

Do Internet Activities Add Value? The Italian Bank Experience¹

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Abstract

Internet banking is a subject receiving great attention in the banking industry and the regulatory community. This paper describes the current state of Internet banking in Italy and discusses its implications for the banking industry and regulatory policy. Using information drawn from 105 banks' balance-sheet data, constituting over 80 percent of the overall commercial banking assets in Italy, during the period 1993-2000, we find that almost 75% of the Italian banks have adopted some form of Internet Banking. As national and inter-regional banks within groups are the leaders in this venture however the regional provincial banks are not lagging too much behind. In fact, in a relative comparison with the small banks in France and Spain, Italian banks are found to be more involved into offering services through internet technology. Furthermore, larger banks are ahead of smaller institutions, and banks that are member of a group are more active in adopting the internet banking than independent banks.

An empirical examination, based on both univariate and multivariate regression models, indicate that there is a significant link between offering of Internet banking activities and bank profitability. This positive association continues to be significant under different assumptions and definitions of what constitutes to be an "internet" banking activity. Additionally, the significant influence of internet-activities of banks on performance continues to be significant as we use alternative performance variables – return on assets, return on equity, commission and fee income and stock return – in levels as well as in growth measures. Surprisingly, a negative but marginally significant association is found between the adoption of internet banking and different proxies of risk e.g., nonperforming loans, doubtful loans, and variability of stock returns. Our logit analysis supports some of the univariate findings revealing higher likelihood of adopting active internet activities by larger banks, banks with higher involvement in off-balance sheet activities, past performance, and higher branching network.

However, results here are not necessarily "timeless." It is likely that Internet banking will eventually play a very important factor affecting bank performance for most banks. The speed at which this may happen will depend, in parts, on the future emphasis banks place in their technological and internet banking strategy as well as on the growth in the use of internet technology in the society. Internet banking presents policy makers and regulatory authorities with a set of significant challenges. Changes to the structure and functioning of financial institutions are challenging a regulatory structure that was developed based on increasingly outdated lines of demarcation among types of financial institutions. In addition, existing regulatory policies have to be adapted to the new realities of e-commerce as Internet banking accentuates or lessens various existing public policy concerns, and in some cases, raises entirely new concerns. Finally, traditional methods of safety and soundness supervision must adapt to the changing nature and scope of risks, and the possible creation of new types of risks for banks.

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1. Introduction

Banking over the Internet has attracted increasing attention from bankers and other financial services industry participants, the business press, regulators, and lawmakers, all over the world. Some analysts argue that Internet banking is revolutionizing the banking industry. Others see the Internet as simply adding another delivery channel for remote banking to existing channels such as automated teller machines (ATMs) and telephone banking. While Internet banking is the subject of a large amount of industry discussion, it remains the case that only a small percentage of banking transactions even in the industrialized nations are done via online. Italy has been a relatively leading country in Europe in being increasingly involved in internet banking activities with almost half of the total financial institutions are actively involved in developing and continuing internet banking business. Nevertheless, the adoption of Internet banking by commercial banks has grown at a very rapid pace, and many banks, including some of the nation's largest institutions, have made the development of services over the Internet a major component of their business and marketing strategy.

Among the reasons for Internet banking's increasing attention are the notion that electronic banking and payments will grow rapidly, more or less in tandem with proliferating electronic commerce; industry projections that Internet banking will cut banks' costs, increase banks' revenue growth, and make banking more convenient for customers. However, a bank that adopts Internet banking must develop different methods of conducting business, methods which may introduce new risks to the bank. It is therefore important for bankers, bank supervisors, and policymakers to understand how Internet banking affects the risk and performance of banks.

Despite this attention, there is a richness of information on the nature and scope of Internet banking, but there is a scarcity of evidence about the impact of Internet Banking activities among banks that have adopted it compared to those that have not done so. Our

purpose is to fill significant gaps on this issue, especially with respect to the Italian banking markets, where no rigorous attempts are undertaken to understand his aspect of the banking business.

The evidence reveals a strong and significant association between adoption of internet banking by banks and their profitability. This positive relationship is found to be significant under different assumptions and definitions of “internet” banking activity. Additionally, the significant influence of internet-activities of banks on their performance continues to be significant irrespective of what is used as performance variable following banking literature and industry norms for bank performance definitions. Although a weak inverse association is found between the adoption of internet banking and different proxies of risk however it is too early to ignore the risk associated with internet banking practices. The bivariate logit analysis further reports that larger banks, banks with higher involvement in off-balance sheet activities, banks with positive past performance, and institutions higher branching network are more likely to adopt internet banking activities.

The paper is organized as follows. The next section provides a definition of internet banking activity and describes the current “landscape” in Italy, drawing on information collected by the Bank of Italy at the beginning of 2000. Section 3 reports a brief review of the literature on Internet Banking, comparing and contrasting conclusions of previous research and introducing potential scope for further contribution. Section 4 describe the data and explores whether Internet banking has had a noticeable impact on Italian Banks’ performance and risk, using both univariate and multivariate (OLS and LOGIT models) analysis on banks’ balance-sheet data collected by the Italian Banking Association (ABI). Section 5 highlights the implications of Internet banking may have on banking industry structure, bank regulation and supervision. Section 6 concludes the paper.

2. Internet Banking: Basic Definitions

Recently, the basic concept of Internet banking entails that banks use the Internet as another delivery channel for banking services and transactions. They are able to fully customize their “web sites” and instantly update them without shipping new software to

customers. Web servers would also have the ability to track each customer's online transactions and use search engines to analyse customer behavior and bank profitability. On the WWW, banks can now reach their customers directly, with no intermediaries. The banks has website with some facility associated with web-based activities; Home-based banking: Some of the banking activities can be performed from being at home, a hybrid technology; E-commerce: Bank site offers a link to an E-commerce arcade; Set : Secure electronic transaction availability; Online Trading: bank allows direct trading facilities in the capital market through its trading desk.

In general, Internet banking refers to the use of the Internet as a remote delivery channel for banking services. Such services include traditional ones, such as opening a deposit account or transferring in between accounts and payments as well as investment and trading activities. Here the financial institutions need to determine their objectives for providing Internet-based banking. Most of the banks currently providing Internet banking products and services have offered, to a large extent, an identical and standard package of banking services and transactional capabilities. Popular current trend of internet banking products and functions are (1) Deposits and withdrawals - new accounts and existing checking accounts; (2) money market accounts; (3) account balance checking and maintenance; (4) bill payments; (5) credit and debit cards; (6) account fund transfers; (7) loan applications and services; (8) mortgage applications and services; (9) involved with E-commerce activities; (10) online trading; (11) electronic commerce support and services; (12) stock quotes and trading; (13) insurance programs; (14) mutual fund programs (and plans); (15) asset management services; and (16) derived marketing services and plans. The latest definition of internet banking emphasizes the inclusion of “on line trading” to be the crucial component of internet banking where banking services and transactions that can be delivered through the Internet include transferring funds between accounts, inspecting statements, paying bills, and checking investment portfolio.

2A. Background in Italy:

In Italy, the development of Internet banking activity is relatively new. According to JP Morgan (2000), the ratio between on-line banking clients and total banking clients is

rapidly increasing, ranging from 1% at the end of 2000 to an estimate of 16% in 2003. This will create a market of approximately 7 millions banking clients. On the offer side, a survey conducted by the Bank of Italy in March 2000 (cfr. Desario, 2000) showed that of 560 interviewed financial institutions (FIs), more than 300 had an informative web-site and 130 even had a transactional web-site. Furthermore, 50 FIs were actively involved in the electronic payment and in the *e-commerce* in general. As of February 2000, the most widespread offer of products and services concerned trading *on-line* (approximately €11,500 billion), electronic payment (approximately €500 billion), and financing and investing of funds (approximately €250 billion).

3. Literature Review: Does Internet Banking Affect Performance and Risk?

Research on internet banking is a new chapter in banking literature as the emergence of this style of banking business itself is a recent phenomenon. Recently, analysts have begun to investigate the performance of banks that offer Internet banking. The first important study is conducted by England et al. (1998), who estimated the number of US banks offering internet banking and analysed the structure and performance characteristics of these banks. They found no evidence of major differences in the performance of the group of banks offering internet banking activities compared to those that do not offer such services.

Subsequently, Furst, Lang, and Nolle (2000) and Sullivan (2000) found mixed results. In particular, both studies found that adoption rates depend on the size of the bank, with the smallest banks least likely to have adopted Internet banking. Both studies found that Internet banks are more willing to use Federal funds to finance their assets, and that Internet banks are more likely to derive their income from non-interest sources. Both studies also show that credit quality and exam ratings are the same or better among Internet banks relative to noninternet group. The latter paper reported that larger Internet banks hold fewer business loans compared to noninternet banks, while the first paper found exactly the opposite. Compared to non-internet banks, Internet banks in Sullivan's paper tended to have higher non-interest expenses, especially for the large regional banks. For larger banks they found non-interest expense is about the same for Internet and non-

internet banks. Finally, the author reported that profitability is similar for internet and non-internet banks. . Furst, Lang and Nolle found that non-interest expenses are higher for small Internet banks (under \$100 million in assets) compared to non-internet banks. They found that, compared to non-internet banks, return on equity was lower for small Internet banks but was higher for larger Internet banks. Differences in samples and methods of analysis might have accounted for some of the differences between these two studies. They used national banks for their sample, a sample that would contain some banks that are much larger than those in Tenth District states used by Sullivan (2000). These larger banks may have been among the first to adopt Internet banking, which implies more experience with the technology and potential for improved performance. Perhaps most important, the two studies use different methods to control for organizational characteristics. Furst, Lang, and Nolle (2000) stratify their sample by the size of the bank, while in Sullivan (2000), the sample is divided both by size of the bank and by the bank's organizational structure.

More recently, Carlson et al. (2001) further investigated this issue always in the US banking market. Their chief focus was to see if there is an association between offering internet banking and a bank's profitability. They regressed a bank's ROE (Return on Equity) against a set of control variables, and include as an explanatory bivariate variable whether or not a bank offers Internet banking. They also tested whether this relationship differs for more experienced Internet banks relative to new Internet banks. Their finding indicates that Internet banking is not having an independent impact on bank profitability . However, all the studies cited above speculate that it is probably too soon to see a systematic impact on Internet Banking on banks' profitability.

Another research question that has been addressed in the literature is the differences in financial performance between *de novo* Internet banks and non-Internet banks. On this angle, both Sullivan (2000) and Furst, Lang, and Nolle (2000) found that newly chartered Internet banks earn lower profits than newly chartered non-Internet banks. However, these studies define "Internet banks" broadly to include both Internet-only banks and click and mortar banks, and it is difficult to ascertain the impact of the Internet channel on click and mortar performance because these banks do not systematically report the percentage of business activity that flows through their websites

versus their branch networks. Subsequently, DeYoung (2001) compared the financial performance of 10 Internet-only banks and thrifts chartered between 1997 and 1999 to the performance of traditional banks and thrifts chartered during the same time period. The Internet only institutions carried less physical overhead and grew their assets faster (both consistent with the predictions of the Internet business model), but there was no systematic evidence that these institutions offered their loan or deposit customers more favorable prices. The average one-year old Internet-only bank earned significantly lower profits than the average one-year old traditional bank, primarily due to low business volumes and high noninterest expenses.

From a different perspective, surveys conducted by rating agencies and consulting companies reached contrasting conclusions about the impact of the Internet banking on bank performance. Always with reference to the US market, Moody's (2000) doesn't see -- at least in the intermediate term -- a significant influence of Internet activities on large banks' core profitability or competitive position. Arzachs (2000), instead, cites a Booz and Hamilton study affirming that "a mature Internet bank could operate at a 15% - 20% expense-to-revenue ratio" compared with a ratio of about 60% for most banks". On the European and Italian side, most studies so far are industry studies done by consultant groups such as Booz Allen and Hamilton (2000), KPMG (2001), Price Waterhouse (2000) and Tower report (2000). Some of these papers are written on the topic of internet banking in general and in some cases with emphasize on European (in some cases Italian) initiatives. These papers are primarily of descriptive nature discussing the current industry status portraying future perspectives of the industry in different countries. In general, we learn from these reports that an average payment transaction on the internet costs 13 us\$ cents this compares with 26 us\$ cents for a personal computer banking service, 54 us\$ cents for a telephone banking service, and us\$1.08 at a bank branch. This means that costs for internet banking run at only 15-20% of income, compared with an average cost income ratio for the banking industry of about 60% (Tower). It is also estimated that financial institutions which fail to respond to the need for online direct banking on the internet are likely to lose more than 10 % of their customer base over the next five years as their competitive advantages in banking service delivery erode (Price Waterhouse). Another forecasts that the market for internet banking is to grow sharply in

the near future affecting the competitive advantage enjoyed by the traditional, branch banks (KPMG). Booz Allen and Hamilton also revealed that 80 % of the surveyed banks in Europe are planning to provide banking services and transactions over the internet within 3 years.

Our attempt here is to provide some exploratory findings in the European perspective, focusing the developments and initiatives in the Italian banking sector. In Italy, during the last two years, online home banking has emerged as a significant strategy for banks to attract customers. Customers demand new levels of convenience and flexibility in banking services, and much more powerful, easy to use financial management tools - capabilities not available with traditional "brick and mortar" banking to "click and mortar" banking. As mentioned earlier, international consulting experts have suggested that the opportunity of internet banking market is quite open and attractive in the European market especially in Italy (price waterhouse). This paper investigates whether the adoption and involvement of internet as a delivery channel for banking services and transactions add value to the bank, i.e., whether it helps to improve performance of banking institutions in Italy. Given firm performance is a function of multifactor strategies, practices, and environment, our goal here is simply to trace a possible existence of correlation between institutions' decision to adopt a new technology to offer services and their financial returns or performances.

