Should Banks Be Diversified?

Evidence from Individual Bank Loan Portfolios

Abstract

We study empirically the effect of focus (specialization) vs. diversification on the return and the risk of banks using data from 105 Italian banks over the period 1993–1999. Specifically, we analyze the tradeoffs between (loan portfolio) focus and diversification using data that is able to identify loan exposures to different industries, and to different sectors, on a bank-by-bank basis. Our results are consistent with a theory that predicts a deterioration in the effectiveness of bank monitoring at high levels of risk and upon lending expansion into newer or competitive industries. Our most important finding is that both industrial and sectoral loan diversification reduce bank return while endogenously producing riskier loans for high risk banks in our sample. For low risk banks, these forms of diversification either produce an inefficient risk–return tradeoff or produce only a marginal improvement. A robust result that emerges from our empirical findings is that diversification of bank assets is not guaranteed to produce superior performance and/or greater safety for banks.

JEL Classification: G21, G28, G31, G32

Keywords: Focus, Diversification, Monitoring, Bank risk, Bank return

1 Introduction

Should financial institutions (FIs) and banks be focused or diversified? Does the extent of focus or diversification affect the quality of their loan portfolios? Does diversification, based on traditional portfolio theory wisdom, lead to greater safety for FIs and banks? In this paper, we undertake an empirical investigation of these questions. The evidence we present suggests that, in contrast to the recommendations of traditional portfolio and banking theories, diversification of bank assets is not guaranteed to produce superior return performance and/or greater safety for banks.

There are several reasons why the focus vs. diversification issue is important in the context of FIs and banks. First, FIs and banks face several (often conflicting) regulations that create incentives either to diversify or focus their asset portfolios, such as the imposition of capital requirements that are tied to the risk of assets, branching and asset investment restrictions, etc. Hence, from a policy standpoint, it is interesting to ask if FIs and banks benefit or get hurt from diversification of their loan portfolios.

In addition, the very nature of an intermediary's business activities makes the question of focus versus diversification an interesting economic issue to explore. FIs and banks act as delegated monitors in the sense of Diamond (1984), and acquire proprietary information about the firms they lend to, as noted by Fama (1980, 1985), and James (1987), and as modelled by Rajan (1992) and Sharpe (1990). The quality of monitoring and information acquisition is however an *endogenous* choice of FIs and banks. This choice is governed by the extent of agency conflict between equity holders (bank owners) and creditors of an FI. As explained below, this agency conflict is affected by the downside risk of the FI and by the extent of the FI's focus or diversification.

For the sake of illustration, consider the extreme case where the FI's downside risk is extremely high so that on an expected basis most benefits from monitoring accrue only to its creditors (uninsured depositors and providers of borrowed funds). In this case, bank owners have little incentive to monitor. All else being equal, the FI's under-investment in monitoring will be more severe the greater is its downside risk of failure. Under such an incentive structure, can FIs and banks monitor their loans effectively as they expand into different industries and segments of the loan markets? How does the decision to be focused or diversified affect their monitoring incentives and the endogenous quality, i.e., the risk and the return, of their loans?

To answer these questions, we examine data on the asset and loan portfolio composition of individual Italian banks during the period 1993–1999. The choice of Italian banks is driven by the availability of detailed data on the industrial and sectoral composition of their balance-sheets. By contrast, in the United States, publicly available data on bank loan

portfolios is restricted to call reports which do not contain such "fine" asset decompositions. In particular, U.S. regulators do not provide a breakdown of individual (or aggregate) bank lending to specific industries or industrial sectors. Instead, the general level of disaggregation is highly coarse in nature, specifically into household sector loans, commercial and industrial loans, etc. We obtain results that are sufficiently striking and robust to warrant a closer look at the wisdom of simply advocating banks to diversify as much as possible. In turn, they suggest that a more careful assessment needs to be made of the costs and benefits of diversification in banking in general.

Some of these issues have been examined at a theoretical level in a recent paper by Winton (1999). Traditional arguments based on Diamond (1984) suggest that banks should be as diversified as possible. This precludes any agency problem between bank owners and bank creditors. In practice, however, banks cannot fully diversify all their risks. Winton presents a theoretical framework that allows for a residual agency problem between bank owners and bank creditors and investigates the merit of the proverbial wisdom of not putting all your eggs in one basket.[1] The model provides a number of testable empirical hypotheses that are central to the focus versus diversification debate in banking. We state below the empirical hypotheses we test and discuss the economic intuition for them in Section 2.

H.1 The relationship between bank return and diversification is non–linear in bank risk (inverted U–shaped). To be precise, diversification across loan sectors helps a bank's return most when loans have moderate exposure to sector downturns (downside risk)[2]; when loans have low downside risk, diversification has little benefit; when loans have sufficiently high downside risk, diversification may actually reduce returns.

H.2 A bank's monitoring effectiveness may be lower in newly entered and competitive sectors, and thus, diversification can result in an increase in the downside risk of the bank's loan portfolio.

Broadly speaking, these hypotheses reflect the view that a bank's credit risk depends on its monitoring incentives (and effectiveness) as well as on its degree of portfolio diversification.

[1]Winton motivates the issue by comparing the following two advices: *"It's the part of a wise man to keep himself today for tomorrow and not venture all his eggs in one basket"* by Miguel de Cervantes (Don Quixote de la Mancha, 1605), and, *Behold the fool saith "Put not thine eggs in one basket" - which is but a manner of saying, "Scatter your money and attention"; but the wise man saith "Put all your eggs in one basket and watch that basket"* by Mark Twain (Pudd'nhead Wilson, 1894).

[2]By portfolio "downside risk," we mean the likelihood that the portfolio return will be lower than a given threshold (e.g., level of deposits in the bank's capital structure), an event that constitutes a "default." In the paper, we have employed several measures of downside risk, both expected and unexpected, based on their availability and measurability.

Overall, our results provide support for these two hypotheses. We measure focus using the Herfindahl index for a bank's (i) non-financial and housing loan portfolio (I–HHI), (ii) overall asset sector portfolio (A–HHI), and (iii) geographical portfolio (G–HHI).[3] Thus, a decrease in HHI implies an increase in diversification and a reduction in focus. Since geographic focus measure, G-HHI, is not fine enough to produce a sufficient variation across banks, we focus our study on industrial and sector focus measures, I-HHI and A-HHI, respectively. We find that the relationship between focus and bank return is non–linear in the risk of the bank and may in fact be U–shaped as implied by hypothesis H.1. Specifically, increased industrial diversification appears to decrease return for banks with high risk levels, and produces either a relatively smaller decrease or only a small increase in return for banks with moderate risk levels. The effect of increased asset sectoral diversification is analogous, hurting returns of high risk banks and producing only a marginal effect on returns of low risk banks. These results are robust to measurement of bank risk and to endogeneity of focus measures.

Specifically, we proxy for bank risk using a variety of measures: (i) realized risk measured as a bank's doubtful and non–performing loans to assets ratio (DOUBT), (ii) unexpected risk measured as the sample standard deviation of DOUBT and the total as well as the idiosyncratic volatility of the bank's stock market returns (if it is publicly traded), and (iii) expected risk measured as the ratio of loan-loss provisions to assets. Our results are qualitatively robust across these different measures of bank risk. We also correct for the endogeneity of industrial and asset sectoral focus by conducting a simultaneous equations estimation of bank return and bank focus where additional variables are employed to serve as instruments that explain focus. The U–shaped relationship of hypothesis H.1 is robust to this correction, and in fact, statistically stronger in most cases.

We test hypothesis H.2 by examining endogenous loan quality (risk) and treating risk as a dependent variable that is affected by the extent of focus (diversification). Our empirical results suggest that increased focus in terms of industrial sector or asset sectoral exposure (high values for I–HHI and A–HHI) improves loan quality (reduces risk). This effect is also robust to treating focus measures as endogenous variables. Further, the reduction in risk upon an increase in industrial focus is greater, the greater the competition for loans that the bank faces in the industries it lends to. We also find some evidence supporting the hypothesis that when banks enter as lenders into "newer" industries or industries where they had less exposure before, there is a contemporaneous deterioration in a bank's loan quality (increase in its risk).[4] This deterioration is smaller, the greater the industrial focus of the bank's loan

[3]The Herfindahl index is the sum of the squared weights corresponding to a bank's exposure to different industries, sectors, or geographical areas, a higher value corresponding to greater focus or lower diversification.

[4]We use the qualifier "newer" for industries in the sense that they are newer to the bank, i.e., previous exposures of the bank to these industries had been lower or non–existent, rather than being newer in the sense of technological changes produced by the industries.

portfolio. These results underscore the importance of "watching the basket" of loans and the improvement in monitoring effectiveness of banks from specialization.

From the combined results on bank loan return and risk, we conclude that increased industrial and sectoral loan diversification both result in an inefficient risk–return tradeoff for the (Italian) banks in our sample, the effect being strongest for banks with relatively high levels of risk.[5] We conduct additional robustness checks by separating the sample into state-owned and private banks, into money center national and non-national banks, and finally, into banks that are members of a consortium group and those that are not. The results are supportive of our main conclusions.

These results have important and direct implications for the optimal size and scope of banks. While traditional banking theory based on a delegated monitoring argument recommends that it is optimal for a bank to be fully diversified across sectors or "projects" (see, for example, Boyd and Prescott, 1986), our results suggest that there are diseconomies of scope that arise through weakened monitoring incentives and a poorer quality loan portfolio when a risky bank expands into additional industries and sectors. This complements the agency theory based analysis of the boundaries of a bank's activities as proposed in Cerasi and Daltung (2000), Stein (2002) and Berger et al.(2001).[6] From a normative standpoint, our results sound a cautionary note to the adoption of regulatory mechanisms that encourage bank–level portfolio and/or activity diversification, or attempt to measure credit portfolio risk through traditional diversification measures.

The issue of focus versus diversification has not been addressed thoroughly in the context of financial institutions and banks, although it has a long history in the corporate finance literature.[7] This is primarily because it has been difficult to obtain bank-level (cross-

[5]While we do not report these results due to the lack of richness in the measure of geographic diversification, we find that geographic diversification does result in an improvement in the risk–return tradeoff for banks with low or moderate levels of risk.

[6]We believe that the agency theories based on conflicts across firm segments proposed in corporate finance to explain the poor performance of conglomerates cannot completely explain the perverse effect of diversification on bank returns and risk. A bank's lending to different industries is much more centralized than is the operation of a typical conglomerate's operating segments. Stein (2002) and Berger et al.(2001), however, tie incomplete contracting to the inability of large banks to process "soft" information about their borrowers. This potentially leads to diseconomies of scale for FIs and banks.

[7]The early evidence in this literature seemed to suggest that diversification destroys value on average leading to what is popularly known as the "diversification discount." See, for example, Lang and Stulz (1994), Comment and Jarrell (1995), Berger and Ofek (1995), Lins and Servaes (1999). The issue of there being a discount on average is, however, disputed. Campa and Kedia (2000), Villalonga (2001), Graham, Lemmon and Wolf (2002), Maksimovic and Phillips (2002) examine the endogeneity of the decision to focus or diversify and question this early evidence, both on empirical as well as economic grounds.

Several theories have been proposed to explain why focus (diversification) may affect firm value. These are based on managerial risk-aversion (Amihud and Lev, 1981), agency problems between managers and

sectional) portfolio data and construct measures of industrial and geographical diversification that are as "fine" or "micro" as those employed in this paper.

Using somewhat coarser measures, Hughes, Lang, Mester and Moon (1996), Saunders and Wilson (2001), and Berger and DeYoung (2001) examine geographical diversification. Caprio and Wilson (1997) examine cross–country evidence for a relationship between on–balance sheet concentration and bank insolvency. Klein and Saidenberg (1998) present portfolio simulations to compare lending by multi–bank bank holding companies and their pro forma "pure–play" benchmark banks. Berger, Demsetz and Strahan (1999) find that consolidation in financial services industry has been consistent with greater diversification of risks on average but with little or no cost efficiency improvements. DeLong (2001) examines the merger of financial firms in the U.S. and finds that bank mergers that are focusing in terms of geography and activity produce superior economic performance relative to those that are diversifying. Finally, Stiroh (2002) finds that during the period from late 1970s to 2001, a greater reliance on non-interest income by the U.S. banks, particularly on trading revenue, is associated with higher risk and lower risk-adjusted profits at the individual bank level.

Section 2 discusses the economic intuition behind the empirical hypotheses. Section 3 describes our data. Section 4 formalizes the hypotheses and presents our empirical results. Section 5 provides a discussion and concludes.

2 Empirical Hypotheses

We restate the empirical hypotheses of Winton (1999) and provide their economic underpinnings. The essence of Winton's model lies in understanding that the quality of bank loan portfolios is *endogenous*: it is determined, in part, by the levels of monitoring induced by a change in the bank's focus or diversification.

H.1 The relationship between bank return and diversification is non–linear in bank risk (inverted U–shaped). To be precise, diversification across loan sectors helps a bank's return most when loans have moderate exposure to sector downturns (downside risk); when loans have low downside risk, diversification has little benefit; when loans have sufficiently high downside risk, diversification may actually reduce returns.

INSERT FIGURE 1 HERE.

shareholders (Denis, Denis and Sarin, 1997, and Cornett et al., 2001), the inefficiency of internal capital markets (Scharfstein and Stein, 2000), and power-struggles between different segments of a firm (Rajan, Servaes and Zingales, 2000).

From traditional portfolio theory, we know that diversification increases the central tendency of the distribution of a loan portfolio. However, as Winton (1999) notes, when debt is risky and the central tendency of distribution is low relative to the level of debt, diversification can in fact increase the probability of default. This would occur for example if downside risk of bank loans is substantial. For the sake of illustration, Figure 1 plots the cumulative probability function for two normal distributions with different standard deviations and with a common mean of zero. Suppose these distributions correspond to (suitably scaled) two possible distributions for realization on bank loans. Suppose further that the level of debt varies along the x-axis.

If the level of debt is to the left of zero (under a suitable scale), e.g., at $x = -1$, then a decrease in standard deviation, by reducing the likelihood of events in the left tail of the distribution (the "default" states), reduces the probability of default. However, if the level of debt is to the right of zero, e.g., at $x = 1$, then a decrease in standard deviation, by reducing the likelihood of events in the right tail of the distribution (the "no-default" states), in fact increases the probability of default. The left skewed nature of a typical loan portfolio's return distribution implies that the level of debt, in fact, may not need to be too high for this effect to arise.

An additional impact bolstering hypothesis (H.1) arises from the interaction of this perverse effect of diversification on bank risk and the bank's monitoring incentives. The conflict of interest between bank owners and bank creditors (similar to the equity holder vs. creditor conflicts first described in Jensen and Meckling, 1976, and Myers, 1977) implies that an increase in the probability of default reduces the incentives of bank owners to monitor their loans. If the loan portfolio has high downside risk, then an improvement in loan monitoring and, in turn, in loan quality produces greater benefits to the creditors than to the bank owners. Since the cost of monitoring is borne by the bank owners (the residual claimants), it follows that if the loan portfolio has high downside risk, then an increase in diversification leads to weaker incentives for bank owners to monitor loans. This, in turn, leads to lower bank returns reinforcing hypothesis H.1.

H.2 A bank's monitoring effectiveness may be lower in newly entered and competitive sectors, and thus, diversification can result in an increase in the downside risk of the bank's loan portfolio.

There are at least three reasons why this might arise. First, banks may lack the monitoring expertise in lending to a new sector when learning costs are present. Second, when the loan sector to which banks migrate is already being supplied with credit by other banks, the new bank entrants may be subject to adverse selection and a "winner's curse" effect.[8]

[8]In addition to Winton (1999), several papers have discussed the adverse effect of competition on bank

This suggests that diversification could lower returns on bank loans and increase the risk of failure to a greater degree when the sectors into which the bank expands are subject to greater competition. Third, diversification can cause a bank to grow in size, subjecting it to agency–based scale inefficiencies discussed in the corporate finance literature.

Thus, diversification *per se* is no guarantee of a reduced risk of failure. By the same token, regulatory requirements to diversify are no assurance of greater banking system safety or stability.[9] In this paper, we empirically test these hypotheses using bank-by-bank data on focus (diversification), return, and risk for Italian banks.

3 Data

3.1 Data sources

Data for the industrial, asset, and geographic decompositions of the portfolios of Italian banks in our study are taken from the regulatory reports submitted by these banks to the Bank of Italy, the Italian Bankers' Association (ABI), and the Interbank Deposit Protection Fund of Italy (FITD). The latter is the Italian equivalent of the U.S. Federal Deposit Insurance Corporation (FDIC). Our sample starts with a base of 105 primarily commercial banks that reported their asset portfolio and other data during the entire 1993–1999 period. The sample period starts in 1993 since the banking law of August 27, 1993 (consolidating act) marked a regime shift in the Italian banking structure. It revolutionized the Italian banking system by encouraging the new model of a "full-service" financial institution. It eliminated the distinction between specialized lending institutions (medium and long-term credit) and retail banks (short-term credit), as opposed to the pre-existing system of specialized banks.

A complete list of the banks and the ones that are traded publicly during our sample period is shown in Appendix A along with the average size of each bank over the sample period. These 105 banks constitute over 80 percent of the total banking assets of Italy. A few of the banks in our sample undertook acquisitions of other banks. The data set, however, does not provide any details as to which were these acquiring banks and which banks they acquired. Furthermore, the data set does not include foreign bank operations in Italy. Over our sample period, the foreign bank penetration of the Italian banking market is however weak largely due to the prohibition on foreign banks from accepting deposits of Italian residents.

loan quality. These include Gehrig (1998), Dell'Arricia, Friedman, and Marquez (1999), Boot and Thakor (2000), and Hauswald and Marquez (2002) for theory, and Shaffer (1998) for empirical results.

[9]For example, in the U.S., regulations restrict a bank's lending to any one counterparty to a maximum of 15% of that bank's capital.

In terms of size, 8 of these 105 banks are "very large" (as defined by the Bank of Italy), 7 are "large," 15 are "medium," and the remaining 75 are "small." In terms of geographical scope of banking activities, 9 of these banks are "national," 18 are "regional," 13 are "intra–regional," 10 are "local," and the remaining 55 are "provincial." Finally, 34 of these banks are publicly traded and 62 of them were state–owned at the beginning of 1993.[10]

While there are natural differences between the banking sectors of any two countries, there are several dimensions along which the Italian banking system is similar to that in the U.S.: (1) Unlike other banking systems in Continental Europe, Italy has a large number of banks (about 850 at the beginning of our sample) giving rise to a less concentrated banking system like that of the U.S. (2) The branching restrictions on banks in Italy were removed in 1990 as they were in the U.S. in the mid 1980s. (3) There has been a wave of consolidation in the banking system in 1990s mirroring that in the U.S. (4) The banking system comprises of a few very large banks and a large number of medium-to-small sized banks as in the U.S. In addition, the risk levels of Italian banks in our sample exhibit economically significant variability, from being very safe to being very risky, which lends an element of robustness and generality to our results. Finally, Italy differs from the U.S. in that many of its banks are state-owned although state-ownership has been steadily declining over the past decade following the Amato-Carli law. However, our results are found to hold for both the privately-owned and the state-owned samples of banks (see Section 4.4).

