NEAR EAST UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF BANKING AND FINANCE
BANKING AND ACCOUNTING PROGRAM

THE EFFECTS OF E-BANKING ON THE FINANCIAL PERFORMANCE BANKS IN TURKEY

DLOVAN WIRYA CHAQMAKHCHI

MASTER'S THESIS

NICOSIA

2018

NEAR EAST UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF BANKING AND FINANCE
BANKING AND ACCOUNTING PROGRAM

THE EFFECTS OF E-BANKING ON THE FINANCIAL PERFORMANCE OF BANKS IN TURKEY

DLOVAN WIRYA CHAQMAKHCHI

20175042

MASTER'S THESIS

THESIS SUPERVISOR
Assist. Prof. Dr. Nil GÜNSEL REŞATOĞLU

NICOSIA

2018

ACCEPTANCE/APPROVAL

We as the jury members certify the "Effects of E-banking on the Financial Performance of Banks in Turkey" prepared by Dlovan Wirya Chaqmakhchi defended on 14 November 2018 has been found satisfactory for the award of degree of Master.

JURY MEMBERS

……..

Assist. Prof. Dr. Nil GÜNSEL REŞATOĞLU (Supervisor)
Near East University
Faculty of Economics and Administrative/Department of Banking and Finance

……..

Assist. Prof. Dr. Behiye Tüzel ÇAVUŞOĞLU (Head of Jury)
Near East University
Faculty of Economics and Administrative/Department of Economics

……

Assoc. Prof. Dr. Aliya IŞIKSAL
Near East University
Faculty of Economics and Administrative/Department of Banking and Accounting

……

Prof. Dr. Mustafa Sağsan
Graduate School of Social Sciences
Director

DECLARATION

I Dlovan Wirya Chaqmakhchi hereby declare that this dissertation entitled "effects of e-banking on the financial performance of Turkish privately owned commercial banks" has been prepared myself under the guidance and supervision of "**Assist. Prof. Dr. Nil GÜNSEL REŞATOĞLU"** in partial fulfilment of The Near East University, Graduate School of Social Sciences regulations and does not to the best of my knowledge breach any Law of Copyrights and has been tested for plagiarism and a copy of the result can be found in the Thesis.

- The full extent of my Thesis can be accessible from anywhere.
- My Thesis can only be accessible from the Near East University.
- My Thesis cannot be accessible for (2) two years. If I do not apply for extension at the end of this period, the full extent of my Thesis will be accessible from anywhere.

Date: 14 November 2018

Signature

Name, Surname: Dlovan Wirya Chaqmakhchi

DEDICATION

This study is dedicated to my parents and friends be specially my mother who have offered me with essential support and encouragement to see me through towards the accomplishment of this study.

ACKNOWLEGMENTS

I would like to express my sincere gratitude to my advisor Assist. Prof. Dr. Nil GÜNSEL REŞATOĞLU the continuous support of my master study and related research, for his endurance, inspiration, and immense knowledge. His supervision helped me in all the time of research and writing of this thesis. I could not have imagined having a better mentor for me.

ABSTRACT

THE EFFECTS OF E-BANKING ON THE FINANCIAL PERFORMANCE OF BANKS IN TURKEY

The emphasis of the study is to examine the effect of electronic banking on financial performance of commercial banks in Turkey. this follows several ideas which have shown that the adoption of e-banking does not always result in poses changes in bank performance. With a lot of contrasting ideas about the possible effects of e-banking and numerous changes taking place in the Turkish banking sector, it remained important that such a study be undertaken. As a result, panel data collected from 6 of the 9 Turkish privately owned commercial banks in Turkey using data from the third quarter of 2014 to the second half of 2018. Panel regression model estimation was conducted and the results from the study showed that an increase in the number of active customers using internet banking and amount of loans given to bank customers has a positive effect on bank performance. The results also showed that bank size is inversely related bank performance. The results also established that an increase in banks deposits does not always lead to an improvement in bank performance. Recommendations were made that bank managers to come up with better liquidity and asset management practices.

Keywords: Adoption, bank deposits, bank loans, bank performance, bank size, e-banking, internet banking, liquid assets, active customers using internet banking.

ŐZ

TÜRKİYE'DE BANKALARIN MALİ PERFORMANSI ÜZERİNE E-BANKACILIK ETKİLERİ

Çalışmanın vurgusu Türkiye'deki ticari bankaların finansal performansı üzerindeki elektronik bankacılık etkisini incelemektir. Bu e-bankacılık benimsenmesi daima banka performansında pozlar değişikliklere neden olmadığını göstermiştir çeşitli fikirler izler. E-bankacılık ve Türk bankacılık sektöründe yaşanan sayısız değişikliklerin olası etkileri konusunda fikir zıt bir sürü ile, böyle bir çalışma gerçekleştirilecektir önemlidir kalmıştır. Sonuç olarak, panel veri yürütülmüştür 2018 Panel regresyon modeli tahmin ikinci yarısına 2014 yılının üçüncü çeyreğinde verileri kullanılarak Türkiye'de 9 Türk özel sektöre ait ticari bankaların 6'dan toplanır ve çalışma sonuçları bir ekonomik olduğunu gösterdi performans ve internet bankacılığını kullanan aktif müşteri sayısında artış ve banka mevduat düzeyi banka performansı üzerinde olumlu bir etkiye sahiptir. Sonuçlar ayrıca, bankaların likit varlık ve kredilerin artış daima banka performansında bir gelişmeye yol açmaz kurdu. Öneriler banka yöneticilerinin daha iyi likidite ve varlık yönetimi uygulamaları ile gelip o yapılmıştır. Ayrıca, parasal yetkililerin ekonomik büyüme ve gelişmesinde ekonomik bir artış teşvik politikaları ile gelip teşvik edildi.

Anahtar Kelimeler: Evlat edinme, banka mevduatları, banka kredileri, banka performansı, e-bankacılık, ekonomik büyüme, enflasyon, internet bankacılığı, likit varlıklar, internet bankacılığını kullanan aktif müşteri.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

ATM: Automated Teller Machine

ATM: Automated Teller Machine

BAT: Bankers Association of Turkey

CBT: Central Bank of Turkey

BD: Bank Deposits

EFT: Electronic Funds Transfers

FDI: Foreign Direct Investment

FEM: Fixed effect Model

GDP: Gross Domestic Product

ICT: Information Communications Technology

ISPA: Investment Support and Promotion Agency

LA: Liquid assets

REM: Random Effect Model

ROA: Return on Assets

ROE: Return on Equity

TAM: Technology Acceptance Model

TITB: Total Investment Towards Internet Banking

TPCB: Telephone and Personal Computer Banking

TRA: Theory of Reasoned Action

INTRODUCTION

There are a lot of technological and informational changes that have been observed in the world. Such changes have marked a period of technological revolution in the financial sector. Such developments have managed to pose significant social and economic changes (Siam, 2012). Of notable effect is banking and considerations were made that technological and informational have greatly altered the banking landscape (Aduda & Kingoo, 2012). In any environment where most consumers have lost trust in financial institutions' ability to deliver quality services and honour their obligations, innovation can help restore consumer confidence in the banking sector. This follows ideas which can be made that innovative measures such as e-banking help to improve serviced quality. Hence, if banks are to attract a huge number of customers and motivate them to engage their services, them investment in e-banking becomes of the key strategies that can be used to bring into manifestation the desired goals. It is also important to note that efforts to diversify bank operations and services can be enhanced through the use of e-banking. This normally works to deal with potential risks affecting the financial systems and diversify in other markets and services.

Meanwhile, the modern economic environment is now being characterised by a lot of changes and complexities which are compounding competitive pressure on banks. With the problem of information asymmetry and increasing operational costs, it becomes imperative that banks engage in innovative measures to boost performance. This also requires that e-commerce and or e-finance be used to offer a wide range of products and services (Stevens, 2002). With an increase in stiff banking conditions and challenges, banks must therefore innovate their operations and service delivery. Innovative measures such as e-banking will therefore help to stir the bank towards the desired path. Such abilities help to ensure that the domestic economy matches international financial standards and requirements to facilitate international transactions. More so, this position domestic economies in a better position to benefit from increased globalisation. This also extends to include dealing with competitive pressure on both domestic and international scale. Also, considerations can be made that e-banking improves the operational capacity of the

bank as it will be able to service a huge number of people in different locations at the same.

On the other hand, it is important to note that the number of financial institutions offering e-banking services especially on the internet, has increased dramatically (Sumra et al., 2011). Thus, innovative measures such as e-banking can be said to have resulted in major operational changes in the banking sector. Furthermore, one can also contend that e-banking has positive impact on bank competitiveness and competencies. However, changes in e-banking have been taking vast different forms and includes activities such as credit cards systems, online statements, online bill payment systems, account to account transfer, electronic funds transfer, ATMs, mobile and PC banking. E-banking has brought so many changes and these changes have caused other non-financial service providers such as retailers and manufacturers to benefit as well. This is because consumers can now afford to buy things online using systems that connect all the transactions to their banks. Banking activities are slowly changing and turning into branchless banking system with the increased usage of e-banking services. This is mainly because e-banking is at the heart of banking convenience, time and cost effectiveness (Nyangosi et al., 2009).

Despite arguments that can be given that e-banking positively impacts bank performance, there are arguments which contend that the opposite is true (Kegan et al., 2005). This follows observations made which showed that the economic conditions such as economic growth play a vital role in determining the effective use of e-banking (Sumra, Manzoor & Abass, 2011). Moreover, economic problems such as the increasing high number of consumers failing to repay their bank loans have not been fully incorporated into examining how they can influence the interaction between e-banking and bank performance. Also, there exist unclarified arguments that bank specific factors especially liquidity and bank deposits, have a huge implication on the adoption of e-banking. This study therefore, seeks to clarify how these factors or elements influence the interaction or impact of e-banking on bank performance.

The main objective of the study is to examine the effects of e-banking on the financial performance of banks. The study also looks at the extent to which banks in Turkey have embraced e-banking. Attention will also be shifted towards examine how economic growth, bank loans, bank deposits, liquid assets and the number of active customers using internet banking influence the bank performance. Lastly, the study seeks to offer relevant recommendations on how to boost the adoption of e-banking and improve bank performance.

Expectations are that this study will be in a strong position to offer suggestions that will aid in identifying challenges undermining both the adoption and usage of e-banking; the nature of the effectiveness of the financial setting under which banks are using e-banking and suggest the best possible policy implications. The study also helps to outline key macroeconomic and financial practices implemented in Turkey and how they have managed to foster financial development and innovation. Efforts will also be centred on the need to stimulate consumers' interests towards using internet banking and improving the quality of life of members of the society.

It is worthy to note that sound banking performance is always needed in any financial system. This can be made possible by identifying problems affecting bank performance and coming up with possible measures to boost bank performance. Hence, this study will aid in coming up identifying problems affecting bank performance and suggesting possible measures to boost bank performance. This study will go a long way in assisting governments in coming up with policies that will help create a conducive atmosphere for improving promoting consumer habits and internet penetration which lead to increased e-banking adoption and usage. As a result, growth in e-commerce can be attained. In addition, this study will also result in the formulation of economic growth and financial development policies that will foster innovation, growth and development of the financial system. Academic scholars can also build on this study to conduct a similar research in other countries.

The study is structured into five chapters and the first chapters focuses on providing theoretical and empirical foundations on e-banking trends and development and how they affect bank performance. The second chapter is centred at providing an

overview of the Turkish economy and conduct a banking sector analysis. Details pertaining to the research design, used variables and data sources are provided in the third chapter. An analysis of the obtained findings is made in the fourth chapter while the fifth chapter looks at conclusions, recommendations and suggestions for future studies.

CHAPTER 1

LITERATURE REVIEW

1.1 Insights on e-banking, e-channels and e-finance

E-banking can be defined as the use of electronic means such as the internet to conduct financial transactions (Onay, 2008). E-banking developments can be highly linked to banking channels and one can contend that e-banking helps to distinguish one delivery channel from the other. For instance, there has been a significant shift from single banking channels to multi-channels, then from multi-channels to cross channels and then from cross-channels to omni-channels where consumers have access to mobile, ADS, the WEB and bank branches as delivery channels (Kegan et al., 2005).

E-channels can be defined as the use of electronic means to deliver financial services (Dannenberg & Kellner, 1998). Such electronic means extends to include the use of the internet, telephone and computers. Both e-banking and e-channels are strongly linked to the need to attain banking effectiveness and efficiency in service delivery (Aduda & Kingoo, 2012). The notable change brought by e-banking and improvements in e-channels is service quality and consumers can now access quality banking services (Sumra, Manzoor & Abass, 2011).

E-finance on the other hand, relates to the provision of financial services using electronic means such as ATMs, credit card etc, (Legris, Ingham & Collerette, 2003). Both e-banking, e-channels and e-finance are strongly inter-twined together and it is impossible to separate them. They however, serve an import ant purpose in the banking sector and represent major form of financial innovation.

Much of the e-banking services that are now being availed in today's financial sector can be linked to major internet developments observed over the past two centuries. This follows observations made that the internet makes it possible to for individuals, communities, employees, suppliers, customers and business entities to communicate with each other and acquire information fast at relatively cheaper price (Nyangosi et al., 2009). Aduda and Kingoo (2012) outlined that internet developments have positive implications in terms of increased efficiency, economies of scale, less overheads and reduced cost. These developments are of significant important in the banking sector as they help both small and large banks to attain operational efficiency and lower operational costs.

1.2 Theoretical Insights

There are basically four theories that can be used to offer explanations about the effects of e-banking on the financial performance of Turkish privately-owned commercial banks and these are the technology acceptance model, innovation diffusion theory, the theory of financial intermediation and the institutional theory. All these theories help to offer insights about why individuals like to use certain e-banking services as opposed to other banks, and what factors should be considered by banks before adopting e-banking services (TAM) and how information seeking behaviour and uncertainty will influence the use of e-banking in improving bank performance (innovation diffusion theory).

1.2.1 Technology acceptance model (TAM)

In this study, reference can be made from the technology acceptance to offer explanations about how the use of e-banking will affect bank performance. This is mainly because TAM helps to explain how people react to changes in information and technology. This is also supported by ideas which have shown that TAM is a notable improvement to the theory of reasoned action (TRA), (Legris, Ingham &

Collerette, 2003). In other words, TAM can be said to be a powerful tool that explains why individuals like or dislike the use of information communications technology (ICT) by using their sense of reasoning.

According to Davis (1989) who developed the TAM, there are external elements which interfere with the way people react to ICT and these elements tends to pose effects on ICT users' intention to use, attitude and belief. Most importantly is how individuals consider the use of ICT will ease their responsibilities and will remain useful in fulfilling their desires. This can also be supported by ideas which have shown that the TAM considers that the use of technology is as a result of direct and indirect factors which include among others, perceived ease, perceived usefulness, attitude and behavioural intentions (Malhotra & Singh, 2009). This therefore implies that the greater the level of perception about how ease and useful the technology will be, the more individuals will begin to use that technology. In this, perceptions are also related to attitude, that is, the more and favourably a person perceive how ease and useful the technology will be, the positive will be the attitude towards the use of that technology. Hence, the intention to use the related technology will also be highly linked to the way an individual perceive about the easiness and usefulness of the technology, the more positive his attitude and intention to use the technology will be.

Propositions made by the Tam also suggest that there is a difference between intention to use and actual use (Davis, 1989). But the most notable thing is that both the intention to use and actual use are both affected by external factors.

In this study, it can be noted that bank customers' intention to use and actual usage of technology will be different and that banks that can successfully convince their customers to use e-banking will be in a strong position to make more profits. This will mainly be in the form of service fees levied on the use of e-banking services and increased banking activities. In conclusion, the acceptance of internet banking can thus be reflected by the number of active customers using internet banking. Using ideas given by Kiragu (2017) and Malhotra and Singh (2009), it can thus be established that the acceptance of internet banking by bank customers results in an increase in the volume of internet banking transactions and service fees charged on the use of internet banking services. An increase in the volume of internet banking

transactions and service fees charged on the use of internet banking services have a positive influence on banking performance.

1.2.2 Innovation diffusion theory

According to Rogers (1995), the development of new technology is a form of innovativeness which serves to improve the lives of its potential adopters. In other words, this theory contends that any object, practice or idea that is new is a form of innovativeness to its potential adopters. The innovation diffusion theory also assumes that the diffusion of innovation is based on the availability of information and that such information tends to diffuse in the society (Bahia, 2007). That is, consumers are on the other hand will seek information about the available form of innovation, its features, costs and benefits before they start using it. The decision to use the technology will thus be based on the adopters' costs-benefit analysis. Meaning that the expected benefits of using the introduced form of innovation must be greater than the costs if adopters are to use the introduced form of innovation. In addition, this theory also considers that innovation is always associated with a lot of uncertainties and that such uncertainties will have an effect on the potential adopters (Okiro & Ndungu, 2013)

The problem of uncertainty is what forces consumers to seek information so as be informed of the potential benefits and costs associated with the new innovation. It is from this assessment that individual beliefs and actual usage of the new innovation will be based.

Meanwhile, this theory also offers explanations as to how new innovation is mostly like to diffuse within a society (Meute, 2010). The diffusion of innovation is further presumed not to be following any other pattern other than an S-shaped pattern (Rogers (1995). This S-shaped pattern is often used to categorise adopters into groups of different types of innovation adopters. This categorisation implies that there are different types of innovation adopters and that their time of adoption varies from one group to the other. One of the notable group of adopters is early adopters which are a group of people who adopts technology and innovation at their early stages of introduction. As a result, these groups of adopters result in the establishment of possible factors explaining changes in innovation adoption behaviour. For instance, Muriuki (2009) asserts that people may adopt innovation

differently and at different stages in time because of their communication behaviours, personality characteristics and socioeconomic status. Any improvement in one of these factors is assumed to cause an increase in the innovation adoption rate (Rogers, 1995).