4. Data and Econometric Analysis

4.a Data

Our primary data set comes from the publicly available data source on bank's financial statements and income-expense reports sent to the regulators and banking associations. ABI, the Italian Banking Association, provided us with the data. We have matched these data with Fitch's IBCA Bankscope data source for additional variables and organizational structures issues. Bank of Italy publications were instrumental in getting details on organizational structure and related variables. In respect of internet related details, we have started with the website of "www.portalino.it." Then, we have used a number of other sources (the web URL are given in the reference-appendix), including a thorough check of the websites of each of the sample banks in order to gather specific details of their internet services and activities. To our knowledge, so far, this has been the most comprehensive initiative in classifying and understanding the internet banking developments in Italy.

We have attempted to limit our data set to banks for which have explicit information on their internet activities and also have consistent performance and asset-liability management variables for these banks during the entire 1993-2000 years. In doing so, we have avoided the inclusion of new banks or banks that were acquired by other banks and ended up with a panel data of 105 banks. These 105 banks constitute over 80 percent of the banking assets of the Italian banking organization with an ample mix of banks of different sizes and types e.g., very large money center, large and medium regional and interregional banks, and relatively smaller provincial and community banks; mix of private versus public institutions; and group versus independent banks. See table 1 for further details on the organizational frequency distribution.

Beyond organizational details, this table also provides a simple breakdown of these banks' internet activities. By the end of 2000, 78 banks had some form of web-based presence with a wide range of differences on what is offered to customers through internet activities. In one extreme, the bank only have the nominal presence describing their basic details of address, banking hours, available services and facilities to answer basic consumer services related questions. On the other extreme, some banks offer all

sorts of banking services and facilities, including online trading possibilities through their websites. In our information details, we found that 58 of the 78 banks with web details provide some sort of banking related transaction or customer service related activities that bank consumers can be benefitted without making a trip to the nearest bank or to a automatic teller machine. Of the sample, 30 institutions provide E-commerce Arcade, 18 provide Online Trading Facilities, and 7 guarantees secure electronic transactions of all types of banking activities.

The table also portrays that it is the national and interregional large banks that are most active in internet activities with over 85% involvement at least with a presence in the web-based banking. The regional and provincial banks are not lagging too much behind. In fact, in a relative comparison with the small banks in France and Spain, and Italian Banking institutions are significantly more involved in offering services through internet technology. Overall, the public banks i.e., stock institutions are more aggressive in adopting internet activities than private banks. Indeed, larger banks are more involved than smaller institutions and banks that are member of a banking group are more active in adopting the internet banking than independent banks. In providing our empirical estimates, we have taken our sample beyond the years when internet banking started. The reason we have done it in order to make sure that we trace the performance and risk details of these bank years before their internet adoption with a follow up with their activities afterwards. All data are taken from the end of year aggregate reporting for each bank.

4.B Empirical Results

4.B1. Univariate Analysis

We employ a large number of proxies for bank return and risk. Given, banks are not required to report any line items in their financial statement or regulatory report that specifically capture the internet banking activities, we take all possible performance and risk measure to trace the possible association or correlation of internet activities and firm performance and risk. For performance, we investigate return on assets, return on equity, interest margin, noninterest margin, net commission and fees to assets and total

commission and fees to assets. Additionally, for the listed company sub-sample, we consider annual stock return as a performance variable. For risk, we use nonperforming loans to assets and doubtful loan to assets ratios. Again, for the stock institution subsample, we take the standard deviation of stock return as a risk measure. These proxies are consistent with the performance variables used by researchers in the banking literature.

Table 2A and 2B are univariate statistics of the sample institutions for the internet group as well as the non-internet group. In these two tables, we analyze the performance of an internet group, we term “broad internet banking group” with noninternet group banking institutions. We constitute this “broad internet group” considering institutions who have adopted at least some form – as described in table 1 - of internet banking activities by the end of year 2000 and the non-internet group is constructed by simply taking banks that do not have any presence in the banking activities via new technology of internet related activities. Table 2A provides the average ratios of the variables mentioned above for the Internet and non-internet groups. The table shows that in respect of almost all performance variables, the internet group outperforms the non-internet group. For example, the internet group reports a ROA of 0.96, Commission Income to Asset ratio of 0.81 relative to the ROA of 0.83 and Commission ratio of 0.49 respectively for the non-internet group. In summary, the internet group reports significantly higher earnings and performances in all considered categories. The difference of performance is more prevalent and significant with respect to the non-interest and fee incomes and stock return categories. This internet group also did not contribute to additional risk, in fact, it reported a lower risk ratios – non-performing loans (3.60 versus 4.13), doubtful loans (1.78 versus 1.90), and standard deviation of stock return (0.61 versus 0.42) - relative to non-internet groups’ activities. The only category where the internet group shows a lower performance is the non-interest expense category where internet group records a 3.01 ratio relative to a lower 2.87 ratio recorded by the non-internet group. This higher expense ratio for the internet group is expected because of the technology cost and higher employee cost associated with the new internet related ventures and business facilities.

Table 2B provides standard average asset-liability ratios of the sample banks. We incorporate asset size, liquid asset (cash and t-bills) to assets, total trading activities to assets, investment securities to assets from the asset side and total deposit to assets, demand deposits to assets and saving deposits to assets on the liability side. Additionally, we consider equity, combined off-balance sheet position, loan loss provision ratios and bank's branching network. The evidence shows that internet group banks are larger (16,283 million to 10,341 million), more involved with trading and investment activities (ratio of 19.57 versus 10.41) relative to the non-internet activities. However the group on average has less equity cushion (8.10 versus 9.46), less retail deposit oriented (for demand deposit, it is 26.45 versus 30.18 and for saving deposits it is 3.59 versus 7.11) financing strategy, and posts lower loan loss provisions (0.86 versus 1.23) relative to the non-internet group. In all cases, these differences between the two groups are statistically significant.

Next, we estimate the differences of the internet and non-internet groups where the definition of internet group is changed from the previous estimation. In table 3A and 3B, we term our internet group as "active internet group." Under this definition, we incorporate only those banks who have a web-presence with explicit basic intermediation services offered via internet and are also involved in at least two of the other internet activities described in table 1. In doing so, we find that the number of observations in our internet sample goes down from the previous 458 observations to 231 observations. The statistics revealed in these two tables (3A and 3B) are consistent with the results in the previous two tables. Additionally, we find that these active internet banking institutions are performing significantly higher than the noninternet groups than the previous comparison with the broad internet group in Table 2A and 2B. For example, return to assets for this group is 1.11 compared to 0.96 of the previously mentioned broad internet group and 0.83 of the non-internet group. This trend continues to be similar for other performance variables. Additionally, the risk variables associated with this active internet group continues to be lower (nonperforming loan is 3.41 and doubtful loan is 1.63) relative to the reported ratios by the noninternet group. The asset-liability variables shown in table 3B reveals that on average the banks in this active internet group are slightly larger than the previously considered "broad internet group" (\$17,404 million

relative to \$16,283 of the broad group and \$10,341 of the noninternet group). The other variables are reasonably similar to the previous results i.e. the internet group has significantly lower equity ratio, higher trading and investment activities and less dependent on retail deposits relative to the noninternet group.

We further reduce to the internet group to a new group called “online trading internet group” by considering only those internet banks that have explicit internet online trading facilities. Only 18 banks in the sample with a total 144 observations are involved in this group. Tracing their performance and balance sheet variables, reported in Table 4A and Table 4B, we find that the internet group continues to be a significantly higher performer without being too risky relative to non internet group. For example, the ROA reported by this group is 1.42 and the net commission fees to asset ratio is 1.04, substantially higher rates reported for the noninternet groups (0.83 and 0.49 respectively).

We report a relative comparison among different “internet groups” in Table 5A and Table 5B. Table 5A provides the performance statistics followed by asset-liability management ratios in Table 5B. What we notice in Table 5A is that as the internet group becomes more specialized, significantly higher is their bank performance. For example, ROA moves from 0.96 (any internet bank or “broad bank group”) to 1.11 (“active internet group”) to 1.42 (“online internet group”). A similar trend is found for total commission and fees income to asset ratio where the earning moves from 3.60 (broad internet group) to 3.41 (active internet group) to 3.50 (online internet group). Interestingly the risk variables for these three groups are relatively similar e.g., the nonperforming loan ratios for these three groups are 3.60, 3.41 and 3.50 respectively. For the stock sub-sample, the stock return is found to be increasingly higher as the internet group goes from a broader group - to an active group - to the online internet group (3.65, 4.73 to 5.08) while the risk variables going lower (0.61, 0.52, to 0.49). In evaluating the balance sheet ratios of these groups (reported in Table 5B), we find that bigger banks are more specialized internet banks and it comes with the fact that these bigger banks are more involved in investment and trading activities and less dependent on traditional deposit financing and are active in off balance sheet activities. One important note however is the fact that noninterest expense ratio increases substantially as the internet banks get increasingly specialized (0.64, 0.68, to 0.95) from the broad group

to active group to the online trading group reflecting higher operational cost associated with offering specialized and detailed internet services.

After evaluating three different groups of internet banks, we have decided to follow-up the middle group i.e. the “active internet banking group” and investigate the marginal performance and risk issues of these banks after their active adoption of internet activities. These results are reported in Table 6. We trace the performance activities of these active internet sample banks from year 1 (end of the year of the adoption year) up to year 5 of since adoption. For year 1, we could gather information on all 78 banks but given most banks have adopted internet banks in late 1990s and year 2000, we could only get information on 70 banks for 2 years after adoption, 48 banks for 3 years after adoption, 30 for 4 years after adoption and finally information on 11 banks with details available for 5 years after adoption. The year 1 statistics reported in column 1 means the percentage change or growth of a particular variable or item from its previous year’s statistics and continuing the same pattern, column 5 reporting for the same item 5 years of since the adoption of active internet banking. In all performance categories, we find that the adopted group has increased their performance every year almost in a linear fashion. That suggests that over time with experience gained in internet banking, banks were more likely to be able to improve their performance in overall banking activities. For example, the ROA growth in year 1 was 5.7% and Commission Income in year 1 was 14.2%. In both categories the percentage increase posted in year 5 show a rate of 22% and 25.1% increase respectively. The changes are a bit lower for stock banks in the capital markets as portrayed by stock returns (7.2% in year 1 and 12.9% in year 5). Interestingly, the risk ratio proxies – non-performing loans, doubtful loans, standard deviation of stock returns – do not change significantly. For example, changing in non-performing loan to asset ratio in year 1 is 0.88% and doubtful loan to asset in year 1 is 1.4% transforming to 4.2% and 2.0% respectively in year 5 after adoption. In fact, for the stock sub-sample, the risk decreased over the years from 9.9% in year 1 to 6.6% in year 5. One interesting note here is that the noninterest expense ratios have gone down substantially as the banks achieved an economies of scale on their early fixed costs on internet activities and lowered their expenses over the years. To be more specific, the

noninterest cost of the sample adopted internet business went down from a ratio of 9.9% to 6.6% over the years.

4.C Multivariate Analysis

4.C.A Ordinary Least Square Regressions

Although, we find in our univariate analyses, an overwhelmingly higher performance by banks (without any substantial increase in risk factors) in the internet group(s) relative to noninternet bank group, however, we know that it is hard to make any conclusive statement on the actual impact of the internet adoptions on firm behavior without a multivariate analysis. Therefore, we employ a series of estimations focusing on the impact of internet adoption on different proxies for firm performance and risk variables. For performance we have used Return on Assets, Return on Equity, and Net Commission and Fee Income to Assets, and Stock Return. For Risk Analysis, we have used nonperforming loan to assets, doubtful loan to assets and standard deviation of stock returns as proxies of bank risk.

We have estimated OLS regressions on all different samples of internet banks, however given the similarities of results and for the sake of brevity, we report results that are based on the group that are considered as the actively involved in internet activities. Table 7 provides evidence of estimates that focus on potential correlates or factors of bank performance with a special focus on the bank observations that have actively adopted internet banking activities. In selecting potential factors associated with performance, we have incorporated bank size (logarithm of assets), lending portfolio (loan to assets), liquidity (liquid assets to assets), loan default (nonperforming loans to assets), financing strategy (deposit to assets ratio), branch network (branch to asset ratio), nontraditional activities (off-balance sheet position to assets), and regional economic environment (logarithm of per capita income).

Additionally, we focus on our key variable, a dummy or bivariate variable, taking a value of 1 when it has adopted substantial or active internet banking activities, otherwise it takes a value of zero. The coefficient associated with this Internet Adoption dummy will indicate the possible association between the internet adoption by banks and their overall performance. We also include time dummy variables for the sample years.

We report the details of these time dummy coefficients and their significance in the appendix but for clarity, we do not report it in the text. The model statistics represented by adjusted R-squared and F-statistics show relatively strong fit for the estimates. What we find in table 7 is that the Internet Adoption variable is significantly associated with performance variable in all 4 estimates and in each case, these parameters are statistically significant at least at the 1 percent level. For other variables, we find size to be positively associated with performance in 2 of the 4 equations; liquid assets ratio as well as nonperforming loan ratio to be negatively associated with performance in 3 out 4 estimations. Off-balance sheet activities are found to be positively influencing performance in all 4 estimations. Economic environment variable did not matter but branching network strategy influenced performance in most estimates. Also, the time dummy variable did not produce any significant new or debatable information that questions the reported association between internet adoption dummy and performance variables.

Next, we investigate whether this internet banking dummy variable influences the growth of performance variables where performance growth is considered as the percentage change of performance from a previous year's performance number for the four performance variable used in our estimate (ROA, ROE, NET COMMISSION RATIO, and STOCK RETURN). This makes our sample to decline from 650 to 562. These estimates are reported in Table 8. Results are strikingly similar to the results reported in Table 7 where internet adoption dummy significantly affected performance especially the strong impact on non-commission and fee income and stock returns. Additionally, the economic environment was found to be crucial in affecting performance or dependent variables.

