

BUSINESS MODELS OF INTERNATIONAL BANKS IN THE WAKE OF THE 2007-2009  
GLOBAL FINANCIAL CRISIS

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## BUSINESS MODELS OF INTERNATIONAL BANKS IN THE WAKE OF THE 2007-2009 GLOBAL FINANCIAL CRISIS

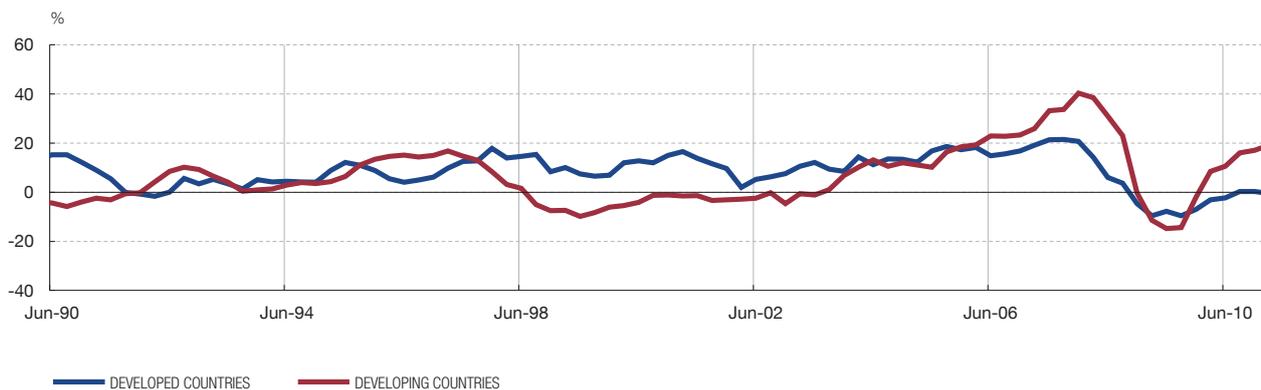
This study provides an analysis of developments in the business models of large internationally operating banks over the period 2006-2010. The investigation focuses on a sub-group (peer group) of the largest internationally active banks in the world (10 institutions out of a wider group of 22), which allows for an in-depth comparison of their business models, balance sheet structures and performance. Our findings support the view that commercial banking oriented business models proved more resilient during and in the aftermath of the global financial crisis (2007-2009) due to their relatively modest exposures to trading and derivatives activities, their greater reliance on stable sources of funding and larger diversity of business lines.

Regarding perspectives for the future, the regulatory environment is the key challenge for banks' business models in the years ahead of us. The evidence shown through the article strongly suggests that regulation should take into account its business model. On this issue, the article briefly discusses how some characteristics intrinsically linked to the business models have been taken into account in several recent important regulatory initiatives such as those that address the systemic and moral hazard risks associated with large financial institutions and those aimed at isolating or ring fencing retail banking vis-à-vis investment banking.

### 1 Introduction

The internationalisation of the banking industry has intensified during the past few decades, both in terms of cross-border capital flows and cross-border entry in banking sectors overseas. As shown in Chart 1, international banking exposures grew at average annual rates above 10% since the mid nineties and up to the start of the financial crisis in the advanced economies, and gathered strength in emerging economies in the years up to the crisis (2003-2007). This process occurred in parallel with the globalisation of international trade and brought important benefits in terms of economic welfare across the globe [Goldberg (2009), CGFS (2010c)]. The rapid advance of international banking also had important repercussions for funding and liquidity management at the institutions involved, and resulted in a diverse range of practices across the spectrum ranging from centralised to decentralised banks [CGFS (2010b)]. All in all, international banking has been an important channel for allocating financial resources around the globe and by doing so has contributed significantly to supporting world economic growth and increasing the financial linkages between areas with excesses of savings and others with lack of them.

