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Impact of Working Capital Management on Banks' Performance: Evidence from UK

DIARY ALI

MASTER'S THESIS

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ACCEPTANCE

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Has been found satisfactory for the Award of Degree of Master

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DEDICATION

IN THE MEMORY OF My Dad, Jalal Ali Abdulkarim (1958 -2007), who departed peacefully on July 11th 2007. Thanks for all your love and sacrifices for us. Your deep love of your children imbued in us a strong sense of intimacy and brotherhood.

My dear mother, brother and sisters with my dear wife Medyia, and my extraordinary children Ney, and Mina, without their love, patience, and sacrifice, this was not possible.

To all my close relatives and friends who supported me to finish this journey.

ABSTRACT

Impact of Working Capital Management on Banks' Performance: Evidence from the UK

The existing theories and empirical literature provided sufficient evidence on the influences of working capital management (WCM) and its components on the profitability of business organizations. Although this framework has been examined on various non-financial sectors, banking sector is rarely been touched. The context of this thesis covers 10 large banks from the UK and the time period considered from 2000 to 2017. Thus, panel ordinary least squared is been adopted. The main objective of this study is to examine the impact of WCM and its elements namely; Borrowers' Collection Period (BCP), Creditors' Payment Period (CPP), Bank Cash Conversion Cycle (BCCC) on UK banks profitability measured by Return on Asset (ROA) and Net Interest Margin (NIM). Correlation analysis reveals negative relation between profitability and BCP and CPP. However, BCCC is found to be positively associated with profitability. OLS regression analysis reveals that only the effect of BCP is statistically significant which is actually negative implying that longer borrower collection period decreases the profitability. Itis concluded that banks are able to increase their profitability with an efficient working capital management.

Keywords: Profitability, working capital management, banking sector, UK

ŐZ

Çalışma Sermayesi Yönetiminin Bankaların Performansına Etkisi: İngiltere'den Kanıtlar

Mevcut teoriler ve ampirik literatür, işletme sermayesi yönetiminin (WCM) ve bileşenlerinin iş organizasyonlarının karlılığı üzerindeki etkileri hakkında yeterli kanıt sağlamıştır. Bu çerçeve çeşitli finansal olmayan sektörler üzerinde incelenmesine rağmen, bankacılık sektörüne nadiren değinilmiştir. Bu tezin içeriği İngiltere'den 10 büyük banka ve 2000'den 2017'ye kadar geçen süreyi kapsamaktadır. Bu nedenle, en küçük kareler paneli benimsenmiştir. Bu çalışmanın temel amacı, WCM ve unsurlarının etkisini incelemektir; Borçluların Tahsilat Dönemi (BCP), Alacaklılar'ın Ödeme Dönemi (CPP), Banka Nakit Dönüşüm Döngüsü (BCCC), İngiltere Bankalarının karlılığı, Varlık Karşılığı (ROA) ve Net Faiz Marjı (NIM) ile ölçüldü. Korelasyon analizi, karlılık ile BCP ve CPP arasındaki negatif ilişkiyi ortaya koymaktadır. Bununla birlikte, BCCC'nin karlılıkla pozitif ilişkili olduğu bulunmuştur. OLS regresyon analizi, sadece BCP'nin etkisinin istatistiksel olarak anlaml ›oldu¤unu ortaya koymaktad› r, bu da gerçekte daha uzun borç alan ›toplama süresinin kârl› l ›¤› azaltt ›¤› n ›gösteren negatiftir. Bankaların karlılıklarını verimli bir işletme sermayesi yönetimi ile artırabildiği sonucuna varmıştır.

Anahtar Kelimeler: Bankalar, İngiltere, işletme sermayesi yönetimi, karlılık.

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LIST OF ABBREVIATIONS

WCM: Working Capital Management

BCP: Borrowers' Collection Period

CPP: Creditors' Collection Period

ROA: Return on Asset

NIM: Net Interest Margin

OLS: Ordinary Least Squared

LEV: Leverage

GRTH: Growth

CUR: Current Ratio

WC: Working Capital

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

According to Bank of England banking sector's history belongs to 1694 where the Bank of England began as a private bank. Banks are the protectors of the overall financial system and smoothing the economic activities.

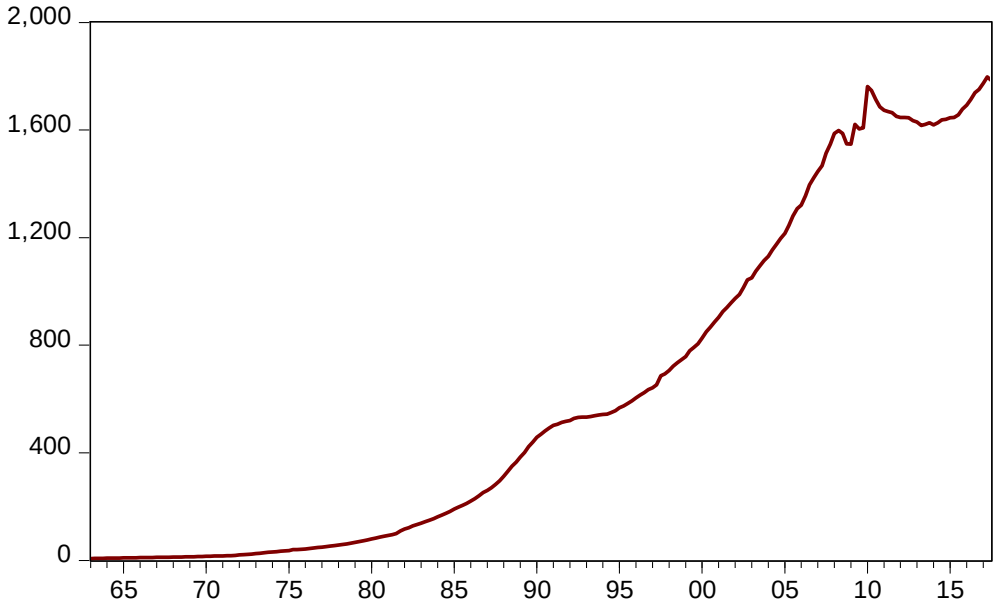

Figure 1: Credit to private non-financial sector by UK domestic banks (billions of pounds). Source: Federal Reserve Economic Data.

Banking sector development has a direct and indirect effect on economic structure and growth especially in the developed economies such as United Kingdom (Tongurai and Vithessonthi, 2018). Banks create opportunity by financing individual industries, businesses, and even trade. Credit to private non-financial sector by domestic banks is one among several measurements of the banking development.

As shown in Figure 1 banking sector in the UK has grown dramatically through 1963 to 2017, reaching to about 1800 Billions of British Pound Sterling at the in 2017 indicating for abnormal growth and efficiency of the UK banking sector. Working capital management is described as a managerial accounting strategy at which aiming to maintain sufficient level of working capital (current assets and current liabilities) in respect to each other to ensure that the firm has adequate cash to respond to immediate demands by the debt holders and to manage daily operations (Dekan, 2009). Moreover, (Yahya and Bala, 2015) argue that companies in the competitive business environment have to efficiently use the resource that asserts the significance of WCM. It has been broadly accepted that the profitability of a business considerably relies on the manner in which its working capital is managed. Inefficient managed working capital not only decreases the earnings but ultimately may cause a serious distress to the enterprises. Major elements of WCM are profitability and liquidity and therefore there is a trade-off between the two variables and WCM is also directly affects the liquidity and profitability (Beaumont and Begemann, 1997).

Moreover, as (Ukaegbu, 2014) stated since the nature of the companies and businesses vary substantially, the firms' working capital differs from an industry to another industry as well. The author compares manufacturing firms as the need to invest heavily in spare parts and components with firms in food and retail industry as they need to have large inventories of goods for resale but would have few trade receivables. In the present thesis, we examine the influences of working capital management components on the financial performance of banks in United Kingdom. No doubt, the items of the financial statements of the banks are substantially varying from non-financial firms due to the nature of the businesses. Bank's major operations are interested in pilling up the temporary inactive money of the public for advancing to others for expenditures. Simply, banks accept deposits and make loans and derive profit from the spread between debts interest rates expense and loans interest rate.

The creditors can be households, other financial institutions, and/or companies. In addition toloans, banks are providing a bunch of other financial services which can also generate non-interest income. Base on reviewed so far, we can understand that the nature of banking industry is substantially varying from other industries in particular non-financial companies. Thus, WCM and its influences on the profitability of the banks are also different.

1. 2 Purposes and Motivation of the Study

WCM plays a vital role in the overall corporate strategy of maximizing shareholders' value. However, maximizing shareholder' wealth comprises determining the proportions of both current assets and short-run liabilities (Nwankwo and Osho, 2010). Moreover, companies those are able to manage their working capital efficiently are likely to response quickly to unanticipated economic changes (Alshubiri, 2011). The risk of short-run default can be avoided by well managing current assets and current liabilities. The contribution of WCM to maximizing the firm's value will be achieved when the marginal return on invested assets in working capital is equal or greater than the cost capital utilized to finance them (Eljelly, 2004).

Furthermore, bout the significance of profitability and liquidity (Raheman and Nasr 2007) argue that a company cannot survive for a long period if it does not care about profit. Meanwhile, it may face insolvency if it does not concern about liquidity and risk. It is worth to note that liquidity in the banking industry is more specific. Banks mainly tend to give out money as loans and receive interests in return. Holding liquid assets does not provide any revenue to the banks. Hence, holding big volumes of liquid assets decreases profit while holding insufficient liquid assets can cause financial distress. Thus, an efficient management of liquid assets is crucial. To the best of our knowledge rarely researches concerning the association between WCM and financial performance of the banks are available in literature.

On the other hand, WCM decisions are important tasks of the financial managers toward their main objective of value maximization. The present thesis,therefore, not only fills a great gap in the relevant literature but also raises remarkable issue to be studied in the bank industry.

1.3 Objective of the Thesis

The current thesis emphasizes on the investigating the possible influences of working capital management on the profitability of banks specifically ten among the largest listed banks in the UK. In particular, the thesis attempt to examine the impacts of chosen explanatory variables namely; creditors' period payment, borrowers' period payment and bank cash convention cycle on return on asset or net interest margin of the sample banks.

1.4 Research Questions

In view of the above stated problems, my research questions for this study are as follows:

1. To what extent does working capital management (Bank Cash Conversion Cycle) affect the profitability of UK banks?
2. What is the effect of Working capital Management (Borrowers' Collection Period) on the profitability of UK banks?
3. How does Working Capital Management (Creditors' Payment Period) affect the profitability of UK banks?

1.5 Limitations and Scope of the Study

This study is based on the data covered by 10 banks in the UK including the largest and oldest banks. There is a population of 22 banks listed on London stock exchange however when we built the sample data we faced some challenges that made us reduce the sample size to 10 banks. Another factor which limited the choice of the sample banks of the study was the age of the banks.

1.6 The Thesis Structure

The rest of the thesis organized as follows:

- In chapter two the most relevant theories and latest literature will be reviewed. Starting with the prior empirical studies that examined the impact of WCM on the profitability of firms in various sectors.
- In chapter three, the thesis data and methodology is presented. The variables and models of this thesis are also provided. In particular, the statistics and econometric techniques that are used presented in chapter three.
- Chapter four outlines the presentation and discussion of descriptive statistics analysis of the data and the results obtained from the empirical approach.
- In chapter five, we provide a summary of the thesis with the main findings. We also conclude and propose the recommendation for further research.

CHAPTER 2

LITERATURE REVIEW

2. 1 Theoretical Framework

2.1.1 Working Capital Management

Working capital management can be considered as a substantial proportion of financial management. It is impossible for any business to run smoothly without appropriate control for it. On the other hand, managing current assets and current liabilities properly is necessary for any business organization. WCM also plays a crucial role in success and failure of business companies irrespective to their nature. WCM has to do with managing all segments of current assets such as cash and equivalent assets and current liabilities such as short-term debts (Yahaya and Bala, 2015).