We follow-up with risk estimates where dependent variables aconsidered are the proxies for firm risk (nonperforming loan to assets, doubtful loan to assets and standard deviation of stock returns). These results are shown in Table 9. The model statistics in these three regressions are found to be relatively weak. Although, the adoption of internet dummy is negatively associated with risk variable, except for the influence on the standard deviation of stock returns, we do not find the other two cases, parameters to be statistically significant. The other control variables reported magnitude and significance

consistent with normal expectations on such empirical relationships. For example, asset size, off-balance sheet activities, liquid assets, and economic environment ratios were inversely associated with risk variables. Financing strategy (deposit ratio) did not matter but past default experience affected risk positively.

4.3B Logit Models

Finally, we investigate the potential factors associated with the likelihood that a bank adopts internet banking. In this case our dependent variable is the bivariate or dummy variable, taking a value of 1 when it has adopted active internet banking activities (also adoption of online trading internet banking takes a value of 1 in regression 2), otherwise it takes a value of zero. We consider bank size (log of assets), loan portfolio structure (loan to assets ratio), past performance (past year's ROA, loan performance (default or nonperforming loan), financing strategy (deposit to asset ratio), and organizational variables (group versus nongroup and stock versus nonlisted banks). The organizational variables are dummy variables taking value of 1 if the bank happens to be involved in a banking group (takes a value of 1 if the bank is a listed company in the capital market) and takes a value of zero otherwise in both cases. We report results of two estimates in Table 10. In the first two columns, we report the likelihood of adopting an "active internet banking" followed by the likelihood of adopting "online internet banking," in column 3 and 4.

The model statistics in these regressions show strong fit of the models with high and significant chi-square and log likelihood statistics. Overall, the evidence indicates that bigger banks (logarithm of assets is positively associated with the dependent variable) are more likely to be associated with internet adoption. Banks with higher off-balance sheet activities are more likely to influence internet adoption while financing strategy did not matter influencing adoption. Banks with higher branch network is more likely to adopt internet banking with a possible reduction of future network in mind. Interestingly, banks with higher loan default are also likely to be involved in adopting internet activities. Additionally, banks with higher past performance (past year's ROA) are associated with likely adoption of internet banking. We also see that listed (public)

banks and banks involved in banking group are more likely to adopt internet banking activities.

5. Internet banking: implications for banking and bank regulation

5.1 Implications for banking industry structure and performance

Globalization and increased competition are trends that have shaped the banking industry for decades. The expansion of Internet banking will contribute to those trends in the same way that previous advancements in telecommunications and data processing did; i.e., by reducing barriers associated with geography and national boundaries. Many markets that were once highly localized (mortgage finance in the United States, for example) have become national and sometimes international in scope. Not only will competition be enhanced by the reduction of geographical barriers, but also by the increased ability of bank customers to search for and locate new suppliers electronically.

Internet banking will also accelerate the ongoing process of “financial deepening” (i.e. the widening applicability of more formalized financial markets in the economy). Traditionally, small, start-up firms, for which little information necessary to evaluate creditworthiness existed, were unable to secure external funding in formal credit markets, including banking. Often entrepreneurs have to seek funds from relatives, friends or private credit markets. Technological advancements in data collection, data management, and financial engineering have improved the ability of potential creditors to assess the creditworthiness of potential borrowers and to price the risk associated with those borrowers through standardized mechanisms such as credit scoring. As a result, the range of businesses and individuals that can obtain loans through financial institutions is expanding rapidly. Credit scoring is based on an analysis of information that can be entered into a standardized database, and thus it avoids the costs associated with customized loan products. Standardized credit scoring is easily transferable to multiple lenders or potential lenders, a process that eliminates any economic rents created when credit depends on specialized knowledge of a lender with respect to a particular borrower. The result is greater access and lower cost for borrowers who qualify for this type of lending.

5.2 Implications for regulatory policy

There are several ways in which the development of Internet banking generates potential challenges for regulatory policy. First, Internet banking, and developing technology more generally, is changing the structure and function of financial institutions. Our existing regulatory structure has been developed based on traditional lines of demarcation among different types of financial institutions, but these lines of demarcation are becoming less relevant over time. Second, Internet banking challenges traditional methods of safety and soundness supervision by changing the nature and scope of existing risks, and possibly by creating new risks.

5.2.1 The impact of financial integration on regulation and supervision

Technological advances make it increasingly desirable and easy to offer a wider range of services for some institutions. Improvements in the ability to integrate financial products and more efficiently market and cross-sell are major advantages of the online environment. But the wider the range of services offered by banks, the more intricate becomes the tasks of identifying which lines of business banks are engaged in, and the more difficult it becomes to coordinate supervision among functional supervisors (cfr. Claessens et al., 2000).

Technological advances are also resulting in a greater penetration of traditional banking lines of business by nonbanks, including unregulated/less regulated entities. Regulators could potentially saddle these firms with burdensome regulation. On the other hand, to the extent customer trust is important for establishing and augmenting customer relationships, greater regulation and supervision may give banks a competitive edge. It is not clear how these effects will net out.

In addition, policy makers are now struggling with adapting existing regulations and integrating new laws to the world of Internet banking. They must determine the

appropriate balance between meeting regulatory objectives, and avoiding unnecessary costs and distortions that will harm the development of Internet banking and electronic commerce. Much of the current regulatory and supervisory apparatus governing the operations of banks was designed based on physical location. That is, to service existing customers and to expand their customer base, both within a nation and internationally, banks could be expected to establish a physical presence within, or in relatively close proximity to, the geographic area where their customers are located.

As Internet banking expands in importance, policy-makers will have to address a number of questions arising from possible conflicts between traditional notions of “place” and the new concept of “cyberspace.” For example, in the case of Internet banking across national borders, do the laws of the “home country” (i.e., the country where the Internet bank is licensed) apply to issues such as consumer protection, or do the laws of the “host country” (i.e., the country where the bank customer resides) apply? Further, would harmonization of national laws and regulations as they apply to cross-border Internet banking be a useful policy? On the one hand, harmonization could reduce the uncertainty and costs of compliance with multiple national regulations. On the other hand, harmonization might short circuit valuable experimentation with alternative regulatory designs. Moreover, it may be difficult to design regulations that are “technology neutral,” resulting in regulatory policies that favor existing technologies over newer or yet to be developed technologies. Such questions do not necessarily have easy answers, and policy-makers are likely to grapple with them well into the future, as electronic banking and electronic commerce increase in importance.

5.2.2. Safety and soundness supervision

Most observers agree that as electronic banking becomes more widespread and complex, the necessity for banks to assess and manage operational risks will become more crucial. Security failure at a particular institution could not only cause large losses for that institution, but could spawn a general lack of confidence in electronic banking innovations, thereby retarding development. In addition, and unlike in the case of other remote banking channels such as telephone banking, security risks surrounding the Internet may be especially challenging to address, because the Internet is a network designed to promote open access.

Regulators have warned financial institutions that the risk of breaches in security and intrusions is increasing as the number of remote access devices increases. Risks and threats in the digital world appear to mirror those in the physical world -- threats to bank information systems may be facilitated internally by disgruntled, dishonest, or poorly trained insiders, or externally by hackers and thieves using increasingly sophisticated and widely available tools and techniques. Few banks have experienced serious breaches of their security system, but a major breach could undermine consumer or market confidence in the bank's ability to manage Internet-based transactions. Poor security may also create reputational or legal risks for banks that are seen as providing inadequate protection for customers' personal data.

Security-related risks could be compounded if processes to authenticate customers online are inadequate. As financial institutions search for new and more convenient ways of using technology to open Internet banking accounts online (instead of having to fill out a paper application, sign it, and mail it), they also must address how to limit fraud and security vulnerabilities.

The internet banking also has implications for other traditional banking risks, such as credit risk, liquidity risk, and market risks. These risks will not necessarily increase or decrease but they can assume different forms, requiring new ways of management. As regards to credit risk, for example, the use of Internet allows banks, especially small institutions, to expand their geographic reach out of their traditional area, which increases the challenge of understanding local market dynamics and risks. In fact, diversification -- in the various geographic, industrial, and sectoral forms -- doesn't guarantee either greater safety or more value for banks, as recently shown by Acharya, Hasan, and Saunders (2002).

On the liquidity risk side, two main concerns arise. First, due to the speed of information over the Internet, informed (or misinformed) depositors could withdraw their funds in mass at any time in response to bad news about a bank, giving rise to a dangerous bank run. Second, Internet banking can increase deposit volatility if the major force driving depositors choices is the interest rate offered by banks. In this case, bank liquidity might be affected, limiting the volume of activity created through this channel.

Finally, banks may be exposed to increased market risk due to recent growth in securities issuance and trading on-line. This risk could take the form of increased securities return volatilities and foreign exchange risk if the bank accepts deposits from foreign customers or create accounts denominated in currencies other than their local currency. In light of the above new forms of risks, the Basel Committee on Banking Supervision (2001) has identified 14 *Risk Management Principles for Electronic Banking* to help banking institutions expand their existing risk oversight policies and processes to cover their Internet Banking activities. These principles are intended not as absolute requirements but as supervisory expectations and guidance in order to promote safety and soundness for Internet banking activities, while preserving the necessary flexibility in implementation that derives in part from the speed of change in this area.

6. Conclusions

New technology and internet banking are increasingly taking important role in the business of banking and financial services through out the world. The banking literature however has not received enough attention yet in analysing the adoption patterns, optimal strategies, and associated impact and performance of banking institutions. This paper attempts to void some gaps by focusing on the internet banking initiatives and experiences undertaken by the Italian banking institutions and markets. This is one of the first comprehensive approaches in the European context analysing internet stragies and impacts by financial institutions.

Obviously one should not (or cannot) simply conclude that internet banking decision is the key factors determining firm performance and growth. What we attempt to establish here is whether there are strong association or correlation between banks that have adopted new technology in offering bank services and their performance. The evidence reveals a strong and significant association between adoption of internet banking by banks and their profitability. This positive relationship is found to be significant under different assumptions and definitions of “internet” banking activity. Additionally, the significant influence of internet-activities of banks on their performance continues to be significant using alternative bank performance variables. We find a weak

association between the adoption of internet banking and risk. However, we also emphasize that it is too early to ignore the risk associated with internet banking practices as the adoption is a recent phenomenon and we do not have enough data points or information to make any conclusive comments. In determining the likelihood of adopting internet banking, we find size, non-traditional banking activities, past performance, and banks with large branching network are more eager or likely to adopt internet banking activities.

Our plan in the near future is to focus on the specific details of bank strategies that helped individual banks in respect of adopting optimal new technology resulting strong profit without increasing substantial risk. We also want to focus on the bank product, sectors, markets, and geography to better correlate internet activities and risk-return scenarios as it relates to overall asset-liability management of banks. We are developing a cluster analysis across different distinct strategy groups to better understand this phenomenon.

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2. Bank of Italy.
3. <http://www.kpmgconsulting.it/>
4. http://www.lastampa.it/redazione/news_high_tech/banca121.asp
5. <http://www.banca121.it>
6. <http://www.i-am.it/app/liv1/calendario00.asp>
7. <http://uk.docs.yahoo.com/pr/releases/itsalent141099.html>
8. http://www.confcommerciocl.it/conv_banca121.htm
9. <http://www.intel.com/eBusiness/casestudies/milano/challenge.htm>
10. <http://www.webank.it/>
11. <http://www.ilsole24ore.com>
12. <http://www.omnitel.it>
13. <http://www.2000.it> or <http://wap.2000.it>
14. <http://www.blu.it>
15. <http://www.inwind.it>
16. <http://wind.it>
17. <http://www.tim.it>
18. <http://www.donovan.it>
19. <http://digilander.iol.it/rominapaolucci/banche.htm>
20. <http://www.intel.com/eBusiness/casestudies/milano/>

Table 1
INTERNET BANKING IN ITALY
ADOPTION FREQUENCY

Bank	N	WebBased Information	Home-Banking	E-commerce Arcade	Secure Electronic Transaction	Online Trading Facility
	105	78	58	30	7	18
CHARTER TYPE						
National	8	7	6	4	3	6
Iregional	14	12	12	6	1	2
Regional	20	15	11	7	1	5
Provincial	57	39	27	10	1	5
Community	1	0	0	0	1	-
Not Known	5	5	2	3	0	-
ORGANIZATIONAL FORM						
Public	32	27	17	10	3	10
Private	73	51	41	20	4	8
SIZE						
Very Large	8	7	5	3	2	4
Large	7	7	6	4	2	4
Medium	15	13	10	5	2	3
Small	75	51	37	18	1	7
GROUP						
Member of a Group	29	28	22	13	4	6
Independent	76	50	36	17	3	12

Note: Web Info: The banks has website with some facility associated with web-based activities; Home-based banking: Some of the banking activities can be performed from being at home, a hybrid technology; E-commerce: Bank site offers a link to an e-commerce arcade; Set : Secure electronic transaction availability; Online Trading: Bank allows direct trading facilities in the capital market through its trading desk.

Table 2 – PANEL A
Italian Banks with Any Form or Broad form of “Internet Bank”. Under this broad definition of “Internet Bank,” sample includes All Banks with Explicit Information on the Use of any of the Internet Related Service Technology
PERFORMANCE STATISTICS - 1993-2000

Variables /Ratios	Internet Bank Versus Non-internet Bank		
	N=458	N=192	Statistical Significance of the Difference Between the Two Sample Groups
(percent)	Internet Banks	Non-internet Banks	“t”-statistics
Return on Assets	0.96	0.83	2.07 *
Return on Equity	9.25	8.90	1.68 *
Interest Margin to Assets	1.61	1.85	-1.83 +
Noninterest Margin to Assets	-1.02	-1.93	1.97 *
Noninterest Income to Assets	0.64	0.53	2.10 *
Noninterest Expense to Assets	3.01	2.87	1.74 +
Net Commission And Fees to Assets	0.57	0.39	2.43 *
Total Commission And Fees to Assets	0.81	0.49	3.15 *
Non-performing Loan to Assets	3.60	4.13	-2.04 *
Doubtful Loans to Assets	1.78	1.90	-1.69 +
Stock Return To Assets	3.65	2.87	3.05 **
Standard Deviation of Stock Returns	0.61	0.42	2.02 *

Note: This broad definition of “Internet Bank” includes any banks with the availability of any of the following internet related service technologies (Web-based, Homebanking, E-commerce Arcade; Secure Electronic Transaction, or Online Trading). Stock Return and Standard Deviations are based on 214 observations. **, *, + mean significant at 1, 5, and 10 percent significance level respectively.

