annual transaction of ATM and branch have respectively increased at about 15 and 16.5 percent during 2011-17 as their average transactions up-surged to 3 and 30 million Rials in 2017 owing to the diversification of the ATM options while contemporaneously motivating people to use Telephone-banking, Internet-banking, Mobile-banking, POS, and Pinpad instead of branch-based services.

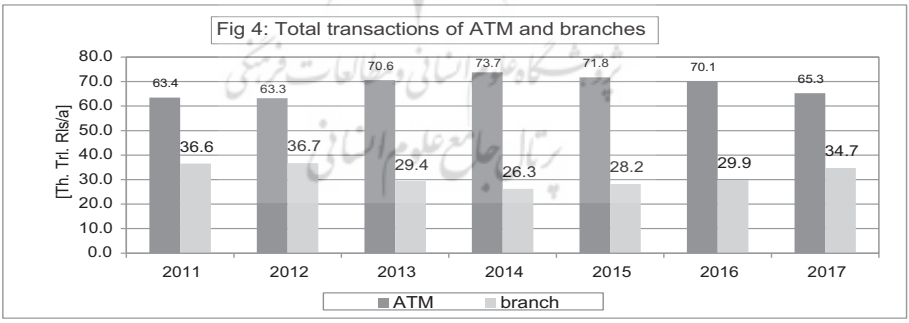

Figure 4. Total Transactions of ATM and Branches. *Data Source:* Central Bank of Iran

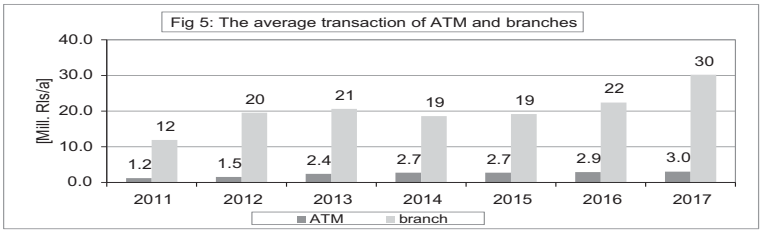

Figure 5. The Average Transaction of ATM and Branches. *Data Source:* Central Bank of Iran

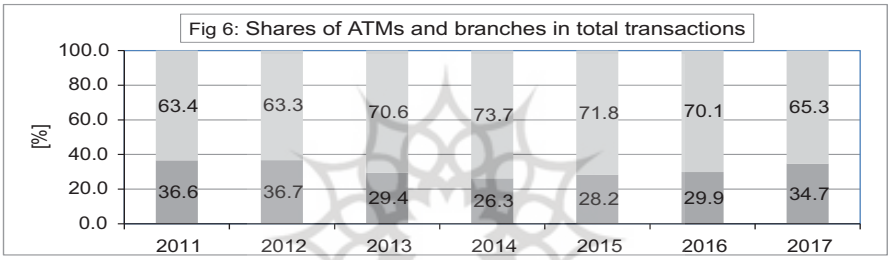

Figure 6. Shares of ATMs and Branches in Total Transactions. *Data Source:* Central Bank of Iran

In this vein, the share of ATM in total transactions has mounted to 65 percent in 2017 by about 3 percent growth which remarkably overpasses the E-branches' transactions as well (Figure 6). Furthermore, the average E-banking transactions rise by about 29 percent which obviously overpasses inflation (19 percent).

Eventually, although the direct impact of E-banking on the banks' benefit is hardly characterized by the current data capacity, the efficiency of instruments has been considerably enhanced over the past few years.

5 Methodology and Data

E-banking is empirically expected to improve banks profitability. Henceforth, E-banking indicators are taken into account as explanatory variables to illustrate banks' profit margin model. Six key E-banking indicators are applied in the banks' profitability regression model including the ratio of ATM, P.O.S, virtual branch, online-branch, debit card, and pin-pad to total assets which are accompanied by the other macroeconomic explanatory variables such as

balance sheet indicators (the ratio of equity to assets, and the ratio of current assets to total assets) and two macro-financial-explanatory variables (stock market price and nominal exchange rate).

In this context, Dynamic Panel Data Model is utilized to estimate the impact of macroeconomic variables and E-banking indicators on the banks' profitability.

