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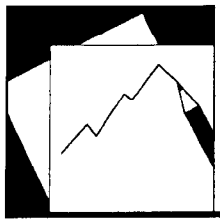

IMF Working Paper

Bank Consolidation, Internationalization, and Conglomeration: Trends and Implications for Financial Risk

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Bank Consolidation, Internationalization, and Conglomeration: Trends and Implications for Financial Risk

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Abstract

This paper documents global trends in bank activity, consolidation, internationalization, and financial firm conglomeration, and explores the extent to which financial firm risk and systemic risk potential in banking are related to consolidation and conglomeration. We find that while there is a substantial upward trend in conglomeration globally, consolidation and internationalization exhibit uneven patterns across world regions. Trends in consolidation and conglomeration indicate increased risk profiles for large, conglomerate financial firms, and higher levels of systemic risk potential for more concentrated banking systems. We outline research directions aimed at explaining why bank consolidation and conglomeration do not necessarily yield either safer financial firms or more resilient banking systems.

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Contents Page

Text Tables

Figures

Appendices

I. Introduction and Summary

Recent studies have documented a trend toward bank consolidation, internationalization, and conglomeration for several industrialized and emerging market countries.[2] Consolidation is resulting in more concentrated banking systems, composed of a smaller number of larger firms. Internationalization is evidenced by the increasing numbers of banks and other financial institutions that operate across national borders. Conglomeration is resulting in a larger number of financial groups whose activities combine those of bank and nonbank financial firms. In these studies, as well in the literature reviewed below, the interplay between financial firm risk, systemic risk, and these trends have been analyzed quantitatively only for a limited set of countries and financial institutions within a country.

This paper contributes to the existing literature in two ways. First, it presents novel evidence of trends in bank activity, consolidation, and internationalization, as well as conglomeration in financial firms (banks, insurance companies, and other nonbank institutions) globally, that is for a set of countries substantially larger than that examined in previous work. Second, it documents the extent to which financial firm risk and systemic risk potential in banking are related to some dimensions of consolidation and conglomeration. This is accomplished by addressing the following questions. Do large financial firms exhibit higher levels of risk than smaller firms? Does financial risk differ between conglomerate and nonconglomerate firms? Is the systemic risk potential in a banking system related to consolidation?

The remainder of this paper is organized in three sections. Section II documents worldwide trends in bank activity, bank consolidation, and internationalization with data on more than 100 countries, whose total banking system assets account for about 98 percent of total assets of the banking systems of IMF members. In addition, conglomeration in financial firms (banks, insurance companies, and other nonbank institutions) is documented for a sample of the largest 500 firms in 1995 and 2000. The main findings of this section can be summarized as follows:

- In the 1995–2000 period, asset growth at banks in developed countries was mainly funded with wholesale deposit or nondeposit liabilities. This may indicate an increase in funding risk in these countries, owing to the higher volatility of these funding sources relative to retail deposits. By contrast, assets growth in major emerging countries shows a greater reliance on more stable retail deposits, indicating a reduction in funding risk in all these countries.

- On average, there appears to be an increase in concentration of banking markets worldwide. Yet, consolidation between 1995 and 2000 presents uneven patterns across the world, with countries witnessing increases as well as decreases in their three-firm and five-firm concentration ratios. The data indicate clustering of

[2]See Group of Ten (2001), Bank for International Settlements (2001), and IMF (2001).

consolidation in particular regions and/or countries, rather then global convergence in banking system structures.

- Internationalization exhibits uneven patterns across world regions. It has increased significantly in the United States, in several countries of Western Europe and in some non-Asian emerging markets. But internationalization has been fairly limited, if not decreasing, in other regions.

- There is a substantial upward trend in conglomeration globally. Such a trend is a feature of regions of the world where conglomeration has been historically allowed in various degrees by existing regulation, such as Western Europe, as well as of countries, such as the United States and Japan, where restriction on permissible activities of intermediaries have been lifted only recently. The evidence on large financial institutions worldwide indicates remarkable increases in conglomeration in some emerging market countries.

Section III is organized in two parts. The first part reviews the likely effects of consolidation, internationalization, and conglomeration trends on the incentives for individual financial firms to take on risk, and presents evidence on the net effects of these trends on financial firms' risk-taking, extending previous work by De Nicoló (2000). The second part defines systemic risk potential, reviews the likely effects of consolidation, internationalization, and conglomeration on systemic risk potential, and presents evidence regarding the cross-country relationship between systemic risk potential and consolidation, along the lines of previous work by De Nicoló and Kwast (2002). The main findings of this section can be summarized as follows:

- Large firms undertaking a wide scope of activities did *not* exhibit levels of risk lower than smaller and specialized firms in 1995. On the contrary, they exhibited level of risk-taking *higher* than smaller and specialized financial firms in 2000. This result suggests that the factors creating incentives for firms to take on more risk, including moral-hazard-induced incentives, appear to have outweighed the risk reductions potentially achievable through scale or scope economies, as well as through geographic or product diversification.

- Systemic risk potential in banking, as measured by an indicator of joint risk-taking of systemically important banks in each country, did *not* decrease with banking system concentration across countries. On the contrary, we find that highly concentrated banking systems exhibited levels of systemic risk potential higher than less concentrated systems during the 1993–2000 period, and this relationship has strengthened during the 1997–2000 period. This result suggests that consolidation may have the potential of increasing the incentives for financial firms to take on correlated risks, thereby reducing banking systems' diversification.

Section IV concludes by discussing some directions for research suggested by our findings.

II. Consolidation, Internalization, and Conglomeration Trends

This section documents trends in bank activity, consolidation, and internationalization in the commercial banking industry. Banking continues to play a central role in all countries' financial systems. Indeed, among the 500 largest financial firms in the world as of end-2000, 362 were bank-led, accounting for about 74 percent of the 500 largest firms' total assets. Furthermore, it documents financial firm conglomeration among the largest financial firms worldwide.[3]

A. Consolidation

Overview

The Group of Ten (2001) study (G-10 hereafter) analyzed consolidation in the financial sectors of 12 countries (the G-10 countries plus Spain and Australia). It noted the high level of merger and acquisition (M&A) activity in the 1990s among financial firms in the thirteen countries. M&A activity increased during the decade with considerable activity during 1997–99.[4] Most M&As involved firms competing in the same segment of the financial services industry and the same country. Acquisitions of banking firms accounted for 60 percent of all financial mergers and 70 percent of the value of those mergers. The G-10 study also found that the number of banking firms decreased in almost every country during the decade. The decrease in numbers of banks coincided with an increase in industry concentration, as measured by the percentage of a country's deposits controlled by the largest banks.

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[3]A detailed analysis of the linkages between trends in banking, nonbanking intermediaries, and securities markets across a large cross-section of countries is outside the scope of this paper. Increased integration between banks, insurers, and financial funds are discussed in Van den Berghe, Verweire, and Carchon (1999). Global developments of institutional investors are documented in Impavido, Musalem, and Tressel (2001, 2002). Global equity market developments are documented by Claessens, Klingebiel, and Shmuckler (2002).

[4]This was true for mergers in all industries (see e.g., Andrade, Mitchell, and Stafford (2001)). For example, general M&A activity in the United States and in the U.S. commercial banking industry reached historic highs between 1998 and 2000. In discussions of banking consolidation, there is a large literature on the U.S. depository industry where numbers of institutions have shrunk dramatically since 1980. The American thrift and credit cooperative industries experienced thousands of institutional failures as well as considerable merger consolidation. Interestingly, the American commercial banking industry, which suffered record failures during the last half of the 1980s and record mergers of healthy institutions, also experienced record entry by newly formed (de novo) banks in the 1990s. Much of the consolidation of the healthy portion of the American commercial banking industry was intra-firm consolidation of banking organizations' multiple bank subsidiaries.

According to the results of a survey reported in the G-10 study, the primary motivation for consolidation of the financial services industry was cost savings and revenue enhancements. The study concluded, however, that the driving forces encouraging consolidation have been improvements in information technology, financial deregulation, globalization (of both financial and real sectors), and increased shareholder pressure for financial performance. In discussing consolidation in emerging market countries, the studies by the Bank for International Settlements (2001) (BIS hereafter) and the IMF (2001) identified two other factors contributing to consolidation: banking crises and the privatization of state-owned banks.

During the 1980s and 1990s, many countries experienced some difficulties in their banking or financial sectors.[5] In many of these difficulties and crises substantial portions of the banking and depository industry sectors became economically insolvent. In some countries failed institutions merged with other institutions; in other cases failed institutions were recapitalized with government assistance or nationalized. Some of the move toward privatization of state-owned banks comes from countries in Eastern Europe and the former Soviet Union. Other countries as well have found that state-owned enterprises often are less efficient in terms of both operation and credit allocation. The privatization of state-owned banks—and the nationalization of failed private banks, with subsequent privatization—in many countries constitutes a restructuring of the banking industry, usually directed by the government.

As noted, the evidence reported in recent studies has been limited to major developed and emerging market economies. The remainder of this section is structured in two parts. The first part documents aspects of growth of banking activity in the world. The second part documents consolidation worldwide, as captured by recent changes in measures of banking system concentration.

Evidence on growth in banking (deposit-taking institutions)

Assets of deposit money banks grew by almost 50 percent between 1995 and 2000 (see Table 1).[6] This was more than twice the growth in GDP during the same period. Deposits at

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[5]Some of these difficulties were serious financial crises which in some cases emanated from their banking or financial sectors, and in others from circumstances more external to the banking or financial sector (such as currency crises and external debt crises), and some were a combination of these factors (see Lindgren et al. (1999)).

[6]Assets of the world's deposit money banks grew from SDR 21 trillion at year-end 1995 to over SDR 31 trillion by year-end 2000. Deposit money banks are depository institutions such as commercial banks, savings banks, cooperative societies, and other institutions accepting deposit accounts. Data are from *International Financial Statistics* and cover 169 of the IMF's 184 member countries. Assets at deposit money banks are constructed through summing reserves, foreign assets, and claims on central government, subnational governments,

deposit money banks grew by about 34 percent, which means that a substantial portion of assets growth was funded by nondeposit liabilities. More than 87 percent of deposit money bank assets are with institutions in OECD countries—two-thirds in G-7 countries alone. Between year-end 1995 and year-end 2000, assets grew by about 45 percent in industrialized countries. This growth far outpaced the 23 percent growth in GDP during the same period. This may reflect increasing reliance on deposit money bank financing, or, since assets include foreign claims, it may reflect increased internationalization of banking activity.

Table 1. Financial Assets of Deposit Money Banks, 1995 and 2000

Country Group	Number of Countries	Assets as Percent of Total		Assets as a Percent of GDP	
		1995	2000	1995	2000
OECD	29	87.8	87.2	121.5	148.1
G-7	7	69.1	67.1	118.0	139.1
G-10	11	76.8	74.9	122.7	147.4
Emerging markets	48	11.2	11.4	105.2	130.0
Other developing	92	1.1	1.4	68.0	78.3
Total	169	100.0	100.0	118.4	143.8

Source: *International Financial Statistics*.

