Determinants of commercial bank interest margins and profitability:
some international evidence

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Abstract: Using bank level data for 80 countries in the 1988-1995 period, this paper shows that differences in interest margins and bank profitability reflect a variety of determinants: bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and several underlying legal and institutional indicators. Controlling for differences in bank activity, leverage, and the macroeconomic environment, we find that a larger bank asset to GDP ratio and a lower market concentration ratio lead to lower margins and profits. Foreign banks have higher margins and profits compared to domestic banks in developing countries, while the opposite holds in developed countries. Also, there is evidence that the corporate tax burden is fully passed on to bank customers.

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1.   Introduction

As financial intermediaries, banks play a crucial role in the operation of most economies. Recent research, as surveyed by Levine (1996), has shown that the efficacy of financial intermediation can also affect economic growth. Crucially, financial intermediation affects the net return to savings, and the gross return for investment. The spread between these two returns mirrors the bank interest margins, in addition to transaction costs and taxes borne directly by savers and investors. This suggests that bank interest spreads can be interpreted as an indicator of the efficiency of the banking system. In this paper, we investigate how bank interest spreads are affected by taxation, the structure of the financial system, and financial regulations such as deposit insurance.

A comprehensive review of determinants of interest spreads is offered by Hanson and Rocha (1986). That paper summarizes the role that implicit and explicit taxes play in raising spreads and goes on to discuss some of the determinants of bank costs and profits, such as inflation, scale economies, and market structure. Using aggregate interest data for 29 countries in the years 1975-1983, the authors find a positive correlation between interest margins and inflation.

Recently, several studies have examined the impact of international differences in bank regulation using cross-country data. Analyzing interest rates in 13 OECD countries in the years 1985-1990, Bartholdy, Boyle, and Stover (1997) find that the existence of explicit deposit insurance lowers the deposit interest rate by 25 basis points. Using data from 19 developed countries in 1993, Barth, Nolle and Rice (1997) further examine the impact of banking powers on bank return on equity - controlling for a variety of bank and market characteristics. Variation in banking powers, bank concentration and the existence of explicit deposit insurance do not significantly affect the return on bank equity.

This paper extends the existing literature in several ways. First, using bank-level data for 80 developed and developing countries in the 1988-1995 period, we provide summary statistics on size and

decomposition of bank interest margins and profitability. Second, we use regression analysis to examine the underlying determinants of interest spreads and bank profitability. The empirical work enables us to infer to what extent the incidence of taxation and regulation is on bank customers and/or the banks themselves.

Apart from covering many banks in many countries, this study is unique in its coverage of interest margin and profitability determinants. These determinants include a comprehensive set of bank characteristics (such as size, leverage, type of business, foreign ownership), macro indicators, taxation and regulatory variables, financial structure variables, and legal and institutional indices. Among these, the ownership variable, the tax variables, some of the financial structure variables, and the legal and institutional indicators have not been included in any previous study in this area. To check whether some of these determinants affect banking differently in developing and developed countries, we further interact these variables with the country's GDP per capita.

The results indicate that bank characteristics, macro indicators, implicit and explicit financial taxation, deposit insurance, overall financial structure, and the legal and institutional environment all significantly affect bank interest spreads and profitability.

Our results show that well-capitalized banks have higher net interest margins and are more profitable. This is consistent with the fact that banks with higher capital ratios tend to face a lower cost of funding due to lower prospective bankruptcy costs. In addition, a bank with higher equity capital simply needs to borrow less in order to support a given level of assets.

Differences in the bank activity mix also have an impact on spreads and profitability. Our results show that banks with relatively high non-interest earning assets are less profitable. Also, banks that rely largely on deposits for their funding are less profitable, as deposits apparently require high branching

and other expenses. Similarly, variation in overhead and other operating costs is reflected in variation in bank interest margins, as banks pass on their operating costs to their depositors and lenders.

The international ownership of banks also has a significant impact on bank spreads and profitability. Foreign banks, specifically, realize higher interest margins and higher profitability than domestic banks in developing countries. This finding may reflect that in developing countries a foreign bank's technological edge is relatively strong, apparently strong enough to overcome any informational disadvantage in lending or raising funds locally. Foreign banks, however, are shown to be less profitable in developed countries, as there they may not have a technological edge.

Macroeconomic factors also explain variation in interest margins. We find that inflation is associated with higher realized interest margins and higher profitability. Inflation entails higher costs - more transactions, and generally more extensive branch networks - and also higher income from bank float. The positive relationship between inflation and bank profitability implies that bank income increases more with inflation than bank costs. Further, high real interest rates are associated with higher interest margins and profitability, especially in developing countries. This may reflect that in developing countries demand deposits frequently pay zero or below market interest rates.

Banks are subject to implicit and explicit taxation that may affect their operations. Implicit taxes include reserve and liquidity requirements that are remunerated at less-than-market rates.[2] We find that reserves reduce interest margins and profits especially in developing countries, since there the opportunity cost of holding reserves tends to be higher and remuneration rates are lower. Explicit taxes translate into higher net interest margins and bank profitability. In fact, the regression coefficients suggest that the corporate tax is fully passed on to bank customers in poor and rich countries alike, and is not

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[2] Directed and subsidized credit practices that interfere with the banks' credit allocation policies represent additional implicit taxes. However, due to lack of data for most of the countries in our sample we do not evaluate the impact of such practices here.

simply a tax on bank rents. This result is consistent with the common notion that bank stock investors need to receive a net-of-company-tax return that is independent of this company tax.

The existence of an explicit deposit insurance scheme coincides with lower interest margins. The effect on bank profitability is also negative, although it is not significant. These results may reflect design and implementation problems inherent in explicit deposit insurance systems.

Regarding financial structure, banks in countries with a more competitive banking sector -- where banking assets constitute a larger portion of the GDP -- have smaller margins and are less profitable. The bank concentration ratio positively affects bank profitability, and larger banks tend to have higher margins. A larger stock market capitalization to GDP increases bank margins, reflecting possible complementarity between debt and equity financing. A larger stock market capitalization to bank assets, however, is related negatively to margins, suggesting relatively well-developed stock markets can substitute for bank finance.

Finally, we find that legal and institutional differences matter. Indicators of better contract enforcement, efficiency of the legal system and lack of corruption are associated with lower realized interest margins and lower profitability.

Section 2 next describes the basic approach of this study. Section 3 discusses the data. Section 4 presents the empirical results. Section 5 concludes.

2.   Investigating banking spreads and profitability

The efficiency of bank intermediation can be measured by both ex ante and ex post spreads. Ex ante spreads are calculated from the contractual rates charged on loans and rates paid on deposits. Ex post spreads consist of the difference between banks' actual interest revenues and their actual interest expenses. The ex post measure of the spread generally differs from the ex ante measure on account of

loan defaults. The ex post spread is more useful, as it controls for the fact that banks with high-yield, risky credits are likely to face more defaults. An additional problem with using ex ante spread measures is that data are generally available at the aggregate industry level and are put together from a variety of different sources and thus are not completely consistent. For these reasons, we focus on ex post interest spreads in this paper.[3]

As a measure of bank efficiency, we consider the accounting value of a bank's net interest income over total assets, or the net interest margin. To reflect bank profitability, we consider the bank's before-tax profits over total assets, or before tax profit/ta. By straightforward accounting, before tax profit/ta is the sum of after-tax profits over total assets, or net profit/ta, and taxes over total assets, or tax/ta. From the bank's income statement, before tax profit/ta further satisfies the following accounting identity:

(1)   before tax profit/ta = net interest margin + non-interest income/ta - overhead/ta

                - loan loss provisioning/ta

where the non-interest income/ta variable reflects that many banks also engage in non-lending activities, such as investment banking and brokerage services; the overhead/ta variable accounts for the bank's entire overhead associated with all its activities, while loan loss provisioning/ta simply measures actual provisioning for bad debts.

While net interest margin can be interpreted as a rough index of bank (in)efficiency, this does not mean that a reduction in net interest margins always signals improved bank efficiency. To see this, note that a reduction in net interest margins can, for example, reflect a reduction in bank taxation or,

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[3] A problem with ex post spreads, however, is that the interest income and loan loss reserving associated with a particular loan tend to materialize in different time periods.

alternatively, a higher loan default rate. In the first instance, the reduction in net interest margins reflects an improved functioning of the banking system, while in the second case the opposite may be true. Also, note that variation in an accounting ratio such as net interest margin may reflect differences in net interest income (the numerator) or differences in (say) non-lending assets (in the denominator). In the data set, the accounting data is organized so as to be comparable internationally. All the same, there may remain differences in accounting conventions regarding the valuation of assets, loan loss provisioning, hidden reserves, etc.[4]

This study focuses on accounting measures of income and profitability, as (risk-adjusted) financial returns on bank stocks are equalized by investors in the absence of prohibitive barriers. For this same reason, Gorton and Rosen (1995) and Schranz (1993) also focus on accounting measures of profitability when examining managerial entrenchment and bank takeovers.

The above accounting identity suggests a useful decomposition of realized interest spreads, i.e. net interest margin, into its constituent parts, i.e. into non-interest income, overhead, taxes, loan loss provisions, and after-tax bank profits. This approach, with some modifications, is taken in the study by Hanson and Rocha (1986). As a first step to analyzing the data, section 3 of the paper provides an accounting breakdown of the net interest variable, net interest margin, for individual countries and for selected aggregates. While it may be misleading to compare accounting ratios without controlling for differences in the macroeconomic environment the banks operate in and the differences in their business, product mix, and leverage, these breakdowns still provide a useful initial assessment of differences across countries.

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[4] See Vittas (1991) for an account of the pitfalls in interpreting bank operating ratios. Accounting data also tend to reflect economic realities with a long lag so that they inadequately flag pending banking crises such as those that have recently occurred in South-East Asia.

Next, controlling for bank characteristics and the macro environment, we provide an economic analysis of the determinants of the interest and profitability variables, net interest margin, and before tax profit/ta. This empirical work also provides insights as to how bank customers and the banks themselves are affected by these variables. The net interest margin regressions specifically tell us how the combined welfare of depositors and lenders is affected by the spread determinants. The relationship between the interest spread variable and a bank's corporate taxes, for instance, informs us to what extent a bank is able to shift its tax bill forward to its depositors and lenders. Next, the before tax profit/ta regressions give information on how spread determinants affect bank shareholders. Equivalently, the relationship between bank profitability and bank corporate income taxes reflects to what extent a bank can pass on its tax bill to any of its customers, depositors, lenders or otherwise.[5]

The subsequent regression analysis starts from the following basic equation:

$$(2) \qquad I_{ijt} = \alpha_o + \alpha_i\, B_{ijt} + \beta_j X_{jt} + \gamma_t T_t + *_j C_j + \varepsilon_{ijt}$$

where I_{ijt} is the independent variable (either net interest margin or before tax profits/ta) for bank i in country j at time t; B_{ijt} are bank variables for bank i in country j at time t; X_{jt} are country variables for country j at time t; and T_t and C_j are time and country dummy variables. Further, α_o is a constant, and α_i, β_j, γ_t and $*_j$ are coefficients, while ε_{ijt} is an error term. Several specifications of (2) are estimated that differ in which bank and country variables are included.

