# FINANCIAL INTEGRATION, SINGLE MONETARY POLICY, AND BANK EFFICIENCY IN THE EUROZONE

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# FINANCIAL INTEGRATION, SINGLE MONETARY POLICY, AND BANK EFFICIENCY IN THE EUROZONE

**By**

**EHSAN RAJABI**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

**April 2015**

*To those that devoted their lives to science, nothing can give more happiness than making discoveries, but these cups of joy are full only when the results of their studies find practical application.*

Louis Paster

## DEDICATIONS

I would like to dedicate it to my decendent father and mother and my beloved family: brother, Thank you for the never-ending loves and support.

My gratitude goes to my father and mother in-law for their sincere support.

Finally, I dedicate this dissertation to my loving wife, Forozan Sanjari, and my child, Parmida, for their never-ending support and encouragement, helps to believe and discovery of myself to finish journey ofPhD degree.

Thank you,
EHSAN RAJABI
UNIVERSITI PUTRA MALAYSIA
December 2014

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

## FINANCIAL INTEGRATION, SINGLE MONETARY POLICY, AND BANK EFFICIENCY IN THE EUROZONE

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**April 2015**

**Chair: Junaina Muhammad, PhD**

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This study analyzes the cost and profit efficiency of the banking sector in the euro area Member States during the period from 1999 until 2012. The two-stage approach, the generalized method of moment (GMM) regression model is used to regress the efficiency level obtained from the first stage on factors that could influence the efficiency score. Therefore, the efficiency score measures that derived from the DEA estimations are used as the dependent variable and then regressed upon environmental variables, financial integration, and Single Monetary Policy.

The result suggests that the cost and profit efficiency of a given bank is found to be on average negatively related to population density, banking activity, loan management activity, and profitability while economic condition, financial deeping rate, and bank network extension have a positive influence on cost and profit efficiency.

Then, this study estimates the relationship between cost and profit efficiency scores and financial integration, which we defined as five groups of competition, bank market ownership, financial liberalization, free capital flow, and the euro area control variables. The results of the GMM estimator suggest that concentration ratio, foreign ownership, domestic credit, and market integration are negatively related to bank cost and profit efficiency while that the coefficient of real credit growth and capital flow have a positive relationship to the cost and profit efficiency score at the 1% level for all years of panel data. Furthermore, empirical findings of bank market power, government budget deficit targeting, and public debt targeting are consistent in both cost and profit efficiency models.

Finally, this study analyzes the link between bank efficiency and Single Monterey Policy that is defined by credit channel, interest rate channel, and exchange rate channel and price stability variables in panel regression analysis. The result of GMM estimator shows that there is a positive relationship between efficiency score and bank lending and liquidity but capitalization, exchange rate, inflation targeting, long term interest rate targeting were associated with lower cost and profit efficiency scores.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

## INTEGRASI KEWANGAN, DASAR MONETARI TUNGGAL, DAN KECEKAPAN BANK DI DALAM NEGARA KESATUAN ZON EROPAH

Oleh

**EHSAN RAJABI**

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Kajian ini menganalisis kos dan keuntungan kecekapan sektor perbankan di zon kesatuan Eropah dalam tempoh dari tahun 1999 hingga 2012. Pendekatan dua peringkat model regresi kaedah umum dari masa (GMM) digunakan untuk mengregresi tahap kecekapan yang diperolehi dari peringkat pertama kepada faktor-faktor yang boleh mempengaruhi skor kecekapan yang ada. Oleh itu, pengukuran skor kecekapan yang diperoleh daripada anggaran DEA digunakan sebagai pembolehubah bersandar dan kemudian diregresi ke atas pembolehubah alam sekitar, integrasi kewangan, dan Dasar Monetari Tunggal.

Hasil dapatan menunjukkan bahawa kecekapan kos dan keuntungan bank yang diberikan didapati secara puratanya berhubungan secara negatif dengan kepadatan penduduk, aktiviti perbankan, aktiviti pengurusan pinjaman dan keuntungan manakala keadaan ekonomi, kadar deeping kewangan, dan lanjutan rangkaian bank mempunyai pengaruh yang positif ke atas kecekapan kos dan keuntungan.

Kajian ini juga menganggarkan hubungan antara pengukuran kecekapan kos dan keuntungan dan integrasi kewangan, yang ditakrifkan sebagai lima kumpulan persaingan, pasaran pemilikan bank, liberalisasi kewangan, aliran modal percuma, dan pembolehubah kawalan kawasan euro. Keputusan penganggar GMM mencadangkan bahawa nisbah konsentrasi, pemilikan asing, kredit tempatan, dan integrasi pasaran adalah berhubungan secara negatif dengan kecekapan  kos dan kecekapan keuntungan manakala pekali pertumbuhan kredit sebenar dan aliran modal mempunyai hubungan yang positif dengan kecekapan kos dan keuntungan pada tahap 1% bagi semua tahun data panel. Tambahan pula, dapatan empirikal kuasa pasaran bank, sasarkan defisit bajet kerajaan, dan sasaran hutang awam adalah konsisten dalam kedua-dua model kecekapan kos dan keuntungan.

ii

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This thesis submitted to the Senate of Universiti Putra Malaysia has been accepted as fulfilment of the requirements for the degree of Doctor of Philosophy.