Challenges however, lie is what the theory contends as early adopters and the rest of the adopters. This is because there have been mixed outcomes concerning efforts to prove the existence of early adopters and other studies argue against this view (Brancheau & Wetherbe, 1990; Burkhardt & Brass, 1990). Such an ability to separate the two, also lies on the extent to which one can consider it as practical or to the extent to which empirical supported can be provided. But Rogers (1995) insisted that early adopters have an influence on other potential adopters to adopt the new innovation. This theory however, applies a lot in as far as the need to seek information about the potential benefits and costs associated with a particular innovation and uncertainty are concerned. Hence, it can be used to offer explanations as to how information seeking behaviour and uncertainty will influence the use of e-banking in improving bank performance. This is important because managers will be in a position to specifically implement the new innovation appropriately.

This theory also implies that technological innovativeness plays a key role towards influencing bank performance and that banks should innovate their operations so as to ease consumers life and activities. Hence, it is only beneficial innovativeness that consumers will adopt in relation to its easiness and usefulness. Thus, easiness and usefulness of e-banking should be a pillar upon which banks should centre their e-banking focus and improvements in performance will automatically change once these aspects are addressed. The innovation diffusion theory also poses positive implications on bank performance through an increase in the number of active customers using internet banking. In this case, diffusion innovation in the form of internet banking can be said to aid feasibility, convenience and efficiency in the use of internet banking. Hence, as internet banking diffuses through the entire banking sector, the number of active customers using internet banking is expected to rise. This will have an expected positive impact on bank performance ((Kiragu, 2017; Malhotra & Singh, 2009).

1.3 Definition and forms of electronic banking

Electronic banking otherwise known as e-banking refers to the ways and processes through which transactions are electronically conducted (Ombati et al, 2011). From this definition, it can be observed that there is a strong linkage that exists between e-banking and internet banking as internet banking is often classified as e-banking. Notable examples of e-banking include electronic funds transfers, mobile phone banking, use of plastic money, telephone banking and the use of ATMs. E-banking can assume a lot of different forms and the well-known e-banking forms are;

1.3.1 Automated Teller Machine (ATMs)

Flitch (2000) considers ATMs as machines that are used for conducting monetary transactions in the form of cash using an ATM card and can issue a receipt. The ATM is linked to a customer's bank account and customers can use them to check account balances, make payments, deposit funds and withdraw funds. Banks make profits on ATMs as they levy fees on the usage of ATMs and this contributes towards improving the financial performance of the bank.

Cracknell (2004) also suggested that the introduction of ATMs has managed to save banks by helping them cut on costs. This is because the usage of ATMs does not require more employees to manage them and most people will have little or no need to visit bank branches. Moreover, ATMs can be strategically positioned in a lot of areas and thus improving consumer access to banking services. Insights obtained from the work by Flitch (2000) has shown that the use of ATMs contributes towards improving operational capacity and reaching new and more markets at the same time.

Moreover, the usage of ATMs is considered to have significantly improved bank performance following the reduction in the price and costs of ATMs (Cracknell, 2004). In addition, potential increases in the demand for banking services is more likely to be met by an increase in the availability of e-banking services such as ATMs. Hence, it is worthy to conclude in regards to the use of ATMs that ATMs result in favourable effect towards cutting down costs, servicing a huge number of people at the same time and improving income streams.

1.3.2 Telephone and personal computer banking

According to ideas by Ovia (2001) telephone and personal computer banking (TPCB) is a service that allows bank customers to communicate with their respective banks by making telephone calls to the bank using specific codes that are assigned to each individual customer. TPCB also allows customers to get access to their credit card payment details, account transactions, funds transfer and check their account balances. Shittu (2010) contends that the main advantage of TPCB is that it is considered to be bring banking to consumers' proximity since it relies on text to text speech and interactive voice response and does not rely on physical location.

1.3.3 Mobile banking

The use of a combination of a personal digital assistant and mobile telecommunication devices to perform credit transactions, payments, account transactions and check account balances and other banking transactions is what is termed mobile banking. Muriuki (2009) established that the use of mobile banking applications is mainly concerned with three important aspects of mobile financial information services, mobile brokerage and mobile accounting. Furthermore, Muriuki (2009) also contends that there is a significant growth in both the development and use of mobile banking applications with more than 2 in every 5 people having access to mobile banking (Muriuki, 2009).

Mobile banking has resulted in a significant improvement in convenience in banking and this has also extended to include beneficial effects on banks. Its development has also necessitated the development and use of other services such as virtual bank accounts and consumers can access their accounts through text messages. Nowadays, consumers are no capable of trading stock online, get access to other financial information online and transfer funds online whilst at home or travelling and such developments are increasingly becoming beneficial (Meute, 2010),

With the increased globalisation levels, it becomes apparent and beneficial for both consumers and banks to make use of mobile banking as it results in a reduction in costs, saves time and offers a lot of convenience and flexibility. Mobile banking is thus a form of innovation that allows banks will notably be in a strong position to deliver a wide range of services through the use of mobile banking applications.

Muriuki (2009) established that there is a positive relationship that exists between the use of mobile banking applications and bank performance.

1.3.4 Electronic funds transfers

Bahia (2007) defined electronic funds transfer (EFT) as the use of computer-based systems to transfer of money from one account to another across multiple institutions or either within a single financial institution. There are various ways EFT can be conducted and these include the use of point-of-sale (POS), ATM and credit cards, and electronic terminals. Retailers and other non-financial institutions have bene benefited a lot from EFT as it has facilitated the payment of transactions such as bills and online purchases. But the notable thing is that it can be applauded for it its improved security, simplified bookkeeping, increased efficiency and lower administrative costs. But the extent to which banks will benefit from this service relies to greater extent on the number of customers using this facility as well as the volume of transactions conducted. increased efficiency, simplified bookkeeping, and greater security. Just like any other e-banking facility, EFT will poise positive effects on bank performance through increased transaction volume and service fees.

1.3.5 Self-service banking

This is a self-service facility that is offered to small business owners and consumers so as to allow them to undertake normal day to day activities using WIFI and telephone connections. This is mainly advantageous to consumers because it allows them to enjoy banking convenience as they can buy and sell securities, check balances, pay bills and move money between accounts (Malhotra & Singh, 2009).

1.3.6 POS Banking (credit and debit cards)

These are computer systems that are situated at sales points to capture transactions that are linked to a bank account (Gerlach, 2000). POS are widely used by consumers when making retail payments but can also be said to be a substitute of cash payments as well as a means of transferring funds (Oshikoya, 2007). POS is facilitated by the use of credit and debit cards of the consumer. The transaction will be credited against the consumer’s account and debited into the retailer’s account. POS are advantageous in the sense that they are fast and convenient to customers.

1.3.7 Internet banking

Internet banking is a form of banking whereby banking transactions are conducted through the use of an internet connection that is linked to a computer system (Egland et al., 2008). Internet banking can be used for a variety of purposes such as buying certificates of deposit and financial instruments, paying mortgages, checking account balances, paying bills and transferring funds. Just like any other e-banking facility, internet banking is fast and convenient (Gerlach, 2000). But the problem lies in ensuring that online transactions are carried out in a secure manner. Bank customers stand a risk to lose all the money through internet scams, this is one of the major reasons and risks as to why some bank customer may be reluctant to adopt e-banking.

1.3.8 Interactive TV banking

TV-banking involves the use of television sets to interact with bank customers. Vila et al. (2013), established that TV-banking is not of the most viable e-banking channel. Also, it can be used for quite a number of platforms and on different banking applications and activities such as paying bills, teleshopping and other T-Commerce activities.

1.3.9 Branchless banking

A significant number of banks are slowly changing into branchless banks. This is because most of the banking activities are now being done outside banking halls at the comfort of customers' homes or in any public place (Siam, 2006). It is important to note that branchless does not take-out the importance of customers visiting their bank branches. This is because some customers still prefer to use traditional banking channels which are associated with proof of making transaction, security and trust (Kariuki, 2005). Notable examples of branchless banking include the use of mobile phones, POS devices, ATMs and the internet. All these aspects serve as delivery channels and are meant to foster improvements in service delivery (Jean-Azam, 2006). These channels are also designed in a manner that makes it easy for banks to combine them with other distribution channels (Oshikoya, 2007). In Turkey, banks like Ziraat bank and other commercial banks in Turkey have a wide range of services that are linked to the use of mobile phones, EFTPOS and POS devices, POS and ATMs.

1.4 Benefits and challenges of adoption of e-banking

Foremost, it must be noted that e-banking does not only benefit banks but also allows consumers to benefit a lot from the use of banking services. Thus, efforts to examine who benefits from the adoption of internet banking will hinge on the perspective from which one is looking from. However, much of the effort in this study will be based on the banks' perspective.

One of the ways banks can benefit from e-banking is through increased servicing capacity (Okiro & Ndungu, 2013). That is, the ability to service a high number of customers over a short period of time. This is mainly because e-banking allows banks to reach more people in different areas and different times of the day and this becomes one of the key ways, banks can use to counter competitive pressure.

Secondly, the adoption of e-banking allows banks to conduct what is known as geographical penetration and diversification. Banks will be in a position to service other markets which are beyond its geographical reach. More so, e-banking makes it easy for banks to introduce other financial services which makes it easy for them to hedge against the risk of other services failing.

Thirdly, e-banking can be associated with flexibility, convenience and efficiency. This is because customers will be in a position to undertake financial transactions at any point of time and place irrespective of the time of the day (Bahia, 2007).

Fourthly, Meute (2010) considers that e-banking enables banks to respond fast to consumers' needs and queries. As a result, banks which offer e-banking services can be considered to be highly responsive to consumers' needs and wants and are often innovative banking leaders.

Fifthly, Okiro and Ndungu (2013) asserts that e-banking is advantageous to banks as it allows them to cut on costs such as rent, wages and salaries. Banking costs are one of the key challenges undermining bank performance and banks that are capable of reducing costs are in a good position to reap from the market. Hence, e-banking can be regarded as an avenue that allows banks to cut on costs, make more profits and expand operations.

Lastly, one can point out that e-banking offer potential revenue growth benefits to banks (Muriuki, 2009). This is mainly because banks will be in a position to levy charges on the use of e-banking services. As a result, banks will make more profits with each increased usage and volume in e-banking services as well as number of consumers using e-banking.

Despite all these benefits, it must be pointed out that e-banking has potential negative effects on banks and that its ability to offer beneficial effects on banks is subject to conditions. For instance, the use of high services fees can actually trigger an increase in operational costs which can reduce profitability levels. Also, skilled and qualified staff are required to run e-banking facilities and instead of cutting on wages and salaries, this can actually trigger a rise in employment costs as more wages and salaries are paid out to employees to run and maintain e-banking services (Ombati et al., 2011).

When it comes to the conditions that govern the effectiveness of e-banking, it is apparent that consumers attitude have a strong implication on this. This is because consumers attitude will make a huge difference between the intention to use and actual usage of e-banking as postulated by the diffusion theory (Rogers, 1995).

The quality of the available ICT infrastructure also serves as an important factor to consider. It must be noted that banks that do not have high quality ICT infrastructure may not be able to benefit from the use of e-banking services. This can actually prove to be frustrating to consumers and cause the banks to lose customers to other banks with high quality ICT infrastructure (Ombati et al 2011).

On the other hand, the responsiveness of consumers to e-banking is also important. In some cases, consumers are slow to respond to the introduction of e-banking services as they will be seeking information on the potential benefits, risks and costs of adopting the newly introduced form of innovation (Malhotra & Singh, 2009). It is during this period that operational costs will tend to be high as banks wait on customers to increase their adoption and usage of the newly introduced e-banking service.

There are also demographic factors which come into play in influencing the effects of e-banking on banks. Onay (2008) contends that things such as gender and level of education relatively influence the usage of e-banking by consumers. This implies that

the more educated the people are and the more positive and less bias the social system is to a particular race; the more people will use e-banking services. But this is not always the case as some people are not well educated to use e-banking services and some only confine e-banking services to male activities (Sumra, Manzoor & Abass, 2011)

From this analysis, it becomes important to note and consider that banks need to consider of all these benefits, challenges and conditions if they are to fully benefit from e-banking. But as it stands, e-banking can be said to be having positive effects on the financial performance of banks.

1.5 Risks of electronic banking

The banking sector has never been spared from risks and it continues to face a significant number of risks. With facilities such as e-banking being offered, it becomes clear that banks will have to battle an increased level of risks. One of the risks that affects banks is operational risk. There is always a risk that banks will fail especially with economic misfortunes such as financial and economic crisis, banks usually struggle to contain operational risks (Aduda & Kingoo, 2012). Most banks have been forced to liquidate as a result of operational risks. The International Monetary Fund (2002) even consider it a must that banks be in possession of sound operational and risks management strategies to deal with potential banking risks.

Security risk can also not be ignored when looking at banking risks. This is because the use of e-banking exposes consumers to banking scams (Al-Smadi & Al-Wabel, 2011). Consumers are often reluctant to use e-banking services mainly because of the fear of losing money. This is high especially with observations being made that there are now a lot of scammers and fake sites around (Ombati et al 2011).

Reputational risk is also another risk to consider and this is because systems disruptions and breaches of security can affect a bank's reputation. These risks are highly linked to the extent to which a bank relies on the use of e-banking services. That is, the more a bank relies on electronic delivery channels, the greater the potential for reputational risks. Bank customers can lose trust and confidence in the bank in the case that continuous disruptions have been encountered and are

experiencing a lot of e-banking deficiencies (Al-Smadi & Al-Wabel, 2011). These issues can also extend to affect other electronic banking users.

Thus, Carlson and Lang (2001) contends that it is important that banks have effective supervisory systems that monitor banking risks. The International Monetary Fund (2017) also highlighted that banks need to proper risks management strategies to counter all possible risks threatening them. This also extends to include liquidity and interest risks. Other risks management measures can include the implementation of BASEL accord and imposition of minimum capital requirements (Ombati et al 2011).

1.6 The notion of bank performance

In the context of banking, performance is composed of a wider number of indicators and there are basically three widely known and used bank performance indicators. The first indicator relates to return on assets (ROA) which indicates how we'll bank managers are using the bank's assets (Oshikoya, 2007). A high ROA is preferable to a lower ROA because it shows that banks mangers are employing effective means towards generating more returns from the use of the bank's assets.

The other indicator is return on equity (ROE) which provides an indication of how much equity holders will get in return for investing their capital resources in to the bank (Jean-Azam, 2006). Thus, if equity holders are to invest more funds into the bank then, a higher ROE must be attained.

Net interest margin (NIM) can also be used to measure bank performance. The use of NIM helps banks to determine how much profits they will make from interest income set against interest expenses (Kingoo, 2011). Improvements in bank performance can be observed when banks have higher NIMs

There are variations of bank performance measurement. Revell (1980) used interest margin as a performance measure for U.S. commercial banks. He defined interest margin as the difference between interest income and expense divided by total assets. Arshadi and Lawrence (1997) measured bank performance using normal

correlation analysis. Their multidimensional indexes include indexes of profitability, pricing of bank services and loan market share. Size affects the efficiency of banks. Previous research, especially in the United States, indicates that scale economies appear in small banks and not in large ones (Short, 1979; Miller & Noulas, 1996).

Irrespective of the used measure of bank performance, Miller and Noulas (2007) suggested that it is imperative to work towards ensuring that all these three indicators are simultaneously attained at all for the bank. This is because a fall in one of the indicators can actually prove to be too costly for the bank. Moreover, bank performance is tied to a number of indicators and important banking goals. Hence, it is always important to ensure that the banking sector is attaining sound performance levels. For instance, Siam (2006) established that highly performing banks are in a strong position to withstand economic hardships. This implies that banks with higher performance levels are more easily positioned to deal with things such as economic and financial crisis. Malhotra and Singh (2004), also pointed out that bank performance is important because it is directly related to bank competitiveness. This implies that better performing banks with high profit margins can easily counter competitive pressure as they will be in possession of the necessary financial resources to impalement counter competitive measures. Bank performance is also tied to bank survival, growth and development (Kariuki, 2005). It is worthy to note that efforts to devote resources towards research and development are highly determined by how much profits the bank is earning. Hence, earning more profits allows banks to engage in efforts to boost operational capacity.

E-banking poses significant effect on bank performance through increased operational capacity, improved efficiency levels and, lower costs. With the nature of e-banking and its implications., expectations can be made in line with observations made by Davenport (2003) which suggest that innovative measures will contribute towards improving bank performance.

1.7 Empirical studies on e-banking and bank performance

Malhotra and Singh (2009) focused on a sample of 85 commercial banks to examine the influence of internet banking on bank performance and risk in India over an 8-

year period to 2008. Findings established from the univariate revealed that more than half of the commercial banks is India offer Internet banking facilities. The results also show that there is a positive relationship between bank size and the ability to offer internet services. This implies that large banks are more equipped to offer internet banking services as opposed to smaller banks. The study results also revealed that there is no significant relationship between the ability to offer internet banking services and bank performance. Which implies that both smaller and large banks can enjoy a growth in performance irrespective of whether they choose to offer internet banking services or not. The results however, established that high risk profile associated with the use of internet banking hinders bank customers from using Internet banking services. Hence, expectations can thus be made that risk lowers the use of internet banking services and size does not influence the ability to offer internet banking services.

