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A Performance Analysis of the Online Banking System

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Introduction

The global economic scenario has undergone, over the last twenty years, a radical transformational and developing process which has shaped many of its aspects by imposing new schemes and rules which nowadays are strongly consolidated. Economy's globalization is now accepted with fait accompli with both the positive and the negative aspects that it entails. The technological boom of the 90s which led to the massive diffusion of the information systems in the most developed countries now plays a fundamental role in every day's activities. Today words such e-, electronic and virtual which stand for something that does not belong to our real world, but rather, to the so called "virtual reality" seem to have breached in our vocabularies with an aggressive force. Innovation technology has had without any doubt a dominant role in the financial and economic environment of the last decades; the computerized mechanization of the productive processes and the creation of software for the management of accounting practices have literally forced companies and financial institutions to a structural and organizational modernization which is still on-going.

This evolutionary process of economic and financial nature has in addition generated the necessity for banks to identify new areas of competence in order to reach higher efficiency standards, as competition becomes more and more aggressive. The objective of this analysis is to effectuate a performance evaluation of the online banking system by taking into account all the micro and macro variables which affect a country's economic environment, and by considering the most efficient financial performance indicators for banks.

The analysis is divided in three chapters. In the first chapter it will discussed how online banks run their activities by describing their business model and their relations with both customers and stakeholders. By doing so it will be possible to start highlighting the first main differences that distinct online banks from traditional banks. Furthermore, to complement the business

model, it will be shown a SWOT analysis which underlines an online bank's strengths, weaknesses, opportunities and threats.

The second chapter will provide a deep analysis and understating of performance measurement by explaining what it is and why it is useful. In addition, the chapter will mainly focus on describing all the performance indicators, from the most efficient to the least reliable ones, which are monitored and studied by companies' and banks' analysts to provide financial performance reports.

Lastly, in the third chapter it will be reported a comparative performance analysis between online and traditional banks belonging to the European and North American countries by examining their socio-demographic backgrounds and by interpreting the meaning of their banks' performance indicators. In light of the information gathered, a conclusive paragraph will help clarifying whether or not online banks are more efficient with respect to traditional banks.

Chapter 1: The Online Banking System

1.1 The Business Model of Internet Banks

Over the past decades the banking system has undergone major radical changes and transformations which followed an unpredictable pattern. This relentless process was mainly attributable to the strong impact provided by the development of IT infrastructures and other business forces. Banks have then started to evolve from a physical structure which required clients to meet in person with the employees, to a more flexible system which, instead, enabled them to carry out their businesses anywhere they would be able to connect to the Web. This, as a consequence has opened the path for a set of appealing opportunities and the relative need to develop a unique and efficient business model.

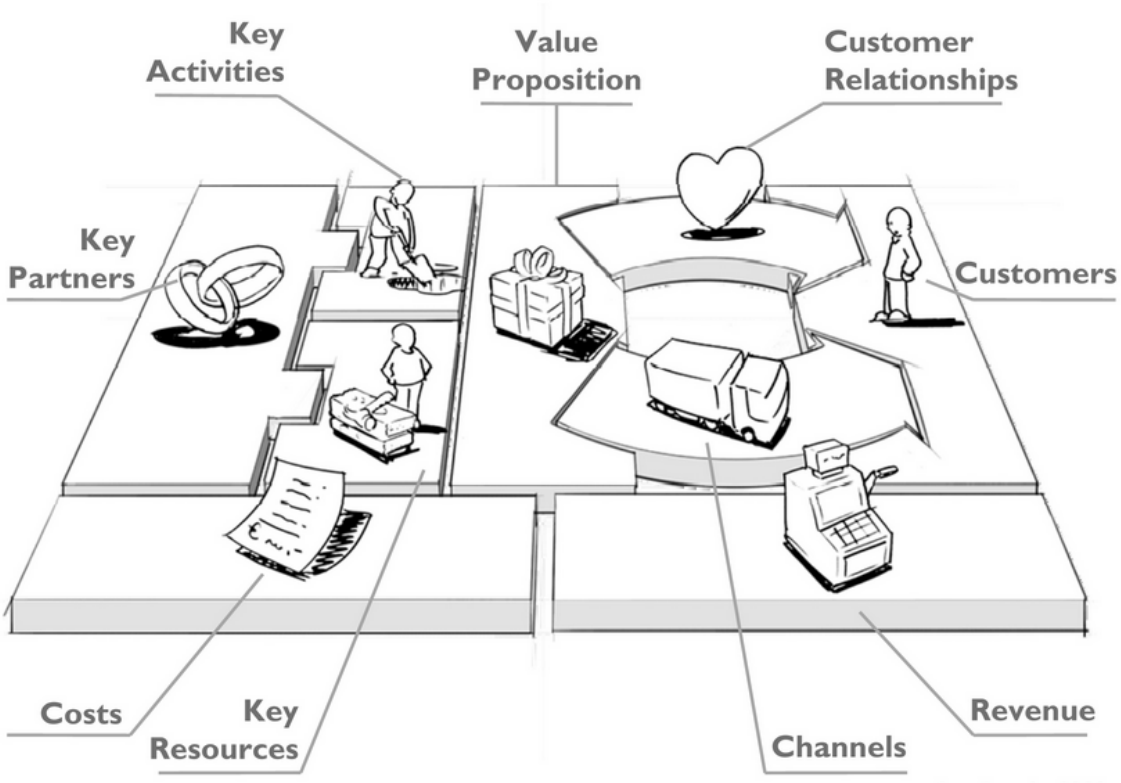
The process of a business model is part of a bank's or any entities' business strategy which describes the economic rationale behind any strategic action aimed at creating and proposing value. The way in which the traditional business model for banks has shifted to a new one thanks to the development of innovation can be outlined by taking into consideration the nine main drivers for a business model:

- Key Activities: The key activities which are useful to establish a functional business model for a company.
- Key Partners: The key partners through which the company makes solid alliances.
- Key Resources: The key resources which allow the company to run an efficient business.
- Customers Segment: The segment of clients targeted by the company to provide its services or products. Clients are gathered according to types, needs, interests and relationships.
- Customers Relationships: The establishment of a solid relationship between the company and its customers.

- Channels of Communication: The channels of distribution and communication which link the company to its customers.
- Value Proposition: The products and services offered to the clients.
- Cost Structure: The costs that the company has to face.
- Revenue Streams: The stream of revenues generated by the sale of products and services.

These nine business drivers are what characterizes the so called "Business Model Canvas.[1] The Business Model Canvas represents an essential strategic tool which exploits the visual language to create and develop innovative and creative business models. More precisely, it describes the way in which a company creates, distributes and captures value. Figure 1.1 portrays the structure of typical Business Model Canvas.

Figure 1.1



[1] The Business Model Canvas was initially introduced by Alexander Osterwalder in its first project "Business Model Ontology, 2004 , and subsequently developed by himself with the support of Yves Pigneur, Alan Smith and a community of 470 experts of the field from over 45 different countries. The diffusion of his book "Business Model Generation" has turned the Business Model Canvas in a global standard.

At this point it is possible to highlight which are the main features which characterized the business model of internet banks. The elimination of physical boundaries which entails both positive and negative aspects is probably the first major. With the elimination of geographical barriers the market place of online banks is much broader with respect to traditional banks which is restricted within physical boundaries.

Online banks are able to meet clients' demands with more rapidity and efficiency without any geographical or time constraint by offering their services through web sites' user-friendly interfaces. By doing so, clients are able to customize their products and preferences with the aid of information transparency. Furthermore, online platforms improve the communication between banks and their customers which result in an enhanced customer loyalty. The type of clients which are targeted by online banks to provide these types of services are mostly those with a high educational level and a good knowledge of IT infrastructures, and whose age ranges from 18 to 65 years.

With the advent of the Internet, online banks not only have improved the relationship with their customers but also have strengthen their level of business networking. In the past, traditional banks used to have a mediator role between customers and financial institutions through their branch networks. Today, however, with the expansion of financial markets thanks to the online platform, banks are able to offer a wider array of products by involving new stakeholders into their business plans. One case is represented by the "Online Banking ePayments"[2] in which online banks work in conjunction with technology providers whose main competences are specific to address the particular requirements of online payments. The provision of differentiated products and services in a highly competitive environment is what sets the basis for the obtainment of a competitive advantage over rivals, and online banks seem to have found the right path to pursue.

[2] A type of payments network where the consumer is authenticated in real-time by his financial institution's online banking infrastructure and payments are made as a credit transfer from his financial institution to the merchant.

For what concerns the cost structure, online banks and traditional banks face different types of costs. For internet banks the main barrier to entry is represented by high start-up costs due the implementation of IT infrastructures and the development of security software to ensure that the private information of their clients are carefully protected. Along with that, high costs are also attributable to the marketing processes like the need to establish a solid brand awareness among clients. However, since the majority of the business transactions are carried online, internet banks report lower networking, production and transactions costs. For the same reason, also labour cost is lower as most of the transactions are carried out by clients themselves. For what regards the revenues streams, instead, online banks seem to draw most of their profits from deposit products, transactional commissions, advertising, servicing and fee charges.

1.2 SWOT Analysis

Along with the business model canvas also the SWOT analysis[3] is useful to have a better and more clear understanding of the potentials which characterize the online banking system's internal and external environment. SWOT analysis is an essential tool which is used to evaluate a company's strategic plan by analysing its strengths, weaknesses, opportunities and threats whenever there is the need to achieve a determined goal. By doing so, the analysis gives a clear and complete idea of what is the internal and external environment which characterize the company. SWOT analysis is not limited only to profit-maximization companies but it can be used in any other decisional process in which desired ends have been set. Entities such as no-profit organizations, governments units and single individuals avail

[3] This strategic plan's idealization is attributed to Albert Humphrey which guided a research program in Stanford University between the 60s and the 70s.

themselves of the use of the SWOT analysis. Many researches have demonstrated that SWOT analyses may influence a company's performance.[4]

Like for any other entities the SWOT analysis can also be applied to the online banking system so that it is possible to analyse which is its general environment and how it is efficient at managing its core competences. Table 1.2 (pg. 10) shows a typical SWOT analysis matrix adapted to the online banking system's internal and external environment.

Strengths

With the development of IT infrastructures, online banks have acquired most of their competitive advantages. By offering their financial services through web-platforms, without any geographical constraints, online banks are able to provide faster and more efficient transactions. Moreover, for the same reason, since clients do not need to meet face-to-face with the banks' employees, they are able to cover a wider customer segment. With respect to traditional banks, the Internet allows online banks to reduces their costs and thus achieve a cost advantage. More specifically, the costs which are reduced are transaction costs and costs on personnel and its management; that is because online banks rely less on land resources. As bank size increases and knowledge further develops, online banks are able to consolidate the complexity of their business which results in more efficiency, faster operations, additional reduction on costs and achievement of economies of scale.