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Signature: _____ Date: _____

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# TABLE OF CONTENTS

# LIST OF TABLES

# LIST OF FIGURES

# LIST OF ABBREVIATIONS

| | |
|---|---|
| EMU | European Monetary Union |
| ECB | European Central Bank |
| HICP | Harmonized Index of Consumer Prices |
| EU | European Union |
| SGP | Stability and Growth Pact |
| EMU | Economic and Monetary Union |
| SSM | Single Supervisory Mechanism |
| SMP | Single Monetary Policy |
| GMM | Generalized Method of Moments |
| DEA | Data Envelopment Analysis |
| WDI | World Development Indicators |
| IMF | International Monetary Fund |
| Eurostat | Statistical Office of the European Union |
| DMU | Decision Making Units |
| CRS | Constant Returns to Scale |
| TE | Technical Efficiency |
| CE | Cost Efficiency |
| SCP | Structure Conduct Performance |
| CR | Concentration Ratio |
| NEIO | New Empirical Industrial Organization |
| SFA | Stochastic Frontier Analysis |
| NCB | National Central Bank |
| LSR | Least-Squares Regression |
| DFA | Distribution Free Approach |
| TFA | Thick Frontier Approach |
| FDH | Free Disposal Hall |
| SE | Scale Efficiency |

| | |
|---|---|
| VRS | Variable Returns to Scale |
| NIRS | Non-Increasing Return to Scale |
| PE | Profit Efficiency |
| EBF | European Banking Federation |
| GMID | Global Market Information Database |
| WDI | World Development Indicators |
| FDI | Foreign Direct Investment |
| SOE | State-owned-Enterprises |
| BLC | Bank Lending Channel |
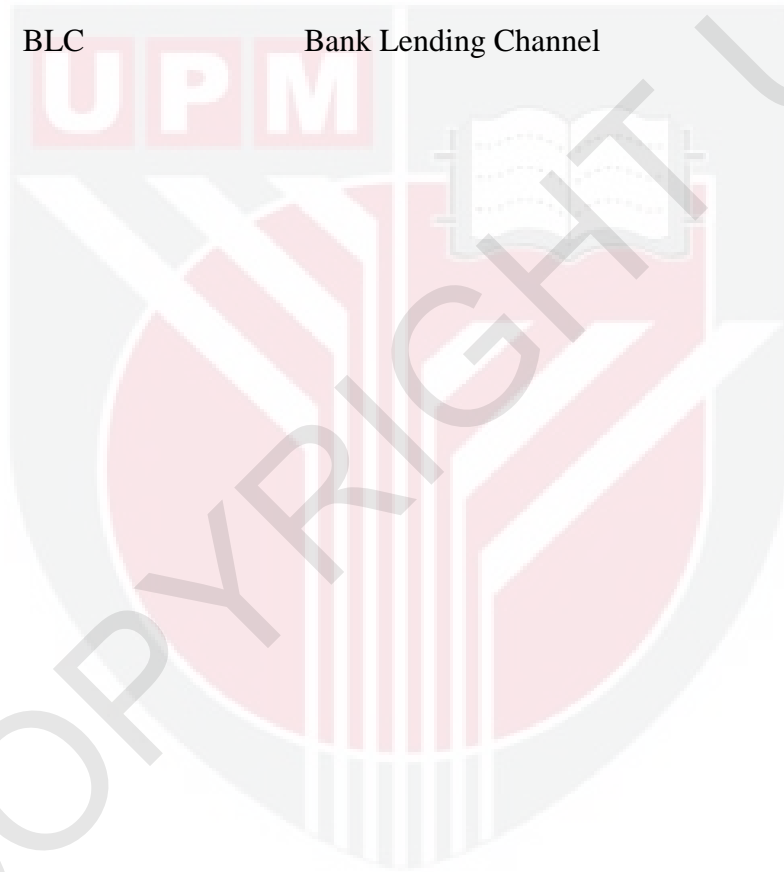
# CHAPTER 1

# INTRODUCTION

## 1.1    Background of the Study

The Eurozone, which is composed of the seventeen European countries that have joined together to form a common monetary union, represents more than 15% of global Gross Domestic Production (GDP) and 20% of world exports (Eurostat, 2010). The European Central Bank (ECB) is the sixth of the seven institutions of the European Union (EU) as listed in the Treaty on European Union (TEU). It is the central bank for the Eurozone, one of the world's most important central banks, to administrate the monetary policy of the 17 EU Member States that constitute the Eurozone. In 1957, the European Union was created. From 1957 to 1999, economic integration has progressed as follows by Treaty of Rome (1957), the snake (1970s), European Monetary System (1979), the Single European Act (1986), Maastricht Treaty (1991), and Stability & Growth Pact (1997) and finally in 1999 the Euro is launched among 11 members of EU. Greece, Slovenia, Cyprus and Malta, Slovakia and Estonia have been joined Euro area from 2001 to 2011.