Table 1 also shows the distribution of deposit bank assets among 169 countries and the relationship of assets to GDP for countries classified by Standard & Poor's (S&P) as emerging market countries.[7] Deposit money banks in emerging market countries hold about 11 percent of the world's deposit money bank assets. For both 1995 and 2000, the banking system asset to GDP ratio increases as GDP increases according to averages of country groupings. Growth in assets at deposit money banks in industrialized countries was less than

nonfinancial public enterprises, private sectors, other banking institutions, and nonbank financial institutions.

[7]S&P does not include Singapore—which is included in the country organization in Table 1—as an emerging market country; S&P also includes Taiwan Province of China as an emerging market country, but it is not a Fund member; Mexico, the Czech Republic, Greece, Hungary, Poland, Portugal, and Turkey are considered by S&P as emerging market countries, but are included with OECD countries in Table 1.

for emerging market countries. Emerging market countries saw assets grow more than 50 percent at their deposit money banks between year-end 1995 and year-end 2000. Other developing countries, with about 1.5 percent of the world's deposit money bank assets, saw the highest growth in financial assets. From year-end 1995 to year-end 2000, assets almost doubled.

Table 2 shows the distribution of deposits among 106 countries for which data are available. For all groups of countries, the deposit to GDP ratio increased between 1995 and 2000. As shown in Table 3, industrialized countries saw deposits grow at rates more modest than assets, while other developing countries had asset and deposit growth at similar rates. By contrast, emerging market countries had deposit growth that exceeded asset growth (deposits represented about half of assets in 1995, but about two-thirds of assets in 2000).

Table 2. Deposits and GDP for 106 Countries for 1995 and 2000

Country Group	Number of Countries	Demand, Savings, Time & Foreign Currency		Total Deposits as a Percent of GDP	
		Percent of Total			
		1995	2000	1995	2000
G-7	7	28.7	28.2	63.4	65.7
G-10	11	31.2	30.3	64.4	67.0
OECD	29	35.3	34.7	63.1	66.3
Emerging market countries	37	4.2	6.0	52.5	78.2
Other developing countries	41	0.5	0.8	45.5	50.2

Source: *International Financial Statistics*.

In sum, the data reveal notable shifts in the worldwide composition of bank funding. The types of deposits contained in the *IFS* data may be characterized as retail. They do not appear to include, at least for certain countries, wholesale deposits. This is useful when evaluating the difference between assets and deposit growth. Asset growth exceeding deposit growth (with deposits defined as in *IFS*) means growth was funded with wholesale deposit or nondeposit liabilities. Both of these funding categories are considered less stable sources of funding than retail funds. On the other hand, the faster growth of deposits to assets in major emerging market countries shows a greater reliance on more fundamental retail deposits. This may indicate a reduction in funding risk in all these countries.

Table 3. Percentage Change in Assets, Deposits, and GDP, 1995 and 2000

Country Group	Assets	Deposits	GDP
G-7	48.0	27.1	22.8
G-10	44.7	26.0	21.1
OECD	45.4	27.5	21.5
Emerging market countries	52.7	82.4	23.6
Other developing countries	104.9	96.3	78.0

Source: *International Financial Statistics*.

Evidence on banking industry concentration

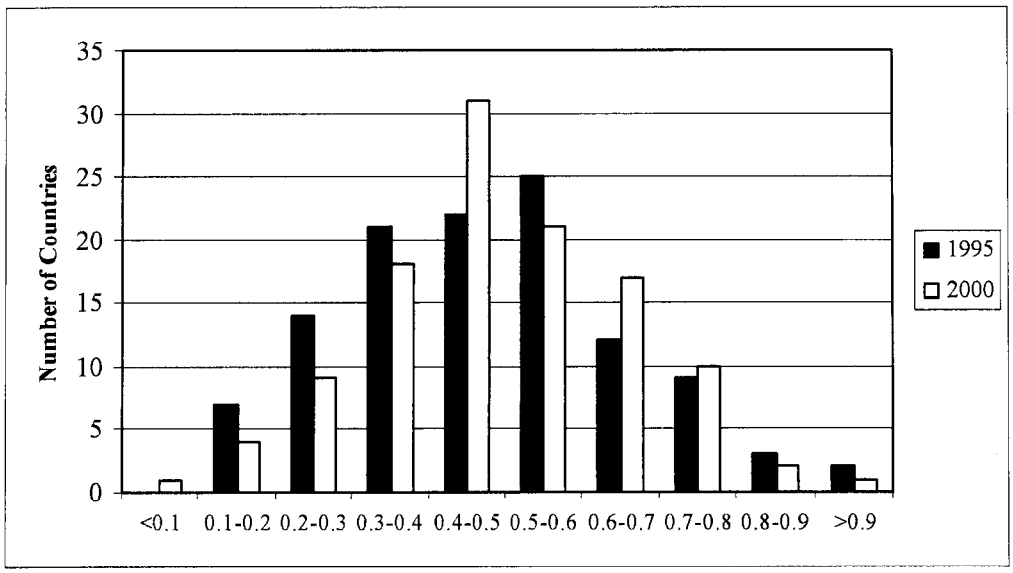
A standard measure of consolidation focuses on concentration. Measuring concentration in banking and financial services is difficult, since it is difficult to measure the productive activity of banks and other financial institutions. Though imperfect, holdings of assets and deposits are typically used to construct measures of concentration. Typically, the share of the largest institutions of assets or deposits is constructed as one measure of concentration. An increase in a concentration ratio is indicative of an increase of consolidation. A decrease in such a ratio can be the result of either entry of new banks or consolidation concentrated among smaller firms, or both.

Using data from several sources, three-firm and five-firm concentration ratios were constructed for 115 and 95 countries, respectively.[8] For 2000, the mean three-firm

[8]IFS, OECD, and Fitch-IBCA databases were used to construct information on Fund member countries' banking (or depository institution) industries. Data were collected on total deposits and total assets from the IFS data set, since there is a good time series of consistently collected data, and the Fitch/IBCA data base does not report all institutions in a country. Deposits and assets of the three and five largest institutions were collected from the Fitch/IBCA data base. In constructing three- and five-firm concentration ratios, however, it was ascertained that deposit data from the two data bases are incompatible—IFS data typically show domestic placements while Fitch/IBCA data show total deposit holdings for the institutions regardless of where the deposits are held. It was therefore decided to use concentration ratios based on assets. Yet, it was found that in some countries assets of all relevant institutions reported in the Fitch/IBCA set far exceeded the assets reported for deposit money banks in IFS in about 25 percent of the countries considered. Therefore, for those countries with substantial discrepancies, a base of total assets was constructed using the Fitch/IBCA data base. For some countries, disaggregated data could not be obtained for as many as five banks.

concentration ratio of the 115 countries was 49 percent. This was higher than the 47 percent average in 1995. Three-firm concentration ratios in 1995 and 2000 ranged from 15 percent to over 90 percent (Figure 1). Yet, shifts in three-firm concentration ratios during the 1995–2000 period appear uneven: 56 out of 115 countries recorded a decrease in their three-firm concentration ratios, while the remaining countries exhibited an increase in these ratios.

Figure 1. Distribution of Three-Firm Concentration Ratios, 1995 and 2000



The distribution of five-firm concentration ratios indicates higher shares controlled by the five largest banks in a country. The mean five-firm concentration ratio in 1995 was 57 percent. This increased slightly to 60 percent in 2000. Examination of the distribution of five-firm concentration ratios suggests a shift from low concentration ratios to higher concentration ratios more pronounced than that exhibited by three-firm concentration ratios (see Figure 2). However, heterogeneity in consolidation across countries emerge, since 39 out of 95 countries recorded a decrease in five-firm concentration ratios.

Average three-firm and five-firm concentration ratios are shown for 1995 and 2000 by geographic regions in Table 4, and by GDP per capita in Table 5. Except for Africa and Central Asia, average three-firm and five-firms concentration ratios increased between 1995 and 2000. However, consolidation exhibits uneven patterns within world regions. In most regions, the number of countries in which concentration increased is only slightly larger than the number of countries in which concentration declined.[9] Consolidation exhibits uneven

[9]Three-firm concentration ratios decreased in 9 countries out of 20 in Western Europe, in 7 countries out of 17 in Eastern Europe, in 8 countries out of 20 in Latin America, in 17 countries out of 23 in Africa, and in 4 countries out 11 in East Asia. Similar patterns are found for five-firm concentration ratios. They decreased in 7 countries out of 20 in Western

patterns also when ranked by GDP per capita: both three-firm and five-firm ratios have increased on average in all countries but the poorest.

Figure 2. Distribution of Five-Firm Concentration Ratios, 1995 and 2000

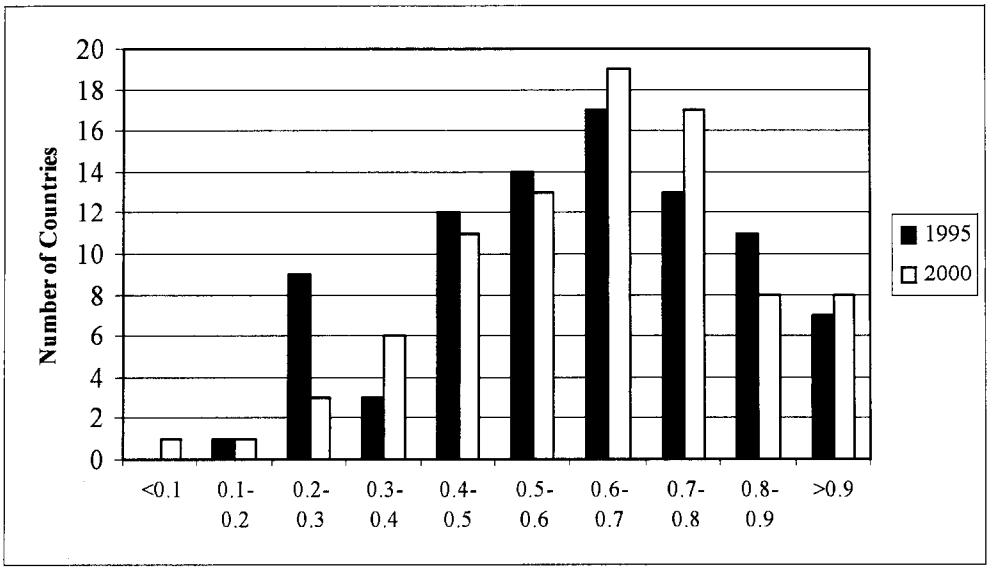


Table 4. Asset Concentration Ratios, 1995 and 2000

Region	Average Three-Firm Asset Concentration Ratio (in percent)			Average Five-Firm Asset Concentration Ratio (in percent)		
	Number of Countries	2000	1995	Number of Countries	2000	1995
All countries	115	49	48	95	60	57
North America	2	37	34	2	58	51
Western Europe	20	53	49	20	66	61
Eastern Europe	17	53	48	13	61	60
Latin America	20	45	43	19	60	54
Africa	23	49	56	10	48	56
Middle East	13	46	45	12	58	57
Central Asia	7	43	48	6	48	55
East Asia	11	48	41	11	61	53
Oceania	2	60	53	3	82	69

Europe, in 7 countries out of 13 in Eastern Europe, in 7 countries out of 19 in Latin America, in 7 countries out of 10 in Africa, and in 3 countries out 11 in East Asia.