The rapid expansion of international banking was interrupted sharply by the 2007-2009 global financial crisis which saw important reductions in banks' international activities and exposures (Chart 1). The crisis has led to important restructurings of business models and international strategies of many globally oriented banks, often aided by unprecedented government support in the form of substantial capital injections, asset protection schemes and liability guarantees [Stolz and Wedow (2010)]. Moreover, cross-border bank linkages proved important transmission channels of the crisis, which predominately had its origin in the mature economies and their complex financial systems, to emerging market economies [Cetorelli and Goldberg (2011a)]. Hence, the high degree of interconnectedness of the global banking system, established over the previous years through the interrelated processes of financial liberalisation, globalisation of trade and finance and financial innovation, contributed to spread the impact of the financial crisis on domestic banking systems across the world [Lane and Milesi-Ferretti (2008)].



SOURCE: BIS.

NOTE: Exchange rate adjusted.

This article provides an analysis of developments in the business models of large internationally operating banks over the period 2006-2010, thus including the global financial crisis, which have seen important changes in the global banking landscape. The investigation focuses on a sub-group (*peer group*) of the largest internationally active banks in the world (10 institutions out of a wider group of 22), which allows for an in-depth comparison of their business models, balance sheet structures and performance.

The analysis distinguishes between four, relatively simplified and general business models for internationally operating banks: The specialised investment bank, the investment banking oriented diversified or universal bank, the commercial banking oriented diversified or universal bank and the specialised commercial bank (see Table 1).

Our findings support the view that commercial banking oriented business models proved more resilient than the specialised and diversified investment banking business models during and in the aftermath of the global financial crisis (2007-2009). In fact, the balance sheet structure of both the specialised commercial bank and commercial banking oriented universal bank models displayed relatively modest adjustments after 2008, while those of numerous banks adopting investment banking oriented business models changed relatively strongly, with significant relative reductions in securities markets activities, on the assets side, and in trading and derivatives exposures, on the liabilities side. This was compensated by relative increases in retail and wholesale lending activities, and in deposit financing. All in all, most investment banking oriented universal banks in our sample started to move towards the business model of the commercial banking oriented universal bank. In this process, international bank exposures in developed countries experienced a contraction and have not recovered previous rates of growth, in contrast with the remarkable rebound in developing economies – as Chart 1 suggests –.

The structure of the article is as follows. In Section 2 we provide an overview of the various business models of large global banking groups, which shows the large dispersion in the their activities – retail, wholesale commercial, investment banking and asset management – among banks. We also discuss recent trends in the size of banks and provide evidence of the significant increase in the concentration of international banks. The subsequent section focuses on the performance of the banks in the peer group, which reveals important differences in behaviour across countries as well as inside the same country. Section 4 investigates in depth the funding modes of several of the banks, which shows the existence

of strongly different funding structures between different business models. Moreover, the section highlights the differences in liquidity management of large globally active banks, which range between centralised and decentralised approaches. Finally, the last section presents our conclusions, including a discussion of the challenges and perspectives of international banking. The Annex shows different financial indicators for the group of the largest globally active banks.

## 2 Recent trends in global banks' business models and size

The international banking groups that dominate global banking are organized across a variety of business models, depending on historical and geographical characteristics, comparative advantages and strategic choices. A traditional separation, especially in the US industry, has been that between investment and commercial banks. Investment banking entails underwriting securities issuance for corporate and government clients, advice in mergers and acquisitions (M&A), sales and trading activities in financial markets (including securities lending activities) and asset management business, financed predominantly by wholesale funding, as investment banks as a rule have limited access to deposit funding.<sup>1</sup>

During the past decade, investment banks developed relatively new business lines such as proprietary trading, – which involved trading in financial markets with the firm's own funds –, and prime brokerage business, which entailed providing financial services, including clearing and settlement services and securities lending to professional investors such as hedge funds. By contrast, commercial banks in the US fund themselves largely through deposits and hence had access to the liquidity facilities of the Federal Reserve, while their business was concentrated on providing retail and wholesale lending to households and corporations. With the adoption of the Gramm-Leach-Bliley Act, in 1999, the traditional separation between investment and commercial banks in the US was overturned which allowed for the establishment of universal banks that combined a wide range of banking activities in one bank holding company [Komai and Richardson (2011)]. Hence, the US moved towards the global dominant business model of universal banking, that other advanced countries had already accepted – initially in Europe and later in Japan as well –.