Weaknesses

The decision of online banks to carry out most of their business on the web, besides representing their strength point gives rise to potential weaknesses. In order to run their business and being efficient, online banks need to consolidate their activities in countries where there is an optimal level of

[4] Source: Scott Armstrong (1982), "The Value of Formal Planning for Strategic Decisions", http://dx.doi.org/10.1002/smj.4250030303

R&D expenditures as a % GDP, IT expenditures as a % of GDP, Internet accessibility and people owning a personal computer as a % of total population. Moreover, the customer segment targeted is very specific. Most of the customer who avail themselves of online banks' services are in the most part people with a high educational level and good understanding of IT technologies. For this reason, all those customers who do not fall in this category would turn to traditional-physical banks for their needs. Furthermore, most of the online banks rely heavily on deposit products to generate their revenues giving less emphasis to other financial offers; this as a consequence hinders their product differentiation which is one of the main drivers to achieve a competitive advantage. Standing on the customers' perspective, security about personal data and its integrity represents one of the main issues. Online banks need to invest considerable amount of money on security software as thefts of account information and virus attacks towards banks' databases occur with high frequency.

Opportunities

One of the most profitable opportunities that online banks should take advantage of is the expansion of financial markets. The direct impact of the Internet on financial markets has been of doubtless importance: it facilitates information and data analysis; it improves information exchange; it fastens transactions and it enhances communication between economic agents. By offering a wider array of financial products both to risk-averse and risk-lovers customers, ranging from bonds, options, mutual funds and mortgages, online banks would be able to differentiate their services and thus achieving a competitive advantage not only over other online banks, both domestic and foreign, but also over traditional banks and other financial institutions. Another big opportunity is represented by the extensive net of contacts offered by the Internet. As aforementioned, in fact, Internet enhances communication and networking opening the path for new business opportunities which involve the collaborations between banks and other

newly created professional figures such as online stores and service providers. The collaboration between banks and other stakeholders sets the basis for the implementation of new business strategies which eventually lead to value creation for both customers and banks.

Threats

The main obstacle for online banks is represented by the large number of competitors. Online banks are threatened by traditional banks which offer differentiated products, financial institutions which provide specific financial solutions and above all foreign banks. Because of the development of economic globalization, the banking markets and particularly the online ones are increasingly becoming more international for what concerns the overall financial and economic integration. In light of that, foreign banks are able to access the domestic market and turning it in an aggressive competitive environment by offering more attractive products and better services; this as a result poses a big threat to domestic banks. In addition, also the lack of supervision on online activities and the implementation of effective legal norms prevent online banks from running a flawless business. The rapid evolution of the Internet, in fact, requires that laws which rule over online transactions are up-to-date, as in the case of financial losses to the detriment of customers or in the case of other specific situations there exist no adequate compensatory countermeasures.

Table 1.2

	HELPFUL **(for the objective)**	**HARMFUL** **(for the objective)**
INTERNAL **(within the organisation)**	**Strengths** • Faster and efficient transactions • No geographical barriers • Low transaction costs • Low labour and management costs • Economies of scale	**Weaknesses** • Highly dependent from IT infrastructures and Internet accessibility • Can only target specific customers • Poor product differentiation • Lack of data security
EXTERNAL **(outside the organisation)**	**Opportunities** • Exploitation of financial markets • Networking opportunities • Collaboration opportunities with other entities and service providers	**Threats** • Competitors (especially foreign banks) • Lack of efficient regulations

Chapter 2: Performance Measurement

2.1 What is Performance Measurement?

Performance measurement is the process whereby information about a given organization, group, or individual is collected, analysed and reported in order to give an estimate of the parameters which determine the results of business strategies and activities in objective monetary terms.

It is a tool which helps to understand whether a company is doing well, if goals are met, if improvements are necessary and if ultimately consumers are satisfied. A performance measure is characterized by a number and a unit of measure which are always linked to a goal or a target. “When you can measure what you are speaking about, and express it in numbers, you know something about it” (*Lord Kelvin*).

In general, depending on an organization’s target, performance can be expressed in terms of:

- Efficiency: how well resources are utilized and costs managed to reach the goal.
- Effectiveness: the capability of producing a desired result.
- Quality: the extent to which a given product reaches consumers’ expectations.
- Productivity: The value added by the production process divided by the value of the labour and capital consumed.

Moreover, depending on the targeted audience, it is possible to distinguish between Financial Performance and Managerial Performance. The first one analyses data in order to provide information both to managers and external parties such as stakeholders and banks; the latter, instead, provides information exclusively to managers in order to make internal decisions

which comprise planning, implementation and control. Even if there are these two distinct branches, the final aim of performance measurement is always the value creation both for consumers and financial institutions.

For the purpose of this analysis more emphasis will be put on that branch of performance measurement which refers to financial performance and more specifically to banks.

Financial performance analysis relies on a Financial Statement which comprises a Balance Sheet complemented by an Income Statement, and a Cash Flow Statement. The Balance Sheet is the representation of a company's financial position on a specific period of time, such as the end of its financial year. It is divided in two parts and it displays what a company owns and owes to creditors. Moreover, it takes into account the different sources of revenues, trading and investment and commissions. Table 1.1 shows the elements which constitute a balance sheet (see Appendix Table 1 pg.30).

The income statement which provides additional information besides the balance sheet, measures the financial performance of a company by summarising how expenses and revenues from non-operating and operating activities are incurred, thus highlighting its profitability for a specific period of time. The Income Statement is represented in Table 1.2. The cash flow statement, instead shows a company's revenues and expenses and more specifically it summaries how the cash of a company flows in and flows out at the end of the fiscal year. Moreover, it captures both the current operating results and the relative changes in the balance sheet. Table 1.3 reports a cash flow statement with the indirect method.

The final aim of performance measurement is always to support value creation[5] which can be seen either from the shareholders' perspective or from stakeholders' one. For shareholders success can be measured by share price, dividends and profits, whereas for stakeholders it can be measured by stakeholders' satisfaction.

[5] The change in value due to a company's performance

2.2 Performance Indicators

A performance indicator is a performance measurement tool which can be defined as a "statistical or logical order of magnitude linked naturally or arbitrarily to the measurement of financial or policy activities*"(Pascal Delorme and Olivier Chatelain*). Moreover, a performance indicator is characterized by a function which indicates the object of the measure; the methods of acquiring it, which comprise data formulas; its reliability, which determines the possibility to be monitored over time and interpreted; and its intrinsic limits, which constitute what cannot be measured with efficiency or measured at all.

When considering an indicator as a potential candidate for a given analysis, several key conditions must be taken into account for its validity, which are: the variables of statistical significance required for the computation and the frequency of calculation. Statistical significance ascertains whether any experiment's or analysis' outcome is the result of a specific relationship between determined factors or just the result of chance. The frequency of calculation has different interpretations, for instance, it can be considered as the interval of time which passes between two data collections utilized to obtain an indicator.

In addition, an indicator, to be efficient must respect a complex set of criteria. It must be: achievable, specific, measurable, clear, relevant, economic and monitorable. According to Eurostat[6] the following criteria must be satisfied: "logic, relevance, possibility of setting a target, frequency of data collection and possibility of estimating with precision".

Clearly, choosing the right indicator bearing on mind this precise set of rules is not always an easy task, in fact, a wrong assessment can lead to the

[6] Eurostat is a Directorate-General of the European Commission located in Luxemburg. It gathers and elaborates data of the members states of the European Union for statistical purposes. It seeks to provide an informative statistical service of elevate quality to the European Union with comparable data between countries and regions.

elimination of the right indicator which may ultimately impair the transparency of the results.

After having explained the general definition and rules which characterize a performance indicator, the analysis can move forward into describing with a more detailed approach what are the performance estimators and how they are employed by financial institutions.

With time banks have become more complex in terms of structure, networks and business planning; howbeit, when looking at performance measurement as a bank's capacity to generate sustainable profitability, performance indicators remain unchanged. In fact, parameters as efficiency, earnings, leverage and risk-taking can give an approximate fair estimation of how well a bank is performing; even though there exist many other indicators which can be utilized according to a bank's needs.

Moreover, commercial banks play a key role in the economic resource allocation of a country as well as in its economic growth by carrying out an intermediation function which can be sustainable only if they result to be profitable. A good financial performance generates positive outcomes which reward stakeholders for their investments, and in turn attracts new investors in the country improving its welfare. On the contrast, a poor banking performance can lead to potential instability in the economy as a whole by triggering failures in the banking system itself which may ultimately lead to financial crisis, as the one in 2007. [7]

A bank's performance determinants can be grouped in bank specific factors and macroeconomic factors. Bank specific factors influence a bank's performance from its core as they derive from internal managerial and financial decisions and include capital size, size of deposit liabilities, interest rate policy and labour productivity.

[7] The Global Financial Crisis of 2007 is recognized by the most important world economics' experts as the worst financial crisis since 1930, the year of Great Depression. Crisis' break-out can be attributable to the bursting of the United States housing bubbles and the sub-prime mortgage crisis.

Macroeconomic factors, instead, which also influence the performance of a bank are beyond its control as they are country-wide, and they comprise inflation, GDP, interest rates and other macroeconomic variables which can possibly affect the performance outcome of a bank.

For what concerns bank specific factors the ones which are of greater importance in the analysis of the banking system are the capital adequacy, the asset quality, the efficiency management and the liquidity management.

Capital adequacy measures the financial strength of a bank and it is one of those specific factors which determine its level of profitability. Capital fulfils many important roles, in fact, it is the main pillar of the financial sustainability of a bank as it funds its business activities and acts as a buffer in riskier operations. As a matter of fact, capital adequacy defines the inner strength of a bank and in particular its ability to withstand losses during financial crisis. With the introduction of the Basel Capital Accord which took full implementation by the end of 2006, an outline of the explicit procedures that regulate the minimum threshold of capital requirements taking into consideration market risk, operational risk and credit risk was established. [8]

Another bank specific variable which affects the profitability of a bank is asset quality. It is common knowledge that the main source of income of a bank derives from loans, in that sense loans can be considered as a bank's major asset whose quality determines its financial position. Loans which form a bank's portfolio can be categorized into performing and nonperforming[9]; evidently the level of nonperforming loans must be kept low to ensure an efficient portfolio management. This efficiency which reflects the performance of a bank can be highlighted by comparing nonperforming loans over total loans.