Sources: *IFS*, Fitch-IBCA.

It may be concluded that, on average, there appears to be an increase in concentration of banking markets. However, changes in concentration among the 115 (or 95) countries are not uniform. That is, worldwide consolidation between 1995 and 2000 presents uneven patterns across the world. It has proceeded at a fast pace in several countries, such as in the United States, in many Western European countries, and in several Eastern European and Latin American countries, but has been either slow or negligible in many other countries. Concentration ratios actually *decreased* on average in Africa, Central Asia, and in several countries in other regions. These uneven patterns of consolidation are related to the level of countries' development. When concentration ratios are ranked by per capita GDP, they increased, on average, in all countries but the poorest. As a result of these uneven patterns, the world distribution of banking systems' concentration has slightly shifted up, but the dispersion of concentration in banking systems remains high. Thus, the evidence indicates clustering of consolidation in particular regions and/or countries, rather then global convergence in banking system structures.

Table 5. Asset Concentration Ratio by Per Capita GDP, 1995 and 2000

2000 per capita GDP Quartiles Per capita GDP = X In US$	Average Three-Firm Asset Concentration Ratio (in percent)			Average Five-Firm Asset Concentration Ratio (in percent)		
	Number of Countries	2000	1995	Number of Countries	2000	1995
X ≤ 907	29	46	56	24	56	62
907 < X ≤ 3,254	29	54	46	24	62	57
3,254 < X ≤ 12,243	29	54	50	24	69	61
12,243 < X	28	50	47	23	66	63

Sources: *IFS*, Fitch-IBCA.

B. Internationalization

Overview

In documenting global internationalization trends, Smith and Walter (1998) noted increases in cross-border M&A activity during the 1985–95 period, with about 15 percent of transactions involving acquisitions of financial institutions by banks in developed countries of partial stakes in some emerging markets. Berger et al. (2000) reported for the 1986–98 period substantial increases in European banks' intra-EU and international M&A transactions, while intranational M&A transactions, albeit slightly rising, where dwarfed by domestic transactions in the United States.

The G-10 study documented internationalization by considering cross-border M&A "majority transactions" in 13 developed countries for the 1990–99 period, defined as mergers and acquisition transactions in which the acquirer's ownership share of the target exceeded 50 percent as a result of a transaction.[10] Thus, the G-10 study's data focused on a restricted set of transactions, since it excluded partial acquisition transactions that do not result in majority ownership of one shareholder. The study noted that in all countries most of this M&A activity involved banking firms and that most transactions were domestic. Cross-border transactions were less frequent, although they had increased in number and value in recent years.

BIS (2001) discussed internationalization involving emerging markets by documenting increased entry of foreign banks in several major developing nations. The BIS study noted banking crises, deregulation, and reductions of foreign entry restrictions as major catalysts of the increased penetration of foreign banks in some emerging markets.[11] Foreign entry was shown to have been intense in Eastern Europe and in some Latin American countries, whereas it was comparatively lagging in Asia.

The incentive for financial firms to expand internationally depend on perceived profit opportunities relative to those available in domestic markets, as well as the regulatory environment of the host country. Berger et al. (2002) noted that the cross-border expansion of banks in the EU does not appear to have been as intense as it might be expected by the reduction of barriers to entry in many countries. Clearly, factors other than such barriers appear important in determining banks' choices to expand abroad. Focarelli and Pozzolo (2001) find that OECD banks take equity positions in foreign banks in countries with high expected real growth, inefficient and low-concentration domestic banking systems, and lax regulation. In addition, they document that the banks expanding abroad are large, profitable, and headquartered in developed countries. Buch and DeLong (2002), using a global database on cross-border M&As, find that banks operating in more regulated environments are less likely to be the targets of international bank mergers.

Evidence

We document global internationalization trends in banking using data on foreign bank ownership in 105 countries. Foreign bank ownership is measured by foreign-controlled assets, defined as the total assets of banks in which more than 50 percent of equity is owned by foreign entities. In addition to majority acquisitions, changes in foreign controlled assets

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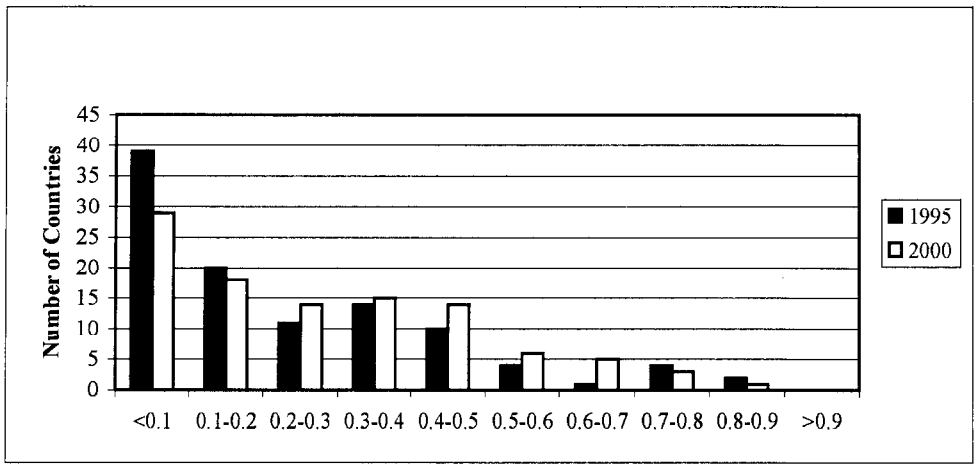
[10]Group of Ten (2001) adopted the definition used in the Securities Data Company database (see Data Annex A, p. 333).

[11]A significant positive relationship between foreign bank entry and banking crises in 15 emerging market countries is found by Mathieson and Roldos (2001).

include most, although not all, partial acquisitions of domestic banks by foreign banks.[12] Figures for foreign-controlled assets, both total and relative to the size of a country's banking system, are reported and compared for the years 1995 and 2000 by world region and by GDP per-capita (Figure 3 and Table 6).

In absolute terms, internationalization has increased remarkably worldwide. World foreign-controlled assets have almost doubled from 1995 to 2000, increasing from about 5 trillion dollars to more than 9 trillion dollars in 2000. The total foreign-controlled asset share, given by the ratio of foreign-controlled assets to total assets, has increased from 15 percent to 21 percent, while the mean foreign asset share, defined as the average of foreign asset ratios across countries, has increased from 23 percent in 1995 to 27 percent in 2000. A value of the mean share higher than the total share indicates that small banking systems exhibited a higher fraction of domestic assets under foreign control than large banking systems. Yet, as a percent of domestic assets, changes in internationalization are not uniform.

Figure 3. Distribution of Mean Foreign-Controlled Asset Ratios, 1995 and 2000



[12]In some instances our measure is likely to underestimate foreign presence in a country when such presence is embedded in the activities of foreign branches, since the numerator of our measure of foreign ownership only includes the largest foreign branches operating in a country.

Table 6. Foreign Bank Ownership, by Region and by Per Capita GDP

	1995				2000						
By Region (No. of countries)	Total Bank Assets (US$ Bil)	Foreign-Controlled Total Assets (US$ Bil)	Total Foreign Asset Share	Mean Foreign Asset Share	Total Bank Assets (US$ Bil)	Foreign-Controlled Total Assets (US$ Bil)	Total Foreign Asset Share	Mean Foreign Asset Share	***Change in Foreign Assets***	***Change in Foreign Asset Share***	***Change in Mean Foreign Asset Share***
All Countries (105)	33,530.0	5,044.0	15.0	23.0	43,670.0	9,121.0	21.0	27.0	4,077.0	6.0	4.0
North America (2)	4,467.0	454.0	10.0	8.0	6,764.0	1,321.0	20.0	13.0	867.0	10.0	5.0
Western Europe (19)	16,320.0	3,755.0	23.0	24.0	22,780.0	6,473.0	28.0	32.0	2,718.0	5.0	8.0
Eastern Europe (17)	319.0	80.0	25.0	21.0	449.0	133.0	30.0	35.0	53.0	5.0	14.0
Latin America (14)	591.0	108.0	18.0	14.0	781.0	312.0	40.0	27.0	204.0	22.0	13.0
Africa (25)	154.0	13.0	9.0	38.0	155.0	12.0	8.0	29.0	-1.0	-1.0	-9.0
Middle East (9)	625.0	85.0	13.0	14.0	864.0	141.0	16.0	16.0	56.0	3.0	2.0
Central Asia (4)	150.0		2.0	4.0	242.0	7.0	3.0	6.0	4.0	2.0	2.0
East Asia (11)	9,961.0	455.0	5.0	14.0	10,412.0	624.0	6.0	18.0	169.0	1.0	4.0
Oceania (2)	582.0	90.0	15.0	39.0	698.0	95.0	14.0	37.0	5.0	-1.0	-2.0
By 2000 per capita GDP = X in US$											
$X \leq 907$	1,174.0	19.0	2.0	29.0	2,216.0	21.0	1.0	23.0	2.0	-1.0	-6.0
$907 < X \leq 3,254$	680.0	51.0	8.0	18.0	796.0	106.0	7.0	13.0	55.0	-1.0	-5.0
$3,254 < X \leq 12,243$	1,385.0	330.0	24.0	21.0	1,807.0	626.0	35.0	31.0	296.0	9.0	10.0
$12,243 < X$	29,633.0	4,570.0	15.0	22.0	38,036.0	8,276.0	22.0	29.0	3,706.0	7.0	7.0

Sources: *IFS*, Fitch-IBCA.

Internationalization exhibits uneven patterns across world regions. Foreign-controlled assets have increased most in Western Europe. Table 6 indicates that the increase in Western European foreign-controlled assets accounts for about 67 percent of total world increase in foreign-controlled assets. The total foreign asset share has increased from 23 percent in 1995 to 28 percent in 2000, while the mean share has increased 14 percentage points. Consistent with the trends reported in Berger et al. (2000), our evidence indicates an advanced process of European integration and ownership consolidation through partial acquisitions, which is captured only to a limited extent by the data reported in the G-10 study.

The second largest increase in foreign ownership is recorded in the United States. As a percent of total domestic assets, foreign-controlled ownership in the United States increased from 8 percent in 1995 to a remarkable 22 percent in 2000, primarily due to the expansion of European banks in the United States. Although dwarfed in size by the increases in Western Europe and the United States, the other large increases of foreign-controlled assets are recorded in Latin America, East Asia, and Eastern Europe. In all other regions increases have been small or even negative, as in Africa. However, foreign-controlled assets as a percent of total assets have increased most in Latin America and Eastern Europe, followed by North America, and Western and Eastern Europe.