2.1.2 Working Capital Management and Profitability

Profitability is the firm's ability to generate profit with the invested asset. The importance of the WCM and its implications has been discussed by many previous studies. Working capital decisions have an influence on the firm's risk, return, and market value (Horne and Wachowicz, 2008). An efficient WCM is highly essential for companies especially when investment opportunity increases (Aktas, Croci and Petmezas, 2015).

(Lind, 2012) argue that with an efficient WCM companies can raise capital for further strategic goals, reduce the financial expenses, and consequently increase profit. Moreover, (Knauer and Wöhrmann, 2013) proposed that WCM is highly pivotal to firm's success. However, unjustifiable over investment in working capital would inversely influence profitability or investment returns (Vishnani and Shah, 2007).

Thus, the prime objective of efficient management of working capital ought to control and exploit current financial resources of a company to balance between profitability and the risk associated with it (Ricci & Vito 2000).

2.1.3 Liquidity and Profitability

Maintaining liquidity is another important function of financial manager since liquidity inversely affects the profitability of the firms. Liquidity and profitability are both substantial goals for any business organization. The company faces a serious problem if gives up one of the two important goals for another one. If the company foregoes profit for liquidity, then the firm cannot continue to survive and exist without profit. Likewise, as argued by (Scharf, 1984) liquidity is short-run objective of any firm that should be addressed to protect a business organization from bankruptcy The importance of liquidity side by side with the profitability has been addressed by other studies such as (Smith,1980) and (Raheman and Nasr, 2007) where they are insistence on the importance on the profitability and liquidity as to crucial objective of any business organization.

Trade-off between the liquidity and profitability should be in such a way that companies should invest in working capital up to the level that marginal returns are greater than the cost of invested capital (Weston and Brigham, 1977).

2.1.4 Debtors' Management and Profitability

Establishing an optimal credit policy by setting credit terms and controlling the collection period of credits are the very significant aims that financial managers always concerns in particular in the bankingindustry where credits are the major source of revenue and profit. An optimal credit policy is a point where marginal investment rate of return is equal to the marginal cost of financing the investment, in other words, it is the policy where firm value is maximized (Egbide and Enyi, 2008). The study further argues that firms through expanding sales turnover program usually extend its credit period to increase operating profit.

However, this can be achieved only if marginal operating profit is greater than marginal cost of extended credit period. Meanwhile, credit periods that granted to customers, generally, have a positive impact on profitability and expected to maximize firms' value (Lazaridis and Tryfonidis, 2006). The foregoing captures consensus of scholars' on opinions regarding the relationship or association between managing receivables and profitability is objective of most of the business organizations. Moreover, Debtors' collection period in the present thesis is measured as the ratio of Banks' current assets such as cash and due from banks multiplied by 365 days to interest income (Yeboah and Agyei, 2012).

2.1.5 Creditors Management and Profitability

The prime purpose of efficient management of working capital especially accounts payable is to enhance the performance of the company[1] and the stability of the firms which measured by liquidity level. Thus, all the various components of WCM (measured by debtors' collection period (DCP), creditors' payment period (CPP), and cash conversion cycle (CCC) in this thesis) can be managed to raise both growth of a firm and its profitability (Lazaridis and Tryfonidis, 2006 and Egbide and Enyi, 2008). Account payables are counterparts to short-term debts in the banks' balance sheet are significantly subject on the company's purchases which, in turn, will depend on the magnitude of production. Thus, the decision to whether to take trade discount or stretch account payables or not, ought to be based on the trade-off between the benefits and costs of credit policy. The firm should balance the benefits of trade credit against the cost of giving up potential cash discount, any possible delay in payment, penalties, possible increase in the selling prices (Horne and Wachowicz, 2008). Therefore, the ultimate efforts of the financial managers with respect to account payables is to ensure that firm's liquidity is not inversely affected by optimizing cash outflows from the firm.

[1] In this thesis, the banks' performance is measured by profitability.

However, in the current thesis creditors' payment period is measured by short-run debt to interest expense multiplied by 365 days (Yeboah and Agyei, 2012).

2.1.6 Cash Conversion Cycle (CCC) and Profitability

The CCC has been broadly used as the comprehensive measurement of working capital management in literature (Enqvist, Graham andNikkinen, 2014). In this thesis, CCC is measured by the difference between debtors' collection period and creditors' payment period for banks.

Efficient WCM practices attempt to shorten the CCC to optimize to the level that best matches the particular requirements of a company (Hager, 1976). A short CCC means quick collection of receivable items and delay in payables. This promotes corporate efficiency in the use of working capital and consequently affects the profitability of the company. (Enqvist et al., 2014). However, according to Shin and (Shin and Soenen, 1998), there is not a clear demarcation for the association between CCC and profitability. This motivates researchers in worldwide to examine the relation empirically and found mixed results.

2.2 Review of Literature

Several researchers examined the influences of working capital management on the financial performance of business organizations from various sectors and countries. Moreover, the past empirical studies regarding the effect of WCM on the profitability of corporations provide mix results. In the following table, the relevant empirical studies that would be reviewed have been summarized.

Table 2.1 Summary of relevant literature on the impact of WCM on profitability

Study	Country	Time Interval	Method	Findings
Deloof (2003)	Belgium	1991 - 1996	Pearson's correlation and regression analysis	Statistically significant impact of account receivables days and account payables days on the profitability.
Falope and Ajilore (2009)	Nigeria	1996 - 2005	Panel OLS and correlation analysis	Negative relationship between WCM and profitability.
Tufail (2013)	Pakistan	2005 - 2010	Panel regression and correlation analysis	The correlation association between WCM and profitability is negative.
Lazaridis and Tryfonidis (2006)	Greek	2001 - 2004	Pearson's correlation and regression analysis	The study insists that the managers can raise profit if they optimize the level of WCM and its components.
Ukaegbu (2014)	Kenya	2005 - 2009	Balanced panel approach	A strong negative relationship between net operating profit and CCC across the sample data that's as CCC increases the profit of the companies will decrease.
Padachi (2006)	Mauritian	1998 - 2003	Correlation analysis and panel regression	The result of regression analysis exhibited that high investment in

				receivables and inventories decreases profitability
Alshubiri (2011)	Jordan	2005 - 2009	Unbalanced panel approach	The author proposes that working capital management is positively correlated with firms' performance.
Charitou, Elfaniand Lois (2010)	Cyprus	1998 - 2007	Panel OLS and correlation analysis	CCC and all its components are negatively affecting the profit positions of the companies.
Bhatia and Srivastava (2016)	India	2000 - 2014	Panel (OLS) approach and fixed-random effect models and generalized method of moments (GMM)	Managers of companies can boost the value of their company by shortening CCC, lowers days accounts receivable, inventory days and extending payable days.
Alipour (2011)	Iran	2000 - 2006	Multiple regressions and Pearson's correlation approach	Negative and statistically significant relationship between numbers of day's accounts receivable, inventory turnover days, day's accounts payables, and CCC and profitability of the companies.
Raheman and Nasir (2007)	Pakistan	1999 - 2004	Pearson's correlation approach and OLS panel regression technique	High inverse relationship between WCM components and profitability of the sample companies.

Iqbal and Zhuquan (2015)	Pakistan	2008 - 2013	Panel OLS and correlation analysis	Converse and statistically significant association between the items of WCM and profitability of Pakistani firms.
Awan et al., (2014)	Cement companies in Pakistan	2009 - 2013	Panel ordinary least squared analysis	Negative relationship between the variables has been found.
Juan Garcia-Teruel and Martinez-Sola (2007)	Spain	1996 - 2002	Panel data methodology	Demonstrate that managers can create value by reducing their inventories and the number of days for which their accounts are outstanding.
Afrifa et al., (2014)	Alternative Investment Market	2007 - 2014	Panel data regression analysis	The findings for all SMEs explorer that inventory holding days, accounts receivable days, and account payable days concave relationship with performance.
Yeboah and Yeboah (204)	Ghana-Banks	2005 - 2010	Descriptive statistics, correlation analysis,and OLS pane approach	The findings suggest CCC is conversely related to banks' profitability and bank leverage positively affect the profitability.
Umoren and Udo (2015)	Nigeria-Banks	1998 - 2007	Pearson's correlation and regression technique	The study reports that bank profitability inversely affected by cash conversion cycle and leverage. The study further

				found banks liquidity is negatively influenced by creditors' payment period, leverage, and cash conversion and credit risk.
Yahaya and Bala (2015)	Nigerian-Banks	2007 - 2013	Panel OLS approach	Findings indicate a positive relationship between current ratio and quick ratio and return on assets while cash ratio found to be conversely related to the profitability.
Gill, BigerandMathur(2010)	United States	2005 - 2007	Pearson's correlation and regression approach	Converse relationship between WCM components and profitability.
Mohamad and Saad (2010)	Malaysia	2003 - 2007	Descriptive statistics, correlation analysis and OLS pane approach	Inverse and statistically significant relationship between the items of WCM and profitability.
Karaduman et al., (2010)	Turkey	2005 - 2008	Multiple regressions and Pearson's correlation approach	CCC and all its components are negatively affecting the profit positions of the companies.

2.2.1 Effect of Working Capital Management on Profitability

In the relevant literature, empirical studies mainly focus on examining possible linkage between WCM and firm's profitability. The studies assess working capital management by attempting to examine possible impact of WCM on the companies' profitability. The studies generally state that working capital management which leads to higher profit, should be the in the form of optimal management of WC that is possible to conduct. In literature, most of the studies adopted regression analyses to estimate the influence of different variables on the profitability. Meanwhile, the major explanatory variables that used to represent working capital management was Cash Conversion Cycle (CCC).

(Deloof, 2003) hypothesizes that it's expected for WCM to have statistically significant influence on the profitability of companies since most firms have a great amount of cash invested in working capital. Using correlation and regression analysis and a sample of 1637 Belgian firms the study examined the influences of WCM on the profitability. The correlation tests revealed a negative relation association between the gross operating income and the components of working capital management. The study further reported a statistically significant impact of account receivables days and account payables days on the profitability. Meanwhile, the coefficient of cash conversion cycle found to be negative but statistically insignificant. The author concludes that by minimizing the number of days in inventory and accounts payables, managers can maximize shareholders wealth.

(Falope and Ajilore, 2009) employed an empirical study and provided evidence about the influences of WCM on profitability of firms. The study used secondary data derived from the financial reports of the 50 non-financial companies listed in Nigeria covering 10 years period 1996 to 2005. Specifically, the study examined firm's profitability (measured by ROA) as the function of WCM and its traditional components.

The study included further control variables namely; Size, growth (growth in sale), leverage and economic growth (annual growth in GDP). Panel data econometrics with fixed effect model have been utilized as the method of estimation. The results of the study reports converse and statistically significant relation between profitability position of the firms and average payment period, average collection period, inventory turnover in days, and cash conversion cycle. The authors argue that inverse relationship between profitability and number of days account payable is parallel with the view that less profitable firms delay longer to pay their bills. This is evidence that account payable and profitability are negatively affecting each other. Moreover, the study observed that regarding impact of working capital management on their profitability of large and small companies no considerable difference is found. Lastly, the authors recommend that firms' managers are able to make additional value for the shareholders if they manage working capital efficiently. Precisely by decreasing number of days inventories and account receivables to minimum level possible.

Another study by (Tufail, 2013) examined the influences of WC policies on companies' profitability measured by the proxy of return on asset. Current ratio used to capture the investment policy in WCM. The proxy of current liability to total assets utilized to capture the financing policy of WCM. In addition, the study included debt to equity ratio, quick ratio, and size the model of the study as explanatory variables. The sample of the study built on the 117 listed companies from textile industry on Karachi stock exchange and time interval was considered from 2005 to 2010. The findings exhibit an inverse relationship between companies' profitability and aggressiveness of working capital policy. Nonetheless, among other variables size and liquidity positively and leverage negatively associated with profitability.