[8] The first Basel Accord which was set-up in 1988 required banks to hold their risky-assets as a percentage to their total assets to be less or equal to 8. In 2004, a revised framework, known as Basel II, was issued.

[9] Non-performing loans comprise those operations which cannot repay capital and interests owed to creditors any longer. Non-performing loans in the banking language are often referred to as deteriorated loans.

Also liquidity is closely connected to a bank's profitability. Liquidity stands for a bank's capacity to fulfil its obligations and moreover, it refers to those assets which can be converted to cash in short time. There exist many liquidity ratios to compute liquidity, such as the cash to deposit ratio which is used specifically for banks.

Lastly, how it has been stated before, also macroeconomic variables can directly or indirectly affect performance in the banking system; for instance, GDP, which is the determinant of a booming or slowing economy plays a key role. During a booming economy, demand for credit increases improving a bank's performance, while on contrary during a recession demand for credit decreases worsening its financial position.

2.3 Digging Deeper: Financial and Economic Indicators

For any audience, banks included, the most popular measure of financial performance is the return on equity (ROE). ROE measures and gives an estimate of how efficiently a company's shareholder's equity is employed to generate net income, i.e how much profit a company generates given the initial capital invested by the shareholders.

$$ROE = \frac{Net\ Income}{Average\ Total\ equity}$$

Moreover, ROE is determined by three factors:

First, the Financial leverage which increases the level of risk of a company and as a consequence can positively or negatively affect its return on equity. An adequate level of financial leverage positively affects ROE as it increase a

stock's volatility that in turn increases risk and thus returns. On the contrast, over-leveraging may put a company's position in danger because if the risk of the investments is greater than the expected return, its equity may decrease.

$$Financial\ Leverage = \frac{Assets}{Shareholders' Equity}$$

The Asset Turnover which is specific only to determined assets such as cash to sale, inventory to sales and fixed assets to sales denotes the success of a company in employing its assets for the purpose of generating sales revenue.

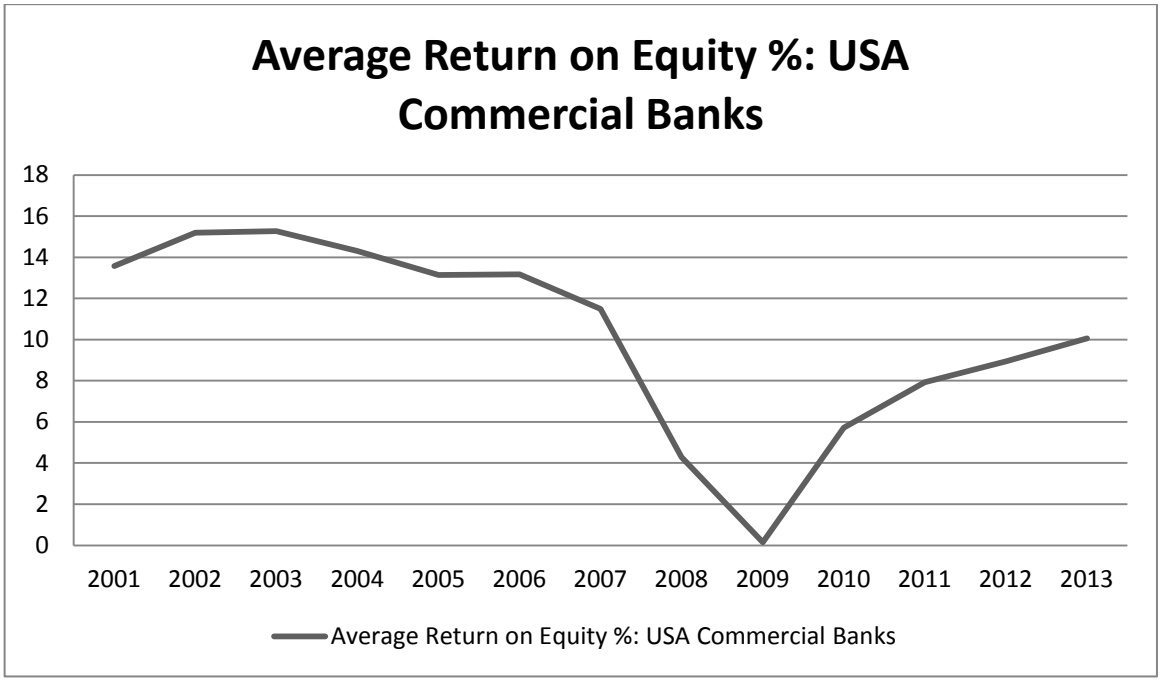
$$Asset\ Turnover\ = \frac{Sales}{Assets}$$

The Profit Margin which is an indicator of efficiency, measures the amount of profit accruing to a company from the sale of a product or service, and it is of primary importance as it reflects its pricing strategy and ability to control costs. As a matter of fact, companies who succeed in implementing a successful low-cost strategies attain higher profit margins.

$$Profit\ Margin = \frac{Net\ Income}{Sales}$$

The reason why ROE is so popular and widely used relies on the fact that it contributes as an accounting measure for the investments made by shareholders, and it also summaries the information contained both in the balance sheet and in the income statement. Figure 2.1 shows the average return on equity in % for the major USA commercial banks. Data for every year has been obtained by averaging each years' quarterly's data on ROE %.

Figure 2.1



Source: www.economagic.com: Time Series Page, 2013

Sometimes in more detailed performance and economic analysis it is not rare to see ROE being decomposed in each of its determinants, in what it is called the DuPont Model. ROE decomposition follows this general formula:

$$ROE = \frac{pre{-}tax\ profits}{operating\ income} \ x \ \frac{operating\ income}{net\ revenue} \ x \ \frac{net\ revenues}{assets} \ x \ \frac{assets}{equity}$$

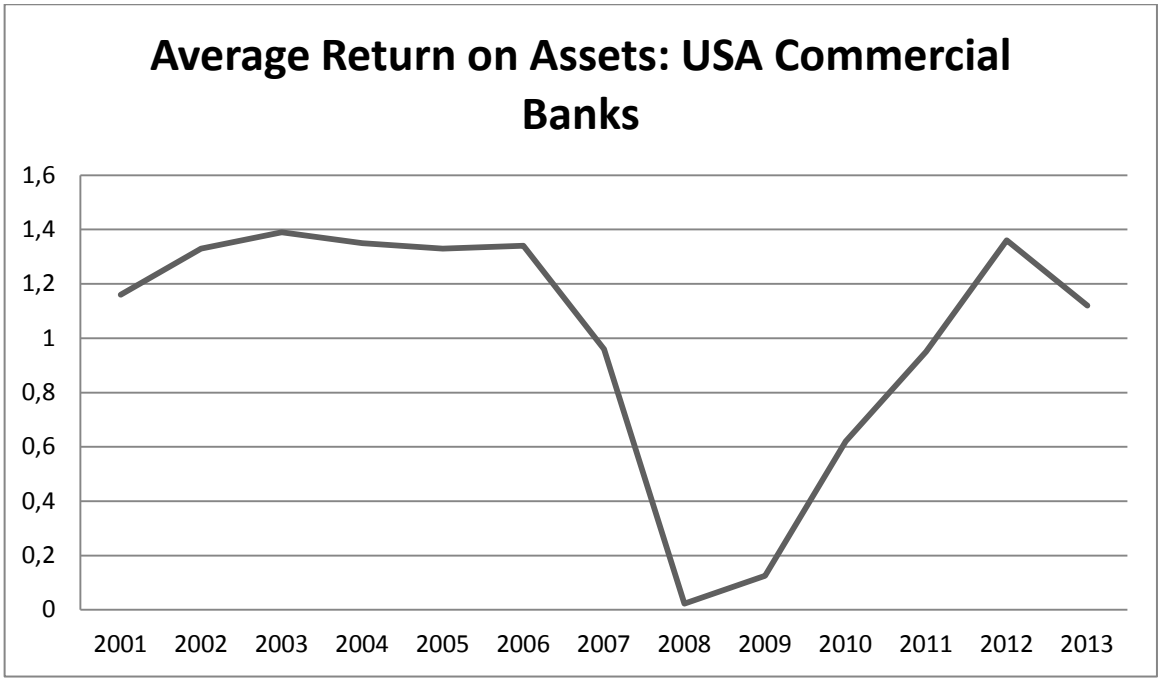
Along with ROE, also other traditional measures such as ROA (Return on Assets), the Cost-to-Income Ratio (C/I) and NIM (Net Interest Margin) which is mostly used to evaluate banks, are worth to mention.

The return on assets is obtained by multiplying the profit margin times the asset turnover, in that, ROA measures the return on each dollar invested in assets, that is, it gives an estimate of company's profitability relative to its total assets. Service-oriented industries, as the banking system, show a significantly higher ROA with respect to capital-intensive industries, but nonetheless a high ROA is preferred since is demonstrates that a company is efficient at managing its assets.

$$ROA = \frac{Net\ Income}{Average\ Total\ Assets}$$

It must be noted that ROA does not distinguish between capital raised from shareholders and capital raised from creditors and remains relatively unaffected by a company's choice of capital structure. ROE, on the contrast considers only equity capital. Figure 2.2 shows the average return on assets in percentage points for the major USA commercial banks. Like ROE, data for every year has been obtained by averaging each years' quarterly's data on ROA.

Figure 2.2



Source: www.economagic.com: Time Series Page, 2013

For what concerns the Net Interest Margin, it is defined as a performance measure which evaluates the success of a bank's or financial institution's investment decision relative to debts.

$$\text{NIM} = \frac{(\text{investments returns} - \text{Interest Expenses})}{\text{Average Earning Assets}}$$

Lastly, the cost-to-income ratio measures the change in costs relative to income, and it is configured as one the of the main key elements in order to evaluate a bank's financial performance. The lower the cost-to-income ratio is, the higher the efficiency. Changes in the ratio may represent a wake-up-call for the financial institution, because an increase in the cost-to-income ratio from the period t_0 to the following period t_1 would mean that costs are increasing at a higher rate with respect to income.

$$\text{Cost} - \text{to} - \text{Income Ratio: } \frac{\text{Operating Expenses}}{\text{Operating Revenues}}$$

Along with the aforementioned financial indicators there exist several others, which will be referred to as economic indicators of performance. In recent years banks which have proven to be successful have required their managers to run an accurate analysis in order to handle an intricate trade-off between growth, return and risk. This task has been made possible taking into consideration economic profit rather than the principles deriving from accounting earnings.