Onay (2008) based his study on how the use of internet-banking services affects bank profitability of Turkish banks. The study period ranged from 1996 to 2005 and focused on a sample of 13 banks. Return on equity (ROE) and assets (ROA) were used as measures of bank performance while explanatory variables were composed of macroeconomic and bank-specific variables. The findings showed that the relationship between internet banking and bank performance varies with the time lag under consideration. Meaning that the benefits of internet banking require a certain time frame before the actual benefits can be reaped. Furthermore, the results also showed that investment towards internet banking is continuous and banks should always expend resources towards improving internet banking facilities. This implies that the extent to which internet banking proves to be effective is determined by the made internet banking improvements made.

Sumra, Manzoor and Abass (2011) explored the relationship between e-banking and bank profitability. The study used a qualitative approach and dwelt on the examination of data collected from 12 banks in Pakistan. The results confirmed that there is a positive relationship that exists between e-banking and bank profitability. This entails that the use of internet banking by commercial banks in Turkey will boost performance. Improvements in bank performance as a result of the introduction and adoption of internet banking allow banks to meets their operational costs and requirements. The study however, suggests that demographic elements such as

literacy rates have no effect on the use of internet banking. Hence, banks are considered to continue offering internet banking facilities and services irrespective of social changes. This is relatively unrealistic as most consumers are reluctant to use technological services which they are not familiar with. Moreover, complications in the use of e-banking services can actually reducing the number of users using e-banking services.

Kegan et al. (2005) drew focus on community banks and how changes in e-banking influence the performance of banks. structural equation modelling technique was used to analyse data collected from community banks in America with assets below US$1 billion. The results are in support of the idea that banks providing internet banking services tend to enjoy from better performance levels. This implies that there is a positive relationship between bank performance and the use of e-banking services. But differences can be observed between the context in which the study was applied and if such is to be applied to Turkey, incomplete conclusions can be made. This study therefore deems it better to examine a similar situation in the context of Turkey.

Aduda and Kingoo (2012) did a study that looks at the potential effects of e-banking on bank performance in Kenya. The study used inferential and descriptive statistics to analyse the collected secondary data. The results also supported the idea that is bank performance is positively linked with improvements in e-banking. Arguments are based on observations made that e-banking improves consumers' convenience and thus causing an increase in the demand for e-banking services. Such an increase in the demand for e-banking services is considered to trigger improvements in bank performance. Arguments established in the study need to be extended to examine the same effects on commercial banks in Turkey. This can be attributed to positive developments that have been observed in Turkey which showed that there has been a substantial increase in Turkey's internet penetration rate. Such changes need to be considered if sound conclusions are to be made about the effect of e-banking on commercial banks in Turkey.

Al-Smadi and Al-Wabel (2011) also examined a similar situation but in the context of banks in Jordan over a 10-year period to 2010 using regression analysis. The study however, established that conditions under which the use of e-banking will affect

changes in bank performance. Deductions were made that the banking situation in Jordan is different. The contextual environment in which banks in Jordan are operating is was established to be having negative influence on the influence of e-banking on bank performance. This shows that only every economic environment favours a positive relationship between e-banking and bank performance. Hence, making generalisations that e-banking will have a positive effect on the performance of banks in Turkey might actually turn out to be false. Moreover, most Turkish people have embraced the use of technology and this tends to significantly influence how e-banking will impact bank performance in Turkey.

Muriuki (2009) concentrated on looking at the determinants of e-banking in Kenya. The study is based on arguments which show that factors affecting the adoption of e-banking. Descriptive analysis was employed and the results showed that perceived external, technological and organizational factors have a huge implication on the interaction between bank performance and e-banking. External elements such as globalisation have huge implications on the adoption of e-banking. This is because globalisation causes other institutions in other countries to develop their technical systems in line with globalisation trends. As a result, globalisation and the adoption of e-banking will be accompanied by increased use of newly introduced e-banking facilities by bank customers. This is results in an increase in service fees and volume of e-banking transactions leading to improved profitability. Meanwhile, technological developments reflect the need to attain improvements in banking efficiency and effectiveness. Thus, the more advanced the bank's e-banking facilities are, the greater the efficiency and effectiveness levels. Such will be reflected by positive changes in bank performance. Also, the way labour and capital resources are organised also influences the extent to which banks will adopt e-banking. This is because banks will be looking for an optimum capital to labour ratio that will maximise bank. Hence, the adoption of e-banking will be regarded as contributing towards attaining that effective and efficient capital-labour ratio that will maximise bank performance.

Ombati et al. (2010), did a study that bases its arguments that there is a positive relationship between the use of technology and service quality in Kenya's the banking sector. Pearson correlation coefficient test was used to analyse data collected from a sample of 120 banks and the results revealed that there is a positive

correlation between technological development and service quality. The results also established that there are banking dimensions which influence the interaction between technological developments and service quality in the banking sector. These service quality dimensions were identified as accurate transactions, convenience, accurate records, efficiency and security. The absence of these dimension means that banks will not be in a position to benefit from the adoption of e-banking. That is, no positive changes in bank performance can be observed so long as these service quality dimensions are absent.

Njuguna et al. (2009) did a panel analysis of banks in Kenya to examine trends observed in the adoption of e-banking. The study revealed that less than 30% of the people in Nairobi have access to e-banking services. This denotes that e-banking services have to be available in areas which they are needed most. Failure to identify areas and target group of people that need e-banking services can cause banks to lose on potential market share. In this case, the Turkish situation is characterised by a high number of people having access to e-banking. Hence, considerations can be made that Turkey is more likely to benefit from e-banking as a result of its high internet penetration and e-banking developments. Observations made from the study also revealed that changes in bank performance attributed to improvements in e-banking will vary with the business cycle stage in which the bank is in. thus, it can be concluded that banks that are in the early stages of the business cycle are less likely to benefit from e-banking as compared to those that have reached the maturity stage. The study also managed to outline that the use of e-banking is governed by conditions which must be met in order to warrant a total improvement in bank performance. These conditions were identified as trialability, visibility, risk, result demonstrability, compatibility, relative advantage, self-efficacy and perceived ease of use usefulness. However, these factors were established to be having different impacts on bank performance. Trialability, visibility and risk were considered to be having adverse effects on bank performance. On the other hand, result demonstrability, compatibility, relative advantage, self-efficacy and perceived ease of use usefulness were observed to vary with each successive change in bank performance. This greatly shows that contextual factors which influence the relationship between bank performance and e-banking in Turkey are most likely to

be different from those of other countries. Hence, it is always important to examine the influence of these factors on bank performance.

Bahia (2007), argues that E-banking has changed from solely internet based to hybrid activities. It means that the traditional banking practices are now mixed up and combined with the internet-based and online banking. There is a huge market for hybrid operating banks (traditional banks with online banking tools) for consumers. People are using the hybrid banking tools for the ease and flexibility of the financial needs. With the hybrid banking system, making payments, conducting financial activities, and operating business online has become much easier.

E-Banking is a source has become one of the most effective and efficient sources of conducting direct deposit, computer banking, stored value cards, and debit cards. The technologies used in E-Banking are competitive and save time at the same. They are secure and safer as compared to traditional cash transfers by hand. It helps in reducing the time as well as risk of doing financial activities. Banking sector and the financial institutions are now competing to acquire these technologies for ease of their customers and to attract further consumer market (Egland et al. 2008).

Gikandi and Bloor (2010) examined implementation and effectiveness of E-Banking in Turkey. The results of the study outlined that there is a radical shift between years 2005 and 2009 in the consumer behaviour and market demand. In the 2005 survey, the banking sector adopting E-Banking increased to 70% whereas, in 2009, it became 100%. However, internet security and cybercrimes were observed as the fundamental challenges to the increasing demand of E-Banking. E-Banking is consistently growing as the convenience and its countless benefits are attracting much of the consumer market. Banks are competing to adopt this technology for the stability and rapid growth in the banking sector.

Meuter (2010) studied the adoption of E-Banking in two categories that includes (1) access-technology and factors related to infrastructure and (2) sector specific factors for retail banking. The first category refers to the ability of the consumers in adopting and using the technology and the second category refers to the sense of trust and confidence of the consumers in these financial institutions. Meuter (2010), also examined the Acceding and Candidate countries' (ACCs) adoption of Internet banking and observed that, lack of accessories like PC and internet availability is an

entry barrier for e-banking development in EU15 and ACCs. The cost for accessing these services is also an issue for Central and Eastern Europe countries. Similarly, consumer also lack confidence on the financial insNACutions for adapting to these technologies.

The study by Iacono and Orlikowski (2004) found that one of the significant factors to accelerate E-Banking is trust. Therefore, the financial institutions must try to work on the trust issue for increasing the demand of E-Banking among the consumers. Similarly, trust is not enough; banks must try to improve response time, assurance, customer services, security and customer privacy, personalization issues, and payment tracking are also important factors for increasing customer satisfaction. Akerlof and Girardone (2011) added that banks can increase the cost-efficiency with E-Banking if imply appropriately.

Bahia (2007) and Vila et al (2013) studied the similar behaviour among the European Union banks that experienced cost-efficiency and increase in productivity with adaption of E-Banking. Carlson and Lang (2001) observed that Turkish retail banking sector experienced reduced cost and increased efficiency with E-Banking. Meuter (2010) added that E-Banking reduce the operational cost that added to the increased productivity and maximized their revenues. According to Ombati et al (2011), E-Banking not only reduces the cost but also helps in effective management of information that also ensures high profitability.

1.8 Model variables

Using the established literature review it can therefore be noted that the major key issues or variables that pose a huge effect on the interaction between internet banking and bank performance among commercial banks in Turkey are loans issued by the bank, liquid assets, bank deposits and bank size.

1.8.1 Internet banking

This is the variable of main concern and its effects on bank performance have been outlined to be positive (Malhotra & Singh, 2009). However, there are cases whereby internet banking can pose a huge challenge on bank performance. For instance, the existence of risks can hinder people from using internet banking. This has an effect

of reducing bot the volume of internet banking transactions as well as revenue inflows made from internet banking activities. Banks will also require a lot of funds to maintain the internet banking infrastructure and this can prove to be costly for banks. A high rising internet banking cost level can high bank performance. Hence, the relationship between internet banking and performance cannot always be positive. But the more people use internet banking, the more banks will make in the form of services fees. The number of active customers using internet banking can also be used as a proxy of internet banking. Expectations will thus be made in line with the findings made by Malhotra and Singh (2009), and Kiragu (2017). that an increase in the number of active customers using internet banking will result in an increase in bank performance.

1.8.2 Percentage of loans issued by the bank

Banks make profits from loans they issue to customers. That is, bank loans are a representation of the banks' assets. Trujilo (2017) contends that an increase in bank loans is a representation of an increase in the bank's assets. This implies that the more assets banks possess in the form of loans, the more they can gain through interest levied on the loans. In this regard, an increase in bank loans can thus be said to lead to positive changes in bank performance. However, Wang and Wang (2015) contends that having a high growth of a percentage of loans issued does not automatically imply bank performance will increase. This is because some loans can be considered as non-performing and can actually fail to generate the required returns. In this case, the relationship between bank loans and performance will be negative. Hence, it is always important for banks to ensure that loans are made to productive individuals and companies. Wang and Wang (2015) also agree and established that proper assets management strategies are needed to maximise the availability and use of liquid assets.

1.8.3 Liquid assets

Liquid assets provide a measure of the bank's liquidity position. That is, the ability of a bank to convert its assets into means of payment. It is important for because to have highly liquid assets. This is because a highly liquid bank can easily meet its day to day demand for withdrawals and other obligations. Banks on the other hand can encounter severe challenges in the event that they are no liquid enough. In addition, the importance of liquidity can be traced to the ability of the bank to invest in internet

banking activities. This can be evidenced by a study conducted by Kegan et al. (2005), which showed that highly liquid banks are in a strong position to invest more in internet banking activities. The effect of liquid assets on bank performance is conditional. This is because too much liquidity can hamper bank performance. As a result, both negative and positive effect ideas by Kegan and others will be used as a base of analysing the impact of liquid assets on bank performance.

1.8.4 Bank deposits

Banks always attempt to lure money deposits from customers. In this case, this can use such deposits to issue more loans and make additional investments. It is in this regard that the effect of bank deposits is considered to be positive (Pastory & Swai, 2013). Pastory and Swai (2013) also noted that there are cases where an increase in bank deposits can reduce bank performance. This normally occurs when an increase in bank deposits is at the expense of other profitable ventures such as internet banking. Hence, either a positive or negative relationship between bank deposit and performance was expected.

1.8.5 Bank performance

Banks performance represents the variable of concern. That is, the dependent variable upon which the effects of internet banking, liquid assets, volume of loans issued by the bank and bank deposits will be estimated. Return on assets was used as a proxy for bank performance.

1.8.6 Bank size

The total assets that are in possession of the bank are a commonly used indicator of bank size. This entails that large banks are those banks that are in possession of a huge asset base as compared to small banks. The extent to which bank size varies with bank performance varies from bank to bank, industry to industry and economy to economy. This entails that the impact of bank size on bank performance might be positive in one country and negative in another country like Turkey. This can be supported by results found in a study done by Kagecha (2014). Kagecha established that there is a negative linkage between bank size and bank performance. With the situation that took place in Turkey, a negative relationship between bank size and performance was expected.

1.9 Summary of empirical studies

This chapter focused on the examination of e-banking on the performance of commercial banks in Turkey. The established literature showed that there is a positive relationship that exists between e-banking and bank performance. This relationship was further established to vary in effect between the context in which one is looking at. As a result, gaps were identified that e-banking will have positive effects on bank performance while in some cases, the relationship is negative.

The results also revealed that there are a series of organisational, technological and external factors that influence the way e-banking impacts bank performance. Though other studies managed to reveal that technological improvements tend to spear up bank performance. However, things such as competition and globalisation tend to force banks into force to adopt similar or highly advanced technological and e-banking developments. This also suggested that

Arguments were made against the established literature which showed that demographic elements such as literacy rates have no effect on the use of internet banking. Hence, the need to fill this gap was based observations made which showed that most consumers are reluctant to use technological services which they are not familiar with. Also, any complications encountered in the use of e-banking services can actually reduce the number of e-banking users.

e-banking can also be considered to be an innovative and strategic meant to improve the quality of services offered by banks. The effectiveness of such a strategic move relies on the extent to which it fulfils service quality dimensions such as accurate transactions, convenience, accurate records, efficiency and security. Failure to cater for these can reduce benefits attributed to the adoption of e-banking.

The study also established that there is a gap that needs to be filled in as much as the conditions governing the effectiveness of e-banking are concerned. These conditions are trialability, visibility, risk, result demonstrability, compatibility, relative advantage, self-efficacy and perceived ease of use usefulness. The impact of these factors varies with the type of financial institutions under consideration, level of financial development, market conditions etc.

Conclusions were made based on the given literature that improvements in e-banking are more likely to cause positive changes in bank performance of banks in

Turkey. Thus, recommendations can be made that e-banking is an innovative move that improves operational efficiency, allows bank to service more customers at the same time and gain more revenue in the form of service fees. Hence, e-banking can be said to result in positive changes in bank performance.

Table 1.1: Summary of empirical studies

Author	Country	Approach	Results
Siam (2006)	Jordan	Qualitative analysis and deductive reasoning analysis based on 20 commercial banks (internet banking, bank performance)	High investment requirements and costs can cause e-banking to have an adverse effect on bank profitability.
Malhotra and Singh (2009)	India.	Multivariate regression analysis of inflation, demand, net advances, net interest income, loans, equity, size and internet banking on bank performance.	The adoption of e-banking is positively related to bank size and banks that offer internet banks services can have better performance ratios as compared to non-Internet banking providers.
Onay (2008)	Turkey	Regression analysis of 13 banks using fee income and commission, overhead expenses, interest spread, internet banking on ROE and ROA.	Contributions from the use of internet banking facilities varies with the business cycle of the organisation and are high in the long run as compared to the short run
Sumra, Manzoor and Abass (2011)	Pakistani	Qualitative analysis of the impact of internet banking on bank performance.	There is a positive relationship between e-banking and bank profitability of banks.
Njuguna et al. (2009)	Kenya	Regression analysis (result demonstrability, relative advantage, self-efficacy, perceived ease of use, perceived usefulness and bank performance)	internet banking helps to improve operational efficiency and this contributes towards improving the financial performance of banks.
Gikandi and Bloor (2010)	Turkey	Quantitative analysis (internet banking, operating cost, bank size, interest expense and ROA).	Customer related and cost reduction factors strongly influence the adoption of e-banking.

Kegan et al. (2005)	Turkey	structural equation model of non-interest expenses to total revenue, inefficiency, non-interest income on total expenses, total assets per employee, average rate of growth in assets and bank performance.	Internet banking services providing banks are better financial performers than non-internet banking service providing banks.
Aduda and Kingoo (2012)	Kenya	Descriptive and inferential statistics (Investment in electronic banking, Number of ATMS systems, Number of debit/cards issued and ROA)	Positive relationship between all the e-banking activities and bank performance
Al-Smadi and Al-Wabel (2011)	Jordan	Accounting techniques (e-banking and bank performance)	e-banking has a significant negative impact on bank performance.
Muriuki (2009)	Kenya	Descriptive analysis of Perceived external, technological, organizational factors and bank performance.	Perceived external, technological and organizational factors have a positive impact on e-banking.
Ombati et al. (2010)	Kenya	Correlation analysis (investments in e-banking, service quality and bank performance)	Technological developments and service quality are directly related with each other and this translates to improved bank performance.
Gikandi and Bloor (2010)	Turkey 2005-2009	Regression analysis of Internet security, awareness, privacy and customer trust against bank performance	Internet security, awareness, privacy and customer trust are some the major future challenges that affect the adoption of e-banking

CHAPTER 2

OVERVIEW OF THE TURKISH ECONOMY AND BANKING SECTOR ANALYSIS

2.1 Overview of the Turkish economic

The Turkish economy bounced back into a positive path following the 2008 financial crisis which saw GDP falling by 5% in 2009 (Deloitte, 2015). Much of the contribution towards improving economic prospects were mainly driven by improvements in the banking sector. Such improvements were evident between the year 2010 to 2011 in which GDP increased to 9% as shown in figure 2.1. Turkey's economic performance is relatively higher than that of other European countries such as Russia, G7, India and economies in transition.