Using a sample of 126 industrial companies from ten different subsectors (Weinraub and Visscher, 1998) investigate the case of aggressive and conservative WC policy. The study used quarterly data frequency and covered the time span of 1984-1993. Descriptive statistics, correlation,and panel regression analysis were employed as measures of analysis. The study aimed

to investigate the possible variations in working capital policies and long-run stability of those policies over time. Financing working capital policy was measured by the proxy of current liability to total assets. The study reports a negative and statistically significant association between financing policies and industry investment in working capital. It's observed that following aggressive working capital will be balanced by conservative working capital financing policy.

(Lazaridis and Tryfonidis, 2006) carried out their research on the relationship between WCM and profitability of 131 listed firms in the Athens stock exchange covering the time span of 2001to 2004. The WCM efficiency is measured by cash conversion cycle and its components. Their findings report significant linkage between WCM and profitability. The study proposes an implication as the results of the empirical findings as they note that an increase in the days' numbers of accounting payable is negatively associated with profitability, that's lower profitable firms wait a longer period to pay their bill benefitting from credits. In line with the prior studies, the study insists that the managers can raise profit if they optimize the level of WCM and its components.

Using balanced panel approach consist from listed manufacturing firms in Kenya, South Africa, Egypt, and Nigeria over time period of 2005-2009, (Ukaegbu, 2014) reports a strong negative relationship between net operating profit and CCC across the sample data that's as CCC increases the profit of the companies will decrease. The study further suggests implications for managers that managers can create positive value for shareholders by reducing the days customers settle their accounts, ensuring that they sell off their inventories as quickly as possible and delaying the payments to their suppliers, as long as this does not affect their credit rating.

(Padachi, 2006) carried out a study which aims to analyze the influence of WCM on the performance of companies. The sample created using 158 small manufacturing firms in Mauritania.

Time period covered six years from 1998 to 2003. The level of aggressiveness of financing policy was measured by the proxy of current liability divided by total assets that's higher ratio indicates for more aggressive financing policy. Size, financial debt to total assets ratio, capital turnover ratio, and liquidity ratio were also included in the regression model. Findings of the study exhibited that if companies highly invest in inventories and receivables their profit will decrease.

(Alshubiri, 2011) employed his study with the same framework (the impact of WCM on the companies' profitability). However, the study was carried out in Jordan. Used data was unbalanced covered 49 listed industrial firms in Amman Stock Exchange during the time span of 2005-2009. Unbalanced panel Ordinary Least Squared model with fixed–effect have been adopted to perform the analysis. In line with the traditional views of WCM theories, the findings of the study suggest that firm's performance and cash conversion cycle which represents WCM are positively correlated. Further findings propose that industrial firms in Jordan are mostly following conservative investment policy. The industrial firms generally are not following aggressive financing policy.

(Charitou, Elfani and Lois, 2010) argue that the recent global financial crisis brought to the foreground the efficient utilization of firms' financial resources. The study also empirically investigated the effects of WCM on the profitability measured by return on assets) of a sample firms that contain of 43 listed firms in Cyprus for the interval of 1998 to 2007. The study found CCC and all its components are negatively affecting the profit positions of the companies. One more time the study confirms the ability of firms to create value for their shareholders by lowering the CCC and its elements. The study further argues that the findings as such important for decision making by financial managers, shareholders, and all stakeholders.

Bhatia and (Bhatia and Srivastava, 2016) studied the relationship between WCM and firms' financial performance (measured byprofitability and market performance) in India (Bombay Stock Exchange).

The study specifically used a large sample consist of 179 firms a long window spanning across 2000-2014 for the analysis and applied both panel (OLS) approach and fixed-random effect models and generalized method of moments. The results obviously point out that the influence of CCC on the firms' financial performance is negative and statistically significant showing that firms can improve financial performance by reducing CCC. The demonstration of this relationship according to the study is that if firms use lesser working capital finance cash out flows with respect to financing cost will decrease. This also decreases the maintenance cost of WC which leads to better margins. Hence, better margins and on the other hand maintained profitability can boost the market value of the company. Therefore, by shortening cash conversion cycle, reduction in account receivables, lowering inventory days and expanding payable account periods, companies' managers can increase their market value.

In Iran, (Alipour, 2011) inspected the association relation between WCM and profitability of the random sample of 1063 firms over the time span of 2001 to 2006. The study, in particular, uses cash conversion cycle as the measurement of WCM efficiency. The study uses multiple regressions and Pearson's correlation approach was used to test the hypotheses. The study found an inverse and statistically significant linkage between numbers of day's accounts receivable, inventory turnover days, day's accounts payables, and cash conversion cycle and profitability of the firms. Based on the obtained results the study proposes that one of the master objectives of the managers should be decreasing cash conversion cycle, this will improve the performance of the firms since longer cash conversion cycle needs to be financed even from external source by the company.

(Raheman and Nasir, 2007) hypothesized that WCM has its influences on both liquidity in one side and profitability of the companies on the other side. By using 94 Pakistani companies which are listed on Karachi Stock Exchange during the period of six years (1999 – 2004).

the study examined the impact of WCM including Average collection period, Inventory turnover in days, Average payment period, Cash conversion cycle and Current ratio on the Net operating profitability of Pakistani firms. Pearson's correlation approach and OLS panel regression technique are used in the study for analysis. The findings exhibit strong opposite linkage between WCM components and profitability of the sample companies. The authors propose that this implies that when CCC increases the net income of the companies will decrease. This provides an opportunity for companies' managers to create value all stakeholders by reducing CCC to reasonable minimum level. The study further explorer converse and statistically significant relationship between profitability and liquidity.

The study followed by another study conducted by (Iqbal and Zhuquan, 2015) who revisited the Pakistani market for the same study as (Raheman and Nasir, 2007) but during post-2008 global financial crisis precisely during 2008 to 2013. In line with the previous the study confirmed the statistically significant inverse relationship between the items of WCM and profitability of Pakistani companies. Moreover, company managers are recommended to give extra efforts toward reducing accounts receivable days, accounts payable days, inventory turnover in days, through which they can raise profit.

Likewise, in their study (Awan et al., 2014) focused on only cement companies in Pakistani financial market. The study aimed to investigate the relationship between WCM and profitability of 10 listed cement companies in Karachi Stock Exchange. The time interval covered during 2009 to 2013. By adopting panel ordinary least squared analysis the study examined the impact of WCM namely, current ratio, quick ratio, net current assets to total assets ratio, working capital turnover ratio and inventory turnover ratio on firm profitability. The results of the analysis were similar to the findings of past empirical researches as negative relationship among the variables has been found. In addition, the current ratio negatively significantly and influences the profitability.

However, the study reported that working capital turnover ratio and inventory turnover ratios effects on the profitability are not statistically significant.

In relatively different researches both (Juan Garcia-Teruel and Martinez-Sola, 2007) in Spain and (Afrifa, Tauringana and Tingbani, 2014) investigated the implications of managing working capital on profitability of small and medium sized enterprises (SMEs).

(Juan Garcia-Teruel and Martinez-Sola, 2007) argue that managing working capital is especially important in the case of SMEs as most of their assets are in the form of liquid assets. On the other hand, SMEs are heavily relying on external financing in terms of short-term debts or current liabilities. Based on this context the authors emphasized their model expecting WCM to have a significant effect on the income of SMEs. The study collected a huge sample of 8872 SMEs and therefore used panel data methodology covering the interval of 1996 to 2002. The results, which are robust to the presence of endogeneity, demonstrate that managers can create value by reducing their inventories and the number of days for which their accounts are outstanding.

Moreover, shortening the cash conversion cycle also improves the firm's profitability. Meanwhile, (Afrifa et al., 2014) provide a study that examined the impact of WCM on small and medium sized enterprises. Moreover, the study differentiates between small and medium firms as well. The used sample consists of 141 SMEs that listed on Alternative Investment Market and the time span covered from 2007 to 2014 and thus, panel data regression analysis adopted in the study. The findings for all SMEs explorer that accounts receivable period, inventory holding period, and accounts payable period have a concave relationship with performance. Nonetheless, the results showed that managing working capital affecting small size firms more than medium size ones. The study concludes that WCM have an influence on the performance of SMEs at which assists the managers and policy-makers while making decisions.

Further studies confirmed the significant impact of the efficiently managed working capital on the performance of companies from various industries and various countries such as: (Gill et al., 2010) in the United States; (Mohamad and Saad, 2010) in Malaysia; Erin et al., (2017) in Nigeria; (Karaduman et al., 2010) Turkey.

2.2.2 Determinants of Bank's Profitability

The existing literature intensively investigated factors that are affecting the banks' profitability. The factors are internal factors which refer to the bank specifics and derived from the balance sheet, income statement, and cash flow statement, external factors which refer to out of bank factors such as economic condition, regulatory, and crisis.

(Petria, Capraru and Ilhanov, 2015) studied the major determinants of bank profitability in EU 27 during the period 2004 to 2011. The explanatory variables were split into two groups, namely internal factors and external factors. The findings suggest that Credit and liquidity risk, management efficiency, the diversification of business, the market concentration/competition and the economic growth have an influence on bank profitability. Especially, the competition impact found to be positive on the profitability of banks in EU27.

A different study by (Djalilov and Piesse, 2016) aimed to compare the determinants of profitability of banks in the early and late transition countries of Central and Eastern Europe. The research used pane GMM approach for the time interval covering 2000 – 2013. The study points out that profitability persists and the determinants of bank profitability differ across the transition countries. Furthermore, the study reveals that in the countries of early transition the competitive in banking sector is higher compared to late transition countries. The influence of credit risk on the bank profitability found to be positive in early transition countries but negative in late transition countries. Banks in late transition countries are negatively affected by monetary freedom and government spending.

Overall findings propose that in early transition countries better capitalized banks are more profitable and the banks are stronger.

Another study by (Soana, 2016) focuses investigation of Banks' profitability as a function of intra and extra factors in Latin America countries by using GMM technique and covering the time period of 1995-2012. The results of the study provide several interesting findings including, 1) converse relationship between banks profitability and capital ratio, 2) asset diversification positively affects banks' profitability, 3) revenue diversification inversely affects banks' profitability, 4) positive association relationship between market concentrations and profitability, 5) regulations and legal improvements are conversely affecting banks' profitability.

Nonetheless, (Tran, Lin and Nguyen, 2016) examined banks' profitability from different perspective. The study examined the possible relationship between liquidity creation, regulatory capital, and bank profitability of US banks. As it has been showed in the study, "regulatory capital and liquidity creation affect each other positively after controlling for bank profitability. However, this relationship is largely driven by small banks and primarily during non-crisis periods". In particular, the study found that banks with more liquidity are more exposed to liquidity risk and have lower profit. Moreover, the profitability of high capitalized banks is negatively affected by regulatory capital while low capitalized banks are positively affected. Finally, the author argues that a change in regulatory capital has differential implications on bank performance.

(Ozili and Uadiale, 2017) investigate whether ownership concentration (measured by the magnitude of direct equity held by majority shareholders) affects the profitability of bank. The sample created from developing countries. The study explorer that banks those has high level ownership concentration enjoy higher profit and higher periodic earning power. However, banks those has dispersed ownership found to have low ROA but higher ROE. Also, higher cost efficiency improves the return on assets of widely-held banks and the return on equity of banks with moderate ownership.

(Bouzgarrou, Jouida and Louhichi, 2017) examined the profitability of banks surrounding the 2008 global financial crisis. The study aims to examine the implications of the crisis on both foreign and domestic banks performance in France. The study's sample consists of 170 commercial banks operating in French market during the period of 2000 to 2012. The study point out that the foreign banks are more profitable than domestic banks, in particular during the financial crisis.