The Economic Value Added (EVA) which was first introduced by the Stern Stewart & Co, a consulting firm,[10] is certainly one of the most useful and widely used among the major financial institutions because as an economic indicator of performance, it is the one which gives a more realistic idea of the true economic profit of a financial institution. It is a financial performance measure which evaluates the quality of the value created (or destroyed) thanks to a specific allocation of resources and their management. EVA is

[10] Stern Stewart & Co which developed the Economic Value Added is a worldwide management consulting firm which was founded in 1982 in New York City. The company does have a sister company called Stern Stewart Capital Partners local in Singapore, whose main activities include: transactional advisor and corporate financer.

based on the principle that a company produces incremental value (EVA >0) only if the return on capital employed is greater than the cost of capital. In the opposite scenario (EVA<0) the company destroys value.

The economic value added, moreover, accounts for the entire cost of capital and cost of equity to measure a company's ability to generate an economic rate of return (ERR) greater than the cost of capital invested. An increase in EVA will be registered when: the rate of return on the existing activities grows (i.e NOPAT grows without investing other resources), new resources are being invested on the venture of new economically convenient projects (i.e new resources are invested until the return on capital is higher than costs), and the company does not invest in those activities whose return is not convenient (i.e disinvesting until the income on which a company is giving up on is compensated by the savings deriving from the cost of capital). Howbeit, as it will be shown later in the analysis, EVA is not considered by banks' analysts as a reliable performance indicator due to its complexity and difficulty in computation.

$$\text{EVA} = \text{Net Operating Profit After Taxes} - (\text{WACC x invested capital})$$

Going deeper, from the theoretical definition of the CAPM Capital Asset Pricing Model (CAPM)

$$E[r_i] = r_f + \beta_{i,m}(E[r_m - r_f)]$$

where:

$E[r_i]$: is the expected return on an asset

r_f: is the risk-free rate

$\beta_{i,m}$: is the beta of the security which is a measure of risk

It possible to calculate the risk-adjusted return on capital (RAROC).

RAROC is an evaluation performance tool which was utilized by Bankers Trust[11] in the 1980s as an adjustment to the return on capital (ROC) and successively accepted by many commercial banks. It allows banks to allocate their capital according to their individual business risk. RAROC can be computed ex-post on the basis of the realized income in order to measure the performances deriving from the single business units or it can also be computed ex-ante referring to the expected income in order to decide which business units to expand and which to reduce; in that scenario the expected RAROC for the different business units is compared to a threshold value decided by the bank.

$$\text{RAROC} = \frac{\text{Revenues} - \text{Expenses} - \text{Expected Losses} + \text{Income from Capital}}{\text{Capital}}$$

Finally, the last set of performance indicators comprises the so called Market-based measures of performance which evaluates a company's market value relative to its estimated economic value.

The Price-Earnings ratio (P/E) is a performance measurement ratio which relates the current share price of a company's to its pre-share earnings. When the price-earnings ratio is high, investors are expecting an increase in earnings in the following period, while a lower price-earnings ratio stands for the opposite.

The Price-to-book value (P/B), instead, compares the market price of the shares of a company to its book value of equity. In general, the P/B ratio is a method adopted to look for stocks which have been low-priced and neglected from the market. A low Price-to-book may be an indicator of two possible situations: either a company's return on assets is really low or the market deems the assets' value to be overstated.

[11] Bankers Trust was an historic American banking organization which became leader in the emerging derivatives business. It soon gained a bad reputation for undertaking risky business activities. Some of its major corporate clients such as P&G and Gilbson Greetings suffered of enormous losses on 1994 because of complex derivative transactions which proved to be unpredictable even to their most expert risk managers.

The Credit Default Swap (CDS), which is the last indicator, is adopted to control a company's exposure to risk, in that, it is similar to an insurance contract because it covers one party against specific credit events.

Both the price-to-book value and the price-earnings ratio configure themselves as fundamental tools to asses a bank's market performance, however, because of their close correlation with ROE they tend to become also indicators of economic performance. Bank analysts prefer the price-to-book value over the price-earnings ratio for clear reasons. The price-earnings ratio fails to predict within reasonable time the risk arising from potential financial breakdowns, and it does not differentiate between banks' business models. Moreover, when financial performance tends to zero, the price-earnings ratio becomes meaningless, because it can increase sharply without economic sense.

For these reasons, bank analysts have opted for the price-to-book ratio, especially during periods of financial crisis to evaluate a bank's ability to face losses and impairment on intangible assets as goodwill.

2.4 Preferred Performance Indicators in the Banking System

As mentioned in the previous paragraph, financial institutions and banks in particular have a multitude of tools at their disposal to assess their own performance, although, only some of them are adopted to serve their purpose depending on the type of company. Not only that, in the banking system itself there exist controversies on the proper indicators to be utilized for an efficient and effective analysis. As it will be shown later, bank analysts, bank consultants and rating agencies analysts apply different methods in their performance analysis.

Major bank analysts who are more familiar with traditional indicators of revenues and credit risk recognize capital adequacy, asset quality and efficiency as the main drivers to assess a bank's performance taking into account also detailed analyses of revenues and costs. On the contrast, those indicators which are deemed to be less reliable in terms of information provided, such as indicators of credit risk relative to the market, liquidity ratios, and efficiency indicators related to capital and credit default swaps spreads are not considered useful and thus disregarded.

According to bank analysts, market-based indicators mirror the value of other indicators which have already been incorporated into a performance's evaluation, so it would be meaningless to add them. Bank analysts have proven to be important on the address of specific issues in the performance evaluation of a bank as they recognized the sustainability of bank revenues whose analysis comprises the share of non-recurring revenues, the evolution of net interests and revenues volatility . Moreover, they attempted to introduce off-balance sheet activities into the performance measurement analysis which has been strongly criticized by other analysts who have considered these off-balance sheet activities impossible to be incorporated into the analysis due to their different methods of measurement.

Bank consultants, instead, do not share the same idea of bank analysts as they tend to step back from the traditional and most popular indicators such as ROE. Moreover, bank consultants place much more emphasis on efficiency indicators, risk indicators and market-based indicators which include bond spreads and credit default swaps; however, they disregard asset quality, revenue and capital adequacy and liquidity indicators. In addition, in the assessment of a bank's revenues sustainability consultants focus on the identification of either the share of core banking income or the share of non-recurring revenues.

For what concerns rating agency analysts, in terms of efficiency indicators, they tend to favour the C/I ratio just like consultants and bank analysts; furthermore, sustainability of income is inferred from sources such as the net

interest margin. With respect to banks analysts and consultants, rating agency analysts are the ones who are the most sensitive to risk adjustment measures of a bank's capacity to absorb shocks, in that, it is plausible to assume that they give extreme relevance to performance indicators such as the credit default swaps (CDS) and the risk-weighted assets (RWA) but most importantly to the coverage ratio which reflects the shock absorption capacity of a bank. Moreover, as well as banks analysts, also the rating agencies take into consideration off-balance sheet activities trying to implement them though qualitative assessments.

Despite the fact that ROE has been considered and it is still considered the most popular and the most efficient performance indicator by banks and financial institutions in general, it has been shown how the answer is far from being univocal. The array of performance indicators is really extensive and it used in a heterogeneous way among the above mentioned banks' researches: bank analysts, consultants and rating agency analysts. However, it is not a hard task to notice how in this heterogeneity of indicators some of them result to be the most frequently used across all the parties, and how others fall into the shadows due to their uninformative nature. Indicators based on efficiency such as cost-to-income ratio and return on the risk weighted assets fall into the first category, whilst the market-based indicators such as EVA and RAROC due to their complexity and difficulty of application are disregarded in order to favour an analysis which results to be more informative, reliable and easier to compute. What has been said since now will be summed up on Table 1.4, which shows each banks analysts' preferences on indicators ranked by category.

2.5 Beyond the Traditional Performance Indicators: the Business Model and Corporate Governance

It is clear by now how many key factors there exist in order to assess a bank's performance and how despite their big array, analysts tend to have different preferences on their use. To have a complete framework and to fully understand how banks perform during stressed market conditions and financial shocks which are the result of their business strategies, it is useful to go beyond and take into account other factors which may seem at first negligible. These factors are the business model and corporate governance.

A business model, how it has been already mentioned in Chapter 1 represents the set of organizational and strategic solutions through which a company gains a competitive advantage. In other words: the business model describes the logic through which a company creates distributes and captures value (*Alexander Osterwalder*). Success or failure of a business depend upon a company's ability to create value for its customers through an accurate analysis of keys factors such as clients, proposed value, channels of distributions, partners, revenues, and cost structure.

Business models which lead to long-term efficient strategies and thus profitability represent one of those factors which make the difference between success and failure, therefore, it is necessary to analyse in the specific, which are the key specific business elements that ultimately characterize a bank's efficiency and sustainable structure.

One of most the important features which constitute a business model's analysis is the possibility to evaluate whether a bank is able to tolerate shocks and maintain its financial position stable by monitoring key business drivers such as loans and deposit margins. For what regards banks' business models, it has been found that larger banks gain a significant amount of their income under the form of trading income and fees, which are non-interest income. Moreover, large banks tend to be more active on the capital markets as they prefer to detain a small part of their assets in the form of loans rather

than securities. A bank's size certainly matters when considering the effect that it produces on its performance under a business model perspective. Being too large may represent a double-cutting edge, because on the one side large size may render a bank too big to fail by decreasing its funding costs, but on the other it might make it too big to be saved, given a possible financial shock and tight public finances. It is easy to point out, then, how the size of a bank matters to shareholder in bigger countries since it can potentially influence performance and thus generating more benefits.[12]

A first step in the development of a sensitivity analysis of a bank's profitability taking into account the different business drivers is to consider the different sources of revenues, and in particular the ones which arise from commissions, interest rate bearing activities, trading and investment. The reason behind this consideration resides in the fact that nowadays the banking system is driven and characterized by many businesses lines which bear diverse risk factors, with respect to the past decades where it could thought of as a mono-business activity.

The former banking system's performance which was constituted by just deposits and loans could be easily assessed by analysing its main business line, however, today, due to the emerging complexity in the system, it is necessary to evaluate the tight net of business lines through a more sophisticated matrix-type analysis. Each business line must be analysed independently to eventually evaluate their added contribution in the overall performance. Moreover, In order to have a detailed and reliable analysis and thus understanding how a business is run and which are its main drivers, it is necessary to meet many important conditions.

[12] See: Hughes, J.P.,Lang, Mester, L.J., Moon and Pagano, "Do bankers Sacrifice Value to build Empires? Managerial incentives, industry consolidation and financial performance", 2003.