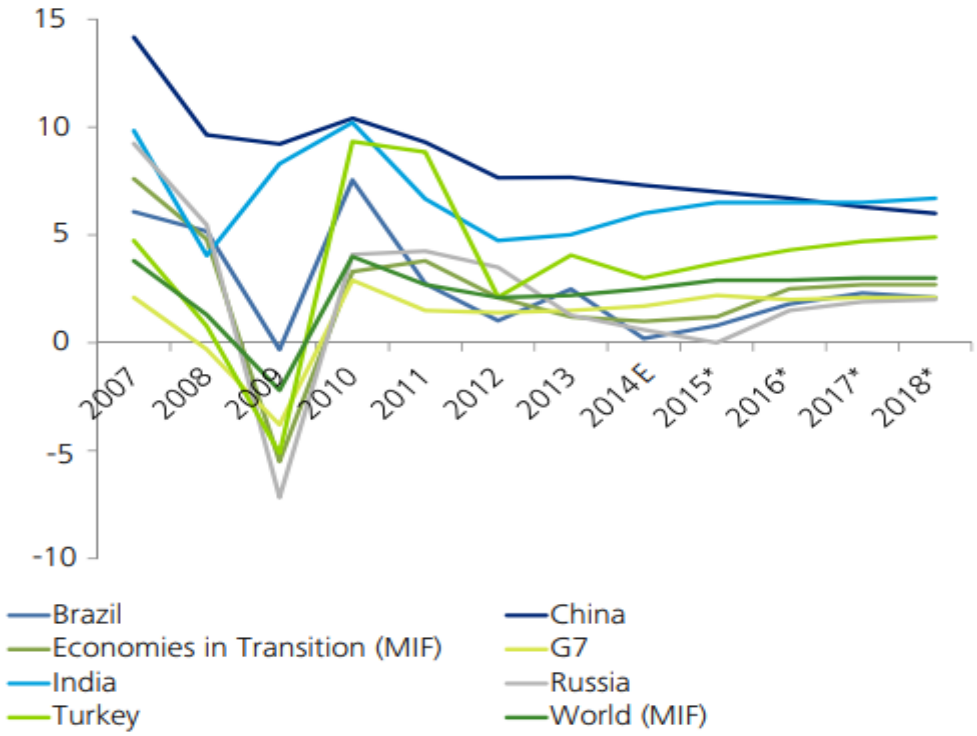


Figure 2.1: Real GDP growth

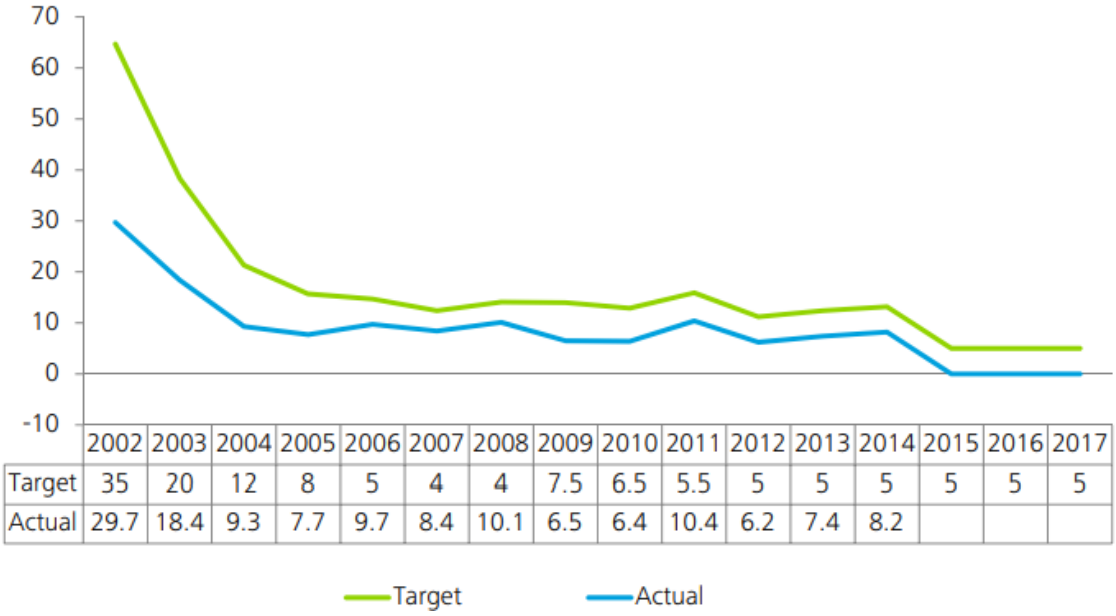
Source: Deloitte (2015)

Economic improvements witnessed in Turkey were attributed to increased loan volumes, capital inflows, fiscal stimulus, low interest rates and domestic demand. But these improvements were being hindered by a rising current account deficit as advanced countries were normalising their monetary policies (Deloitte, 2015). The ongoing global economic transformations have not managed to spare the Turkish banking sector. As it stands, the Turkish banking sector has been going through a lot of changes which include, asset purchasing facilities, Volker rule, Basel III and tight regulations.

2.2 Major economic challenges affecting the Turkish economy

2.2.1 Inflation

Inflation is one of the major drawbacks that has been affecting the Turkish economy and CBT has been making frantic efforts to deal with inflation. Ever since the since the period 2002, the CBT has been battling erratic problems of inflation.



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Target	35	20	12	8	5	4	4	7.5	6.5	5.5	5	5	5	5	5	5
Actual	29.7	18.4	9.3	7.7	9.7	8.4	10.1	6.5	6.4	10.4	6.2	7.4	8.2			

Figure 2.2: Actual vs targeted CPI levels

Source: Deloitte (2015)

The year 2002, registered the highest level of inflation with a CPI of 29.7% which is slightly lower than the targeted rate of 35%. Though there has been a drop in the CPI to 18.4% in 2003 and 6.2% in 2012, the inflation rate remained relatively high above the 6.2 mark. The period 2008 which was characterised by the effects of the financial crisis also witnessed a surge in inflation from 8.4% in 2007 to 10.1%. this provides tangible evidence that inflation has been Turkey's prominent economic challenge. The CBT has thus been engaging in a tight monetary stance to fight against the rising inflation level.

2.2.2 Depreciating value of the Lira

The Turkish lira has been losing value against major currencies such as the euro, US dollar and British pound. Such has been linked to political events such as souring ally relationships between Ankara and Washington (Wyman, 2016). The Lira depreciated against the dollar from US$1=□3.7401 into a lowest par of US$1=□6.7046 in September 2018 (https://www.poundsterlinglive.com). This tends to impact the value of exports and causes them to be expensive while the value of imports falls on the international market.

2.2.3 Political disturbances

Political disturbances tend to mirror negative sentiments and expectations. Every act or event of political instability is reflected by the depreciation of the local currency

(Ertugul & Selguk, 2018). Investors are often reluctant to invest or make positive investment decisions in a country that is characterised by political instabilities. This has been one of the issues affecting the Turkish economy. Hence, political instabilities can be said to be a major drawback against FDI inflows and economic growth.

2.2.4 Effects of the 2008 financial crisis

The 2008 financial crisis did not only pose threats to financial growth and stability but also went one to put other economies into economic doldrums. This is because the financial crisis was highly characterised by a series of bad economic misfortunes such as collapse of financial institutions loss of customer deposits, corporate scandals, liquidation of assets etc. (Bourkhis & Nabi, 2013). Furthermore, some of the effects of the 2008 financial crisis are still being felt and Turkey continues to suffer from such effects. One of the notable ways Turkey has been affected is through inflationary and interest rate challenges (Kibritçioglu, 2010). Consumers on the other hand, have been reluctant to boost their savings with financial institutions.

2.3 Financial sector analysis

The Turkish banking sector is one of the largest financial services contributors to the Turkish economy. This is supported by theoretical insights which show that banks have an intermediary role to play in an economy (Hellwig, 2009). Also, academic scholars also support the idea behind the importance of banks citing that they aid in providing the much-needed funds to support consumption and production activities (Brunnermeier, 2014; Macit, 2012).

The gathered facts are in support of this idea and show that of the USD$51 billion foreign direct investment (FDI) inflows that was recorded between the year 2000 to 2017 in Turkey, 78% was contributed by the banking sector. This is shown in figure 2.3 and the insurance sector was second, contributing 15.4% of FDI inflows followed by other financial services providers who raked in 6.6% of the FDI inflows.

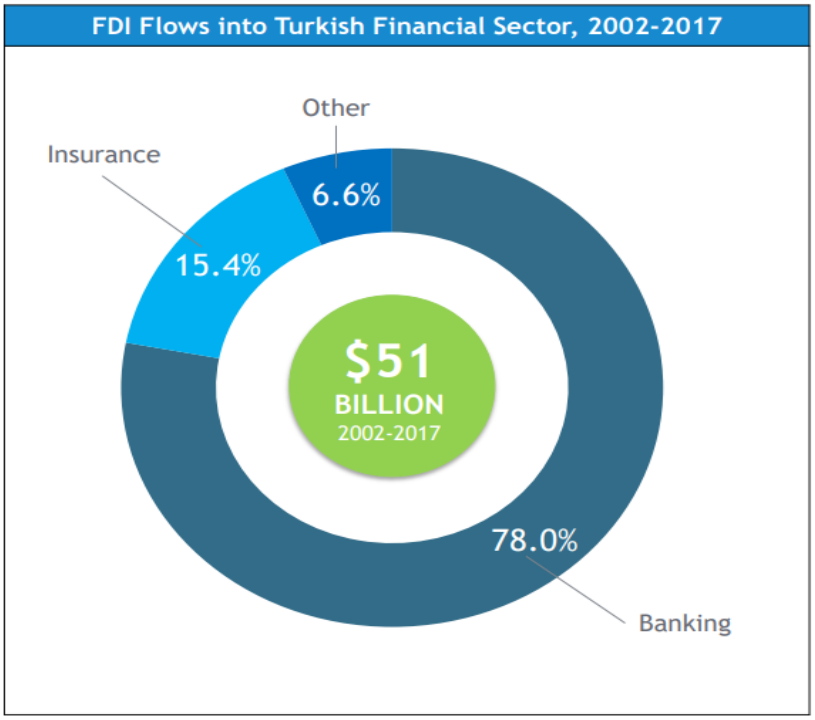
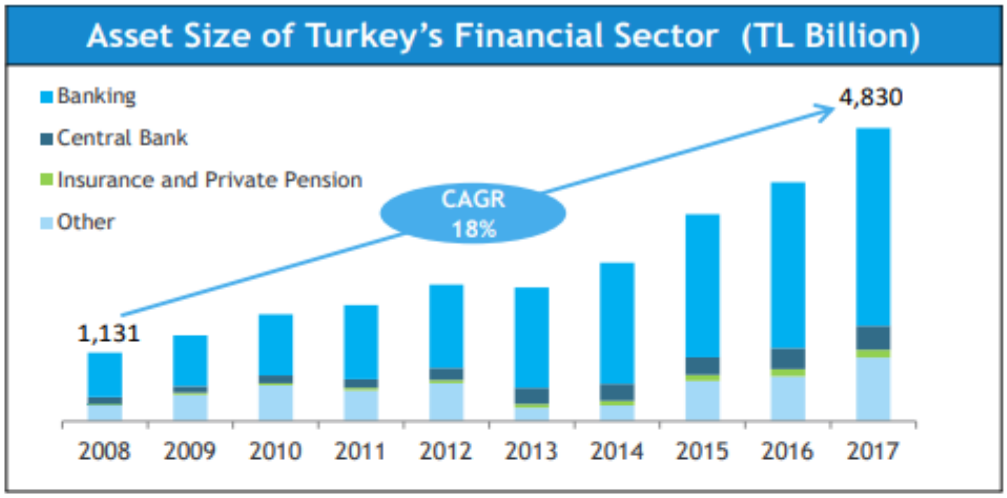


Figure 2.3: FDI inflows into the Turkish banking sector

Source: ISPA (May, 2018)

The dominance of the banking sector in Turkey over other financial service providers can also be evidenced by the growth of the of the banking sector. According to Hellwig (2009), total assets is one the most favourable indicator of bank size. With this in mind, it can be noted that there has been a significant growth in Turkey's banking sector with a CAGR of 18%.



	CAGR 2008-2017	Share 2017
Banking	18	67
Central Bank	15	8
Insurance & Pension	19	3
Other	17	22

Other includes: BIST capitalization, securities, consumer finance, real estate investments, investment trusts, asset management and venture capital investment trust assets

Figure 2.4: Asset size of Turkey's banking sector

Source: ISPA (May, 2018)

During the period 2008 to 2017, the Turkish banking sector accounted for 67% of the total assets growth that was observed in Turkey's financial sector. Insurance and pensions contributed of 3% but with a slightly higher CAGR of 19%. Other financial services providers had a CAGR of 17% followed by the Central Bank of Turkey (CBT) which had a CAGR of 15%. Contributions made by other financial services providers in terms of the total assets growth experienced in Turkey's financial sector stood at 22% relative to the 8% made by the CBT.

With this in mind, conclusions can be drawn that the Turkish banking sector still continues to play a vital role in the Turkish economy. Also, its importance is tied to its growth and hence efforts to promote financial growth and development will not only assisting in improving banking activities, but also in boosting economic activities.

Such can be supported by ideas which revealed that there is a positive relationship that exists between financial development and economic growth (Brunnermeier, 2014).

2.4 Banking sector analysis

By the period 2017, the Turkish banking sector was composed of a total of 51 banks. These were made up of 33 deposit banks, 13 development and investment banks and 5 participation banks or simply, privately-owned commercial banks, state-owned deposit banks, deposit banks and foreign banks as shown in table 2.1.

Table 2.1: Overview of the Turkish banking sector

Group name	Banks	Branches abroad	Branches in Turkey
Banking System	47	69	10 430
Privately owned commercial banks	13	28	3 957
State-owned deposit banks	3	31	3 684
Deposit banks	34	69	10 377
Foreign Banks	21	10	2 735

Source: Bank Association of Turkey

(https://www.tbb.org.tr/en/modules/banka-bilgileri/banka_sube_bilgileri.asp)

All these 51 banks had amassed a total of □3.3 Trillion worth of assets and major five banking players were Ziraat Bankasi, Turkiye Is Bankasi, Garanti Bank and Halk Bank with total assets with □408 billion, □346 billion, □311 billion, □293 billion, and □280 billion, respectively.

Such trends were marked with a 50% ownership by assets between state owned banks and locally owned banks. The Turkish government and locally owned banks each owned 36% of the total assets that were accumulated by banks by the period 2017. Foreign owned banks owned 28% of the total assets.

One of the notable trends experienced within the Turkish banking sector is improvements in asset and liability composition of the banks. This can be supported by figure 2.3. Figure 2.3 provides evidenced of improvements in diversification of the Turkish banking sector as noted by the growth in asset composition and a decline in

liability composition. Such diversification efforts help to deal with banking risks that can undermine bank performance, survival and growth (Wyman, 2016).

It can be noted that there is a significant growth in bank loans from 32% in 2004 to 65% in 2017. This signifies an improvement in both banking and economic activities and such is profitable for banks. This is because banks will be in a position to earn more revenue from interest charged on loans (Deloitte, 2015). However, deposits fell from 62% in 2004 to 53% in 2017 and this tends to reduces banks' capacity to issue more loans. Hence, a decline in bank deposits can be said to be negatively related to bank performance.