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[5] Generally, taxes and other variables can change interest rates as well as quantity variables, i.e. loan and deposit volumes. In the short term, the major effects may come through pricing changes, in which case

net interest margin and *before tax profit/ta* immediately yield easily interpreted welfare consequences for the banks and their customers. With market imperfections in the form of credit rationing or imperfect competition in the credit markets, changes in quantities generally have first order welfare implications independently of changes in prices. Quantity changes, however, are not pursued in the empirical work.

3.   The data

        This study uses income statement and balance sheet data of commercial banks from the

BankScope data base provided by IBCA (for a complete list of data sources and variable definitions,

see the Appendix). Coverage by IBCA is very comprehensive in most countries, with banks included

roughly accounting for 90 percent of the assets of all banks. We started with the entire universe of

commercial banks worldwide, with the exception that for France, Germany and the United States only

several hundred commercial banks listed as 'large' were included. To ensure reasonable coverage for

individual countries, we included only countries where there were at least three banks in a country for a

given year. This yielded a data set covering 80 countries during the years 1988-1995, with about 7900

individual commercial bank accounting observations. This data set includes all OECD countries, as well

as many developing countries and economies in transition. For a list of countries, see Table 1.

        Table 1 provides country averages of interest spreads and bank profitability. Column 1 provides

information on net interest income over assets, or net interest margin, as a percentage. At the low end,

there are several countries such as Luxembourg, the Netherlands and Egypt with a net interest margin of

about 1 percent. For the case of Egypt, the low net interest margin can be explained by a predominance

of low-interest directed credits by the large state banking sector. Generally, developing countries, and

especially Latin American countries such as Argentina, Brazil, Costa Rica, Ecuador and Jamaica,

display relatively large accounting spreads. This is also true for certain Eastern European countries such

as Lithuania and Romania. Columns 3 though 6 provide an accounting breakdown of the net interest

income into its four components: overhead minus non-interest income, taxes, loan loss provisioning, and

net profits, all divided by net interest income. These shares add to one hundred percent except for cases

where information on loan loss provisioning is missing.

The tax/ni variable reflects the explicit taxes paid by the banks (mostly corporate income taxes). Banks also face implicit taxation due to reserve and liquidity requirements and other restrictions on lending through directed/subsidized credit policies. These indirect forms of taxing banks show up directly in lower net interest income rather than in its decomposition. Nonetheless, the tax/ni variable indicates that there is considerable international variation in the explicit taxation of commercial banks. Several countries in Eastern Europe (for example Lithuania, Hungary and the Czech Republic) impose high explicit taxes on banking. The lowest value of tax/ni is at 0 for Qatar, in the absence of significant taxation of banking. For some countries, such as Norway, Sweden or Costa Rica, low tax/ni values reflect the tax deductibility of plentiful bad debts.

The loan loss provisioning/ni variable is a direct measure of difference in credit quality across countries but it also reflects differences in provisioning regulations. This variable is high for some Eastern European countries. The loan loss provisioning/ni variable is also high for some developed countries such as France and the Nordic countries. As a residual, the net profits/ni variable reflects to what extent the net interest margin translates into net-of-tax profitability.

Columns 7-11 of Table 1 further tabulate the various accounting ratios (relative to total assets) in the accounting identity (1) presented above. The non-interest income/ta variable reveals the importance of fee-based services for banks in different countries. Banks in Eastern Europe, for example in Estonia, Hungary, and Russia, seem to rely heavily on fee-based operations. This is also the case in some Latin American countries, such as, Argentina, Brazil, Colombia, Peru and a few African countries as in Nigeria, and Zambia.

The overhead/ta variable provides information on variation in bank operating costs across banking systems. This variable reflects variation in employment as well as in wage levels. Despite high wages, the overhead/ta variable appears to be lowest at around 1 percent for high-income countries,

such as Japan and Luxembourg. The overhead/ta cost measure is notably high at 3.6 percent for the United States, perhaps reflecting the proliferation of banks and bank branches due to banking restrictions. In the tax/ta column, Jamaica, Lithuania, and Romania stand out with high tax-to-assets ratios of around 2 percent. Loan loss provisioning, proxied by loan loss provisioning/ta, is equally high in Eastern Europe, and in some developing countries. Finally, net profits over assets, or net profit/ta, also tends to be relatively high in developing countries.

In Table 2 we present statistics on accounting spreads and profitability for selected aggregates. The first breakdown is by ownership; a bank is said to be foreign-owned if fifty percent or more of its shares is owned by foreign residents. The table displays a rather small difference in the net interest margin variable for domestic banks (at 3.7 percent) and foreign banks (at 2.9 percent). This small difference, however, masks that foreign banks tend to achieve higher interest margins in developing countries, and lower interest margins in developed countries.[6] These facts may reflect that foreign banks are less subject to credit allocation rules and have technical advantages (in developing countries), but also have distinct informational disadvantages relative to domestic banks (everywhere).

Interestingly, foreign banks pay somewhat lower taxes than domestic banks (as indicated by the tax/ta variable). This difference may reflect different tax rules governing domestic and foreign banks, but also foreign banks' opportunities to shift profits internationally to minimize their global tax bill. Foreign banks also have a relatively low provisioning as indicated by loan loss provisioning/ta, which is consistent with the view that foreign banks generally do not engage in retail banking operations.

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[6] See Claessens, Demirgηç-Kunt and Huizinga (1997) for more detailed information on the average spreads of domestic and foreign banks for different groupings of countries by income. This paper also considers how entry by foreign banks affects the interest spreads and operating costs of domestic banks.

The next breakdown in the table is by bank size. For countries with at least 20 banks, large banks are defined as the 10 largest banks by assets. Large banks tend to have lower margins and profits and smaller overheads. They also pay relatively low direct taxes, and have lower loan loss provisioning.

The table also considers bank groupings by national income levels and location.[7] Analyzing data on 4 income levels, we see that the net interest margin is highest for the middle income groups. Banks in the middle income group also have the highest values for the overhead/ta, tax/ta, and loan loss provisioning/ta variables. The net profit/ta variable tends to be highest for banks in the lower income groups. Banks in the high income group, instead, achieve the lowest net interest margin, and they face the lowest ratios of overhead, taxes, loan loss provisioning, and net profits to assets.

Next, the breakdown by regions reveals that the net interest margin is highest in the transitional economies at 6.4 percent, and also rather high in Latin America at 6.2 percent, while it is the lowest for industrialized countries at 2.7 percent. The transitional countries further stand out with high ratios of overhead, taxes, loan loss provisioning, and net profits to assets. Industrialized countries, have the lowest net profit/ta value at 0.4 percent, probably due to high level of competition in banking services. Figures 1 and 2 also illustrate income decomposition for different regions.

Table 3 provides information on some of the macroeconomic and institutional indicators used in the regression analysis. The data is for 1995, or the most recent year available. The tax rate variable is computed on a bank-by-bank basis as taxes paid divided by before-tax profits. The figure reported in the table is the average for all banks in the country in 1995. The reserves/deposits variable is defined as the banking system's aggregate central bank reserves divided by aggregate banking system deposits. Actual reserve holdings reflect required as well as excess reserves. Reserves are generally remunerated

[7] For country groupings by income, see the World Development Report (1996). Countries in transition are China, the Czech Republic, Estonia, Hungary, Lithuania, Poland, Romania, Russia, and Slovenia.

at less-than-market rates, and therefore actual reserves may be a reasonable proxy for required reserves, as averaged over the various separate deposit categories. For several developing countries, Botswana, Costa Rica, El Salvador, Jordan, and for Greece, the reserves ratio is above 40 percent, indicating substantial financial repression. In contrast, this ratio is rather low in Belgium, France and Luxembourg at 0.01.

The deposit insurance variable is a dummy variable that takes on a value of one if there is an explicit deposit insurance scheme (with defined insurance premia and insurance coverage), and a value of zero otherwise. Even for the case of an explicit deposit insurance scheme, however, the ex post insurance coverage may prove to be higher than the de jure coverage, if the deposit insurance agency chooses to guarantee all depositors. With a value of zero, there is no explicit deposit insurance, even if there may be some type of implicit insurance by the authorities.

Next, the table presents some indicators of financial market structure. The concentration variable is defined as the ratio of the three largest banks' assets to total banking sector assets. As is well known, the concentration of the U.S. banking market is rather low, at a value of 16 percent, compared to values of about 50 percent for France and Germany.[8] The number of banks in the table reflects the number of banks in the data set with complete information. The bank/gdp ratio defined as the total assets of the deposit money banks divided by GDP. This ratio reflects the overall level of development of the banking sector. The next variable, mcap/gdp is the ratio of stock market capitalization to GDP, as a measure of the extent of stock market development. Developing countries tend to have lower bank/gdp and mcap/gdp ratios, with some notable exceptions. Malaysia, South Africa and Thailand, for instance, have relatively high ratios for both variables.

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[8] The U.S. figure may understate the concentration ratio in individual banking markets, as protected from outside competition by interstate banking and branching restrictions.

The final column in the table provides an index of law and order, which is one of the institutional variables used in the regression analysis. This variable is scaled from 0 to 6, with higher scores indicating sound political institutions and strong court system. Lower scores, in contrast, reflect a tradition where physical force or illegal means are used to settle claims. The table reflects that there is considerable variation in legal effectiveness among countries in the sample.

4.   Empirical results

This section presents regression results. Table 4 and Table 5 report the results of regressions of the net interest margin and before tax profit/ta variables, respectively. All regressions include country and year fixed effects. The tables include several specifications, with the basic specification including a set of bank-level variables, and macroeconomic indicators as regressors. These are important control variables which we include in all specifications. Subsequently, we add the taxation variables, the deposit insurance index, financial structure variables, and legal and institutional indicators. The deposit insurance index, is again excluded from the specification in columns 4 and 5, while the financial structure variables are excluded from the specification in column 5. The reason for dropping some variables from regressions 4 and 5 is that we wish to ensure that banks from a reasonable number of countries are included in the regressions. The estimation technique is weighted least squares, with the weight being the inverse of the number of banks for the country in a given year. This weighing corrects for the fact that the number of banks varies considerably across countries. The five specifications in the two tables are discussed in each of the five subsections.