The economic impacts of this zone are resounding worldwide nations. Thus, both the successes and failures of the European Central Bank policies will affect not only country members of the Eurozone, but also the global economy in general. The formation of the ECB and its currency, the Euro, has presented greater success to the euro Member States. Its long-term efficiency, productivity, and stability will based on the efficacy of the ECB policies in addressing some critical obstacles to its success.

The European banking markets, especially banks, in their function as financial intermediaries, contribute to economic activity in a number of ways. In this case, the banking systems in developing countries have undertook major reforms in order to create effective banking institutions with a high level of soundness and capable of facilitating economic growth (Andries, Apetri, & Cocris, 2012). Furthermore, banking sector has undergone significant transformation worldwide in its operational environment during the last two decades. Both environmental and internal factors have influenced its structure, efficiency, and performance in banking industry, and effective banking system is better able to withstand negative shocks and contribute to the stability of the financial sector (Brissimis, Delis, & Tsionas, 2010). Therefore, the efficiency of the banking system becomes an important issue to the academic world, the banking system decision-makers, and regulatory bodies.

Moreover, the banking sector is considered by any economy as a key sector for the smooth operating of its domestic economic system, so the development of the new banking status is an issue of major concern. When competition increases between banks or between banks and other financial institutions, internally and internationally, bankers and policy makers are to determine whether banks are managed efficiently and productively, and if not to take remedial action.

In other respects, analyzing the efficiency level of banks is of interest from a policy perspective because if banks are becoming more efficient then, one would expect better performance, enhanced profitability, greater amounts of funds channeled through the system, competitive prices, and service quality for consumers, as well as increased safety and soundness (Casu, Girardone, & Molyneux, 2004) . In addition, looking at efficiency differences across countries may help to identify the achievement or perhaps of policy notations or, additionally, may highlight a variety of strategies carried out through banking systems. The information acquire about the evaluation of the bank's performance is known to improve its overall efficiency of operations and in turn may in improving its competitive frontier.

The empirical findings of research about bank efficiency indicate that the level of efficiency may differ over the time as well as from one bank to another because of a number of micro-and macroeconomic elements. The performance of a bank is dependent upon internal specific factors (which are controllable by the bank) and environmental factors (which do not depend exclusively on the bank management) to the environment in which bank performs its activities; these factors affect the level of bank efficiency. As such, identification and employment of these factors have a significant influence on the bank performance are essential conditions for enhancing efficiency.

For enhancing efficiency, development of a highly effective and dependable financial system constitutes a substantial purpose of the reform procedure as well as transferring from an intensive economy to a market economy within European Monetary Union (EMU). A series of factors could have a considerable influence on bank performance in the euro area such as financial liberalization, development in circulation of capital, goods and services, financial integration, economic interaction among union members and new common monetary environment.

Therefore, monetary and financial integration are crucial elements of the process of economic integration in European Union (EU) which we evaluate its potential benefits on bank efficiency. In principle, the establishment of a common currency area, Member States in the sample will powerfully reinforce the mobility of financial flows and cross-border banking activities. Even so, the existing dissimilarity of average costs and the wide different of profitability among various banking systems continue to raise questions concerning the future upcoming of the progressive integration of banks within an effectively integrated the euro area banking system. Therefore, the study of the differences throughout bank efficiency among Member States of the euro area, which apply financial integration, will also clarify the competitive position of each country in case of banking sector and may shed light on capacity to respond to the new changing environment.

On top of that, on January 1, 1999, eleven European countries fixed the exchange rates of their national currencies irrevocably and started monetary union with the conduct of a single monetary policy under the responsibility of the Governing Council of the European Central Bank (ECB) for EU-17 Member States, which constitute the Eurozone. This generation of a single currency for several countries raises the necessity to better comprehend the transmission process of monetary policy in the new currency area. While theory provides a wide array of various transmission channels (*e.g.,* exchange rate, asset price or interest rate channels). These offer a

2

significant influence to banks system (Ehrmann, Gambacorta, Sevestre, Worms, & Martinez, 2010). The key task in this particular effort is to discover the reaction of monetary policy actions to bank performance.