Given the fact that a large range of business undertakings is possible for banking groups active in the international arena, it is convenient to distinguish between specialised and diversified business models [ECB (2010)]. Specialised banks are banks that restrict themselves – only or predominantly – to a few activities, for example investment banking or retail banking services. By contrast, diversified or universal banks combine different banking activities in one organisation, for instance a bank combining investment banking and corporate banking activities.

In order to analyse the impact of the 2007-2009 global financial crisis on the business models of large global banking groups we focus on the 22 banks that belong to the list of the largest systemically important financial institutions (SIFIs) in the world, as published by the Financial Times in November 2009 [FT (2009)]. The choice of the sample was based predominantly on business model, size and geographical criteria.<sup>2</sup> They can be split into four groups along the

1 Due to regulatory constraints, the five US investment banks that existed before the 2007-2009 financial crises – Goldman Sachs, Morgan Stanley, Merrill Lynch, Lehman Brothers and Bear Stearns – did not have deposit-taking business.

2 US commercial banks (Bank of America-Merrill Lynch, JP Morgan Chase and Citigroup), US investment banks (Goldman Sachs, Morgan Stanley), banks from respectively the euro area (including the two largest Spanish banks Banco Santander and BBVA), the UK and Japan, and finally banks from some other countries, i.e. Switzerland and Canada (UBS, Credit Suisse and Royal Bank of Canada). The Annex provides a set of financial indicators that allows for a more detailed inspection of these banks.

	Commercial Banks	Investment Banks
Specialised	<p>Its funding structure is dominated by customer deposits, and it is characterized by a reduced exposition to trading and derivatives.</p> <p>The asset structure comprises strong lending activity (retail /wholesale), and shows limited trading business.</p> <p>(i.e.: Mitsubishi UFJ).</p>	<p>Its funding structure is dominated by short-term debt financing and by a significant exposure to trading and derivatives. Customer deposits financing is not significant.</p> <p>The asset structure is depicted by the considerable contribution of investment securities and trading activities.</p> <p>The asset structure is characterized by reduced lending activity (retail / wholesale)</p> <p>(i.e.: Goldman Sachs &amp; Morgan Stanley)</p>
	Diversified or Universal	<p>Its funding structure is dominated by customer deposits, although it shows a more diversified profile than that of specialized commercial banks.</p> <p>The finance structure exhibits a reduced exposure to trading and derivatives .</p> <p>The asset structure displays a relatively low contribution of trading activities.</p> <p>Customer deposits financing and lending activities (retail / wholesale) play a relevant role compared with investment banking oriented universal banks.</p> <p>(i.e.: Citigroup, HSBC, Banco Santander and BBVA).</p>

SOURCE: Merck, Van Rixtel and González.

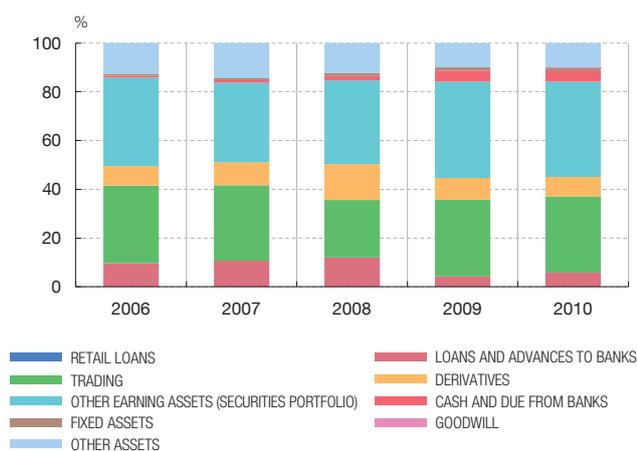
lines of the business model/speciality matrix represented in Table 1. For the sake of simplicity we have further restricted the number of banks shown in the tables and graphs to 10 institutions, which form our peer group of banks representative of each category.