The research further investigates the bank profitability persistency and found that lagged profitability negatively and positively affects domestic and foreign banks respectively.

(Yanıkkaya, Gümüş and Pabuççu, 2018) demonstrate the and compare the dynamics of the profitability of Islamic and conventional banks in the Islamic Cooperation countries and the United Kingdom during the period of 2007 and 2013 and collecting a sample of 354 conventional banks versus 74 Islamic banks. The profitability proxy measured by return on assets and net interest margin while several explanatory variables were included in the dynamic panel model to conduct the study. The estimation results indicate the impact of most of the explanatory variables on Islamic and conventional banks' profitability are different implying that profitability of Islamic banks relies on the different dynamics than that of conventional ones. The study further explorer that the dependent variables (profitability) are no persistent and nor related to macro variables.

2.2.3 Industry effect on working capital

Because the needs and policies are substantially varying from firms in an industry to another one, WCM might be very different across the industries. In this matter, (Weinraub and Visscher, 1998) studied the various strategies pursued by firms to manage working capital such as conservative, aggressive and/or moderate across various industries. The study has two main objectives; *first* to figure out whether the industries with aggressive investment policy follow aggressive financing strategies, *second* to examine the stability of WCM. The study reveals a huge difference between the industries' investment and financing strategies in working capital and these strategies are stable over time. A strong tendency towards that the industries that are conservative in some aspects are much aggressive in others.

(Filbeck and Krueger, 2005) carried out a study using annual reports of WCM by CFO magazine to investigate whether managing working capital varies across industries. In contrary to (Weinraub and Visscher, 1998), the study discovered some differences among industries regarding working capital measurements and over time. In particular, the study states that working capital performance is not stable over time and heavily depended on changes in macro variables such as competition and innovation rates and interest rate.

Moreover, (Hawawini, ViallletandVora, 1986) employed a study about the need for investment in working capital across industries. Investment in working capital was measured by working capital requirements. The finding indicates for substantial variations in working capital needs across industries. For instance, working capital requirements found to be negative for aircraft industry implying that they are already making positive returns from investment in working capital. While firms in computer production industry are investing a huge proportion of total sales (approximately 36%) in working capital.

Apparently, based on jus reviewed above it can be observed that managing working capital is very sensitive to the type of industry as well as can vary over time.

2.2.4 Banks' Working Capital Management

Obviously, as reviewed above several empirical studies employed regarding the implications of working capital management on various non-financial subsectors such as manufacturing, cement, industrials, and service sectors etc. However, banking sector has barely been touched. (Yeboah and Yeboah, 2014) examined the possible impacts of WCM on banks' profitability in Ghana covering the period of 2005 to 2010. The study made its analysis using descriptive statistics, correlation analysis,and OLS pane approach. Moreover, the components of WCM were represented by cash conversion cycle, creditors' collection period and debtors' collection period in the study. The findings suggest CCC is conversely related to banks' profitability and bank leverage positively affect the profitability.

Another study by (Umoren and Udo, 2015) examined the impact of WCM (measured by cash conversion cycle, creditors' collection period and debtors' collection period) on the performance (profitability and liquidity) of selected 22 deposit money banks in Nigeria. The study uses Pearson's correlation and regression technique to analysis. The study reports that bank profitability inversely affected by cash conversion cycle and leverage. The study further found banks liquidity is negatively influenced by creditors' payment period, leverage, and cash conversion and credit risk.

(Yahaya and Bala, 2015) argue that WC is considered as the lifeblood and nerve of the business concern. The study uses a different method to re-examine the impact of WCM on Nigerian banks' financial performance during 2007-2013. The study measures WCM components by cash ratio, quick ratio, and current ratio. The study adopted panel OLS approach to the analysis. Findings indicate a positive relationship between current ratio and quick ratio and return on assets while cash ratio found to be conversely related to the profitability.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Research Design

Research design is actually a substantial part of any research. Through research design, the researchers are ensured that the collected data is sensibly linked to the major objectives, questions, and assumptions of the study (Yin, 2003). The major goal of the present thesis is to examine the possible influence of banks' WCM on their profitability. The whole aim pf the study and the study's model illustrated graphically in Figure 2.

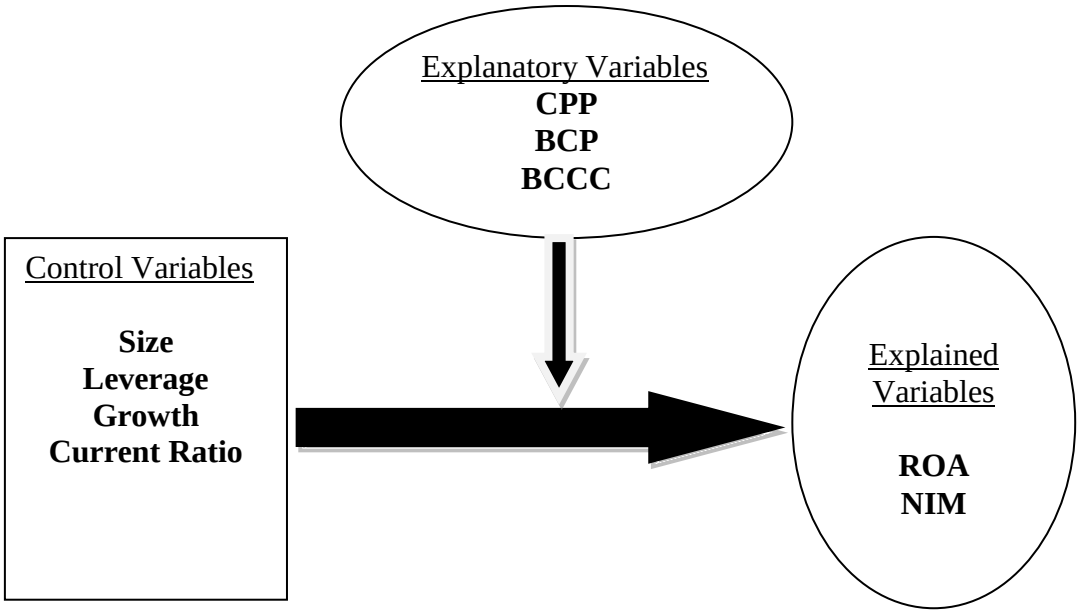

Figure 2: Research Design.

3.2 Data and Sample

The data used in the thesis is fetched from Thomson Reuter's DataStream database. The ratios are not readyin the database, therefore necessary data is obtained from the database and ratios are calculated using Excel software. The time interval covered 18 years from 2000 to 2017 and the sample banks used in the thesis are 10oldest listed banks in the UK which provide us a panel data consisting of 180 observations.

According to the London Stock Exchange (2018), 22 banks are listed in the market while approximately 65% of them are UK banks and the rest are foreign banks that operate in the UK and have been already listed in London Stock Exchange market. While creating the sample of this thesis we were looking for the banks that are old enough to have longer time period which allows us to obtain larger sample size in both cross-section and time series data. We were able to gather 10 of the listed banks in the UK together for the purpose of this study as they are listed below:

Table: 3.1 Sample banks and their total assets

No.	Banks	Total Assets £-bn. (2017)	% of all sample
1	HSBC HOLDINGS PLC	1862	23.53%
2	BANCO SANTANDER S.A.	1421	17.96%
3	BARCLAYS PLC	1129	14.27%
4	LLOYDS BANKING GROUP PLC	809	10.22%
5	ROYAL BANK OF SCOTLAND GROUP PLC	736	9.30%
6	BANCO BILBAO VIZCAYA ARGENTARIA S.A.	675	8.53%
7	STANDARD CHARTERED PLC	490	6.19%
8	COMMERZBANK AG	477	6.03%
9	CLOSE BROTHERS GROUP PLC	192	2.43%
10	BANK OF IRELAND	121	1.53%
	Total	7912	100%

Bank performance can be measured and compared to others by their market share of current accounts; a greater market share indicates that more customers are willing to keep their money in a specific bank. Moreover, this measurement is very important to the banks themselves, that's the larger the account the more potential to increase the revenue. Regardless the types of accounts, all accounts are accompanied with an increase in revenue. According to the ranking of banks by (Statista, 2014), the largest share of market share current account is taken by

London headquartered Lloyds Bank PLC. Lloyds Bank PLC's had more than one quarter specifically 27% percent of all current accounts at 2014. Each of Barclays Bank PLC and the Royal Bank of Scotland were coming at the second place by 18% of market share. Moreover, the fourth and fifth position occupied by HSBC HOLDING PLC and Standard Chartered PLC by 12% and 10% of current account market shares respectively.

Our sample is included banks that have 85% of the UK market share plus five more banks. Therefore, we believe our sample is covering banks that dominate UK market by more than 85% which is much closer to the population. We confirm that the sample of this thesis is adequate to inference the population of total banks in the UK.

Thus, the empirical model of this study is emphasized on panel data technique. Panel data has some merits over time series data such as it allows the researchers to examine both time series and cross-section data simultaneously. Further merit is to examine both time and individual dimensions and to examine dynamic properties of the data (Baltagi, 2005).

3.3 Variables

To examine the impact of WCM of the profitability of banks, the model of this thesis contains three types of variables namely explained variables, explanatory variables, and control variables. The variables are summarized in Table 3.2 and followed by the detail demonstration about the variables.

Table 3.2 Summary of the variables

Variables	Abbreviation	Type	Expected Effect
Return on Asset	ROA	Dependent	
Net Interest Margin	NIM	Dependent	
Borrowers' Collection Period	BCP	Independent	(-)
Creditors' Payment Period	CPP	Independent	(-)
Banks' Cash Conversion Cycle	BCCC	Independent	(+)
Bank Size	lnSIZE	Control	
Growth	GRTH	Control	
Leverage	LEV	Control	
Current Ratio	CUR	Control	

3.3.1 Explained Variables

In the present study, the explained variable is profitability. We use two common measurements of bank profitability which are frequently used in literature. The bank's profitability is measured by return on assets (ROA) and net interest margin (NIM) and calculated as follows:

1. ROA = the ratio of [net income / total assets]
2. NIM = The ratio of [net interest income / total earning assets]

3.3.2 Explanatory Variables

The selected explanatory variables are backed by literature as already reviewed in the previous chapter. Specifically, the explanatory variables in this thesis are working capital management and its components which are measured by banks' cash conversion cycle (BCCC), borrowers' collection period (BCC), and creditors' payment period (CPP). Both BCCC and CPP are expected to have a

negative impact on the profitability while BCP is expected to positively affect profitability.

The variables have been calculated as below:

1. BCP = the ratio of [bank's current assets / interest income *365 in days].
2. CPP = the ratio of [bank's short term debt / interest expense *365 in days].
3. BCCC = the difference between BCP and CPP [BCP – CPP].

3.3.3 Control Variables

Control variablesare variables that are related to the explained variable and included in the regression analysis in the same way as an independent variable but typically not interested. The aim of entering control variables in the regression is to omit their impacts from the equation and consequently overcome the omitted variable bias. In this thesis, the control variables are size (lnSIZE), growth (GRTH), current ratio (CUR), and leverage (LEV). The variables have been calculated as below:

1. lnSIZE = natural logarithm of banks' total assets
2. GRTH = growth in banks' revenue
3. LEV = the ratio of total liability to total assets
4. CUR = the ratio of current assets to current liability.

3.4 The Econometric Model

So far, the potential influence of WCM and it's components on the profitability of companies have been reviewed theoretically. In addition, sufficient empirical evidences have been also provided. Moreover, the particular variables in this study have been introduced in the previous section. Thus, the model of this thesis comprises of two major panels.