Year

HICP
Average inflation since 1999
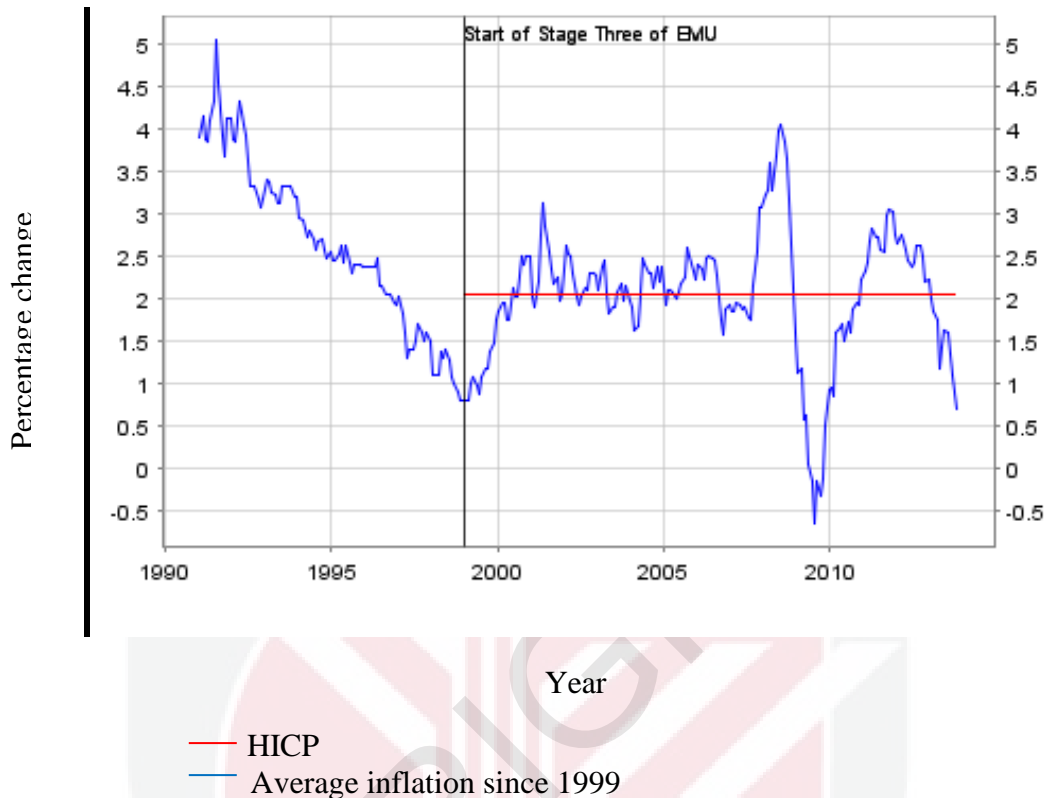
**Figure 1.1. Inflation Rate (HICP) in the Euro area 1991-2012**
(Source: Eurostat; Data prior to 1996 are estimated on the basis of non-harmonized national Consumer Price Indices (CPIs))

The principal target of the ECB's monetary policy is to maintain price stability. The ECB aims at inflation rates of below, but close to, 2% over the medium term. Inflation refers to a general increase in consumer prices measured against a standard level of purchasing power and measured by an index that has been harmonized across all the euro area Member States. We present the Harmonized Index of Consumer Prices (HICP), in brief, from 1991 to 2012 in Figure 1.1. Historically, the euro area inflation average 2.3 percent reaching an all-time high of 5.0 percent in July of 1991 and a record low of -0.7 percent in July of 2009. After August of 2009, the most recent reading indicated a +1% rate of inflation. This number is suspect for as will be shortly discussed. Oil prices increasing, limiting the annual growth rate and unit labor costs are suspected for several reasons of rising HICP rate.

Year

**Figure 1.2. Monetary Aggregate M3 in the Euro area 1999-2013**
(Source: European Commission and European Central Bank calculations based on Eurostat data)

Concerning monetary aggregates, the ECB's definitions of the euro area monetary aggregates are based on harmonized definition of M3 includes all currency in flow, bank deposits, repurchase agreements, debt securities with a maturity of up to and including two years, and money market fund shares. By increasing money supply, the purchasing power of Euro is reduced and pressure on the exchange rate is put downward. However, price inflation increases because of an increase in M3. The Eurozone M3 is reported in headlines as a percent change from the previous month or as a three-month average, which smooth monthly volatility in the money supply.

Figure 1.2 presents the annual growth rate of M3 in the euro area from 1999 to 2013. In December 2009, the annual growth rate of M3 remained negative, standing at -0.2. The data continues to support our assessment of a moderate fundamental step of monetary expansion and low inflationary push over the medium term. The prevailing interest rate constellation continues to have a significant influence on both the level and composition of annual M3 growth. On the one hand, the low interest rate on short-term bank deposits develops the allocation of funds away from M3 and into longer-term deposits and securities. Therefore, a low opportunity cost of holding funds is implied by the narrow spreads between the interest rates paid on different short-term deposits, which cause to rise at a highest annual rate of more than 12% in December 2009.