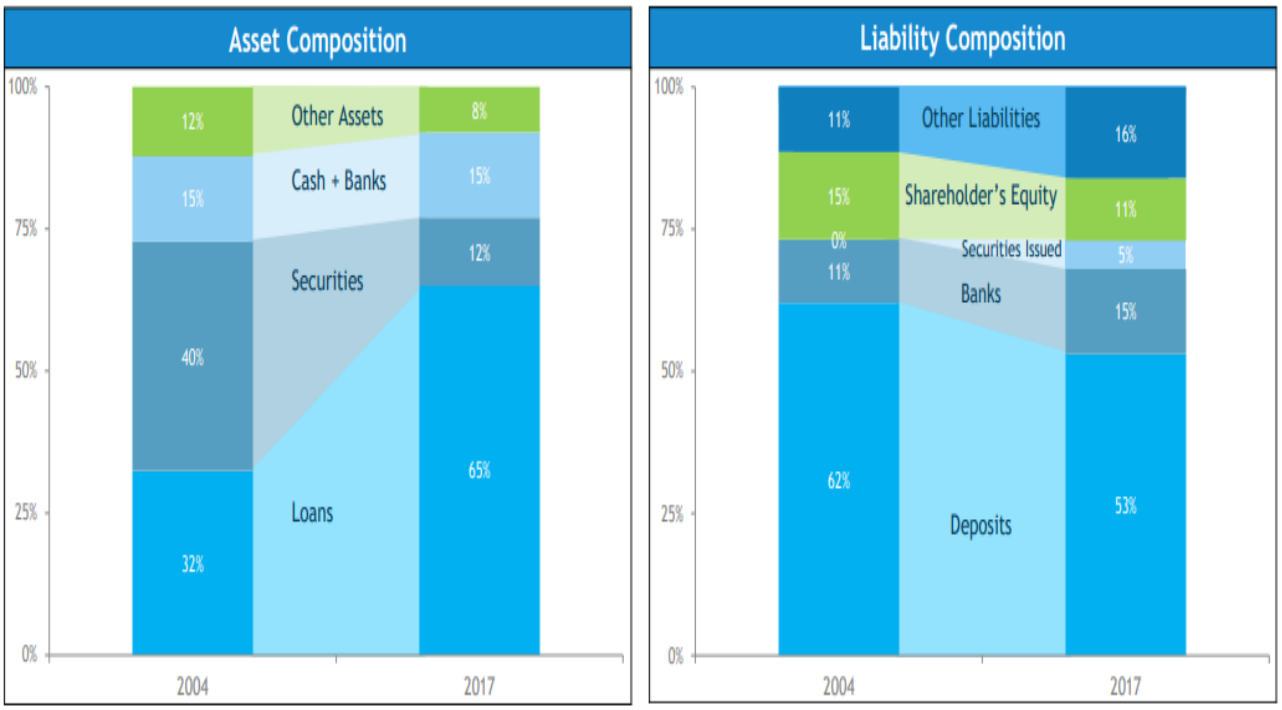


Figure 2.5: Diversification of the Turkish banking sector

Source: ISPA (May, 2018)

Though cash with banks and other banks remained stable at 15% between 2004 to 2017, there has been a significant decline in shareholder from 15% to 11%. This signifies risk averse behaviour by banks' equity holders. Such can also show that equity holders have been losing trust in the ability of bank managers to manage their capital resources in the most profitable ways (Bpourkhis & Nabi, 2013). This is

because equity holders will inject more capital resources into banks that are making more profits.

Also, more capital injections will be higher into those banks that can use the available capital resources in the most effective ways that will generate higher equity returns for the equity holders. Equity holders will always need higher equity rates to compensate for the opportunity costs of investing into the banks.

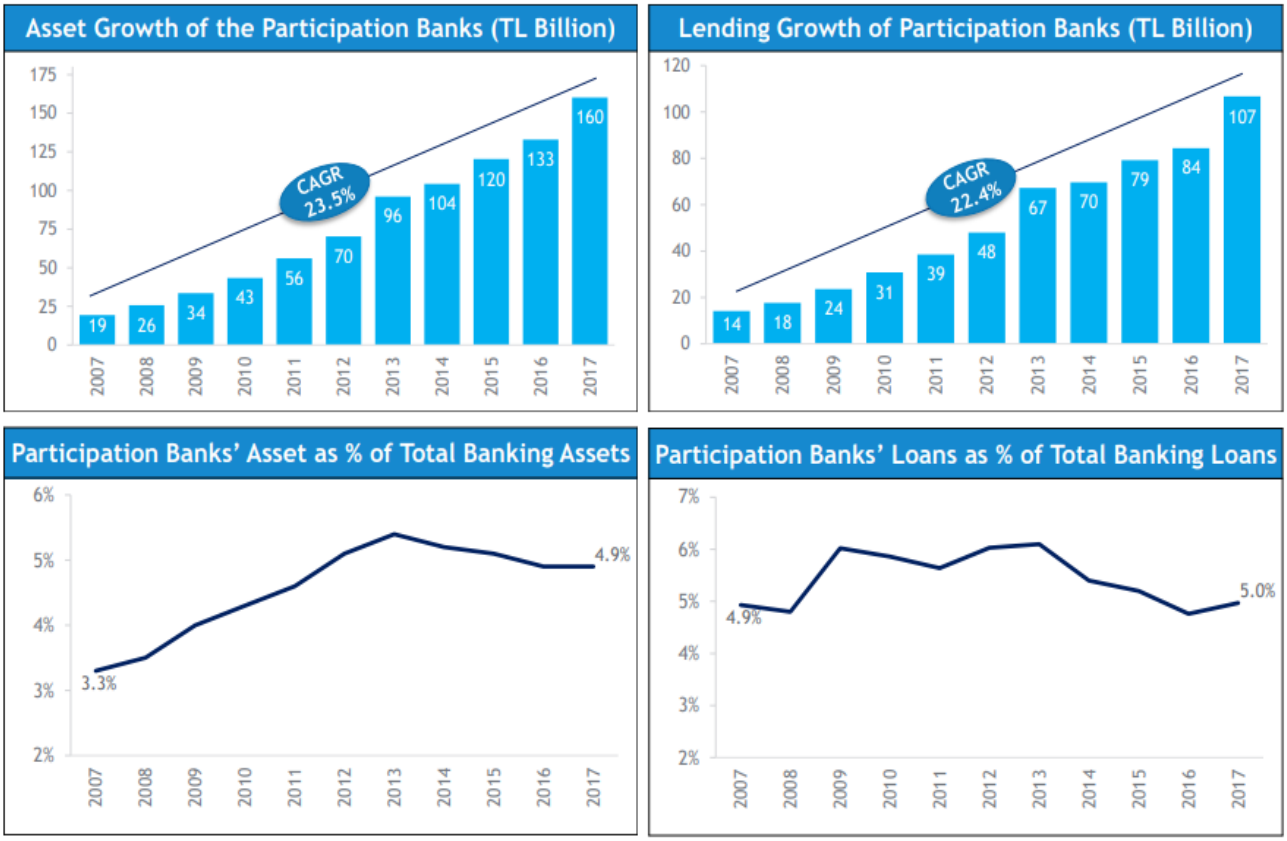


Figure 2.6: Asset and lending growth of the Turkish banking sector

Source: ISPA (May, 2018)

Banking sector trends in Turkey were also accompanied by the introduction of Islamic banking in the early 1980 and operated as 'Special Finance Houses' (Wyman, 2016). They were later renamed to participation banks in 2005. Stipulated guidelines were set by the BAT that they confirm to the required Islamic banking principles.

Presently, there are 5 participation banks in Turkey and these banks have been playing a vital role in Turkey's banking sector. This can be supported by figure 2.6,

which shows that participation banks have been growing in size as noted by total assets since 2007. In 2007, participation banks had a CAGR of □19 billion which increased to □160 billion. This figure has also been growing in relation to the total banking assets recorded. For instance, it can be seen that the proportion of participation banks' assets to total banking assets increased from 3.3% in 2007 to 4.9% in 2007. The same applies to loans issued by the participation which grew from 4.9% to 5% in the same period.

2.5 Major challenges undermining Turkish banking sector activities

2.5.1 Risk

Risk is one of the major challenges that affect banks worldwide and it can be observed to exist in different forms. However, in banking, notable risks are liquidity risk, interest risk, performance risk and these risks can drive down bank performance and growth. Risk is always associated with negative sentiments and reactions especially towards banking activities (Hellwig, 2009). Following the loss of consumer deposits after the ravaging effects of the 2008 financial crisis, Turkish bank customers have been exhibiting a slow response towards banking activities (Kibritçioglu, 2010).

In the event of a financial crisis or a surge in banking risks requires that central banks increase capital adequacy ratios as a provision against risks (Hellwig, 2009). This has however, been the opposite case with the CBT as can been noted in figure 2.7. The capital adequacy ratio declined from 28% in 2004 to 16.9% in 2017. It however, remained above the 10.5% legal margin. Such reflect a decline in risk but should be aligned to match the risk outlook.

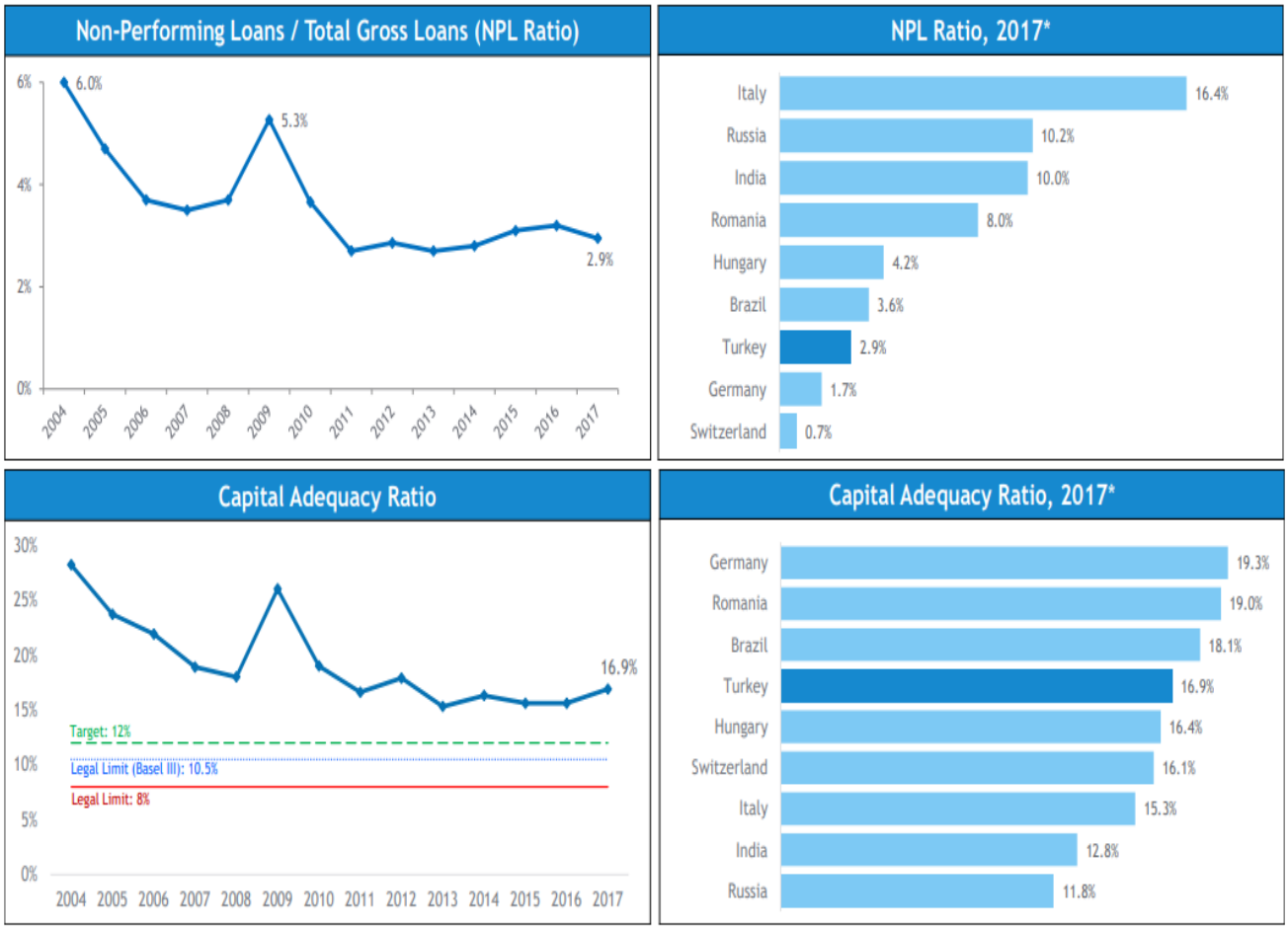


Figure 2.7: Reflectors of the risk outlook

Source: ISPA (May, 2018)

2.5.2 Macroeconomic instability

Macroeconomic instabilities in the form of inflation and high interest rates have proved to be a stumbling block to the Turkish banking sector. Inflationary problems are coupled with a reduction in savings and an increase in bank withdrawals (Hellwig, 2009). These two incidences tend to disturbance the economy from functioning well. High interest rates also tend to reduce borrowing and banks will experience a decline in loans as well as revenue inflows from fees.

2.5.3 Falling revenue margins

Revenue margins in the Turkish banking sector have been on a downward path and this extend to affect both fee income and interest income. The BAT established that falling market rates which went down from 25% in 2014 to 11% in 2015 have been necessitating a decline in revenue margins (Macit, 2012). This can be attributed to

high level of competition within the Turkish banking sector. Turkey is considered to be having a high level of competition as compared to key European countries such as Germany, Netherlands, Spain and Italy (see figure 2.8).

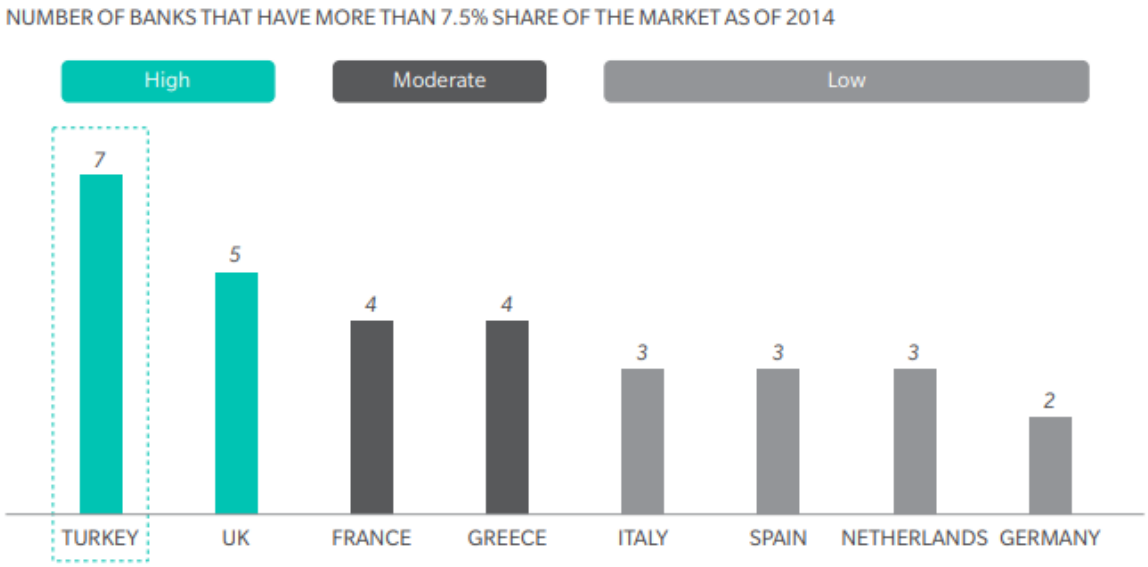


Figure 2.8: Market making competition in banking in key European countries

Source: Wyman (2016)

2.5.4 Decline in operational efficiency

Operational efficiency is a key determinant of bank performance, growth and survival. Insights obtained from the study by Wyman (2016), revealed that banks that can attain improvements in Operational efficiency are more posed to benefit from economies of scale. As a result, they also tend to have a better competitive advantage over other banks (Macit, 2012). However, though Turkish banks have grew, operational efficiency remained relatively low. Wyman (2018) established that Turkish banks have been achieving an operating expense ratio of 20% while asset size continued to double. Most banks experienced changes in performance that are below of the hurdle rate (Wyman, 2016).

2.6 Economic policies to stir financial growth and development

Having established that inflation poses negative effects on the Turkish economy, the CBT managed to engage in a tight monetary policy to squeeze out excess expenditure. A combination of a tight fiscal and monetary policies to stir economic

activities towards a desired economic growth path (Brunnermeier, 2014). This should be accompanied by a reduction in unnecessary increases in government expenditure. High interest rates can also be levied on consumption borrowing.

The Medium-Term Program has also been put into action to curb the rising current account deficit. Turkey's current account deficit has been relatively high above the economic growth rate and stood above 5% (Deloitte, 2015). Current account deficit tends to compound external debt and this is often reflected in high taxes and interest rates.

Turkey's specialisation in 'mid-tech sectors' resulted in an increase foreign trade deficit. The challenge with focusing on 'mid-tech sectors' is that they insignificantly contribute towards economic growth (Kibritçioglu, 2010). Moreover, the global demand associated with final products by 'mid-tech sectors' is often low. The CBT has thus shifting focus from 'mid-tech sectors' to 'high-tech sectors' which are associated with high global demand, high growth potential and comparative advantage.

Diversification into MENA areas is also a possible solution that Turkey can tap into. This is because there has been intensive growth potential in other European countries which Turkey can tap into.

Improving spending efficiency and generating new revenue streams is also another possible economic strategy that can be used to stir economic progress. This is because spending efficiency will help to stir funds towards productive sectors and activities which can boost economic growth. Efforts to deal with inflation and unemployment requires a huge injection of funds and a control of spending towards productive sectors and activities (Brunnermeier, 2014).

Structural reforms can also be used to deal with the problem of import dependency that has been characterising Turkey's current account position (Wyman, 2016). In doing so, measures can be put towards reducing energy imports and devoting huge domestic expenditure towards energy sectors. Moreover, there is a greater need to mobilise domestic savings from the economy. This will go a long way in making available funds to stir up domestic production and local investment growth.

2.7 Commercial banking activities and internet banking trends in Turkey

The global economy still continues to enjoy a lot from developments in digital facilities such as e-banking. With more than 7 476 billion people around the world, and more than half of the global population using internet, it remains apparent that banks stand to gain from developments in e-banking as denoted by figure 2.9 (Hootsuite, n.d).

Figure 2.9: An overview of global digital developments

Source: Hootsuite (n.d)

The ability to benefit from global developments in e-banking also includes banks in Turkey where a high number of people are now having access to internet. Meanwhile, Turkey' banking sector has grown to be one of the most financially developed and innovated banking systems around the world.