Internationalization exhibits uneven patterns also within world regions. As a percent of total domestic assets, foreign-controlled assets have increased significantly in some European countries (Austria, Ireland, Spain, Portugal, Germany, and the Nordic countries) but increases have been fairly small in others (e.g., the United Kingdom and Switzerland). They increased the most in the Eastern European countries where transition has proceeded at a fast pace, but they were negligible in other countries, such as Romania and Russia.

In Latin America, the marked increase of foreign-controlled ownership in Argentina and Mexico is primarily due to the aggressive entry strategies of the two largest Spanish banks. Substantial increases were also recorded in Uruguay and Venezuela. By contrast, foreign-controlled assets, both in total and relative to domestic banking systems, has increased much less, if not at all, in the remaining 10 Latin American countries. In Africa, the total foreign-controlled asset share has decreased in 19 out of 25 African countries, while it has increased in the remaining 6. Internationalization does not present remarkable differences among countries in the Middle East and Central Asian regions. By contrast, 8 out of 11 East Asian countries and areas exhibited negligible increases in the total foreign-controlled market share, with the exception of Hong Kong SAR, Korea, and Thailand.

As shown in Table 6, the phenomenon of internationalization is mainly polarized on medium- to high-income countries, likely owing to attractive risk-return investment opportunities for foreign banks in such countries. Internationalization has increased most in the group of richest and second richest countries, and has actually decreased among the poorest. Thus, internationalization has so far concentrated, with some notable Latin American and Eastern European exceptions, in the richest areas of the world. The data reveal that regional concentration, rather than globalization, characterize recent internationalization trends.

In sum, worldwide internationalization exhibits uneven patterns across regions, within regions, and across countries ranked by income levels. The share of foreign-controlled banking assets has increased significantly in the U.S., in several countries of Western Europe and in several non-Asian emerging markets. By contrast, increases in internationalization have been fairly limited in all other countries of world continents. Internationalization has actually *decreased* on average in Africa. Moreover, internationalization has increased on average in all countries but the poorest.[13] Quantitatively, it is internationalization in the U.S. and Europe that is the most striking feature of the internationalization trend in world banking industries. That is, regions and/or countries of the developed world currently represent the most interconnected cluster of national banking systems.

C. Conglomeration

Overview

Technology, which has lowered telecommunications and information costs, with deregulation as a permissive element, are the major environmental factors accounting for conglomeration in the industrialized countries. Globalization on the part of financial institutions' corporate clientele who demand a geographical and product-diverse mix of services is also cited. Company motives for conglomeration are less clear. The industry itself refers to revenue enhancement, resulting from product diversification and the ability to offer clientele one-stop shopping, and economies of scope in the production of financial services. However, the evidence for economies of scope is not clear-cut in banking, and seems confined to smaller specialty firms in the investment industry. Among asset management companies, there are benefits from cross-selling that may also exist in insurance.[14]

The discussion of conglomeration in emerging markets tends to be confined to banks. However, reasons cited for conglomeration in these markets are not dissimilar to those cited for industrialized countries, though the catalysts may differ. Governments responded to macroeconomic pressures and banking crises in the 1990s by deregulation which, together with higher capital requirements, threatened profits, and encouraged more competitive behavior (BIS, 2001, and IMF, 2001). The absence of a prohibition on universal banking allowed banks under these pressures to move away from traditional commercial banking in order to keep customers who, for example, began to save via securities, rather than deposits. Some countries also responded to the banking crises of the 1990s by legislation allowing banks to undertake a wider range of activities than hitherto possible. For example, privatized

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[13]Claessens and Lee (2002) report an increased in internationalization, as measured by the assets controlled by foreign banks as a fraction of total assets of banks operating in a given country, in a sample of 58 countries classified as low-income. The difference between theirs and our results mainly stems from their measurement of total bank assets, given by total assets reported by Bankscope, while we use measures of total bank assets based on IFS data.

[14]The literature on the conglomeration of financial firms is surveyed in Zephirin (2001).

pension systems in Latin America created synergies between asset management and insurance.

Evidence

We document conglomeration trends in large financial institutions worldwide by examining firm-level data for the largest financial firms. Conglomeration trends are documented by focusing on the following questions: (1) has conglomeration increased over time? (2) Are the trends in mature and emerging markets similar?

Our analysis is based on statistics on financial performance of the largest 500 financial institutions worldwide ranked by total assets in 2000 and in 1995, extracted from the Worldscope database. These institutions are classified as conglomerates and nonconglomerates using individual firm information on their major lines of business and/or main activities (for example, banking, insurance, securities investment). Any institution which has two or more activities is classified as a conglomerate. The goal is to assess whether conglomeration is on the rise by comparing the degree of conglomeration in 1995 and 2000, and to characterize the trends in financial conglomerates in industrialized and emerging market economies. A detailed data description (including sample selection criteria, methodology of classifications, main features, and some limitations of our sample) is provided in Appendix I.

Key features of our samples are summarized in Tables 7–9. Table 7 describes number and asset share of conglomerates in 1995 and 2000 for samples that include the original largest 500 firms selected, together with subsamples composed of the largest 250, 100, and 50 firms. Table 8 reports the same statistics presented for firms in countries, grouped according to regions. Finally, Table 9 presents similar statistics for financial firms, classified by major type (i.e., bank, insurance companies, and other financial institutions).

Conglomeration of financial institutions has increased between 1995 and 2000, both in terms of the proportion of conglomerate firms and of the proportion of assets held by conglomerates. The trend is upward for all four subsets (500, 250, 100, and 50) of the largest financial institutions and also for all regional groupings . In 2000, 60 percent of the largest 500 financial institutions were conglomerates, up from 42 percent in 1995.

As expected, the rate of financial conglomeration increases with the size (in terms of total assets) of financial institutions in both 1995 and 2000. In 2000, in the largest 50 institutions, 92 percent are conglomerates (holding about 94 percent of total assets), whereas in the top 500 institutions only 60 percent are conglomerates (with 80 percent of total assets), and that pattern also holds for the intermediate subsamples—the largest 100 and 250 financial institutions. In 1995, the proportion of financial conglomeration is 88 percent among the top 50 institutions (with 89 percent of total assets), and only 42 percent in the top 500 financial institutions (holding 72 percent of assets), and again this pattern holds in the subsamples.

Table 7. Financial Conglomeration by Asset Size [1/]

(In percentage)

Sample	1995					2000				
	Asset Size (Billions of US$)			Conglomerates (%)		Asset Size (Billions of US$)			Conglomerates (%)	
	Highest	Lowest	Average	Number	Assets	Highest	Lowest	Average	Number	Assets
Global List										
Top 500 Financial Institutions	590.29	8.80	299.55	41.8	72.1	1,281.4	11.1	646.3	59.6	80.1
Top 250 Financial Institutions	590.29	31.28	310.79	69.2	80.7	1,281.4	34.1	657.7	72.2	83.6
Top 100 Financial Institutions	590.29	90.45	340.37	85.0	86.8	1,281.4	116.5	699.0	89.0	91.7
Top 50 Financial Institutions	590.29	169.14	379.72	88.0	89.4	1,281.4	257.5	769.5	92.0	94.2

Sources: Worldscope.

1/ Based on a sample of top 500 financial institutions ranked by total assets, in billions of U.S. dollars.

Table 8. Summary Statistics of Financial Conglomeration, 1995 and 2000 1/

Country	No. of Institutions	Total Assets	No. of Cong.	TA of Cong.	No. of NCong.	TA of NCong.	% of Cong.	% of Cong. Asset
				1995				
United States	102	5,327.0	43	4,185.7	59	1141.3	42.0	78.6
Canada	18	883.7	11	772.6	7	111.0	61.0	87.4
Japan	127	10,012.2	9	4,410.0	118	5602.3	7.0	44.0
Australia	9	449.4	6	367.8	3	81.7	66.0	81.8
Subtotal	256	16,672.3	69	9,736.1	187	6936	27.0	58.4
Western Europe	201	15,634.1	124	13,983.3	77	1650.75	61.7	89.4
Latin America	5	179.6	2	116.0	3	63.64	40.0	64.6
Asia	32	971.4	10	302.6	22	668.79	31.3	31.2
Africa	6	144.1	4	79.6	2	64.48	66.0	55.3
Total	500	33,601.4	209	24,217.5	291	9,383.89	41.8	72.1
Memo Item								
Industrialized Countries	462	32,479.0	196	23,827.1	266	8,651.76	42.4	73.4
Emerging Market Countries	38	1,122.5	13	390.4	25	732.13	34.2	34.8
				2000				
United States	109	9,624.0	67	7,028.3	42	2,595.6	61.5	73.0
Canada	14	1,221.3	10	1,093.9	4	127.4	71.4	89.6
Japan	119	9,327.3	25	5,348.9	94	3,978.4	21.0	57.3
Australia	9	670.1	9	670.1	0	0.0	100.0	100.0
Subtotal	251	20,842.7	111	14,141.3	140	6,701.4	44.2	67.8
Western Europe	162	22,437.0	119	20,552.7	43	1,884.3	73.5	91.6
Eastern Europe	4	61.8	4	61.8	0	0	100.0	100.0
Latin America	16	453.7	15	436.9	1	16.8	93.8	96.3
Asia	51	1,784.5	33	1,220.9	18	563.6	64.7	68.4
Africa and Middle East	16	456.2	16	456.2	0	0.0	100.0	100.0
Total	500	46,035.9	298	36,869.7	202	9,166.2	59.6	80.1
Memo Item								
Industrialized Countries	420	43,528.0	236	34,929.9	184	8,598.1	56.2	80.2
Emerging Market Countries	80	2,507.9	62	1,939.8	18	568.1	77.5	77.3

Sources: Worldscope.

1/ Based on a sample of top 500 financial institutions ranked by total assets, in billions of U.S. dollars.

Table 9. Financial Conglomeration by Classifications of Institutions, 1995 and 2000 1/

Industry Type 2/	1995				2000			
	Total Institutions		Total Assets		Total Institutions		Total Assets	
	Number	Percentage	Billions of US$	Percentage	Number	Percentage	Billions of US$	Percentage
Banks	360	72.0	26,063.1	77.6	360	72.0	34,273.1	74.4
Of which:								
Conglomerates	156	43.3	19,585.9	75.1	243	67.5	29,640.4	86.5
Nonconglomerates	204	56.7	6,477.2	24.9	117	32.5	4,632.7	13.5
Insurance companies	108	21.6	5,691.9	16.9	94	18.8	8,518.4	18.5
Of which:								
Conglomerates	40	37.0	3,469.7	61.0	40	42.6	5,604.0	65.8
Nonconglomerates	68	63.0	2,222.2	39.0	54	57.4	2,914.4	34.2
Other financial institutions 3/	32	6.4	1,846.4	5.5	46	9.2	3,244.4	7.0
Of which:								
Conglomerates	13	40.6	1,161.9	62.9	15	32.6	1,625.2	50.1
Nonconglomerates	19	59.4	684.5	37.1	31	67.4	1,619.1	49.9
Total	500	100.0	33,601.4	100.0	500.0	100.0	46,035.9	**100.0**

Sources: Worldscope database.