The first aspect to take into consideration is data. For any kind of analysis the first obstacle posed to the achievement of a solid result is research and use of the right set of data. Data must be available and comparable, in fact, those sections of the balance sheet such as trading, investment banking and asset management which result to be hardly comparable and detailed can lead to a poor business' assessment.

Along with data, factors such as off-balance sheet activities which have already been discussed previously in our analysis, and diversification represent other key elements which allow to evaluate the determinants of a business model's performance. Off-balance sheet activities which comprise those assets, debts or financing operations not included in the balance sheet, could lead to an underestimation of the risk and thus to an over-estimation of the risk-adjusted profitability if not taken into consideration. For what concerns diversification it is important to highlight its importance given its high correlation with a business' performance. Its implementation can lead to an improvement in the economies of scale, and to a decrease in earnings volatility by spanning many activities in different regions.

At the beginning of the chapter it has been mentioned how besides the business model also corporate governance plays its key role in the assessment of a bank's performance. Corporate governance refers to the set of rules, practices, and processes which discipline the management of the company itself, and furthermore it also comprises many other different aspects of its life. It can describe how a company is being controlled, the general set of guides lines, the investment processes, the issues arising from the separation between ownership and management [13], and the balance of power at senior managerial levels.

In corporate governance for banks, compensation incentives represent a useful to assess a bank's internal performance over a given period of time. Certain

[13] According to the Fisher's Separation Principle it is possible to separate a firm's investment decisions from its financial decisions. More specifically, a firm maximizes its revenues regardless of the owners' single preferences.

banks' business models allow for the implementation of bonuses (compensation incentives) to reward those which perform in a proficient way; thus, analysing the internal incentive or bonus schemes of a bank during a determined period of time can provide a more detailed framework for the assessment of its performance. Even though compensation bonuses can make good indicators they have led to a risky attitude in the banking system due to being linked to risky market activities which sought to maximize the short-term profits while completely disregarding the long-period outcomes, which eventually would impair the bank.

Appendix Table 1

Table 1.1

Financial Statement: Balance Sheet

Assets	Liabilities and Shareholders' Equity
Fixed Assets – (Non-Current Assets) o **Tangible** o **Intangible** o **Financial**	**Equity** o **Shareholders' Equity**
Current Assets o **Liquidity** o **Inventory** o **Trade Receivables**	**Non-Current Liabilities** o **Long-term Financial Debt** o **Long-term Trade Payables** **Current Liabilities** o **Short-term Financial Debt** o **Short-term Trade Payables**

Source: John Wild, Financial Accounting Fundamentals, (2009)

Table 1.2

Financial Statement: Income Statement

INCOME STATEMENT
+ Sales
- Operating Costs
= EBIT (Earnings before interests and taxes)
- Net Financial Expenses/Revenues
= EBT (Earnings before taxes)
- Income Taxes
= Net Profit / Loss

Source: John Wild, Financial Accounting Fundamentals, (2009)

Table 1.3

Financial Statement: Cash Flow Statement

Net Income **+ Depreciation** **+/- Loss/Gain on Disposal** **FLOW OF POTENTIAL CASH FLOW** **- Change (+/-) in Current Assets** **+ Change (+/-) in Current Liabilities**
A) CASH FLOW FROM OPERATING ACTIVITIES **+ Disinvestments** **- Investments** **+ Gain on Disposal** **- Losses on Disposal**
B) CASH FLOW FROM INVESTING ACTIVITIES **+ Issue on Equity Capital** **+ Long Term Financing** **- Distribution of Dividends** **- Repayment of Debts** **- Redistribution of Equity Capital**
C) CASH FLOW FROM FINANCING **NET CASH FLOW = A + B + C**

Source: John Wild, Financial Accounting Fundamentals, (2009)

Table 1.4

Preferred Performance indicators in the banking system by ranking

Category of indicators	Type	Bank analysts	Consultants	Rating agencies
Revenue and cost	**Net interest income metrics**	1		
	- Including after the deduction of impairment charges		1	
	- Net interest income/ interest bearing assets			1
	Share of key income sources	2		
	- Share of trading income			2
Efficiency	**Return on tangible equity**	1		3
	- Cost-to-income	2		1
	- Cost-to-income including impairments		2	
	- Return on risk-weighted assets		1	2
	- Return on equity (ROE)	3		
	- Return on assets (ROA)		3	
Market based	**Price-to-tangible equity (P/TE)**	1 2	1 2	2
	- Credit Default Swap (CDS)	3		
	- Price to earnings (P/E)			1
	- Senior debt spread		3	
	- Distance to default (DD)			
	- Impairment charges as percentage of total loans	1 3	1 2	3 1
	Coverage ratio	2		2
	-Non performing loans (NPLs) ratio		3	4
	-Net NPLs/regulatory own funds			

Source: www.ecb.europa.eu, "Beyond ROE – How To Measure Bank Performance", September 2010

Chapter 3: Performance Analysis of the Online Banking System.

3.1 An Introduction

The internet has offered and still offers important growth and performance-improving opportunities to many companies, which are achieved thanks to the possibility to establish solid commercial relations with their clients. Restricting the field of vision to financial institutions, internet can represent a scenario rich of opportunities and economic potentials to banks, and specifically for what concerns the product innovation, the distributive process and the market.

Similarly to what happened to other sectors, also banks are modifying the way in which they relate to the market in order to take on a protagonist role in the ever changing transformational process of the external and internal environment. However, a bank's decision to embrace this renewing process must be supported by a justifiable economic return, thus, the comprehension of the link between internet banking and its performance becomes an empirical issue. It is at this point that one starts wondering if the results in terms of profits will be worth the effort, i.e whether online banking's profitability is rewarding or not with respect to traditional banking.

A bank's performance determinants which have already been thoroughly discussed in the previous chapter are of fundamental importance to evaluate its profitability, but for what concerns the specific case of online banking it is necessary to find out also what are the micro and macro components useful to carry out an efficient analysis aimed at revealing the advantages or disadvantages of this innovative process.

The decision of a bank to undertake a particular strategy is doubtlessly determined by its comparative advantage in the cost structure and in the revenue model. Moreover, it is easily intuitive to understand how a bank's strategy would be mostly influenced by the external economic environment

and by the types of clients to be targeted. Countries in which the development of ICT infrastructures is more consolidated with respect to others, which may still lag behind, certainly offer the best opportunities for an online strategy. Along with that follows the cultural level of the population, because reasonably, the higher the knowledge level of the clients about the web and its advantages, the higher the profitable opportunities to banks.

Online banking performance has been analysed by many experts who have tried to highlight its most significant characteristics, thus, to better understand its dynamics, for the purpose of this analysis it would be useful to examine the performance of the most relevant countries in terms of economic power such as Europe and United Stated, and draw general and comparative conclusions at the end. The analysis will be mainly focused on pre-crisis banks, as post-crisis banks and more precisely those banks which have few years of life, the so called "de-novo banks" follow a different structural pattern.

3.2 Online Banking Performance Analysis in Europe

The overall European banking system is constituted by a heterogeneous environment in which banks decide to develop their specific business strategy according to the economic goal they wish to pursue. The majority of the banking groups hold both traditional banks[14] and pure internet[15] banks so that they are able to take advantage of both business models. For what concerns the concentration of stand-alone internet banks it can be argued that it is rather pour compared to the other existing types of banks; while pure-internet banks have reported a greater increment in number. This is because even banks which at the beginning of their life have started with a traditional banking model have undergone a transformational phase which expanded

[14] Banks whose main financial services are held in physical branches. Face-to-face contact between the service provider and the clients.

[15] Banks which allow clients to perform financial transactions via the Web without the support of physical branches and their employers.

their channels of communications, adding tools such as telephone banking and financial advising, thus resulting in a sort of mixed model.

It can be summed up that in Europe stand-alone internet banks are really uncommon, that the majority of pure-internet banks are owned by big banking groups and that pure-internet internet banks plus mixed banks account roughly for about 70% of all banking activities in Europe.

As the main pure-internet banks are located in the UK, Italy Spain and Finland, data from these countries will be used to analyse the banking environment and at a later stage to draw conclusions.[16] European pure-internet banks belonging to the above mentioned countries are reported in Table 2.1(See Appendix Table 2 pg.50) Both UK and Italy own the largest number of pure internet banks. Moreover, Table 2.1 shows all the mixed banks for each country in order to proceed with a comparative analysis.

The performance indicators used to evaluate this banking system are ROAE, ROAA and the cost-to-income ratio. ROAE is an adjusted version of ROE which can provide a more precise picture of a bank's profitability because it takes into account gross net income instead of net income which overcomes problems of different taxation among countries. ROAA is often used by financial institutions and banks to assess their performance by measuring their capacity to generate profits from their assets. The cost-to-income ratio which is fundamental to evaluate a bank's performance shows its costs in relation to its income.

Table 2.2 reports ROAE, ROAA and C/I data both for pure-internet banks and mixed banks, from which it possible to highlight the first results. Looking at data it is immediate to notice how there is no substantial difference between mixed banks' and internet banks' ROAE and ROAA. Moreover, they both report positive results with UK being the only exception for what regards internet banks;[17] in fact, as reported in the table, UK's ROAA is the only

[16] Source: Eurostat, 2008

[17] The reason behind UK's poor results is to be found in its cost structure, in fact, it incurs in higher costs with respect to the other countries.

negative indicator whilst its ROAE, instead is half of that of mixed banks. Leaving British banks aside, for what regards ROAA internet banking performs better with respect to mixed banks both in Finland and Italy, and again in Finland and in Spain for what concerns ROAE.

When looking at the cost-to-income ratio there seems to be no particular anomalies except for UK, whose C/I ratio for internet banks is twice as that of its mixed banks[18] For Italy, Spain and Finland the difference is not statistically significant. Moreover, it can be pointed out how Finland's C/I for internet banks is lower with respect to that of mixed banks, highlighting a better efficiency in terms of costs/revenues for pure-internet banks. These first findings place Finland's pure-internet banking system as the best performing among all countries taken in consideration.

The reason of these results finds its roots in the market structure which characterizes and shapes European countries in different ways, but that would only be the tip of the iceberg. Finland's market structure has remained steady during the years, since it has not undergone any major transformation in the banking system. More specifically, the number of banks and branches has not decreased in contrast to what happened in the rest of Europe; in fact, Italy, UK and Spain have recorded a decline in credit institutions throughout the years and an increase in the number of merges and acquisitions, which has continually shaped the external competitive environment.