4.1   Bank characteristics and macroeconomic indicators

The first bank characteristic is book value of equity divided by total assets lagged one period, or equity/ta_{t-1}.[9] Previously, Buser, Chen and Kane (1981) have examined the theoretical relationship between bank profitability and bank capitalization. These authors find that banks generally have an interior optimal capitalization ratio in the presence of deposit insurance. Generally, banks with a high franchise value - reflecting costly bank entry - have incentives to remain well-capitalized and to engage in prudent lending behavior (see Caprio and Summers (1993), and Stiglitz (1996)). Berger (1995) provides empirical evidence that for U.S. banks there is a positive relationship between bank profitability and capitalization, although the evidence is not conclusive. The author notes that well-capitalized firms face lower expected bankruptcy costs for themselves and their customers, thereby reducing their cost of funding.

The first columns in Table 4 and 5 confirm a positive relationship between the equity/ta_{t-1} variable and net interest income and bank profitability. In the regressions, the equity/ta_{t-1} variable is also interacted with GDP per capita (measured in units of constant $1,000 dollars for the year 1987). The positive coefficient on the interaction variables in the before tax profit/ta regression can reflect a higher bank franchise value in wealthier countries. The coefficients for the equity/ta_{t-1} variable and the interaction with per capita GDP together indicate how the equity/assets ratio affects the bank variables in countries with different income levels. For a country with a per capita GDP of $10,000, for instance, the point estimate of the effect of the equity/ta_{t-1} variable on before tax profit/ta is 0.067 (or 0.047 + 10x0.002).

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[9] The lagging is to correct for the fact that profits - if not paid out in dividends - have a contemporaneous impact on bank equity.

Next, there is a negative and significant coefficient on the non-interest earning assets/ta variable in the net interest margin equation, but there is no significant relationship for the before tax profit/ta equation. Note that the sign on the non-interest earning assets/ta variable interacted with per capita GDP is negative in both the net interest margin and the before tax profit/ta specifications. Apparently, in wealthier countries the presence of non-interest earning assets depresses net interest income and profitability more than in poorer countries. By contrast, the sign on loan/ta variable is positive in the net interest margin equation and negative in the before tax profit/ta equation. However, the coefficient of the variable interacted with GDP in the profit equation is positive, indicating that at higher income levels banks' lending activities tend to be more profitable.

On the liability side, customer and short-term funding consists of demand deposits, savings deposits and time deposits. On average, this type of customer funding may carry a low interest cost, but it is costly in terms of the required branching network. In Table 4, we see that this liability category does not significantly affect the net interest variable, while in Table 5 there is some evidence that it lowers bank profitability.

Differences in overhead may also capture differences in bank business and product mix, as well as the variation in the range and quality of services. The overhead to assets ratio variable, overhead/ta, has an estimated coefficient of 0.173 in the net interest margin regression, which suggests that about a sixth of a bank's overhead cost is passed on to its depositors and lenders. The interaction of the overhead/ta variable with per capita GDP also enters with a positive coefficient, indicating there is a larger share of overhead passed on to financial customers in wealthier countries. This may reflect more competitive conditions in developed country banking markets than in the developing countries. In the before tax profit/ta regression the interaction of the overhead/ta variable with per capita GDP enters negatively indicating that higher overheads eat into bank profits.

The foreign ownership variable equals one, if at least 50 percent of the bank's stock is in foreign hands and it is zero otherwise. In both Tables 4 and 5, the foreign ownership variable has a positive coefficient, while its interaction with per capita GDP has a negative coefficient. This suggests that foreign banks realize relatively high net interest margins and profitability in relatively poor countries. This may reflect that foreign banks are frequently exempt from unfavorable domestic banking regulations, and may apply superior banking techniques. Note that the point estimate of the foreign ownership effect in the net interest margin equation for a wealthy country with a per capita GDP of $20,000, however, is negative at -0.016 (i.e., 0.004 - 20x0.001), as is the effect on profitability at -0.015 (i.e., 0.005 - 20x0.001). Foreign banks' technological and efficiency advantages in developed countries may be insignificant, while there they do face informational disadvantages. This can explain that on net foreign banks in developed countries are relatively unprofitable.

Next, we turn to the macro indicators in the regressions. First, per capita GDP has no significant impact on realized net interest margins, while this variable enters with a positive coefficient in the profitability equation. The per capita GDP is a general index of economic development, and thus it reflects differences in banking technology, the mix of banking opportunities, and any aspects of banking regulations omitted from the regression. Growth, defined as the growth rate of per capita real GDP, is insignificant in both spread and profit regressions. The percentage change in the GDP deflator, or inflation, is estimated to increase the net interest margin and bank profitability, although significance of the coefficients in the profitability regressions is low. This may reflect that banks obtain higher earnings from float, or the delays in crediting customer accounts, in an inflationary environment. With inflation, bank costs generally also rise. A larger number of transactions may lead to higher labor costs, and as shown by Hanson and Rocha (1986, p. 40), result in a higher bank branch per capita ratio. On net, however, the

regression results suggest that the impact of inflation on profitability, while not very significant, is positive throughout.

The real interest rate is constructed using the short-term government debt yield, and where not available, other short term market rates. The real interest variable enters the net interest margin and before tax profit/ta regressions positively in Table 4 and Table 5, while this variable interacted with per capita GDP has a significantly negative coefficient in Table 4. Thus there is some evidence that real interest rises do not increase spreads as much in developed countries, perhaps because their deposit rates are not tied down by deposit rate ceilings as real interest rates rise.

4.2   Taxation variables

Banks are subject to direct taxation through corporate income tax and other taxes; and they are subject to indirect taxation through reserve requirements. Reserve requirements are an implicit tax on banks if, as is usual, official reserves are remunerated at less-than-market rates. The corporate income tax and the reserve tax differ in important respects. First, the corporate income tax, in principle at least, can be targeted at pure profit. Corporate income tax, to the extent it is a profit tax, is relatively undistorting.[10] The reserve tax, by its very nature, is a tax proportional to the volume of deposit taking, and therefore is a distorting tax. From a welfare perspective, the corporate income tax thus appears to be superior to the reserve tax. A second important difference is that the severity of the reserve tax depends on the opportunity cost of holding reserves. This may depend on financial market conditions as much as on any tax code. Related to this second condition, reserve requirements are also an instrument of monetary policy.

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[10] In practice, however, the corporate income tax may not be a pure profit tax if complete expensing of costs is not allowed.

As far as we know, no previous empirical research on the incidence of the corporate income tax on the banking sector exists. In contrast, several studies have considered the impact of reserve requirements on bank profitability. Several studies, in particular, exist on how Federal Reserve Membership of U.S. commercial banks in the 1970s affected their profitability (see Rose and Rose (1979), and Gilbert and Rasche (1980)). Fed membership subjected banks to generally higher reserve requirements. The studies in this area generally support the notion that non-member banks were more profitable than member banks (with similar characteristics) as they held relatively little cash. Competition among member and non-member banks in the same market appears to have prevented member banks from passing their higher reserve cost on to their customers. In related work, Kolari, Mahajan, and Saunders (1988) have studied the impact of announcements of reserve requirement changes on bank stock prices using an event study methodology.[11]

Since detailed information on the reserve regulation of all our countries is not available, we use a proxy to capture bank reserves. The reserves variable in the regressions is constructed as the product of a banking system's aggregate reserves/deposit ratio (as in Table 3) and the individual bank's ratio of its short-term funding to total assets. Customer and short-term funding, consisting of demand deposits, saving deposits, time deposits here proxy for reservable deposits. The reserves variable thus is an approximation of actual bank reserves that reflects differences in system-wide reserve requirement rules.

In Tables 4 and 5, the reserves variable enters the regressions negatively. The regression coefficients in the net interest margin equations of Table 4 reflect two effects (i) less-than-market remuneration, and (ii) the impact on the bank's lending and deposit rates. The impact of the first effect is expected to be negative since under-remunerated reserves lower a bank's net interest income and

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[11] Huizinga (1996), and Eijffinger, Huizinga and Lemmen (1996) examine how nonresident withholding taxes affect interest rates, while Fabozzi and Thurston (1986) examine how differences in reserve requirements are priced into money market instruments.

profitability. The impact of the second effect could either be zero, in which case the bank bears the full cost of higher reserves, or positive, indicating that the cost of reserves is passed on to bank customers in terms of higher interest margins. From the before tax profit/ta regressions in Table 5, we see that the reserves variable negatively affects bank profitability. This suggests that the second or pass-through effect is either non-existent, or not large enough to off-set the first or direct effect. Abstracting from any pass-through, the coefficient on the reserves variable in either the net interest margin or the before tax profit/ta can also be interpreted as a bank's opportunity cost of holding reserves. The reserves variable interacted with per capita GDP enters the net interest margin and before tax profit/ta regressions positively. This positive interaction term may reflect that the opportunity cost of holding reserves is higher in wealthier countries.

We capture the explicit taxes the banks pay with the variable tax rate, which is measured by a bank's tax bill divided by its pre-tax profits. This variable has a significantly positive impact on interest margins and profitability. The tax rate variable interacted with per capita GDP is negative and significant in both regressions. These results suggest that both the net interest margin and profitability increase with tax rates, but less so in richer countries. These results suggest that the corporate income tax is passed through to bank customers to some degree.

To calculate the extent of this pass-through, we use the estimated coefficients on the tax rate variable and its interaction with per capita GDP. Let the pass-through be defined as the increase in before tax profits following a one unit increase in the corporate tax bill, tax, or δ(before tax profits)/δtax. Next, note that (δ(before tax profits)/$\delta\tau$)/A = β, where τ is the tax rate, A are assets, and β is estimated at 0.022 - 0.0004*per capita GDP. Further δtax/$\delta\tau$ = (δ(before tax profits)/$\delta\tau$) + before tax profits, as tax = τ*before tax profits. It now follows that δ(before tax profits)/δtax = β/($\beta\tau$ + before tax profit/ta). This

expression can be evaluated using mean values of τ, before tax profit/ta, and per capita GDP separately

for countries in each of four income groups (low income, lower middle income, upper middle income,

and high income), where per capita GDP is the international average for 1995. The calculations suggest

that the pass-through coefficient, δ(before tax profits)/δtax, equals 1.01, 0.72, 1.00, and 1.21 for countries

in the four income groups, respectively.[12] Essentially, these results suggest that there is a complete pass-

through of the corporate income tax to bank customers. Thus there is no support for the notion that the

corporate income tax is a nondistorting tax on bank profits. Generally, the corporate income tax is a

source-based tax on domestically employed capital resources. A complete pass-through of this tax is

consistent with the assumption that international investors demand a net-of-tax return on capital invested

in a particular country independent of the country's source-based taxes.