The financial statements data which constitutes 248 samples to estimate model involve 18 different banks with their historical data from 2006 to 2016. The data set is also extracted from the unbalanced data base of Banking Superior Institute of Iran. Equation (1) is introduced as a regression model. Meanwhile, the impact of lagged dependent variable is required to apply the dynamic relation. Furthermore, the Sargan test is also conducted to examine the over-identification restriction and the correlation between the residual terms and instrumental variables.

$$PMAR.it = C + \beta 1\ PMARit\text{-}1 + \beta 2CAit + \beta 3LATAit + \beta 4SBAit + \beta 5ATMAit + \beta 6PIPAit + \beta 7OBAit + \beta 8BCAit + \beta 9POSAit + \beta 10STit + \beta 11EXRit + \varepsilon it \quad (1)$$

The variables utilized in the equation (1) are described in the Table (1).

Table 1
Description of Variables

Variable Name	Definitions
PMAR	Ratio of Banks' Profit to Earning Assets
CA	Ratio of Equity to Total Assets
LATA	Liquid Assets to Total Assets Ratio
ATMA	Ratio of Number of ATMs to Total Assets
PIPA	Ratio of Number PIN PAD to Total Assets
OBA	Ratio of Number of Online Branches to Total Assets
BCA	Ratio of Number of Branch Cards to Total Assets
POSA	Ratio of Number of POS to Totsl Assets
SBA	Ratio of Number of Swift Branches to Total Assets
ST	Stock Market Price Growth Rate
EXR	Foreign Exchange Rate

Note: Digits 1 added to the dependent variable denote the first lag of the variable.

E-banking summary statistics are shown in Table (2) which includes the mean, maximum, minimum, and standard deviation of ATMs and Pin Pads' transactions on total assets ratio, as well as the share of online branches and branch cards on total assets. While the average of Profit Margin Ratio (PMAR) indicates a positive yield, the higher PMAR illustrates higher

revenue-assets ratio and consequently assets return. The higher average ratio of branch cards highlights the customers' behavioral pivot from ATM, Pin Pad, and online branches towards the promoted-virtual payments via POS and wallet instruments.

Table 2
Summary Statistics

variable	Min	Max	Mean	Std.Dev.
PMAR	-0.07	0.14	0.02	0.03
LATA	0	0.72	0.14	0.12
ATMA	0	0.16	0.02	0.02
PIPA	0	0.39	0.04	0.07
OBA	0	0.09	0.01	0.02
BCA	0	727.23	95.2	149.5

Source: Research Findings.

The correlation matrix highlights the linear association among E-banking and performance variables. Table (3) indicates low correlation between two sets of explanatory variables including E-banking indicators and banks' performance variables. It is evidently observed that the E-payment drivers are strongly correlated because of the supplementary features. Besides, the banks financial indicators' correlation confirms, for instance; there is a positive correlation between the profit margin and the ratio of current assets to total assets.

Table 3
Correlation Matrix

	PMAR	LATA	ATMA	PIPA	OBA	BCA
PMAR	1					
LATA	0.55	1				
ATMA	-0.31	-0.14	1			
PIPA	-0.29	-0.18	0.9	1		
OBA	-0.32	-0.21	0.83	0.84	1	
BCA	-0.31	-0.14	0.89	0.76	0.69	1

Source: Research Findings.

6 Model Estimation Results

The results indicate that the ratio of ATMs and Electronic Cards transactions to banks' assets negatively-significantly influence the profitability as its shown in Table (4) mainly because of high substitution ratio with the other payment

instruments and maintenance cost. The ratio of online branch transactions to the banks' assets negatively-insignificantly affects the profitability owing to the rapid increase in the NPLs and loan/loss expenses which has consequently shrunk Shared Revenues over the past 10 years. Accordingly, a set of bank products which are functionally supplied at the counter of online branches would considerably grow maintenance and consequently branch cost. Meanwhile, given the fact that the Pin Pads transactions are technically terminated at the branch counters, the branches should face overheads which mitigate profit margin through higher operational costs. SWIFT-branches have positively-significantly enhanced the banks internal-secured cash flow while simultaneously improved fund efficiency, banks' services fees, and ultimately profit margin.

In this regard, the impact of stock price index and nominal exchange rate reduce the profit margin in accordance with the empirical evidence (Bastanzad et. al., 2015) due to the positive impact of financial market flourishing on the opportunity cost of loan reimbursement, deposit composition, and consequently an increase in the NPLs ratio. In other words, an increase in the stock price index negatively exacerbates macroeconomic flow of funds while surging NPLs ratio and loan/loss expenses which consequently diminish profit margin. Nonetheless, exchange rate depreciation weakens profit margin as well due to positive impact of exchange rate depreciation on NPLs, loan/loss expenses, and subsequently higher provision requirement. In this regard, banks should be mandatorily committed to surge provisions as a buffer to confront the economic downturn in the real sectors, a dip at the stock market price, or depreciation at the foreign exchange market. The Sargan test does not approve over-identification hypothesis which simultaneously enhances the reliability of the instrument variables as well.