These stylized facts and the use of Italian banking data to address other important economic issues such as the benefit of relationship banking (Degatriache et al., 2000) and the effect of bank mergers on loan contracts (Sapienza, 2002a) lead us to believe that our results would generalize to banking sectors of other countries, including the U.S.[11]

For each bank in our sample, data is available to calculate the following portfolio decompositions:

1. A disaggregated industrial sector decomposition based on each bank's top five industrial sector exposures with a sixth exposure comprising of the sum of the remaining exposures, where the exposures could be to any of the 23 industries among: (1) Agricultural, Forestry, and Fishing products, (2) Energy products, (3) Iron and non–iron Material and Ore, (4) Ores and products based on non-metallic minerals, (5) Chemicals, (6) Metal products, apart from machinery and means of conveyance, (7) Agricultural and Industrial machinery, (8) Office, EDP Machinery, and others, (9) Electric mate-

[10]We are very grateful to Paola Sapienza for supplying us the state–ownership dummy for our sample based on her work on Italian banks in Sapienza (2002b).

[11]Descriptions of the Italian banking sector can be found in Degatriache et al. (2000) and Sapienza (2002a). Industry perspectives on the developments of the Italian banking system can also be found in BNP Paribas (2001) and Goldman Sachs (2001).

rial, (10) Transport, (11) Food products, Beverages, and Tobacco-based products, (12) Textile, Leather, Shoes, and Clothing products, (13) Paper, Publishing, and Printing products, (14) Rubber and Plastic products, (15) Other Industrial products, (16) Construction, (17) Services trade and similar, (18) Hotel and Public firms products, (19) Internal Transport services, (20) Sea and Air Transport, (21) Transport related services, (22) Communication services, and (23) Other Sales related services. Note that in aggregate these exposures (collectively defined in the data as Non–financial and Household exposures) constitute the dominant part of each bank's portfolio.

2. A broad asset sector decomposition based on exposures to (1) Sovereigns, (2) Other governmental authorities, (3) Non–financial corporations, (4) Financial institutions, (5) Households, and (6) Other counterparties.

Note that the size of bank lending to a particular sector or industry in our data set is net of loans that are already classified as either doubtful or non–performing. Unfortunately, our data set does not provide more detailed loan-by-loan or borrower-by-borrower information within these decompositions.

The Financial Statement variables and capital structure variables are obtained from the Bank of Italy and Bankscope data bases. Stock market data items for the 34 banks that are publicly traded were taken from the Datastream and Milan Stock exchange information bases on Italian Banks. A few banks had to be discarded from the sample due to missing values of relevant variables, e.g., doubtful and non–performing loans.

3.2 Construction of Herfindahl indices

We measure focus (diversification) by employing a Hirschman Herfindahl Index (HHI) measure. HHI is the sum of the squares of exposures as a fraction of total exposure under a given classification. In our case, we construct two different kinds of HHI's, which consist of Industrial and Household sector HHI, more simply referred to as Industrial sector HHI (I–HHI) and Broad Asset sector HHI (A–HHI).

I–HHI is based on the 5 top industries where loans were made for each bank. The 6th exposure considers the rest of the industrial loan portfolio. For the 6th exposure, we employed two conventions: first, where the 6th exposure is treated as a separate "hypothetical" industry, and second, where the 6th exposure is treated as being equally divided among the remaining 18 industries. Our results were not sensitive to this choice. Hence, we report results with I–HHI computed using the 6th exposure as a hypothetical industry. Thus, if the proportional exposures to six industries are X_1, X_2, X_3, X_4, X_5, and X_6, respectively, then I–HHI equals $\sum_{i=1}^{6}(X_i/Q)^2$, where $Q = \sum_{i=1}^{6} X_i$. Note that the HHI has a maximum of 1 when all loans are made to a single industry.

A–HHI is the sum of the squared exposures (measured as a fraction) in the form of sovereign loans, other governmental loans, non-financial sector loans, financial sector loans, household sector loans, and other loans.

3.3 Balance-sheet and Stock market variables

We employ the following (annual) variables obtained from the balance–sheet and stock market data for the banks in our sample over the period 1993–1999.

Return measures:

1. ROA: return on assets measured as Net Income / Assets.
2. SR: stock return measured as the return over the current year, i.e., as the return from the end of previous year to the last day of the current year.

Risk measures:

- DOUBT, the doubtful and non–performing assets ratio measured as Doubtful and Non–performing Loans / Assets.[12]
- PROVISION, the ratio of Loan-loss Provisions to Assets, which can also be interpreted as an ex-ante measure of the level of expected losses.

In addition, we also seek to establish the robustness of our results with the following measures of unexpected losses:

- STDOUBT: the sample standard deviation of DOUBT for each bank.
- STDRET: the monthly stock return volatility for each publicly traded bank based on monthly stock return data.
- IDIOSYNCRATIC: the component of monthly stock return volatility for each publicly traded bank that is not explained by the market return proxied by the MIB General index, a weighted arithmetic average of all stocks listed on the Milan Stock Exchange (Borsa Valori di Milano).

[12]Note that realized losses can be interpreted as capturing the level of expected losses.

It is conceivable to come up with an alternative measure of the risk of a bank that is based on the returns (profitability), variability of returns, and the correlation of returns for different industries a bank lends to. For Italy, Morgan Stanley Capital Indices provide industry-by-industry returns. However, the classification of industries therein does not map conveniently onto the classification of industries employed in our data set. Hence, we use only those bank return and bank risk measures that are available at the aggregate bank level. By contrast, the focus (diversification) measures are computed for each bank using disaggregated industry-by-industry exposures of each bank. We believe that measuring bank focus in this manner gives a reasonable first-order approximation since over our sample period, Italian banks derived on average between 60–70% of their revenues from their lending related activities (see BNP Paribas, 2001).

Control variables:

1. SIZE: asset size of the bank (in millions of dollars calculated using the spot exchange rate between USD and Italian Lira at the point of measurement).

2. EQRATIO: capital ratio of the bank measured as Equity (Book–Value) / Assets, the approximate equivalent of the bank's Tier 1 capital ratio. This is essentially equivalent to one minus (book–value) debt to assets ratio for the bank.

3. BRRATIO: branch ratio measured as Number of Bank Branches (excluding headquarters) / Assets. Note that this is simply the inverse of a measure of average branch size.

4. EMPRATIO: employee ratio measured as Number of Employees / Assets.

INSERT TABLES 1 AND 2 HERE

Table 1 presents the univariate statistics (mean, median, standard deviation, minimum, and maximum) for these variables and for Herfindahl indices for all the banks over the sample period of 1993–1999. Note that the mean (median) bank's size is about 12 billion (3 billion) USD, the mean (median) capital ratio is 8.732% (8.113%), and the mean (median) ratio of doubtful and non–performing loans to assets is 5.234 (3.199).[13] The average industrial and asset sectoral focus measures (I–HHI and A–HHI) are low suggesting a significant degree of diversification in these areas.

[13]The 1990s were a particularly difficult period for many Italian banks and industries (see BNP Paribas, 2001, Goldman Sachs, 2001, and Sapienza, 2002a, b).

Table 2 completes the descriptive statistics by presenting the correlation matrix among these variables. As Table 2 illustrates, the measures of focus, I–HHI and A–HHI, are not highly correlated, the correlation being 0.26. This suggests the possibility that the effects of these different diversification measures on bank risk–return performance may be different. Further, there is significant variation in all the variables we employ and the correlations suggest a relationship between return measures (ROA, ROE, and SR) and the balance-sheet control variables (SIZE, EQRATIO, BRRATIO, EMPRATIO).

Table 3a presents the year-by-year quintiles of the focus measures, specifically I–HHI and A–HHI vary continuously across the quintiles in each year.[14]

Finally, Table 3b contains the year-by-year quintiles of various risk measures. As evidenced therein, 1993–1999 represents a turbulent period for Italian banks with losses measured as doubtful loans to assets ratio (DOUBT) reaching values above 10% for about 10% of the sample in each year, with maximum values ranging from 15–45%. Overall, the latter half of the sample period appears to have more stable values of DOUBT. Doubtful loans trended upward between 1993 and 1996 as a result of the lingering effects of the 1992–1993 crisis, increasing fragility of state-owned enterprises, rising risk from exporting companies, and problems affecting the construction industry and the service sector. With the exception of the period of the Russian and Asian crises, doubtful loans to assets ratio stabilized post–1997. In further evidence, new allowances to loan-loss provisions, an ex-ante measure of risk in contrast to realized doubtful loans, also followed a similar pattern over the sample period (see BNP Paribas, 2001). Other risk measures, including overall stock return volatility (STDRET), and idiosyncratic stock return volatility (IDIOSYNCRATIC), exhibit similar behavior, demonstrating the high levels of riskiness of many banks in the sample. Our sample period thus provides potential insights regarding countries with banking systems subject to similar stressful periods.

[14]Note that Appendix A and Tables 1, 2 and 3a also provide statistics for the geographic focus (G–HHI) computed as the sum of the squared exposures (measured as a fraction) to Domestic (Italian) loans, European Union loans, and Rest of the World loans. However, the average geographical focus (G–HHI) in Table 1 is quite high capturing the fact that most banks in our sample lent to domestic Italian firms. Furthermore, Table 3a shows that G–HHI is equal to one for about 25% of the sample in each year. This reflects the fact that relatively smaller Italian banks have no loan exposures outside of Italy (see Appendix A). Since our data set does not provide a disaggregation of loans within Italy into different regions of Italy, we focus below only on I–HHI and A–HHI, the industrial and asset sectoral focus measures. Goldman Sachs (2001) and Sapienza (2002a, b) also provide corroborating evidence on the level of geographical focus of Italian banks during this period.

4 Effect of Focus on Bank Performance

To study the overall effect of a bank's focus (diversification), we study its effect on both bank return and bank risk. If focus produces an increase in bank return and a decrease in bank risk, then we interpret this result as implying that focus improves bank performance, and thus, by implication, that increased diversification would decrease bank performance. On the other hand, if focus results in a decrease in bank return and an increase in bank risk, then we conclude that focus weakens bank performance, i.e., increased diversification would improve bank performance. When bank return and bank risk either both increase or both decrease, the overall effects on bank performance are ambiguous and cannot be determined without taking a stand on what constitutes an "efficient" risk–return tradeoff. To partially address the issue concerning the endogeneity of focus measures, we consider the relationship between focus in year $t-1$ on performance measures in year t. We complement this analysis with an important robustness check that employs focus measures in year t as well but treats them as endogenously determined variables.

4.1 Test of hypothesis H.1: Effect of focus on bank returns

The hypothesis H.1 stated in Section 2 in terms of bank diversification is restated below in terms of focus.

H.1: The relationship between bank returns and focus is non–linear and U–shaped in bank risk. To be precise, when loans have low exposure to sector downturns (downside risk), focus has little impact for a bank's returns; focus affects a bank's returns most adversely when loans have moderate downside risk; when loans have sufficiently high downside risk, focus may actually enhance a bank's returns.

Before examining the non–linear relationship between bank returns and focus as a function of bank risk, we first consider the linear regression below to understand the average relationship between bank returns and focus.

$$\text{Return}_t \;=\; \alpha_0 + \alpha_1 * \text{I–HHI}_{t-1} + \alpha_2 * \text{A–HHI}_{t-1} + \epsilon_t. \tag{4.1}$$

The null hypothesis we wish to test is that diversification is better for bank returns ("Don't put all your eggs in one basket"), i.e., by implication that focus is harmful to bank returns:

$$\alpha_1 < 0,\ \alpha_2 < 0. \tag{4.2}$$

As noted earlier, Return_t is proxied by two variables: (i) return on assets–ROA, and (ii) stock return–SR. Throughout the paper, regressions are run by pooling observations across

all banks and across all years and including time-dummies for 1995 through 1999 as well as bank-specific fixed effects (except when their inclusion in the specification would lead to a multi-collinearity problem). In addition, we employ the following control variables for each bank: log of its size–SIZE, its equity to assets ratio–EQRATIO, its branch to assets ratio–BRRATIO, and its employment expense to assets ratio–EMPRATIO, all measures in year t. Finally, we adjust returns for risk by employing the risk measure DOUBT_{t-1}, the ratio of its doubtful and non–performing loans to assets, also as an explanatory variable.

Next, we test the hypothesis that, in contrast to the specification in equation (4.1), the return–focus relationship is in fact non–linear and U–shaped in bank risk, as implied by hypothesis H.1 above (see the discussion in the Introduction of the paper and in Section 2). Put another way, the hypothesis states that bank risk interacts with bank focus in a U–shaped manner in explaining the cross–sectional variation across banks in the return–focus relationship. Mathematically, this is equivalent to the statement that the effect of focus on returns, d(Returns)/d(Focus), is U–shaped in risk, reaching its minimum at moderate levels of risk. To try to capture this, we modify equation (4.1) by introducing interaction terms between the focus measures and our measure of risk, the non–performing and doubtful loans (RISK) as well as risk squared (RISK^2). That is:

$$\begin{aligned}\text{Return}_t &= \alpha_0 + \alpha_1 * \text{I–HHI}_{t-1} + \alpha_2 * \text{A–HHI}_{t-1} + \eta * C_{t-1} + \beta_0 * \text{RISK}_{t-1} + \\ &\quad \beta_{11} * \text{I–HHI}_{t-1} * \text{RISK}_{t-1} + \beta_{12} * \text{I–HHI}_{t-1} * \text{RISK}^2_{t-1} + \\ &\quad \beta_{21} * \text{A–HHI}_{t-1} * \text{RISK}_{t-1} + \beta_{22} * \text{A–HHI}_{t-1} * \text{RISK}^2_{t-1} + \epsilon_t, \end{aligned} \tag{4.3}$$

where C_{t-1} is a vector representing the non–risk control variables stated above. Under this specification, the effect of focus on returns is quadratic in risk. For example, for industrial focus, I–HHI:

$$\text{d(Return)/d(Focus)} = \alpha_1 + \beta_{11} * \text{RISK} + \beta_{12} * \text{RISK}^2. \tag{4.4}$$

Thus, the hypothesis that the effect of a bank's focus on its returns is U–shaped in its risk takes the form:

$$\beta_{11} < 0,\ \beta_{12} > 0,\ \beta_{21} < 0,\ \beta_{22} > 0. \tag{4.5}$$

As stated above, we employ different measures of bank RISK in the regression above: the ratio of doubtful and non–performing loans to assets, DOUBT_{t-1}, the standard deviation of DOUBT, STDOUBT, and loan-loss provisions to assets ratio, PROVISION_{t-1}. While DOUBT is a measure of realized losses, STDOUBT and PROVISION are potentially more attractive as *ex–ante* measures of unexpected and expected bank risk, respectively. Note that there is only one value of STDOUBT for a bank over the entire period. Hence, the

time index in RISK_{t-1} is not relevant when risk is proxied by STDOUBT. In general, these risk measures are based on discretionary actions of bank owners. To eliminate any bias arising from this, we also employ for the publicly traded sample two stock return based measures of unexpected bank risk: the total stock return volatility of a bank, STDRET, and its idiosyncratic volatility, IDIOSYNCRATIC.

INSERT TABLE 4 HERE.

Table 4 presents the results for linear regressions of bank returns on focus specified in equations (4.1) and (4.3) with return on assets (ROA) as the bank return and DOUBT, STDOUBT and PROVISION as the risk measures. Note that all standard errors reported in the tables are corrected using White's adjustment for heteroscedasticity. Examination of lags did not reveal a significant auto–correlation problem in our data.The null hypothesis for estimation of (4.1) that focus reduces bank returns (and thus diversification increases bank returns) is rejected for both measures of loan portfolio focus: industrial and household focus (I–HHI) and broad asset sector focus (A–HHI), as reflected in the positive and statistically significant (mostly at the 5% confidence level) coefficients on these measures in Columns 1 and 2. The inclusion of control variables in Column 2 significantly enhances the explanatory power of equation (4.1). The control variables for a bank's capital ratio and the risk of its loans (doubtful and non–performing loans to assets ratio) are strongly significant in their effect on ROA.

Columns 3–5 of Table 4 test whether the return–focus relationship is non–linear and U–shaped in bank risk, thus linking the cross–sectional effect of focus on returns to the level of bank risk (see equation 4.3). These results provide support for a U–shaped relationship between focus and returns as a function of the risk level of the bank. The coefficients on the interaction terms, $\text{HHI}_{t-1} * \text{RISK}_{t-1}$, and $\text{HHI}_{t-1} * \text{RISK}^2_{t-1}$, are negative and positive respectively, and are statistically significant (in some cases at 5% and in all but one cases at 10%). This holds for both measures of focus, I–HHI and A–HHI, and for all three measures of bank risk, DOUBT, STDOUBT, and PROVISION. Computation of F–statistics to test the statistical significance of linear and quadratic terms, separately and jointly, revealed that the coefficients on these terms are statistically significant (at a 99% confidence level) in contributing to the explanatory power of the regressions in Columns 3–5 of Table 4.

INSERT TABLE 5 HERE.

In Table 5, we repeat these tests with stock return (SR) as the bank return measure. In addition, we employ stock return based measures of bank risk. Observe that the sample size is much smaller for the stock return based measures of bank returns since only 34 out of

our 105 banks are publicly traded. The control variables for a bank's capital ratio and the risk of its loans which were strongly significant in their effect on ROA have a less significant impact on the bank's stock return (SR). The coefficients on I–HHI and A–HHI in Columns 1 and 2, corresponding to estimation (4.1), are strongly significant.

In contrast to Table 4 for ROA as bank return, the U–shaped hypothesis H.1 finds relatively weaker support with SR as bank return. Most coefficients on linear and quadratic interaction terms, $\text{HHI}_{t-1} * \text{RISK}_{t-1}$, and $\text{HHI}_{t-1} * \text{RISK}^2_{t-1}$, are significant or marginally significant, while a few are insignificant. The U–shaped hypothesis fares relatively better when bank risk is proxied by DOUBT, STDOUBT, PROVISION, or IDIOSYNCRATIC, compared to STDRET as the proxy for bank risk. In terms of signs, all coefficients have correct signs (as implied by hypothesis H.1) except the linear terms with STDRET as the risk measure. Note however that a positive sign of the linear coefficients provides even further evidence against the effect of diversification on bank returns being positive. Moreover, once we control for endogeneity of focus measures, the coefficients always take correct signs and are statistically significant. However, before proceeding to this endogeneity correction, we discuss the magnitude of the effects documented so far.

INSERT FIGURE 2, FIGURE 3 AND FIGURE 4 HERE.

To understand the economic significance of the U–shaped relationship, we plot the marginal effect d(Return)/d(Focus) for different values of RISK for both measures of Focus, I–HHI and A–HHI, and for different measures of Return and RISK. In Figures 2-A and 3-A, we employ ROA as the return measure, and employ DOUBT and STDOUBT as the risk measures, respectively. In Figures 2-B, 3-B, 4-A and 4-B, we employ SR as the return measure, and employ DOUBT, STDOUBT, STDRET, and IDIOSYNCRATIC, as the risk measures, respectively. In all plots, the marginal effect is plotted for both I–HHI (thick line) and A–HHI (dotted line). The range of the RISK proxy is taken to be over the spectrum covered by that proxy for the Italian banks in our sample over the period 1993–1999 (Table 3b).

Consider Figures 2-A and 3-A. These are based on estimated coefficients from Table 4, Columns 3 and 4, respectively. As can be seen in these plots, d(ROA)/d(I–HHI) is close to zero at low risk values, is small and negative at moderate risk levels (5–10% for DOUBT and 2–14% for STDOUBT), and is positive and sharply rising at high risk levels. The spectrum of high risk levels where the effect is positive and sharply rising consists of the highest risk decile (about 10% of the sample in each year) in case of DOUBT and the highest quartile (about 25% of the sample) in case of STDOUBT. The fact that these high risk banks constitute a significant portion of our total sample in each year is consistent with the observation that the 1990s were a particularly difficult period for many Italian banks (and industries) resulting in

significantly high non–performing loan ratios for many banks (see also BNP Paribas, 2001, Goldman Sachs, 2001, and Sapienza, 2002a, b for corroborating evidence).