First Panel: Where ROA Is The Dependent Variable:

$$ROA_{it} = \beta_0 + \delta\ lnBCP + \beta_1 lnSIZE_{it} + \beta_2\ GRTH_{it} + \beta_3\ LEV_{it} + \beta_4 CUR_{it} + u_{it} \quad (1)$$

$$ROA_{it} = \beta_0 + \delta lnCPP + \beta_1 lnSIZE_{it} + \beta_2 GRTH_{it} + \beta_3 LEV_{it} + \beta_4 CUR_{it} + u_{it} \quad (2)$$

$$ROA_{it} = \beta_0 + \delta\ BCCC + \beta_1 lnSIZE_{it} + \beta_2 GRTH_{it} + \beta_3 LEV_{it} + \beta_4 CUR_{it} + u\ it \quad (3)$$

Second Panel: where NIM is the dependent variable:

$$NIM_{it} = \beta_0 + \delta\ lnBCP + \beta_1\ lnSIZE_{it} + \beta_2\ GRTH_{it} + \beta_3\ LEV_{it} + \beta_4\ CUR_{it} + u_{it} \quad (4)$$

$$NIM_{it} = \beta_0 + \delta\ lnCPP + \beta_1\ lnSIZE_{it} + \beta_2\ GRTH_{it} + \beta_3\ LEV_{it} + \beta_4\ CUR_{it} + u_{it} \quad (5)$$

$$NIM_{it} = \beta_0 + \delta\ BCCC + \beta_1\ lnSIZE_{it} + \beta_2\ GRTH_{it} + \beta_3\ LEV_{it} + \beta_4\ CUR_{it} + u_{it} \quad (6)$$

Where, NIM and ROA are dependent variables representing profitability of bank *i*at time *t*. β0 is intercept. δ is the coefficient of independent variables. β1, β2, β3, and β4 are the coefficients of control variables respectively and u_{it} is error term.

3.5 Statistics and Econometric Techniques

Microsoft Excel and Eviews software will be used to employ the empirical study. Next chapter consists of the applications and discussion of the results of various statistics and econometrics tests in order to estimate the profitability of banks as the function of working capital management. The analysis will be performed step by step as follows:

3.5.1 Descriptive Statistics

The analysis starts with descriptive statistics where we measure the normality of the data through Jarque-Bera test and central tendency by mean and median. The test further reports the variability of the data measuring minimum, maximum, skewness, and kurtosis of all the variables. Descriptive statistics convey data into a manageable form and simpler summary. Among several measures or several data series that we may have in a study, descriptive statistics helps to simplify big volumes of data in a sensible way.

Descriptive statistics are differentiated from inferential statistics. With the former we are simply demonstrating what the data is or what the data exhibits while with the later we are trying to reach conclusions that extend beyond the immediate data alone. For example, through the sample data we try to estimate what population might. In addition, another characteristic of inferential statistics is to make a judgment regarding the probability that an realized variation between two sets of groups is happened by chance or is dependable in that study. Therefore, descriptive statistics is simply used to learn what data is, however, inferential statistics used to guess population through our sample data.

3.5.2 Unit Root Test

This follows by unit root test, where we test whether the series is stationary or not. In other words, whether the series' mean, variance and covariance are steady over time. There are some mathematics adjustments behind the name of the unit root of the process. Where basically a process can be expressed with a single term (series of monomials). That's each monomial is corresponding to a root. The series has unit root if one of these roots is greater or equal to 1. An analysis suffers from serious issues if the series has unit root such as errant behaviour and spurious regression.

Due to the former issue, the hypothesis tests cannot be correctly performed because when a series has unit root the conventional statistics distributions are not following their actual distribution such as t-statistics and f-statistics, and therefore the hypothesis testing will be misleading and invalid. However, if a series has the latter issue then although two series are not related to each other at all regressing one on other can have very high R-squared. Thus, the presence of unit root is an extreme issue and makes any analysis to be invalid.

3.5.3 Correlation Analysis and Multicollinearity Test

As a preliminary test of the regression analysis, we investigate the correlation associations among the variables. The presence of

If the correlation is found between two variables it means that when there is a systematic change in one variable, there is also a systematic change in the other; the variables alter together over a certain period of time. If there is correlation found, depending upon the numerical values measured, this can be either positive or negative. A positive correlation exists if one variable increases simultaneously with the other, i.e. the high numerical values of one variable relate to the high numerical values of the other. A negative correlation exists if one variable decreases when the other increases, i.e. the high numerical values of one variable relate to the low numerical values of the other. By performing Pearson's correlation test we can detect the problem of multicollinearity which is one of the substantial assumptions of CLRM. The test further explores the correlations between working capital management and its elements and banks' profitability.

3.5.4 Fixed-Random Panel Test

In order to perform panel regression estimation first, we must identify the most suitable model (random or fixed) for our panel model. To do this, thesis relies on Hausman test. The Hausman test is sometimes described as a test for model misspecification. In panel data analysis (the analysis of data over time), the Hausman test can help you to choose between fixed effects model or random effects model. The null hypothesis is that the preferred model is random effects; the alternative hypothesis is that the model is fixed effects.

Essentially, the tests look to see if there is a correlation between the unique errors and the regressors in the model. The null hypothesis is that there is no correlation between the two.

3.5.5 Autocorrelation Test

Lastly, as the robustness of the model autocorrelation of the residual must be detected. Autocorrelation refers to the correlation of a time series with its own past and future values. Autocorrelation is sometimes called “serial correlation”, which refers to the correlation between members of a series of numbers arranged in time. In fact, the consequence of ignoring autocorrelation when it is present is the coefficient estimates derived using OLS are still unbiased, but they are inefficient, i.e. they are not BLUE, even at large sample sizes, so that the standard error estimates could be wrong. There thus exists the possibility that the wrong inferences could be made about whether a variable is or is not an important determinant of variations in the dependent variable. The model assumed to be not suffering from autocorrelation issue. The autocorrelation test will be conducted using Durbin-Watson criteria.

CHAPTER 4

EMPIRICAL RESULTS

4.1 Descriptive Statistics

Descriptive statistic presents the study's data set in an informative way. In descriptive statistics, the variation of variables is measured by max and min value. We can see that ROA range lies between about -1.64% and 5.41% while NIM variation lies between the ranges of two positive values 0.58% and 5%. Arithmetic mean is 0.93% and 1.85% associated with standard deviation of 1.06% and 0.86% for ROA and NIM respectively implying the efficiency of UK banks.

Table 4.1 Descriptive Statistics

	ROA	NIM	BCP	CPP	BCCC	LNSIZE	GRTH	LEV	CUR
Mean	0.0093	0.0185	902.90	4196.0	-3293.1	8.4763	0.0663	0.9365	0.5844
Median	0.0089	0.0176	570.65	3390.1	-2633.7	8.6503	0.0172	0.9401	0.1689
Maximum	0.0541	0.0500	3593.5	19663.	1414.8	9.3792	1.9849	0.9786	29.572
Minimum	-0.0164	0.0058	0.3876	96.836	-16817	6.2308	-0.7731	0.8423	0.0004
Std. Dev.	0.0106	0.0087	840.47	3300.2	2968.1	0.7071	0.2807	0.0278	2.3627
Skewness	1.1251	0.9867	1.4467	1.8468	-1.7056	-1.5293	2.8257	-1.3591	10.691
Kurtosis	6.2668	4.1730	4.3833	7.2567	7.0027	4.7575	17.537	4.9983	128.35
Jarque-Bera	118.02	39.529	77.142	238.22	207.44	93.338	1824.6	85.368	12128
Probability	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	180	180	180	180	180	180	180	180	180

Concerning working capital management and its elements, it's observed that they are associated with high level of fluctuations. Mean and standard deviation of BCP are 902 and 840 days respectively. Likewise, CPP's mean is 4196 days but the standard deviation is 3300 days. Creditors' payment period is substantially longer than borrowers' collection period. CCC reports not better outcomes as it takes the mean of -3293 days and standard deviation of 2968 days. Moreover, the asymmetry of distribution is measured by skewness and it's positive for UK banks' profitability indicator. Regarding the normality of the variables as reported in Table 4.1, the prob. Value of Jarque-Bera test statistic is less than 0.01 implying that none of the variables is normally distributed.

4.2 Unit Root Test

Table 4.2 Unit root test at level

Variables		**Levin Lin Chu Statistic**	**ADF Fisher Chi-squareStatistic**	**PP Fisher Chi-square Statistic**
ROA	τ_T	-3.34103*	36.1310*	25.9042
NIM	τ_T	-1.59179***	30.5156**	19.1101
lnBCP	τ_T	-1.33376***	39.9457*	46.3887*
lnCPP	τ_T	-1.94261**	36.7431**	25.9165
BCCC	τ_T	-1.70646**	40.2120*	20.5108

Where: *Null Hypothesis: Data is not stationary.Asterisks (***), (**) & (*) denotes 10%, 5% & 1% significant level respectively.τ_T represents the most common model with intercept and trend.*

Stationarity of data refers to a data which has a steady mean, variance, and auto-covariance over time. In regression analysis, if the data is not stationary or it has unit root it can cause spurious problem that's although two variables are totally unrelated, if we regress one over the other we obtain high R-squared and the results will be misleading. Another issue of non-stationarity is that if the variables in the model have unit root the standard assumption of asymptotic distribution is not valid in other words the t-values will not follow t-distributions and the hypothesis tests cannot be correctly undertaken.

Thus, as the very beginning step all the dependent and independent variables subjected to unit root test and their stationarity have been confirmed as presented in Appendix A. The stationarity tests performed based on Akaike Information Criteria allowing for 0-3 lags. The stationarity examined for the series with trend and intercept. The unit root hypothesis decisions are rejected in most of the cases using different criteria such as Levin, Lin and Chu; Im, Pesaran and Shin; Augmented Dickey and Fuller; Philips and Perronapproach.

4.3 Correlation Analysis

As already mentioned in the earlier chapter, the correlation analysis is performed to identify the strength of association between the independent variables and profitability ratios, in addition, it aims to investigate the multicollinearity problem of the models. The correlation test outcome is as depicted in Table 4.3. Focusing on the correlation between the explanatory variables and explained variables, borrowers' collection period is -48% and -39% correlated with ROA and NIM, this inverse correlation implies that the less collection period of borrowers the higher profit banks would have. The case is same for the correlation between creditors' collection period and profitability as the correlation between them is -47% -56%. However, bank cash conversion cycle is positively correlated with ROA and NIM by 38% and 52% respectively implying that efficient management of BCCC increases bank profitability.

Regarding the multicollinearity test, the common rule of thumb state that if the correlation level between the independent variables is less than 80%, and then the issue of multicollinearityis not existed. The correlation between CPP and BCCC is 96.9% which is very high but the variables are not included together in one regression. The degrees of correlation between the pairs of all other variables are found to be at most 70% or less. Thereby, we confirm the models of this study are not suffering from multicollinearity problem.

Table 4.3 Correlation Matrix between the Variables

	ROA	NIM	BCP	CPP	BCCC	LNSIZE	GRTH	LEV	CUR
ROA	1								
NIM	0.677	1							
BCP	-0.485	-0.392	1						
CPP	-0.468	-0.568	0.502	1					
BCCC	0.383	0.521	-0.275	-0.969	1				
LNSIZE	-0.692	-0.704	0.396	0.502	-0.446	1			
GRTH	0.203	0.125	-0.250	-0.093	0.0331	-0.139	1		
LEV	-0.636	-0.778	0.096	0.397	-0.414	0.718	-0.009	1	
CUR	0.222	0.379	0.103	-0.149	0.195	-0.234	-0.027	-0.273	1

4.4 Autocorrelation test

Obtaining efficient estimation of the coefficients requires the absence of autocorrelation problem. The standard errors of the models ought to be not correlated either positively or negatively. The Value of Durbin Watson is one way to detect the problem of autocorrelation.