Year
**Figure 1.3. GDP Growth Rate in the Euro area 1996-2013**
(Source: European Commission and European Central Bank calculations based on Eurostat data)

Figure 1.3 presents historical data of the GDP annual growth rate (in prices of the previous year) for the euro area. The GDP in the Eurozone restricts -0.60 percent in the third quarter of 2013 over same quarter of the previous year. Historically, from 1996 until 2013, the euro area GDP annual growth rate averages 1.4 percent stretching an all-time high of 5.0 % in March of 1995 and a descend to -5.2 % in March of 2009.

Government debt is one of the crucial indicators in assessing sustainability of public finances. Normally, investors make use of government debt as a percent of GDP to measure a country capability to make upcoming payments on its debt, thus affecting the country borrowing costs and government bond yields.

**Year**
**Figure 1.4 Government Debts (% of GDP) in the Euro area 2000-2013**
(Source: European System of Central Bank, European Commission and national data)

Under the terms of the EU's Stability and Growth Pact (SGP), Member States pledge to keep general government budget deficits may not exceed 3.0 % of its GDP and government debt may not exceed 60 % of GDP (SGP, 1999). Figure 1.4 presents government gross debt to GDP for the Eurozone from 2000 until 2013. In 2013, general government gross debt for the euro area attains a peak of 93.4% of GDP and the debt ratio declines moderately to reach 66% of GDP by the end of 2007. At the same time, at the national level, government deficit and debt ratios in many cases remain too high, considering the challenges arising from ageing populations *(The monetary policy of the ECB,* 2011).

Within phrase of EU-17 banking sector structural, banks are the direct address of ECB's monetary policy decision and, as such, process of integration. The way and extent, which they pass on changes in the policy interest rates to their customers, is a vital component of overall effects of monetary policy.

To address this, Table 1.1 indicates a number of structural indicators for the EU-17 banking sectors. Between 2002 and 2012, the total numbers of credit intuition functioning in the EU-17 falls from 6698 to 5486. The total assets of the banking sectors of all countries increase histrionically between 2002 and 2012. In the four largest EU-17 countries by population or GDP (France, Germany, Italy and Spain), the rate of growth of assets is 61% in nominal terms. According to Dermine (2006), this growth highlights the effectiveness of deregulation and the single market program in bringing about the end of 'repressed' banking systems.

In three of the 'big four countries', the number of bank branches rise between 2002 and 2012. The sole exception is the Spain, in which there is a large reduction in the size of branch networks. Meanwhile, total EU-17 banking sector employment undulates over the same period, reaching around 2.2 million in 2009. Finally, the data on CR5 (the five-firm concentration ratio for total assets) shows little evidence of any

consistent trend in banking sector concentration, which increases in some countries but fall in others between 2002 and 2012.

Generally, structural indicator of economic and bank system of the euro area, shows us to the importance of a comprehensive evaluation of Eurozone's banking system in term of efficiency. This research is to investigate the performance of EU-17 banking system influenced by financial integration and Single Monterey Policy (SMP).

Therefore, this study proposes to estimate the efficiency of the euro area banking system in maintaining an unbiased monetary policy with a goal of price stability, to recognize bank structural problems and find the ways to improve the performance of the Eurozone banks through the further debt crisis. To do so, this study will investigate the status and position of banks (by measuring efficiency) in the euro area under influence of financial integration and Single Monetary Policy factors. Specifically, this study will pose and resolve three questions. Firstly, which environmental factors had influenced efficiency of the Eurozone banking sector by country comparison? Second, whether had financial integration significantly improved or worsened the bank efficiency levels in the euro area? Thirdly, whether had the implementation of Single Monetary Policy by ECB significantly influenced the level of efficiency in the euro area banks previously practiced by the national economies?