4.3   Deposit insurance

Several studies have previously examined the impact of deposit insurance using international

data. Demirgüç-Kunt and Detragiache (1997) find that the existence of an explicit deposit insurance is

positively associated with the probability of banking crises. Barth, Nolle and Rice (1997), however, find

that no significant impact of deposit insurance on banks' return on equity for a sample of 142 banks in

1993. Boyle, and Stover (1997) estimate that deposit insurance lowers the deposit rate by 25 basis

points using aggregate deposit interest rate data for 13 OECD countries during the 1985-1990 period.

These authors discuss that in principle deposit insurance has a theoretically ambiguous effect on interest

margins. On the one hand, the deposit rate for insured deposits should decrease given the insurance

protection. On the other hand, mispriced deposit insurance provides banks with an incentive to engage in

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[12] For the low income countries, *before tax profit/ta* and τ have mean values of 0.016 and 0.225 for all banks, while the average GDP
        per capita is $426 for the countries in this group in 1995. The calculations reflect that in higher income countries the mean value of

more risky lending strategies to increase the contingent pay-out from the deposit insurance agency.[13]

This moral hazard problem and the associated risks can lead bank creditors to demand a higher interest rate. Also, for a given risk deposit insurance may lead banks to lend money more cheaply than they otherwise would, depressing net interest margins and profitability. Even banks that do not engage in risky lending strategies themselves may experience a downward effect on interest margins on account of bank competition.

The deposit insurance variable equals one if there exists an explicit deposit insurance regime. For various countries, it varies with time reflecting changes in the deposit insurance regime during the sample period. The results suggest that an explicit deposit insurance scheme lowers net interest margins.[14] While the impact on bank profits is also negative, this result is not significant. The negative effect on profits may not be significant due the offsetting impact of mispriced subsidies in actual deposit insurance schemes. These results suggest that explicit deposit insurance regimes do not produce higher bank profitability and margins, perhaps due to design and implementation problems.

4.4 Financial structure variables

In column 4 of Tables 4 and 5 we include two sets of financial market or structure variables. First, we include the market concentration ratio, number of banks and the bank's total assets, as indicators of market structure and scale effects. Various authors, such as Gilbert (1984), Berger (1995), and Goldberg

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before tax profit/ta is lower, while the value of τ changes little.

[13] Brewer and Mondschean (1994) offer empirical support for the nation that deposit insurance creates incentives for banks to engage in risky asset acquisition by examining the junk bond holdings of U.S. banks, while Demirguç-Kunt and Huizinga (1993) argue that deposit insurance is an important determinant of bank stock prices during the international debt crisis period of the 1980s.

[14] Deposit insurance may affect margins and profits also through its effect on financial structure by encouraging new entry and making operation of small banks feasible. However, when we include financial structure variables in the regression the results do not change.

and Rai (1996), have pointed out that such variables may proxy for market power as well as for differences in bank efficiency. No attempt is made here to distinguish between the corresponding market power and efficient structure hypotheses.

The second set of variables are financial structure variables in the sense that they measure the importance of bank and stock market finance - relative to GDP and to each other. Reasons why these variables matter may also hinge on market power arguments. A high bank credit-to-GDP ratio, for instance, may reflect a high demand for banking services fueling competition among banks. Secondly, these variables can reflect any complementarity or substitutability between bank and stock market finance. The Miller-Modigliani theorem states that debt and equity finance are purely substitutes in the absence of taxes and bankruptcy costs. In practice, however, debt and equity finance may also be complementary, as modeled in Boyd and Smith (1996). DemirgηH-Kunt and Maksimovic (1996) provide empirical evidence that shows that ability to attract equity capital may also enhance firms' borrowing capacity, especially in underdeveloped financial markets. In this setting, easier equity finance may increase rather than reduce the demand for debt finance reflecting that these sources of finance are complements.

Turning to the first set of market concentration/scale variables, we see that the bank concentration ratio, has a significant and positive impact on bank profitability, while bank size, as proxied by total assets, has a significant and positive impact on interest margins only. The number of banks variable has no significant impact on either interest margins or profits.

The second set of financial structure variables has a more significant effect on bank margins as opposed to bank profits. This may indicate that these variables have a greater impact on banks' loan and deposit customers compared to other clients. Bank/gdp ratio has a significantly negative impact on margins and profits, perhaps reflecting more intense interbank competition in well-developed financial

systems. This effect is smaller in richer countries that already have relatively developed banking sectors. The stock market capitalization to GDP, or mcap/gdp ratio, enters the net interest margin equation positively, which suggests that a larger stock market per se enables banks to obtain higher interest margins. This may be due to the complementarity effect between debt and equity financing discussed above. As stock markets develop, improved information availability increases the potential pool of borrowers, making it easier for banks to identify and monitor them. This increases the volume of business for banks, making higher margins possible. In the regression, the stock market capitalization to banking assets ratio, or mcap/bank, enters the interest margin equation negatively. This suggests that a larger stock market relative to the banking sector lowers bank margins, reflecting substitution possibilities between debt and equity. For both stock market development indicators, the interaction with per capita GDP enters the interest margin equation with an opposite effect. This suggests that any stock market development impact on interest margins is muted in wealthier countries.

4.5   Legal and institutional indicators

The final columns in Tables 4 and 5 report regressions that include a variety of legal and institutional indicators. First, the contract enforcement dummy, ranging from 1 to 4, measures the degree to which contractual agreements are honored and not subject to language and mentality differences. A higher value means greater contract enforcement. In both the net interest margin and before tax profit/ta regressions, the contract enforcement variable has a negative and significant sign. Lower contract enforcement may in fact prompt banks to require higher interest margins and investors to require higher profitability to compensate for the additional risk. In both regressions, the contract enforcement variable interacted with per capita GDP enters positively, suggesting a muted effect of this variable in wealthier countries.

The law and order index, ranging from 0 to 6, captures the extent to which the legal system works well in adjucating disputes. From Table 4, we see that a higher value of the law and order index is significantly associated with lower interest margins. The reason may again be that an effective legal system reduces the required risk premia on bank lending. For this variable, the interaction with per capita GDP enters the equation negatively, however. Finally, the corruption index, ranging from 0 to 6, reflects a lack of corruption in government. Specifically, a higher score indicates that government officials are less likely to take bribes. The results of Table 4 now indicate that cleaner government (or a higher value for the corruption index) is associated with lower realized interest spreads, and this less so in wealthier countries. Again, banks may require a lower risk premium on their investments in countries which has an environment relatively free of corruption. Overall, the regressions indicate that the underlying legal and institutional variables are important in explaining cross-country variation in interest spreads and bank profitability. For two of the three variables, the interaction with per capita GDP has a coefficient of opposite sign, suggesting muted effects of institutional differences in wealthier countries.

6.   Conclusions

Banking systems around the world differ widely in size and operation. Across countries, commercial banks have to deal with different macroeconomic environments, different explicit and implicit tax policies, deposit insurance regimes, financial market conditions, and legal and institutional realities. Using a comprehensive cross-country data set with bank-level data, this paper analyzes how bank characteristics and the overall banking environment affect the functioning of banks, as reflected in interest margins and bank profitability.

In this paper we confirm some findings in earlier research, for instance a positive relationship between capitalization and profitability, and a negative relationship between reserves and profitability.

Other important determinants of bank margins and profitability, such as ownership, corporate taxation, financial structure and the legal and institutional setting have not been considered in the literature.

The paper finds that foreign ownership is associated with higher interest margins and bank profitability, especially in developing countries. Similarly, several institutional factors, such as indices of credit rights, law and order and corruption, and differences in financial structure, have more pronounced effects on interest margins and bank profitability in developing countries than in developed countries. These results may reflect the relatively closed nature of banking markets in developing countries. Coupled with earlier empirical evidence that a weak institutional environment makes banking crises more likely (Demirguc-Kunt and Detragiache, 1997), these results suggest that returns to improving underlying institutions are indeed high.

Reserves also have a more pronounced impact on margins and profitability in developing countries than in developed countries. This latter result may simply reflect the relatively high opportunity cost of holding reserves in poorer and more inflationary countries.

The corporate income tax appears to be passed on fully to bank customers, in developing and developed countries alike. This finding is consistent with the notion that bank stock investors require net-of-company-tax returns independent of the level of company taxation. It also implies that the corporate income tax on banks is likely to distort the underlying saving and investment decisions, with possibly negative implications for economic growth. These considerations have to weigh heavily in considering the merits of the corporate income tax on banks as part of the overall tax system.

On the other hand, we find that official reserves depress bank profits. Prima facie this suggests that reserve requirements are a better instrument to tax bank profits than the corporate income tax. Note that the implicit reserve tax in many countries, however, is much more variable than the corporate income tax. The level of banking investment and activity therefore is unlikely to be adjusted to each and every

change in the implicit reserve tax. Variability in the reserve tax therefore can go a long way towards explaining the responsiveness of bank profits to this tax. These issues are further pursued in DemirgηH-Kunt and Huizinga (1997).

Policy makers have an interest in promoting banking sectors that are both stable and efficient. Banking stability clearly requires sufficient banking profitability, while economic efficiency requires banking spreads that are not too large. A prerequisite to formulating effective banking policies thus is a better understanding of the determinants of bank profitability and interest margins, which this paper tries to provide.

Several other topics remain for further study. Countries worldwide differ considerably in the extent of foreign ownership of their banking systems. An interesting issue is how the entry by foreign banks affects the operation of domestic banking firms. In principle, foreign entry can affect the pricing by domestic firms, and force them to reduce their operating costs and to remain competitive. Both of these effects determine whether the entry of foreign firms is overall welfare improving. We address the impact of foreign entry in Claessens, DemirgηH-Kunt and Huizinga (1997).

As a related issue, it is interesting to consider what determines foreign bank entry. Foreign bank entry, and foreign direct investment generally, may well be driven by the different (worldwide) taxation of domestic and foreign firms rather than simply by countries' comparative advantage in providing financial services.

We have found some evidence that government regulations, such as the design of deposit insurance schemes have an impact on bank margins. It would be interesting to analyze this issue further by taking into account differences in design features. We intend to return to these issues in future work.