1/ Based on a sample of top 500 financial institutions ranked by total assets, in billions of U.S. dollars.

2/ Classifications of financial institutions are based on the description provided by Worldscope database.

3/ Includes securities companies, finance companies, real estate and mortgage credit institutions, leasing companies, and others.

Banks' predominance in the financial industry is illustrated by the predominance of firms listed as banks; however, in both years, 28 percent of the sample consisted of nonbank financial institutions. Banks also have a greater tendency to diversify their activities compared to insurance companies and other financial institutions. Between 1995 and 2000, the proportion of conglomerates in the banking industry[15] (holding 75 and 87 percent of total banking assets, respectively, in 1995 and 2000) increased from 43 to 68 percent, whereas, the proportion of conglomerates among insurance companies (with 61 and 66 percent of total assets in 1995 and 2000, respectively) only increased from 37 to 43 percent in the same period. The proportion of nonconglomerates is also high among other financial institutions, where the percentage of conglomeration in fact declined from 41 percent in 1995 to 33 percent in 2000.

In terms of the number of financial institutions, U.S., European, and Japanese firms dominate our sample in both 1995 and 2000, and both contribute positively to the upward trend in conglomeration. In 2000, 62 percent of the largest U.S. firms were conglomerates, compared to 42 percent in 1995. In Japan, the percentage of conglomerate financial institutions has increased from 7 percent in 1995 to 21 percent in 2000. Australia and Canada also exhibit substantial growth in financial conglomeration between 1995 and 2000. In these four industrial countries, which in total account for more than half of the financial institutions in both the 1995 and 2000 samples, 44 percent of the top financial institutions (with 68 percent of assets) were conglomerates in 2000, compared to 27 percent (with 58 percent of assets) in 1995.

In Western Europe (where France, Germany, Italy, and the United Kingdom dominate in terms of the number of financial institutions) 74 percent of the largest financial institutions were conglomerates in 2000, compared to 62 percent in 1995; in Asia, the proportion of financial conglomeration has increased to 65 percent in 2000 from 31 percent in 1995. Similar comparisons of conglomeration in Eastern Europe, Latin America, Africa, and the Middle East are not feasible due to lack of data or limited sample in 1995.

In general, industrialized countries dominate our sample of the largest 500 financial institutions in terms of both number of institutions and asset size. In 1995, only 38 institutions are from the emerging market countries. The economies represented are Brazil, Greece, Korea, Malaysia, South Africa, Taiwan Province of China, and Thailand. However, in 2000, because of the substantial growth in asset size of the largest financial institutions in emerging market economies (in Eastern Europe, Asia, Latin America, and Middle East) they can be included in the sample. As a result, the total number of institutions from industrialized countries fell from 462 in 1995 to 420 in 2000.

Industrialized countries have a higher portion of conglomerates than the emerging market economies in 1995—42 percent of the institutions (holding about 73 percent of assets) from the former are conglomerates, whereas only 34 percent of emerging market institutions (with only 35 percent of assets) are conglomerates. In 2000, however, the situation is reversed: 56 percent of the institutions from industrialized countries are conglomerates (with 80 percent of total assets), whereas emerging markets are up to about 76 percent of conglomerates (holding about

[15]The industry here reflects the sectoral attribution in the Worldscope database, even though the companies referred to operate in more than one sector.

77 percent of assets). This higher proportion of conglomerates among the 2000 emerging market institutions compared to 1995 may however, reflect the fact that relatively few emerging market institutions are large enough to enter our sample of the largest 500 financial institutions in 1995. Some of these have been formed relatively recently in order to expand beyond banking, as is indicated in the case of one Argentinean institution. In many other cases, however, conglomeration emerges clearly as a long-term feature of the market.

Overall, the evidence indicates a substantial upward trend in conglomeration globally. Such a trend is a feature of regions where conglomeration has been historically allowed in various degrees by existing regulation, such as Western Europe, as well as of countries, such as the U United States and Japan, where restrictions on permissible activities of intermediaries have been lifted only recently. This trend is also a feature of many emerging market countries, where remarkable increases in conglomeration have recently been recorded.

III. Implications for Financial Risk

A. Risk of Individual Financial Firms

Overview

In discussing the incentives for financial firms to take on risk, it is important to stress the distinction between the new *opportunities* that consolidation, internationalization, and conglomeration may allow firms to exploit, and the *choices* firms actually take under these new opportunities. Firms' choices translate into *outcomes* that are not simply related to these new opportunities. For example, the diversification opportunities possibly arising from either consolidation, internationalization, or conglomeration may allow a banking firm to pursue riskier investments aimed at increasing profitability. This may result either in a larger or a smaller profitability when adjusted for risk, depending on the way the bank adjusts its portfolios of exposures following a domestic merger, a foreign acquisition, or the acquisition of a nonbank intermediary. Financial firm choices may also result in either a smaller or a larger probability of failure, depending on the extent to which a firm's increase in risk-taking is counterbalanced by a choice of a larger capital.[16]

While the effects of consolidation on the efficiency of financial institutions have been the subject of a vast literature, evidence on the effects of consolidation on financial firms' risk-taking have been more limited.[17] Consolidation may provide differential incentives for financial firms' risk-taking, ceteris paribus. On the one hand, a larger size attained through consolidation may allow a financial firm to increase its resilience to shocks by attaining higher profits through the exploitation of scale economies, as well as a lower variability of profits due

[16]As pointed out by Winton (1999), diversification may actually increase risk if loan monitoring is reduced. Haubrich (1998) discusses in detail the relationships between bank risk, probability of failure, the size of the liability of a deposit insurance agency and bank diversification.

[17]See Amel et al. (2002), Group of Ten (2001), and Berger et al. (1999) for recent reviews.

to enhanced diversification opportunities. On the other hand, scale economies are not unlimited owing to the more complex and costly management of large firms; very large banks may become too big to fail, to liquidate, or to discipline effectively, with the attendant increase in moral hazard; reduction in competition may provide disincentives for firms to improve efficiency; and a highly concentrated industry may capture regulators and/or influence governments. All these factors may give incentives for larger financial firms to take on more risk.

Few studies present either direct or indirect evidence on consolidation and financial firms' risk, mainly for developed economies.[18] The evidence based on 1990s' data suggests that scale economies, if they exist, do not result in higher bank profitability, and that "super" large banks are no more efficient and no less risky than large or medium-sized banks. De Nicoló (2000) considers a large sample of banks in 21 industrialized countries for the 1988–98 period. He finds that, with the exception of small U.S. bank holding companies, large banks exhibit higher values of proxy measures of probability of failure than smaller banks. Beitel and Schierek (2001) detect a recent shift in value creation of consolidation in European banking markets: European acquiring banks involved in large M&A transactions have recorded significant negative cumulative returns since 1998, and cross-border transactions appear to be value destroying. Using detailed loan information for a sample of Italian banks, Acharya, Hasan, and Saunders (2002) find that diversification of bank assets does not translate into superior performance and/or greater safety for banks.

Internationalization may allow economies of scale to spread and favor financial firms' geographic diversification, thereby reducing the risk profile of those firms that expand internationally.[19] Yet, the possible capture of the highest credit quality customers by foreign institutions may leave domestic financial firms to serve a higher proportion of domestic higher credit risk customers, thereby worsening risk profiles. In addition, protected domestic institutions, such as state-owned banks, may respond to increased foreign competition by venturing into higher risk areas to maintain their franchise value. To date, we are not aware of

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[18]Studies of the U.S. banking industry in the 1980s and early 1990s found mixed evidence. Boyd and Graham (1991) and Boyd and Gertler (1994), in discussing consolidation in the U.S. banking industry, emphasized incentive effects leading to higher risk-seeking of large banks. In considering a sample of U.S. bank mergers between 1981 and 1986, Benston Hunter and Wall (1995) found some evidence that risk diversification could be a motive for bank acquisitions. Craig and Santos (1997) compared pre- and post-merger risk of a sample of bank mergers of U.S. bank holding companies and found higher post-merger profitability and lower post-merger risk. However, Boyd and Graham (1998) found evidence of higher risk-seeking and failure rates for large banks for the 1990s. More recently, Cebesoyan and Strahan (2002) find that increasingly sophisticated loan management practices by U.S. banks, usually associated with the expansion of size and scope of their activities, do not reduce bank risk.

[19]While Crystal, Dages, and Goldberg (2001) provide some indirect evidence of this for several Latin American countries, Amihud, DeLong, and Saunderes (2002) find no significant changes in risk for acquirers in cross-border mergers.

any study that has explicitly analyzed the effects of internationalization on financial firms' risk-taking.[20]

A number of studies have discussed the effects of conglomeration on financial firms' profitability and efficiency.[21] Yet, analyses of the risk implications of conglomeration have been more limited. As in the case of consolidation and internationalization, conglomeration may induce differential incentives for financial firms' risk taking. On the one hand, conglomeration may result in scope efficiencies and product diversification, which may reduce firms' risk profiles. On the other hand, conglomeration could result in an extension of the safety net to nonbank financial firms if banking and nonbanking activities are not effectively ring-fenced, with attendant increases in moral hazard. In addition, conglomeration makes supervision more difficult.[22]

Few studies have analyzed the relationship between conglomeration and risk-taking for developed economies, and we are aware of no study that has focused on developing economies. Lown et al. (2000), extending Boyd, Graham and Hewittt's (1993) analysis to data for the 1990s, simulate cross-industry mergers among the largest U.S. bank holding companies and nonbank financial institutions and insurance companies. They find that consolidation of life insurance companies and bank holding companies reduce risk as measured by both the variance-covariance of returns and the probability of bankruptcy. However, mergers with securities, property, and casualty insurance companies may increase risk modestly. The advantages of bank-life mergers are attributed to banks' ability to benefit from their customer networks and economies of scope in selling life insurance products. Whalen (2000) obtains similar results by using risk-return data of U.S. banks that sold insurance abroad during the 1990s, attributing the result to the benefits of diversification. Dinenis and Nerullah (2000) find potential risk reductions associated with hypothetical mergers between large European banks and insurance brokerage. However, it should be observed that these studies assume that the investment and risk-taking choices of potential conglomerates are simply the (weighted) average of the existing

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[20]However, the result that the increasing presence of foreign banks is associated with a reduction of domestic banks' profitability presented by Claessens, Demirguc, and Huizinga (2001) does not bode well for lower levels of risk at domestic banks facing increased foreign competition.

[21]See, for example, Cumming and Hirtle (2001), Mishkin (1999) and Edwards (1998) and Amel et al. (2002).