Table 2 – PANEL B
Italian Banks with Any Form of “Internet Bank.” Under this definition of “Broad Internet Bank,” sample includes All Banks with Explicit Information on the Use of Any of the Internet Related Service Technology
ASSET-LIABILITY MANAGEMENT VARIABLES - 1993-2000

Variables /Ratios (percent)	Internet Bank Versus Non-internet Bank		
	N=458 Internet Banks	N=192 Non-internet Banks	Statistical Significance of the Difference Between the Two Sample Groups “t”-statistics
Assets	16,283	10,341	3.06 **
Equity to Assets	8.10	9.46	-1.98 *
Liquid Assets to Assets	30.42	32.04	-0.63
Trading, Securities and Investments to Assets	19.57	10.41	4.73 **
Investment Securities to Assets	3.02	2.01	2.36 *
Deposits to Assets	72.71	73.01	-0.24
Demand Deposit To Assets	26.45	30.18	-2.78 *
Saving Deposit to Assets	3.59	7.11	-3.48 **
Off Balance Sheet Activities to Assets	11.73	10.93	1.30
Loan Loss Provision to Assets	0.86	1.23	-4.02 **
Bank Branches	63	42	6.03

Note: The broad definition of “Internet Bank” includes any banks with the availability of any of the following internet related service technologies (Web-based, Homebanking, E-commerce Arcade; Secure Electronic Transaction, or Online Trading). **, *, + mean significant at 1, 5, and 10 percent significance level respectively.

Table 3 – PANEL A
Italian Banks with “Active Internet Bank” Services. Sample Includes Banks with Active
in Using Web-based and At Least Two other the Internet Related Service Technology
PERFORMANCE STATISTICS - 1993-2000

Variables /Ratios	Internet Bank Versus Non-internet Bank		
	N=231	N=192	Statistical Significance of the Difference Between the Two Sample Groups
(percent)	Internet Banks	Non-internet Banks	“t”-statistics
Return on Assets	1.11	0.83	2.50 *
Return on Equity	10.05	8.90	1.99 *
Interest Margin to Assets	1.74	1.85	-1.03
Noninterest Margin to Assets	-1.45	-1.93	1.78 +
Noninterest Income to Assets	0.68	0.53	2.23 *
Noninterest Expense to Assets	3.09	2.87	1.88 +
Net Commission And Fees to Assets	0.65	0.39	2.61 *
Total Commission And Fees to Assets	0.94	0.49	3.40 **
Non-performing Loan to Assets	3.41	4.13	-1.99 *
Doubtful Loans to Assets	1.63	1.90	1.88 +
Stock Return To Assets	4.73	2.87	3.90 **
Standard Deviation of Stock Returns	0.52	0.42	1.82 +

Note: “Internet Bank” Related Activities by banks include (Web-based, Homebanking, E-commerce Arcade; Secure Electronic Transaction, or Online Trading). **, *, + mean significant at 1, 5, and 10 percent significance level respectively.

Table 3 – PANEL B
Italian Banks with “Active Internet Bank” Services. Sample Includes Banks with Active
in Using Web-based and At least Two other the Internet Related Service Technology
ASSET-LIABILITY MANAGEMENT VARIABLES - 1993-2000

	Internet Bank Versus Non-internet Bank		
Variables /Ratios	N=231	N=192	Statistical Significance of the Difference Between the Two Sample Groups
(percent)	Internet Banks	Non-internet Banks	“t”-statistics
Assets	17,404	10,341	3.37 **
Equity to Assets	7.93	9.46	2.05 **
Liquid Assets to Assets	28.16	32.04	1.34
Trading, Securities and Investments to Assets	20.42	10.41	4.95 **
Investment Securities to Assets	3.69	2.01	2.92 **
Deposits to Assets	70.11	73.01	0.52
Demand Deposit To Assets	25.14	30.18	-2.95 **
Saving Deposit to Assets	3.23	7.11	3.62 **
Off Balance Sheet Activities to Assets	11.94	10.93	1.61
Loan Loss Provision to Assets	0.84	1.23	4.10 **
Bank Branches	74	42	6.90 **

Note: “Internet Bank” Related Activities by banks include (Web-based, Homebanking, E-commerce Arcade; Secure Electronic Transaction, or Online Trading). **, *, + mean significant at 1, 5, and 10 percent significance level respectively.

Table 4 – PANEL A
Italian Banks with “Online Trading Internet Bank” Activities.
Sample Includes Banks with Available Online Trading Service Technology
PERFORMANCE STATISTICS - 1993-2000

Variables /Ratios	Internet Bank Versus Non-internet Bank		
	N=144	N=192	Statistical Significance of the Difference Between the Two Sample Groups
(percent)	Internet Banks	Non-internet Banks	“t”-statistics
Return on Assets	1.42	0.83	3.18 **
Return on Equity	13.55	8.90	2.52 *
Interest Margin to Assets	1.70	1.85	-0.41
Noninterest Margin to Assets	-1.89	-1.93	0.36
Noninterest Income to Assets	0.95	0.53	2.99 **
Noninterest Expense to Assets	3.48	2.87	1.97 *
Net Commission And Fees to Assets	0.73	0.39	3.01 **
Total Commission And Fees to Assets	1.04	0.49	3.63 **
Non-performing Loan to Assets	3.50	4.13	-1.78 +
Doubtful Loans to Assets	1.72	1.90	-0.84
Stock Return To Assets	5.08	2.87	4.69 **
Standard Deviation of Stock Returns	0.49	0.42	1.58

Note: “Internet Bank” Related Activities by banks include (Web-based, Homebanking, E-commerce Arcade; Secure Electronic Transaction, or Online Trading). **, *, + mean significant at 1, 5, and 10 percent significance level respectively.

Table 4 – PANEL B
Italian Banks with “Online Trading Internet Bank” Activities.
Sample Includes Banks with Available Online Trading Service Technology
ASSET-LIABILITY MANAGEMENT VARIABLES - 1993-2000

Variables /Ratios (percent)	Internet Bank Versus Non-internet Bank		
	N=144 Internet Banks	N=192 Non-internet Banks	Statistical Significance of the Difference Between the Two Sample Groups “t”-statistics
Assets	23,114	10,341	2.96 **
Equity to Assets	7.59	9.46	-1.70 +
Liquid Assets to Assets	23.48	32.04	-2.80 *
Trading, Securities and Investments to Assets	26.95	10.41	6.67 **
Investment Securities to Assets	8.40	2.01	8.14 **
Deposits to Assets	62.18	73.01	-2.03 *
Demand Deposit To Assets	22.20	30.18	-2.80 *
Saving Deposit to Assets	3.01	7.11	-2.96 **
<u>Off Balance Sheet Activities to Assets</u>	15.43	10.93	2.41 *
Loan Loss Provision to Assets	0.80	1.23	-4.17 **
Bank Branches	88	42	7.83 **

Note: “Internet Bank” Related Activities by banks include (Web-based, Homebanking, E-commerce Arcade; Secure Electronic Transaction, or Online Trading). **, *, + mean significant at 1, 5, and 10 percent significance level respectively.

Table 5 – PANEL A
Different Groups of Italian Internet Banks
Comparison Among “Any Internet Bank”, “Active Internet Bank” and “Online Trading Internet Banks” PERFORMANCE STATISTICS - 1993-2000

Variables /Ratios (percent)	Internet Banks			
	1 Any Internet Banks N=458	2 Active Internet Banks N=231	3 Online Trading Internet Banks N=144	4 Significant Difference Between the Groups?
Return on Assets	0.96	1.11	1.42	YES
Return on Equity	9.25	10.05	13.55	YES
Interest Margin to Assets	1.61	1.74	1.70	
Noninterest Margin to Assets	-1.02	-1.45	-1.89	
Noninterest Income to Assets	0.64	0.68	0.95	YES *
Noninterest Expense to Assets	3.01	3.09	3.48	YES *
Net Commission And Fees to Assets	0.57	0.65	0.73	YES
Total Commission And Fees to Assets	0.81	0.94	1.04	YES
Non-performing Loan to Assets	3.60	3.41	3.50	
Doubtful Loans to Assets	1.78	1.63	1.72	
Stock Return To Assets	3.65	4.73	5.08	YES
Standard Deviation of Stock Returns	0.61	0.52	0.49	YES

Note: “Internet Bank” Related Activities by banks include (Web-based, Homebanking, E-commerce Arcade; Secure Electronic Transaction, or Online Trading). If the mean statistics are statistically different from each other at least at the 10 percent significance level, we put YES. YES * means significant in only one of the comparisons.

Table 5 – PANEL B
Different Groups of Italian Internet Banks Comparison Among “Any Internet Bank”,
“Active Internet Bank” and “Online Trading Internet Banks”
ASSET-LIABILITY MANAGEMENT VARIABLES - 1993-2000

Variables /Ratios (percent)	Internet Banks			
	1	2	3	4
	Any Internet Banks	Active Internet Banks	Online Trading Internet Banks	Significant Difference Between the Groups?
	N=458	N=231	N=144	
Assets	16,283	17,404	23,114	YES
Equity to Assets	8.10	7.93	7.59	YES *
Liquid Assets to Assets	30.42	28.16	23.48	YES
Trading, Securities and Investments to Assets	19.57	20.42	26.95	YES
Investment Securities to Assets	3.02	3.69	8.40	YES
Deposits to Assets	72.71	70.11	62.18	YES *
Demand Deposit To Assets	26.45	25.14	22.20	YES
Saving Deposit to Assets	3.59	3.23	3.01	YES
Off Balance Sheet Activities to Assets	11.73	11.94	15.43	YES *
Loan Loss Provision to Assets	0.86	0.84	0.80	YES *
Bank Branches	63	74	88	YES

Note: “Internet Bank” Related Activities by banks include (Web-based, Homebanking, E-commerce Arcade; Secure Electronic Transaction, or Online Trading). If the mean statistics are statistically different from each other at least at the 10 percent significance level, we put YES.

YES * means significant in only one of the comparisons.

Table 6
Performance Growth Since the Adoption of Internet Banking Technology
services: Active Internet Bank 1993-2000

Variables /Ratios (Growth)	Adoption + Year 1 N=78	Adoption + Year 2 N=70	Adoption + Year 3 N=48	Adoption + Year 4 N=30	Adoption + Year5 N=11
Return on Assets	5.7%	6.3%+	16.1%	21.4%	22.0%
Return on Equity	4.0%	5.8%	13.3%	16.3%	15.1%
Interest Margin	0.76%	1.04%	2.9%	3.5%	3.5%
Noninterest Margin	0.10%	0.69%	2.6%	2.8%	2.9%
Noninterest Income	6.0%	7.4%	6.8%	9.3%	10.5%
Noninterest Expense	19.4%	15.60%	11.28%	9.4%	8.4%
Net Commission And Fees	12.8%	14.9%	16.2%	17.8%	25.1%
Total Commission And Fees	14.2%	16.6%	17.9%	21.0%	23.5%
Non-performing Loan	0.88%	1.6%	3.9%	4.6%	4.2%
Doubtful Loans	1.4%	1.8%	2.9%	2.6%	2.0%
Stock Return	7.2%	8.7%	14.9%	15.8%	12.9%
Standard Deviation of Stock Return	9.9%	10.1%	8.3%	6.6%	6.0%

Growth Percentages are Relative to Adoption Year's Performance Ratios.

Table 7
Internet Adoption and Performance Correlates
OLS Pooled Estimate of Active Internet Banks 1993-2000

Intercept	Dependent Variables			
	ROA	ROE	Net Commission and Fee Income	Stock Return
Variables	Regression 1	Regression 2	Regression 3	Regression 4
	Parameters (t-stat)	Parameters (t-stat)	Parameters (t-stat)	Parameters (t-stat)
Intercept	-8.48 (1.83)+	-7.56 (2.05)*	0.012 (1.89)+	0.085 (3.51)**
Log of Assets	0.18 (1.56)	0.45 (0.89)	0.06 (3.85)**	0.18 (1.72)+
Loan to Assets	0.08 (1.03)	0.08 (1.67)	-0.01 (1.22)	0.01 (0.43)
Liquid Assets to Assets	-0.02 (2.04)*	-0.06 (1.89)+	-0.01 (1.58)	-0.15 (2.03)*
Non-performing Loan to assets	-6.23 (3.81)**	-4.41 (2.52)*	-0.012 (1.51)	-2.50 (1.86)+
Deposit to Assets	-0.01 (1.36)	0.18 (1.26)	0.01 (1.63)	2.02 (1.34)
Off-Balance Sheet Activities to Assets	0.39 (1.60)	0.32 (2.11)*	0.38 (2.91)**	0.27 (2.16)*
Logarithm of Per Capita Income in a Given Year	0.05 (1.51)	0.24 (1.73)+	0.16 (1.42)	0.23 (1.08)
Branch to Asset	0.04 (2.02)*	0.01 (1.56)	0.18 (2.44)*	0.012 (1.70)+
Internet Adoption Dummy	0.03 (3.42)**	0.03 (3.17)**	0.041 (4.39)**	0.09 (3.62)**
Adjusted R-Squared	.2062	.1658	.1855	.2042
F-Statistics	14.51**	9.08**	10.11**	9.14**
Number	650	650	650	215

Note: The Dummy Internet variable takes a value of 1 for banks with Active Internet Bank Sample; otherwise it takes a value of zero. Alternative dummy variable measurements e.g., using online trading banking firm taking a value of 1 provides similar estimation although the internet dummy variable while significant report weaker t-statistics relative to the reported ones. The year dummy variables did not provide any significant information that warrants detailed analyses therefore not reported in the table.