Table 4
Arellano-Bond Dynamic Panel Estimation Results

pmar	Coef.	Std. Err.	z	p>|z|	[95% Conf. Interval]	
Pmar	0.52	0.09	5.34	0.000	0.33	0.71
L1.						
Ca	0.04	0.03	1.21	0.22	-0.02	0.10
Lata	0.15***	0.05	2.90	0.004	0.05	0.26
Sba	0.24***	0.08	2.99	0.003	8.29	0.39
Atma	-0.68**	0.31	-2.18	0.029	-1.30	-0.07
Pipa	0.12	0.11	1.06	0.29	-0.10	0.34
Oba	-0.1	0.41	-0.26	0.79	-0.91	0.69
Bca	-0.0003	0.0003	-0.97	0.33	-0.0001	0.0003
Posa	0.002	0.002	1.13	0.25	-0.0001	0.006
St	-0.0007**	0.003	-2.10	0.03	-0.0001	-0.005
Exr	-0.0001	0.004	-0.27	0.78	-0.0001	0.0007
Cons.	-0.02*	0.012	-1.67	0.09	-0.04	0.003

Note: Standard errors in parentheses; the significant parameters are indicated as such with ***, **, * indicate significance at 1%, 5% and 10% levels. *Source:* authors' calculations

7 Conclusions

The recent electronic and communication technological development enhances banking business environment and augments banking services which has simultaneously led to an expansion in the virtual financial transactions in order to restructure banks/customers' relationships. Electronic banking which is empirically supported by the Internet, the World Wide Web development, and technological advances, is considered as a new innovation in banking industry to speed up financial and banking transactions, and to diversify banks' products. Besides, Near Field Communication development accelerates the E-banking development through synchronizing Internet with payment tools such as online branches, ATM, Telephone, Mobile, POS, SWIFT-Branches, PinPad, kiosk, television-based platforms, personal digital assistant (PDA), and virtual teller machines (VTMs) in both developed and developing economies despite the significant global digital gap. E-banking development has also been associated with an improvement in banking pillars including ratifying a new consistent set of prudential regulations, upgrading the supervisory measures, developing risk management principles, restructuring banks service framework as well as introducing the new-augmented business models. Accordingly, E-banking which is noticeably carried out by different sorts of tools has been constantly streamlining the communication network among market agents, customers and credit institutions at the competitive business industry while consequently allows individual banks to access the new opportunities and geographical horizons. Furthermore, E-banking delivers a new set of services to achieve the modern

financial development via facilitating domestic and overseas wireless transactions in the context of corporate banking, commercial banking, investment banking, retail banking, specialized banking, development banking.

Electronic banking has considerably accelerated Iranian banking transactions, as the value of transactions boosted to 1183 billion USD by 10.2 percent constant annual growth during 2011-17. The ratio of E-banking transactions to GDP reaches 298 percent as a record in 2017, which ironically led to an improvement in GDP growth as well. The ratio of E-banking transactions to broad money likewise rose to 296 percent in 2017 which underscores the penetration of E-payment in the social and economic environment. Accordingly, the ATM as a user-friendly vehicle of the annual banking transactions mounted to 65.3 thousand-trillion Rials in 2017 which expresses both the increasing role of virtual transactions and diminishing role of branches in the E-banking.

The findings highlight that the ratio of ATMs and Electronic Cards transactions to banks' assets negatively-significantly influence the profitability due to higher substitution ratio with the other payment instruments and higher maintenance cost. The ratio of online branch transactions to the banks' assets negatively-insignificantly affects the profitability due to the rapid increase in the NPLs and loan/loss expenses which has consequently shrunk Shared Revenues over the past 10 years. SWIFT-branches have positively-significantly enhanced the banks internal-secured cash flow while simultaneously improved fund efficiency, banks' services fees, and ultimately profit margin. Moreover, an increase in the stock price index worsens flow of funds while surging NPLs ratio and loan/loss expenses which consequently diminish profit margin. Exchange rate depreciation weakens profit margin as well due to positive impact of exchange rate depreciation on NPLs, and loan/loss expenses, and subsequently higher provision requirement.

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