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Table 1. Bank Spreads and Profitability : Country Averages 1988-1995

Ratios are calculated for each bank in each country and then averaged over the country's sample period. All ratios are in percentages. Data are from BankScope data base of the IBCA and in percent. Net interest margin is defined as net interest income over total assets. Overhead/ni - non-interest income is overhead over net interest income - non-interest income all over assets. Tax/ni is total taxes paid over net interest income. Loan loss provision/ni is loan loss provisions over net interest income and Net profit/ni is net profits over net interest income. Non-interest income/ta is net non-interest income over total assets. Overhead/ta is overhead divided by total assets. Tax/ta is taxes paid over total assets. Loan loss provisions/ta is loan loss provisions over total assets. Net profit/ta is net profits divided by total assets.

	Net Interest	of which:				Non-int.	Overhead/ta	Tax/ta	Loan loss	Net
	margin	Overhd -non- int.inc /ni	Tax/ni	Loan loss prov./ni	Net profit/ni	income/ta			prov./ta	profit/ta
Argentina	7.3	35.6	5.5	28.5	30.3	6.3	9.4	0.4	1.8	2.0
Australia	3.0	32.8	8.5	28.1	33.2	1.3	2.8	0.3	0.7	0.6
Austria	1.7	54.9	6.8	25.7	24.8	0.5	1.5	0.1	0.5	0.3
Bahrain	2.2	30.8	2.7	32.9	43.3	0.8	1.4	0.0	0.6	1.1
Belgium	2.0	48.7	10.2	20.4	24.0	0.9	2.1	0.2	0.4	0.4
Bolivia	3.1	73.7	1.9	12.6	12.6	2.0	5.2	0.6	0.6	-1.1
Botswana	6.0	43.7	11.8	12.9	31.5	2.8	5.4	0.7	0.7	1.9
Brazil	8.9	60.5	11.6	13.8	17.5	4.5	10.2	1.1	1.3	1.4
Canada	2.9	47.3	12.7	21.5	19.0	1.2	2.5	0.4	0.6	0.6
Chile	4.3	71.7	2.4	13.8	14.2	-0.1	3.0	0.1	0.6	0.5
China	2.1	30.0	15.9	.	54.2	1.0	1.6	0.3	.	1.2
Colombia	6.0	53.8	10.3	12.9	27.7	5.8	8.3	0.7	0.9	2.2
Costa Rica	13.6	40.7	4.7	57.6	9.9	3.5	8.1	0.8	5.7	3.5
Cyprus	1.0	59.1	11.1	15.8	22.0	3.1	3.2	0.3	0.3	0.5
Czech Rep.	3.3	13.5	23.2	53.4	13.6	1.5	2.1	0.6	2.0	0.3
Denmark	4.8	52.9	5.4	33.3	8.6	1.0	3.7	0.3	1.6	0.3
Dominican Rep.	6.6	52.8	8.6	9.1	30.9	3.1	6.3	0.6	0.5	2.3
Ecuador	7.7	52.8	4.7	12.8	34.9	3.8	8.1	0.4	1.0	2.5
Egypt	1.4	-32.7	11.2	62.6	63.5	2.1	1.4	0.3	0.7	1.2
El Salvador	3.2	34.3	1.9	14.0	49.8	1.6	2.9	0.1	0.4	1.5
Estonia	4.7	-35.9	24.1	.	111.7	8.7	7.0	1.1	.	5.3
Finland	1.8	50.1	9.4	55.6	-10.7	1.2	2.1	0.2	0.8	-0.1
France	2.4	48.3	7.0	50.8	-1.7	1.4	2.6	0.2	1.0	0.1

Table 1. Continued

	Net Interest margin	of which:				Non-int. income/ta	Overhead/ta	Tax/ta	Loan loss prov./ta	Net profit/ta
		Overhd-non-int.inc/ni	Tax/ni	Loan loss prov./ni	Net profit/ni					
Germany	2.0	51.6	12.3	29.5	12.6	1.1	2.1	0.3	0.6	0.3
Greece	3.0	33.8	12.7	25.7	29.7	2.2	3.4	0.4	0.6	1.0
Guatemala	5.6	80.5	3.6	.	16.0	1.4	5.7	0.2	.	1.1
Haiti	2.8	53.8	7.3	12.4	26.5	2.8	4.2	0.2	0.4	0.8
Honduras	4.3	72.3	9.8	.	17.9	0.9	4.0	0.4	.	0.8
Hong Kong	2.5	17.1	10.2	6.0	67.8	1.3	1.4	0.3	0.2	2.0
Hungary	4.7	17.5	13.7	68.8	29.9	5.8	7.0	0.6	2.7	1.4
India	4.0	18.2	12.4	19.3	50.2	1.6	2.0	0.6	0.7	2.3
Indonesia	3.6	47.5	10.9	17.8	26.2	1.2	2.9	0.4	0.7	0.9
Ireland	3.6	56.4	8.4	11.6	23.5	0.9	2.9	0.3	0.5	0.8
Israel	2.8	41.9	17.1	23.6	17.3	1.8	3.2	0.4	0.7	0.4
Italy	3.4	56.5	14.3	17.4	11.9	1.4	3.3	0.5	0.5	0.4
Jamaica	10.5	33.9	21.2	2.2	43.1	2.8	6.3	2.2	0.3	4.5
Japan	1.6	61.9	16.2	10.0	12.1	0.2	1.3	0.2	0.1	0.2
Jordan	2.1	48.0	10.4	24.1	24.5	1.4	2.4	0.2	0.5	0.5
Korea	1.8	36.4	12.5	34.0	29.9	1.5	2.2	0.2	0.5	0.5
Lebanon	2.7	45.6	9.2	13.7	35.3	0.9	2.1	0.3	0.5	0.9
Lithuania	10.6	29.8	17.5	81.7	-22.2	5.0	7.5	2.0	5.8	0.7
Luxembourg	0.8	-11.5	28.2	52.7	46.0	0.9	1.0	0.2	0.3	0.3
Malaysia	2.7	40.0	15.9	17.3	29.2	0.8	1.9	0.4	0.4	0.8
Malta	2.4	37.6	18.0	6.2	39.1	1.1	2.0	0.4	0.1	0.9
Mexico	4.6	40.8	6.1	42.2	15.4	2.1	4.5	0.3	1.1	0.9
Morocco	3.4	66.8	13.6	0.1	21.9	1.3	3.5	0.5	0.0	0.8
Nepal	3.6	10.5	25.3	16.1	48.1	2.1	2.4	1.0	0.5	1.8
Netherlands	1.4	43.1	9.7	21.4	26.1	1.0	1.7	0.1	0.3	0.4
Nicaragua	4.4	85.2	8.0	18.5	-10.4	3.3	6.3	0.3	0.9	0.2
Nigeria	5.3	-29.3	13.1	88.3	27.8	5.8	7.0	0.7	1.6	1.8
Norway	3.2	51.6	4.6	44.3	3.2	1.2	2.8	0.1	1.4	0.2
Oman	4.1	43.1	5.5	15.2	36.2	1.4	3.3	0.2	0.6	1.4
Pakistan	2.8	38.8	28.6	.	32.6	1.8	2.9	0.9	.	0.8
Panama	2.1	29.9	4.3	20.3	46.4	1.4	2.0	0.1	0.4	1.0
Papua N. Guin.	3.2	-2.6	20.2	40.8	45.8	4.2	5.0	0.4	0.9	1.1
Paraguay	5.9	63.5	5.5	11.4	23.3	2.5	6.2	0.4	0.7	1.5
Peru	6.5	43.8	14.3	47.0	12.1	5.7	9.6	0.7	1.7	0.8
Philippines	4.1	29.8	6.6	10.3	55.0	3.0	4.3	0.3	0.4	2.2
Poland	6.1	16.8	27.9	23.3	34.9	2.4	3.6	1.6	1.3	2.1
Portugal	3.3	45.9	8.0	25.5	23.7	1.0	2.5	0.3	0.9	0.7
Qatar	1.9	6.6	0.0	15.0	85.2	1.1	1.3	0.0	0.2	1.6
Romania	9.7	1.9	26.2	36.8	44.3	2.4	2.8	2.3	3.7	4.3
Russia	4.7	-5.0	33.3	47.2	37.1	10.9	7.0	1.9	2.6	4.7
Singapore	2.2	20.7	21.6	8.7	56.4	1.0	1.4	0.5	0.1	1.3
S. Africa	3.9	45.1	11.8	16.1	29.0	1.9	3.6	0.5	0.7	1.1
Spain	3.6	60.3	10.2	17.7	12.7	1.2	3.2	0.4	0.6	0.7
Sri Lanka	3.7	31.8	11.1	9.7	52.5	2.0	3.0	0.5	0.4	2.1
Swaziland	5.4	52.1	16.3	2.8	30.9	2.7	5.5	0.9	0.2	1.7
Sweden	3.1	26.3	1.9	64.6	11.2	1.5	2.5	0.1	1.9	0.3
Taiwan	2.0	34.6	10.1	10.8	45.5	1.0	1.6	0.2	0.2	1.0
Tunisia	2.3	31.4	9.9	56.1	48.0	2.2	3.1	0.2	1.1	0.8
Turkey	6.3	11.7	10.0	32.9	47.2	4.0	5.4	0.8	0.8	3.3

Table 1. Continued

	Net Interest margin	of which:				Non-int. income/ta	Overhead/ta	Tax/ta	Loan loss prov./ta	Net profit/ta
		Overhd -non-int.inc/ni	Tax/ni	Loan loss prov./ni	Net profit/ni					
U.K.	2.3	18.4	20.6	29.8	40.9	2.3	3.0	0.4	0.7	0.8
U.S.	3.9	47.6	12.5	15.2	25.8	1.8	3.6	0.5	0.7	1.0
Venezuela	7.2	49.9	2.7	16.7	30.6	2.8	6.4	0.2	1.0	2.5
Yemen	4.0	48.8	14.1	2.6	34.6	-0.5	1.4	0.6	0.1	1.4
Zambia	-4.7	186.1	-6.6	-49.1	-30.4	9.5	0.4	0.3	2.4	1.7

Table 2. Bank Spreads and Profitability : Selected Aggregates 1988-1995

Net interest margin is defined as net interest income over total assets. Non-interest income +overhead/ni is net non-interest income plus overhead over net interest income. Tax/ni is total taxes paid over net interest income. Loan loss provision/ni is loan loss provisions over net interest income and Net profit/ni is net profits over net interest income. Overhead/ta is overhead divided by total assets. Non-interest income/ta is net non-interest income over total assets. Tax/ta is taxes paid over total assets. Loan loss provisions/ta is loan loss provisions over total assets. Net profit/ta is net profits divided by total assets. All ratios are in percentages. Data are from BankScope data base of the IBCA and in percent. A foreign bank is defined as having at least 50 percent foreign ownership. Large category includes the largest ten banks and the remaining banks are classified as small. Large versus small distinction is made only if there are more than 20 banks in a given year. The data by income group and by region are means of country averages. Income and region classifications follow World Bank definitions as published in the World Development Report (1996).