[22]Other risks associated with conglomeration have been identified. The risk faced by the conglomerate as a whole can be larger than the sum of the risks of each component unit, due to the fact that the volatility of one unit of a conglomerate may be affected by the actions of another unit (see Cumming and Hirtle, 2001). Zeckhauser (2001) also points out that as size and complexity grow, firms may no longer understand their internal risk, or realize the extent to which their own actions may influence market prices. The difficulties of harmonizing risk-management systems adopted by managers in the context of bankinsurance (bancassurance) conglomeration have been emphasized by Strahan (2000) and Davies (2000).

units. Rather than measuring the actual effects of conglomeration, these studies document profit and diversification *opportunities* of conglomeration, or lack thereof.

Evidence

We gauge the effects of consolidation and conglomeration on financial firm risk by addressing the following two questions: Do large financial firms exhibit higher levels of risk-taking than smaller firms? Does financial firms' risk-taking differ between conglomerate and nonconglomerate firms? A negative answer to the first question would suggest that consolidation is likely to reduce financial firms' risk profiles. The finding of higher risk-taking for nonconglomerate firms would suggest that the benefits of scope diversification are translated in lower risk outcomes.

We focus on the net effects of consolidation. If the exploitation of economies of scale and scope and diversification benefits from larger sizes are the primary objective of financial firms' investment strategies, then larger firms should be less risky than smaller firms. If, instead, firms' investment strategies exploit such benefits to take on more risk either because of "too-big-to-fail" risk taking incentives or because of regulatory capture and managerial incentives, then larger banks might exhibit a higher risk profiles. The net effects of these factors should be reflected in the sign of correlations between measures of risk and size across firms. For example, evidence of no effect of consolidation on banks' risk taking could be an indication that the effect of the factors that potentially pull bank's risk profiles in opposite directions actually cancel out.

Similar considerations apply to the net effects of conglomeration. If product diversification and scope efficiencies arising from conglomeration are a primary concern of financial firms' investment strategies, then conglomerates should be less risky than nonconglomerate firms. If, instead, financial firms' investment strategies exploit such benefits to take on more risk, then conglomerates might exhibit higher risk profiles. For example, evidence of a lower risk profile of conglomerates as compared to nonconglomerates could be an indication that the factors that lead conglomerates to take on less risk dominate those that push up banks' risk profiles.

The foregoing net effects are gauged by simple measures of correlation between a proxy measure of a financial firm's risk-taking, size, and business mix. We take such measures for the 1995 and 2000 samples of the largest financial institutions worldwide described in Section II.C. Our proxy measure of financial firm's risk taking is given by an estimate of a firm's probability of failure, called Z-index.[23] This index combines in a single indicator: *profitability*,

[23]For a derivation of the Z-index, see De Nicoló (2000). The Z-index may underestimate the risk of failure for two reasons. First, it does not capture a sequence of negative realization, since it is a single period measure of risk. Second, the negative tail of the return distribution may not be well approximated by just the mean and standard deviation of the distribution. However, these problems might not represent a concern in comparisons of firms' Z-indexes at a point in time if the extent of the underestimation "error" is approximately uniform across firms.

given by a period average return on assets (ROA); *leverage*, given by the period average equity capital-to-asset ratio (K); and *return volatility*, given by the period standard deviation of returns on asset (S). Specifically, the Z-index is given by the ratio: (ROA+K)/S. It increases with profitability (ROA) and leverage (K), and decreases with return volatility (S). Thus, a larger value of the Z-index indicates a smaller risk profile for a financial firm.

The relationship between the Z-index, consolidation, and conglomeration is gauged by (a) (conditional) correlation coefficients between financial firms' Z-indexes and size; and (b) comparisons between mean Z-indexes of conglomerate and nonconglomerate firms. Since there is a high correlation between conglomeration and financial firm size, the separate computations in (a) and (b) may allow us to distinguish the effects of conglomeration from those due to consolidation. Table 10 provides information about the size of conglomerate and nonconglomerate firms in the 1995 and 2000 samples. Clearly, conglomerates were larger than nonconglomerates in both 1995 and 2000. In addition, differences in sizes of the two groups have increased greately, especially at very large sizes, from 1995 to 2000.

We also provide information regarding the cross-firm correlation between the components of the Z-index (profitability, leverage, and return volatility) and financial firm's size and business mix. This may allow to identify which components of the Z-index might have driven the cross-sectional relationship between the Z-index and firms' size and business mix. For each firm in the 1995 (2000) sample, profitability is computed as the average return on assets realized during the 1993–96 (1997–2000) period. The return on assets in a given year is the ratio of income net of taxes and provisions to average assets during that year. Capital ratios and the volatility of return on asset for the years 1995 and 2000 are computed similarly.

Table 10. Size Distribution Statistics of Conglomerates and Nonconglomerates
(Total assets, in billions of U.S. dollars)

Distributions	1995		2000	
	Conglomerates	Nonconglomerates	Conglomerates	Nonconglomerates
Number of firms	180	252	264	193
Maximum	590	306	1282	498
Median	71	20	40	28
Minimum	9	9	11	10

Source: Worldscope.

Simple statistics of the Z-index and its components classified by firm size and by whether or not a firm is a conglomerate provide a first indication of the cross-firm relationships of interest. Table 11 shows mean values of the Z-index and its components for the entire sample of the largest 500 financial firms classified as large (above the median) or small (below the median),

and as conglomerates and nonconglomerates, for the years 1995 and 2000. Looking at the 1995 statistics, we note that Z-indices do not appear to differ among firms with the exception of small conglomerates, which exhibit the lowest value. The ROA attained by conglomerates appears larger than that of nonconglomerates, while the equity capital-to-asset ratios of conglomerates are smaller than those of nonconglomerates. Interestingly, we note that ROA volatility of conglomerates is not smaller than that of nonconglomerates. By and large, the same relationships hold for the 2000 sample of firms, although changes in the mean values of the Z-index and its components occurred between 1995 and 2000.

The simple statistics reported in Table 11 do not account for the different macroeconomic and institutional environments in which firms operate, or for other firm-specific characteristics. Ideally, the net effects of consolidation and conglomeration on firm's risk-taking would be captured by correlations measured conditional on all other factors affecting financial firms' choice of return, risk, and capitalization. We partially control for these factors by computing conditional correlations estimated by means of simple linear regressions. The dependent variables are the Z-index and its components. The independent variables are country dummies, which capture different country averages; a conglomerate dummy, whose coefficient indicates the mean difference of the dependent variable between conglomerates and nonconglomerates; and firm size, where the coefficients associated with conglomerate and nonconglomerate sizes are allowed to differ. Table 12 summarizes the results of these regressions for the years 1995 and 2000. Note that differences in correlations obtained using 1995 and 2000 data embed effects due to mergers and acquisitions that occurred during the period, as well as the inclusion of a larger number of firms located in emerging markets, as detailed in Section II.C.

Table 11. Z-index, Return on Assets, Equity Capital to Asset Ratios, and Return Volatility

	Nonconglomerates		Conglomerates	
	Small	Large	Small	Large
	Assets ≤ Median	Asset ≥Median	Assets ≤Median	Asset ≥ Median
		1995		
Z-index	5.22	5.68	3.75	5.98
ROA	1.18	1.11	1.42	1.69
E/A (in percent)	6.43	5.37	5.80	5.31
ROA volatility	0.84	0.69	0.82	1.08
		2000		
Z-index	5.53	3.99	5.65	5.77
ROA	1.00	1.08	1.46	1.58
E/A (in percent)	8.65	7.53	7.95	7.29
ROA volatility	0.62	0.69	1.04	0.63

Source: Worldscope.

The 1995 regressions exhibit values of the Z-index that do not vary significantly with whether a firm is a conglomerate or not, or with firm size. Similar results are exhibited by the profitability

regressions. By contrast, leverage is both larger for conglomerates and for larger firms, while larger conglomerates exhibit a larger volatility of returns on assets. The 2000 regressions present a different picture. The Z-index of conglomerates is significantly lower than that of nonconglomerates. That is, conglomerates, which are larger firms on average, exhibit a higher level of risk-taking than nonconglomerates, which are smaller firms on average.

Similar results (not reported) are obtained for U.S., Japanese, and Western European firms separately. For the year 2000, consistent with the evidence reported in De Nicoló (2000), in the U.S. and Japan samples the Z-index of conglomerates is significantly lower than that of nonconglomerates. By contrast, the Z-index of conglomerates and nonconglomerates for the Western European sample does not differ significantly. Yet, European conglomerates record lower ROAs and capital ratios but also a lower ROA volatility.

In sum, consolidation and conglomeration, as captured by both increases in firms' size and firms' expansion of the scope of their activities, were *not* associated with lower levels of financial firms' risk-taking at the largest 500 financial firms worldwide in 1995. By contrast, we find that larger and conglomerate firms exhibited levels of risk-taking *higher* than smaller and specialized financial firms in 2000. In particular, larger and conglomerate firms did not attain levels of profitability significantly higher that smaller and more specialized firms. Moreover, larger firms with a wider scope of activities were more leveraged and did not attain a lower volatility of returns than smaller and specialized financial firms. Overall, this evidence suggests that the factors creating incentives for firms to take on more risk appear to have offset the risk reductions potentially achievable through scale or scope economies, as well as through geographic or product diversification.[24]

Table 12. Regression Results on Risk, Conglomeration, and Size 1/

	Z-index	ROA	Equity/Asset	ROA Std. Dev.
1995				
Conglomerate dummy	0.28	0.08	**-1.57	-0.22
	(0.37)	(0.38)	(-2.66)	(-1.09)
NC Asset	0.05	0.11	*-0.54	0.26
	(0.04)	(0.69)	(-1.74)	(1.17)
C Asset	-0.37	0.07	0.20	**0.13
	(-1.11)	(0.05)	(1.14)	(2.21)
R2	0.07	0.23	0.24	0.93
No. of firms	432	432	432	432

[24]Our results are also consistent with work by Stiroh (2002) and Staikouras, Wood, and Denney (2002), who provide evidence for U.S. and European banks unsupportive of the conventional wisdom that fee-based (noninterest) earnings are less volatile than loan-based (interest) earnings, and that fee-based earnings reduce bank risk through diversification.

	Z-index	ROA	Equity/Asset	ROA Std. Dev.
2000				
Conglomerate dummy	**-1.53	**-0.38	**-3.49	-0.18
	(-2.08)	(-2.16)	(-3.20)	(-0.31)
NC Asset	-0.66	0.38	-0.27	0.08
	(-1.12)	(0.27)	(-0.42)	(0.66)
C Asset	-0.03	0.06	0.07	0.01
	(-0.23)	(1.27)	(0.29)	(0.41)
R2	0.40	0.55	0.28	0.75
No. of firms	457	457	457	457

1/ All variables are averaged over the period 1993–96 for the 1995 regressions, and over the period 1997-2000 for the 2000 regressions. The independent variables of the regressions are country dummies (coefficients are not reported), a dummy variable equal to 1 if a firm is a conglomerate (Conglomerate dummy), total assets for nonconglomerate firms, NC Asset (Total asset x dummy =1 if the firm is a nonconglomerate, = 0 if not), and total assets for conglomerate firms, C Asset (Total asset x dummy =1 if the firm is a conglomerate, = 0 if not). Coefficient of NC Asset and C Asset are multiplied by 100. Estimates are OLS. Standard errors are adjusted for heteroskedasticity. T-statistics are reported in parentheses. ** and * indicate significance levels at the 5 percent and 10 percent levels, respectively.