First, the model of the specialised or “pure” investment bank, such as for example Goldman Sachs.<sup>3</sup> Second, the investment-banking oriented diversified or universal bank, which includes Barclays, BNP Paribas, Deutsche Bank and UBS. These banks show predominantly investment- banking related exposures in both asset and funding structures, but at the same time they have significant business lines related to more traditional commercial banking activities. Third, we have identified the model of the commercial-banking oriented diversified or universal bank, of which Citigroup and HSBC and the two largest Spanish banks, i.e. Banco Santander and BBVA, are examples. Here, the orientation towards commercial banking may involve a diversification into retail and wholesale banking, or a specialisation on either retail or wholesale banking business, while at the same time maintaining considerable exposures to investment banking activities.<sup>4</sup> Finally, we define the specialised or “pure” commercial bank as characterised by a very high concentration of business activities on both deposit funding and retail and wholesale lending. We use funding characteristics as the main criterion to classify a commercial bank, taking into account that the financial crisis put the spotlight especially on banks’ funding structures.

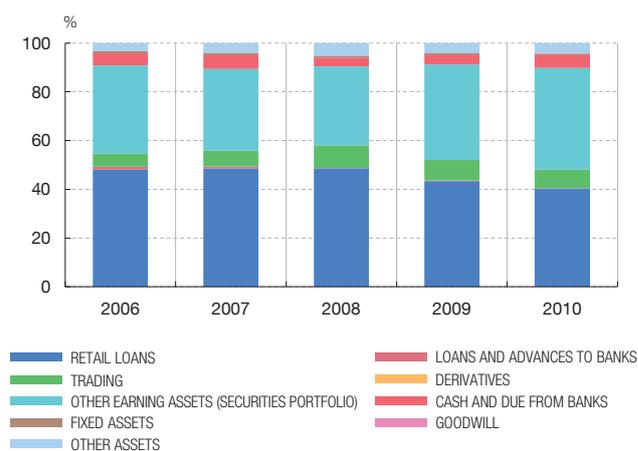
<sup>3</sup> Although both Goldman Sachs and Morgan Stanley changed their official status from investment bank to traditional bank holding companies in October 2008, which was a pragmatic move to obtain access to the full range of liquidity facilities of the Federal Reserve and to avoid using mark-to-market accounting for certain assets [Wall Street Journal (2008)], their actual business model remained that of a specialised investment bank.

<sup>4</sup> Our data source Bankscope does not unequivocally provide data on retail and wholesale bank lending activities for all banks and hence we cannot provide more detailed classifications of retail and wholesale-oriented commercial banks.

2.1 GOLDMAN SACHS. Specialised investment bank



2.2 MITSUBISHI UFJ (a). Specialised commercial bank



SOURCE: Bankscope.

a Mitsubishi UFJ reports according to the Japanese fiscal period. Thus, 2010 end-of-period data are reflected by the statements released on 31.03.2011.

Hence, a very high relative dependence on deposit funding has prevalence over a very high relative share of retail and wholesale lending to classify a bank as a specialised commercial bank. In our sample, Mitsubishi UFJ fulfils the criteria of this business model.

Changes in the asset structures of these ten banks over the period 2006-2010 are shown in Charts 2 to 4. For the sake of clarity, we have aggregated various asset items to show more clearly developments in retail and corporate lending, lending to banks and securities markets activities, which include a wide range of items such as securities holdings and trading and derivatives exposures.