	Net int. margin	of which: overhd -non- int.inc. /ni	Tax/ni	Loan loss prov./ni	Net profit/ni	Non-int. income/ta	Overhead/ ta	Tax/ta	Loan loss prov./ta	Net profit/ta
Total	3.5	43.1	11.5	24.8	20.6	1.6	3.2	0.3	0.8	0.8
Ownership										
Domestic	3.7	46.2	11.1	22.8	19.9	1.6	3.3	0.4	0.8	0.8
Foreign	2.9	29.0	13.1	33.5	24.4	1.6	2.8	0.3	0.7	0.8
Size										
Large	2.6	35.5	13.1	27.5	23.9	1.2	2.5	0.3	0.6	0.5
Small	3.4	48.0	11.9	22.0	18.2	1.5	3.1	0.4	0.7	0.7
Income Groups										
Low income	2.8	37.9	11.3	20.0	30.8	3.2	3.1	0.5	0.8	1.5
Lower middle income	5.7	36.8	11.0	24.9	27.2	3.2	5.1	0.7	1.3	1.8
Upper middle income	4.1	32.7	11.2	27.3	28.8	2.1	3.8	0.4	1.0	0.9
High income	2.6	30.0	10.3	31.8	27.9	1.2	2.3	0.2	0.7	0.5
Regions										
Africa	3.0	20.1	14.7	17.3	47.9	1.8	2.4	0.4	0.5	1.5
Asia	3.0	20.6	14.5	17.4	47.4	1.8	2.5	0.4	0.5	1.4
Latin America	6.2	48.7	6.8	21.1	23.4	3.1	6.2	0.5	1.1	1.5
Middle East and North Africa	2.9	26.1	8.5	23.4	41.9	1.6	2.6	0.3	0.5	1.1
Transitional economies	6.4	13.2	21.8	51.9	13.1	4.4	4.5	1.4	3.0	1.9
Industrial economies	2.7	32.9	10.4	34.7	21.9	1.2	2.5	0.3	0.8	0.4

Table 3. Economic and Institutional Indicators

GDP/CAP is the real GDP per capita in US$. Inflation is the annual inflation of the GDP deflator. Both are obtained from World Bank National Accounts. Tax rate is defined as the total taxes paid by banks divided by before tax profits. It is from BankScope data base by IBCA. Reserves/deposits is defined as the reserves of the banking system over deposits, from IMF, International Financial Statistics. Deposit Insurance is a dummy variable which takes the value one if there is an explicit deposit insurance scheme in place zero otherwise. It is compiled from Kyei (1995) and Talley and Mas (1990). Concentration is defined as the ratio of largest three bank assets to total banking assets. Number of banks is the number of banks in the data set with complete information. Both variables are obtained from BankScope data base. Bank/gdp is the total assets of the deposit money banks divided by GDP. It is obtained from IMF, International Financial Statistics. Mcap/gdp is the stock market capitalization divided by GDP. Stock market data are from IFC's Emerging Market Data Base. Law and order indicator, produced by International Country Risk rating agency, reflects the degree to which the citizens of a country are willing to accept the established institutions to make and implement laws and adjudicate disputes. It is scored 0-6 with higher scores indicating sound political institutions and a strong court system. Lower scores indicate a tradition of depending on physical force or illegal means to settle claims.   For all variables 1995 figures were reported, if available. Otherwise figures are for the most recent year available. N.a. means not available.

	Gdp/cap (US $)	Inflation	Tax rate	Reserves/ deposits	Deposit insurance	Concentration	No. of banks	Bank/ gdp	Mcap/ gdp	Law and order
Argentina	3825	0.02	0.15	0.06	1	0.48	11	0.23	0.13	5
Australia	14542	0.03	0.47	0.02	0	0.45	44	0.77	0.70	6
Austria	16947	0.02	0.23	0.04	1	0.75	12	1.27	0.14	6
Bahrain	7902	0.02	0.01	0.10	n.a.	0.94	7	0.49	n.a.	5
Belgium	16197	0.03	0.27	0.01	1	0.46	49	1.53	0.39	6
Bolivia	665	0.11	0.10	n.a.	0	0.57	11	0.43	0.01	3
Botswana	1844	0.18	0.32	0.41	n.a.	0.94	5	0.14	0.09	n.a.
Brazil	2113	22.95	0.38	0.13	0	0.43	56	0.32	0.21	3
Canada	16091	0.02	0.35	0.01	1	0.56	72	0.72	0.65	6
Chile	2481	0.12	0.07	0.08	1	0.40	23	0.45	1.10	5
China	468	0.12	0.21	n.a.	0	0.99	5	0.80	0.06	n.a.
Colombia	1445	0.23	0.18	0.23	1	0.35	28	0.20	0.22	2
Costa Rica	1936	0.23	0.09	0.59	0	0.76	22	0.15	0.07	n.a.
Cyprus	7500	0.03	0.34	0.16	n.a.	0.75	9	0.91	0.30	5
Czech Rep.	3165	0.15	2.01	0.18	1	0.76	15	0.87	0.33	n.a.
Denmark	22386	0.02	0.16	0.07	1	0.77	56	0.55	0.33	6
Dominican Rep.	829	0.13	0.19	0.25	1	0.62	13	0.17	n.a.	4
Ecuador	1243	0.23	0.12	0.10	0	0.89	6	0.24	0.15	4
Egypt	709	0.12	0.25	0.20	0	0.89	9	0.65	0.13	4
El Salvador	994	0.12	0.04	0.32	1	0.86	4	0.28	0.67	3
Estonia	2820	0.29	0.20	n.a.	0	n.a.	7	n.a.	n.a.	n.a.
Finland	18275	0.03	0.48	0.15	1	0.70	12	0.70	0.35	6
France	18128	0.01	0.26	0.01	1	0.48	98	0.99	0.34	6
Germany	16572	0.02	0.56	0.04	1	0.50	82	1.19	0.24	6
Greece	5140	0.10	0.21	0.46	1	0.70	16	0.40	0.15	6
Guatemala	898	0.10	0.10	0.32	0	0.29	24	0.16	n.a.	3
Haiti	230	0.72	0.25	0.35	n.a.	1.00	3	0.10	n.a.	3
Honduras	900	0.25	0.33	0.14	0	1.00	3	0.22	0.09	3
Hong Kong	11911	0.02	0.13	n.a.	0	0.44	35	n.a.	2.17	6
Hungary	2330	0.20	0.13	n.a.	1	0.40	22	0.40	0.04	n.a.
India	423	0.06	0.04	0.16	1	0.90	5	0.35	0.38	4
Indonesia	718	0.13	0.30	n.a.	0	0.38	21	0.41	0.33	5
Ireland	13653	0.01	0.26	0.05	1	0.75	12	0.46	0.42	6
Israel	10515	0.10	0.53	0.07	0	0.48	26	0.91	0.42	5
Italy	15491	0.05	0.48	n.a.	1	0.27	66	0.62	0.11	6
Jamaica	1573	0.33	0.24	0.33	0	0.52	10	0.30	0.41	3
Japan	23960	0.02	0.57	0.01	1	0.21	81	1.32	0.72	6

Table 3. Continued

	Gdp/cap (US $)	Inflation	Tax rate	Reserves/ deposits	Deposit insurance	Concentration	No. of banks	Bank/gdp	Mcap/ gdp	Law and order
Jordan	1263	0.02	0.31	0.49	0	0.93	7	0.70	0.70	5
Korea	5663	0.06	0.26	0.10	0	0.17	43	0.55	0.40	5
Lebanon	1800	n.a.	0.24	0.16	1	0.61	6	0.79	n.a.	n.a.
Lithuania	1233	0.36	0.37	0.14	0	0.76	8	0.17	0.03	n.a.
Luxembourg	21433	0.07	0.45	n.a.	1	0.30	108	0.41	0.14	6
Malaysia	3108	0.06	0.32	0.12	0	0.31	49	0.84	2.82	5
Malta	6102	0.04	0.29	0.08	n.a.	0.69	7	0.75	n.a.	n.a.
Mexico	1749	0.45	0.20	0.23	1	0.59	20	0.35	0.32	3
Morocco	853	0.07	0.34	0.07	n.a.	0.63	8	0.46	0.18	6
Nepal	203	0.07	0.35	n.a.	n.a.	1.00	3	0.22	0.06	n.a.
Netherlands	17187	0.02	0.21	0.01	1	0.84	25	1.14	0.90	6
New Zealand	12008	0.08	0.28	0.03	0	0.52	8	0.87	0.53	6
Nicaragua	786	0.09	0.22	0.27		0.63	13	0.32	n.a.	n.a.
Nigeria	339	0.65	0.06	0.14	1	0.87	9	0.13	0.03	3
Norway	23083	0.03	0.16	0.01	1	0.52	27	0.68	0.31	6
Oman	5696	0.04	0.12	0.05	0	0.69	6	0.29	0.15	5
Pakistan	377	0.14	0.53	0.19	0	0.73	15	0.37	0.16	2
Panama	2435	0.05	0.08	n.a.	n.a.	0.54	9	0.69	0.10	3
Papua New Guinea	1104	0.03	0.23	0.03	n.a.	0.78	5	0.31	n.a.	3
Paraguay	1049	0.13	0.17	0.33	0	0.35	23	0.20	n.a.	4
Peru	1046	0.13	0.43	0.32	1	0.65	22	0.13	0.20	3
Philippines	615	0.07	0.12	0.12	1	0.44	21	0.43	0.79	4
Poland	1903	4.65	0.40	0.10	1	0.45	32	0.29	0.04	n.a.
Portugal	5199	0.11	0.14	0.03	1	0.32	38	0.88	0.19	6
Qatar	12820	n.a.	0.01	0.04	n.a.	1.00	2	0.71	n.a.	n.a.
Romania	1341	2.16	0.30	0.33	0	0.70	7	0.15	n.a.	n.a.
Russia	1989	1.90	0.46	0.19	0	0.44	18	0.12	0.05	n.a.
S. Africa	2176	0.09	0.23	0.04	0	0.71	15	0.67	2.09	4
Saudi Arabia	5316	0.04	0.00	n.a.	0	0.96	4	0.41	0.33	5
Singapore	13436	0.04	0.29	0.08	0	0.48	19	0.96	1.74	6
Spain	9137	0.05	0.26	0.08	1	0.50	49	1.01	0.35	4
Sri Lanka	640	0.11	0.23	n.a.	0	0.63	7	n.a.	n.a.	n.a.
Swaziland	787	0.47	0.16	0.21	n.a.	n.a.	4	0.23	0.30	n.a.
Sweden	19387	0.04	-4.91	n.a.	0	0.41	18	0.62	0.78	6
Taiwan	7268	0.02	0.18	n.a.	1	0.40	25	n.a.	n.a.	5
Thailand	1807	0.04	0.31	0.04	0	0.49	14	0.98	0.86	5
Tunisia	1464	0.05	0.20	0.04	n.a.	0.55	8	0.55	0.22	n.a.
Turkey	1848	1.06	0.14	0.27	1	0.43	29	0.17	0.17	5
U.K.	13478	0.02	0.36	n.a.	1	0.39	71	1.12	1.27	6
U.S.	20931	0.01	0.27	0.03	1	0.16	372	0.48	0.95	6
Venezuela	2651	0.51	0.06	0.25	1	0.46	17	0.13	0.05	4
Yemen	280	n.a.	0.51	n.a.	n.a.	1.00	3	n.a.	n.a.	n.a.
Zambia	247	0.55	0.34	0.08	0	1.00	3	0.10	n.a.	4