A natural question to ask is whether these observations are outliers that should be ignored. In fact, it turns out that these observations cannot be treated as mere outliers and discarded for banking systems under stress. As mentioned earlier, the 1990s were a particularly difficult period for many Italian banks and industries. We examined, for example, the sets of banks in each year with DOUBT ratio in the top 10% of DOUBT ratios across all banks in that year. Importantly, we found that many banks experienced fluctuations in their DOUBT values from being very low to very high. This is captured in the high values of STDOUBT, the standard deviation of DOUBT, in Table 1 and Table 3b. However, different banks experienced these fluctuations *at different points during the sample period*. Eliminating observations with high DOUBT values thus amounts to retaining only those data points for each bank that correspond to low or moderate values of DOUBT. Moreover, if one were to omit the top 10% observations of DOUBT in each year, then the omitted data points correspond to over 25 banks (about 1/4th of our sample size of 105 banks) across different years. Put simply, banks with the highest values of DOUBT in any given year are not necessarily the same banks with the highest values of DOUBT in other sample years.

We conclude that the observed U–shape in the effect of I–HHI on ROA as a function of DOUBT and STDOUBT indeed provides support for hypothesis H.1. In contrast to the effect of I–HHI, d(ROA)/d(A–HHI) is uniformly positive and increasing over the observed range of DOUBT and STDOUBT, suggesting that asset sectoral focus improves bank returns for all banks in our sample, especially for high risk banks. We also conclude that diversification across industries and asset sectors is not particularly beneficial for returns of banks in our sample and in fact is especially costly for high risk banks. Furthermore, the effects seem economically important. For example, for a bank with DOUBT of 25% in the previous year, the effect of increasing industrial focus from 0.16 (approximately equally exposed to six industries) to 0.20 (approximately equally exposed to five industries) is to increase its next year ROA by approximately 0.80%. Note that such a bank lies in the highest DOUBT decile. A similar increase in focus for a bank with standard deviation of DOUBT of 20% results in an increase in its return of approximately 0.40%. Such a bank lies in the 75%ile–90%ile region of STDOUBT in our sample. Given that mean ROA is 0.93% with a standard deviation of 0.85% (Table 1), these effects are economically important.

A similar conclusion is drawn from Figures 2-B, 3-B, 4-A and 4-B, where stock return (SR) is employed as the return measure and the risk measures employed are DOUBT, STDOUBT, STDRET, and IDIOSYNCRATIC, respectively. For SR, the marginal effect d(SR)/d(Focus) is uniformly positive for both I–HHI and A–HHI as focus measures. In terms of economic magnitudes of effects, for a bank with STDRET of 15% in the previous year, the effect of increasing industrial focus from 0.16 (approximately equally exposed to six industries)

to 0.25 (approximately equally exposed to four industries) is to increase its next year SR by approximately 3.60%. Such a bank lies in the 50%ile–75%ile region of STDRET in our sample. Given that mean SR is 21.0%, this effect is economically significant. The only exception to the uniformly positive effect of focus on SR arises when risk is proxied by idiosyncratic stock return volatility. In this case, the marginal effects of I–HHI and A–HHI on SR are U–shaped, being negative in the 5–15% region of IDIOSYNCRATIC, and positive and sharply rising, in the region to the right of 15% value of IDIOSYNCRATIC. While this second region covers only a very few banks in our sample, we show below that once we correct for endogeneity of focus measures, the effect in fact is positive over almost the entire sample.[15]

4.2 Endogeneity of focus measures

In our tests so far, we employed Focus measures with a lag, i.e., we considered the effect of Focus_{t-1} on Return_t. This helps to partially address the endogeneity issue. Arguably, it is appropriate for ROA_t, since any monitoring-related effects of focus may get captured in book returns only with a lag. However, this is less justifiable in the case of stock returns since they will reflect contemporaneous information as to the expected effects of any focus changes (assuming these changes are publicly observable). Hence, it is important to consider the effects of Focus_t on Return_t. However, in doing so, one must address the endogeneity issue: Specifically, if a bank has some latent characteristic that induces it to be focused and

[15]We also explored the question as to whether the U–shaped relationship between return and focus, as a measure of risk, was a spurious econometric outcome due to the quadratic specification employed? To answer this question, we considered the following piece–wise linear relationship:

$$\begin{aligned} \text{d(Return)/d(Focus)} &= \alpha + \beta_1 * \text{Dummy}(3\% \leq \text{DOUBT} < 6\%) \\ &+ \beta_2 * \text{Dummy}(6\% \leq \text{DOUBT} < 10\%) \\ &+ \beta_3 * \text{Dummy}(10\% \leq \text{DOUBT} < 15\%) \\ &+ \beta_4 * \text{Dummy}(15\% \leq \text{DOUBT} < 25\%) \\ &+ \beta_5 * \text{Dummy}(\text{DOUBT} \geq 25\%) \end{aligned} \tag{4.6}$$

We considered similar piece-wise linear relationships for risk measures other than DOUBT. If the U–shaped relationship is robust, then the sum of α and the β's associated with relatively lower levels of DOUBT should be negative and decreasing (increasing in magnitude) but the sum of α and β's should eventually be positive and increasing as higher and higher DOUBT observations are considered. This is precisely what the estimated coefficients reveal. For example, in the case of industrial focus (I–HHI), we find that $0 > \alpha + \beta_1 > \alpha + \beta_2 > \alpha + \beta_3$, and $\alpha + \beta_3 < \alpha + \beta_4 < 0 < \alpha + \beta_5$. The coefficients estimated for asset focus (A–HHI) and for other proxies for risk (STDOUBT, PROVISION, STDRET, and IDIOSYNCRATIC) reveal a similar pattern. This gives us confidence that the non–linear relationship between returns and focus as a function of risk is not purely an artifact of our quadratic specification. These results are available from the authors upon request.

simultaneously results in greater bank returns, then estimations of equation (4.3) will likely produce biased estimates.[16]

To account for the possible endogeneity of focus measures, we estimate a simultaneous equations system where Return_t and Focus_t are both treated as variables to be explained and where the error terms of the two equations in the system are allowed to be correlated with each other. This is essentially a Seemingly Unrelated Regression (SUR) approach (see Johnson, 1972, Maddala, 1977, and Theil, 1971). In order to prevent the system from growing too large in terms of the number of coefficients to be estimated, and in turn, to retain statistical power in the estimation, we alternately treat one of the two focus measures, I–HHI_t and A–HHI_t, as endogenous in year t and the other as its exogenous value in year $t-1$. In order to ensure that the order conditions for identifying the system are satisfied, we treat the focus measure that is not treated as endogenous as an explanatory variable only for Return_t. For endogenous determination of Focus_t, we considered a number of independent explanatory variables as instruments:

- NATIONAL DUMMY: This takes on a value of 1 if the bank is classified as "National" (in a geographic sense) by Bank of Italy and 0 otherwise. The dummy is 1 for the nine "very large" banks of our sample (see Appendix A). Eight of these banks are also money center banks.
- PRIVATE DUMMY: This is 1 for all banks that are not publicly traded, 71 out of 105 in our sample, and 0 for the remaining 34 banks.
- DEPOSIT TO ASSET RATIO: This is the ratio of all deposits of the bank to its overall asset base. It is included with a lag, i.e., DEPOSIT TO ASSET RATIO_{t-1} is an explanatory variable for Focus_t.
- STATE-OWNED DUMMY: This is 1 for 62 banks in our sample that are state-owned at the beginning of 1993, as classified by Sapienza (2002b).
- GROUP DUMMY: This takes on a value of 1 for all banks that are "a part of a bank group or a consortium" and 0 otherwise. There are 35 consortium banks in our sample.
- AVERAGE Focus_t: When I–HHI_t (A–HHI_t) is treated as endogenous, this variable is average I–HHI (A–HHI) across all banks in year t.

[16] Campa and Kedia (2000), Villalonga (2001), Graham, Lemmon and Wolf (2002), Maksimovic and Phillips (2002) examine the endogeneity of the decision to focus or diversify for corporations and question, both on empirical as well as economic grounds, the analysis of the "diversification discount" in the corporate finance literature that ignores the endogeneity issue.

The ex-ante rationale for the use of these instruments is as follows. National banks and money center banks may have greater size and scope by definition and thus intrinsically be more diversified. Private banks, state-owned banks, and consortium banks may have an objective function, and in turn, a focus or diversifying strategy, that differs from their respective counterparts: private banks' performance may face less corporate governance scrutiny than does the performance of public banks, state-owned banks may be forced to lend to certain sectors or industries to fulfil state objectives (as documented for Italian banking sector by Sapienza, 2002b), and consortium banks may be following part of a collective focus or diversifying strategy conceived at the level of the consotrium. Banks with a high deposit to assets ratio may not be well-diversified on the liability side and perhaps rely significantly on "core" deposits. The need to focus or diversify for these banks will differ from that of banks well-diversified on the liability side, for example, those with greater access to the purchased funds market. Finally, average focus across all banks in a given year potentially captures other determinants, for example, macro-economic conditions and the regulatory environment, not fully captured through other instruments.

The resulting simultaneous system of equations is presented below when I–HHI$_t$ is treated as endogenous, other specifications we estimate will be described later.

$$\begin{aligned}
\text{Return}_t &= \alpha_0 + \alpha_1 * \text{I–HHI}_t + \alpha_2 * \text{A–HHI}_{t-1} + \eta * C_{t-1} + \beta_0 * \text{RISK}_{t-1} + \\
&\quad \beta_{11} * \text{I–HHI}_t * \text{RISK}_{t-1} + \beta_{12} * \text{I–HHI}_t * \text{RISK}^2_{t-1} + \\
&\quad \beta_{21} * \text{A–HHI}_{t-1} * \text{RISK}_{t-1} + \beta_{22} * \text{A–HHI}_{t-1} * \text{RISK}^2_{t-1} + \epsilon_{rt}, \qquad (4.7) \\
\text{I–HHI}_t &= \gamma + \theta * C_{t-1} + \delta * \text{RISK}_{t-1} + \omega * Z_{t-1} + \epsilon_{it}, \qquad (4.8)
\end{aligned}$$

where C_{t-1} is a vector representing the non–risk control variables (SIZE, EQRATIO, BR-RATIO, EMPRATIO), Z_{t-1} is a vector representing the instrumental variables (NATIONAL DUMMY, PRIVATE DUMMY, DEPOSIT TO ASSET RATIO$_{t-1}$, STATE-OWNED DUMMY, GROUP DUMMY, and AVERAGE I–HHI$_t$), and the error terms ϵ_{rt} and ϵ_{it} may be correlated allowing the two equations to be "related." Time-dummies and bank-specific fixed effects are included in determining both Return$_t$ and I–HHI$_t$. Under this specification, the effect of focus on returns continues to remain quadratic in risk. Forrmally,

$$\begin{aligned}
\text{d(Return}_t\text{)/d(I–HHI}_t\text{)} &= \alpha_1 + \beta_{11} * \text{RISK} + \beta_{12} * \text{RISK}^2, \text{ and} \qquad (4.9) \\
\text{d(Return}_t\text{)/d(A–HHI}_{t-1}\text{)} &= \alpha_2 + \beta_{21} * \text{RISK} + \beta_{22} * \text{RISK}^2. \qquad (4.10)
\end{aligned}$$

The estimation results are reported in Table 6 (for ROA) and Table 7 (for SR). In Table 6, estimated coefficients are reported for ROA$_t$ and I–HHI$_t$ in Columns 1 and 2 with risk measures being DOUBT and STDOUBT, respectively. Columns 3 and 4 report the estimated coefficients for ROA$_t$ and A–HHI$_t$. Table 7 is arranged similarly with risk measures

being STDRET and IDIOSYNCRATIC. Results with other risk measures are not reported for considerations of space. Examining the coefficients on linear and quadratic interaction terms between focus and risk, we conclude that the results corrected for endogeneity of focus provide even stronger and more consistent evidence in support of the U–shaped relationship under hypothesis H.1. Indeed, all coefficients have the correct sign and are statistically significant (all at the 10% confidence level and about a third at the 5% confidence level). The implied marginal effects of focus on return as risk is varied are plotted in Figures 5-A, 5-B, 6-A, and 6-B. These correspond to results in Columns 1 and 2 of Table 6 and Columns 1 and 2 of Table 7, respectively, where industrial focus I–HHI$_t$ is treated as endogenous, and are the counterparts of Figures 2-A, 3-A, 4-A, and 4-B, respectively. The marginal effects when A–HHI$_t$ is treated as endogenous are not plotted for considerations of space.

Most notably, all the marginal effects are U–shaped. Furthermore, the effects are either uniformly positive over the entire range of the risk measure or small but negative at low to moderate values of risk and positive and sharply rising at high values of risk. In particular, the statistical significance of the effect with SR as the return measure and STDRET as the risk measures which were weak earlier (Table 5, Column 6 and Figure 4-A) are now stronger and the coefficients have expected signs. Similarly, the positive effect with SR as the return measure and IDIOSYNCRATIC as the risk measure, which spanned only a small range of risk values (Table 5, Column 7 and Figure 4-B), is now uniformly positive after the endogeneity correction. While the span of DOUBT values over which the effect of I–HHI on ROA is positive is reduced in Figure 5-A compared to Figure 2-A, taking the results as a whole into account adds support for hypothesis H.1.

It is also of interest to examine the estimated coefficients in the endogenous determination of focus measures. The effects overall are similar for both focus measures, I–HHI (Columns 1 and 2) and A-HHI (Columns 3 and 4). Large banks and national or money center banks are more diversified as reflected by the negative sign on SIZE and NATIONAL DUMMY in the focus regressions. Interestingly, private banks are more diversified than public banks, an effect that is quite strong statistically. State-owned banks by contrast are more focused, consistent with Sapienza (2002b)'s conclusion that these banks have an objective that is geared towards supporting specific industries, often at subsidized rates. The deposit to assets ratio and average focus of all banks in the given year do not seem to have any incremental effect while being part of a consortium has a statistically insignificant effect.

Interestingly, the effect of past losses or risk (DOUBT$_{t-1}$, STDOUBT, STDRET$_{t-1}$ and IDIOSYNCRATIC$_{t-1}$) on focus is always negative and significant. This implies that, all else being equal, banks that are overall risky or have recently experienced higher losses or increases in their stock return volatility choose to focus less, i.e., diversify more. This lends support to the need for the endogeneity correction we have employed: If banks that choose to diversify (focus) are precisely the ones that are loss-making (profit-making) or

risky (safe), then a negative relationship between return and diversification arises even in the absence of any direct causal effect of diversification on return. In other words, the negative relationship between return and diversification may be "spurious" in that it simply reflects which banks select to diversify and which banks choose to focus. The results in Table 6 and Table 7 show convincingly that even though this selection problem is present in our sample, it is not solely responsible for the relationship between diversification and return. Hypothesis H.1 is supported even after controlling for this selection problem.[17] Indeed, the empirically observed response of banks to diversify after losses is consistent with the wisdom of traditional portfolio theory wisdom. The empirical relationship between diversification and return suggests, however, that at least some of these banks, especially the riskier ones, might benefit from choosing to increase their focus instead.

Overall, our results lend empirical support to Winton (1999)'s hypothesis that diversification (focus) has a small benefit (cost) at low bank risk levels, has maximum benefit (cost) at moderate risk levels, and in fact, hurts (helps) bank returns at very high risk levels. We find this to hold for both industrial and asset sectoral focus, for return on bank assets as well as stock returns of banks, and for a variety of accounting and stock return based measures for unexpected and expected bank risk. It is important to note, however, that examining bank returns is only one side of the tradeoff between return and risk. Next, we examine the other side of the tradeoff, the effect of the decision to focus (diversify) on *future* bank loan risk.

4.3 Test of hypothesis H.2: Effect of focus on bank loan risk

The hypothesis H.2 stated in Section 2 in terms of bank diversification is restated below in terms of bank focus.

H.2: A bank's monitoring effectiveness may be lower in newly entered and more competitive sectors, and thus, being focused can result in a superior quality of loan portfolio that reduces the bank's loan portfolio risk.

In order to study the effect of focus (diversification) on bank monitoring incentives, and in turn, on the quality of bank loan portfolios, we consider first the risk of bank loans as a dependent variable in the regression

$$\text{RISK}_t \;=\; \mu_0 + \mu_1 * \text{I–HHI}_{t-1} + \mu_2 * \text{A–HHI}_{t-1} + \xi * C_{t-1} + \epsilon_t, \tag{4.11}$$

[17] In fact, hypothesis H.1 is supported even after controlling for possible correlations in error terms of returns and focus measures.

where, as before, C_{t-1} are the non–risk control variables augmented to include past returns (ROA_{t-1} or SR_{t-1}), and risk is proxied by the variable DOUBT_t, STDRET_t or IDIOSYNCRATIC_t. The simplest version of hypothesis H.2 is the null hypothesis that an increase in focus (increase in HHI) reduces the risk of bank loan portfolios:

$$\mu_1 < 0,\ \mu_2 < 0. \tag{4.12}$$

Moreover, entering into "new" loan sectors may adversely affect bank loan portfolio quality due to the lack of monitoring specialization and/or due to poor monitoring incentives. Recall that we use the qualifier "newer" for those industries where previous exposures of the bank have been relatively small or non–existent (rather than being newer in the sense of technological or productive aspects of the industry such as dot.com firms). To test this aspect of hypothesis H.2, we construct two variables called NEW_t and FRACNEW_t, defined as follows.

- NEW_t: This dummy variable is 1 in year t for a bank if its top five industries (ranked by loan exposure amounts) in the non–financial and household part of the loan portfolio in year t include an industry not contained in its top five industries in year $t-1$ and 0 otherwise.[18] In essence, this captures whether a bank has had recent experience in lending to all its top industries, "recent experience" being interpreted as the bank having had a substantial exposure to these industries in the past few years.

- FRACNEW_t: This variable measures the fraction of the loan portfolio of a bank in year t that consists of exposures to "new" industries, newness of an industry being defined as in the description of the variable NEW_t above.

Finally, we also introduce an additional variable, COMP_t, that measures the extent of competition a bank faces for its top five industries, defined as follows.

- COMP_t: For bank i, COMP_t is measured as $\sum_{j=1}^{5}[\ 1-(X_{ij}/R_j)\ ]$, where $R = \sum_{j=1}^{N} X_{ij}$, the total exposure across all banks (1 through N) to industry j. Note that COMP is higher for bank i if its exposure to the (top five) industries it lends to is smaller compared to the exposure of other banks to the same set of industries, i.e., it has a smaller share of lending to these industries.

If COMP_t is high for a bank, we intrepret that it is likely to face greater competition, and adverse selection problems, when it seeks to expand its loans to these industries.

[18] We have also employed a variant of this variable where we used past three years to check if an industry in year t was not contained in the bank's prior top five industry exposures.