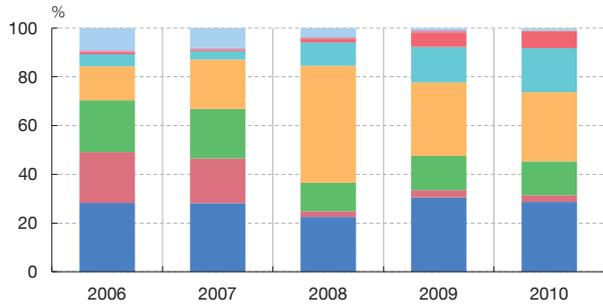
## 2.1 ASSET STRUCTURES OF SPECIALISED BANKS

Goldman Sachs distinguishes itself as the specialised investment bank, with around 80% of its assets related to securities markets activities and negligible activities in retail and corporate lending at end-2010 (Chart 2.1) and around 30% of its assets linked to trading activities, the highest share of the ten banks that we analyse in more detail. Furthermore, after the unprecedented dislocations in international interbank markets, in 2008, Goldman Sachs reduced rather significantly its lending to banks, limiting further the already very modest lending business. By contrast, Mitsubishi UFJ displays the model of the specialised commercial bank, with very high – in relative terms – lending business to households and enterprises and very little trading activity (at only around 8% of its total assets) (Chart 2.2); most importantly, its funding structure has the highest dependence on retail deposits of all banks in our sample (see Section 5). At the same time, this bank maintains a large securities portfolio, which consists largely of securities holdings, especially of government bonds

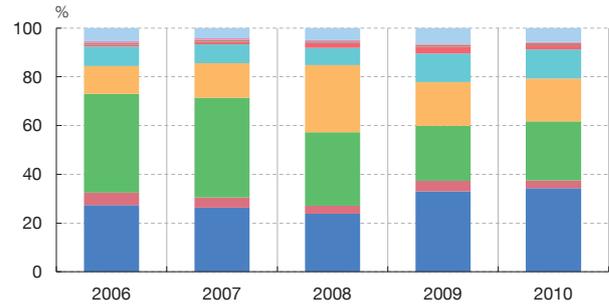
## 2.2 ASSET STRUCTURES OF DIVERSIFIED OR UNIVERSAL BANKS

At end-2010, Barclays, BNP Paribas, Deutsche Bank and UBS securities markets activities amounted to between 55% and 70% of their total assets; at the same time, retail and wholesale lending operations amounted to between 20% and 35% of total assets (see Chart 3). The investment banking orientation of these banks was highlighted in 2008, when their derivatives exposures increased very strongly due to valuation adjustments in the context of the financial crisis. The combined derivatives and trading positions of the four banks as a percentage of their total assets jumped bringing their total securities markets activities to between 55% and 80% of total assets for that year.

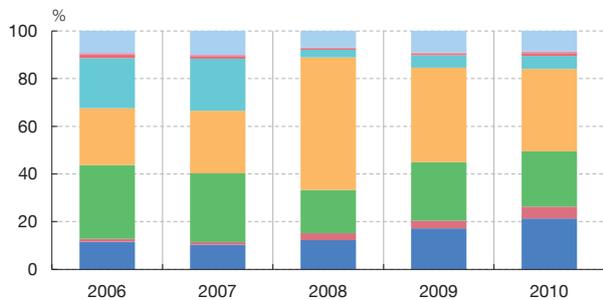
3.1 BARCLAYS BANK. Diversified investment bank



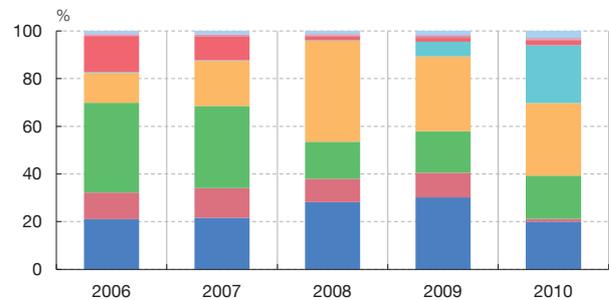
3.2 BNP PARIBAS. Diversified investment bank



3.3 DEUTSCHE BANK. Diversified investment bank



3.4 UBS. Diversified investment bank



SOURCE: Bankscope.