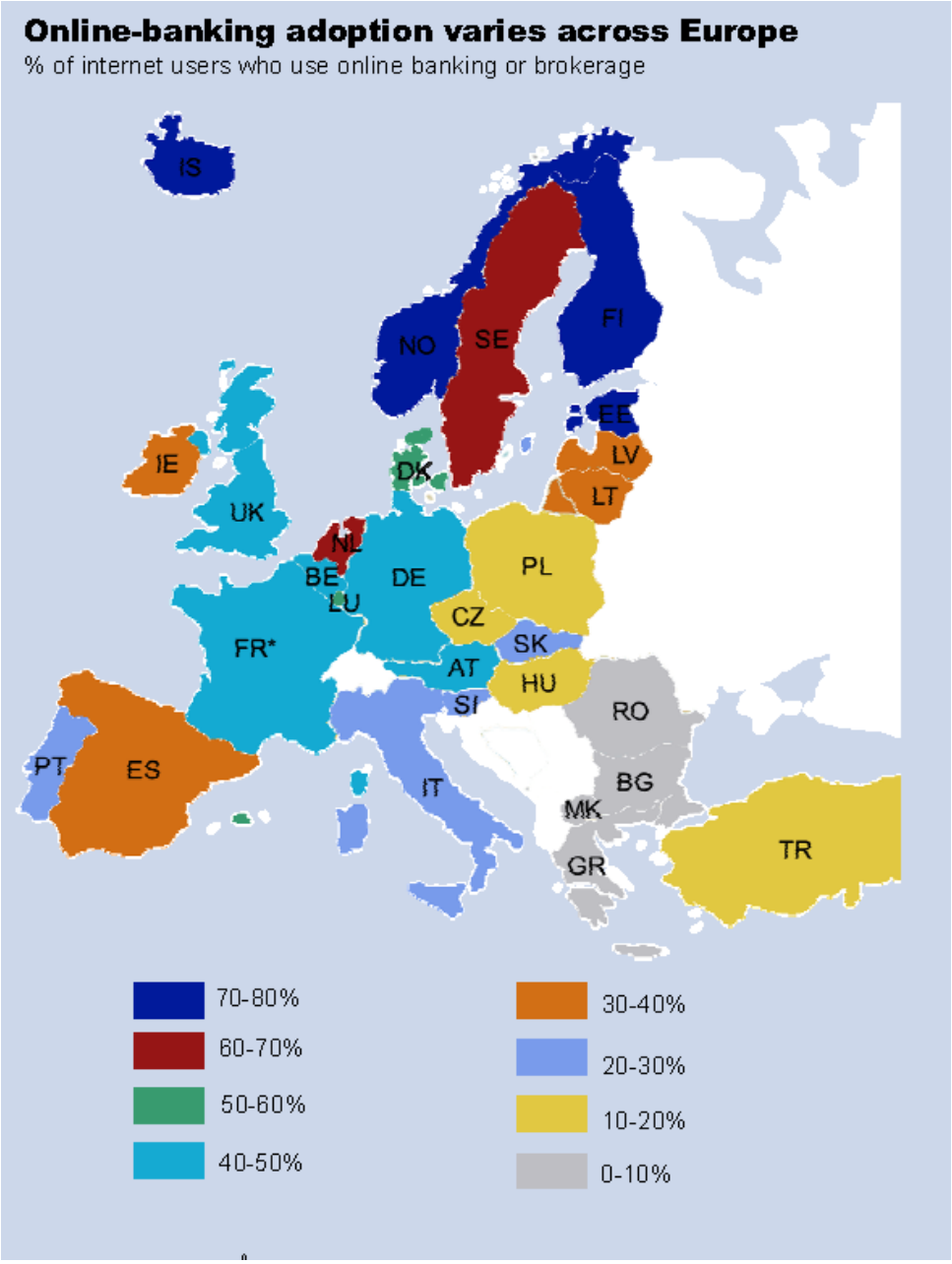
The overall European inclination towards the banking business model is that of despite the favourable conditions to innovate it tends to consider internet banking as an added value to the existing banks rather than establishing stand-alone or pure-internet banks. As it has been stated in the introduction of this chapter a bank's decision to venture as a stand-alone or pure-internet bank depends also on the level of technological capacity of the country in which it is situated, and on internet accessibility for its population.

[18] When the cost-to-income (C/I) is rises it means that the financial institution is facing high costs.

As aforementioned, furthermore, the European online banking system is quite fragmented, in fact, there is a distinct difference in its adoption between North Europe and South Europe. North Europe detains the highest rate adoption, which how it will be shown later can be explained by different factors such as GDP per capita, R&D investments as a percentage of GDP, and the diffusion of IT technologies. Figure 3.1 Shows how the adoption of internet banking varies across Europe with a steady decline from North Europe to South Europe

The general environment portrayed by figure 3.1 can be supported by the findings highlighted in Table 2.3 and Table 2.4. Countries which are more technologically advanced and which allocate a remarkable share of their resources on education and R&D are those which create a fertile field for innovation and progress. Looking at R&D expenses from Table 2.3 it is possible to point out those factors which do influence the rate of success of the adoption of an online business model. Countries such as Italy and Spain whose expenditures in information technologies as a percentage of GDP share demonstrates to be lower with respect to their northern European counterparts like Finland have proven to report worse results in terms of efficiency. Moreover, Table 2.4 describes a clear situation in which internet accessibility is more widespread in Finland than in the rest of Europe, especially in the South where it is less utilised for banking transactions as consequence for the lack of information both from the clients' and the banks' side.

Figure 3.1



Source: www.dbresearch.ru, What we learn from the differences in Europe, February 2006

Lastly, for a performance evaluation to be effective and to get a complete idea of the European scenario, revenues and expenses must be analysed. For what concerns Internet banks the main obstacle is represented by non-interest expenses, as it is easy to assume and verify that online banks have to face

higher front-up costs relative to IT investments and the acquisition of skilled personnel. In general online banks report lower labour costs with respect to standard banks as the latter require a greater labour force in terms of numbers as they have to cover all the physical branches. However, as online banks grow in size the need to acquire a more highly skilled labour force to run their business might potentially bring about greater costs. It must be said, though, that the higher overheads associated to IT, personnel management, start-up costs and marketing can be mitigated, as just a little reduction in these expenses can enhance performance at an increasing rate. Moreover, in the long run IT investments made by online banks can be recovered with the help of the internet by distributing costs over the clients.

For what concerns revenues, as it will be shown later in the US case, the main source is represented by non-interest income to net operating revenue[19] which is found to be positive and significantly related to performance. This result can be justified by the fact that online banks operate mostly with deposit-accounts rather than with other financial activities such as loans and mortgages which are more specific to standard banks. Because of that, the higher share of revenues is generated by deposit-based products[20] and other operating income.

3.3 Online banking performance in the United States

In the United States as in the European Union, the banking system is characterized by a heterogeneous environment in which many business strategies coexist. At the end of 2000 internet banking services were offered only by a limited number of banks, but with the development of IT technologies and internet infrastructures, bigger banking companies have started to implement the online banking business model in their strategies. Figure 3.2 shows how the adoption of the internet banking has increased

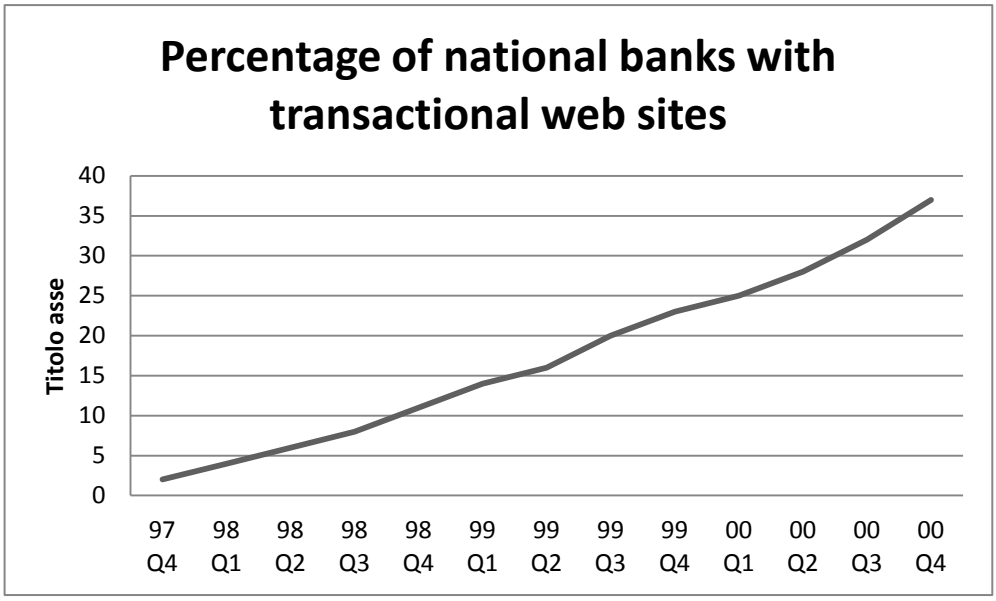
[19] Non-interest income to net operating revenue provides one of the best estimates of an online bank's capacity to generate revenues.

[20] Deposit products are services offered from the bank to the clients upon account deposit.

exponentially from 1997 Q4 to 2000 Q4, confirming banks' willingness to broaden their horizons in terms of profitable opportunities.