In the regression estimations of this study, the values of D-W are reported in Table 4.5 and Table 4.6 which they are [1.98, 1.92, 1.92, 1.81, 1.90 and 1.90] which implies the absence of the issue since it's very close to 2. Precisely, in the D-W test, we test the hypothesis as:

H_0: There is no positive autocorrelation
H_1: There is positive autocorrelation

The rule of thumb is: If d <dL reject H0; If d >dU do not reject H0; If dL< d <dU test is inconclusive. The corresponding values in the DW table for significance points of dLand dU at 0.05 level of significance and *K=5* are 1.679 & 1.788 respectively. Thus, since the values of D-W obtained from the models are greater than dU [1.788] then we cannot reject the null hypothesis. Thereby we confirm that the model is robust in terms of autocorrelation problem.

4.5 Fixed-Random Effect Test

Obviously, in this study the obtained data cover both time series and cross-section observations and therefore panel approach is adopted. Traditional methods for panel data are random effect and fixed effect models for panel data. In this study choosing the proper panel model is examined through Hausman test. The test determines whether the fixed cross effect model or the random cross effect model is the most appropriate.

Essentially, this test aimed to detect any correlation between the errors terms and explanatory variables in the regression model. To perform this test we test the hypothesis of no correlation between the errors and explanatory variables against the presence of correlation between the two. According to Hausmantest, the null hypothesis indicates that the random effect is appropriate. For our analysis, the test was performed before estimating the six models and in all the cases we reject the null hypothesis which implies that the fixed effect is appropriate for the models.

Table 4.4 Hausman random-fixed effect test

	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
First Panel	13.869609	5	**0.0165**
	19.297027	5	**0.0017**
	21.541890	5	**0.0006**
Second Panel	39.044571	5	**0.0000**
	29.934949	5	**0.0000**
	33.032481	5	**0.0000**

4.6 Regression Analysis

While Performing panel regression estimation we attempt with different AR(p) models accompanied with the control variables and independent variables namely AR(1) and AR(2) were included to obtain the best fit model with the minimum error of estimation.[2] As we just reviewed above the robustness tests of the models of this thesis are not biased and robust. Hence, in this section the regression output using OLS estimator is presented in table 4.5. In this section we review the regression findings and discuss it.

[2]The panel regression estimation outputs are presented in Appendix C.

Table 4.5 Regression Results for the first panel (equation 1, 2 & 3)

	Eq. 1		Eq. 2		Eq.3	
Variable	**Coeff.**	**t-Stat**	**Coeff.**	**t-Stat**	**Coeff.**	**t-Stat**
LNBCP	***-0.0016***	**(-2.47)****	-------	-------	-------	-------
LNCPP	-------	-------	***-0.0002***	**-0.16**	-------	-------
BCCC	-------	-------	-------	-------	***-0.0000***	**-0.01**
LNSIZE	*-0.0125*	(-2.68)*****	*-0.0170*	(-3.60)*****	*-0.0171*	(-3.66)*****
GRTH	*-0.0023*	-1.56	*-0.0024*	-1.64	*-0.0025*	(-1.68)*******
LEV	*-0.0754*	-1.32	*-0.0701*	-1.19	*-0.0697*	-1.19
CUR	*0.0003*	1.61	*0.0002*	0.92	*0.0002*	1.16
C	*0.1961*	(7.00)*****	*0.2211*	(3.48)*****	*0.2203*	(3.49)*****
R-squared	0.766		0.757		0.757	
Adjusted R-squared	0.743		0.734		0.734	
F-statistic	33.68		32.10		32.09	
Prob. (F-statistic)	0.000		0.000		0.000	
Durbin-Watson stat	1.980		1.928		1.921	

*Where: *, ** &*** indicate that the coefficient is significant at 1%, 5% and 10% level of significance respectively.*

In both models the coefficient of determination or R-squared is substantially high this is a positive robustness of the models. Particularly, for the regression estimations where ROA is the dependent variable R-squared is more than 75% while in the regression estimations where NIM is the dependent variable R-squared is about 95%. That's in the first cases 75% and in the second cases 95% of the variation of the banks' profitability is demonstrated by the independent variables namely (cash conversion cycle, borrowers' collection period, creditors' collection period, size, growth, leverage, and current ratio).

Table 4.6 Regression Results for the second panel (equation 4, 5 & 6)

	Eq. 1		**Eq. 2**		**Eq.3**	
Variable	**Coeff.**	**t-Stat**	**Coeff.**	**t-Stat**	**Coeff.**	**t-Stat**
LNBCP	***-0.0012***	**(-4.83)****	-------	-------	-------	-------
LNCPP	-------	-------	***-0.0004***	**1.059**	-------	-------
BCCC	-------	-------	-------	-------	***-0.0000***	**0.30**
LNSIZE	*-0.0183*	(-7.21)*****	*-0.0195*	(-7.54)*****	*-0.0197*	(-7.57)*****
GRTH	*-0.0003*	-0.87	*-0.0020*	-0.41	*-0.0002*	-0.56
LEV	*-0.0510*	(-2.32)**	*-0.0376*	-1.57	*-0.0342*	-1.44
CUR	*7.6E-0*	1.50	*0.0004*	0.60	*0.0000*	1.38
C	*0.2326*	(10.08)*****	*0.2248*	(8.85)*****	*0.2198*	(8.74)*******
R-squared	0.955		0.949		0.949	
Adjusted R-squared	0.950		0.944		0.943	
F-statistic	193.4		169.1		167.8	
Prob. (F-statistic)	0.000		0.000		0.000	
Durbin-Watson stat	1.817		1.903		1.901	

*Where: *, ** &*** indicate that the coefficient is significant at 1%, 5% and 10% level of significance respectively.*

F-statistic is also another indicator of the efficiency of the regression model. It's indicated the overall significance of the regression model. F-test will be performed by using the following hypothesis

$\mathbf{H_0}: \boldsymbol{\beta_0} = \boldsymbol{\beta_1} = \boldsymbol{\beta_2} = \boldsymbol{\beta_3} = \boldsymbol{\beta_4} = \mathbf{0}$

$\mathbf{H_1}: \boldsymbol{Atleastoneofthem} \neq \mathbf{0}$

Obviously, there is strong evidence against the null hypothesis which is rejected at1% level of significant in estimating all the six equations. As already presented, in the present thesis profitability is measured by ROA and NIM. Both have been substituted in the regression estimations in order to examine the hidden effects of the working capital management if any. However, the results are pretty identical. Thus we do not differentiate between the models that ROA is the dependent variable and the models that NIM is the dependent variable while we discuss the findings. As it can be seen in Table 4.5 and 4.6, the findings reveal both creditors' collection period and banks' CCC is conversely affecting profitability of the banks. However, their coefficient is negligible and not statistically significant. The negative impact of BCCC is also explored by (Yeboah and Yeboah, 2014) who found inverse linkage between the BCCC and profitability. Nonetheless, (Dellof, 2003) found inverse relationship between CCC and firm profitability but not statistically significant and proposed a plausible demonstration as shortening cash conversion cycle can modify profitability. The negative impact of creditors' collection period can be because of banks with lower profit waiting longer to repay their short-term loan obligations. Borrowers' collection period is found to conversely impact bank's profitability. Precisely according to the regression result if borrowers' collection period increases by 1% the profit decreases by 0.0016 or 0.0012 in both ROA and NIM model respectively. Although the coefficient is negligible but still banks are recommended to decrease the days to collect short-term loans.

The overall results of regression (1) through (6) are consistent with (Deloof, 2003), (Shin and Soenan, 1998) and (Raheman and Nasr, 2007), and propose that managers can raise bank profitability by reducing the number of days in BCP. A possible explanation can be the case that less profitable banks are delaying to repay their debts. Finally, intercept in regression (1) through (6) is positive and statistically significant implying that holding other variables equal to zero the profitability of sample banks is increasing. Regarding the control variables, their effects found to be statistically insignificant except SIZE. Its point out that SIZE is negatively influences the profitability precisely an increase in SIZE by 1% lowers bank's profitability by 0.0125 and 0.0183 in both ROA and NIM model respectively. This may imply that sample banks are heavily relying on liability with leverage of 93.65% which is very high and banks should manage their capital structure to obtain optimal point where the benefit of additional debt is equal to zero. According to capital structure theories Modigliani and Miller (MM) when additional debt for the companies will be harmful after the company reaches optimal point.

CHAPTER 5

CONCLUSION

5.1 Summary of Thesis

The present thesis investigated the impacts of working capital management and its components on the banks' profitability in the United Kingdom. The study has selected ten listed banks in London Stock Exchange market and the time period covers 18 years from 2000 to 2017. The profitability proxies were measured by return on assets and net interest margin, on the other hand, working capital management were measured by bank cash conversion cycle and its components which are (creditors' collection period and borrowers' collection period) accompanied with four control variables. In order to avoid multicollinearity issue each of the independent variables has been estimated alone with four control variable.

To the best of our knowledge rarely researches concerning the association between WCM and financial performance of the banks are available in literature. On the other hand, WCM decisions are important tasks of the financial managers toward their main objective of value maximization. The present thesis, therefore, not only fills a great gap in the relevant literature but also raises a remarkable issue to be studied in the bank industry.

The findings of correlation analysis explored a negative relationship between profitability and borrowers' collection period and creditors' collection period while cash conversion cycle is found to be positively correlated with profitability. The findings the regression estimations reveal both creditors' collection period and banks' cash conversion cycle are negatively affecting the profitability of the banks. However, their coefficient is negligible and not statistically significant. Borrowers' collection period is found to conversely impact bank's profitability.

Precisely according to the regression result if borrowers' collection period increases by 1% the profit decreases by 0.0016 or 0.0012 in both return on assets and net interest margin model respectively. Although the coefficient is negligible still banks are recommended to decrease the days to collect short-term loans. The overall findings are confirmation in confirmation with (Deloof, 2003), (Shin and Soenan, 1998) and (Raheman and Nasr, 2007) who found a negative relationship between the components of working capital management and corporate profitability. Thus, this thesis suggests that managers can create value for their shareholders by reducing the number of days borrowers' collection period. Thus, banks can improve the liquidity position by using the factors of cash conversion cycle and should examine an equilibrium point between liquidity and profitability using those factors in the best way.

5.2 Implications and Recommendations

The conclusion of this thesis provides some implication policies to support bank management. Bank managers must take working capital management as the substantial task to be effectively managed. Banks should keep minimum capital requirements and balance between liquidity and profitability. Holding optimal buffer of liquid assets can enhance managing working capital efficiently which in increases profit.

There is much to be done about banks' working capital management. The existing literature provides a bunch of studies about working capital management and its implications for non-financial firms but didn't provide a strong research on the topic regarding banks yet. This is a huge gap in literature which offers to researchers a big opportunity to employ further studies regarding banks' working capital management.