B. Systemic Risk Potential

Overview

Systemic risk in banking and financial markets has received greater attention recently, as witnessed by the increasing number of theoretical as well as empirical analyses of systemic risk.[25] It is useful to think of financial firms as being exposed to shocks that originate in the real sector, in financial markets, and within the financial industry. Any shock induces *impact* and *transmission* effects. The *width* of a shock can be defined as the fraction of firms and/or markets simultaneously hit at impact. The *depth* of a shock can be defined as the fraction of firms and/or markets hit by the shock *subsequent* to impact, i.e., the intensity of its transmission. A systemic risk event can be defined as a shock whose width and depth are large enough to severely impair the allocation of resources and the existing risk-sharing mechanisms through a financial system. If the banking crises that occurred in many countries in the last three decades are classified as systemic risk events, recent research leaves no doubt about the severity with which they have impaired the real allocations of the economies involved (see Boyd, Kwak, and Smith (2001) and Hoggarth and Saporta (2001).

As pointed out by De Nicoló and Kwast (2002), at the heart of the notion of systemic risk lies the notion of firms' interdependencies. The size and strength of a financial institution's

[25]See Summer (2002) and De Bandt and Hartmann (2000) for recent surveys. An earlier discussion is in Bartholomew (1998).

interdependencies with other financial institutions are key determinants of the depth and width of a shock and its potential to become systemic. Interdependencies can either be direct or indirect. Direct interdependencies arise from interfirm on- and off-balance sheet exposures, such as exposures arising from interbank loans in the interbank market, from counterparty credit exposures on derivatives, as well as from payment and settlement relationships. Indirect interdependencies arise from exposures to the same or similar assets, such as potential losses caused to several institutions through loan concentrations to the same industry, or otherwise highly correlated portfolios. Thus, systemic risk *potential* in a financial system can be defined as the likelihood of the occurrence of systemic risk events. It is determined by firms' interdependencies, whose size and strength directly impacts on the extent to which firms take on correlated exposures.

As for the case of individual firms' risk-taking choices, consolidation may entail differential effects on systemic risk potential. On the one hand consolidation, in increasing the proportion of larger firms in the industry, may increase systemic risk potential through a "size effect." The failure of a large firm makes both width and depth of a shock larger than those induced by a failure of a small firm. An increasing overall level of moral hazard may also result in higher systemic risk potential, owing to a larger proportion of firms that potentially become too big to fail, to unwind in an orderly manner, or to discipline. On the other hand, a smaller number of firms in the industry might allow intermediaries to carry out a peer monitoring function more effectively owing to their better knowledge of counterparties obtained through closer relationships, thereby reducing systemic risk potential.[26] Systemic risk potential may also decrease if financial firms become more transparent to markets and regulators as a consequence of consolidation, since larger financial firms might have more incentives to use cutting-edge internal risk management and control systems as a result of enhanced monitoring of their risks by markets and regulators.

Through consolidation financial firms can increase diversification of their investments on a stand-alone basis. Yet, in so doing correlated exposures among firms may increase. Thus, an important distinction to be made is that between diversification at an *individual firm* level and diversification of a *financial system*. Indirect interdependencies are the mechanism through which it is possible for individual firms to have become more diversified, while systemic risk potential may have increased for important segments of the financial system. For example, consolidation may increase systemic risk potential if large financial firms expand their activities by concentrating their investments in the same sectors and/or countries, thereby increasing their correlated exposures.

The increased scope of financial firms' activities, both cross-country (internationalization) and across business lines (conglomeration), may lead to an increase of systemic risk potential, since a larger fraction of financial firms in a financial system may become more "complex" to manage, and their interdependencies more difficult to monitor. It is important to note that the notion of "complexity" of a financial firm is operationally useful when understood *relative* to the market and institutional infrastructure in which such firms operate. For instance, a large

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[26]See, e.g., Rochet and Tirole (1996).

traditional intermediary operating within an underdeveloped institutional infrastructure may indeed be very "complex" to monitor. Thus, the implications of "complexity" for systemic risk potential are not only confined to firms engaged in sophisticated financial activities.

Although internationalization may allow the spread of economies of scale and favor financial firms' geographic diversification, contagion effects can be magnified in the case of difficulties of financial firms operating in several jurisdictions. As pointed out by Group of Ten (2001) and Berger et al. (2000), an assessment of the direction of the possible effects of consolidation on systemic risk potential is complicated in the context of cross-border financial consolidation, due to uncertainties regarding the jurisdiction of national safety net and coordination problems across regulators. Through conglomeration, the protection of the safety net and the relevant implicit subsidies might be extended to sectors of the financial industry previously uncovered, increasing moral hazard problems with possible adverse consequences on systemic risk potential, if banking and nonbanking activities of the same financial firm are imperfectly ring-fenced.

Conglomeration could pose new risks with implications for systemic risk potential[27]. For example, the systemic risk potential presented by investment banks comes from counterparty exposure to market risk and liquidity risk, as well as from the banks' trades in derivative instruments and the large value of their transactions. Insurance, however, has been viewed as presenting little systemic risk because insurance company liabilities are long-lived and illiquid (unlike bank deposits) and contagious insolvency is seen as a threat only in the context of large intragroup exposures among connected companies. Shocks with large width, such as catastrophic risks, may however be a source of new risks since, not only may a very large section of the industry be simultaneously affected, but also investment banks' entry into derivative instruments linked to catastrophic event realizations could be a source of new exposures.

Furthermore, conglomeration may increase systemic risk potential through enhanced opacity of firms' operations to retail customers. It is sometimes presumed that the risk characteristics of different financial companies can be treated separately, as implicitly assumed, for example by regulatory requirements requiring diverse financial groups to maintain legal firewalls between different segments. However, reputational considerations in a conglomerate may mean that these risks have become correlated, even in the presence of firewalls. Retail customers may not be clear about the differences between companies within a group; difficulties at an insurance company could then induce liquidity difficulties at the group's bank, as customers seek to protect their deposits. Conglomeration may therefore create "run" contagion; as a corollary, the deposit protection afforded deposits may be assumed to extend to other businesses in the group, widening the moral hazard range. The potential for such reputational contagion is increased by the cross selling that makes conglomeration attractive.

Analyses of systemic risk potential in banking have been limited so far to industrialized countries. De Nicoló and Kwast (2002) used estimates of stock return correlations among

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[27] For a detailed discussion, see Zephirin (2001).

U.S. large and complex banking organizations (LCBOs) as measures of firms' total interdependencies. An increase in such correlations was interpreted as a signal of increased correlated exposures across banking firms, i.e., as an increase in systemic risk potential. They found that that (a) the systemic risk potential for the U.S. LCBOs increased during the 1990s and that (b) such increase was related to consolidation among LCBOs during the middle of the decade, while the strength of this relationship weakened during the last years of the decade. Using measures of systemic risk potential germane to those used by De Nicoló and Kwast, Schuler (2002) documents systemic risk potential among the 60 largest European banks in the last 15 years. He finds evidence that interdependencies among large European banks have increased and that the potential for systemic risk has shifted from a national level to a European level. Yet, Shuler's study does not explicitly consider whether consolidation and measures of systemic risk potential are related.

Evidence

We document the relationship between consolidation and systemic risk potential in a large set of countries by means of measures of correlation between a proxy of systemic risk potential and the measures of concentration described in Section II.A. Our proxy measure of systemic risk potential in banking is given by the Z-index of the *aggregate* (i.e., consolidated accounts) of the largest five banking firms in each country.[28] This measure proxies the joint probability of failure of the largest five banks in each country. It can be also viewed as a proxy of a hypothetical bank whose assets, earnings, and equity capital are the relevant asset-weighted sums across the largest five firms. This measure is consistent with the foregoing definition of systemic risk potential based on the strength of total interdependencies among systemically important institutions. It embeds asset-weighted earning's correlations among the largest (systemically important) banking firms. For example, the Z-index of five banks whose returns are perfectly positively correlated is smaller (indicating greater systemic risk potential) than the Z-index of five banks identical in all respects to the original five except that their returns are independent.

Z-indices were computed using consolidated accounting data for the largest five surviving banks operating in each country between 1993 and 2000. For each country with available data we took the largest five surviving banks in 1995 and computed the components of the Z-index using 1993-96 data, namely average return on assets, equity capital to asset ratio, and volatility of returns on assets. We did the same for the largest five surviving banks in 2000 using 1997-2000 data. Finally, we constructed the Z-index for the largest five surviving banks for the entire 1993–2000 period using the relevant components in each subperiod.

The cross-country relationship between systemic risk potential and consolidation is gauged by (conditional) correlation coefficients between our proxy of systemic risk potential and bank concentration measures. Table 14 presents cross-country correlations between the five largest

[28]Differing from De Nicoló and Kwast (2002), the measure of systemic risk potential we use is based on accounting data, as opposed to stock market data.

banks' Z-indices, its components and bank concentration ratios for the 1993–2000 period. The Z-index is negatively correlated with bank concentration in both years, although the correlation is (weakly) significant only in two instances. Yet, these correlations are measured independently of the different macroeconomic and institutional environments in which firms operate. They are also measured independently of government intervention, such as bank recapitalizations, restructuring and bailouts, that have occurred during the many episodes of extreme banking distress witnessed by several countries during the period considered. Ideally, the net effects of consolidation on systemic risk potential would be captured by correlations measured conditional on all other factors affecting the choices of return, risk, and capitalization of the largest five banks in each country. The finding of a positive conditional correlation between the Z-index for the five largest banks and measures of bank concentration would be suggestive of lower systemic risk potential on net.

We compute conditional correlations between our measure of systemic risk potential, the five largest banks' Z-index, bank concentration, and various control variables by means of simple linear regressions estimated for two time period, 1993–2000 and 1997–2000. In these regressions, the dependent variable is the Z-index. The independent variable of interest is bank concentration, as measured by the five-firm concentration ratio. We include regional dummies to control for regional differences in the Z-index arising from different volatility in the macroeconomic environment; and control for differences in real growth and inflation by

Table 13. Cross-Country Correlations between Risk and Concentration Indicators, 1993–2000

	Number of countries	Z-index	ROA	Equity/Asset	ROA Std. Dev.
1995					
C5	89	-0.09	-0.12	-0.13	0.09
C3	104	*-0.15	-0.11	-0.12	0.13
2000					
C5	89	*-0.18	-0.10	-0.19	-0.01
C3	104	-0.07	-0.07	-0.14	-0.01

including real GDP growth and inflation, as measured by the annual percentage change in the GDP deflator.