Table 8
Internet Adoption and Performance Correlates
OLS Pooled: Active Internet Bank Sample
Pooled Growth Estimates 1993-2000

Intercept	Dependent Variables			
	YEARLY GROWTH OF			
	ROA	ROE	Net Commission and Fee Income	Stock Return
Variables	Regression 1	Regression 2	Regression 3	Regression 4
	Parameters (t-stat)	Parameters (t-stat)	Parameters (t-stat)	Parameters (t-stat)
Intercept	8.11 (2.15)*	7.90 (1.85)+	6.11 (2.12)*	3.42 (2.28)*
Log of Assets	0.15 (1.30)	0.18 (1.24)	0.22 (1.76)+	0.36 (2.02)*
Loan to Assets	0.15 (1.68)+	0.18 (1.73)+	0.22 (1.70)+	0.35 (2.00)*
Liquid Assets to Assets	-0.01 (0.08)	-0.004 (0.03)	-0.01 (0.15)	-0.02 (0.80)
Non-performing Loan to assets	-0.32 (1.02)	-0.29 (0.84)	-0.20 (1.06)	-0.28 (0.72)
Deposit to Assets	0.10 (0.81)	0.14 (0.75)	0.18 (0.54)	0.10 (0.61)
Off-Balance Sheet Activities to Assets	0.42 (2.16) *	0.48 (1.75) +	0.32 (2.51)*	0.15 (2.63) *
Logarithm of Per Capita Income in a Given Year	0.02 (2.21) *	0.01 (2.05) *	0.01 (2.43) *	0.02 (3.11)**
Branch to Asset	0.02 (1.63)	0.01 (1.57)	0.02 (1.99)*	0.05 (1.88)+
Internet Adoption Dummy	0.34 (2.59) *	0.18 (2.26) *	0.43 (4.56) **	0.92 (4.01) **
Adjusted R-Squared	10.73	9.01	9.82	16.30
F-Statistics	3.55 *	3.06 +	3.12 *	4.59 *
Number	562	562	562	184

Note: The Dummy Internet variable takes a value of 1 for banks with Active Internet Bank Sample; otherwise it takes a value of zero. Alternative dummy variable measurements e.g., using online trading banking firm taking a value of 1 provides similar estimation although the internet dummy variable while significant report weaker t-statistics relative to the reported ones. The year dummy variables did not provide any significant information that warrants detailed analyses therefore not reported in the table.

Table 9
Internet Adoption and Bank Risk Performance
Active Internet Bank Sample 1993-2000

Intercept	Dependent Variables		
	Non-Performing Loan to Assets	Doubtful Loans To Assets	Standard Deviation of Stock Returns
Variables	Regression 1	Regression 2	Regression 3
	Parameters (t-stat)	Parameters (t-stat)	Parameters (t-stat)
Intercept	-2.76 (1.01)	-1.19 (1.68)+	2.17 (0.61)
Log of Assets	-0.18 (1.90)+	-0.26 (1.58)	-0.21 (1.77)+
Loan to Assets	0.02 (2.98)**	0.17 (2.36)*	0.06 (1.43)
Liquid Assets to Assets	-0.02 (5.68)**	-0.01 (3.76)**	-0.04 (2.66)*
Deposit to Assets	-0.06 (1.51)	-0.49 (0.83)	-0.51 (1.27)
Off-Balance Sheet Activities to Assets	-1.02 (1.75)+	-0.81 (1.82)+	-0.26 (2.99)**
Last Year's Nonperforming Loan or Doubtful Loan to asset	0.71 (1.98)*	0.02 (1.54)	0.64 (1.21)
Logarithm of Per Capita Income in a Given Year	-0.36 (1.82)+	-0.75 (1.87)+	0.23 (1.21)
Branch to Asset	-0.07 (2.63)*	-0.12 (2.41)*	-0.012 (1.42)
Internet Adoption Dummy	-0.13 (1.60)	-0.41 (1.56)	0.03 (1.81)+
Adjusted R-Squared	8.46	7.98	12.46
F-Statistics	5.02 **	4.74 **	5.76 **
Number	562	562	184

Note: The Dummy Internet variable takes a value of 1 for banks with Active Internet Bank Sample; otherwise it takes a value of zero. Alternative dummy variable measurements e.g., using online trading banking firm taking a value of 1 provides similar estimation although the internet dummy variable while significant report weaker t-statistics relative to the reported ones. The year dummy variables did not provide any significant information that warrants detailed analyses therefore not reported in the table.

Table 10
Logit Regressions
Factors Likely to Influence Internet Adoption

	<i>Adoption of Internet Activities</i> Dependent Variable="Active Internet Bank" Web Dummy, Adopter=1, Non-adopter=0		<i>Adoption of Internet Activities</i> Dependent Variable=Adopter of "Online Trading Internet Bank" Dummy, Adopter=1, Non-adopter=0	
	Parameter	Chi-Square	Parameter	Chi-Square
Intercept	0.14	(4.98) **	0.11	(3.50)**
Logarithm of Assets	0.01	(3.04)*	0.01	(4.16)**
Loan to Assets	0.03	(1.03)	0.02	(1.09)
Past Year's ROA	0.02	(2.72)*	0.01	(2.99)*
Nonperforming Loan To Assets	0.18	(1.81)+	0.12	(1.85)+
Deposit to Assets	0.33	(1.20)	0.31	(1.27)
Off-Balance Sheet Activities to Assets	0.19	(1.98)+	0.22	(1.99)+
Branch to Assets	0.06	(2.68)*	0.13	(2.77)*
Group Dummy (if the bank is part of a banking group then Group=1, else Group=0).	0.11	(3.09)*	0.18	(3.54) *
Stock Dummy (if the bank is a stock bank then Stock=1, else Stock=0)	0.45	(3.76)**	0.52	(4.14)**
Model Statistics (N=562)				
-2 Log L	296.41		276.23	
Chi-Square	78.86 **		70.44 **	

Note: ** , * and + mean significant at 1, 5, and 10 percent significance level respectively.

APPENDIX-1

Additional Information of Table 7

	ROA	ROE	Net Commission and Fee Income	Stock Return
Variables	Regression 1	Regression 2	Regression 3	Regression 4
	Parameters (t-stat)	Parameters (t-stat)	Parameters (t-stat)	Parameters (t-stat)
1994	-0.01 (2.20)*	-0.001 (2.01)*	-0.002 (5.02)**	-0.01 (1.71)+
1995	0.021 (1.34)	0.001 (1.04)	0.001 (1.68)+	-0.001 (1.69)+
1996	0.01 (0.82)	0.001 (0.22)	0.001 (1.74)+	0.01 (3.59)**
1997	-0.001 (2.51)*	-0.002 (2.01)*	-0.001 (2.53)*	-0.01 (0.90)
1998	0.001 (0.91)	0.001 (0.29)	0.002 (0.61)	0.02 (2.31)*
1999	-0.001 (2.99)**	-0.002 (3.37)**	-0.001 (2.06)*	-0.050 (1.01)
2000	0.001 (1.28)	0.001 (0.96)	0.002 (1.18)	0.61 (1.52)

APPENDIX – 2²

INTERNET AND TECHNOLOGY RELATED ISSUES IN ITALY: GENERAL STATISTICS

Italy is the fourth largest economy in Europe and the seventh largest in the world. In the last 50 years, Italy has moved from a primarily agrarian society to a modern post-industrial economy. This extremely rapid economic development has been unique among Western nations and has had a strong impact on Italian culture and society. Jobs and work in Italy today encompasses all the different stages of modern economic development at the same time. Especially in the Southern part of the Peninsula, many Italians still earn their livings as small farmers and fishermen or as skilled artisans, selling what they create with their own two hands. At the other end of the spectrum, Italian design and engineering know-how is playing an important role in the creation of the space station. “If one were to chart technological development on a linear scale, one could accurately place Italy at both the beginning of the scale, the end of the scale and at every point in between”³.

The competitive and growing nature of Italy’s society and economy extends to its usage and development of web-based services and technology. The number of Italian web users at the end of 1999 was 8.2 million (14.3% of the total population)⁴. As of October 2000, about one out of every two Italian households owned a PC⁵ and, according to a study done by GartnerGroup, 97% of Italian businesses are connected to the internet and 76% have their own website. However, other research⁶ indicates that Italy is behind the US and the other European countries in web usage. This is illustrated by the number of active web servers in

² I am grateful to Elisabetta Gentile for research assistance on this Appendix-2. A large portion of the report in this appendix is taken from different Italian business newspapers, journals, and websites with appropriate citation. Her language skill and ability to summarize materials for me was simply excellent. Most materials in this appendix are not original contributions by myself or Elisabetta rather they are summary of other work with our own aggregation and editorial imaginations. However, I recognize her contribution in this section (appendix 2 only) not only as my assistant but as my co-author (for this section). The key intention of this appendix is to give readers to have a thorough idea on the developments of technology and internet activities, both in the corporate world and banking world, from a historical to current perspectives. It is written more from a business point of view rather than the academic point of view I have followed in the main component of my paper.

³ Williams, Brendan J. *Italy and the Internet*, www.webworld.com.

⁴ *I Dati Il Sole* 24 Ore, September 13 2000, data from the SMAU Ict 2000 Observatory.

⁵ Osborne, Jim *Unicredito to Give Computer, Internet Access to 37,500 Staff*, Bloomberg Financial News, February 2001.

⁶ *La Rete in Cifre*, *Il Sole* 24 Ore, September 13 2000, study conducted by the Internet Software Consortium.

these countries: in July 1999 there were only 724,000 active web servers in Italy, whereas there were 32 million in the US, 2.5 million in the UK, 2.1 in Germany and 1.3 million in France. There are several reasons why the Internet has not taken off as quickly in Italy as it has in other industrialized Countries. First of all, the national average of PCs present in homes is relatively small. However, it is important to notice that this average varies sensibly between the roaring industrialized Northern part of the Country and the less developed South. Another obstacle to the development of the Internet is that in Italy, as in most European countries, one is charged for local phone calls⁷. About four years ago Italy's center-left coalition convinced Telecom Italia, then the national telephone company, to create a special reduced rate for home connections, but Telecom discontinued this plan soon after its privatization. Given those premises, e-commerce has also been slow to develop in Italy: the Italian distributive structure, which largely consists of numerous small, specialized shops (if compared with actual US trends), is not suited well to e-commerce. There is a general fear of web-based interactions and Italians have historic diffidence towards commerce that is not face-to-face and prices online are not as competitive as they are in more traditional venues and credit card usage in Italy is low⁵. Concerns about security have also discouraged web usage, especially for Internet Banking. At least from a legislative perspective, however, Italy is at the forefront in this area. The Bassanini Law⁸, which was recently passed states that:

“The acts, data and documents signed by the Public Administration and by private customers with telecommunications or internet-based methods, contracts made with this methods, as well as their storage and transmission, are valid and relevant to all of the effects of the law”.

This official recognition by the Italian Government of the concerns posed by Internet transactions is an important first step towards increasing consumer confidence in e-commerce¹. There are many other positive indications regarding the future of web usage in Italy than a comprehensive legislative framework. The cultural diffidence towards the Internet is subsidizing, and it has now gained mainstream acceptance. Italian businesses have finally realized that the Internet is a necessity, because of the dramatic boost it represents for global competition⁹.

It is also possible that Italy could become one of the largest markets for Internet services, if

⁷ *La Tariffa Urbana a Tempo Stozza la Crescita di Internet in Italia*, Il Manifesto, September 17 2000.

⁸ Law n. 59 March 15 1997.

⁹ Barba, Paolo *Ora Sì che il Mercato è Senza Frontiere*, Il Mondo, November 17 2000.

these services become more oriented towards cell phone users in the future¹⁰. In fact while Italy, when compared to the sixteen European nations, the US and Japan has one of the lowest concentrations of computers, phone lines and web servers, it is second only to the Scandinavian countries regarding its concentration of mobile phones¹¹. The Internet probably offers the greatest advantages to Italy's small and medium-sized companies, which have been the driving force behind Italy's economic development. Currently, these companies use the Internet primarily for business-to-business transactions. The Internet allows them the global access to consumers and producers that was previously available only to large companies. At the same time, they will be able to retain the flexibility and efficiency that have allowed them to compete with larger companies. The opportunities offered by the Internet to Italian businesses and banks have been compared to a tornado: they don't know exactly when it is going to arrive, but they are all working to be ready.

1. Mobile Financial Services

The present Italian projects and pilots on mobile commerce and mobile payments mark a qualitative leap. It is an important step towards the mobile telephone as the easiest, most flexible and widespread smart-card-based operating platform for everyone. Mobile telephony is becoming such a determining factor in the acceleration of Internet penetration that Italy is coming closer and closer to the forerunning countries¹².

Italian people are learning that in everyday life mobile phones can be used for more than just making phone calls. An important aspect, in this sense, is the expected convergence between mobile phones and the Internet. Market research¹³ indicates that today 67% of all Italian families have at least one cellular phone (up by 75% against June '99). Ovum expects that in 2005 there will be 63.6 million mobile phones in Italy, which is more than one mobile phone per resident¹⁴! More than half of the Italian population will participate in mobile commerce in 2005. It is estimated that by 2004, 61% of the mobile phones in use in Italy will be Internet enabled¹⁵. In terms of leading applications, such financial services as mobile brokerage,

¹⁰ Williams, Brendan J. *Italy and the Internet* www.webworld.com.

¹¹ Data GartnerGroup (2000).