To test the hypothesis concerning deterioration of loan portfolio quality upon entry into "newer" industries and the potential "winner's curse" or adverse selection effect upon entry into competitive industries, we modify regression (4.11) along two dimensions. First, we introduce NEW_t, FRACNEW_t, and COMP_{t-1}, as explanatory variables for RISK_t. Second, we introduce interaction terms between these three variables and the two focus measures I–HHI_{t-1} and A–HHI_{t-1}.[19] The resulting specification is

$$\begin{aligned}\text{RISK}_t &= \mu_0 + \mu_1 * \text{I–HHI}_{t-1} + \mu_2 * \text{A–HHI}_{t-1} + \xi * C_{t-1} + \\ &\quad \nu_{10} * \text{NEW}_t + \nu_{20} * \text{FRACNEW}_t + \nu_{30} * \text{COMP}_{t-1} + \\ &\quad \nu_{11} * \text{I–HHI}_{t-1} * \text{NEW}_t + \nu_{12} * \text{A–HHI}_{t-1} * \text{NEW}_t + \\ &\quad \nu_{21} * \text{I–HHI}_{t-1} * \text{FRACNEW}_t + \nu_{22} * \text{A–HHI}_{t-1} * \text{FRACNEW}_t + \\ &\quad \nu_{31} * \text{I–HHI}_{t-1} * \text{COMP}_{t-1} + \nu_{32} * \text{A–HHI}_{t-1} * \text{COMP}_{t-1} + \epsilon_t. \end{aligned} \tag{4.13}$$

Consider the marginal effect of NEW_t on RISK_t. We obtain

$$\text{d}(\text{RISK}_t)/\text{d}(\text{NEW}_t) = \nu_{10} + \nu_{11} * \text{I–HHI}_{t-1} + \nu_{12} * \text{A–HHI}_{t-1}. \tag{4.14}$$

The null hypothesis is that $\text{d}(\text{RISK}_t)/\text{d}(\text{NEW}_t)$ is positive and is increasing in bank's diversification or decreasing in bank focus. This is because, for a well-diversified bank, the effect of entry into new industries is primarily one of spreading its monitoring resources more widely. By contrast, for a focused bank, the effect of entry into new industries is beneficial from a traditional diversification standpoint and is also less harmful from the standpoint of a deterioration in monitoring quality since even with an additional industry, the bank remains relatively specialized. That is, the constant term ν_{10} is positive and the interaction term coefficients ν_{11} and ν_{12} are negative. The hypothesis with respect to the marginal effect of FRACNEW_t and COMP_{t-1} on RISK_t take similar forms yielding the overall hypotheses:[20]

$$\nu_{i0} > 0, \quad \nu_{i1} < 0, \quad \nu_{i2} < 0, \ i = 1, 2, 3. \tag{4.15}$$

INSERT TABLE 8 HERE.

[19] We draw the reader's attention here to the fact that the variables NEW, FRACNEW, and COMP, had either statistically insignificant or economically insignificant effects on Return measures when added to the specification in Section 4.1. Hence, these variables were omitted therein.

[20] Note that if diversification has an effect on bank risk due to (agency) costs associated with any corresponding increase in the bank size, increase in the number of branches or employees, then such effects should be at least partially captured through the coefficients in the regressions on the control variables: SIZE, BRRATIO, and EMPRATIO.

Table 8 presents empirical evidence on how the decision to focus or diversify endogenously affects the risk of bank loan portfolios by reporting the results of tests of equations (4.11) through (4.13) above. The first three columns in Table 8 correspond to the entire sample where the risk measure employed is doubtful and the non–performing loans to assets ratio DOUBT_t, while the last six columns correspond to the publicly traded sample where the risk measures employed are stock return volatility STDRET_t and its idiosyncratic component IDIOSYNCRATIC_t. In each panel of three columns, the first two columns correspond to the test of hypothesis (4.12) and the third column corresponds to the test of hypothesis (4.15).

From Columns 1 and 2 in each panel of Table 8, we observe that the effect of both industrial and asset sectoral focus on bank risk is negative and statistically significant (at the 5% confidence level always for I–HHI and mostly so for A–HHI). The effect is economically significant for risk measure DOUBT_t. For example, the effect of increasing a bank's industrial focus from 0.16 (approximately equally exposed to six industries) to 0.33 (approximately equally exposed to three industries) in year $t-1$ is to decrease the bank's year t doubtful and non-performing loans to assets ratio by approximately 0.51%. Note that the average DOUBT value in the sample period is 5.23% with a standard deviation of 5.63%. The effect is of similar magnitude for stock return based volatility measures. However, given their higher average values in the sample, the effect is not as economically significant. Since DOUBT is perhaps a better proxy for loan portfolio's downside risk than are the stock return based risk measures, we view this evidence as supportive of hypothesis H.2 captured in equation (4.12).

INSERT TABLE 9 HERE.

Furthermore, the above effect persists even after controlling for endogeneity of the focus measures. In Table 9, we consider a simultaneous equations estimation of RISK_t and Focus_t where one of the focus measures is treated as being endogenously determined. The focus specification we test for the presence of endogeneity is identical to that of Section 4.2: We employ the same set of instrumental variables and allow the error terms across risk and focus equations to be correlated. The determinants of focus measures are analogous to the estimation results in Table 6 and Table 7. The coefficients on both focus terms, I–HHI and A–HHI, are always negative and statistically significant.

Finally, Column 3 in the panels of Table 8 reveal that when a bank enters "new" industrial sectors, loan risk increases at a rate that is increasing in the extent of diversification of the bank: The direct coefficient on NEW_t is always positive (though only marginally significant) and the coefficient on interaction terms between NEW_t and the two focus measures is negative and significant. This is consistent with hypothesis H.2 captured in equation (4.15). For highly diversified banks (low I–HHI and A–HHI), the effect of moving into new industries

is negative (of the order of 0.5% on DOUBT ratio at lowest values of I–HHI and A–HHI in the sample). For moderate diversification, the effect is close to zero (for example, at average values of I–HHI and A–HHI in the sample). Finally, for highly focused banks, the effect is in fact positive. The variable FRACNEW_t, the fraction of bank loan portfolio in the newer industries, has no substantial effect on bank risk.

Stronger than the effect of entry into newer industries is the effect of competition that a bank faces in lending (in the five largest industries it has loan exposures to). The direct coefficient on COMP_{t-1} is positive and significant. This suggests that banks facing greater competition have riskier portfolios. This could be due either to the negative effect of competition on profits, which in turn provides risk-taking incentives, as formalized in Allen and Gale (2000), or, due to the positive effect of market power on charter-values or continuation values of banks which in turn provides risk-avoidance inentives, as documented by Keeley (1990). In terms of economic magnitudes, consider two banks that are otherwise identical but one is a leader in one of its top five industries, holding an 80% share. The other bank is relatively a smaller loan player in this same industry, which does however belong to its own top five industries in terms of exposure amounts, holding say the remaining 20% share. The difference in competition faced by these two banks contributes to the difference in their doubtful loans to assets ratio of $[(1.0-0.2)-(1.0-0.8)]*2.3\% = 1.38\%$, where 2.3% is the estimated coefficient on COMP_{t-1} in Column 3 of the DOUBT panel in Table 8.

Furthermore, the risk-increasing effects of competition are greater the more diversified are banks. The coefficients on the interaction terms between COMP_{t-1} and focus measures, I–HHI_{t-1} and A–HHI_{t-1}, are both negative and statistically significant. In other words, an increase in focus, i.e., a decrease in diversification, reduces risk more when the competition that the bank faces in its loan sectors is higher. This interaction effect is however economically small compared to the direct effects of focus measures on bank risk and the direct effect of competition on bank risk as well as the interaction effect of focus measures and entry into newer industries.

These results provide at least partial evidence supporting the hypothesis that quality of monitoring by banks is poorer in newer industries and that banks face greater adverse selection when they expand into industries that have been previously penetrated by their competitors. This also suggests that if banks take the effect of lending competition into account and are value–maximizing, then they should choose to diversify (if at all) into industries with lower penetration by other banks, as proposed by Boot and Thakor (2000). In a recent paper, Hauswald and Marquez (2002) also demonstrate that bank incentives to concentrate informational resources are increasing in the degree of adverse selection they face in the market, which in turn, would be greater if banks expand by lending more to

industries where (lending) competition is strong.[21]

4.4 Additional Robustness of Tests and Results

4.4.1 State–owned vs. private banks

Sapienza (2002b) finds that the objective functions of state–owned Italian banks differ from those of private Italian banks. State–owned banks charge lower interest rates than do privately owned banks to similar or identical firms, even if the company is able to borrow more from privately owned banks. Further, she finds that state-owned banks mostly favor firms located in depressed areas and large firms. This makes it plausible that a part of the inefficiency arising from diversification may simply be due to the presence of state–owned banks in our sample. To check this, we employed the same classification of state–owned and private Italian banks employed by Sapienza (2002b) and re–examined our hypotheses for the private (not state–owned) bank sample. Based on the available classification at the beginning of 1993, 34 banks in our sample were privately–owned. The qualitative nature and the significance of our results remained unaffected by restricting our analysis to this smaller sample, i.e., both focus measures improve bank returns on average, the effect of focus on returns is U–shaped as a function of bank risk, and both focus measures reduce bank risk.[22]

4.4.2 National vs. intra-regional and local banks

The measure of focus and diversification employed in our paper concerns the asset–side of the bank balance–sheet, i.e., it is based on a bank's loan exposures to different industries and sectors. The effect of changes in focus or diversification might affect money center banks differently since these do not rely as heavily on core (local) deposits. To check for links between asset-side focus and performance while controlling for the liability structure of banks, we employed the classification of banks in our sample into national banks and non-national (i.e., intra-regional or local) banks. Eight out of nine national banks in our sample were also identified as money center banks. Estimation of the effects of focus (diversification)

[21] It is also possible that the ex-ante screening by banks suffers as well in newer industries, as theoretically shown by Hauswald and Marquez (2002), amplifying the effect of ex-post poor monitoring. However, our data does not allow us to distinguish between these two possible channels. This appears to be a fruitful goal to pursue in future research should more micro-level data on bank lending and monitoring practices become available.

[22] These results are contained in Tables 11, 12, and 13, which are available from the authors upon request. Note that the classification of Italian banks into state–owned and private banks in Sapienza (2002b) is based upon their ownership as at the beginning of 1993. While there have been changes in the state vs. private ownership of some Italian banks since then (in particular, a decline in the number of state–owned banks, see Goldman Sachs, 2001), we have been unable to obtain a comprehensive data set that provides these changes.

on return (Tables 4, 5) and on risk (Table 8) separately for the sample of national banks and the rest of the banks produced qualitatively similar patterns for both the samples. This confirms that our results are not driven by the presence of the large, national banks.[23]

4.4.3 Consortium banks

Another feature of certain Italian banks in our sample reflects the fact that they are "part of a bank group or a consortium." Since bank strategy to focus or diversify might be determined at a consortium–wide level, it might be deemed as more appropriate to measure return and risk of such banks also at a consortium–wide level. Consequently, we estimated the effects of focus (diversification) on return (Tables 4, 5) and risk (Table 8) separately for the sub-sample of banks that are not a part of a bank group or consortium. There were 70 such banks in our sample. While the overall pattern remains qualitatively unaffected, we find that in fact, the harmful effect of diversification on risk is actually more pronounced.[24]

4.5 Overall effects of diversification on bank performance

Combining the empirical findings of Tables 3 through 8 regarding the effects of diversification (focus) on bank returns (hypothesis H.1) and bank loan portfolio risk (hypothesis H.2), we summarize our results in Figure 7 in terms of their implications for the benefits of loan portfolio diversification. Note that in Figure 7, $\uparrow$ means an increase and $\downarrow$ means a decrease.

We conclude that for our sample of banks:

1. Industrial diversification does not result in an efficient tradeoff between risk and return: return is close to being unaffected or increases by a small amount with diversification for low to moderate risk banks and it deteriorates with diversification for high risk banks, whereas loan risk for banks increases with diversification. This implies an overall deterioration in performance of high risk banks upon diversification.

2. Broad asset sector diversification appears to affect bank performance in a manner analogous to industrial diversification (summarized above).

[23]These results are contained in Tables 14, 15, and 16, available from the authors upon request. We also classified banks into two samples depending upon whether their deposits to assets ratio was greater or smaller than the median deposits to assets ratio in each year. This classification produced similar results to those obtained from division of the sample into national and non-national banks. The corresponding Tables 17, 18, and 19, are also available upon request.

[24]These results are contained in Tables 20, 21, and 22, and are available from the authors upon request.

3. The effect of industrial and asset sector diversification on banks with moderate risk levels cannot be assessed without taking a stand on how much bank return should increase per unit increase in bank risk.[25]

Crucially, a robust finding that emerges from our results is that the conventional wisdom of not putting all one's eggs in a single basket cannot be applied uniformly to all banks. That is, diversification, per se, is no guarantee of superior performance or greater bank safety and soundness – which is a major goal of regulatory policy.

Figure 7: Summary of the Effect of Diversification on Bank Return, Risk, and Performance

	Moderately Risky Banks	Highly Risky Banks
Industrial or Sectoral Diversification	Return unaffected or ↑ marginally Risk ↑ ⇒ Decreased Performance OR Effect on Performance Ambiguous	Return ↓ significantly Risk ↑ ⇒ Decreased Performance

5 Discussion and Conclusion

In this paper, we have examined the effects of a bank's decision to focus (diversify) on its return and risk. Understanding these two effects enables us to derive conclusions about the overall effects of focus (diversification) on a bank's performance. Indeed, we believe that this is the first paper to employ measures of focus (diversification) based on relatively micro-level data, i.e., industrial and sectoral exposures in individual bank asset portfolios.

Driven by the availability of data, our tests are based on a unique data set of 105 Italian banks over the sample period 1993–1999. While data limitations mean that our results need to be interpreted with caution, they do suggest some implications for the optimal size and scope of banks. While traditional banking theory based on a delegated monitoring argument (see, for example, Boyd and Prescott, 1986) recommends that the optimal organization of a

[25]In practice, many banks use a RAROC (risk–adjusted return on capital) framework to determine whether such loans are beneficial. Commonly the return per unit of risk of the loan should exceed some cost of capital benchmark specified by the bank such as the after tax ROE of the bank.

bank is one where it is as diversified as possible, our results suggest that empirically, there seem to be diseconomies of diversification for certain banks. These diseconomies arise in the form of poor monitoring incentives and/or greater credit risk of loan portfolios when a bank expands into industries where it faces a high degree of competition or lacks prior lending experience.

Such diseconomies of scope suggest that the optimal industrial organization of a banking sector might be one that comprises several focused or specialized banks instead of a large number of diversified banks, an outcome that may also be attractive from a systemic risk standpoint as noted by Acharya (2001) and Shaffer (1994). Finally, our results potentially explain the results of DeLong (2001) who finds that bank mergers that are focusing (in terms of activity and geography) produce superior economic performance relative to those that are diversifying.

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Captions for Tables and Figures

Table 1: This table presents the mean, median, standard deviation, minimum value, and maximum value for the measures of bank return (ROA, ROE, SR), risk (DOUBT, STDOUBT, PROVISION, STDRET, SYSTEMATIC, IDIOSYNCRATIC), and bank focus (I–HHI, A–HHI, G–HHI) for 105 Italian banks over the sample period 1993–1999. In addition, it presents these univariate statistics also for several control variables (SIZE, EQRATIO, BRRATIO, EMPRATIO) employed in the paper. Section 3 contains the definitions of all variables and also a description of how they are computed.

Table 2: This table presents the correlation coefficients between the measures of bank return (ROA, ROE, SR), risk (DOUBT, STDRET, SYSTEMATIC, IDIOSYNCRATIC), and bank focus (I–HHI, A–HHI, G–HHI) for 105 Italian banks over the sample period 1993–1999 all measured at the annual frequency. In addition, it also includes control variables (SIZE, EQRATIO, BRRATIO, EMPRATIO) employed in the paper. Section 3 contains the definitions of all variables and also a description of how they are computed. All correlation coefficients in the table which are greater than 0.08 in magnitude are statistically significant at least at the 10% confidence level.

Table 3a: This table presents the various quantile values (in particular, the mean, minimum, 10 percentile, 25 percentile, 50 percentile (the median), 75 percentile, 90 percentile, and maximum) for each year of industrial loan portfolio focus (I–HHI), for broad asset sectoral focus (A–HHI), and for geographic loan portfolio focus (G–HHI), for 105 Italian banks over the sample period 1993–1999.

Table 3b: This table presents the various quantile values (in particular, the mean, minimum, 10 percentile, 25 percentile, 50 percentile (the median), 75 percentile, 90 percentile, and maximum) for each year of Doubtful and Non–Performing Loans to Total Assets Ratio (DOUBT), for the standard deviation of DOUBT (STDOUBT), for each year of loan-loss provisions to assets ratio (PROVISION), for each year of overall stock return volatility (STDRET), and for each year of idiosyncratic stock return volatility (IDIOSYNCRATIC), for 105 Italian banks over the sample period 1993–1999.

Table 4: This table presents the results for the test of whether the relationship between bank return (ROA_t) and bank focus ($I–HHI_{t-1}$, $A–HHI_{t-1}$) is positive on average (equation 4.1) and whether it is non–linear and U–shaped in bank risk (equation 4.3) for 105 Italian banks over the sample period 1993–1999. The specification tested also employs the control

variables (SIZE, EQRATIO, BRRATIO, EMPRATIO), the year dummies for time fixed effects, and bank-specific fixed effects. The risk measures employed are DOUBT, STDOUBT, and PROVISION. Section 3 contains the definitions of all variables and also a description of how they are computed. Note that $*$, # and + indicate statistical significance of the estimated coefficients at the $1, 5$, and 10 percent significance level, respectively. The t-statistics in parentheses are corrected for heteroscedasticity using White's correction. The coefficients on bank-specific fixed effects are not reported for the sake of brevity.

Table 5: This table presents the results for the test of whether the relationship between bank return (SR_t) and bank focus (I–HHI_{t-1}, A–HHI_{t-1}) is positive on average (equation 4.1) and whether it is non–linear and U–shaped in bank risk (equation 4.3) for 105 Italian banks over the sample period 1993–1999. The specification tested also employs the control variables (SIZE, EQRATIO, BRRATIO, EMPRATIO), the year dummies for time fixed effects, and bank-specific fixed effects. The risk measures employed are DOUBT, STDOUBT, PROVISION, STDRET, and IDIOSYNCRATIC. Section 3 contains the definitions of all variables and also a description of how they are computed. Note that $*$, # and + indicate statistical significance of the estimated coefficients at the $1, 5$, and 10 percent significance level, respectively. The t-statistics in parentheses are corrected for heteroscedasticity using White's correction. The coefficients on bank-specific fixed effects are not reported for the sake of brevity.

Table 6: This table presents the results for the test of whether the relationship between bank return (ROA_t) and bank focus (I–HHI_t, A–HHI_t) is positive on average (equation 4.1) and whether it is non–linear and U–shaped in bank risk (equation 4.3) for 105 Italian banks over the sample period 1993–1999. The results are corrected for endogeneity of focus measures I–HHI_t and A–HHI_t. In Columns 1 and 2, I–HHI is treated as endogenous. In Columns 3 and 4, A–HHI is treated as endogenous. The specification is a simultaneous system of equations as in equations (4.7) and (4.8). The tests employ the control variables (SIZE, EQRATIO, BRRATIO, EMPRATIO), the year dummies for time fixed effects, bank-specific fixed effects, and instrumental variables for determination of focus (NATIONAL DUMMY, PRIVATE DUMMY, DEPOSIT TO ASSET $RATIO_{t-1}$, STATE-OWNED DUMMY, GROUP DUMMY, and AVERAGE I–HHI_t). The risk measures employed are DOUBT (Columns 1 and 3) and STDOUBT (Columns 2 and 4). Section 3 and Section 4.2 contain the definitions of all variables and also a description of how they are computed. Note that $*$, # and + indicate statistical significance of the estimated coefficients at the $1, 5$, and 10 percent significance level, respectively. The t-statistics in parentheses are corrected for heteroscedasticity using White's correction. The coefficients on bank-specific fixed effects are not reported for the sake of brevity.