Table 2.2: Internet Users in Turkey from the year 2004 to 2016

Year	Internet Users**	Penetration (% of Pop)	Total Population	Non-Users (Internetless)	1Y User Change	1Y User Change	Population Change
2016*	**46,196,720**	58 %	79,622,062	33,425,342	5.1 %	2,242,750	1.22 %
2015*	**43,953,971**	55.9 %	78,665,830	34,711,859	11.1 %	4,385,829	1.47 %
2014	**39,568,141**	51 %	77,523,788	37,955,647	12.2 %	4,314,708	1.71 %
2013	**35,253,433**	46.3 %	76,223,639	40,970,206	4.4 %	1,473,995	1.84 %
2012	**33,779,438**	45.1 %	74,849,187	41,069,749	6.7 %	2,118,819	1.81 %
2011	**31,660,619**	43.1 %	73,517,002	41,856,383	10 %	2,866,612	1.67 %
2010	**28,794,008**	39.8 %	72,310,416	43,516,408	11 %	2,854,892	1.47 %
2009	**25,939,116**	36.4 %	71,261,307	45,322,191	7.3 %	1,761,760	1.3 %
2008	**24,177,356**	34.4 %	70,344,357	46,167,001	21.5 %	4,275,070	1.19 %
2007	**19,902,285**	28.6 %	69,515,492	49,613,207	58.8 %	7,370,544	1.18 %
2006	**12,531,741**	18.2 %	68,704,721	56,172,980	19.4 %	2,040,490	1.24 %
2005	**10,491,251**	15.5 %	67,860,617	57,369,366	7.4 %	726,506	1.32 %

Source: http://www.internetlivestats.com/internet-users/turkey/

Table 1.2 denotes that there is a growth in the number of internet users since 2005 which had a total of 10 491 251 million internet users in 2005 and grew to 46 196 720 million users in 2016. Such a high number represents potential opportunities that the Turkish banking systems strands to offer. With a penetration rate of 58% as of 2016 and a population change of 1.22%, more is yet to be gained by banks in Turkey and the adoption of e-banking therefore serves as one of the key strategies banks can use to tap into the available innovativeness opportunities.

2.8 Current and future projection of the Turkish banking sector

The Turkish banking sector is still posed to grow but current challenges are mainly being posed by the falling exchange value of the Turkish lira against major currencies. In 2014, the value of the Lira was 2.04TL for each US$1 traded but

recently by the end of July, the lira was traded at 8TL for each US$1 traded (Dargent, 2018). This resulted in an increase in the level of withdrawals from banks as consumers rushed to purchase US dollars and other foreign currencies which were much relatively stable that the Lira. As a result, the level of bank deposits declined and the capacity of banks to issue more loans in this case was hinder and this translates to a decline in bank performance (Pastory & Swai, 2013). But banks that were involved in foreign exchange activities during that time did make profits on currency trading through service fees.

There are also strong signs that the Turkish economy has been 'overheating' and this imposes challenges on the future growth prospects of the banking sector. This is because a lot of Turkish banks have been accumulating a lot of restructured loans (Dargent, 2018). BAT (n.d) also further states that there has been a significant growth in bank loans in 2017 which reached as high at 85% of GDP in 2017.

Also, the loosening of regulatory standards is more likely to have negative implications on confidence in the banking sector. This is because weaker standards have an effect of reducing reporting visibility, asset quality and capital buffers (Gikandi & Bloor, (2010).

However, the increased in external support from other European economies is proving to be handy for a lot of banks such as Garanti Bank and Yapi Kredi, receiving foreign support (Dargent, 2018). This enables banks to fund their operations and investment activities. Hence, expectations are that a continued increase in external support is more likely to lead to an increase in investment by banks. This will also stir up financial development and growth.

Also, an increase in efforts by the Turkish government to promote economic growth and development is more likely to stir up an increase in banking activities. With potential increases in consumption and production activities, banks are more posed to increase the extent to which they fulfil their financial intermediation functions. Hence, the projected increase in economic growth in Turkey is more likely to be accompanied by an improvement in banking activities.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Research design

The study is a quantitative approach dwells on the use of secondary panel data collected from the Bankers Association of Turkey. As such, the study relies on the use of econometric techniques to offer explanations about the explain the effects of electronic banking on financial performance of commercial banks in Turkey.

3.1.1 Model estimation

Due to the nature of the banks being examined, a balanced panel model was deemed fit for estimating the effects of electronic banking on financial performance of commercial banks in Turkey. the model is thus composed of 6 cross sections each having a total of 16 observations which gives a total of 96 observations. The variables of concern are return on assets (ROA), number of active customers using internet banking (NAC), bank deposits (GBD), bank loans (LNS), liquid assets (LA) and bank size (BS). The following regression expression was used to form the base of the estimation process;

$$ROA = \beta_0 + \beta_1 NAC + \beta_2 BP + \beta_3 LNS + \beta_4 LA + \beta_5 LBS + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1).$$

The explanatory power of the model is determined using R-squared and the significance of the estimated model by the F-statistic (Greene, 2003). μ represents the error term while the OLS estimators are denoted by $\beta_0 - \beta_4$. Insights by Gujarat (2009), recommends that all the variables by changed into logs so as to avoid the problem heteroscedasticity. Equation 2 thus becomes the final estimated model after changing the variables into logarithms;

$$LROA = \beta_0 + \beta_1 LNAC + \beta_2 BD + \beta_3 LLNS + \beta_4 LLA + \beta_5 LBS + \mu \ldots\ldots\ldots\ldots\ldots\ldots (2).$$

Equation (2) thus constitute a foundation upon which panel data estimations will be done. Hence, both fixed and random effect models will be based on the formulated equation (2). Elhorst (2003) contends that the difference between a fixed effect model (FEM) and a random effect model (REM) is that the former assumes that the cross-section is homogenous. On the other hand, a REM assumes that the cross-section is heterogeneous.

The benefits of panel data make it possible to include a lot of observations (Judson, 1999). As a result, the obtained results can be said to be more efficient. Elhorst (2003) also outlined that panel data estimations have an advantage over other estimation procedures in the sense that they allow a lot of hypotheses to be tested. Moreover, the problem of omitted variable bias is not usually prevalent in panel data estimations. Ideas given by Petersen (2009), also showed that panel data can be used to deal with the problem of immeasurable effects of heterogeneity.

3.1.2 Definition and description of variables

Table 3.1: Definition and description of variables

Nature of the variable	Variable	Variable description	Related literature	Expected Sign
Dependent variable	Return on assets (ROA)	Provides an indication of how the bank is using its assets and is one the widely used indicator of bank performance.	Oshikoya, (2007)	
	Percentage of loans issued (LNS)	Provides an indication of the changes in the growth of loans issued by the banks. A growth in banks loans is more likely to lead to an improvement in bank performance.	Trujilo-Ponce (2013)	**+**
	Total number of active internet banking customers (NAC), a proxy of internet banking.	This measures the number of bank customers who use internet banking.	Malhotra and Singh (2009) (Kiragu, 2017).	+
	Bank deposits	Measures the growth in the amount of funds deposited into banks by bank customers either for short term or long term keeping	Pastory and Swai (2013)	+ -
	Liquid assets (LA)	Gives an indication of the liquidity position of the bank. The more liquid assets the bank is, the better the liquidity.	Kegan et al. (2005). Marozva (2015)	**+** **-**
	Bank size (BS)	Provides an indication of how big is the bank in terms of total assets	Kagecha (2014)	**-**

3.1.3 Population and sampling methods

The study focuses on 6 of the 9 Turkish privately owned commercial banks in Turkey. the decision to focus on examining the effects of electronic banking on financial performance of privately-owned commercial banks in Turkey was necessitated by insights which showed that private banks are in a strong position to benefit from internet banking. This is mainly because of the efficiency levels, profit centred objectives and have the required investment potential to invest a lot of resources in internet banking.

Table 3.2: Description of the banks in relation to CAR and total assets

		Privately-owned Commercial Banks	CAR (%)	Total assets (us$ M)
Sample size		Akbank T.A.Ş.	16.78	28 747
		Anadolubank A.Ş.	16.92	741
		Fibabanka A.Ş.	17.18	1 351
		Şekerbank T.A.Ş.	14.33	1 851
		Turkish Bank A.Ş.	15.68	252
		Türk Ekonomi Bankası A.Ş.	15.10	15 350
		Adabank A.Ş.	14.85	14 130
Population		Türkiye İş Bankası A.Ş.	14.30	8 640
		Yapı ve Kredi Bankası A.Ş.	15.20	12 320
		Türkiye Garanti Bankası A.Ş.	17.99	34 685

** CAR and total assets as at June 2018 as published by BAT*

3.1.4 Data sources, analysis and presentation

Model data was taken from the BAT website and spans from the third quarter of 2014 to the second half of 2018. Eviews 9.5 was used to estimate the bank performance-internet banking model. Return on assets, the number of customers using internet banking, economic growth, loans issued by the bank, liquid assets and bank deposits.

3.2 Diagnostic tests

Diagnostic tests were mainly based on the use of the Durbin Watson statistic which provides an indication of the existence of serial correlation (Durbin & Watson, 1951). A Durbin Watson statistic which is close to 2 is usually preferable and has to fall

within the lower and upper statistics in order to offer confirmation that there is no serial correlation. Secondly, redundancy tests were carried out on the FEM to determine if its obtained results are redundant or not in explaining the effects of electronic banking on financial performance of commercial banks in Turkey. The decision is to accept the null hypothesis that the estimated FEM is not redundant when the obtained p-value is greater than 0.05.

The Hausman test was also used to determine whether the REM or a FEM offers the best explanation of the effects of electronic banking on financial performance of commercial banks in Turkey. Hausman (1978), asserts that given a vector of independent variables **X**, a dependent variable **Y** whose interaction is expressed in the form of the following model;

$$\mathbf{Y} = b\mathbf{X} + \mathbf{e} \quad \ldots\ldots (1)$$

Hausman (1978) contends that model (1) has only one estimator $\boldsymbol{\beta_1}$ which is efficient but both $\boldsymbol{\beta_0}$ and $\boldsymbol{\beta_1}$ are consistent. Var$\boldsymbol{(\beta_0)}$ - Var($\boldsymbol{\beta_1}$) therefore provides an indication of the related degrees of freedom. Incorporating these ideas, the Hausman test can thus be established as follows;

$$H = (\boldsymbol{\beta_0} - \boldsymbol{\beta_1})' \boldsymbol{(}Var\boldsymbol{(}\beta_0\boldsymbol{)} - Var(\beta_1)\boldsymbol{)}^{t} (\beta_0 - \beta_1) \quad \ldots\ldots (2)$$

The Moore-Penrose inverse matrix is denoted by t and makes it feasible to determine if the REM is efficient and consistent. As a result, hypotheses of the concerned diagnostic tests will be in connected to the following three statements;

- **H_1:** There established models do not suffer from the problem of serial correlation.
- **H_2:** The FEM regression model is not redundant.
- **H_3:** The REM offers the best explanation of the effects of electronic banking on financial performance of commercial banks in Turke

CHAPTER 4

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

The study focuses on 6 of the 9 Turkish private banks and uses data that spans from the third quarter of 2014 to the second half of 2018. Efforts to examine how internet banking affects bank performance of these 6 private banks was motivated by observations made which showed that private banks are in a strong position to benefit from internet banking mainly because of the efficiency levels and profit centred objectives. Thus, data analysis and presentation are based on panel data regression estimation of quarterly data from the period September 2014 to June 2018.

4.2 Unit root test

Unit root tests were conducted with a motive of determining if the variables do not cause spurious effects on the obtained results. In this case, spurious results occur when the variables have a unit root (Pesaran, 2007). Hence, it is required that the variables be stationary (Maddala & Wu, 1999).

Table 4.1, provides insights of the unit root tests that were conducted to determine if the variables stationary at their level. Using results provided in table 4.1, it can therefore be concluded that the variables are stationary at level and will not cause spurious effects on the obtained results. However, the variable NAC has an element of non-stationarity at levels when computed using the Levin, Lin & Chu t and Im,

Pessaran and Shin W-test. But the PP shows that NAC is stationary and under this case, the PP results are highly recommended (Gujarat, 2003). Hence, the variable NAC can be said to be stationary at level.

Table 4.1: Panel unit root tests

At level						
	Levin, Lin & Chu t		Im, Pessaran and Shin W-test		PP - Fisher Chi-square	
VARIABLE	**Statistic**	**Probability**	**Statistic**	**Probability**	**Statistic**	**Probability**
LROA	-5.71598	0.0000	-2.58273	0.0049	32.2121	0.0013
LLNS	-5.85855	0.0000	-2.96448	0.0015	45.0004	0.0000
LLA	-5.53597	0.0000	-2.45213	0.0071	44.9106	0.0000
LBD	-3.43590	0.0003	-1.54512	0.0012	33.1355	0.0009
LNAC	-7.24367	0.0000	-3.15278	0.0008	53.0970	0.0000
LBS	-9.03625	0.0000	-4.20194	0.0000	79.1334	0.0000

Lag length selection is based on the modified Akaike criterion,

Quadratic Spectral Kernel bandwidth selection

4.3 Correlation coefficient test

The study also placed effort on examining if both bank and economic specific variables are correlated with each other and this was accomplished by using Pearson correlation coefficient test. The depicted results in table 4.2 show that total number of active customers (LNAC) is significantly and positively correlated with bank profitability (LROA) by 0.277 at 0.01significance level. Such suggests that improvements or an increase in the number of active customers using internet banking will possibly cause an increase in bank performance.

Table 4.2: Correlation coefficient test

	LROA	LBD	LLA	LNAC	LBS	LLNS
LROA	**1**					
LBD	0.0860 (0.4048)	**1**				
LLA	-0.0838 (0.4168)	-0.0631 0.5415	**1**			
LNAC	0.1063 (0.3025)	0.0570 0.5812	-0.1689 0.1000	**1**		
LBS	-0.3276 (0.0011)	0.2673 0.0085	-0.16189 0.1153	-0.1362 0.1858	**1**	
LLNS	0.6781 (0.0000)	-0.1311 0.2030	-0.0293 0.7769	-0.0105 0.9189	-0.3101 0.0021	**1**

A positive correlation of 0.086 which is insignificant at 0.05 level can also be observed to exist between LROA and LBD. LBD is positively correlated with LNAC and LLNS by 0.057 and 0.2673 respectively.

The correlation between LBD and LNAC suggests that an increase in bank deposits is more likely to cause an increase in bank performance. The results also show that an increase in bank's liquid assets is more likely to lead an increase is loans issued by banks. But the effect of internet banking investments has a insignificant effect on bank performance at 0.05 significance level.

4.4 Analysis of the sampled commercial banks

An analysis was conducted based on the sample 6 of the 9 commercial banks. Panel data analysis techniques which include the combination of fixed and random effect models were used to analyse the findings.

4.4.1 Fixed effect regression analysis

Foremost, the estimation of a FEM assumes that all the cross sections are homogenous. That is, in this case, it assumes that all the banks that were examined are homogenous and this is however not the case.

It can also be noted that an increase in bank deposits results in an unfavourable change in bank performance by 4.36%. This can be supported by results established by Pastory and Swai (2013) which showed that an increase in bank deposits is at the expense of other profitable ventures such as internet banking. In addition, efforts to attract more deposits can results in conditions which do not favour bank performance.

Table 4.3: Fixed effect regression analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBD	-0.043613	0.046804	-0.931828	0.3541
LLA	0.029185	0.016063	1.816879	0.0728***
LNAC	0.151345	0.065802	2.300010	0.0239**
LBS	-0.131673	0.034106	-3.860689	0.0002*
LLNS	2.468785	0.318109	7.760824	0.0000*
C	-4.928579	1.107759	-4.449144	0.0000*
R-squared	0.556970		F-statistic	10.68606
Adjusted R-squared	0.504849		Prob(F-statistic)	0.000000
Durbin Watson = 1.912744				

Cross-sections=6; Periods=16; Dependent Variable: LROA

, ** and * Significant at 0.01, 0.05 and 0.10 level*

The estimated results also show that internet banking has significant positive effects on bank performance. This can be evidenced by the fact that an increase in the number of active internet banking consumers by 1% will result in an increase in bank performance by 15.13%. This goes along with findings made by Malhotra and Singh (2009), which suggests that an increase in the usage of internet banking by the bank and its customers favours positive changes in bank performance.

A positive relationship of 2.92% can also be observed between bank performance and the bank's liquid assets suggesting that an improvement in bank liquidity results in a favourable increase in performance. Hence, they are in support of the results

established by Kegan et al. (2005) which established that bank liquidity and performance are positively related with each other. This is possibly because an increase in liquid assets makes it easy for banks to easily finance operations and invest projects. This will intron lead to an increase in bank performance in the long run.

Bank size can also be established to be negatively related with bank performance by 0.1317. This means that an increase in bank size by 1% will result in a decrease in bank performance by 13.17%. This is along what established by Kagecha (2014) and conclusions can be made that the banks are suffering from diseconomies of scale.

The results also concur with findings established by Wang and Wang (2015), which showed that an increase in loans can have a positive effective on bank performance. This is because some an increase in loans makes it easy for banks to make more profits by charging interests on loans. Bank profitability will increase by 246.88% as revenue inflows outweigh bank expenses following an increase in loans issued by the bank.

It can be said that 55.70% of the changes in internet banking are explained by LNAC, LLA, LLNS, LBD and LBS. The Durbin Watson is close to 2 and is also within and upper bounds (1.690) values (see Durbin Watson table). Hence, conclusions can be made that the model does not suffer from autocorrelation problems.

Effort was also placed toward testing the significance of the FEM. Table 4.4, provides results of the redundant fixed effects test that was carried out to determine if the FEM is redundant. The null hypothesis is expressed as follows;

- **H_0:** The fixed effect regression variables are jointly insignificant.
- **H_1:** The fixed effect regression variables are jointly significant.