## Table 1.1. Structural indicators for EU-17 banking sectors

| Country | Number of Credit Institution | | | | Assets (€ billion) | | | | Number of branches | | | | CR5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2002 | 2007 | 2009 | 2012 | 2002 | 2007 | 2009 | 2012 | 2002 | 2007 | 2009 | 2012 | 2002 | 2007 | 2009 | 2012 |
| **Belgium** | 113 | 111 | 111 | 110 | 775 | 1299 | 1156 | 1085 | 5550 | 4425 | 4201 | 3819 | 82.0 | 83.4 | 77.1 | 66.3 |
| **Germany** | 2180 | 1966 | 1948 | 1776 | 6370 | 7564 | 7425 | 8219 | 50867 | 39777 | 38851 | 36239 | 20.5 | 22.0 | 25.0 | 33.0 |
| **Estonia** | 18 | 23 | 35 | 33 | 5 | 21 | 21 | 20 | 198 | 266 | 213 | 163 | 99.1 | 95.7 | 93.4 | 89.6 |
| **Ireland** | 85 | 81 | 81 | 81 | 475 | 1607 | 1577 | 1124 | 926 | 1158 | 1228 | 1065 | 46.1 | 50.4 | 58.8 | 46.4 |
| **Greece** | 57 | 62 | 65 | 52 | 201 | 384 | 491 | 441 | 3263 | 3850 | 4078 | 3629 | 67.4 | 67.7 | 69.2 | 79.5 |
| **Spain** | 348 | 357 | 351 | 314 | 1342 | 3005 | 3433 | 3574 | 39009 | 45500 | 44431 | 38142 | 43.5 | 41.0 | 43.3 | 51.4 |
| **Finland** | 366 | 358 | 347 | 313 | 166 | 288 | 387 | 597 | 1572 | 1693 | 1538 | 1404 | 78.6 | 81.2 | 82.6 | 79.0 |
| **France** | 944 | 842 | 733 | 659 | 3831 | 6698 | 7183 | 7712 | 26162 | 39560 | 38311 | 38359 | 44.6 | 51.8 | 47.2 | 44.6 |
| **Italy** | 821 | 821 | 801 | 740 | 2024 | 3334 | 3692 | 4211 | 29948 | 33230 | 34030 | 32872 | 30.5 | 33.1 | 34.0 | 39.7 |
| **Cyprus** | 408 | 215 | 155 | 155 | 409 | 93 | 139 | 128 | 993 | 921 | 930 | 850 | 56.8 | 64.9 | 65 | 62.5 |
| **Luxembourg** | 184 | 156 | 147 | 147 | 662 | 1025 | 1012 | 868 | 271 | 229 | 226 | 203 | 30.3 | 27.9 | 27.8 | 33.1 |
| **Malta** | 15 | 22 | 24 | 29 | 16 | 38 | 41 | 53 | 99 | 104 | 116 | 107 | 82.4 | 70.2 | 72.7 | 74.4 |
| **Netherlands** | 86 | 93 | 93 | 122 | 1356 | 2168 | 2217 | 2490 | 4269 | 3604 | 3137 | 2466 | 82.7 | 86.3 | 85.0 | 82.1 |
| **Austria** | 821 | 796 | 785 | 747 | 554 | 885 | 1028 | 974 | 4466 | 4266 | 4167 | 4460 | 45.6 | 42.8 | 37.2 | 36.5 |
| **Portugal** | 202 | 178 | 170 | 159 | 310 | 439 | 520 | 556 | 5348 | 6055 | 6432 | 6259 | 60.5 | 67.8 | 70.1 | 69.9 |
| **Slovenia** | 24 | 23 | 25 | 23 | 19 | 43 | 53 | 51 | 721 | 711 | 706 | 695 | 68.4 | 59.5 | 59.7 | 58.4 |
| **Slovakia** | 26 | 26 | 26 | 26 | 23 | 58 | 54 | 60 | 1020 | 1169 | 1230 | 1061 | 66.4 | 68.2 | 72.1 | 70.7 |
| **Euro area** | **6698** | **6130** | **6476** | **5486** | **18543** | **28740** | **30412** | **32163** | **174682** | **186518** | **184674** | **171793** | **59.14** | **44.4** | **44.6** | **43.0** |

(Source: Statistical Data Warehouse of ECB, 2012) ,
credit institutions includes commercial banks, savings banks, post office banks, credit unions, etc.
Year selection is because of significant events for the euro area like 2002 for the Euro money introduced, 2007 for USA financial crisis, 2009 for Greece crisis, and 2012 is because of European Monetary Fund & Support Package

## 1.2    Statement of the Problem

The banking industry exposes a multitude of new developments and challenges. Deregulation, liberalization, information technology, and the entry of new types of competitors have contributed to internationalization of the existing capital markets and to the developments of new markets of sophisticated financial instruments. The banking scenery changes even more radically in Europe, where the introduction of the single currency (Euro) in 1999 has removed institutional obstacles for banks to operate in other EU countries.

This changing banking environment concentrates on the competitive conditions in the Eurozone and on the viability of its - until recently - sheltered banks. After all, for long, domestic banks have enjoyed comparative advantages on the domestic markets for bonds and equity in the field of underwriting and trading activities based on the existence of national currencies. Nowadays, in particular after the constitution of the Euro, the efficiency of the euro area banks will become more and more crucial in the light of the current and expected increase in competition. Less efficient banks run the risk to be driven from the market. Efficiency can also be a decisive element in the game of mergers and take-overs, where inefficient banks are an easy and sought-after target.

Furthermore, in order to response a major concern of investors and policy makers how is the health performance of EU-17's banks, this study seeks to discover the level and spread of bank efficiency in the Eurozone. In particular, it targets on differences across countries explain by environmental condition like various macroeconomic conditions, various banking specification, bank specific characteristics, and other sources over time. Therefore, this study attempts to determine the influencing factors of bank efficiency level in the Eurozone.