Table 7: This table presents the results for the test of whether the relationship between bank return (SR_t) and bank focus (I–HHI_t, A–HHI_t) is positive on average (equation 4.1) and whether it is non–linear and U–shaped in bank risk (equation 4.3) for 105 Italian banks over the sample period 1993–1999. The results are corrected for endogeneity of focus measures I–HHI_t and A–HHI_t. In Columns 1 and 2, I–HHI is treated as endogenous. In Columns 3 and 4, A–HHI is treated as endogenous. The specification is a simultaneous system of equations as in equations (4.7) and (4.8). The tests employ the control variables (SIZE, EQRATIO, BRRATIO, EMPRATIO), the year dummies for time fixed effects, bank-specific fixed effects, and instrumental variables for determination of focus (NATIONAL DUMMY, PRIVATE DUMMY, DEPOSIT TO ASSET RATIO$_{t-1}$, STATE-OWNED DUMMY, GROUP DUMMY, and AVERAGE I–HHI_t). The risk measures employed are STDRET (Columns 1 and 3) and IDIOSYNCRATIC (Columns 2 and 4). Section 3 and Section 4.2 contain the definitions of all variables and also a description of how they are computed. Note that $*$, # and + indicate statistical significance of the estimated coefficients at the $1, 5$, and 10 percent significance level, respectively. The t-statistics in parentheses are corrected for heteroscedasticity using White's correction. The coefficients on bank-specific fixed effects are not reported for the sake of brevity.

Table 8: This table presents the results for the effect of bank focus (I–HHI_{t-1}, A–HHI_{t-1}), entry into newer industries (NEW_t and $FRACNEW_t$), and competition faced by a bank in lending ($COMP_{t-1}$), on bank risk for 105 Italian banks over the sample period 1993–1999. The risk measures considered are $DOUBT_t$, $STDRET_t$, and $IDIOSYNCRATIC_t$. Column 1 tests the specification with only the focus measures (equation 4.11), Column 2 adds to this specification the control variables (SIZE, EQRATIO, BRRATIO, EMPRATIO, ROA_{t-1} or SR_{t-1}), and Column 3 tests the specification that further includes the effect of entry into newer industries and of competition faced in lending (equation 4.13). All specifications also employ the year dummies for time fixed effects, bank-specific fixed effects. Section 3 and Section 4.3 contain the definitions of all variables and also a description of how they are computed. Note that $*$, # and + indicate statistical significance of the estimated coefficients at the $1, 5$, and 10 percent significance level, respectively. The t-statistics in parentheses are corrected for heteroscedasticity using White's correction. The coefficients on year dummies and bank-specific fixed effects are not reported for the sake of brevity.

Table 9: This table presents the results for the effect of bank focus (I–HHI_t, A–HHI_t) on bank risk for 105 Italian banks over the sample period 1993–1999. The risk measures considered are $DOUBT_t$ (Columns 1 and 3) and $STDRET_t$ (Columns 2 and 4). The results are corrected for endogeneity of focus measures I–HHI_t and A–HHI_t. In Columns 1 and 2, I–HHI is treated as endogenous. In Columns 3 and 4, A–HHI is treated as endogenous. The

specification is a simultaneous system of equations analogous to equations (4.7) and (4.8), equation (4.7) being replaced by equation (4.11). The tests employ the control variables (SIZE, EQRATIO, BRRATIO, EMPRATIO, ROA_{t-1} or SR_{t-1}), the year dummies for time fixed effects, bank-specific fixed effects, and instrumental variables for determination of focus (NATIONAL DUMMY, PRIVATE DUMMY, DEPOSIT TO ASSET RATIO_{t-1}, STATE-OWNED DUMMY, GROUP DUMMY, and AVERAGE I–HHI_t). Section 3 and Section 4.2 contain the definitions of all variables and also a description of how they are computed. Note that $*$, # and + indicate statistical significance of the estimated coefficients at the $1, 5$, and 10 percent significance level, respectively. The t-statistics in parentheses are corrected for heteroscedasticity using White's correction. The coefficients on bank-specific fixed effects are not reported for the sake of brevity.

Figure 1: This figure illustrates the effect of diversification (focus) on the probability of failure. It plots the cumulative probability function, Prob ($z < x$), for two normal distributions with different standard deviations and with a common mean of zero. The thick line denoted as "less diversified" has a standard deviation of 1.0 whereas the dashed line denoted as "more diversified" has a lower standard deviation of 0.5. For the sake of illustration, z is treated as the distribution of bank returns and x as the level of bank debt (under a suitable scale). If the level of debt x is to the left of the central tendency of zero, e.g., at $x = -1$, then a decrease in standard deviation, by reducing the likelihood of events in the left tail of the distribution (the "default" states), reduces the probability of default. However, if the level of debt x is to the right of zero, e.g., at $x = 1$, then a decrease in standard deviation, by reducing the likelihood of events in the right tail of the distribution (the "no-default" states), in fact increases the probability of default.

Figures 2, 3, 4: These figures present the economic significance of the relationship between bank return and bank focus which is non–linear as a function of bank risk. It plots the marginal effect d(Return)/d(Focus) as specified in equation (4.4), the underlying specification for which is equation (4.3). In each plot, the marginal effect is plotted for both focus measures, I–HHI and A–HHI. Returns are proxied by ROA (Figures 2-A, 3-A) or SR (Figures 2-B, 3-B, 4-A, 4-B), and risk measures are proxied by DOUBT (Figures 2-A, 2-B), STDOUBT (Figures 3-A, 3-B), STDRET (Figure 4-A) or IDIOSYNCRATIC (Figure 4-B). The coefficients used to plot the relationships are obtained from Table 4 (Figures 2-A, 3-A) and Table 5 (Figures 2-B, 3-B, 4-A, 4-B). For each figure, the range of respective risk variable is taken to be between 0% and an upper bound which covers the minimum and the maximum values over our sample period (see Table 3b). Section 3 contains the definitions of all variables and also a description of how they are computed.

Figures 5, 6: These figures present the economic significance of the relationship between bank return and bank focus which is non–linear as a function of bank risk. It plots the marginal effect d(Return)/d(Focus) as specified in equation (4.4), the underlying specification for which is the simultaneous system of equations (4.7) and (4.8). The marginal effect is thus corrected for the endogeneity of focus measures, as described in Section 4.2. In each plot, the marginal effect is plotted for both focus measures, I–HHI and A–HHI. Returns are proxied by ROA (Figures 5-A, 5-B) or SR (Figures 6-A, 6-B), and risk measures are proxied by DOUBT (Figure 5-A), STDOUBT (Figure 5-B), STDRET (Figure 6-A) or IDIOSYNCRATIC (Figure 6-B). The coefficients used to plot the relationships are obtained from Table 6, Columns 1 and 2 (Figures 5-A, 5-B) and Table 7, Columns 1 and 2 (Figures 6-A, 6-B). For each figure, the range of respective risk variable is taken to be between 0% and an upper bound which covers the minimum and the maximum values over our sample period (see Table 3b). Section 3 contains the definitions of all variables and also a description of how they are computed.

Appendix A

Banks in Our Sample over the Period 1993-1999

	Name of Italian Bank	Publicly Traded	State Owned	Size	Type	Average Asset Size: 93-99 (ml $)	Average I-HHI	Average A-HHI	Average G-HHI
1	IST.BANC.S.PAOLO TORINO SP		Yes	VERY LARGE	NATIONAL	127697.41	0.256	0.333	0.747
2	BANCA DI ROMA	Yes	Yes	VERY LARGE	NATIONAL	92116.38	0.205	0.402	1.000
3	CARISPA PROV. LOMBARDE SPA		Yes	VERY LARGE	NATIONAL	88961.87	0.242	0.295	0.865
4	B.CA COMMERCIALE ITALIANA	Yes	Yes	VERY LARGE	NATIONAL	87582.60	0.292	0.373	0.581
5	B.CA NAZ.LE DEL LAVORO SPA	Yes	Yes	VERY LARGE	NATIONAL	86629.62	0.291	0.321	0.811
6	CREDITO ITALIANO	Yes	Yes	VERY LARGE	NATIONAL	65935.05	0.288	0.337	0.702
7	BANCA MONTE PASCHI SIENA	Yes	Yes	VERY LARGE	NATIONAL	64653.49	0.228	0.266	0.872
8	BANCO DI NAPOLI SPA	Yes	Yes	VERY LARGE	NATIONAL	48283.50	0.221	0.289	0.868
9	ROLO BANCA 1473 S.P.A.	Yes		LARGE	INTRA-REGIONAL	36928.96	0.257	0.288	0.741
10	BANCO DI SICILIA SPA		Yes	LARGE	INTRA-REGIONAL	30238.15	0.237	0.232	0.950
11	B.CA POP. DI NOVARA	Yes		LARGE	NATIONAL	24109.91	0.247	0.390	0.915
12	B.CA POP. DI MILANO	Yes		LARGE	INTRA-REGIONAL	23473.00	0.277	0.373	0.772
13	CARISPA DI TORINO SPA		Yes	LARGE	INTRA-REGIONAL	23048.44	0.246	0.350	0.781
14	B.CA NAZ.LE AGRICOLTURA	Yes		LARGE	INTRA-REGIONAL	21764.49	0.234	0.383	0.786
15	DEUTSCHE BANK SPA			LARGE	INTRA-REGIONAL	19286.35	0.253	0.362	0.810
16	CARIVERONA BANCA S.P.A.		Yes	LARGE	INTRA-REGIONAL	19186.40	0.271	0.349	0.912
17	B.CA POP. DI BERGAMO-CREDITO VARES	Yes		LARGE	INTRA-REGIONAL	19013.32	0.240	0.348	0.966
18	BANCA TOSCANA	Yes		LARGE	INTRA-REGIONAL	15357.70	0.245	0.356	0.996
19	CARISPA IN BOLOGNA SPA		Yes	LARGE	INTRA-REGIONAL	14610.17	0.228	0.324	0.947
20	CR PARMA E PIACENZA SPA		Yes	LARGE	INTRA-REGIONAL	14443.26	0.230	0.340	0.909
21	BANCA ANTONIANA-POP.VENETA			MEDIUM	REGIONAL	13083.25	0.244	0.428	0.985
22	BP VERONA/POP.VERONA-S.GIM.E S.PRO	Yes		MEDIUM	REGIONAL	13075.80	0.254	0.352	0.965
23	CARISPA DI FIRENZE SPA		Yes	MEDIUM	REGIONAL	11350.44	0.226	0.325	0.994
24	CARISPA PADOVA ROVIGO SPA		Yes	MEDIUM	REGIONAL	10990.80	0.235	0.427	0.999
25	B.CA POP. EMILIA ROMAGNA	Yes		MEDIUM	REGIONAL	10943.33	0.254	0.372	0.957
26	MEDIOCREDITO LOMBARDO-SPA		Yes	MEDIUM	REGIONAL	10688.70	0.253	0.687	0.993
27	BANCA CARIGE S.P.A.	Yes	Yes	MEDIUM	REGIONAL	10479.00	0.250	0.325	0.974
28	BANCO DI SARDEGNA SPA	Yes	Yes	MEDIUM	REGIONAL	10348.93	0.206	0.265	0.900
29	CENTROBANCA		Yes	MEDIUM	REGIONAL	9576.32	0.305	0.487	0.945
30	EFIBANCA		Yes	MEDIUM	REGIONAL	9414.93	0.324	0.417	0.884
31	CREDITO BERGAMASCO	Yes		MEDIUM	REGIONAL	7848.34	0.261	0.390	0.902
32	BANCA MEDIOCREDITO SPA		Yes	MEDIUM	REGIONAL	7638.04	0.249	0.325	0.997
33	B.R.E. BANCA		Yes	MEDIUM	REGIONAL	7110.85	0.242	0.312	0.997
34	B.AGRICOLA MANTOVANA	Yes		MEDIUM	REGIONAL	6898.42	0.245	0.386	0.962
35	BANCA DELLE MARCHE		Yes	MEDIUM	REGIONAL	6752.06	0.212	0.321	1.000
36	INTERBANCA	Yes	Yes	MEDIUM	REGIONAL	6678.02	0.298	0.412	0.919
37	B.CA POP. DI LODI	Yes		MEDIUM	REGIONAL	6413.13	0.239	0.360	0.897
38	B.CA POP. DI BRESCIA	Yes		MEDIUM	REGIONAL	5921.20	0.241	0.361	0.996
39	B.POP.COM.IO INDUSTRIA	Yes		MEDIUM	REGIONAL	5684.98	0.242	0.491	0.917
40	CARISPA DI VENEZIA SPA		Yes	MEDIUM	REGIONAL	4930.30	0.223	0.344	0.926
41	B.POP.ETRURIA E LAZIO	Yes		MEDIUM	REGIONAL	4704.56	0.234	0.444	0.999
42	CREDITO EMILIANO S.P.A.	Yes	Yes	SMALL	INTRA-REGIONAL	6889.18	0.235	0.346	0.935
43	BANCA SELLA SPA			SMALL	PROVINCIAL	3706.60	0.212	0.359	0.909
44	B. DEL SALENTO-C.P.SAL.SPA			SMALL	PROVINCIAL	3507.56	0.218	0.344	0.911
45	BANCA FIDEURAM SPA	Yes		SMALL	PROVINCIAL	3369.71	0.213	0.430	0.999
46	B.PIC.LO CRED.VALTELLINESE	Yes		SMALL	PROVINCIAL	3297.29	0.219	0.385	0.959
47	BANCA DI LEGNANO	Yes		SMALL	PROVINCIAL	2665.17	0.252	0.347	0.978
48	CREDITO ARTIGIANO	Yes		SMALL	PROVINCIAL	2384.90	0.257	0.500	0.973
49	B.CHIAVARI RIV LIGURE SPA	Yes		SMALL	PROVINCIAL	2330.64	0.210	0.291	0.958
50	B.DESIO E DELLA BRIANZA	Yes		SMALL	PROVINCIAL	2094.03	0.226	0.454	1.000
51	B.AGRIC.POP. RAGUSA			SMALL	PROVINCIAL	2052.50	0.261	0.396	1.000
52	B.CA TRENTO E BOLZANO			SMALL	PROVINCIAL	1966.21	0.233	0.360	0.973
53	BANCA DI PIACENZA			SMALL	PROVINCIAL	1841.55	0.221	0.399	1.000

Appendix A (Continued)

Banks in Our Sample over the Period 1993-1999

	Name of Italian Bank	Publicly Traded	State Owned	Size	Type	Average Asset Size: 93-99 (ml $)	Average I-HHI	Average A-HHI	Average G-HHI
54	MEDIOCREDITO CENTRALE SPA		Yes	SMALL	PROVINCIAL	6426.76	0.296	0.528	0.417
55	B.CA POP. DI SONDRIO	Yes		SMALL	PROVINCIAL	5012.77	0.235	0.456	0.974
56	B.CA POP. VICENTINA			SMALL	PROVINCIAL	4843.56	0.261	0.486	0.977
57	CASSAMARCA S.P.A.		Yes	SMALL	PROVINCIAL	3699.20	0.217	0.306	0.849
58	BIVERBANCA SPA		Yes	SMALL	PROVINCIAL	3499.32	0.230	0.370	0.970
59	CARISPA BOLZANO SPA		Yes	SMALL	PROVINCIAL	3491.64	0.202	0.371	0.994
60	BANCA POP. DI ANCONA SPA			SMALL	PROVINCIAL	3466.38	0.223	0.328	1.000
61	CARISPA DI LUCCA SPA		Yes	SMALL	PROVINCIAL	3155.62	0.200	0.323	0.991
62	CA.RI.TRO SPA		Yes	SMALL	PROVINCIAL	3088.71	0.208	0.308	0.993
63	CARISPA TRIESTE-BANCA SPA		Yes	SMALL	PROVINCIAL	2816.87	0.229	0.349	0.991
64	BANCA MEDITERRANEA SPA			SMALL	PROVINCIAL	2802.25	0.210	0.288	1.000
65	CARISPA DI PERUGIA SPA		Yes	SMALL	PROVINCIAL	2671.11	0.239	0.327	0.998
66	B.CA POP. FRIULADRIA			SMALL	PROVINCIAL	2514.32	0.247	0.408	0.999
67	CARISPA PISTOIA PESCIA SPA		Yes	SMALL	PROVINCIAL	2462.67	0.213	0.311	0.999
68	B. P. PUGLIA E BASILICATA			SMALL	PROVINCIAL	2436.34	0.207	0.243	0.985
69	CARISPA DI S.MINIATO SPA		Yes	SMALL	PROVINCIAL	2417.15	0.235	0.354	0.977
70	CARISPA UDINE E PN SPA		Yes	SMALL	PROVINCIAL	2191.54	0.242	0.367	0.988
71	CARISPA DI ASTI SPA		Yes	SMALL	PROVINCIAL	2181.40	0.213	0.356	0.999
72	CARISPA DI PISA SPA		Yes	SMALL	PROVINCIAL	2163.15	0.203	0.376	0.984
73	B.C.C. DI ROMA			SMALL	PROVINCIAL	2142.55	0.225	0.362	0.722
74	BANCA POP. IRPINIA			SMALL	PROVINCIAL	2135.68	0.199	0.438	1.000
75	BANCA POP. ALTO ADIGE			SMALL	PROVINCIAL	2060.46	0.244	0.406	0.962
76	TERCAS-C.R. TERAMO SPA		Yes	SMALL	PROVINCIAL	2034.38	0.219	0.324	0.998
77	CARISPA DI FERRARA SPA		Yes	SMALL	PROVINCIAL	1966.96	0.200	0.309	1.000
78	CARISPA DELLA SPEZIA SPA		Yes	SMALL	PROVINCIAL	1887.49	0.214	0.273	1.000
79	CARISPA DI RIMINI SPA		Yes	SMALL	PROVINCIAL	1759.66	0.215	0.368	0.980
80	B.CA POP. DI INTRA-SCPARL	Yes		SMALL	PROVINCIAL	1692.76	0.212	0.374	0.971
81	B.CA POP. DI CREMONA	Yes		SMALL	PROVINCIAL	1686.39	0.281	0.411	1.000
82	B.POP. LUINO E VARESE-SPA	Yes		SMALL	PROVINCIAL	1677.24	0.228	0.438	0.999
83	CARISPA DI ALESSANDRIA SPA		Yes	SMALL	PROVINCIAL	1641.21	0.212	0.302	1.000
84	CARISPA DI FORLI' SPA		Yes	SMALL	PROVINCIAL	1596.49	0.244	0.352	1.000
85	CARISPA DI RAVENNA SPA		Yes	SMALL	PROVINCIAL	1539.31	0.235	0.328	0.993
86	CARISPA DI CESENA SPA		Yes	SMALL	PROVINCIAL	1518.21	0.207	0.327	1.000
87	B.POP.DI ABBIATEGRASSO-SPA			SMALL	PROVINCIAL	1445.37	0.235	0.507	0.999
88	MED. TRENT.-ALTO ADI. SPA		Yes	SMALL	PROVINCIAL	1403.68	0.314	0.620	1.000
89	CARISPA PROV. CHIETI SPA		Yes	SMALL	PROVINCIAL	1384.76	0.217	0.343	1.000
90	CR PESCARA LORETO SPA		Yes	SMALL	PROVINCIAL	1349.76	0.231	0.360	1.000
91	CARISPA DI FERMO SPA		Yes	SMALL	PROVINCIAL	1313.52	0.223	0.309	1.000
92	BANCA MONTE PARMA - SPA		Yes	SMALL	PROVINCIAL	1297.52	0.203	0.419	0.999
93	CARISPA DI RIETI SPA		Yes	SMALL	PROVINCIAL	1292.20	0.208	0.256	1.000
94	CARISPA DI SAVONA SPA		Yes	SMALL	PROVINCIAL	1292.03	0.209	0.298	0.998
95	B.CA POP. DI SPOLETO SPA			SMALL	PROVINCIAL	1264.85	0.222	0.268	1.000
96	CARISPA DI GORIZIA SPA		Yes	SMALL	PROVINCIAL	1251.80	0.231	0.288	0.997
97	CARISPA PROV. VITERBO SPA		Yes	SMALL	PROVINCIAL	1194.85	0.198	0.374	0.987
98	IRFIS- MED. SICILIA SPA		Yes	SMALL	PROVINCIAL	1155.97	0.274	0.652	0.997
99	CARISPAQ - SPA		Yes	SMALL	PROVINCIAL	1135.98	0.230	0.337	1.000
100	CRED. FOND. TOSCANO SPA		Yes	SMALL	PROVINCIAL	1126.50	0.236	0.280	0.997
101	BANCA POP. UDINESE			VERY SMALL	LOCAL	1207.66	0.267	0.402	0.995
102	CARISPA ASCOLI PICENO SPA		Yes	VERY SMALL	LOCAL	1187.36	0.210	0.257	1.000
103	B.CA DI VALLE CAMONICA			VERY SMALL	LOCAL	1102.95	0.228	0.383	0.999
104	CARISPA TERNI E NARNI SPA		Yes	VERY SMALL	LOCAL	834.76	0.216	0.243	1.000
105	CARISPA CIVITAVECCHIA SPA		Yes	VERY SMALL	LOCAL	426.94	0.218	0.273	1.000