Table 4.4: Redundant Fixed Effects Tests

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.567893	(5,85)	0.0002

It can be rejected at 5% that the estimated FEM variables are jointly insignificant. This is because the probability of the observed Chi-square of the fixed cross-section

is below 0.05 and stands at 0.0002. Hence, conclusions can be made that the variables LLA, LLNS, LBD and LBS are jointly significant in explaining the effect of internet banking on bank performance.

4.4.2 Random effect regression analysis

The random effect also provides support to findings established by the fixed effect regression model that internet banking has a positive effect on bank performance. This can be noted by the fat that an increase in the number of people using internet banking by 1% results in an increase in bank performance by 16.56%. The results also support ideas given by Pastory and Swai (2013) which contends that the effect of bank deposits on bank performance can either be negative or positive. In this case, an increase in bank deposits by 1% results in an increase in bank performance by 312.04%. In addition, efforts to attract more deposits from customers are greatly putting the banks' efforts to make profits at an advantage. The results are also in support of ideas given by Wang and Wang (2015) which showed that an increase in loans favour bank performance. The results show that an increase in loans by 1% results in an increase in bank performance by 26.11% and this is high and good for banks. In addition, contrasting results can be observed between bank size and bank performance. In the sense that an increase in bank size by 1% lowers bank performance by 20.26%. Such a negative effect possibly suggests that an increase in bank size is causing diseconomies of scale.

Table 4.5: Random effect regression analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNAC	0.165591	0.174829	0.947157	0.3461
LLA	-0.036659	0.034770	-1.054350	0.2945
LBS	-0.202586	0.078896	-2.567772	0.0119**
LLBD	0.261113	0.083095	3.142345	0.0023*
LLNS	3.120397	0.331378	9.416423	0.0000*
C	-7.256618	1.132627	-6.406889	0.0000*
R-squared	0.530683	F-statistic	20.35363	
Adjusted R-squared	0.504610	Prob(F-statistic)	0.00000	
Durbin Watson = 1.468642				

Cross-sections=6; Periods=16; Dependent Variable: LROA

** and ** Significant at 0.01 and 0.05 level*

It can be said that 53.07% of the changes in internet banking are explained by LNAC, LLA, LLNS, LBD and LBS. The Durbin Watson statistic of 1.4686 falls within the lower (1.381) and upper bounds (1.690) values (see Durbin Watson table). Hence, conclusions can be made that the model does not suffer from autocorrelation problems.

4.4.3 Hausman Test

The random effect works on a more realistic assumption and considers that there are differences that exist between the banks (Mutl & Pfaffermayr, 2011). In this study, the Hausman test was used to determine if a REM model should be used to explain the effects of electronic banking on financial performance of commercial banks in Turkey. The null hypothesis is expressed as follows;

- **H_0:** The random effect regression model is the best suitable model to explain the effects of electronic banking on financial performance of commercial banks in Turkey.
- **H_1:** The fixed effect regression model is the best suitable model to explain the effects of electronic banking on financial performance of commercial banks in Turkey.

Table 4.6, thus shows that it can be rejected that a random effect regression model is the best suitable model to explain the effects of electronic banking on financial performance of commercial banks in Turkey as opposed to the FEM. This is because the p-value is less than 0.05 and hence we can reject the null hypothesis. As a result, the FEM's estimators can be considered to be consistent and efficient. This can be supported by the established redundant FEM test results. The results showed that the FEM variables are jointly significant in explaining the effect of internet banking on bank performance.

Table 4.6: Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	26.763763	5	0.0001

4.5 Discussion of findings

From the established results, it can initially be noted that internet banking provides a platform upon which banks can effectively enhance their operational capacity. It also offers ways banks can use to tap into existing markets as well as expand into other profitable and untapped markets. In doing so, banks will make more from service fees, commissions and an increase in the volume of transactions carried at each internal of time and thus causing an increase in bank performance. Internet banking also serves as a mechanism upon which banks can improve their operational capacity, effectiveness and efficiency. These three aspects (operational capacity, effectiveness and efficiency) represents the much-needed elements to improve bank performance and internet banking is one of the key elements and strategies that allows banks to attain and boost the effectiveness of these three aspects in improving bank performance. Hence, it can thus be argued that internet banking results in an increase in bank performance.

An increase in bank loans has positive effects on bank performance and this is because much of loans allow banks to charge more interest rates. More so, this can result in an increase in revenue inflows. Assuming that revenue inflow is high as compared to expenditure, banks will continue to make more profits. The ability of banks to make profits is determined by the ability of banks to issue loans to productive individuals and corporations. if not, then banks can suffer losses through increased levels of non-performing loans. Also, some loans can turn out to be bad debts. It is therefore important for banks to ensure that they productively allocate loans to activities that yield better returns. This is along with literature studies which contend that revenue inflow be maximised so as to make more profits.

The results have provided mixed conclusions on the effect of liquid assets on bank performance. This implies that the effective contribution of liquid assets towards improving bank performance is conditional. This entails that efforts to improve bank liquidity can actually hinder investment in other profitable projects. For instance, the desire to increase the level of liquid assets can imply that banks have to cut expenditure on internet banking. This in turn means banks will not effectively benefit from internet banking. As such, revenue inflows either through increased numbers of people using internet banking and service fees will decrease. This decrease will be accompanied by a reduction in revenue inflows. An increase in liquid assets can also

mean that banks will be cut down on fixed long terms investments and yet highly profitable. Hence, an improvement in liquidity will only cause an increase in bank performance in the short run but in the long run will cause a decline in performance as the banks loses its competitiveness to other banks which will be making more investments in fixed long term and profitable investments. Bank performance will fall when the fall in revenue is higher that the margin at which costs are falling. This therefore implies that the desire to improve bank liquidity must be matched with profit generating projects.

An increase in bank deposits is good banks as it allows banks to issue more loans out of those deposits. This is because an increase in deposits also makes it feasible for banks to have additional funds to invest in other activities. This will result in an increase in future revenue inflow. However, the results have also shown that an increase in bank deposits is not favouring bank performance. This suggests that the banks' is not properly managing its liabilities well. Suggestions can be made that the banks deposit management strategies are costing the bank revenue inflows. More revenue can be lost when banks' deposit strategies are not properly structured. For instance, a bank can lower deposit fees so as to attract more deposits. This can prove to be costly when revenue inflow falls and costs continue to rise. This therefore implies that there is a greater need to ensure that banks' deposit strategies do not compromise the ability of the banks to make profits.

Considerations must also be made that an increase in bank size is at the disadvantage of efforts to improve the performance of banks in Turkey. this is mainly because there is a certain level of bank size that is optimum for bank performance and any level beyond that will cause diseconomies of scale. This will result in an increase in costs and an additional acquisition of assets will contribute towards inefficient use of bank assets. Hence, it can be said that an increase in bank size does not always lead to improved bank performance. This is because of the idea that different banks have got different levels of financial, human and technical support that is required to manage and sustain a particular level of bank size.

In addition, it can be deduced from the study that different banking strategies have different implications on bank performance. That is, banks with effective strategies are more posed to make profits irrespective of their sizes or whether they use

internet banking or not. This is because banking strategies are in response to changes in the external environment such as economic changes (recessions, financial crisis, inflation etc). Moreover, it can be said that any activity that causes an increase in the volume of loans issues by banks and use of the internet banking facilities will result in an increase in bank performance. This however requires that banks be in possession of the necessary financial, technical and strategic support.

The results also agree with propositions made by the innovation diffusion theory which contends that the adoption of internet banking is an innovative move by banks. Such an innovative move has been established in this study to be associated with increased internet banking transactions and services fees. This study also confirmed the existence of a positive relationship between internet banking and bank performance. However, it was established in this study that too much and idle bank liquidity can hamper bank performance. Hence, implications from this study point to the idea that banks should innovate their operations and services by adopting internet banking.

CHAPTER 5

CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FUTURE STUDIES

5.1 Conclusions

The main focus of the study is to examine the effects of electronic banking on financial performance of commercial banks in Turkey. Foremost, it can be concluded that internet banking represents an innovative move by banks to improve their operations and counter competitive pressure. Hence, it can also be said to be a mechanism which banks can use to boost their performance levels as they operational capacity and efficiency level begins to increase with each successive adoption and usage of internet banking.

The diffusion of internet banking (as explained by the innovation diffusion theory) through the entire banking sector offers a lot of benefits not only to banks but also to consumers as well. This is because consumers will be in a strong position to undertake banking activities easily and effectively at their own convenience. Their acceptance of the adopted internet banking services (as explained by the technology acceptance model) is reflected in the number of active customers using internet banking. However, it must be noted that bank customers can choose to use or not to use internet banking and this depends on decisions based on a cost-benefit analysis. That is, more consumers will use internet banking given the fact that they benefit a lot from using internet banking. This is also determined by a number of factors such as costs and risks of using internet banking, availability of internet banking infrastructure. Most consumers nowadays are reluctant to use internet banking all

because of the associated risks. With a high level of internet and mobile banking scams, it remains a challenge for banks to encourage more consumers to use internet banking. Banks on the other hand, stand to benefit a lot from the use of internet banking. This is mainly because internet banking is a form of innovation which improves operations and service delivery. It can also be said to be a major source through which banks can gain a competitive advantage over other banks.

The Turkish economy can be said to be in a strong position to post huge improvement in economic performance. Such improvements in economic performance are mainly necessitated by improvements and developments in the Turkish banking sector. However, previous misfortunes such as the Turkish banking and financial crisis of 2008 still continue to haunt the Turkish banking sector. This is a major stumbling block towards the growth and development of the entire financial sector. As it stands, most bank consumers in Turkey have lost trust and confidence in the banking sector. This is coupled by problems posed by inflation and high interest rates charged by most economic players. However, a series of economic policies and the influence of Special Deposit Insurance have managed to instil confidence in the Turkish banking sector. Hence, continued and significance influence by the Turkish government will have a significant effect on improving the performance, growth and development of the banking sector.

Using the established results, it can therefore be concluded that investing in internet banking provides a powerful incentive to banks which they can use to improve their performance levels. This is mainly through an increased ability to service a huge customer base, reach a wider number of customers in different geographical locations, improve their efficiency levels and cut on costs.

It has been established that an increase in economic performance is desirable for banks to improve their performance. This mainly stems from ideas which point out that an improvement in economic growth provides an incentive for banks to benefit from increased production and economic activities, issue more loans from savings and get more profits from increased service fees. Such is true as incidences of economic instabilities in Turkey went on to affect the performance of a lot of banks.

Meanwhile, the problem of diseconomies of scales is one of the biggest challenges affecting bank performance as it results in a decrease in bank performance following

an increase in operational costs. An increase in bank size beyond an optimum level suggests that there is an inefficient allocation of resources.

Improvements in the liquidity position of the bank only causes positive changes in bank performance when they do not reduce the amount of funds that are available for investment into other profitable projects and the acquisition of assets which yield high rates of returns in the future. Also, too many idle and liquid funds do not amount to profit making ability but rather are an opportunity cost of increased loans, assets, investments and returns from assets and investments.

5.2 Recommendations

Recommendations can be made that there is a need for;

- Bank managers to come up with better liquidity management practices which will help to efficiently allocate funds between alternative projects and assets.
- There is greater need for banks to deal with non-performing loans and set provisions for bad debts.
- Banks must embark on strategies that help to lure more bank deposits from customers.
- Bank managers must increase investments towards improving internet banking systems and this includes tapping into other areas such as mobile banking.
- Bank managers need to address the problem of diseconomies of scale and ensure that an additional acquisition of banks assets does not lead to bank inefficiency.

5.3 Suggestions for future studies

During the course of the study, observations were made that changes in bank performance as a result of the adoption and use of internet banking were firm specific. Hence, suggestions can be made that efforts should be placed in examining how individual banks are affected by the adoption and use of internet banking.

REFERENCES

Aduda, J., & Kingoo, N. (2012). The relationship between electronic banking and financial performance among commercial banks in Kenya. Journal of Finance and Investment analysis, 1(3), 99-118.

Ahmad, A. M. K., & Al-Zu'bi, H. A. (2011). E-banking functionality and outcomes of customer satisfaction: an empirical investigation. International Journal of Marketing Studies, 3(1), 50.

Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behaviour. Englewood Cliffs, NJ: Prentice-Hall.

Akerlof, G. A. (1970). The Market for Lemons: Quality Uncertainty and the Market Mechanism. Quarterly Journal of Economics, 84, 488.500.

Akyüz, Y. and Boratav, K. (2003), The Making of the Turkish Financial Crisis. World Development, Vol. 31, No. 9, pp. 1549-1566

Al-Smadi, M. O., & Al-Wabel, S. A. (2011). The impact of e-banking on the performance of Jordanian banks. Journal of internet banking and commerce, 16(2), 1.

Amedu, U. M. (2005). Domestic electronic payment in Nigeria: The Challenges. Central Bank of Nigeria Bullion, vol. 29, No. 1, January/March.

Arshadi, N. & Lawrence, E. C. (1987). An Empirical Investigation of New Bank Performance. Journal of Banking & Finance, 11, 33-48.

Asiabugwa, M.A. (2011). E-Commerce Strategy and Performance of Commercial Banks in Kenya. Unpublished MBA project, University of Nairobi.

Au, Y.A., & Kauffman, R. J. (2008). The economics of mobile payments: Understanding stakeholder issues for an emerging financial technology application. Journal of electronic commerce research and applications, 7(2), 141-164.

Bankers Association of Turkey (n.d). Accessed from https://www.tbb.org.tr/en/banks-and-banking-sector-information/statistical-reports/20 on 14 March 2018

Berger, A. N. (2003), The Economic Effects of Technological Progress: Evidence from the Banking Industry", Journal of Money, Credit and Banking, 35(2), 141-76.

Bourkhis, K., & Nabi, M. S. (2013). Islamic and conventional banks' soundness during the 2007–2008 financial crisis. Review of Financial Economics, 22(2), 68-77.

Brancheau, J.C., & Wetherbe, J.C. (1990). The Adoption of Spreadsheet Software: Testing Innovation Diffusion Theory in the Context of End-User Computing. Information Systems Research, 1(2), 115-143.

BRSA (2010), From Crisis to Financial Stability (Turkey Experience, Working Paper.

Brunnermeier, M. K., & Sannikov, Y. (2014). A macroeconomic model with a financial sector. American Economic Review, 104(2), 379-421.

Burkhardt, M.E. & Brass, D.J. (1990). Changing Patterns or Patterns of Change: The Effects of Change in Technology on Social Network Structure and Power. Administrative Science Quarterly, 35, 104-127.

Cheruiyot, S. K., (2010). Impact of internet banking on financial performance of commercial banks in Kenya. Unpublished MBA project, University of Nairobi

Cooper, D. R., & Schindler, P. S. (2011). Business Research Methods (9th ed.) McGraw Hill

Cracknell, D. (2004). Electronic Banking for the poor: Panacea, Potential and pitfalls. Retrieved 28th November 2012 from http//www. Microsave.org.

Cunningham, L. F., Gerlach, J., & Harper, M. D. (2005). Perceived risk and e-banking services: An analysis from the perspective of the consumer. Journal of Financial services marketing, 10(2), 165-178.

Dabholkar, P.A., Bobbit, L.M. & Lee, E. (2003). Understanding consumer motivation and behaviour related to self-scanning in retailing. International Journal of Service Industry Management, 14 (1), 59–95.

Dannenberg, M. & Kellner, D. (1998). The bank of tomorrow with today's technology, International Journal of Bank Marketing, 16(2), 90-7.

Dargent, E. (2018). Turkish banks: this time it's different?. 28/08/2018 accessed from https://www.bondvigilantes.com/blog/2018/08/28/turkish-banks-time-different/ on 14 March 2018.

Davenport, T. H. (2003). Process Innovation: Reengineering Work through Information Technology, Boston, Harvard Business School Press.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. Management Science, 35(8), 982.

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, MIS Quarterly, 13(3), 319-340.

Delgado, J., Hernando, I. & Nieto, M. J. (2004), "Do European Primarily Internet Banks Show Scale and Experience Efficiencies?" Working Paper No. 0412, Banco de Espana, Madrid.

Deloitte (2015). The call for rerouting Turkish banking sector outlook 2015. Available at https://www2.deloitte.com/content/dam/Deloitte/tr/Documents/financial-services/turkish-banking-sector-outlook-2015.pdf.

DeYoung, R. & Rice, T. (2003), "Noninterest Income and Financial Performance at U.S. Commercial Banks", Emerging Issues Series, Supervision and Regulation Department, Federal Reserve Bank of Chicago.

DeYoung, R., (2001). The financial performance of pure play Internet banks. Economic Perspectives, Federal Reserve Bank of Chicago, Chicago, 60-75.

Diamond, D. & Dybvig, P. (1983), Bank runs, deposit insurance and liquidity, Journal of Political Economy, 9(1), 401-419.

Durbin, J., & Watson, G. S. (1951). Testing for serial correlation in least squares regression. II. Biometrika, 38(1/2), 159-177.

EC (2009), Growth and economic crises in Turkey: leaving behind a turbulent past? Economic Papers 386.

Economic Report (2013). The Turkish 2000-01 banking crisis. Retrieved from https://economics.rabobank.com/publications/2013/september/the-turkish-2000-01-banking-crisis/ on 13 September 2018.

Elhorst, J. P. (2003). Specification and estimation of spatial panel data models. International regional science review, 26(3), 244-268.

Ertugrul, A., & Selguk, F. (2018). Turkish Economy: 1980-2001. In Inflation and disinflation in Turkey (pp. 19-46). Routledge.

Essay on the Economics of Imperfect Information. Quarterly Journal of Economics,1(2), 90-95.