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APPENDICES

Appendix A: Unit Root Test

Panel unit root test: Summary

Series: ROA

Date: 04/27/18 Time: 22:25

Sample: 2000 2017

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 3

Newey-West fixed bandwidth and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.34103	0.0004	10	140
Breitung t-stat	-0.69841	0.2425	10	130
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.28854	0.0111	10	140
ADF - Fisher Chi-square	36.1310	0.0148	10	140
PP - Fisher Chi-square	25.9042	0.1690	10	170

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Appendix II :Panel unit root test

Panel unit root test: Summary

Series: NIM

Date: 04/27/18 Time: 22:26

Sample: 2000 2017

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 3

Newey-West fixed bandwidth and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.59179	0.0557	10	140
Breitung t-stat	-0.93289	0.1754	10	130
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.04703	0.1475	10	140
ADF - Fisher Chi-square	30.5156	0.0619	10	140
PP - Fisher Chi-square	19.1101	0.5147	10	170

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: LNBCP

Date: 04/27/18 Time: 22:29

Sample: 2000 2017

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 3

Newey-West fixed bandwidth and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.33376	0.0911	10	155
Breitung t-stat	-0.64016	0.2610	10	145
Null: Unit root (assumes individual unit root process)				

Im, Pesaran and Shin W-stat	-2.36613	0.0090	10	155
ADF - Fisher Chi-square	39.9457	0.0051	10	155
PP - Fisher Chi-square	46.3887	0.0007	10	170

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: LNCPP
Date: 04/27/18 Time: 22:30
Sample: 2000 2017
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on AIC: 0 to 3
Newey-West fixed bandwidth and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.94261	0.0260	10	163
Breitung t-stat	-4.62025	0.0000	10	153
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.59678	0.0047	10	163
ADF - Fisher Chi-square	36.7431	0.0126	10	163
PP - Fisher Chi-square	25.9165	0.1686	10	170

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: BCCC

Date: 04/27/18 Time: 22:31

Sample: 2000 2017

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 3

Newey-West fixed bandwidth and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.70646	0.0440	10	161
Breitung t-stat	-3.13890	0.0008	10	151
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.61634	0.0044	10	161
ADF - Fisher Chi-square	40.2120	0.0047	10	161
PP - Fisher Chi-square	20.5108	0.4264	10	170

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Appendix B: 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	13.869609	5	**0.0165**

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LNBCP	-0.002877	-0.003121	0.000000	0.0612
LNSIZE	-0.008391	-0.004534	0.000003	0.0174
GRTH	0.000730	0.002285	0.000000	0.0007
LEV	0.015762	-0.036625	0.000834	0.0696
CUR	0.000831	0.000839	0.000000	0.8583

Cross-section random effects test equation:
Dependent Variable: ROA
Method: Panel Least Squares
Date: 04/27/18 Time: 22:52
Sample: 2000 2017
Periods included: 18
Cross-sections included: 10
Total panel (balanced) observations: 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.082987	0.041002	2.023968	0.0446
LNBCP	-0.002877	0.000476	-6.049247	0.0000
LNSIZE	-0.008391	0.002272	-3.694006	0.0003
GRTH	0.000730	0.001741	0.419648	0.6753
LEV	0.015762	0.043629	0.361274	0.7184
CUR	0.000831	0.000224	3.709953	0.0003

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.719349	Mean dependent var	0.009369
Adjusted R-squared	0.695537	S.D. dependent var	0.010696
S.E. of regression	0.005902	Akaike info criterion	-7.347490
Sum squared resid	0.005747	Schwarz criterion	-7.081410
Log likelihood	676.2741	Hannan-Quinn criter.	-7.239606
F-statistic	30.20854	Durbin-Watson stat	1.310482
Prob(F-statistic)	0.000000		

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	19.297027	5	**0.0017**

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CPP	-0.000001	-0.000001	0.000000	0.7316
LNSIZE	-0.012548	-0.008110	0.000004	0.0234
GRTH	0.001565	0.003578	0.000000	0.0007
LEV	0.017004	-0.050984	0.001122	0.0424
CUR	0.000172	0.000126	0.000000	0.3964

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 04/27/18 Time: 22:57

Sample: 2000 2017

Periods included: 18

Cross-sections included: 10

Total panel (balanced) observations: 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.101925	0.044572	2.286746	0.0235
CPP	-5.53E-07	2.61E-07	-2.115458	0.0359
LNSIZE	-0.012548	0.002490	-5.040358	0.0000
GRTH	0.001565	0.001911	0.818536	0.4142
LEV	0.017004	0.048098	0.353524	0.7241
CUR	0.000172	0.000221	0.779284	0.4369

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.666162	Mean dependent var	0.009369
Adjusted R-squared	0.637836	S.D. dependent var	0.010696
S.E. of regression	0.006437	Akaike info criterion	-7.173944
Sum squared resid	0.006836	Schwarz criterion	-6.907864
Log likelihood	660.6549	Hannan-Quinn criter.	-7.066060
F-statistic	23.51794	Durbin-Watson stat	1.010811
Prob(F-statistic)	0.000000		

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	21.541890	5	**0.0006**

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
BCCC	0.000000	0.000000	0.000000	0.4829
LNSIZE	-0.014761	-0.009380	0.000003	0.0028
GRTH	0.001217	0.003638	0.000000	0.0001
LEV	0.032472	-0.043320	0.001106	0.0227
CUR	0.000211	0.000136	0.000000	0.1875

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 04/27/18 Time: 22:59

Sample: 2000 2017

Periods included: 18

Cross-sections included: 10

Total panel (balanced) observations: 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.104380	0.045297	2.304370	0.0224
BCCC	1.54E-07	2.87E-07	0.536394	0.5924
LNSIZE	-0.014761	0.002324	-6.350499	0.0000
GRTH	0.001217	0.001939	0.627731	0.5310
LEV	0.032472	0.048100	0.675088	0.5006
CUR	0.000211	0.000226	0.936141	0.3506

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.657704	Mean dependent var	0.009369
Adjusted R-squared	0.628661	S.D. dependent var	0.010696
S.E. of regression	0.006518	Akaike info criterion	-7.148925
Sum squared resid	0.007009	Schwarz criterion	-6.882845
Log likelihood	658.4033	Hannan-Quinn criter.	-7.041041
F-statistic	22.64564	Durbin-Watson stat	0.980053
Prob(F-statistic)	0.000000		

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	39.044571	5	**0.0000**

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
BCP	-0.000001	-0.000002	0.000000	0.0000
LNSIZE	-0.009302	-0.005486	0.000001	0.0000
GRTH	-0.001703	-0.000677	0.000000	0.0000
LEV	-0.062682	-0.106867	0.000193	0.0015
CUR	0.000872	0.000846	0.000000	0.1407

Cross-section random effects test equation:
Dependent Variable: NIM
Method: Panel Least Squares
Date: 04/27/18 Time: 23:02
Sample: 2000 2017
Periods included: 18
Cross-sections included: 10
Total panel (balanced) observations: 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.156980	0.021761	7.213772	0.0000
BCP	-1.46E-06	4.02E-07	-3.642088	0.0004
LNSIZE	-0.009302	0.001310	-7.103419	0.0000
GRTH	-0.001703	0.000920	-1.850971	0.0660
LEV	-0.062682	0.024995	-2.507769	0.0131
CUR	0.000872	0.000107	8.148016	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.883996	Mean dependent var	0.018505
Adjusted R-squared	0.874153	S.D. dependent var	0.008798
S.E. of regression	0.003121	Akaike info criterion	-8.621529
Sum squared resid	0.001607	Schwarz criterion	-8.355449
Log likelihood	790.9376	Hannan-Quinn criter.	-8.513645
F-statistic	89.81160	Durbin-Watson stat	1.036487
Prob(F-statistic)	0.000000		

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	29.934949	5	**0.0000**

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CPP	-0.000000	-0.000000	0.000000	0.0005
LNSIZE	-0.011279	-0.008210	0.000001	0.0000
GRTH	-0.001476	-0.000446	0.000000	0.0000
LEV	-0.032793	-0.053915	0.000138	0.0720
CUR	0.000804	0.000736	0.000000	0.0012

Cross-section random effects test equation:

Dependent Variable: NIM

Method: Panel Least Squares

Date: 04/27/18 Time: 23:04

Sample: 2000 2017

Periods included: 18

Cross-sections included: 10

Total panel (balanced) observations: 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.145239	0.022325	6.505619	0.0000
CPP	-1.89E-07	1.31E-07	-1.441725	0.1513
LNSIZE	-0.011279	0.001247	-9.044768	0.0000
GRTH	-0.001476	0.000957	-1.541980	0.1250
LEV	-0.032793	0.024091	-1.361210	0.1753
CUR	0.000804	0.000111	7.265716	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.876229	Mean dependent var	0.018505
Adjusted R-squared	0.865727	S.D. dependent var	0.008798
S.E. of regression	0.003224	Akaike info criterion	-8.556723
Sum squared resid	0.001715	Schwarz criterion	-8.290643
Log likelihood	785.1050	Hannan-Quinn criter.	-8.448839
F-statistic	83.43630	Durbin-Watson stat	0.955552
Prob(F-statistic)	0.000000		

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	33.032481	5	**0.0000**

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
BCCC	0.000000	0.000000	0.000000	0.0026
LNSIZE	-0.012040	-0.009192	0.000000	0.0000
GRTH	-0.001597	-0.000528	0.000000	0.0000
LEV	-0.027503	-0.044634	0.000133	0.1370
CUR	0.000818	0.000743	0.000000	0.0004

Cross-section random effects test equation:
Dependent Variable: NIM
Method: Panel Least Squares
Date: 04/27/18 Time: 23:07
Sample: 2000 2017
Periods included: 18
Cross-sections included: 10
Total panel (balanced) observations: 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.146108	0.022538	6.482663	0.0000
BCCC	5.05E-08	1.43E-07	0.354249	0.7236
LNSIZE	-0.012040	0.001157	-10.40984	0.0000
GRTH	-0.001597	0.000965	-1.654416	0.0999
LEV	-0.027503	0.023933	-1.149160	0.2522
CUR	0.000818	0.000112	7.286118	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.874765	Mean dependent var	0.018505
Adjusted R-squared	0.864139	S.D. dependent var	0.008798
S.E. of regression	0.003243	Akaike info criterion	-8.544964
Sum squared resid	0.001735	Schwarz criterion	-8.278884
Log likelihood	784.0468	Hannan-Quinn criter.	-8.437080
F-statistic	82.32319	Durbin-Watson stat	0.950283
Prob(F-statistic)	0.000000		

Appendix C: Panel OLS Regression Estimation Output

Dependent Variable: ROA

Method: Panel Least Squares

Date: 04/27/18 Time: 22:54

Sample (adjusted): 2001 2017

Periods included: 17

Cross-sections included: 10

Total panel (balanced) observations: 170

Convergence achieved after 11 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNBCP	-0.001626	0.000658	-2.470973	0.0146
LNSIZE	-0.012536	0.004661	-2.689597	0.0079
GRTH	-0.002303	0.001468	-1.569248	0.1186
LEV	-0.075428	0.057012	-1.323018	0.1878
CUR	0.000300	0.000187	1.610338	0.1094
C	0.196151	0.059972	3.270691	0.0013
AR(1)	0.533356	0.076130	7.005849	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.766421	Mean dependent var	0.008999
Adjusted R-squared	0.743670	S.D. dependent var	0.010481
S.E. of regression	0.005306	Akaike info criterion	-7.550423
Sum squared resid	0.004336	Schwarz criterion	-7.255289
Log likelihood	657.7860	Hannan-Quinn criter.	-7.430661
F-statistic	33.68711	Durbin-Watson stat	1.980279
Prob(F-statistic)	0.000000		

Inverted AR Roots .53

Dependent Variable: ROA
Method: Panel Least Squares
Date: 04/28/18 Time: 18:54
Sample (adjusted): 2001 2017
Periods included: 17
Cross-sections included: 10
Total panel (balanced) observations: 170
Convergence achieved after 11 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCPP	-0.000182	0.001085	-0.167695	0.8670
LNSIZE	-0.017066	0.004738	-3.602061	0.0004
GRTH	-0.002465	0.001503	-1.640531	0.1029
LEV	-0.070184	0.058788	-1.193860	0.2344
CUR	0.000195	0.000210	0.928608	0.3545
C	0.221108	0.063533	3.480201	0.0007
AR(1)	0.593668	0.069508	8.540978	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.757682	Mean dependent var	0.008999
Adjusted R-squared	0.734079	S.D. dependent var	0.010481
S.E. of regression	0.005405	Akaike info criterion	-7.513690
Sum squared resid	0.004499	Schwarz criterion	-7.218556
Log likelihood	654.6637	Hannan-Quinn criter.	-7.393928
F-statistic	32.10186	Durbin-Watson stat	1.928008
Prob(F-statistic)	0.000000		