¹² Bucci, Piero *Mobile Financial Services and M-payments in Italy*, <http://epso.jrc.es/newsletter/vol01/1-4.html>.

¹³ Source: "eFamily" research by Federcoming and Niche Consulting.

¹⁴ The Italian population is about 57.5 million units.

¹⁵ Source: Forrester Research (2000).

mobile payment and mobile banking will be the second-largest revenue source¹⁶.

Since the second half of 1999 the main Italian banking institutions have launched on the market a variety of E-Banking services (Internet banking, online trading, etc.) connecting more than two hundred thousand clients. They are now starting to integrate such services with the mobile services also including mobile phone payments¹⁰. In terms of marketing, Italian banks believe that providing mobile payment services to their customers is one of the first priorities.

Telecom Italia Mobile (TIM)¹⁷, together with Oberthur Card Systems and Società per i Servizi Bancari (SSB) has developed a system that allows the mobile phone user to carry out banking functions and m-payments. Only the number of the authorized mobile phone is required to make payments. To activate the services, TIM customers must go to their own banks, sign a contract and authorize the payment instruments at their disposal. From that moment, the mobile phone is enabled to display a special menu for handling payment transactions. The transmission of the data from the SIM card to the mobile network is managed from the SAT already active on the TIM network. In addition to the GSM standard and bank codes on the SIM card, security is guaranteed by the fact that the payment instrument identification data is not transmitted on the network.

As it is going to be discussed in further detail in the next section¹⁸, TIM and Banca Popolare di Milano have jointly launched We@TIM, a set of services for online trading, mobile banking and general access to e-commerce. These services are based upon a smart card supplied by TIM that can be used on TIM mobile telephones with dual-readers. We@TIM customers can also buy and sell shares, consult their own bank accounts, transfer funds or make use of all the electronic services of *BPM*.

There are further important agreements signed by TIM, for instance with the Monte dei Paschi di Siena Group or with Yahoo! Europe in order to provide TIM customers with a comprehensive range of WAP contents and services¹⁹.

¹⁶ Source: Durlacher Corp. (1999).

¹⁷ <http://www.tim.it>

¹⁸ See paragraph II.2.

¹⁹ See paragraph II.3.

Omnitel²⁰ has launched a trading service along with Self Trade, a French broker on the Net. On *Omnitel 2000* it is possible to buy and sell online, either by accessing the Internet site or WAP²¹. The agreement allows Omnitel clients to operate this service with a Self Trade account. Omnitel's Telematic Payment System Division is also developing value-added services for customers in the field of payments via the Web and GSM/UMTS. To this end, Omnitel plans to create opportunities for collaboration with the Italian banking system sector in order to develop online transaction services. Omnitel is also starting a mobile auction service targeted for its customers.

Blu²² and Nokia have signed a turnkey contract for the supply and rollout of network solutions for their GSM network. Blu is probably also going to adopt the Nokia Electronic Mobile Payment System (EMPS) technology. The EMPS is a joint project between Nokia, MeritaNordbanken and Visa in the area of payment and it was demonstrated during the last CeBIT 2000. The Nokia solution showed how the WAP and Personal Area Network (PAN) connectivity technologies enable customers to purchase either via online transaction over the Internet or at the merchant point-of-sale by using a WAP enabled phone with a reliable credit card payment. This involves the Europay, Mastercard and Visa (EMV) compliant bankcard, WAP Identity Module (WIM) and Secure Electronic Transaction (SET) technologies. This year in June Banca Nazionale del Lavoro, which owns a 7% share of Blu, started a mobile trading operation on the normal dual band GSM SAT with a Blu On SIM card.

Wind²³ and Bull Italia signed an agreement last year, which gave Bull the task of defining a new Wind company card, based on Bull technology. Such an initiative should prepare new innovative mobile payment services even if, at present, there is no public information available. Since there is strong pressure coming from competitors, it is easy to foresee that Wind will react in the near future by introducing m-payment services.

Italian Investors

In the 1990-2000 decade, investing habits of Italian people underwent such a rapid and

²⁰ <http://www.omnitel.it>.

²¹ <http://www.2000.it> or <http://wap.2000.it>.

²² <http://www.blu.it>.

²³ <http://www.inwind.it>; <http://wind.it>.

intense evolution that the “BoT people”²⁴ times seem to be light-years away. In comparison with savers from other Countries, Italians keep investing more in real estate, but it looks like the Stock Exchange has become some kind of ‘national hobby’: 22.7% of the sample analyzed in the BNL / Centro Einaudi survey declare to own stocks. This *asset class* represents about 40% of financial wealth, which is equivalent to the value reached by State bonds in the mid-1990s, at their maximum splendor. Italians investing their saving through the Stock Exchanges are 7 millions by now.

According to the BNL / Centro Einaudi report⁷, in 2000 the Italians’ average portfolio was divided among current account deposits (15.2%), BOT (4.3%), CCT (4.3%), BTP (8.4%), deposit certificates (3.6%), domestic stocks (34.9%), foreign stocks (5.7%) and mutual funds (23.6%). From this standpoint, therefore, we can infer signals of investors’ maturity. However, this increased interest in stocks is also a sign of a “speculative will”²⁵.

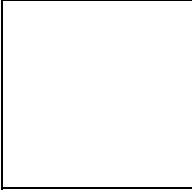
Another interesting insight, emerging from this survey, is that Italian families save less and less. From 30% of income in the 1970s, the average family saving has decreased to about 11%. This is a common trend in almost all industrialized countries, with which intermediaries have to cope. Also, people express dissatisfaction for the results of their investments, which was already present in 1999, but that in 2000 turned into a “do-it-yourself” choice. Naturally, in this evolution, Internet has played an ‘accelerator’ role. Some observers believe that the traditional *close relationship* between a bank and its customers is going to change; others believe that in the long run the new channel will strengthen the preexisting bonds, thanks to the new distance services²².

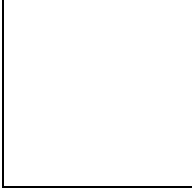
Italian savers’ behavior is becoming more and more active and characterized by autonomous choices. They are taking advantage of the new variety of financial instruments they are offered, as a consequence of financial liberalization and integration in the European Markets. Also, from the year 2000 they could enjoy new operating possibilities, thanks to the application of *IT* to mass services. The year 1999 was the year of the “frustrated saver,” for a series of reasons:

► **low returns on bonds**, where most of the investments had been allocated;

²⁴ Russo, G. and Valletta, M. Editors (2000) *Un Risparmiatore “Fai da te”*, XVIII Rapporto BNL/Centro Einaudi sul risparmio e sui risparmiatori in Italia.

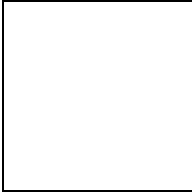
²⁵ *Con Internet Risparmiatore Fai da te*, in Osservatorio del Credito, http://sole.ilsole24ore.com/credito/problemi_settore.htm.

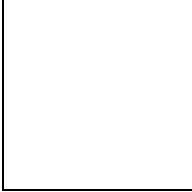
 an unresolved **social security issue**, with the public pensions reform yet to be approved and integrative pension funds that couldn't 'take off' because of strict regulations;

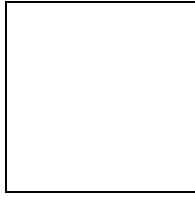
 increasing importance attributed to **immediate returns** and **liquidity** of financial instruments.

These variations are coherent with the general economic climate, characterized by a slight but significant restarting of inflationary expectations (because of the dollar and oil prices) and of the high volatility of Stock Markets, which have been (directly or indirectly) the main source of diversification for family assets in the latest 5 years.

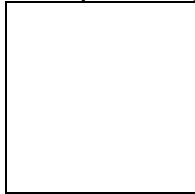
In the year 2000 the "do-it-yourself" trend in investments proved itself in several ways:

 the increasing importance of **direct investment** – that is, not mediated by mutual funds – in stocks and in particular the share of it that has been channeled through online trading increased dramatically;

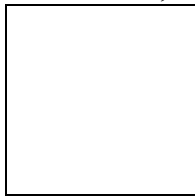
 the decision made by many investors to operate on their own on the market, as a form of integrative social security, instead of adhering to collective pension funds (few of them show a good knowledge of the possibilities offered by private pension funds);



more and more investors declare they find it harder to make investment choices (according to KPMG Consulting, ‘pessimists’ are 22.7% more than ‘optimists’) but they tend seek for higher quality information autonomously;

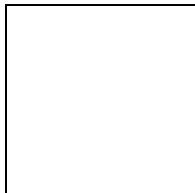


it looks like investors have set a **delegation limit** to their intermediaries: about 50% of the sample would entrust the management of their savings to a FI – mostly their bank – and this percentage remains more or less constant, despite of the increased volume of total investment.

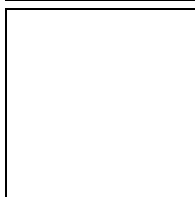


However, in 2000 the investors’ **trust** in their banks is still a key factor. Do it yourself doesn’t mean ‘do without a bank’; instead, banks score higher in investors’ recognition.

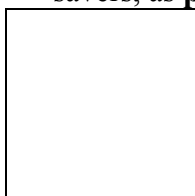
Banks act as qualifying subjects, in that they:



provide **platform services**;

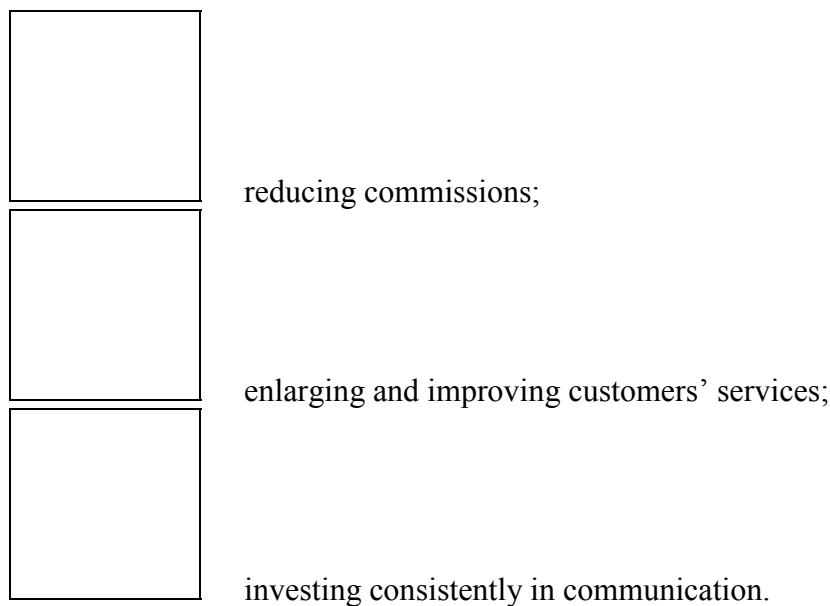


contribute to “manufacture” such financial products, requested by the savers, as **protected investments and mixed insurance-financial services**;



integrate financial products with those **add-ons** particularly appreciated by investors, for example packages that lower costs for traditional banking services or enhance their value.

Italian banks are facing radical changes: from pure intermediaries of savings, they are becoming “engineers” of new financial products and services, contenting the savers’ new needs as soon as they arise. At first, online intermediaries have lowered their commissions in order to attract new customers, but it was soon evident that it is not enough to earn larger market shares. It is vital to satisfy the needs of do-it-yourself savers by offering more services, mostly in terms of information and consulting. In its report, KPMG Consulting isolates three growth determinants:



At the end of 1999 the winners of this challenge were Fineco and Directa, for both the number of customers (63% the former and 15% the latter, without considering the home banking customers) and the volume of intermediated investments (52% for Fineco and 34% for Directa). This ranking is confirmed also at the end of 2000. The value of intermediated investments in the same period shows that this market has a high degree of concentration. In fact, the first 8 operators (Fineco, Directa, Imi Web Trader, BancaSella, Banca 121, TradeIntesa and group channels, Xelion and group channels, Paschihome) intermediated about 90% of the whole online activities and 9.9% of the Italian Stock Exchange’s whole intermediated amount.

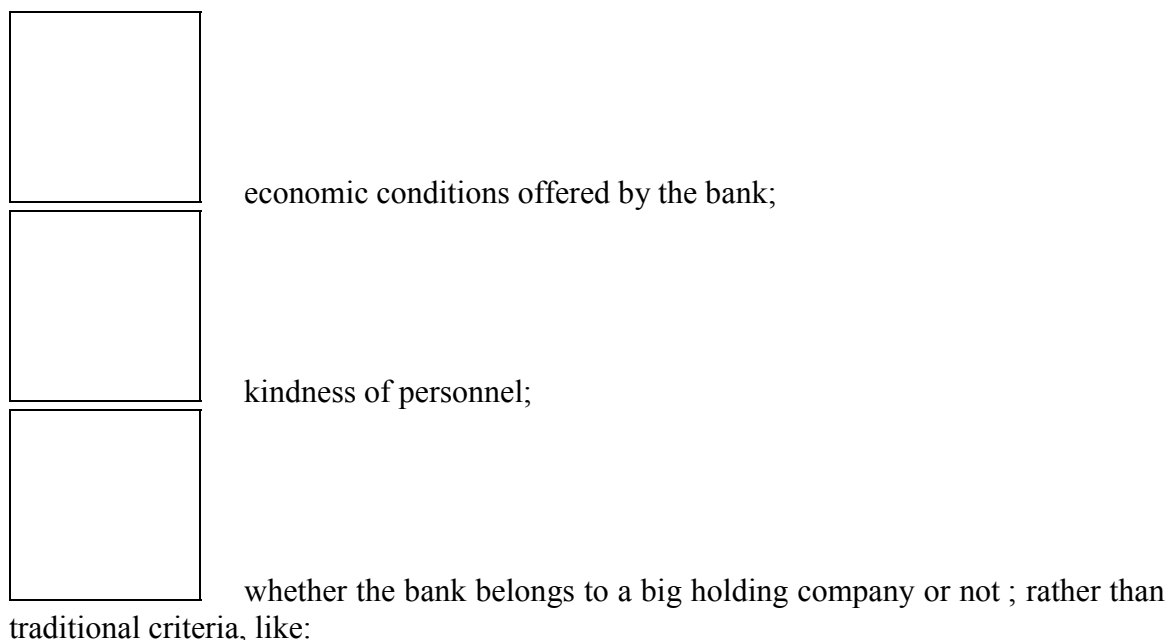
Exactly like in the US, in Italy online trading is spreading more quickly among private savers than online banking, which is still used mostly by firms. On this basis, observers²⁶ foresee a relatively rapid development of a particular category of accounts: the ones that brokers offer

²⁶ *Banche: Come le Scelgono gli Italiani*, in Osservatorio del Credito (2000).

online, allowing savers to buy and sell shares in real time. It has been estimated⁷ that in the mid-term the potential *clientèle* for Internet-based banking services will be 15-20% of Italians having a bank account. This means that it will not be a *niche* service, but it won't even be a mass phenomenon for a long time²⁷.