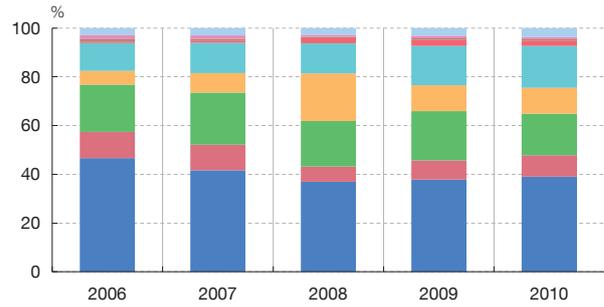
Barclays, BNP Paribas and Deutsche Bank expanded substantially their commercial banking activities in relative terms after 2008, as shown by the increasing shares of their lending to retail and corporate customers. This process was fostered by important acquisitions, such as the takeover of Fortis by BNP Paribas and that of Deutsche Postbank by Deutsche Bank. The exception was UBS, which experienced a very significant deleveraging after 2008, undergoing major changes in its business model. The dominant move towards commercial banking after 2008, is reflected in significant declines in the shares of derivatives and trading activities, with Deutsche Bank and Barclays mostly reducing derivatives exposures in relative terms, and BNP Paribas lowering its trading activities. The data also show that Barclays and UBS, followed by BNP Paribas, retreated significantly from interbank lending activities in recent years, owing to the severe impact of the financial crisis on international interbank funding markets.

The commercial banking oriented business model (Citigroup, HSBC, Banco Santander and BBVA) can be seen in the relatively large size of their lending activities that totalled between 45% and 65% of total assets at end-2010, and which consisted of retail, non-financial corporate wholesale and interbank lending (see Chart4). At the same time, their nature as universal banks was reflected in the importance of securities markets activities, between 25% and 40% of total assets. Notwithstanding relevant investment banking

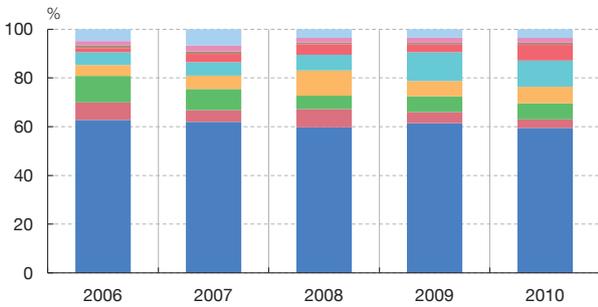
4.1 CITIGROUP. Diversified commercial bank



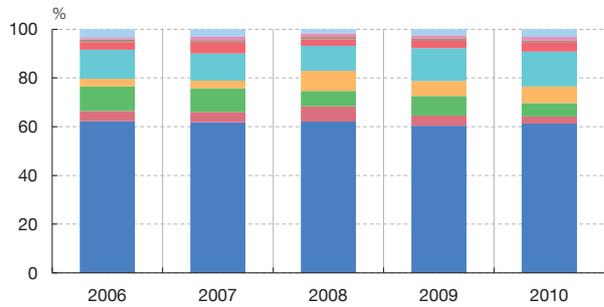
4.2 HSBC. Diversified commercial bank



4.3 BANCO SANTANDER. Diversified commercial bank



4.4 BBVA. Diversified commercial bank



SOURCE: Bankscope.

business, these banks are characterised by relatively small shares of derivatives and trading exposures in their asset structures, those of Banco Santander and BBVA being the lowest. The data show that basically all four banks increased the share of retail and corporate lending in total assets during the past few years, while generally reducing the share of interbank lending, which seems related to the impact of the global financial crisis. Besides, their balance sheet structures have been more stable than those of other banks.