Table 1 - Univariate Descriptive Statistics: Italian Banks 1993-1999

Variable/Ratio	Mean	Median	St. Deviation	Minimum	Maximum
ROA (%)	0.927	0.982	0.852	-5.962	2.958
ROE (%)	8.76	11.60	29.30	-6.229	37.75
Stock Return (%) - SR	20.95	10.37	41.76	-24.01	129.30
Industrial Sector I-HHI	0.237	0.231	0.038	0.181	0.793
Asset Sector A-HHI	0.371	0.352	0.098	0.197	0.875
Geographical Sector G-HHI	0.947	0.895	0.099	0.315	1.000
Asset Size (million $) - SIZE	11,894	3,080	22,674	376	152,596
Equity to Asset Ratio (%) – EQRATIO	8.732	8.113	3.76	0.604	31.80
Branch to Asset Ratio – BRRATIO	0.022	0.221	0.010	0	0.06185
Employment Expenses to Assets Ratio (%) – EMPRATIO	1.855	0.018	0.611	0.232	4.636
Doubtful and Non-Performing Loans to Assets Ratio (%) – DOUBT	5.234	3.199	5.632	0	44.43
Standard Deviation of DOUBT - STDOUBT	14.853	9.760	10.856	2.760	28.564
Standard Deviation of SR – STDRET	6.745	13.04	11.204	1.701	41.86
Systematic Risk	6.673	8.471	11.580	0.060	27.358
Idiosyncratic Risk	4.941	6.256	10.006	0.017	18.241
Provision for Loan Losses to Assets Ratio (%)	0.601	0.640	2.098	0.105	5.267

Table 2 - Bivariate Descriptive Statistics: Italian Banks 1993-1999
Correlation Coefficients

Variable/Ratio	ROA	ROE	SR	I-HHI	A-HHI	G-HHI	SIZE	EQ	BR	EMP	DOUBT	STD RET	SYSTEM ATIC	IDIOSYN CRATIC
ROA	1.00													
ROE	0.621	1.00												
SR	0.294	0.144	1.00											
I-HHI	-0.001	0.062	0.124	1.00										
A-HHI	0.144	0.083	0.193	0.257	1.00									
G-HHI	0.134	0.037	0.162	-0.307	-0.024	1.00								
SIZE	-0.225	-0.101	-0.155	0.205	-0.115	-0.589	1.00							
EQRATIO	0.422	0.146	0.112	0.009	0.236	0.084	-0.321	1.00						
BRRATIO	0.139	0.038	0.002	-0.366	-0.294	0.425	-0.400	0.133	1.00					
EMPRATIO	0.087	-0.009	-0.319	-0.384	-0.365	0.356	-0.278	0.167	0.743	1.00				
DOUBT	-0.418	-0.266	-0.075	-0.061	-0.041	0.099	0.003	-0.063	-0.116	-0.134	1.00			
STDRET	0.245	0.116	0.697	0.197	0.126	0.038	-0.006	0.044	-0.044	-0.275	-0.201	1.00		
SYSTEM ATIC	0.162	0.081	0.336	0.075	0.105	0.030	-0.005	0.028	-0.028	-0.256	-0.134	0.793	1.00	
IDIOSYN CRATIC	0.182	0.103	0.606	0.132	0.116	0.028	-0.005	0.039	-0.041	-0.195	-0.182	0.836	0.439	1.00

Note: All correlation coefficients greater than 0.08 in magnitude are statistically significant at least at 10% confidence level.

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Table 3a – Quantiles of Focus Measures

FOCUS MEASURES	MEAN	MINIMUM	10%ile	25%ile	50%ile	75%ile	90%ile	MAXIMUM
I-HHI	**0.2375**	**0.1812**	**0.2039**	**0.2130**	**0.2304**	**0.2528**	**0.2819**	**0.7938**
1993	0.2397	0.1868	0.1996	0.2127	0.2333	0.2563	0.2871	0.5000
1994	0.2395	0.1812	0.2059	0.2160	0.2320	0.2501	0.2859	0.3994
1995	0.2327	0.1854	0.2054	0.2117	0.2276	0.2433	0.2732	0.3346
1996	0.2362	0.1845	0.2047	0.2130	0.2319	0.2508	0.2828	0.3213
1997	0.2358	0.1905	0.2040	0.2147	0.2303	0.2529	0.2721	0.3235
1998	0.2424	0.1849	0.2051	0.2125	0.2321	0.2556	0.2801	0.7938
1999	0.2363	0.1874	0.2012	0.2111	0.2299	0.2571	0.2784	0.3598
A-HHI	**0.3715**	**0.1975**	**0.2666**	**0.3108**	**0.3521**	**0.4094**	**0.4964**	**0.8759**
1993	0.4181	0.2564	0.3185	0.3017	0.3954	0.4517	0.5540	0.7049
1994	0.3557	0.2199	0.2688	0.2982	0.3369	0.3782	0.4589	0.8759
1995	0.3423	o.1975	0.2573	0.2928	0.3345	0.3704	0.4343	0.6665
1996	0.3346	0.2108	0.2483	0.2846	0.3264	0.3670	0.4149	0.7138
1997	0.3410	0.2129	0.2535	0.2934	0.3268	0.3669	0.4445	0.7247
1998	0.4124	0.2169	0.3028	0.3421	0.3947	0.4604	0.5517	0.8000
1999	0.4011	0.2364	0.2982	0.3391	0.3808	0.4369	0.5222	0.7833
G-HHI	**0.9477**	**0.3155**	**0.8169**	**0.9424**	**0.9957**	**1**	**1**	**1**
1993	0.9542	0.3778	0.7981	0.9564	0.9987	1	1	1
1994	0.9634	0.3138	0.8747	0.9569	0.9981	1	1	1
1995	0.9529	0.3155	0.8408	0.9471	0.9966	1	1	1
1996	0.9393	0.4850	0.7959	0.9240	0.9942	1	1	1
1997	0.9406	0.4811	0.7944	0.9434	0.9948	1	1	1
1998	0.9418	0.4680	0.8116	0.9338	0.9929	0.9989	1	1
1999	0.9412	0.4278	0.8278	0.9259	0.9919	0.9983	1	1

Table 3b - Quantiles of Risk Variables

RISK VARIABLES	MEAN	MINIMUM	10%ile	25%ile	50%ile	75%ile	90%ile	MAXIMUM
DOUBT	**5.23**	**0.00**	**0.84**	**2.77**	**5.63**	**6.19**	**10.06**	**44.43**
1993	3.66	0.23	1.22	1.96	2.99	4.22	6.72	14.72
1994	4.96	0.21	1.52	2.45	3.75	6.17	9.73	24.06
1995	5.91	0.00	1.71	3.24	4.44	7.75	11.68	24.09
1996	6.48	0.00	1.70	2.89	4.45	8.00	12.84	34.15
1997	6.36	0.00	1.70	2.58	4.44	7.68	10.60	36.91
1998	6.70	0.19	1.55	2.71	4.53	7.14	11.27	40.94
1999	6.51	0.09	1.38	2.59	4.18	6.98	10.62	44.43
STDOUBT	**14.85**	**2.76**	**4.96**	**6.35**	**9.76**	**17.50**	**24.91**	**28.56**
PROVISION	**0.60**	**0.10**	**0.21**	**0.39**	**0.64**	**1.75**	**2.12**	**5.26**
1993	0.60	0.10	0.18	0.25	0.68	0.95	1.44	3.94
1994	0.62	0.09	0.19	0.27	0.72	0.74	1.76	4.86
1995	0.68	0.12	0.19	0.33	0.78	0.80	2.21	4.94
1996	0.71	0.13	0.21	0.35	0.84	0.94	2.28	5.08
1997	0.78	0.14	0.22	0.36	0.88	0.95	2.46	5.25
1998	0.83	0.14	0.24	0.35	0.84	1.04	2.51	5.26
1999	0.85	0.15	0.26	0.36	0.86	0.96	2.60	5.14
STDRET	**6.75**	**1.70**	**3.63**	**8.45**	**13.04**	**27.17**	**39.84**	**41.86**
1993	7.01	1.74	4.01	7.85	11.23	25.83	38.82	35.31
1994	6.08	1.70	4.65	7.97	14.53	25.71	30.61	31.35
1995	8.21	1.79	3.97	8.16	14.91	26.02	34.80	37.92
1996	5.45	1.72	2.41	8.51	12.50	26.91	37.05	40.04
1997	10.20	1.86	2.68	7.03	19.82	30.87	36.83	41.86
1998	6.75	1.76	2.04	7.16	11.73	31.08	35.48	39.72
1999	5.77	1.70	2.76	6.91	12.61	31.63	37.99	38.43
IDIOSYNCRATIC	**4.94**	**0.02**	**2.17**	**3.94**	**6.26**	**8.99**	**12.02**	**18.24**
1993	4.99	0.17	2.05	3.06	6.42	7.46	10.28	16.45
1994	4.51	0.13	2.16	2.87	5.56	8.02	10.04	17.02
1995	5.08	0.95	1.88	3.76	5.94	9.24	12.65	16.24
1996	4.42	0.09	2.00	2.99	5.43	8.77	11.07	15.96
1997	4.75	0.31	2.15	3.56	5.98	9.03	11.65	17.06
1998	5.48	0.86	3.24	4.54	7.12	10.74	14.81	18.24
1999	5.07	0.02	2.95	4.36	8.09	10.01	14.08	18.08

Table 4 - Test for Non-monotonicity in Effect of Focus on Bank Returns on Assets

	1	2	3	4	5
	ROA_t	ROA_t	ROA_t	ROA_t	ROA_t
Intercept	0.006 (1.71)+	0.001 (1.85)+	0.023 (1.03)	0.018 (1.29)	-0.008 (1.54)
I-HHI $_{t-1}$	0.013 (2.01)#	0.002 (1.93)+	0.008 (1.97)#	0.015 (1.98)#	0.001 (1.62)
A-HHI $_{t-1}$	0.002 (2.96)*	0.004 (2.16)#	0.016 (2.68)#	0.019 (2.28)#	0.015 (2.05)#
SIZE $_{t-1}$		-0.002 (1.87)+	-0.001 (1.03)	-0.001 (0.80)	-0.002 (1.31)
EQRATIO $_{t-1}$		0.089 (10.37)*	0.086 (6.35)*	0.075 (6.22)*	0.028 (5.16)*
BRRATIO $_{t-1}$		0.072 (1.81)+	0.032 (1.78)+	0.021 (1.39)	0.116 (1.53)
EMPRATIO $_{t-1}$		-0.093 (1.44)	-0.063 (1.21)	-0.267 (1.60)	-0.065 (1.33)
DOUBT $_{t-1}$		-0.065 (3.87)*	-0.096 (2.01)#		
STDOUBT				-0.047 (1.80)+	
PROVISION $_{t-1}$					-0.085 (1.73)+
I-HHI $_{t-1}$ * DOUBT $_{t-1}$			-1.020 (1.82)+		
A-HHI $_{t-1}$ * DOUBT $_{t-1}$			-0.046 (1.89)+		
I-HHI $_{t-1}$ * (DOUBT $_{t-1}$)^2			7.391 (2.16)#		
A-HHI $_{t-1}$ * (DOUBT $_{t-1}$)^2			2.906 (1.87)+		
I-HHI $_{t-1}$ * STDOUBT				-1.319 (1.69)+	
A-HHI $_{t-1}$ * STDOUBT				-0.517 (1.88)+	
I-HHI $_{t-1}$ * (STDOUBT)^2				8.776 (1.75)+	
A-HHI $_{t-1}$ * (STDOUBT)^2				5.320 (2.04)#	
I-HHI $_{t-1}$ * PROVISION $_{t-1}$					-0.764 (1.80)+
A-HHI $_{t-1}$ * PROVISION $_{t-1}$					-2.552 (2.19)#
I-HHI $_{t-1}$ * (PROVISION $_{t-1}$)^2					3.754 (1.52)
A-HHI $_{t-1}$ * (PROVISION $_{t-1}$)^2					6.420 (1.87)+
1995	0.001 (1.61)	0.014 (1.39)	0.016 (1.31)	0.001 (1.40)	0.001 (1.49)
1996	0.002 (2.09)#	0.002 (0.95)	0.001 (1.18)	0.015 (1.71)+	0.008 (1.63)
1997	-0.001 (0.73)	-0.001 (2.14)#	-0.001 (2.14)#	-0.001 (0.68)	-0.001 (1.35)
1998	0.002 (1.84)+	0.002 (1.08)	0.001 (1.20)	0.015 (0.70)	0.009 (1.03)
1999	-0.001 (1.36)	-0.003 (1.99)#	-0.002 (1.90)+	-0.022 (1.69)#	-0.014 (1.85)+
Adj-R^2	0.0229	0.3612	0.4055	0.4003	0.4129
F-Statistics	3.28*	38.64*	40.25*	44.39*	36.76*
Number	604	604	604	604	604

Note: *, #, and + indicate statistical significance of the parameters at 1, 5, and 10 % significance level respectively. White-corrected t-statistics are in the parenthesis.

Table 5 - Test for Non-monotonicity in Effect of Focus on Bank Stock Returns

	1	2	3	4	5	6	7
	SR_t	SR_t	SR_t	SR_t	SR_t	SR_t	SR_t
Intercept	-0.422 (2.65)#	-0.097 (1.99)#	-0.089 (1.74)+	-0.072 (1.88)+	0.052 (1.69)+	-0.082 (1.79)+	-0.037 (0.81)
I-HHI $_{t-1}$	0.013 (3.16)*	0.052 (2.99)*	0.085 (3.23)*	0.058 (3.06)*	0.021 (2.47)#	0.039 (2.82)#	0.018 (2.46)#
A-HHI $_{t-1}$	0.192 (4.02)*	0.104 (3.63)*	0.071 (3.37)*	0.050 (3.78)*	0.044 (2.64)#	0.076 (2.99)*	0.027 (2.52)#
SIZE $_{t-1}$		-0.073 (0.81)	-0.114 (0.58)	-0.127 (1.39)	-0.032 (1.06)	-0.002 (1.53)	-0.001 (1.12)
EQRATIO $_{t-1}$		0.003 (0.65)	0.006 (1.03)	0.013 (1.45)	0.076 (0.74)	0.047 (1.05)	0.067 (1.15)
BRRATIO $_{t-1}$		0.135 (1.71)+	0.131 (1.70)+	0.146 (1.53)	0.104 (1.54)	0.103 (1.57)	0.108 (1.62)
EMPRATIO $_{t-1}$		-2.825 (2.40)#	-2.829 (1.63)	-0.814 (1.35)	-0.384 (1.80)+	-0.648 (2.30)#	-0.204 (1.52)
DOUBT $_{t-1}$		-1.03 (0.18)	-1.759 (0.46)				
STDOUBT				-1.184 (0.41)			
PROVISION $_{t-1}$					-0.072 (2.02)#		
STDRET $_{t-1}$						0.0276 (2.41)#	
IDIOSYNCRATIC $_{t-1}$							-0.884 (1.92)+
I-HHI $_{t-1}$ * DOUBT $_{t-1}$			-0.491 (1.67)+				
A-HHI $_{t-1}$ * DOUBT $_{t-1}$			-1.091 (1.62)				
I-HHI $_{t-1}$ * (DOUBT $_{t-1}$)^2			5.064 (1.90)+				
A-HHI $_{t-1}$ * (DOUBT $_{t-1}$)^2			6.041 (1.99)#				
I-HHI $_{t-1}$ * STDOUBT				-0.276 (1.50)			
A-HHI $_{t-1}$ * STDOUBT				-0.275 (1.67)+			
I-HHI $_{t-1}$ * (STDOUBT)^2				4.083 (1.42)			
A-HHI $_{t-1}$ * (STDOUBT)^2				3.748 (1.90)+			
I-HHI $_{t-1}$ * PROVISION $_{t-1}$					-0.256 (1.44)		
A-HHI $_{t-1}$ * PROVISION $_{t-1}$					-0.905 (1.78)+		
I-HHI $_{t-1}$ * (PROVISION $_{t-1}$)^2					2.562 (1.70)+		
A-HHI $_{t-1}$ * (PROVISION $_{t-1}$)^2					4.094 (2.36)#		
I-HHI $_{t-1}$ * STDRET $_{t-1}$						1.329 (1.48)	
A-HHI $_{t-1}$* STDRET $_{t-1}$						3.062 (1.76) +	
I-HHI $_{t-1}$ * (STDRET $_{t-1}$)^2						5.743 (0.51)	
A-HHI $_{t-1}$ * (STDRET $_{t-1}$)^2						8.053 (1.06)	
I-HHI $_{t-1}$ * IDIOSYNCRATIC $_{t-1}$							-0.641 (1.89)+
A-HHI $_{t-1}$ * IDIOSYNCRATIC $_{t-1}$							-0.524 (2.33)#
I-HHI $_{t-1}$ * (IDIOSYNCRATIC $_{t-1}$)^2							3.082 (1.60)
A-HHI $_{t-1}$ * (IDIOSYNCRATI C $_{t-1}$)^2							2.081 (1.83)+
1995	0.091 (0.92)	-0.001 (1.42)	-0.001 (1.48)	0.001 (1.52)	0.002 (1.30)	0.067 (1.17)	0.028 (1.66)+
1996	0.053 (0.54)	0.018 (1.97)#	0.017 (1.90)#	0.013 (2.01)#	0.025 (2.26)#	0.036 (0.95)	0.025 (1.29)
1997	-0.021 (0.98)	-0.001 (0.58)	-0.001 (0.50)	-0.006 (0.48)	-0.003 (0.97)	-0.014 (1.06)	-0.007 (1.22)
1998	0.032 (2.86)#	0.014 (0.82)	0.014 (0.76)	0.014 (0.69)	0.007 (1.06)	0.035 (2.31)#	0.029 (2.00)#
1999	-0.051 (3.54)*	-0.049 (2.58)#	-0.049 (2.41)#	-0.059 (2.14)#	-0.035 (2.01)#	-0.039 (2.46)#	-0.014 (2.05)#
Adj-R^2	0.0658	0.2846	0.3082	0.2958	0.2937	0.2895	0.2603
F-Statistics	7.33*	14.10*	12.43*	11.86*	10.54*	12.06*	9.80*
Number	152	152	152	152	152	152	152

Note: *, #, and + indicate statistical significance of the parameters at 1, 5, and 10 % significance level respectively. White-corrected t-statistics are in the parenthesis.