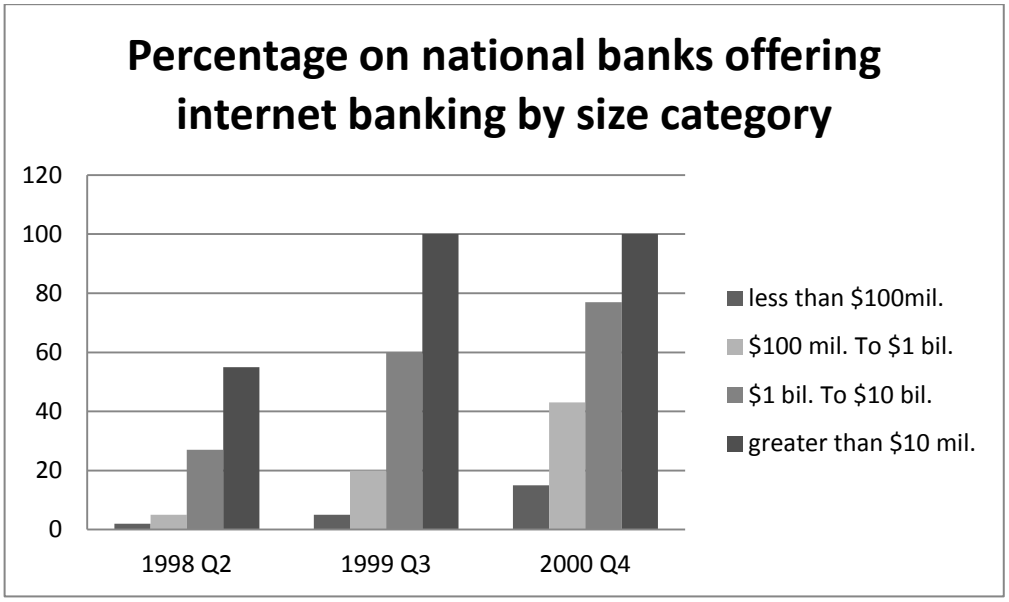
North American banks have thus started forecasting the potential benefits arising from the internet banking at the beginning of 2000. However, it must be noted that not all banks had the possibility to start venturing in this new emerging field; in fact, the majority of banks offering web transactions were and still are large sized banks. One of the reasons behind this trend may be explained by the high start-up costs required to undertake an internet banking service, thus, small banks whose capital was worth only $100 Million in assets found the benefits deriving from the online banking being off-set by the start-up costs. Moreover, large sized banks seem to perform better in terms of ROE and non-internet expenses relative to net operating revenue, and furthermore seem to rely more on credit card loans rather than deposits relative to purchase funds. *Furst, Lang and Noelle (2000)*. Figure 3.3 shows how the adoption of web banks is influenced by bank size and its capital.

Figure 3.2



Source: http://www.occ.gov, Internet Banking in USA, 2003

Figure 3.3



Source: http://www.occ.gov, Internet Banking in USA 2003

In order to undertake a deeper analysis in the North American economic environment, the attention will be focused on Tenth Federal Reserve District which reflects the general trend of the whole country; again, the banks taken into consideration are pure-internet banks and not stand-alone internet banks, as the number of stand-alone internet banks like in Europe is too low to make an efficient comparative analysis.

In the Tenth Federal District banks can be grouped into four main groups: large regional banks, regional banks, community banks and large community banks. Community banks comprise independent banks and savings institutions whose total organizational assets holdings are less than $1 billion; large community banks comprise, instead, those financial institutions whose total organizational assets holdings are less or equal than $1 billion; regional banks are depositary institutions bigger than community and large community banks whose total holdings are greater than 1$ billion; lastly, large regional banks possess the same characteristics as the standard regional

banks except for that they hold more than $ 150 million in bank assets with respect to regional banks which hold less than $ 150 million in bank assets.

This categorization has to be made necessary because bank size and other relevant factors, as it has been discussed before play their key role in the determination of a bank's performance. The sample size of data utilized for this analyses is sufficiently big to generate results which reflect the trends of the entire country, but understandably slight differences may exist from a country to another. Looking at Table 2.5 the first thing to be noticed is how the 201 banks who have adopted an online business strategy record $649.9 million worth in assets versus the $81.2 million of the 1390 banks who decided to maintain a standard model. Moreover, as the size of the banks increases from community bank to large regional bank it is important to highlight how the implementation of the online business strategy seem to follow an incremental tendency in the size-performance relation; the larger the bank size the higher the profitability deriving from the opportunities offered by web accessibility.

Bank size doubtlessly gives a boost to profitability but it is not the only driver. When taking into consideration the European case is has been shown how market structure and demographical factors were also important determinants. USA is not an exception.

For what concerns demographical aspects most of the large community banks and large regional banks seem to provide their internet banking services in urban area rather than non-urban; also community banks seem to adopt the same strategy except for the fact that they do not achieve the same results. The choice to concentrate most of the internet activities in the urban area is determined, presumably, by the degree of internet accessibility and the cultural level of the population.

As a consequence, banks which offer online services have a highly educated clientele with respect to those banks which do not provide it. Interestingly, moreover, the age of the people who avail themselves of internet banking,

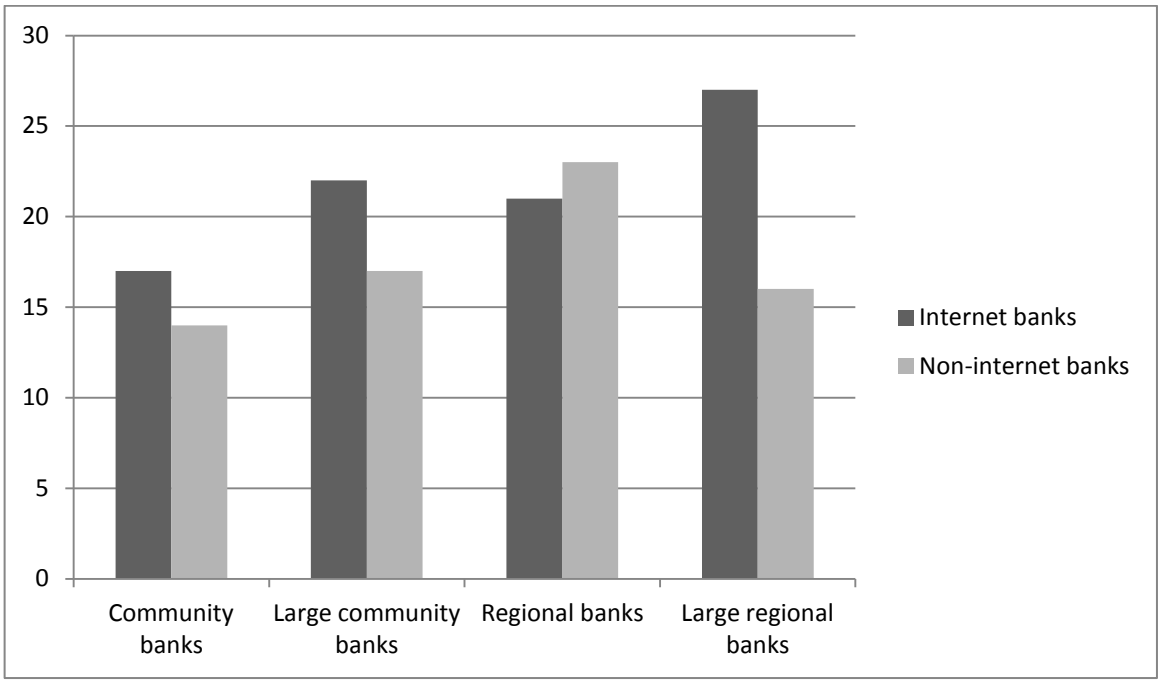
which ranges from 18 to 64 records a higher percentage instead of those who are still bound to traditional banking. Younger generations which are more familiar with IT technologies tend to choose the services provided by internet banks at a higher rate and tend to stay loyal.

In addition, what has to be considered in order to evaluate the effect produced on performance by the implementation of this business strategy is both expenses and profitability. Apart from the higher start-up costs how it has been mentioned before, online banks seem to report higher total non-interest expenses relative to net operating revenues with respect to standard banks. Other non-interest expenses which report a statistically significance between the two models are accountable to the front-up expenses that an online bank has to incur in to run its business.

Non-interest income relative to bank size are shown in figure 3.4. Most of these expenses can comprise web accessibility, software development, anti-fraud systems, research and development, advertising and training; these expenses are reported in Table 3.6. What gets the attention once again is how expenses seem to be dependent from the bank size.

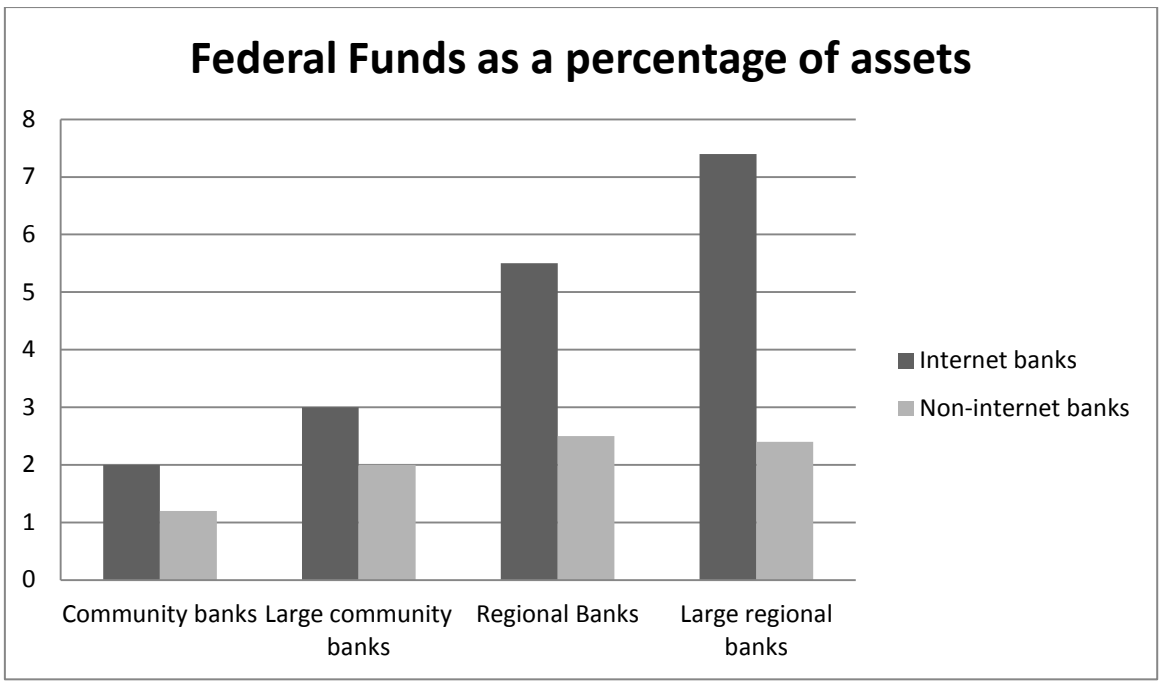
Even if the internet banking system seems to report higher expenses, specifically non-internet expenses, this does not necessarily mean that it would incur in less profitability and as a consequence lower performance trends. Higher start-up costs and those costs relative to the innovation process may lead to greater achievements in the long run; furthermore, as banks get used to the new environment and get to know its mechanisms, with time and experience they are able to reduce costs and gain a competitive advantage. Despite the greater expenses, the reason behind online banks' apparent success can be explained by their business strategies. Internet banks seem to undertake atypical strategies. First, they tend to participate more aggressively in the Federal funds market and rely more on non-interest income, which is shown in Figure 3.5. The difference in non-interest income between large sized online banks and large sized standard banks has proven to be statistically significant.