In second scenario, during the past two decades, the deregulation of financial services in the European Union (EU) together with the establishment of the Monetary Union and the introducing of the Euro have targeted at promoting integration through the formation of a level-playing-field in the provision of banking services across the EU-17. Without a doubt, in the calculation for gains from financial integration, it is suspected that banks in different countries would become equally efficient with removing cross-border constraints. In addition, EU regulators believe that a well-integrated financial system is essential to improve the efficiency of the euro area economy by reducing the cost of capital and enhancing the allocation of financial resources. Although, it is mostly agreed that deepening financial integration is beneficial in general speaking but it may also have negative effects. By way of example, integration in a particular market segment might lead to a high degree of consolidation, which might hinder competition. Furthermore, financial integration has significant implications for financial regulation and the issue of financial stability has suspected an extremely international dimension. As a result, it is important to monitor and realize the procedure of financial integration and its effect on bank performance.

In light of the ongoing process of financial integration, it is of specific interest to investigate its impact on efficiency scores for all the euro area Member States over the convergence period. Moreover, an advantage of looking at all Member States

banking system in terms of efficiency level is that it permits us to single out differences across countries that, then, may help discover optimal pathways towards the next rounds of financial integration, which potentially could lead towards a successful adoption of banking supervision (banking union). Therefore, this research is designed to contribute to the current debate by investigating the influence of financial integration factors on the efficiency of the Eurozone banking system. This permits us to examine the link between the dynamics of efficiency and financial integration (which closely relates to competition, foreign ownership, financial liberalization, and capital flow).

In last scenario, since first of January 1999 eleven mainland European countries execute a uniform monetary policy, the members of the Economic and Monetary Union (EMU) attuned monetary and even fiscal policies to common targets. This common monetary policy is most sensitive and critical for not only permanent economic growth, but also investment decision and financial intermediators. It is because of the managing on inflation, exchange rate and interest rate has a significant impact on credit institute performance (like efficiency) by their theoretical and empirical linkages. Otherwise, the introduction of the Euro seems to be a crucial stage in the process of rapid change within the financial structure of European Union by improving the financial landscape to a substantial extent. Particularly in the banking sector, (international) mergers and acquisitions are frequent occurrences. European banks thereby not only expand their scale but also extend their scope of activities. These types of rapid modifications in banking structures, systems of financial markets, and behavior of financial agents make the management of the Single Monetary Policy by the ECB much more difficult. It is most likely that the monetary transmission mechanism of the economies in the euro area will change further, which complicates the already difficult task of the new European monetary authorities. Consequently, deeper insights into the monetary transmission mechanism and its linkage and influence on banking activity are of utmost importance issue.

This issue will become more important when single supervisory mechanism (SSM) for banks in the euro area is a future step in strengthening the Economic and Monetary Union (EMU). In the new single mechanism, ultimate responsibility for specific supervisory tasks that has associated with the financial stability of the euro area banks will lie with the European Central Bank (ECB). Therefore, assigning the task of banking supervision to the ECB raises questions regarding the consequences for its primary mandate, Single Monetary Policy, on the euro area banking system. Consequently, evaluation of ECB monetary policy is definitely an option for the euro area banking system that a move to comprehensive assessment of single monetary policy by ECB regarding to bank efficiency. As a result, a comprehensive and extensive assessment of ECB policy (as monetary policymaker) in case of single monetary policy could have discovered the weakness and strength of its operation and light up the darkness way of newly attributes supervisory power under European banking union. Therefore, this study will examine influence of environmental variables, financial integration, Single Monetary Policy on cost and profit efficiency in the euro area.

10

## 1.3    Research Objectives

The broad objective of this research is to understand the nature and impact of environmental condition, European financial integration, and Single Monetary Policy on level of bank efficiency in the euro area during the period from 1999 until 2012. In this case, the thesis has expected to achieve the following three specific objectives:

**Objective 1:** To estimate the cost and profit efficiency of banks in the euro area by considering environmental variables;

**Objective 2:** To investigate the influence of financial integration on the level of bank efficiency in the euro area;

**Objective 3:** To investigate the effect of Single Monetary Policy by ECB on the level of bank efficiency in the euro area.

The results from this particular research will be useful in providing a framework for future monetary policy and development of financial integration in the euro area as well as in other countries or economics union with similar economic backgrounds to the euro area case.

## 1.4    Significance of the Study

Our study contributes to the literature fivefold aspect. First, the literature is a treasure of country studies on efficiency in the banking industry. Studies on international comparison of efficiency are rare. Actually, such an international comparison is really a heroic attempt, as the differences in banking behavior and economic and institutional conditions (in terms of institutions, supervisory rules, government interference, customer preferences and level of development) between countries are huge. As activities of banks diverge strongly and as part of these activities truly are challenging, it is actually for just one country quite a task to capture bank behavior by one model. Moreover, international comparisons are easily distorted by national differences in macroeconomic condition, banking sector specification categories, as shown in this study. In other words, it can easily be confirmed that single-country studies are entirely unsuitable for international comparisons and provide misleading results.