Table 6 – Simultaneous (SUR) Estimation of Effect of Focus on Bank Return Treating Focus Measure as Endogenous Variable

	1	1	2	2	3	3	4	4
	ROA_t	I-HHI $_t$	ROA_t	I-HHI $_t$	ROA_t	A-HHI $_t$	ROA_t	A-HHI $_t$
Intercept	0.142 (6.10)*	0.319 (8.00)*	0.148 (5.99)*	0.355 (7.75)*	0.024 (1.15)	0.325 (8.87)*	0.029 (1.04)	0.294 (8.69)*
I-HHI $_t$ (Col 1 & Col 2) I-HHI $_{t-1}$ (Col 3 & Col 4)	0.001 (1.71)+		0.001 (1.81)+		0.006 (1.85)+		0.005 (1.81)+	
A-HHI $_{t-1}$(Col 1 & Col 2) A-HHI $_t$ (Col 3 & Col 4)	0.013 (1.79)+		0.015 (1.84)+		0.013 (2.38)#		0.011 (2.01)#	
SIZE $_{t-1}$	-0.001 (0.85)	-0.007 (3.75)*	-0.002 (0.73)	-0.006 (3.54)*	-0.001 (1.06)	-0.007 (1.93)+	-0.001 (1.14)	-0.005 (1.95)+
EQRATIO $_{t-1}$	0.042 (5.50)*	-0.097 (2.35)#	0.045 (5.03)*	-0.075 (2.46)#	0.074 (5.83)*	0.182 (1.76)+	0.053 (6.65)*	0.157 (1.72)+
BRRATIO $_{t-1}$	0.155 (1.78)+	0.092 (1.04)	0.127 (1.86)+	0.052 (0.99)	0.314 (1.71)+	-1.637 (2.14)#	0.357 (1.60)	-0.992 (1.96)#
EMPRATIO $_{t-1}$	-0.051 (1.45)	-0.010 (0.73)	-0.048 (1.44)	-0.008 (0.77)	-0.051 (1.19)	-0.165 (0.97)	-0.106 (1.32)	-0.231 (0.50)
DOUBT $_{t-1}$	-0.013 (1.87)+	-0.016 (3.70)*			-0.077 (2.38)#	-0.156 (2.03)#		
STDOUBT			-0.032 (1.69)+	-0.026 (2.81)#			-0.035 (1.68)+	-0.016 (2.39)#
I-HHI $_t$ * DOUBT $_{t-1}$	-1.243 (1.76)+				-1.006 (1.89)+			
A-HHI $_{t-1}$ * DOUBT $_{t-1}$	-0.025 (2.41)#				-0.027 (2.14)#			
I-HHI $_t$ * (DOUBT $_{t-1}$)^2	5.242 (1.89)+				5.673 (1.72)+			
A-HHI $_{t-1}$ * (DOUBT $_{t-1}$)^2	1.318 (1.68)+				1.372 (1.75)+			
I-HHI $_t$ * STDOUBT			-0.480 (1.82)+				-1.057 (1.68)+	
A-HHI $_{t-1}$ * STDOUBT			-1.431 (1.68)+				-1.909 (1.77)+	
I-HHI $_t$ * (STDOUBT)^2			5.433 (2.31)#				5.096 (1.83)+	
A-HHI $_{t-1}$ * (STDOUBT)^2			7.936 (1.95)+				7.325 (2.14)#	
NATIONAL DUMMY		-0.016 (1.98)#		-0.019 (2.02)#		-0.006 (1.90)+		-0.016 (1.99)#
PRIVATE DUMMY		-0.023 (2.55)#		-0.025 (2.47)#		-0.040 (4.02)*		-0.025 (3.23)*
DEPOSIT TO ASSET RATIO $_{t-1}$		-0.011 (1.08)		0.014 (1.02)		-0.057 (0.51)		-0.046 (0.84)
STATE-OWNED DUMMY		0.017 (2.02)#		0.018 (2.06)#		0.001 (2.38)#		0.005 (2.08)#
GROUP DUMMY		-0.001 (0.82)		-0.004 (0.66)		-0.001 (1.19)		-0.002 (1.05)
AVG I-HHI $_t$ (Col 1, 2) AVG A-HHI$_t$ (Col 3, 4)		0.004 (1.17)		0.003 (0.98)		0.001 (0.72)		0.002 (1.07)
1995	0.012 (1.64)	-0.006 (0.53)	0.008 (1.46)	0.017 (1.62)	0.010 (1.58)	-0.005 (1.06)	0.007 (1.46)	-0.006 (1.09)
1996	0.005 (1.47)	-0.002 (0.46)	0.005 (1.38)	0.016 (1.44)	0.003 (1.40)	-0.002 (1.23)	0.005 (1.28)	-0.007 (1.28)
1997	-0.003 (2.51)#	-0.012 (1.48)	-0.006 (2.17)#	-0.007 (1.58)	-0.002 (2.37)#	-0.009 (1.91)+	-0.003 (2.18)#	-0.007 (1.98)#
1998	0.001 (0.71)	-0.005 (1.08)	0.003 (0.81)	0.003 (0.98)	0.001 (0.61)	-0.004 (1.23)	0.001 (0.67)	-0.005 (1.58)
1999	-0.004 (2.01)#	-0.011 (2.26)#	-0.006 (1.97)#	-0.006 (2.03)#	-0.004 (1.97)#	-0.015 (2.09)#	-0.005 (2.02)#	-0.027 (2.18)#
System Weighted R^2	0.3990		0.3818		0.4205		0.3927	
Cross Model Covariance	0.016+		0.018+		0.014+		0.015+	
Cross Model Correlation	0.024#		0.025#		0.022#		0.023#	
Number	604		604		604		604	

Note: *, #, and + indicate statistical significance of the parameters at 1, 5, and 10 % significance level respectively. White-corrected t-statistics are in the parenthesis.

Table 7 - SIMULTANEOUS (SUR) estimation of effect of Focus on Bank Return Treating Focus Measure as Endogenous Variable

	1	1	2	2	3	3	4	4
	SR_t	I-HHI $_t$	SR_t	I-HHI $_t$	SR_t	A-HHI $_t$	SR_t	A-HHI $_t$
Intercept	0.025 (1.03)	0.221 (6.37)*	0.024 (1.42)	0.326 (8.25)*	0.023 (1.30)	0.302 (6.88)*	0.028 (1.41)	0.334 (8.38)*
I-HHI $_t$ (Col 1 & Col 2) I-HHI $_{t-1}$ (Col 3 & Col 4)	0.015 (1.92)+		0.014 (1.78)+		0.004 (1.86)+		0.012 (1.84)+	
A-HHI $_{t-1}$(Col 1 & Col 2) A-HHI $_t$ (Col 3 & Col 4)	0.017 (2.15)#		0.021 (2.48)#		0.013 (1.84)+		0.018 (2.29)#	
SIZE $_{t-1}$	-0.002 (1.48)	-0.006 (2.87)#	-0.008 (1.34)	-0.003 (2.97)*	-0.004 (1.28)	-0.015 (2.84)#	-0.012 (1.45)	-0.005 (2.90)*
EQRATIO $_{t-1}$	0.078 (1.27)	-0.185 (1.97)#	0.069 (1.01)	-0.157 (2.11)#	0.071 (1.18)	-0.172 (1.92)+	0.051 (1.07)	-0.156 (2.11)#
BRRATIO $_{t-1}$	0.106 (1.68)+	-0.132 (2.19)#	0.108 (1.62)	-0.108 (2.14)#	0.095 (1.08)	-0.144 (2.28)#	0.083 (1.26)	-0.105 (2.17)#
EMPRATIO $_{t-1}$	-1.08 (1.46)	-0.165 (0.95)	-1.126 (1.32)	-0.178 (1.07)	-0.850 (1.58)	-0.103 (1.04)	-0.972 (1.62)	-0.157 (0.91)
STDRET $_{t-1}$	-0.096 (2.02)#	-0.153 (2.05)#			-0.066 (2.48)#	-0.126 (2.47)#		
IDIOSYNCRATIC $_{t-1}$			-0.048 (2.47)#	-0.025 (2.10)#			-0.074 (2.26)#	-0.027 (2.38)#
I-HHI $_{t-1}$ * STDRET $_{t-1}$	-0.875 (1.70)+				-0.009 (1.74)+			
A-HHI $_{t-1}$ * STDRET $_{t-1}$	-0.344 (1.86)+				-0.020 (2.03)#			
I-HHI $_{t-1}$ * (STDRET $_{t-1}$) ^{2}	4.819 (1.96)#				4.862 (1.86)+			
A-HHI $_{t-1}$ * (STDRET $_{t-1}$) ^{2}	1.092 (1.84)+				1.320 (1.78)+			
I-HHI $_{t-1}$ * IDIOSYNCRATIC $_{t-1}$			-0.055 (1.78)+				-0.044 (1.99)#	
A-HHI $_{t-1}$ * IDIOSYNCRATIC $_{t-1}$			-0.044 (2.02)#				-0.038 (1.88)+	
I-HHI $_{t-1}$ * (IDIOSYNCRATIC $_{t-1}$) ^{2}			1.550 (1.82)+				1.166 (1.71)+	
A-HHI $_{t-1}$ * (IDIOSYNCRATIC $_{t-1}$) ^{2}			2.021 (1.99)#				2.542 (1.95)+	
NATIONAL DUMMY		-0.006 (1.87)+		-0.005 (1.83)+		-0.005 (1.91)+		-0.006 (1.92)+
PRIVATE DUMMY		-0.037 (4.02)*		-0.043 (3.98)*		-0.032 (3.77)*		-0.043 (3.49)*
DEPOSIT TO ASSET RATIO $_{t-1}$		-0.053 (0.15)		-0.053 (3.18)*		-0.045 (0.86)		-0.061 (3.58)*
STATE-OWNED DUMMY		0.002 (2.34)#		0/004 (1.92)+		0.005 (2.13)#		0.009 (2.04)#
GROUP DUMMY		-0.014 (3.40)*		-0.014 (3.27)*		-0.011 (3.10)*		-0.017 (3.29)*
AVG I-HHI $_t$ (Col 1, 2) AVG A-HHI $_t$ (Col 3, 4)		0.001 (0.71)		0.001 (0.72)		0.002 (0.68)		0.002 (1.00)
1995	0.011 (1.23)	-0.004 (0.90)	0.015 (1.15)	-0.009 (1.06)	0.017 (1.29)	-0.005 (1.08)	0.010 (1.44)	-0.009 (1.33)
1996	0.005 (1.47)	-0.003 (1.25)	0.004 (1.28)	-0.008 (1.20)	0.003 (1.12)	-0.005 (1.51)	0.008 (1.10)	-0.005 (1.46)
1997	-0.006 (1.40)	-0.018 (1.59)	-0.011 (1.41)	-0.015 (1.32)	-0.013 (1.50)	-0.013 (1.44)	-0.021 (1.73)+	-0.013 (1.50)
1998	0.018 (1.67)+	-0.008 (1.52)	0.009 (1.65)	-0.005 (1.44)	0.016 (1.69)+	-0.015 (1.60)	0.010 (1.55)	-0.018 (1.61)
1999	-0.005 (1.91)+	-0.016 (1.96)#	-0.002 (1.79)+	-0.017 (1.99)#	-0.015 (1.81)+	-0.011 (2.07)#	-0.005 (1.82)+	-0.009 (2.11)#
System Weighted R^2	0.2944		0.3168		0.3140		0.3253	
Cross Model Covariance	0.0320		0.0302		0.0365		0.0317	
Cross Model Correlation	0.0417		0.0443		0.0400		0.0404	
Number	152		152		152		152	

Note: *, #, and + indicate statistical significance of the parameters at 1, 5, and 10 % significance level respectively. White-corrected t-statistics are in the parenthesis.

Table 8 - Test for Effect of Focus on Bank Loan Risk (DOUBT): Hypothesis H.2

Variables	Dependent Variable								
	$DOUBT_t$			$STDRET_t$			$IDIOSYNCRATIC_t$		
	1	2	3	1	2	3	1	2	3
Intercept	0.103 (1.99) #	0.082 (1.85)+	0.075 (1.83)+	0.082 (1.72)+	0.075 (1.68)+	0.089 (1.74)+	0.076 (1.71)+	0.079 (1.69)+	0.072 (1.75)+
I-HHI $_{t-1}$	-0.028 (3.09)*	-0.016 (2.82)#	-0.020 (2.61)#	-0.038 (2.04)#	-0.042 (2.13)#	-0.050 (2.14)#	-0.018 (2.14)#	-0.022 (2.35)#	-0.035 (2.05)#
A-HHI $_{t-1}$	-0.061 (2.57)#	-0.051 (2.48)#	-0.051 (2.41)#	-0.022 (1.99)#	-0.018 (1.92)+	-0.012 (1.88)+	-0.068 (2.31)#	-0.056 (2.24)#	-0.049 (2.14)#
SIZE $_{t-1}$		-0.009 (1.74)+	-0.016 (1.64)		-0.017 (1.61)	-0.013 (1.74)+		-0.010 (1.50)	-0.011 (1.42)
EQRATIO $_{t-1}$		-0.051 (1.84)+	-0.062 (1.88)+		-0.059 (1.90)+	-0.046 (1.97)+		-0.032 (1.49)	-0.039 (1.17)
BRRATIO $_{t-1}$		-0.601 (1.99)#	-0.625 (1.94)#		-0.586 (2.18)#	-0.533 (1.85)+		-0.011 (1.44)	-0.024 (1.29)
EMPRATIO $_{t-1}$		-0.763 (1.54)	0.740 (1.46)		0.504 (1.08)	0.616 (1.06)		0.071 (1.49)	0.084 (1.33)
ROA $_{t-1}$ or SR $_{t-1}$		-0.042 (1.36)	-0.041 (1.22)		-0.024 (1.06)	-0.053 (1.85)+		-0.031 (1.55)	-0.027 (1.48)
NEW			0.017 (1.74)+			0.019 (1.53)			0.013 (1.90)+
FRACNEW			-0.022 (1.28)			0.067 (1.42)			0.028 (1.66)+
COMP $_{t-1}$			0.023 (1.89)+			0.026 (1.96)#			0.025 (2.07)#
IHHI $_{t-1}$* NEW			-0.030 (1.67)+			-0.022 (1.70)+			-0.026 (1.79)+
AHHI $_{t-1}$* NEW			-0.031 (1.85)+			-0.025 (1.78)+			-0.015 (1.82)+
IHHI $_{t-1}$* FRACNEW			-0.007 (1.08)			-0.015 (1.27)			-0.022 (2.00)#
AHHI $_{t-1}$* FRACNEW			-0.001 (1.30)			-0.024 (1.15)			-0.019 (1.35)
I-HHI $_{t-1}$* COMP $_{t-1}$			-0.018 (1.99)#			-0.014 (2.02)#			-0.027 (1.74)+
A-HHI $_{t-1}$* COMP $_{t-1}$			-0.027 (2.14)#			-0.038 (2.13)#			-0.026 (1.98)#
Adj-R^2	0.0279	0.2416	0.2829	0.0307	0.2119	0.2576	0.0301	0.2515	0.3309
F-Statistics	10.14 *	9.25 *	10.17*	5.39 *	6.55 *	6.80 *	3.96 *	5.46 *	6.23 *
Number	604	604	604	152	152	152	152	152	152

Note: *, #, and + indicate statistical significance of the parameters at 1, 5, and 10 % significance level respectively. White-corrected t-statistics are in the parenthesis.

Table 9 - SIMULTANEOUS (SUR) Estimation of Effect of Focus on Bank Loan Risk Treating Focus Measure as Endogenous Variable

	1	1	2	2	3	3	4	4
	$DOUBT_t$	$I\text{-}HHI_t$	$STDRET_t$	$I\text{-}HHI_t$	$DOUBT_t$	$A\text{-}HHI_t$	$STDRET_t$	$A\text{-}HHI_t$
Intercept	0.096 (1.75)+	0.132 (3.50)*	0.075 (1.71)+	0.080 (3.49)*	0.075 (1.71)+	0.320 (6.61)*	-0.088 (0.76)	-0.080 (0.87)
$I\text{-}HHI_t$ (Col 1 & Col 2) $I\text{-}HHI_{t-1}$ (Col 3 & Col 4)	-0.012 (1.68)+		-0.045 (2.11)#		-0.008 (1.70)+		-0.018 (1.89)+	
$A\text{-}HHI_{t-1}$(Col 1 & Col 2) $A\text{-}HHI_t$ (Col 3 & Col 4)	-0.014 (1.97)#		-0.026 (1.86)+		-0.012 (1.89)+		-0.014 (1.77)+	
$SIZE_{t-1}$	-0.038 (0.64)	-0.042 (3.11)*	-0.085 (0.69)	-0.016 (3.28)*	-0.031 (0.86)	-0.017 (2.89)*	-0.072 (0.80)	-0.011 (1.42)
$EQRATIO_{t-1}$	0.072 (1.88)+	-0.826 (0.69)	0.006 (1.15)	0.643 (0.903)	0.072 (1.80)+	-0.716 (1.02)	0.005 (1.01)	0.573 (0.80)
$BRRATIO_{t-1}$	-0.055 (1.90)+	0.089 (1.14)	-0.027 (1.79)+	-0.099 (1.17)	-0.030 (1.75)+	0.025 (1.06)	-0.027 (1.80)+	-0.044 (1.40)
$EMPRATIO_{t-1}$	-0.013 (0.50)	-0.046 (0.82)	-0.060 (1.28)	-0.048 (1.19)	-0.701 (1.09)	-0.053 (0.98)	-0.096 (1.07)	-0.055 (1.29)
$DOUBT_{t-1}$	-0.055 (1.36)	-0.157 (3.37)*			-0.144 (1.05)	-0.090 (2.75)#		
$STDRET_{t-1}$			0.612 (1.08)	-0.090 (2.09)#			0.007 (1.24)	-0.086 (1.87)+
ROA_{t-1}	-0.009 (1.04)	0.074 (1.56)			-0.011 (0.87)	0.091 (1.80)+		
SR_{t-1}			0.003 (0.94)	-0.013 (1.39)			0.002 (1.08)	-0.007 (1.20)
NATIONAL DUMMY		-0.044 (1.89)+		-0.045 (1.91)+		-0.020 (1.70)+		-0.041 (1.76)+
PRIVATE DUMMY		-0.026 (2.94)*				-0.022 (2.91)*		
DEPOSIT TO ASSET RATIO $_{t-1}$		-0.036 (0.80)		-0.012 (1.81)+		-0.022 (0.86)		-0.017 (1.46)
STATE-OWNED DUMMY		0.003 (2.14)#		0.026 (2.57)#		0.004 (2.26)#		0.022 (3.68)*
GROUP DUMMY		-0.004 (1.19)		-0.010 (3.05)*		-0.008 (1.49)		-0.017 (3.68)*
AVG $I\text{-}HHI_t$ (Col 1, 2) AVG $A\text{-}HHI_t$ (Col 3, 4)		0.006 (1.45)		0.020 (1.25)		0.003 (1.14)		0.006 (1.57)
1995	-0.004 (1.48)	-0.005 (1.24)	-0.002 (1.22)	-0.015 (1.42)	-0.003 (1.40)	-0.005 (1.43)	-0.006 (1.20)	-0.009 (1.47)
1996	0.005 (1.56)	-0.007 (1.48)	0.005 (1.08)	0.004 (1.19)	0.006 (1.44)	-0.006 (1.57)	0.008 (0.84)	0.005 (1.37)
1997	-0.008 (0.83)	-0.007 (0.89)	0.003 (0.88)	0.008 (1.07)	-0.009 (0.64)	-0.007 (0.90)	0.007 (0.99)	0.011 (1.60)
1998	-0.017 (1.33)	-0.002 (1.19)	-0.003 (1.19)	-0.012 (1.44)	-0.015 (1.39)	-0.003 (1.48)	-0.005 (1.31)	-0.007 (1.34)
1999	-0.016 (1.88)+	-0.016 (1.89)+	-0.017 (1.29)	-0.014 (1.76)+	-0.012 (1.84)+	-0.014 (1.77)+	-0.016 (1.42)	-0.007 (1.41)
System Weighted R^2	0.3006		0.3903		0.3214		0.2991	
Cross Model Covariance	0.0322		0.0248		0.0386		0.0277	
Cross Model Correlation	0.0484		0.0383		0.0407		0.0304	
Number	604		152		604		152	

Note: *, #, and + indicate statistical significance of the parameters at 1, 5, and 10 % significance level respectively. White-corrected t-statistics are in the parenthesis.