Table 4. Determinants of Net Interest Margins

The regression is estimated using weighted least squares pooling bank level data across 80 countries for the 1988-95 time period. Number of banks in each period is used to weight the observations. Regression also includes country and time dummy variables which are not reported. Dependent variable is the net interest margin defined as interest income minus interest expense over total assets. Detailed variable definitions and data sources are given in the appendix. Standard errors are given in parentheses.

	(1)	(2)	(3)	(4)	(5)
Bank Characteristics					
Equity/ta $_{t-1}$	.046***	.047***	.044***	.064***	.063***
	(.007)	(.007)	(.007)	(.007)	(.006)
Equity/ta $_{t-1}$ ι gdp/cap	-.001	.000	-.001	-.002**	-.002***
	(.001)	(.001)	(.001)	(.001)	(.001)
Loan/ta	.017***	.008**	.012***	.022***	.019***
	(.004)	(.004)	(.004)	(.004)	(.004)
Loan/ta ι gdp/cap	-.000	.001***	.001***	.000	.000
	(.000)	(.000)	(.000)	(.000)	(.000)
Non-interest earning assets/ta	-.016**	-.020***	-.021***	-.011	-.020***
	(.007)	(.007)	(.008)	(.007)	(.007)
Non-interest earning assets/taι gdp/cap	-.001*	-.001	.000	-.002**	-.001
	(.001)	(.001)	(.001)	(.001)	(.001)
Customer &short term funding/ta	-.007	.003	.004	-.000	-.004
	(.005)	(.005)	(.006)	(.005)	(.005)
Cust. & shrt term funding/ta ι gdp/cap	.000	-.000	.000	-.000	.000
	(.000)	(.000)	(.000)	(.000)	(.001)
Overhead/ta	.173***	.025***	.213***	.141***	.310***
	(.022)	(.019)	(.019)	(.018)	(.019)
Overhead/ta ι gdp/cap	.002***	.004*	.004*	.009***	.005***
	(.002)	(.002)	(.002)	(.002)	(.002)
Foreign ownership dummy	.004***	.003**	.004***	.004***	.003***
	(.001)	(.001)	(.001)	(.001)	(.001)
Foreign ownership dummy ι gdp/cap	-.001***	-.001***	-.001***	-.000***	-.000***
	(.000)	(.000)	(.000)	(.000)	(.000)
Macro Indicators					
Gdp/cap	.000	.000	.000	.000	-.011***
	(.001)	(.001)	(.001)	(.001)	(.002)
Growth	.004	.005	.006	-.011	-.020**
	(.008)	(.008)	(.008)	(.008)	(.007)
Inflation	.021***	.026***	.025***	.020***	.003
	(.006)	(.006)	(.006)	(.006)	(.005)
Real interest	.044***	.060***	.058***	.051***	.025***
	(.007)	(.007)	(.007)	(.007)	(.006)
Real interest ι gdp/cap	.001	-.004**	-.003*	-.005***	-.000
	(.002)	(.002)	(.002)	(.002)	(.002)
Taxation					
Reserves		-.076***	-.076***	-.024*	-.104***
		(.015)	(.015)	(.016)	(.016)
Reserves ι gdp/cap		.011***	.011***	.009***	.004
		(.003)	(.003)	(.003)	(.004)
Tax rate		.016***	.015***	.017***	.017***
		(.002)	(.002)	(.002)	(.002)
Tax rate ι gdp/cap		-.001***	-.001***	-.001***	-.001***
		(.000)	(.000)	(.000)	(.000)

*, ** and *** indicate significance levels of 10, 5 and 1 percent respectively.

Table 4. Continued

	(1)	(2)	(3)	(4)	(5)
Deposit Insurance					
Deposit insurance dummy		-.009***			
		(.003)			
Financial Structure					
Bank/gdp			-.024**		
			(.010)		
Bank/gdp ι gdp/cap			.001*		
			(.001)		
Mcap/gdp			.016***		
			(.005)		
Mcap/gdp ι gdp/cap			-.002***		
			(.001)		
Mcap/bank			-.013***		
			(.003)		
Mcap/bank ι gdp/cap			.001**		
			(.001)		
No. of banks			-.001		
			(.015)		
Concentration			.004		
			(.005)		
Total assets ($)			.003***		
			(.000)		
Legal and Institutional Indicators					
Contract enforcement dummy				-.042***	
				(.007)	
Contract enforcmt dummy ι gdp/cap				.003***	
				(.001)	
Law & order index				-.003***	
				(.001)	
Law & order index ι gdp/cap				-.000***	
				(.000)	
Corruption				-.009***	
				(.001)	
Corruption ι gdp/cap				.001***	
				(.000)	
Adj R^2	.50	.51	.50	.58	.63
N. of obs	5841	5276	5212	5054	4497

*, ** and *** indicate significance levels of 10, 5 and 1 percent respectively.

Table 5. Determinants of Bank Profitability

The regression is estimated using weighted least squares pooling bank level data across 80 countries for the 1988-95 time period. Number of banks in each period is used to weight the observations. Regression also includes country and time dummy variables which are not reported. Dependent variable is the before tax profits divided by total assets. Detailed variable definitions and data sources are given in the appendix. Standard errors are given in parentheses.

	(1)	(2)	(3)	(4)	(5)
Bank Characteristics					
Equity/ta $_{t-1}$	.047***	.051***	.055***	.058**	.015***
	(.009)	(.009)	(.009)	(.010)	(.006)
Equity/ta $_{t-1}$ ι gdp/cap	.002	.002***	.003***	.002***	.003***
	(.001)	(.001)	(.001)	(.001)	(.001)
Loan/ta	-.013***	-.024***	-.023**	-.015***	-.018***
	(.005)	(.005)	(.005)	(.005)	(.004)
Loan/ta ι gdp/cap	.001***	.003***	.003***	.003***	.001***
	(.000)	(.000)	(.000)	(.000)	(.000)
Non-interest earning assets/ta	-.005	-.010	-.011	-.014	-.033***
	(.010)	(.010)	(.010)	(.010)	(.007)
Non-interest earning assets/taι gdp/cap	-.007***	-.007***	-.007***	-.008***	.002**
	(.001)	(.001)	(.001)	(.001)	(.001)
Customer &short term funding/ta	-.029***	-.017**	-.014***	-.031***	-.051***
	(.006)	(.007)	(.008)	(.001)	(.005)
Cust. & shrt term funding/ta ι gdp/cap	.002***	-.000	-.000	.001	.002***
	(.000)	(.001)	(.001)	(.001)	(.000)
Overhead/ta	-.023	-.006	-.004	-.024	-.114***
	(.025)	(.026)	(.026)	(.026)	(.019)
Overhead/ta ι gdp/cap	-.030***	-.049***	-.049***	-.048***	.007***
	(.003)	(.003)	(.003)	(.003)	(.002)
Foreign ownership dummy	.005***	.006***	.006***	.006***	.006***
	(.001)	(.001)	(.001)	(.001)	(.001)
Foreign ownership dummy ι gdp/cap	-.001***	-.001***	-.001***	-.001***	.000***
	(.000)	(.000)	(.000)	(.000)	(.000)
Macro Indicators					
Gdp/cap	.008***	.008***	.008***	.007***	.000
	(.001)	(.001)	(.001)	(.002)	(.002)
Growth	.002	-.006	-.007	-.019	.004
	(.010)	(.011)	(.011)	(.011)	(.007)
Inflation	.011	.015*	.014*	.009	.011*
	(.008)	(.008)	(.008)	(.008)	(.005)
Real interest	.023***	.029***	.029***	.023***	.026***
	(.009)	(.010)	(.010)	(.009)	(.006)
Real interest ι gdp/cap	-.000	-.001	-.001	-.000	-.003**
	(.002)	(.002)	(.002)	(.002)	(.002)
Taxation					
Reserves		-.126***	-.129***	-.106***	-.091***
		(.021)	(.021)	(.023)	(.016)
Reservesι gdp/cap		.029***	.031***	.032***	.005***
		(.004)	(.004)	(.004)	(.004)
Tax rate		.022***	.022***	.021***	.017***
		(.003)	(.003)	(.003)	(.002)
Tax rate ι gdp/cap		-.000	-.000**	-.003**	.000***
		(.000)	(.000)	(.000)	(.000)

*, ** and *** indicate significance levels of 10, 5 and 1 percent respectively.

Table 5. Continued

	(1)	(2)	(3)	(4)
(5)				
Deposit Insurance				
Deposit insurance dummy		-.005		
		(.004)		
Financial Structure				
Bank/gdp			-.028*	
			(.014)	
Bank/gdp ι gdp/cap			.002*	
			(.001)	
Mcap/gdp			.010	
			(.007)	
Mcap/gdp ι gdp/cap			.000	
			(.001)	
Mcap/bank			-.001	
			(.001)	
Mcap/bank ι gdp/cap			-.001	
			(.001)	
No. of banks			.000	
			(.000)	
Concentration			.010*	
			(.007)	
Total assets ($)			.000	
			(.000)	
Legal and Institutional Indicators				
Contract enforcement dummy				-.022***
				(.007)
Contract enforcmt. dummy ι gdp/cap				.001***
				(.001)
Law & order index				-.000
				(.001)
Law & order index ι gdp/cap				-.000*
				(.000)
Corruption				-.002*
				(.001)
Corruption ι gdp/cap				-.000
				(.000)
Adj R^2	.21	.27	.27	.31	.35
N. of obs	5841	5276	5212	5054	4497

*, ** and *** indicate significance levels of 10, 5 and 1 percent respectively.