Inverted AR Roots	.59

Dependent Variable: ROA
Method: Panel Least Squares
Date: 04/27/18 Time: 23:01
Sample (adjusted): 2001 2017
Periods included: 17
Cross-sections included: 10
Total panel (balanced) observations: 170
Convergence achieved after 12 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BCCC	-3.15E-09	2.94E-07	-0.010716	0.9915
LNSIZE	-0.017197	0.004697	-3.661137	0.0003
GRTH	-0.002539	0.001510	-1.681540	0.0947
LEV	-0.069730	0.058414	-1.193715	0.2344
CUR	0.000213	0.000183	1.163581	0.2464
C	0.220300	0.063101	3.491196	0.0006
AR(1)	0.595905	0.069320	8.596433	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.757639	Mean dependent var	0.008999
Adjusted R-squared	0.734032	S.D. dependent var	0.010481
S.E. of regression	0.005405	Akaike info criterion	-7.513514
Sum squared resid	0.004499	Schwarz criterion	-7.218380
Log likelihood	654.6487	Hannan-Quinn criter.	-7.393752
F-statistic	32.09439	Durbin-Watson stat	1.921592
Prob(F-statistic)	0.000000		

Inverted AR Roots	.60

Dependent Variable: NIM

Method: Panel Least Squares

Date: 04/28/18 Time: 19:51

Sample (adjusted): 2002 2017

Periods included: 16

Cross-sections included: 10

Total panel (balanced) observations: 160

Convergence achieved after 13 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNBCP	-0.001209	0.000250	-4.834187	0.0000
LNSIZE	-0.018354	0.002544	-7.215197	0.0000
GRTH	-0.000378	0.000430	-0.877153	0.3819
LEV	-0.051097	0.022022	-2.320286	0.0217
CUR	7.69E-05	5.12E-05	1.501878	0.1353
C	0.232689	0.023083	10.08036	0.0000
AR(1)	1.146094	0.079108	14.48778	0.0000
AR(2)	-0.270608	0.081905	-3.303932	0.0012

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.955836	Mean dependent var	0.018087
Adjusted R-squared	0.950895	S.D. dependent var	0.008920
S.E. of regression	0.001977	Akaike info criterion	-9.514652
Sum squared resid	0.000559	Schwarz criterion	-9.187915
Log likelihood	778.1722	Hannan-Quinn criter.	-9.381975
F-statistic	193.4354	Durbin-Watson stat	1.817097
Prob(F-statistic)	0.000000		

Inverted AR Roots	.81	.33

Dependent Variable: NIM

Method: Panel Least Squares

Date: 04/28/18 Time: 19:53

Sample (adjusted): 2002 2017

Periods included: 16

Cross-sections included: 10

Total panel (balanced) observations: 160

Convergence achieved after 13 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCPP	-0.000411	0.000388	-1.059699	0.2911
LNSIZE	-0.019557	0.002592	-7.545969	0.0000
GRTH	-0.000209	0.000501	-0.416731	0.6775
LEV	-0.037613	0.023857	-1.576602	0.1171
CUR	4.24E-05	6.99E-05	0.606712	0.5450
C	0.224828	0.025392	8.854255	0.0000
AR(1)	1.027508	0.080163	12.81777	0.0000
AR(2)	-0.210450	0.081436	-2.584226	0.0108

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.949800	Mean dependent var	0.018087
Adjusted R-squared	0.944183	S.D. dependent var	0.008920
S.E. of regression	0.002107	Akaike info criterion	-9.386535
Sum squared resid	0.000635	Schwarz criterion	-9.059798
Log likelihood	767.9228	Hannan-Quinn criter.	-9.253859
F-statistic	169.1002	Durbin-Watson stat	1.903283
Prob(F-statistic)	0.000000		

Inverted AR Roots	.75	.28

Dependent Variable: NIM

Method: Panel Least Squares

Date: 04/27/18 Time: 23:08

Sample (adjusted): 2002 2017

Periods included: 16

Cross-sections included: 10

Total panel (balanced) observations: 160

Convergence achieved after 13 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BCCC	3.34E-08	1.10E-07	0.302912	0.7624
LNSIZE	-0.019722	0.002605	-7.571587	0.0000
GRTH	-0.000289	0.000513	-0.562968	0.5743
LEV	-0.034298	0.023740	-1.444758	0.1507
CUR	8.12E-05	5.86E-05	1.386595	0.1677
C	0.219865	0.025147	8.743165	0.0000
AR(1)	1.028172	0.080109	12.83460	0.0000
AR(2)	-0.209875	0.081408	-2.578078	0.0109

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.949436	Mean dependent var	0.018087
Adjusted R-squared	0.943779	S.D. dependent var	0.008920
S.E. of regression	0.002115	Akaike info criterion	-9.379315
Sum squared resid	0.000640	Schwarz criterion	-9.052577
Log likelihood	767.3452	Hannan-Quinn criter.	-9.246638
F-statistic	167.8192	Durbin-Watson stat	1.901731
Prob(F-statistic)	0.000000		

Inverted AR Roots	.75	.28

Dependent Variable: ROA
Method: Panel Least Squares
Date: 06/05/18 Time: 01:46
Sample (adjusted): 2001 2017
Periods included: 17
Cross-sections included: 10
Total panel (balanced) observations: 170
Convergence achieved after 11 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BCCC	1.75E-07	4.38E-07	0.399731	0.6899
LNBCP	-0.001745	0.000702	-2.486037	0.0140
LNCPP	0.000899	0.001681	0.534475	0.5938
LNSIZE	-0.012621	0.004727	-2.670132	0.0084
GRTH	-0.002380	0.001534	-1.551802	0.1228
LEV	-0.073081	0.057670	-1.267225	0.2070
CUR	0.000379	0.000241	1.571897	0.1181
C	0.188701	0.062275	3.030134	0.0029
AR(1)	0.537343	0.076382	7.034913	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.766857	Mean dependent var	0.008999
Adjusted R-squared	0.740782	S.D. dependent var	0.010481
S.E. of regression	0.005336	Akaike info criterion	-7.528761
Sum squared resid	0.004328	Schwarz criterion	-7.196735
Log likelihood	657.9447	Hannan-Quinn criter.	-7.394029
F-statistic	29.40944	Durbin-Watson stat	1.965066
Prob(F-statistic)	0.000000		

Inverted AR Roots	.54

Dependent Variable: NIM
Method: Panel Least Squares
Date: 06/05/18 Time: 01:50
Sample (adjusted): 2002 2017
Periods included: 16
Cross-sections included: 10
Total panel (balanced) observations: 160
Convergence achieved after 14 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BCCC	6.92E-08	1.43E-07	0.482423	0.6303
LNBCP	-0.001277	0.000271	-4.711912	0.0000
LNCPP	0.000329	0.000526	0.625504	0.5327
LNSIZE	-0.018233	0.002582	-7.060312	0.0000
GRTH	-0.000380	0.000455	-0.835588	0.4048
LEV	-0.049919	0.022153	-2.253355	0.0258
CUR	0.000106	6.99E-05	1.510464	0.1332
C	0.228569	0.024193	9.447768	0.0000
AR(1)	1.152756	0.079709	14.46201	0.0000
AR(2)	-0.275219	0.082731	-3.326693	0.0011

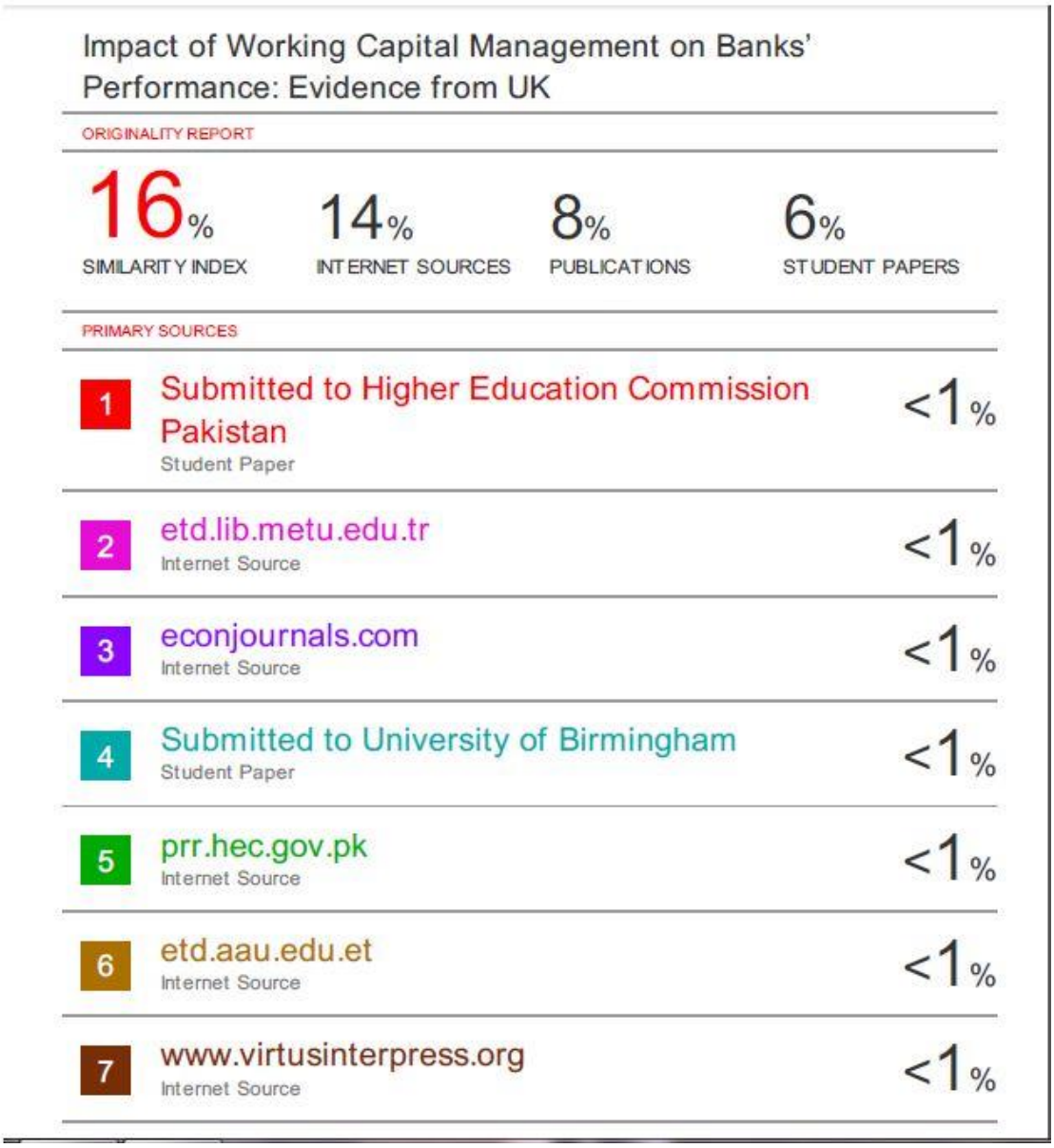
Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.955958	Mean dependent var	0.018087
Adjusted R-squared	0.950336	S.D. dependent var	0.008920
S.E. of regression	0.001988	Akaike info criterion	-9.492405
Sum squared resid	0.000557	Schwarz criterion	-9.127228
Log likelihood	778.3924	Hannan-Quinn criter.	-9.344119
F-statistic	170.0268	Durbin-Watson stat	1.809908
Prob(F-statistic)	0.000000		

Inverted AR Roots	.82	.34

PLAGIARISM REPORT



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ETHICS COMMITEE APPROVAL

YAKIN DOĞU ÜNİVERSİTESİ

BİLİMSEL ARAŞTIRMALAR ETİK KURULU

01.06.2018

Dear Diary Jalal Ali

Your project "**Impact of Working Capital Management on Banks' Performance: Evidence from UK**" 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.