Figure 1: Effect of Diversification on Probability of Failure

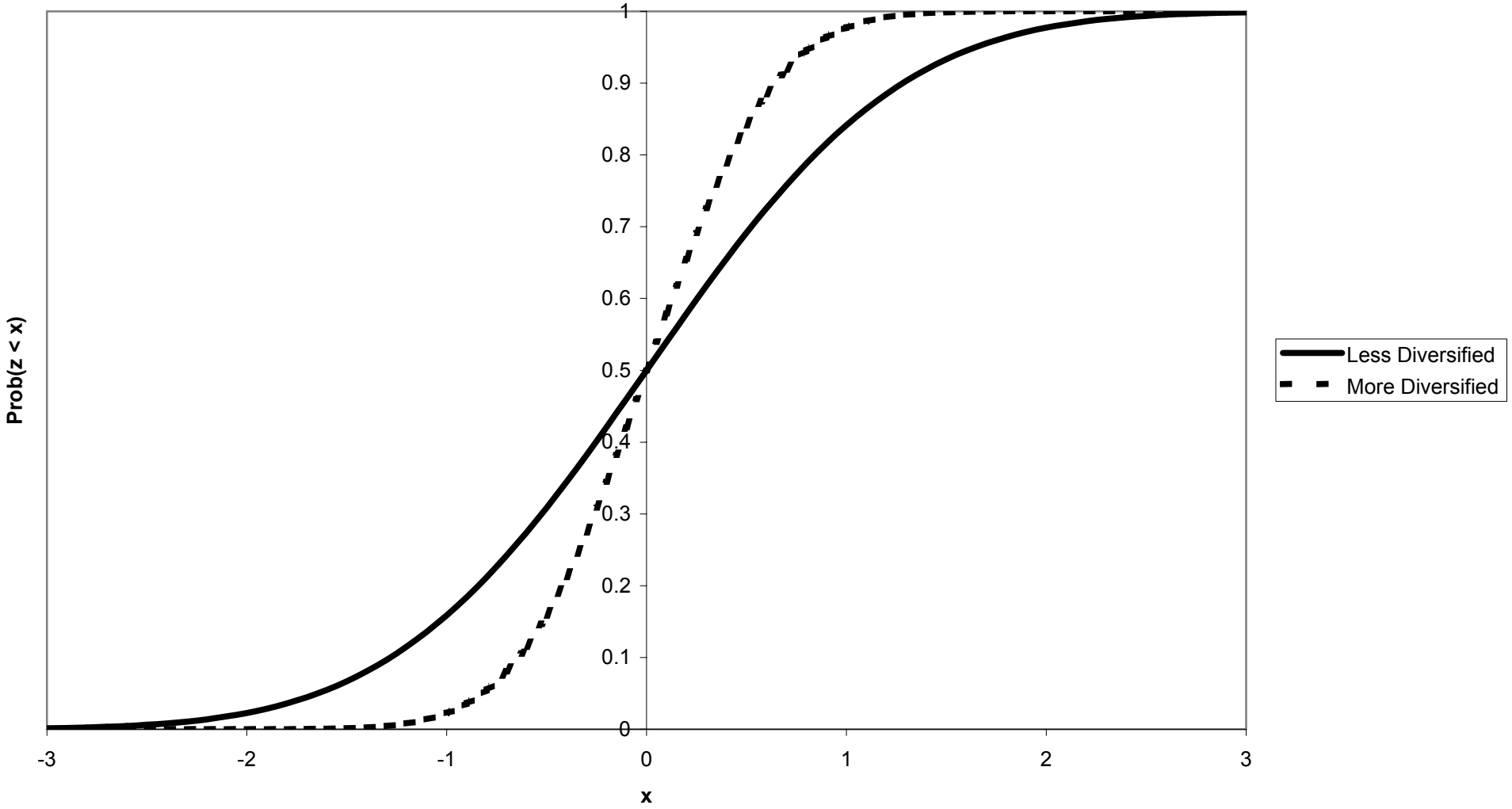

Figure 2-A: Non-monotonicity in Effect of Focus on Bank Returns (ROA) as a Function of Bank Risk (DOUBT)

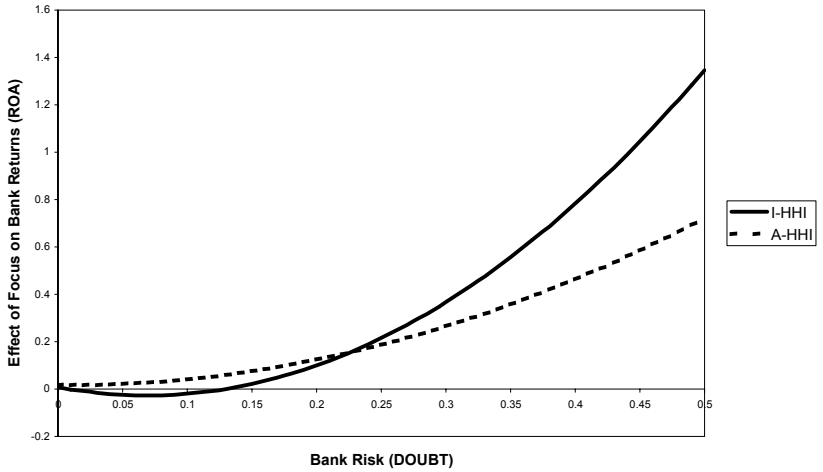

Figure 2-B: Non-monotonicity in Effect of Focus on Bank Stock Return (SR) as a Function of Bank Risk (DOUBT)

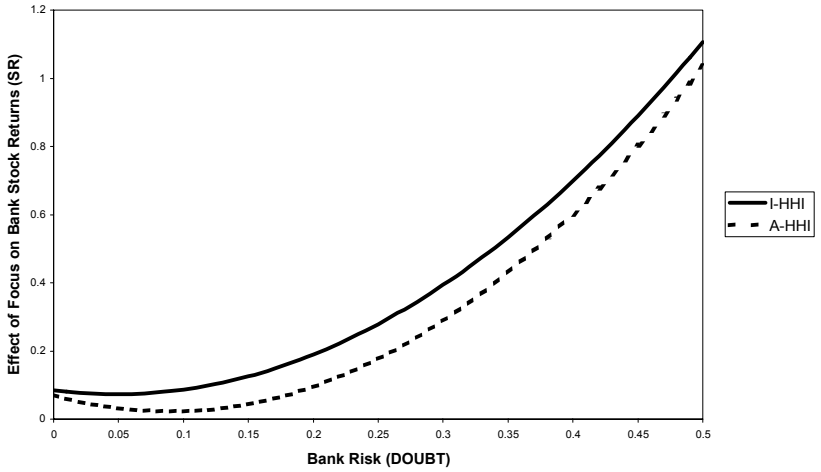

Figure 3-A: Non-monotonicity in Effect of Focus on Bank Returns (ROA) as a Function of Bank Risk (STDDOUBT)

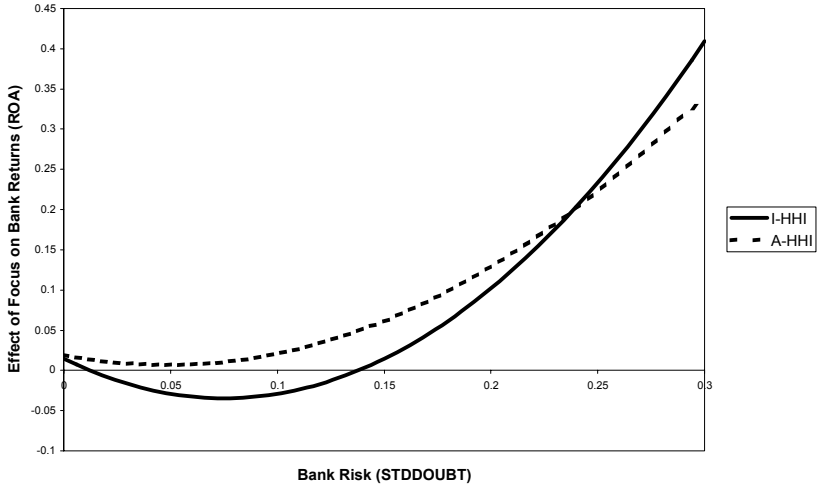

Figure 3-B: Non-monotonicity in Effect of Focus on Bank Stock Return (SR) as a Function of Bank Risk (STDDOUBT)

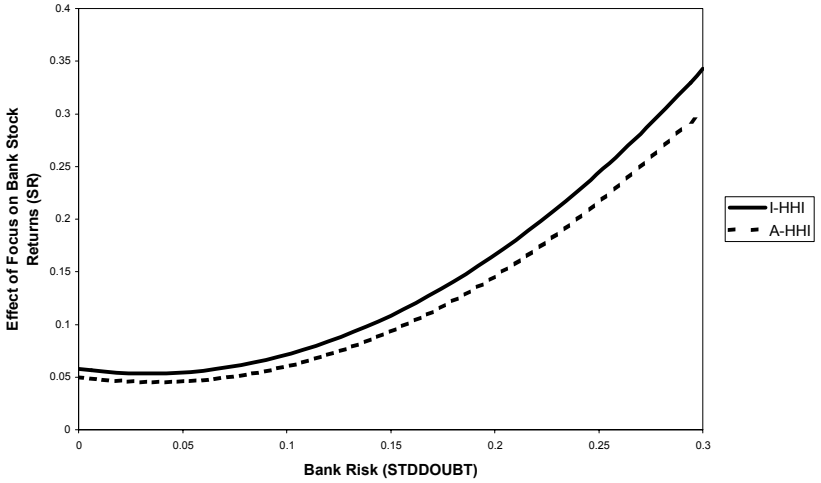

Figure 4-A: Non-monotonicity in Effect of Focus on Bank Stock Return (SR) as a Function of Bank Risk (STDRET)

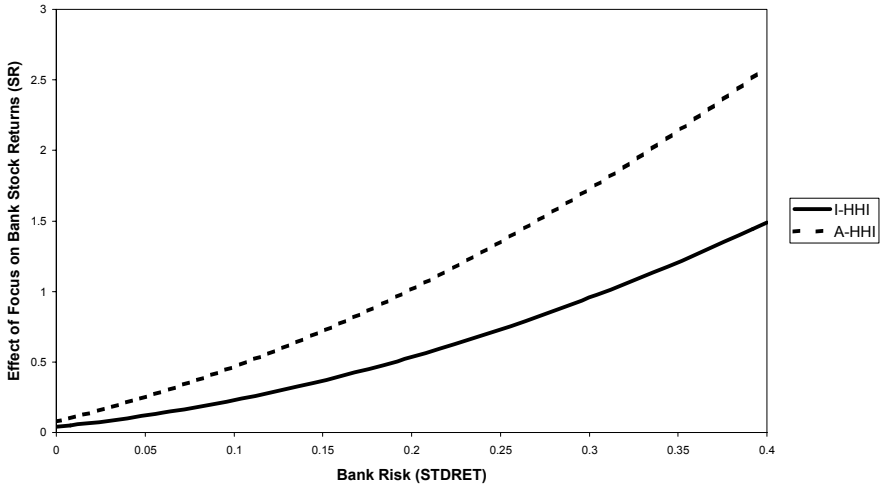

Figure 4-B: Non-monotonicity in Effect of Focus on Bank Stock Return (SR) as a Function of Bank Risk (IDIOSYNCRATIC)

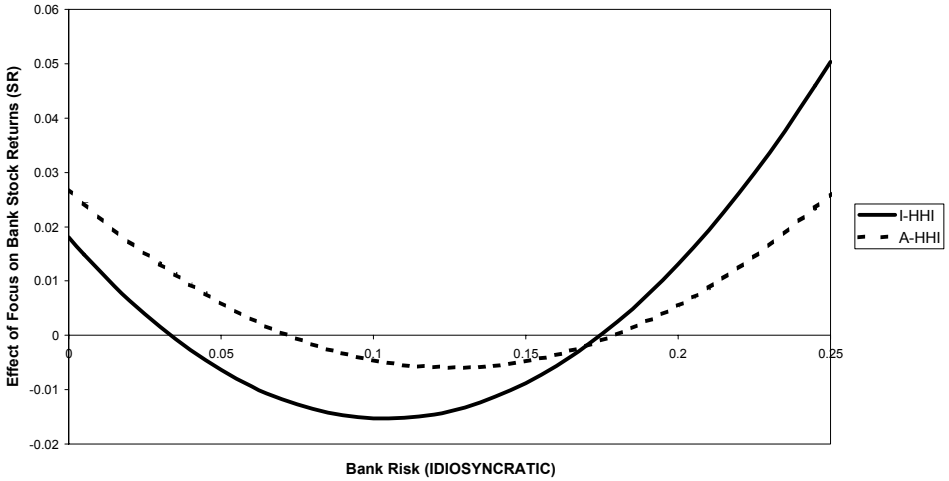

Figure 5-A: Non-monotonicity in Endogeneity-corrected Effect of Focus on Bank Returns (ROA) as a Function of Bank Risk (DOUBT)

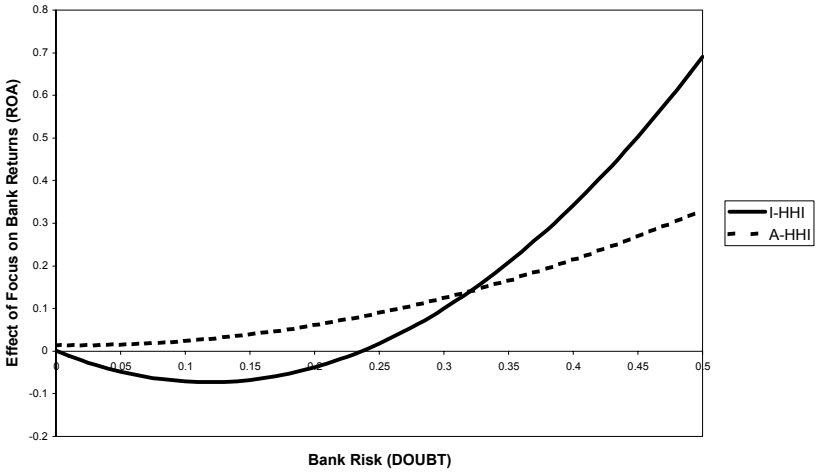

Figure 5-B: Non-monotonicity in Endogeneity-corrected Effect of Focus on Bank Returns (ROA) as a Function of Bank Risk (STDDOUBT)

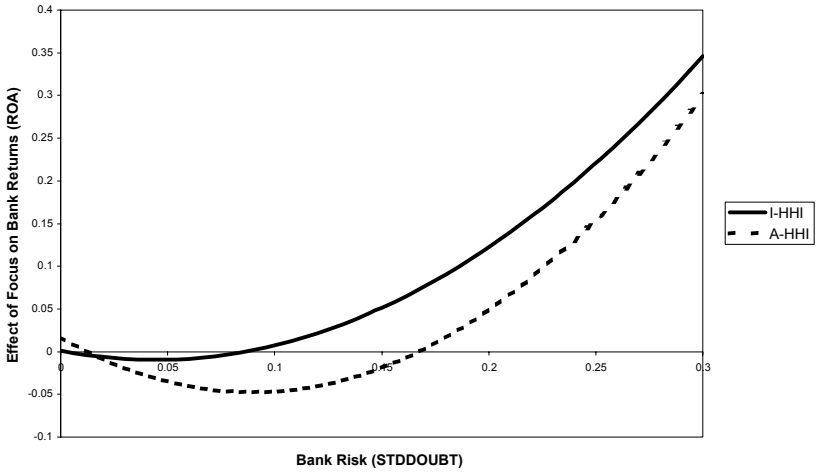

Figure 6-A: Non-monotonicity in Endogeneity-corrected Effect of Focus on Bank Stock Return (SR) as a Function of Bank Risk (STDRET)

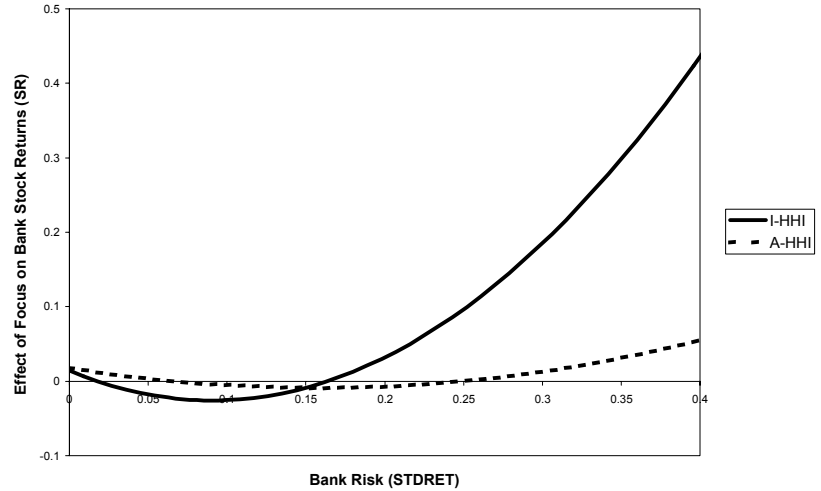

Figure 6-B: Non-monotonicity in Endogeneity-corrected Effect of Focus on Bank Stock Return (SR) as a Function of Bank Risk (IDOSYNCRATIC)