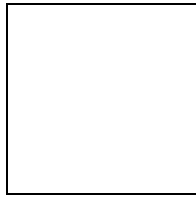
The BNL / Centro Einaudi report shows that in 2000 only 5.7% of the sample declared to carry out online transactions regularly. The typical user of distance banking services lives in the North-western regions of the Country, is between 30 and 44, employee or shopkeeper, with a medium education level and relatively high family income. These individuals appreciate the most the possibility to carry out the normal account transactions from home, but soon after this comes online trading. Finally, what strikes the most is the high level of satisfaction shown by those who already use Internet banking: 63% of the sample declare themselves 'extremely satisfied', 28.6% are 'sufficiently satisfied' and only 2.9% are 'unsatisfied'.

The backlash that Italian banks have to expect is the weakening of customer loyalty²⁸. Internet offers users a chance to immediately highlight strengths and weaknesses: if an intermediary is not able to offer quality products and services, customers will move elsewhere. The BNL / Centro Einaudi survey shows that when choosing a bank Italians are giving increasing importance to such criteria as (see, also Table 3 in Appendix):

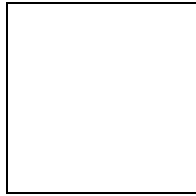


²⁷ Remoli, Francesco *Il Trading Online in Italia: Le Leve Competitive* Graduation Thesis, Università degli Studi di Roma Tre, A.Y. 2000-2001

²⁸ *Banche e Internet: Arriva l'e-banking di Seconda Generazione*, in Osservatorio del Credito, www.ilsole24ore.com.



closeness to home or workplace;



existence of a dated relation with that particular bank (the so-called 'family bank').

At a first glance, e-commerce and Internet banking (*IB*) are not as popular in Italy as they are in other European countries (see Table 1 and Figure 1). Of the 8.5 million Italians who used the Internet in June 2000, only 14.5% bought goods and services online²⁹ and only 3.5% of Italian bank clients used online banking services, as opposed to 12% of German and 25% of Swedish bank clients³⁰. However, latest research from Jupiter MMXI³¹ shows that Internet users in Italy are second only to the Germans in the amount of time they spent on finance sites in May 2001 (see Table 2). One in three Italians (31.9%) visited financial information sites, such as *Ilsole24ore.com*, *Voltrade.it* and *Borsitalia.it* as well as banking sites, such as *Fineco.it*, *Cartasi.it* and *Cariplo.it*. They spent on average 58.3 minutes on these sites in May 2001.

Who Are the Traders?

Affirmed professionals: entrepreneurs, executives or managers, with a level of education ranging from high school to a college undergraduate or graduate degree, who know the Internet and have enough money to play the Stock Exchange: that's the identikit of the Italian do-it-yourself savers, born of the new economy and emerged from the BNL / Centro Einaudi report. It has been estimated that today there are at least 100,000 such savers in Italy. They reside in the Northwest and Center-North of the Country; Northeastern investors are more cautious, while Center-Southern and Southern Italian investors have fewer resources. For all

²⁹ Barba, Paolo and Ferro, Luigi *Nel Rapporto con il Pubblico, ma Soprattutto tra Aziende, il Business via Internet Rivoluziona le Strategie Distributive*, *Il Mondo*, July 21 2000.

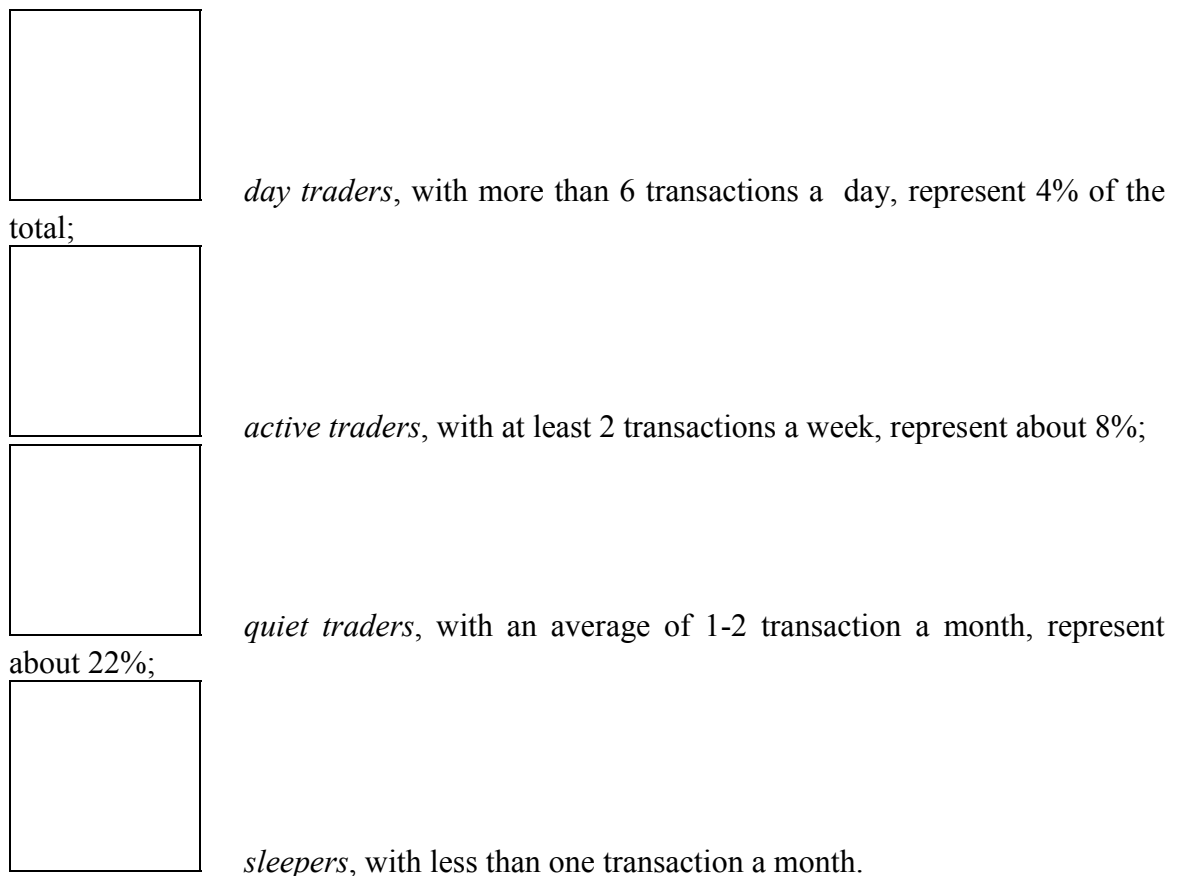
³⁰ Wason, Eleanor *Italian Internet Banking Doubled in 2nd Half of 2000*, Bloomberg Financial News, March 28 2001 – data from a survey produced by KPMG Consulting, Inc.

³¹ http://uk.jupitermmxi.com/xp/uk/press/releases/pr_070401.xml.

of them, however, trading is above all a hobby: they go back home from work and spend the night buying and selling on the Internet. At the moment this is still a small group, but figures show a dramatic upward trend.

Almost 61% of the users are between 18 and 34, while 32% are between 35 and 54 (this is the most interesting segment for financial services)³². The research also confirms that online trading activity and Internet usage show some similarities as to the *type* of user and usage. 43% of users connect from home, 33% from office and the remaining share from both³³. Statistics show that 26.4% of all online trading users have operated on the Stock Exchange; 63.6% of those behaved like real traders, both buying and selling securities.

The KPMG survey³⁰ divides the population of traders into four main categories (see Table 4 and Figure 3):



The latter category represents the overwhelming majority of the population. Forecasts assess the number of Italian clients acquired by online trade around 3 million by the end of 2003. Thanks to both free Internet access and higher availability of such services as real-time

³² Source: KPMG Consulting, on Forrester Research data (2000).

³³ Scacchioli, M. *Trading Online, nel 2003 Tre Milioni di Clienti*, in Finanza e Mercati, Il Sole 24 Ore, September 29 2000.

information from the markets, Warrant and CW transactions, access to the main European and US Stock Exchanges and the possibility to have a personalized portfolio. As already mentioned earlier³⁴, a higher inclination to investing in stocks corresponds to a national maturation, in comparison with other Western countries that are already mature under this aspect. “Do it yourself”, as the mood for the beginning of the third millennium, means trust in one’s own analysis and choice skills: it is a sort of autonomous answer to the new needs developed by the savers, for which they can’t find an adequate institutional reply.

TRENDS IN THE BANKING SECTOR

Online banking is actually undergoing a worldwide phase of reconsideration and consolidation. Competition is cutthroat and some models have proven to be inadequate in terms of returns. Stock markets have been clouded since more than one year, with negative consequences on the trading activity and on the whole savings management system³⁵. Moreover, after the initial enthusiasm for cost cuttings and real time operability, little by little problems and gaps have emerged, first of all the absence of advising and human contact. To try to solve these issues, the various operators have put into effect different steps. In the US, several players are reviewing their strategies, raising the commission prices, eliminating the least remunerating services and often joining forces with traditional operators in order to integrate the different offers – graceful euphemism to indicate that they are acquired by large FIs.

In Europe the phenomenon of online banking started later than in the US, and there are still – although limited – growth margins. The Old Continent’s banking sector was more static than overseas, and this allowed young and aggressive virtual banks to gain relevant market shares. Even in Europe, however, Internet banking has set off for a rationalization process, which has seen some operators enter into the orbit of major groups and differentiate their offers, thus getting closer to their customers’ needs.

In this light, in Italy, the **multi-channel strategy** is playing an important role. Basically, the physical and virtual channel come alongside into contact with the customers, who have several instruments to interact with their bank: Internet, phone, WAP, traditional branches, brokers and financial shops. The latter ones are multifunctional structures where a client can

³⁴ See paragraph one.

³⁵ <http://digilander.iol.it/rominapaolucci/banche.htm>

receive consulting services and operate through computer instruments. The new trend is to go beyond the financial shop, to offer an even closer environment to the customers and their family members. In these new structures customers find human contact and technology, consulting and personalization. Financial activity lies at the center, but customers can find purely informative and service activities as well. These centers take financial shops as a starting point, but they are different for the multiplicity of online services and instruments. They represent a synthesis of the most advanced functions of modern credit institutions. The evolution that turned the banks from cash deposit centers to providers of advanced services has found a new outlet under the sign of technology.

Customer Needs

The banking market in Italy is fiercely competitive, with many leading financial institutions now developing a presence on the Internet. The challenge in online banking, therefore, is not simply to have website, but to devise a service that outclasses that of the competition in terms of facilities and functionality. Specifically, it means moving beyond the first and second generation of websites, which are designed more for the convenience of the institutions themselves and their back-office systems, than they are to benefit the customer³⁶.

The first generation of e-business saw companies establishing a static presence on the Web, with HTML-based websites that served as online brochures and catalogs. This was followed by web front-ends that linked to back-end order management and inventory control systems. That represented an advantage for many customers, as they were able to place and track orders directly from supplier websites, giving them more control. But the chief beneficiaries were still the companies, thanks to the reduced transaction costs of taking orders over the Net.

Online customers are becoming more sophisticated in their requirements and are beginning to expect services more customized and tailored to their individual requirements. They want to be able to access services when and where convenient, using a wide range of devices, from mobile phones to domestic TVs. The third-generation e-business implementations aim to meet this need.

Banking is one of the key sectors where third-generation e-business systems are being deployed. The latest e-commerce banking applications are converting the benefits of improved integration with back-office systems more effectively to deliver customer

advantages. Third-generation systems are beginning to emerge, focusing more than ever before on the customers and what they might want or find attractive.

What customers demand the most from home banking services are *security* and *reliability*. Customers expect third-generation services to be easy to access and simple to navigate. Speed and availability are essential. Links to a host of other services from news feeds to business information are now expected as a normal completion of the service (See Table 4 in Appendix for informative partners of the main online trading providers).

Traditional Credit Institutions and the Challenge of Internet Banking: The Case of Banca Popolare di Milano

Founded in 1865, with more than 400 branches all over Italy³⁷, Banca Popolare di Milano is a good example of how traditional Italian banking institutions have seized the new opportunities and sought to meet the customers' new needs. During the late 1990s, *BPM* decided it needed an innovative and pioneering Internet strategy; basically, the vision was to become a pioneer of Internet retail banking in Italy³⁸. The first outcome of this strategy was the launch, in 1998, of InLineaNet®, *BPM*'s initial online service. InLineaNet offered access to basic banking capabilities such as checking the status of customer accounts and making electronic payments online.

However, the bank saw this service only as a starting point, as it had ambitious plans to push Internet technology as far as it could possibly go in delivering highly customized, adaptable and responsive services targeted at a range of segments in the banking market in Italy. It wanted to move the third generation of e-business with a portfolio of services aimed at specific types of customers and tailored to their individual needs²¹.