Accounting for government intervention to prevent or resolve banking distress at systemically important banks is necessary, since unobserved as well as observed government intervention would likely occur as a response to high levels of systemic risk potential. In addition, these interventions might be more frequent in banking systems where the systemic importance of banks, as captured by their market share, is higher. Yet, these interventions could lower measured systemic risk potential when the measurement period includes both periods in which government did, and did not intervened. On the one hand, controlling accurately for government intervention aimed at prevention of failures of systemically important banks is difficult, since some of these actions, as well as their timing, may be imperfectly observed. However, government intervention has been observed in all episodes classified by a large literature as

banking "distress" or banking "crises."[29] Thus, we constructed a "government intervention" dummy variable taking the value of unity in all cases in which a government intervened at any time during the measurement period to resolve banking distress at systemically important banks, and zero otherwise. This variable is constructed on the basis of the classifications and dating of four studies, as reported in Bank of England (2000), updated for the more recent years with publicly available information.

Table 14 report results for three regression specifications, estimated for the 1993–2000 and the 1997–2000 periods. The first regression includes all countries in the sample (full sample) with no control for government intervention, the second controls for government intervention, while the third includes only countries with no observed government intervention (no-government intervention sample). The coefficient of bank concentration in the regression of the Z-index of the largest five surviving banks is *negative* and significant in all regressions except the first, where government intervention is not controlled for. Moreover, the coefficient associated with the bank concentration variable increases in absolute value when we consider regressions for the most recent years[30]. Thus, systemic risk potential was *positively* and significantly associated with bank concentration, and this positive relationship appears to have strengthened in recent years. Thus, there is lack of evidence that more "consolidated" banking systems exhibit lower systemic risk potential.

In sum, our evidence suggests that systemic risk potential in banking, as measured by an indicator of joint risk-taking of the five largest banks in each country, does *not* decrease with banking system concentration across countries. On the contrary, we found evidence that high concentration of a banking system, as measured by a five-firm concentration ratio, was associated with higher levels of systemic risk potential, and such relationship has not become weaker through time. These findings are consistent with the results for risk at individual financial institutions previously described. Thus, consolidation appears to be associated with incentives for financial firms to take on correlated risks, thereby reducing banking systems' diversification.

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[29] While the existing qualitative classifications of banking crises and distress track the dating of observed government interventions well, their measurement of crises as *systemic risk realizations*, through classification and dating using binary variables, is by construction very sensitive to the classification criterion used. We are aware of no study that has examined the variations in binary measures of occurrences and dating of banking crises according to different classification criterions.

[30] The same results (unreported) are obtained when the five-firm concentration ratio is replaced by the three-firm concentration ratio. Using the three-firm concentration ratio allows to expand the 1993–2000 (1997–2000) "full sample" from 89 (97) countries to 104 (107) countries.

Table 14. Regressions of Largest Five-Firm Z-Indexes on Five-Firm Concentration Ratios

	Full sample 1993-2000	Full sample 1993-2000	No Gov. Intervention sample 1993-2000	Full sample 1997-2000	Full sample 1997-2000	No Gov. Intervention sample 1997-2000
Constant	**5.02	**5.93	**6.34	**7.70	**7.77	**8.34
	(5.71)	(6.84)	(6.38)	(5.17)	(5.19)	(4.84)
Latin America	**-2.16	**-1.96	**-1.91	**-1.17	-1.52	-0.86
	(-2.88)	(-2.86)	(-2.17)	(-1.71)	(-1.18)	(-0.59)
Eastern Europe	**-3.45	**-3.45	**-4.03	**-3.82	**-3.28	**-3.37
	(-4.93)	(-5.03)	(-4.56)	(-3.79)	(-3.36)	(-3.17)
Asia	**-2.98	**-2.50	**-2.70	**-4.38	**-3.37	**-3.29
	(-4.63)	(-4.38)	(-3.06)	(-4.71)	(-3.65)	(-2.98)
Africa	**-1.50	**-1.84	**-2.18	2.31	2.16	2.19
	(-2.01)	(-2.50)	(-2.68)	(1.09)	(1.02)	(1.03)
Middle East	0.58	0.21	0.01	1.37	1.50	1.91
	(0.79)	(0.29)	(0.01)	(1.01)	(1.22)	(1.48)
Real GDP Growth	**0.01	**0.01	0.01	0.01	-0.01	-0.01
	(2.02)	(2.11)	(1.49)	(0.58)	(0.07)	(-0.91)
Inflation	-0.55	0.03	0.09	-1.08	-1.24	-1.06
	(-0.53)	(0.04)	(0.08)	(-0.71)	(-0.94)	(-0.71)
Gov. Intervention		**-1.72			**-1.67	
		(-4.83)			(-3.12)	
C5	-0.015	**-0.023	**-0.026	*-0.034	**-0.034	*-0.036
	(-1.24)	(-2.03)	(-1.96)	(-1.82)	(-2.01)	(-1.76)
R2	0.44	0.52	0.43	0.34	0.35	0.27
R2C	0.38	0.47	0.35	0.28	0.29	0.19
Countries	89	89	66	97	97	83

1/ All variables are averaged over the relevant period. The independent variables of the regressions include: a constant, five regional dummies (Latin America, Eastern Europe, Asia, Africa, and the Middle East), real GDP growth (RGDP Growth), average annual percent change in the GDP deflator (Inflation), a government intervention dummy (Gov. Intervention), and the five-firm concentration ratio (C5). Estimates are OLS where standard errors are adjusted for heteroskedasticity. T-stats are reported in parentheses, and ** and * indicate significance at 5 percent and 10 percent confidence levels, respectively.

IV. Conclusions

This paper has provided new evidence on trends in bank activity, consolidation, internationalization, and conglomeration, and has documented aspects of the relationship of these trends with financial risk. We believe that our global perspective provides a richer ground for research aimed at rationalizing growth and evolution of financial industry structure. Importantly, this paper complements the few existing studies that have focused on a quantitative assessment of the risk implications of structural trends in the financial industry.

We draw the following four main conclusions from our findings. First, while increased market funding by banks in developed countries may entail greater market discipline and transparency, it can also result in increased funding risk due to more volatile funding sources. This feature of

growth in bank intermediation we have documented has not received much attention to date. Research aimed at gauging the relative strength of these countervailing effects on bank financial risk promises to be useful.

Second, the heterogeneity in developments of banking industry structure across countries we have documented needs explanation. Our finding of divergent patterns of our measures of consolidation and internationalization between rich and poor countries poses the question of whether such developments are indicative of institutional impediments to the adoption of best intermediation technologies in poor countries, or different industry structures are consistent with financial system development. More generally, an important research question is which kinds of modifications to theories that appear successful in explaining certain types of merger waves in nonfinancial sectors, such as those recently proposed by Jovanovic and Rousseau (2002, 2003), are needed to rationalize the heterogeneity in the evolution of banking system structures across countries we have documented.

Third, our finding that larger banks and more complex, conglomerate financial firms exhibit higher levels of risk than their smaller, less complex, specialized financial firms suggests that rationalizations of structural trends in the financial industry based on technological innovation and deregulation need to be complemented with more detailed analyses of bank managerial incentives to take on risk and to exploit the indirect subsidies provided by modern safety nets under different regulatory regimes. Indeed, recent U.S. research suggests that CEO compensation structures at banks may have been rewarding higher risk taking (see Harjoto and Mullineaux, 2003), and that corporate governance in banks may be a key ingredient for successful consolidation (see Brown, Dittmar and Servaes, 2003).

Finally, our finding that higher banking system concentration appears to be associated with higher levels of systemic risk potential indicates the fruitfulness of research aimed at assessing the resilience to shocks of financial *systems,* as opposed to individual financial institutions, and the need to derive measurement and testable implications for systemic risk from theories of financial industry structure.

DATA ON CONGLOMERATION

The empirical analysis of conglomeration is based on selected financial data of the top 500 financial institutions worldwide ranked by total assets in 2000 and in 1995 (constructed from the Worldscope database). The institutions were classified as conglomerates and nonconglomerates using the business descriptions in Worldscope that sketch major lines of business or the main activities (for example, banking , insurance, securities investment) for each institution listed.

The database was constructed using the following selection criteria:

- The largest 500 financial institutions in the Worldscope database, with ranking determined by total assets in 1995 and 2000, measured in billions of U.S. dollars.

- Only privately owned financial institutions, which are presumed motivated by profit, are analyzed; government-owned financial institutions with conglomerate structures, and providing commercial financial services to the private sector are quite prevalent. We will list these, but do not include them in the main comparative database, because the motives for conglomeration are likely to be public sector. Central banks and development-type state-owned financial institutions are excluded.

- A financial institution is classified as a conglomerate if its lines of business include at least two of the following activities: (a) banking; (b) insurance; and (c) securities. While this criterion is relatively simple, the assignment of institutions based on the business descriptions in Worldscope required further judgment. In general, we have tried to be conservative—when in doubt, the institution was assigned to the "nonconglomerate" group. For example, asset management as a description of bank activity was judged insufficient to consider a commercial bank as a conglomerate. Trust business in Japan was a particular issue because the existence of specialized trust banks is unique to Japan. Trust banks were not considered conglomerate institutions, nor was trust business by commercial banks judged sufficient to warrant them being classified as conglomerates. On the other hand, investment banks, or insurance companies, which have entered the credit card business are classified as conglomerate institutions since credit card issue is a typical retail banking activity.

- To compare conglomeration trends between developed and emerging market countries we divide the 1995 and 2000 samples into the two categories. As expected, the proportion of mature economies in the sample of large institutions is much larger than the proportion of emerging market economies in terms of both number and asset size. For example, in the largest 500 financial institutions in 2000 only 80 are from the emerging market countries. The corresponding figure in 1995 is only 38 institutions. The cutoff point (lower limit of asset size) in 2000 was US$11 billion.

- As a result of the relative paucity of the emerging market data in Worldscope (see the description of data limitations below), the Worldscope-sourced data were

supplemented from the Bankscope database, The Banker, adding banks with assets in the set of "> US$11 billion." Unfortunately, Bankscope does not include nonbank financial institutions, such as insurance companies, security firms, and holding companies.

- Since Bankscope does not include the business descriptions available in Worldscope, the classification of this supplemental data by conglomerate status is done through web searches.

The data set has certain limitations:

- Annual data sets are not fully comparable, since the names (and number) of financial institutions may vary from year to year. Previous studies using this database commented on this problem of an unbalanced dataset. It could result from company mergers and acquisitions, since Worldscope typically de-lists merged companies within two years of the acquisition date.

- The Worldscope database coverage is limited to publicly listed companies.

- Information available in the Worldscope database is based on data obtained from primary source documents, such as annual and interim reports of the institutions and other sources directly attributable to company officers. If such information is unavailable for an institution, that institution may be omitted from the Worldscope database.

Financial institutions in the sample were described by their main line of business as: (i) banks (majority); (ii) insurance companies; (iii) securities companies; (iv) finance companies; (v) mortgage institutions; (vi) leasing companies; and (viii) real estate and property management companies. In general, the latter were often removed from the data set, because their financial intermediation activity was very limited.

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