Figure 3.4



Source: www.ideas.repec.com, "How has the adoption of internet banking affected performance and risks in banks?"

Figure 3.5



Source: www.ideas.repec.com, "How has the adoption of internet banking affected performance and risks in banks?"

Like the analysis in the European context, financial performance measures such as ROAA and ROAE help depicting a more clear and accurate picture. Data collection on ROAA and ROAE is shown in Table 2.6. For what concerns ROAA, standard banks seem to report higher numbers, except for large community banks; however, the difference in ROAA between standard and online banks is not significant, 0.625 percentage points on average. Regarding ROE, instead, all online banks independently from size seem to perform efficiently even if large regional banks prove to report higher returns. The difference in return on average equity between online and standard banks is on average 2.45, however it is not statistically significant.

Lastly, internet banking, which requires high investments on IT infrastructures and experience in a field that is subject to continuous changes both in the internal and external environment, does not seem to be a riskier activity with respect to standard banking. As a matter of fact, the loan-to-asset ratio[21] which is one of the main risk components for a bank does not report statically significant differences between the two models. Table 2.7 shows data collected on risk indicators.

[21] One of the most important statistics to assess a bank's liquidity.

Conclusions

The revolution of Web 2.0 and IT infrastructures has changed and shaped the entire global economy bringing a new light of improvement and innovation in the way companies run their business. Retailers, industries, stores have learned how the implementation of the Internet in their activities can foster and enhance their performances, and how it is able to provide them with an edge over competitors. Over the years, also the banking system has been affected by this new wave of innovation which enabled it, with experience, to capture the potential value deriving from its use and to grow faster, depending on the rate of its adoption. This important structural change has been embraced and integrated along with the existing business models by most of the banking groups, especially the major ones which report a rate of adoption as high as 80-90% in the most developed countries in terms of IT Infrastructures and R&D investments.

The resulting general environment has proven to be quite heterogeneous where different banks have adopted the online business model according to their needs and financial possibilities. Major banking groups are the ones which detain the highest rate of adoption, whilst some other minor bank allow their clients to carry out only a few basic online transactions. Traditional banks whose structure is entirely physical and provide clients with services such as loans and mortgages are still an important reality, whereas stand-alone internet banks which do not include any physical branches nor are related to any traditional banking group are quite rare.

The motive of this analysis was to study and evaluate the performance of the online banking system with respect to the traditional banking system by comparing the most notorious and indicated performance measures to banks, and by examining the market and the socio-demographical variables which resulted to be determinant in order to draw general conclusions. The countries taken into consideration are Europe and North America whose distinct analyses have led to a broader comprehension of this emerging phenomena.

The European analysis has highlighted a clear difference in the adoption rate of the online business model between North Europe and South Europe by pointing out how important IT infrastructures and R&D investments are in order to provide a competitive service, and how they positively affect a bank's performance. Other macroeconomic factors like Internet accessibility and its use by the country's population certainly play their role. Countries such as Finland, Denmark, Sweden, and Norway register an average of 80% of individuals aged 16 to 74 who use the Internet for online banking activities, while on the contrast southern countries such as Italy, Spain, France and UK report a rough 35%.[22]

For what concerns both ROAA and ROAE there is no significant difference with respect to standard banks; the cost-to-income ratio (C/I) follows the same pattern with Finland as an exception. In terms of costs, in Europe, but also in the Unites States, internet banks face high non-interest expenses like start-up costs, costs relative to IT implementation and other overheads; on the contrast the costs of labour and personnel management are in general lower. On the revenues side, instead, online banks do not seem to be endowed with particularly profitable activities, as they mainly focus on bank deposits. Thus, clients who are looking for different products, often turn to traditional banks.

The North American situation seems to be rather clear, although there are no strong evidences that support one of the two sides. Internet banking which involves the implementation of IT technologies and web 2.0 in a bank's business strategy has spread throughout the years at an increasing rate, being adopted both by small and large sized banks proving to be more efficient for the latter. What has primarily emerged from this case is how bank size can significantly determine profitability and performance. Large banks with enormous capital resources are able to absorb the huge costs deriving from the start-up costs of the online banking. The fact that internet banking has been adopted mostly by big companies demonstrates that it is not as profitable as it may initially seem.

[22] Source: Eurostat, 2012

Despite the higher start-up costs or more generally non-interest expenses, online banks in the North American regions have overcome this issue by generating higher non-interest revenues (such as fees revenues) with respect to standard banks. Financial performance indicators and risk indicators suggest that internet banking in the United States is neither more efficient in terms of performance nor a riskier business model. As a matter of fact, the differences in ROAE and ROAA between online banks and standard banks is not statistically significant, as well as the loan-to-asset ratio which is the main risk indicator for financial institutions. The same results were obtained in the European analysis.

In light of this analysis and data gathered, it can be concluded that the difference in performance between traditional and online banks is not statistically significant, and that the IT revolution and Web accessibility have nonetheless shaped the banking industry. Online banks are so far seen as an add-on to the existing banking environment, and not as a business model able to efficiently challenge competitors; but they, however support major banking companies into driving more clients towards their services. This, as a consequence sets the stage for a process which provides them with a competitive advantage and a significant boost in profitability. Doubtlessly, as IT infrastructures will further develop and more importance will be given to R&D and innovation, the structure of the banking market would dramatically change.

Appendix Table 2

Table 2.1

Internet Banks and Standard Banks in Europe, 2008

	Spain	Finland	Italy	UK
Stand-alone banks	-	eQ bank	-	-
Pure internet banks (in group)	Caixa Catalunya(Banco de Europa)	Nordea (Luottokunta)	Unicredit (Xelion)	HBOS (Capital Bank)
			MPS (Banca 121)	Cooperative (Smile)
	BBVA (Uno e-bank)		Capitalia (Fineco)	RBS (Coutts)
	BSCH (Open bank)		BPU (Banca Akros, IW Bank)	Prudential (Egg)
			BPM (Webank)	Standard Life (Standard Life)
			Gruppo Ras (Rasbank)	
Mixed banks	CajaAhorro	OP Cooperative	Unicredit	Barcleys
	Ibercaja	OKO	Intesa	Bradford & Bingles
	Pastor	Sampo	Monte dei Paschi	Alliance & Leices
	Bancaja	Alandsbanken	San Paolo	Bank of Scotland
	popular		Sella	Halifax
	Sabadell			HSBC
	BBVA			Lloyd TSB
	La Caixa			Natwest

Source: www.ub.edu, Internet Banking in Europe, 2008

Table 2.2

Financial Performance indicators for Internet and Non-internet banks, (EU) 2001-2004

	Spain	Finland	Italy	UK
Return on average assets (ROAA)				
Mixed banks	0.95	0.83	0.48	0.90
Internet banks	0.91	0.93	0.51	-0.22
Return on average equity(ROAE)				
Mixed banks	13.91	14.24	9.59	17.83
Internet banks	13.99	16.44	8.86	8.86
Cost to income ratio (C/I)				
Mixed banks	57.20	61.11	70.95	45.58
Internet banks	60.53	54.13	71.57	94.41

Source: www.ub.edu, "Internet Banking in Europe", 2008

Table 2.3

Science and Technology, (EU) 2004

	Spain	Finland	Italy	UK
R&D employment (% of total)				
All sectors	1.49	3.24	1.14	-
Business	052	1.72	0.37	-
Government	0.22	0.42	0.20	-
Other knowledge-intensive services employment	72.8	75.1	59.2	58.4
Financial intermediation	70.8	72.4	64.5	49.3
Information technology				
IT expenditure as % of GDP	1.80	3.60	2.00	4.30
Communications expenditure as % of GDP	3.70	3.40	3.30	3.80

Source: www.ub.edu, "Internet Banking in Europe", 2008

Table 2.4

Availability and usage of Internet (EU), 2005

	Spain	Finland	Italy	UK
Accessibility	% of households having access to			
Internet at home	34	51	34	56
A personal computer	55	64	46	65
Usage of internet	% of individuals who used internet in the last three months			
Financial services(internet banking	14	56	8	27
Other financial services	5	14	2	5
Purchasing/ordering goods or services	11	33	4	38

source: www.ideas.repec.org , "How has the adoption of internet banking affected performance and risk in banks? ", 2000

Table 2.5

Adoption Rate and Size of Internet Banks (USA), 2000

Type of Bank		Number of banks	Adoption Rate	Average Assets(millions)
Community Bank	Internet	54	4.2	$79.2
	Non-internet	1231		$49.2
Large Community Bank	Internet	51	30.2	$352.2
	Non-internet	118		$277.0
Regional Bank	Internet	30	60.0	$81.1
	Non-internet	20		69.2$
Large Regional Bank	Internet	66	75.9	$1,605.2
	Non-internet	21		868.6
All Banks	Internet	201	12.6	$649.9
	Non-internet	1390		$81.2

Source: www.ideas.repec.org , "How has the adoption of internet banking affected performance and risk in banks? ", 2000

Table 2.6

Expenses and Profitability for Internet and Non-Internet Banks (USA),2000

Type of Bank		Other Non-interest Expense	Total Non-interest Expense	Return on Average Assets(%)	Return on Average Equity(%)
Community Bank	Internet	21.7	66.3	1.08	12.6
	Non-internet	19.7	65.8	1.11	11.5
Large Community Bank	Internet	19.9	62.9	1.26	15.8
	Non-internet	19.6	60.4	1.23	14.0
Regional Bank	Internet	28.5	70.4	0.84	11.7
	Non-internet	24.0	62.6	0.98	9.5
Large Regional Bank	Internet	24.8	57.3	1.40	20.0
	Non-internet	18.8	48.6	1.55	15.7

Source: www.ideas.repec.org ," How has the adoption of internet banking affected performance and risk in banks?" , 2000

Table 2.7

Credit Risk for Internt and Non-Internet Banks (USA), 2000

Type of Bank		Loan-to-Asset Ratio (%)	Non-current Ratio	Earnings
Community Bank	Internet	65.3	1.47	1.83
	Non-internet	59.1	1.51	1.75
Large Community Bank	Internet	66.1	1.29	1.65
	Non-internet	63.2	1.49	1.63
Regional Bank	Internet	55.2	1.23	1.80
	Non-internet	59.3	1.30	1.70
Large Regional Bank	Internet	57.3	1.30	1.58
	Non-internet	62.4	1.48	1.38

Source: www.ideas.repec.org , “How has the adoption of internet banking affected performance and risk in banks?” , 2000

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