Gikandi, J. & Bloor, C. (2010). Adoption and effectiveness of electronic banking in Kenya. Journal of Electronic Commerce Research and Applications, 9, 277–282.

Hage, J. (1980). Theories of organizations: Forms, process and transformation, New York, John Wiley & Sons.

Hausman, J. A. (November 1978). "Specification Tests in Econometrics". Econometrica. 46 (6): 1251–1271. ISSN 0012-9682. JSTOR 1913827.

Hellwig, M. F. (2009). Systemic risk in the financial sector: An analysis of the subprime-mortgage financial crisis. De economist, 157(2), 129-207.

Hernando, I. & Nieto, M. J. (2005), “Is the Internet Delivery Channel Changing Banks’Performance? The Case of Spanish Banks”, Banco de Espana, Unpublished Manuscript

IHS (2000), Bank Privatisation Finally Agreed

Investment Support and Promotion Agency (ISPA). Financial Services In Turkey. Retrieved from http://www.invest.gov.tr/en-US/infocenter/publications/Documents/Financial.Services.Industry.Pdf on 17 August 2018.

Jean-Azan, O. (2006). Regulatory Issues in Electronic Money: A Legal-Economics Analysis, Netnomics, 1, 53-70.

Judson, R. A., & Owen, A. L. (1999). Estimating dynamic panel data models: a guide for macroeconomists. Economics letters, 65(1), 9-15.

Kagecha, K. P. (2014). Bank Performance: Does Bank Size Matter?. Research paper submitted to the School of Economics, University of Nairobi.

Kalakota, R., &Whinston, A. (1997). Electronic Commerce: A Manager' guide. Addison: Wesley Professional.

Kariuki, N., (2005). Six Puzzles in Electronic Money and Banking, IMF Working Paper, IMF Institute, 19.

Kegan, A., Acharya, R.N., Rao, L.S., & Kodepaka, V. (2005). Does Internet Banking Affect Performance of Community Banks? Presentation at the American Agricultural Economics Association Annual Meeting, providence, Rhode Island July 2005.

Kenett, D. Y., Tumminello, M., Madi, A., Gur-Gershgoren, G., Mantegna, R. N., & Ben-Jacob, E. (2010). Dominating clasp of the financial sector revealed by partial correlation analysis of the stock market. PloS one, 5(12), e15032.

Kibritçioglu, A. (2010). Effects of global financial crisis on Turkey. Munich Personal RePEc, http://mpra. ub. unimuenchen. de/29470/, MPRA Paper, (29470), 5-6.

Kilonzo, K. D. (2007). An analysis of the Legal Challenges posed by electronic banking. Kenya Law review 1, 323 -341.

Kingoo, N. (2011). The Relationship between Electronic Banking and Financial Performance among Commercial Banks in Kenya. Unpublished MBA project, University of Nairobi.

Kiragu, M. (2017). Effects of E-Banking on the Financial Performance of Kenyan Banks. Master thesis, University Of Applied Sciences, Kenya.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. Information & Management, 40, 191-204.

Liao, Z., & Cheung, M. T. (2002). Internet-based e-banking and consumer attitudes: an empirical study. Information & Management, 39(4), 283-295.

Macit, F. (2012). Recent evidence on concentration and competition in Turkish banking sector. International Research Journal of Finance and Economics, 96.

Mackinnon, J. G. (2008). Durbin-Watson Statistic. The New Palgrave Dictionary of Economics: Volume 1–8, 1463-1464.

Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. Oxford Bulletin of Economics and statistics, 61(S1), 631-652.

Malhotra, P. & Singh, B. (2009). The impact of internet banking on bank performance and risk: The Indian experience. Eurasian Journal of Business and Economics, 2 (4), 43-62.

Miller, S., & Noulas, A. (1996). The Technical Efficiency of Large Banks Production. Journal of Banking & Finance, 20(3), 495-509.

Mugenda, A., & Mugenda, M. (2003), Research Methods: Quantitative and Qualitative Approaches, ACTS Publishers, Nairobi

Muriuki, E. (2009). Factors Affecting adoption of e-banking by microfinance institutions in Kenya. Unpublished MBA project, Moi University.

Mutl, J., & Pfaffermayr, M. (2011). The Hausman test in a Cliff and Ord panel model. The Econometrics Journal, 14(1), 48-76.

Njuguna, K. P., Ritho, C., Olweny, T., & Wanderi, M. P. (2012). Internet banking adoption in Kenya: The case study of Nairobi County. International Journal of Business and Social Science, 3 (18), 246-252.

Nyangosi, R., Arora, J. S. & Singh, S. (2009). The evolution of e-banking: a study of Indian and Kenyan technology awareness. International Journal of Electronic Finance, 3 (2), 149 - 165.

Okiro, K., & Ndungu, J. (2013). The impact of mobile banking and internet banking on performance of financial institutions. European Scientific Journal, 9(13), 146-161.

Ombati, T.O., Magutu, P.O., Nyamwange, S.O. & Nyaoga, R.B. (2010). Technology and service quality in the Banking Industry: Importance and performance of various factors considered in Electronic Banking services. African Journal of Business & Management.1, 151 – 164.

Onay, C. (2008). The impact of Internet-Banking on Bank Profitability-The Case of Turkey proceedings from Oxford Business &Economics Conference Program. (June 22-24, 2008)

Oshikoya, F. (2007). What will Technology do to Financial Structure? NBER Working Paper, 6892.

Özatay, F. and Sak, G. (2002), Banking Sector Fragility and Turkey's 2000-01 Financial Crisis, Brookings Trade Forum 2002: Currency Crises, Washington D.C.

Pastory, D., & Swai, J. P. (2013). The Relationship between Bank Growth and Profitability, Emperical Evidence from Eac: Panel Data Analysis. European Journal of Business and Management, Vol.5(26), 14-26.

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. Journal of applied econometrics, 22(2), 265-312.

Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. The Review of Financial Studies, 22(1), 435-480.

Revell, J. (1980). Costs and Margins in Banking: An International Survey, Paris, OECD

Rogers, E.M. (1995). The Diffusion of Innovations, 4th Edition, Free Press, New York, NY.

Rothschild M. & Stiglitz, J. (1976), .Equilibrium in Competitive Insurance Markets: an

Schniederjans, D., Cao, E. S., & Schniederjans, M. (2013). Enhancing financial performance with social media: An impression management perspective. Decision Support Systems, 55(4), 911-918.

Shittu, O.(2010). The impact of Electronic Banking in Nigeria banking System (Critical Appraisal of Unity Bank plc.) Ladoke Akintola University of Technology, Ogbomoso

Short, B. (1979). The Relation between Commercial Bank Profit Rates and Banking Concentration in Canada, Western Europe and Japan. Journal of Banking & Finance, 3, 209-219.

Siam, Z. A. (2006). Role of the Electronic Banking Services on the Profits of Jordanian Banks. American Journal of Applied Science, 3 (9), 1999-2004.

Spence, A. M. (1973). Job Market Signaling., Quarterly Journal of Economics, 87, 355-374.

Steven, A. (2002). Information System: The information of E-Business, New Jersey, Natalie Anderson, 11-36.

Sullivan, R. J. (2000), “How Has the Adoption of Internet Banking Affected Performance and Risk at Banks? A Look at Internet Banking in the Tenth Federal Reserve District”, Financial Industry Perspectives, Federal Reserve Bank of Kansas City, December, pp. 1-16.

Sumra, S.H., Manzoor, M.K., Sumra, H.H. & Abbas, M. (2011). The Impact of e-banking on the Profitability of Banks: A Study of Pakistani Banks, Journal of Public Administration and Governance, l(1), 31-38.

Trujillo-Ponce, A. (2013). What determines the profitability of banks? Evidence from Spain. Accounting & Finance, 53(2), 561-586.

Ugur, M. (2009), Turkish economic policy under AKP government: an assessment for 2002-2007

Wang, R., & Wang, X. (2015). What determines the profitability of banks? evidence from the US. Master thesis, Guangdong University, China.

Wyman, O. (2016). Turkish Banking Sector Profitability: HOW TO ADJUST TO THE NEW LIFE STAGE. Available at https://www.oliverwyman.com/content/dam/oliverwyman/global/en/2016/may/Turkish%20Banking%20Sector%20Profitability_How%20to%20adjust%20to%20the%20new%20life%20stage%20-%20FINAL.pdf.

LIST OF APPENDICES

Appendix 1: Fixed effect regression analysis

Dependent Variable: LROA
Method: Panel EGLS (Cross-section SUR)
Date: 12/10/18 Time: 20:16
Sample (adjusted): 9/01/2014 6/01/2018
Periods included: 16
Cross-sections included: 6
Total panel (balanced) observations: 96
Linear estimation after one-step weighting matrix
Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBS	-0.131673	0.034106	-3.860689	0.0002
LNAC	0.151345	0.065802	2.300010	0.0239
LLNS	2.468785	0.318109	7.760824	0.0000
LLA	0.029185	0.016063	1.816879	0.0728
LBD	-0.043613	0.046804	-0.931828	0.3541
C	-4.928579	1.107759	-4.449144	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.556970	Mean dependent var	12.97208
Adjusted R-squared	0.504849	S.D. dependent var	11.90147
S.E. of regression	0.873161	Sum squared resid	64.80488
F-statistic	10.68606	Durbin-Watson stat	1.912744
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.553636	Mean dependent var	2.827557
Sum squared resid	17.23801	Durbin-Watson stat	2.052314

Appendix 2: Fixed effect Redundancy test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.567893	(5,85)	0.0002

Cross-section fixed effects test equation:
Dependent Variable: LROA
Method: Panel EGLS (Cross-section SUR)
Date: 12/13/18 Time: 00:39
Sample (adjusted): 9/01/2014 6/01/2018
Periods included: 16
Cross-sections included: 6
Total panel (balanced) observations: 96
Use pre-specified GLS weights
Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBD	0.036652	0.040848	0.897277	0.3720
LLA	-0.012938	0.019043	-0.679433	0.4986
LNAC	0.077510	0.075274	1.029698	0.3059
LBS	-0.123747	0.039517	-3.131524	0.0023
LLNS	1.788008	0.324296	5.513512	0.0000
C	-2.925625	1.186293	-2.466192	0.0156

Weighted Statistics

R-squared	0.411867	Mean dependent var	12.97208
Adjusted R-squared	0.379193	S.D. dependent var	11.90147
S.E. of regression	0.977696	Sum squared resid	86.02998
F-statistic	12.60534	Durbin-Watson stat	1.724657
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.389193	Mean dependent var	2.827557
Sum squared resid	23.58858	Durbin-Watson stat	1.882277

Appendix 3: Random effect regression analysis

Dependent Variable: LROA
Method: Panel EGLS (Cross-section random effects)
Date: 12/10/18 Time: 20:18
Sample (adjusted): 9/01/2014 6/01/2018
Periods included: 16
Cross-sections included: 6
Total panel (balanced) observations: 96
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LSIZE	-0.202586	0.078896	-2.567772	0.0119
LNAC	0.165591	0.174829	0.947157	0.3461
LLNS	3.120397	0.331378	9.416423	0.0000
LLA	-0.036659	0.034770	-1.054350	0.2945
LBD	0.261113	0.083095	3.142345	0.0023
C	-7.756829	1.726588	-4.492577	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	3.26E-07	0.0000
Idiosyncratic random	0.402700	1.0000

Weighted Statistics

R-squared	0.530683	Mean dependent var	2.827557
Adjusted R-squared	0.504610	S.D. dependent var	0.637584
S.E. of regression	0.448756	Sum squared resid	18.12441
F-statistic	20.35363	Durbin-Watson stat	1.468642
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.530683	Mean dependent var	2.827557
Sum squared resid	18.12441	Durbin-Watson stat	1.468642

Appendix 3: Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	26.763763	5	0.0001

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LBD	0.016009	0.261113	0.012553	0.0287
LLA	0.075003	-0.036659	0.000629	0.0000
LNAC	0.429473	0.165591	0.002927	0.0000
LSIZE	-0.170308	-0.202586	0.000275	0.0516
LLNS	3.914436	3.120397	0.030156	0.0000

Cross-section random effects test equation:
Dependent Variable: LROA
Method: Panel Least Squares
Date: 12/13/18 Time: 00:42
Sample (adjusted): 9/01/2014 6/01/2018
Periods included: 16
Cross-sections included: 6
Total panel (balanced) observations: 96

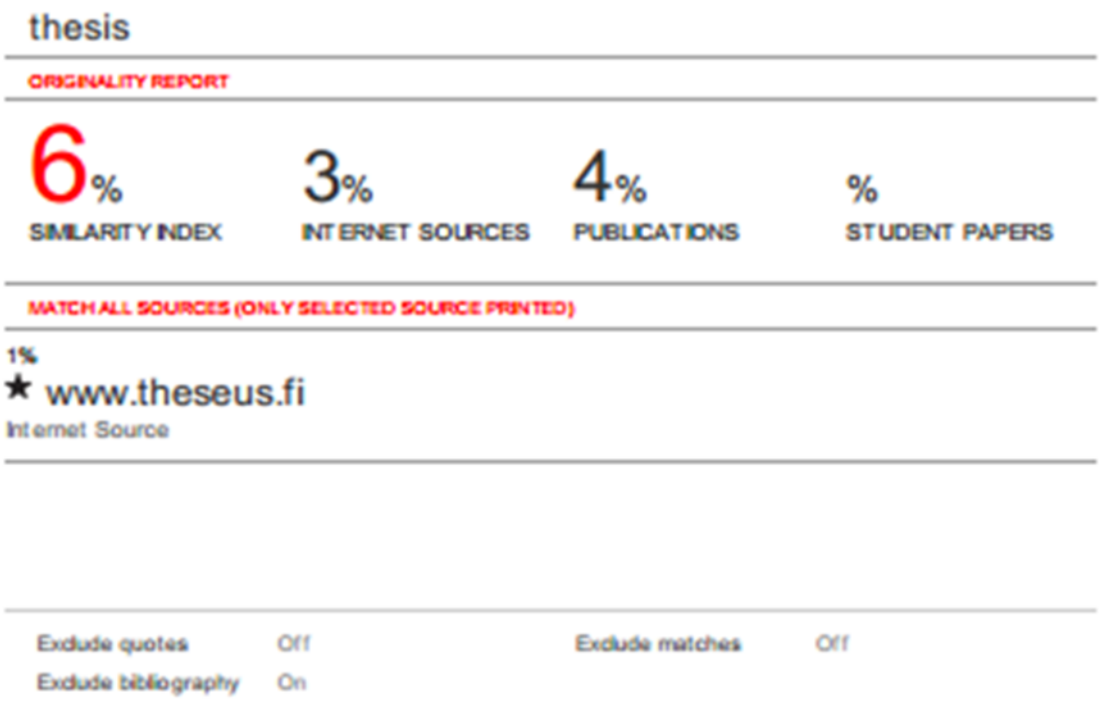
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.08680	1.843086	-6.015346	0.0000
LBD	0.016009	0.139490	0.114767	0.9089
LLA	0.075003	0.042869	1.749606	0.0838
LNAC	0.429473	0.183008	2.346738	0.0213
LSIZE	-0.170308	0.080619	-2.112500	0.0376
LLNS	3.914436	0.374122	10.46300	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.643069	Mean dependent var	2.827557
Adjusted R-squared	0.601077	S.D. dependent var	0.637584
S.E. of regression	0.402700	Akaike info criterion	1.126219
Sum squared resid	13.78421	Schwarz criterion	1.420051
Log likelihood	-43.05852	Hannan-Quinn criter.	1.244991
F-statistic	15.31414	Durbin-Watson stat	1.718884
Prob(F-statistic)	0.000000		

PLAGIARISM REPORT



thesis

ORIGINALITY REPORT

6%	3%	4%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

1%

★ www.theseus.fi

Internet Source

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	On		

ETHICS COMMITEE APPROVAL

YAKIN DOĞU ÜNİVERSİTESİ

BİLİMSEL ARAŞTIRMALAR ETİK KURULU

28.11.2018

Sayın Dlovan Wirya Chaqmarhchi

Bilimsel Araştırmalar Etik Kurulu'na yapmış olduğunuz **"The Effects Of E-Banking On The Financial Performance Of Banks In Turkey"** başlıklı proje önerisi, sadece ikincil kaynak kullanıldığı için Etik Kuruluruna girmesine gerek yoktur. Bu yazı ile birlikte sadece ikincil kaynak kullanmak şartıyla araştırmaya başlayabilirsiniz.

Doçent Doktor Direnç Kanol

Bilimsel Araştırmalar Etik Kurulu Raportörü

Direnc Kanol

Not: Eğer bir kuruma resmi bir kabul yazısı sunmak istiyorsanız, Yakın Doğu Üniversitesi Bilimsel Araştırmalar Etik Kurulu'na bu yazı ile başvurup, kurulun başkanının imzasını taşıyan resmi bir yazı temin edebilirsiniz.

YAKIN DOĞU ÜNİVERSİTESİ

BİLİMSEL ARAŞTIRMALAR ETİK KURULU

28.11.2018

Dear Dlovan Wirya Chaqmarhchi

Your project **"The Effects Of E-Banking On The Financial Performance Of Banks In Turkey "** has been evaluated. Since only secondary data will be used the project it does not need to go through the ethics committee. You can start your research on the condition that you will use only secondary data.

Assoc. Prof. Dr. Direnç Kanol

Rapporteur of the Scientific Research Ethics Committee

Direnc Kanol

Note: If you need to provide an official letter to an institution with the signature of the Head of NEU Scientific Research Ethics Committee, please apply to the secretariat of the ethics committee by showing this document.