Second, our study contributes to the literature by providing estimations of both cost and profit efficiency of banks based on nonparametric frontier analysis for all the euro area Member States; also, it compares efficiencies scores derived from Member States. Although, most of the studies of banking efficiency in the European countries are based on one-year analyses, and one year is not sufficient to observe the efficiency level. Hence, this study will evaluate the efficiency level for fourteen years. Finally, this study will use the most current data of banks in the euro area countries to reflect the most recent changes in the banking deregulation and the competition level. In addition, the sample of this study will include most significant banks (85 percent of total banking assets in the euro area) that operate in all seventeen Member States.

Next, this study fills a gap in the literature by departing from the traditional analysis of efficiency and performance in the euro area banking system by applying two-stage procedure (to my knowledge this is the first study of the euro area banks' efficiency using the two-stage approach). This study uses a two-stage procedure: in the first stage the level of efficiency is estimated through nonparametric methods with environmental variables to explain efficiency difference between Member States, and in the second stage regression analysis, generalized method of moments (GMM) suggested by Arellano and Bond (1991), is applied while the bank efficiency is dependent variable.

Then, the assessing efficiency of banking system and its influence factors can help for the smooth operating of their national economic system and banking industry. It is because of improvement efficiency of banking sector can cause a better banking performance, decrease costs, improvement in quality of services, and betterment in the allocation of resources and increase productivity of the entire economy. Efficiency improvement also contributes to amelioration in the soundness and stability of banking system that achieves profits channel toward increase equity and provision for better absorption of risks.

Finally, the findings of the current study contributed to the body of knowledge. The empirical finding of studies about track of bank efficiency from introducing the Euro to now indicates level of efficiency differs over time and from one bank to another, one country to others. Furthermore, consequence of a series of micro (bank specific characteristic and banking industry) and macroeconomic factors (ownership, competition, financial liberalization, and monetary policy channel and so on) demonstrate its significant influence on bank efficiency. In this path, this research introduces four new variables in European banking literature as first time. Inflation targeting, government budget deficit targeting, public debt targeting, and long-term interest rate targeting are external specific factors that influence the degree of efficiency of the bank from the environment in which the bank performs its activities. Introducing of these new variables is necessary because, recognition and usage of factors that have a significant influence on the performance of banks are important for improving efficiency in the euro area banking market.

## 1.5    Nature of the Study

The current research attempted to identify any relationships that may exist between the Eurozone bank efficiency and environmental variables, financial integration, Single Monetary Policy. The best research methodology to be used to obtain this knowledge is to conduct a quantitative correlational study that examines the relationship between the efficiency of bank and environmental variables, financial integration, and Single Monetary Policy in the euro area. A two-step quantitative research methodology was employed to accomplish the purpose of the current study: DEA and panel regression. DEA, a non-parametric mathematical programming methodology was used to evaluate the cost and profit efficiency of banks of the euro area listed banks in order to get efficiency scores of banks. Next, the efficiency scores generated from the DEA program were used as independent variables in a panel regression model (GMM estimator) to explain bank performance.

12

The characteristics of the quantitative research methodology provide a framework for the current study that focuses upon the use of a specific and narrow purpose by measuring observable data. These data were collected from various sources, Bankscope database for financial reports of the 126 listed banks, World Development Indicators (WDI), International Monetary Fund (IMF), and statistical office of the European Union (Eurostat) for explanatory variables of the euro area Member States during the period of 1999-2012.

## 1.6 Organization of the Study

This study consists of five chapters by fallowing organization:

Chapter One provides an introduction to the our study, where the main information focuses on the background to the study, a statement of the problem, an outline of the research objectives, and significance of the study.

Chapter Two presents a critical review of existing literature on selected topics related to the study: bank efficiency, financial integration, and Single Monetary Policy. In addition, this chapter delves into recent theoretical underpinning related to each objective.

Chapter Three discusses the methodology used to analyze the problem stated in the study. It describes both parametric and nonparametric methods, and how they determine banking efficiency level. It also describes the two-stage approach methods that will be used in the empirical part of this study. In addition, it gives the definition of inputs and outputs that will be used to measure the efficiency score.

Chapter Four addresses the empirical results. It presents the result of employing the two-stage method. In the first stage, it gives the measurements of the cost and profit efficiency score of the banking system in the euro area Member States by using DEA. In the second stage, it presents the results from regressing the efficiency level obtained from the first stage on factors that could influence the efficiency of banks by using a GMM regression. Finally, we discuss these results relate to the research questions and objectives and how they fit into existing or current body of knowledge as well as solving problem that research base on it.

Chapter Five gives an overall significance of the study, and stresses the findings upon which a conclusion or conclusions are drawn in line with the objectives set, acknowledges the limitations, and suggests a number of future research directions.

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133

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140

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