October 1999 saw the launch of a far more comprehensive range of electronic banking services from *BPM* under the We@bank®³⁹ umbrella. Among the range of current and future services are full banking transactions, online trading, WAP services, financial news and non-banking services.

Within We@bank there are a number of solutions depending on individual user requirements. We@exclusive is designed for the most exclusive and consolidated clients who were among the first to use new *IT* solutions, contributing to their development with helpful suggestions.

³⁶ *Banca Popolare di Milano* <http://www.intel.com/eBusiness/casestudies/milano/>

³⁷ <http://www.bpm.it/chisiamo/index.html>.

³⁸ <http://www.intel.com/eBusiness/casestudies/milano/challenge.htm>.

We@finance is for clients who use the Internet everyday for their volumes of online trading, so they tend to be more technologically experienced and expert navigators. We@easy, as the name suggests, is for novices, or those with just basic requirements.

A range of further services will be added to the We@bank portfolio in the future. These will include: trading on NYSE and NASDAQ, smart card authentication, fast Internet access via ADSL, Reserved Bank access and more sophisticated third-generation e-business applications. Many of these will be developed and delivered in partnership with other leading players in the e-business market. The aim is to offer We@bank customers in the financial services sector the chance to create personalized portfolios on the basis of their propensity to risk. They will also be able to receive proposals of financial products, according to profile and investment possibilities. The service is being delivered thanks to a joint venture with California-based BroadVision, a world leader in personalized e-Business applications, which delivers new one-to-one marketing services to its clients.

Customers will also gain fast access to We@bank functions thanks to an agreement that has been signed with Telecom Italia on new technological solutions. The agreement will allow We@exclusive clients to use broadband Internet links based on the innovative ADSL technology free of charge. This makes transmissions on normal telephone lines 10 to 20 times faster.

BPM is also using smart card technology for pioneering third generation e-business applications, thanks to its partnership with TIM. *BPM* and TIM have joined forces to launch We@TIM, the most sophisticated online service platform in Italy, offering online stock exchange trading, mobile banking and electronic purse for broader access to e-commerce services. Access is based on a smart card, which can be used with a mobile phone, a PC or other Internet access devices such as Web phones or Web TVs. Ultimately the system will be used to provide access to a range of other non-banking services such as health care, identification systems, digital signature, electronic purse and mobile and fixed telecoms.

In another joint project, We@bank customers will be able to manage their own accounts using their home TV, thanks to an agreement with Freedomland-ITN TV. Customers of Freedomland-ITN will also be offered special conditions at We@bank, such as no fees or transaction charges on their current accounts. This type of service is entirely consistent with the move towards third-generation e-business applications at *BPM* because it allows customers to choose the means of access that best suits their needs. In addition to these

³⁹ <http://www.webank.it/>

various partnerships, We@bank has also started to offer non-banking services such as ticketing and insurance.

The New Operators: Banca 121

On October 14, 1999 Yahoo!® Europe announced a relationship between Yahoo!® Italy and Banca del Salento that would bring account information from Banca 121⁴⁰ accounts directly to the users of Yahoo! Finance and My Yahoo! in Italy⁴¹. At that time Banca 121 was the personal financial arm of Banca del Salento, specializing in online banking and trading. From December 1999, by using this new *OB* service, registered Yahoo! users can easily and securely view their Banca 121 current checking and savings account balances and transaction history, each time they go to Yahoo! Finance or My Yahoo!. Also, users will find a link to easily access the Banca 121 home page and its online banking and online trading service, to purchase and sell stocks and undertake transactions in real time.

The service provides users with secure online access to their bank account information. Both Yahoo! and Banca 121 employ the SSL⁴² security standard that is widely used by popular Internet browsers and merchants transacting on the web. All financial transactions – such as transfers between accounts – are securely performed on the Banca 121 website. Contemporarily, Yahoo! Finance provides users with a broad range of comprehensive financial services and information.

Banca 121 is the first bank in Italy to have implemented an integrated multi-channel strategy, articulated in branches, financial shops and teleboutiques in franchising, financial promoters and virtual banking (via Internet, phone, TV)⁴³. This allows to multiply the opportunities and channels of contact between the bank and its customers and to make financial services accessible without time, space and place limitations. The bank is characterized for the centrality of customers, the one-to-one and the innovation-oriented logic. The latter one, in particular, is based on the adoption of sophisticated but easy to use technologies.

Soon after the partnership with Yahoo! was announced, Banca 121 has been acquired by the Monte dei Paschi di Siena Group, a large bank holding company. It is actually present on the whole national territory with more than 300 sale points and 1200 financial promoters. Banca

⁴⁰ Read: Banca One-to-One.

⁴¹ <http://uk.docs.yahoo.com/pr/releases/itsalent141099.html>.

⁴² During transmission over the Web, SSL encrypts data to protect it from being read by anyone other than the intended recipient.

121 aims to offer the maximum service customization, with investment solutions which are looked on to after a comprehensive analysis of objectives, time horizon and degree of risk chosen by a single saver. The product portfolio includes, among other items, a large range of estate management, mutual funds and new generation accounts⁴⁴.

Banca 121 has recently launched I-AM.it⁴⁵, the first website which is entirely constructed by its users, through the participation to purposely created communities. For the firms, I-AM.it is a precious access to the Internet world, in terms of both visibility over a large and qualified public, and e-commerce opportunities.

In order to get even savers with less possibilities to invest, Banca 121 has created 4 YOU. 4 YOU is an innovative, and at the same time simple investment offer. It allows, through an original mechanism for the Italian markets, to literally “put together” a capital with monthly deposits of small amounts. It is, practically, a flexible and customizable investment, combining safety of the invested capital with the opportunities to seize investment advantages in the global marketplaces.

At this moment it is not possible to find detailed data on purely ‘virtual’ operators in the Italian banking sector. This appears to be due to two major reasons. On the one hand, as already stressed in Section II, there is a cultural factor to take into account. For Italians, especially in the Southern part of the Country, personal contact is vitally important when it comes to making business. On the other hand, as the phenomenon of *IB* has started later than in the US and other industrialized countries, the Italian operators have been able to learn from the other countries’ experiences. Especially in the US, the strategy of cutting costs by interacting with the customers only virtually has proven to be unsuccessful, mainly because of the lack of consulting services provided. Both of these considerations call the multi-channel strategy into the action.

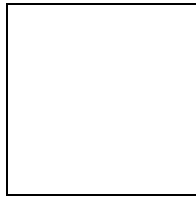
The two cases described above, Banca Popolare di Milano and Banca 121, lead to further conclusions. The former has been chosen as an example of how traditional banking institutions have foreseen an evolution in customers’ needs and the steps they have taken to fulfill them; the latter is an example of new actors, who milked the new technology to gain a market share.

For both of these categories of operators, the guiding principles seem to be the same:

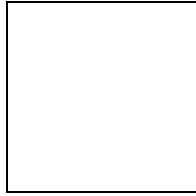
⁴³ http://www.confcommerciocl.it/conv_banca121.htm.

⁴⁴ <http://www.banca121.it>

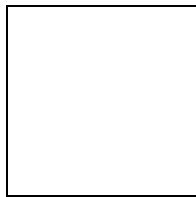
⁴⁵ <http://www.i-am.it/app/liv1/calendario00.asp>.



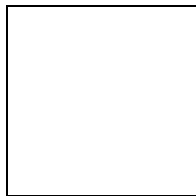
Customer-centric, or customer-oriented structure;



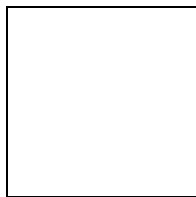
one-to-one logic;



diversification and customization of financial offers;



contemporary use of the virtual channel and the traditional channel to interact with the customers;



use of the new channels to offer also non-banking services.

On the long run, this common set of organizational values will lead these institutions to shape their structures similarly. The online communication channel will also allow former operators in the wholesale financial services sector to directly reach customers, without intermediation in between and thereby offering lower costs. This suggests that in the long run, as the retail-wholesale banking barriers are eroded, financial institutions will tend to be bigger in size and to offer services both on a customer and business-to-business basis.

Despite the most pessimistic forecasts⁴⁶, the these first years' experience of *IB* in Italy suggest that the traditional close client-bank relationship will be strengthened, not broken by the settlement of these new technologies as a part of everyday life. This can be affirmed, again, because banks are choosing to combine this new channel to the more traditional services, instead of switching to it. This means that for customers *IB* will represent just one

more way to get in touch with their bank, not a ‘dematerialization’ of it.

Finally, although many times described – by the mass media in particular – as a “final frontier”, Internet banking cannot be thought of as the farthest evolution of banking services. Banca 121 already provides pocket PC users with online banking and trading services, through infrared (IARDA) connection to a WAP mobile phone or smart card⁴⁷. All of the larger banks offer mobile financial services and m-payments to their customers. Those important steps must be interpreted as the latest, not the final achievements of technology applied to customer services. After each of those has been successfully implemented, a good manager will be already asking to himself: “What’s next?”

⁴⁶ Remoli, Francesco *Il Trading Online in Italia: Le Leve Competitive* Graduation Thesis, Università degli Studi di Roma Tre, A.Y. 2000-2001

⁴⁷ http://www.lastampa.it/redazione/news_high_tech/banca121.asp

Appendix III

TABLES

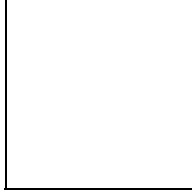
Table 1

Jupiter MMXI May 2001	
Business/Finance websites, at home panels	Digital Media Reach (%)
Norway	56.4
Denmark	45.1
France	38.2
Spain	37.5
UK	36.0
Germany	35.7
Italy	31.9
Switzerland	27.9

Figure 1

Unique Visitors to business and finances websites from home in May 2001

***Sweden: at home and at work panel**



Source: Jupiter MMXI

Table 2

Jupiter MMXI May 2001	
Business/Finance websites, at home panels	Average Minutes per Unique Visitor per Month
Germany	61.3
Italy	58.3
Spain	54.0
Switzerland	42.4
Norway	40.8
Denmark	37.1
UK	32.0
France	31.0

Figure 2

Data from Table 1 and Table 2 have been merged in Figure 2 in order to give a general overview of the spread of *IB* in the eight countries into consideration.

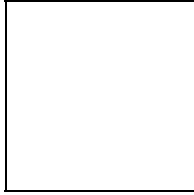


Table 3

WHAT DETERMINES THE CHOICE OF THE PRINCIPAL BANK?								
(percentage values over the total sample, multiple choice)								
	1993	1994	1995	1996	1997	1998	1999	2000
Close to home or workplace	51.2	53.4	56.1	55.1	53.5	57.5	59.4	60.5
Belongs to a large group	9.2	7.1	7.2	10.1	11.0	8.5	9.3	13.1
Family bank since a long time	15.1	17.9	14.9	19.2	21.8	21.4	22.6	26.0
Quantity and variety of services offered	10.3	10.4	7.1	7.4	8.9	8.6	9.6	9.0
Favorable Conditions (service costs, interest rates...)	11.5	10.2	10.9	10.9	13.7	10.6	12.1	21.5
Time of transactions	7.2	5.5	3.9	5.1	4.2	4.4	4.4	5.5
Courtesy of Personnel	14.9	13.8	9.8	12.1	12.5	13.7	14.3	20.1
Promotional initiatives	2.4	3.1	2.1	3.1	2.5	2.2	2.3	2.5
Employer's bank	13.7	13.0	10.7	11.0	9.9	10.3	12.5	7.8
Availability of distance banking services	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Others	1.5	1.9	1.8	0.3	0.6	1.3	0.1	0.2

Source: BNL / Centro Einaudi Report

Table 4

Operators	Informative Partners
Fineco	Il Sole 24 Ore – Radiocor, Reuters International. Lehman Brothers and Intermonte Securities Research
Mediolanum	Consultation program through Mediolanum Promoters
Imiweb	IMIWEB Markets (search by security), Il Sole 24 Ore, Reuters
Banca Sella	Reports and financial analyses Banca Sella
Banca Generali	Websim analyses, Radiocor information
Xelion	UBM (Gruppo Unicredito Italiano), Rasfin SIM (Gruppo Ras) and RCF (Research, Consulting & Forecasting) Il Sole 24 Ore
Cassa di Risparmio di Firenze	Milano Finanza – Tenfore
Banca di Roma	Tenfore / Milano Finanza
We@bank	Banca Akros, Il Sole 24 Ore

Source: Elaboration of Donovan.it data

Table 5

DISTRIBUTION OF CUSTOMERS ACCORDING TO THE FREQUENCY OF ONLINE ACTIVITY	
Day Traders	4%
Active Traders	8%
Quiet Traders	22%
Sleepers	66%

Source: KPMG Consulting

Figure 3

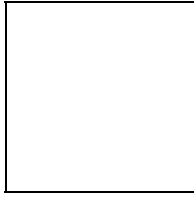


TABLE OF ABBREVIATIONS AND ACRONYMS

ADSL	Asymmetric Digital Subscriber Line
BOT	Italian Short-term State bonds (3, 6, 12 months duration)
BPM	Banca Popolare di Milano
BTP	Italian Treasury bonds (3, 5, 10, 30 years)
CCT	Italian Treasury Credit Certificates (7 years duration)
CW	Covered Warrant
EMPS	Electronic Mobile Payment Services
EMV	Europay, Mastercard and Visa
FI	Financial Institution
<i>IB</i>	Internet Banking
<i>IT</i>	Information Technology
<i>OB</i>	Online Banking
PAN	Personal Area Network
SET	Secure Electronic Transaction
SIM	Subscriber Identity Model
SSL	Secure Sockets Layer
TIM	Telecom Italia Mobile
WAP	Wireless Application Protocol
WIM	Wap Identity Module

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