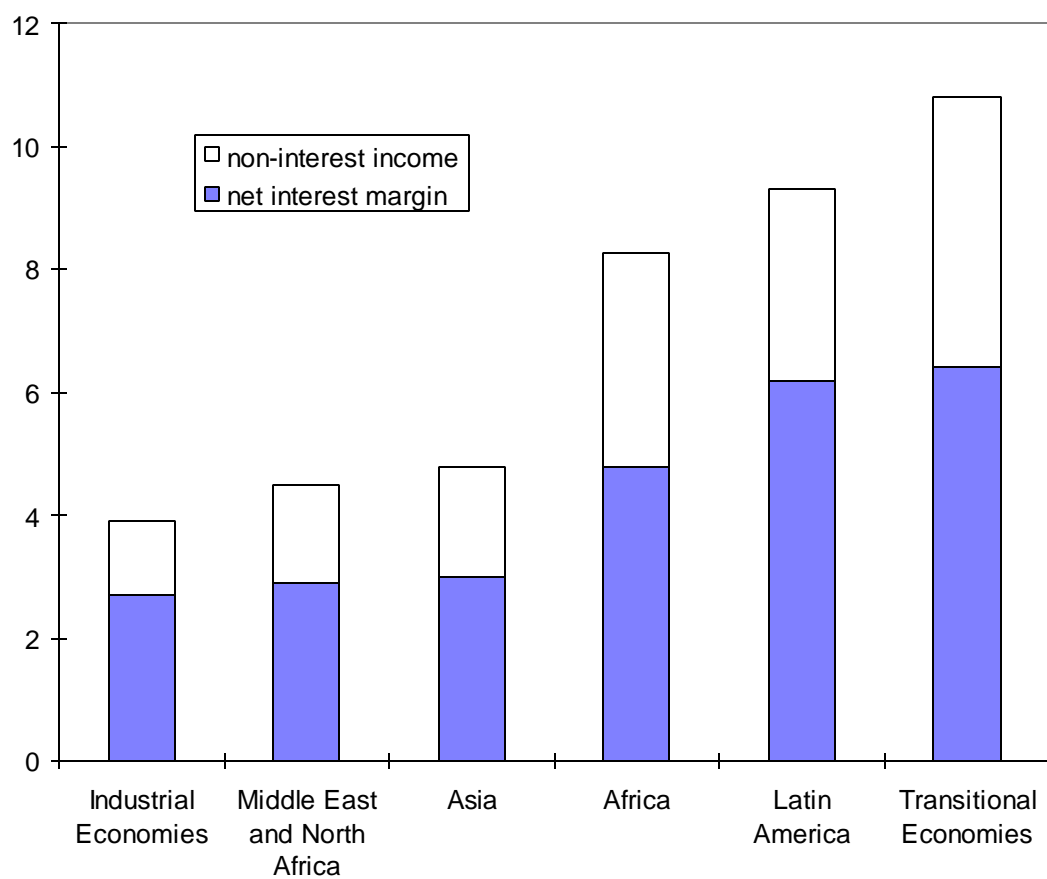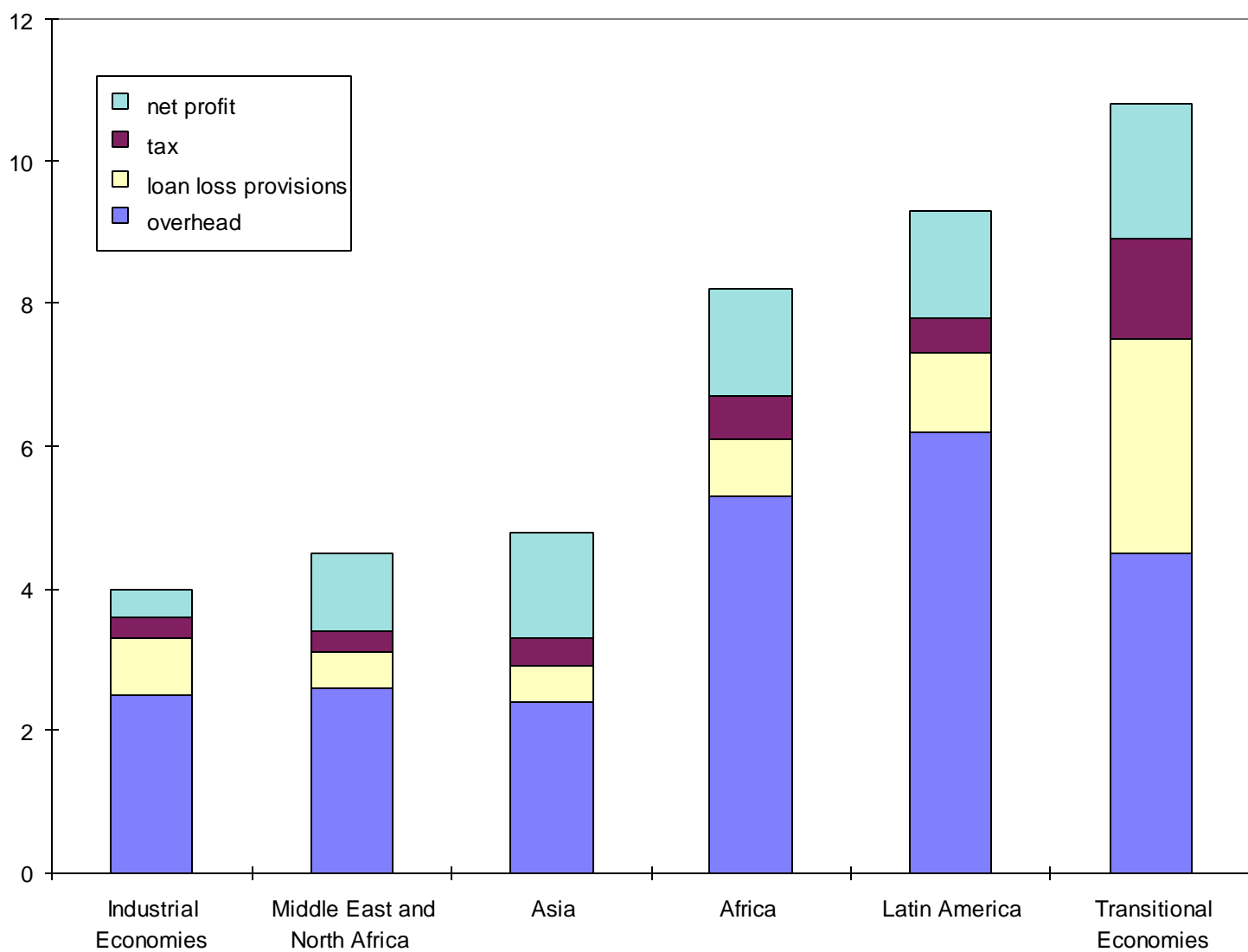# Figure 1 : Interest and Non-interest Income: 1988-1995

Figure 2 : Income Decomposition: 1988-1995

Appendix

Variable Definitions and Sources

Bank Characteristics

Net interest margin - interest income minus interest expense over total assets.

Net profit/ta - before tax profits over total assets.

Equity/ta - book value of equity (assets minus liabilities) over total assets

Loan/ta - total loans over total assets

Non-interest earning assets/ta - cash, non-interest earning deposits at other banks, and other non-interest earning assets over total assets

Customer & short term funding/ta - all short term and long term deposits plus other non-deposit short term funding over total assets

Overhead/ta - personnel expenses and some other non-interest expenses over total assets

Foreign ownership dummy - dummy equals one if a bank has at least 50 percent foreign ownership and zero otherwise.

All bank level variables are obtained from BankScope data base of IBCA.

Macro Indicators

Gdp/cap - real GDP per capita in constant 1987 US$.

Growth - annual growth rate of real GDP.

Iinflation - the annual inflation from the GDP deflator.

Real interest - the nominal interest rate minus rate of inflation. Where available, nominal rate is the rate on short term government securities. Otherwise, a rate changed by the Central Bank to domestic banks such as the discount rate is used. If that is not available, then the commercial bank deposit interest rate is used.

Interest rate data are from the IMF, International Financial Statistics. Other macro data are from World Bank National Accounts.

Taxation

Reserves - reserves of the banking system (IFS line 20) over deposits of the banking system (IFS line 24+25) multiplied by customer & short term funding/ta (as defined above) for each bank.

Tax rate - total taxes paid divided by before tax profits for each bank, obtained from Bankscope.

Deposit Insurance

Deposit insurance dummy - takes the value one if there is an explicit deposit insurance scheme in place and zero otherwise. Compiled from Kyei (1995) and Talley and Mas (1990).

Financial Structure

Bank/gdp - total assets of the deposit money banks divided by GDP. Obtained from IMF, International Financial Statistics. Bank is the summation of IFS lines 22a through 22f.

Mcap/gdp - stock market capitalization divided by GDP. Stock market data are from IFC's Emerging Market Data Base.

Mcap/bank - stock market capitalization divided by total assets of the deposit money banks. Sources of the components are given above.

No. of banks - number of banks with complete data in a given year in the BankScope data base.

Concentration - the ratio of largest three bank assets to total banking assets in a given year, obtained from the Bank scope data base.

Total assets ($) - total assets of each bank in a given year in US$, obtained from the Bankscope data base.

Legal and Institutional Indicators

Contract enforcement index - produced by Business Environmental Risk Intelligence (BERI), this index measures the "relative degree to which contractual agreements are honored and complications presented by language and mentality differences." It is scored 1-4, with higher scores for greater enforceability.

law & order index - produced by International Country Risk rating agency, this index reflects the degree to which the citizens of a country are willing to accept the established institutions to make and implement laws and adjudicate disputes. It is scored 0-6 with higher scores indicating sound political institutions and a strong court system. Lower scores indicate a tradition of depending on physical force or illegal means to settle claims.

corruption index - produced by International Country Risk rating agency, this index reflects the degree of corruption in government. It is scored 0-6. Lower scores indicate "high government officials are likely to demand special payments" and "illegal payments are generally expected throughout lower levels of government" in the form of "bribes connected with import and exports licences, exchange controls, tax assessment, police protection, or loans."