Overall, the detailed investigation of the ten banks in our sub-sample shows in general the dominance of the diversified or universal bank model. The diversification trend in global finance, involving the emergence of large financial conglomerates covering a wide range of financial services including commercial and investment banking, asset management and insurance, has been interpreted as a positive development generating significant economies of scope to the benefit of especially large international clients [Institute of International Finance (2010)]. The results of empirical research on this phenomenon have been somewhat mixed, with earlier studies suggesting that functional diversification of banking groups reduced their economic value rather than enhancing it, providing arguments against combining different business lines in one universal bank [Schmid and Walter (2006), Laeven and Levine (2007)]. More recent empirical studies, though, indicate that the business diversification of banks, including international diversification, may

## TOTAL ASSETS OF THE MOST INTERNATIONALLY-ACTIVE INSTITUTIONS

TABLE 2

Total Assets	Evolution since the end of 2006	2010 Closing data (billion dollars)		Rate of increase from 2010 (a) with respect to:		
		31.12.2010	31.12.2009	31.12.2008	31.12.2007	31.12.2006
BNP Paribas SA	+	2,669.9	-2.9	-3.7	17.9	38.7
Deutsche Bank AG	+	2,546.3	27.0	-13.5	-1.0	21.2
HSBC Holdings Plc	+	2,454.7	3.8	-2.9	4.3	31.9
Mitsubishi UFJ Financial Group, Inc.	+	2,392.5	1.4	4.7	8.5	12.0
Barclays PLC	+	2,323.9	8.0	-27.4	21.4	49.4
Royal Bank of Scotland Group Plc	+	2,267.7	-14.3	-39.5	-23.5	66.8
Bank of America - Merrill Lynch	+	2,264.9	1.9	24.6	32.0	55.2
JPMorgan Chase & Co.	+	2,117.6	4.2	-2.6	35.6	56.7
Citigroup Inc.	+	1,913.9	3.1	-1.3	-12.5	1.6
Mizuho Financial Group, Inc.	+	1,896.7	3.0	5.6	5.0	8.1
ING Groep N.V.	+	1,666.4	7.2	-6.3	-5.0	1.7
Banco Santander, S.A.	+	1,626.8	9.6	16.0	33.4	46.0
Société Générale SA	+	1,512.7	10.6	0.2	5.6	18.3
UBS AG	-	1,406.4	-1.7	-34.6	-42.1	-43.9
UniCredit SpA	+	1,242.0	0.1	-11.1	-9.0	12.9
Credit Suisse Group AG	-	1,101.9	0.1	-11.8	-24.2	-17.8
Goldman Sachs Group, Inc.	+	911.3	7.3	3.0	-18.6	8.7
Morgan Stanley	-	807.7	4.7	22.6	-22.7	-27.9
Banco Bilbao Vizcaya Argentaria, S.A.	+	738.6	3.3	2.4	10.1	34.2
Royal Bank of Canada	+	712.9	10.9	0.3	21.0	35.3
Standard Chartered Plc	+	516.3	18.3	18.7	55.9	91.9
Nomura Holdings, Inc.	+	442.9	13.8	47.7	39.5	2.3

SOURCE: Bankscope and calculations from the authors.

a Rates of increase in local currency. Balances at the end of 2010 (31.12.2010) except for Japanese institutions (31.3.2011) and Canadian institutions (31.10.2010).

improve their value and hence support the view that economies of scope may be pronounced in banking [Gulamhussen et al. (2011), Elsas et al. (2010)]; for a more nuanced view, see Van Lelyveld and Knot (2009)].

The trend of functional diversification adopted by most large global banking groups has been intertwined with the significant increase in the consolidation and concentration of banking services into fewer and much larger banking conglomerates [De Nicolo et al. (2004), Buch and DeLong (2010), Herring and Carmassi (2010)]. The 2007-2009 financial crisis seems to have reinforced this trend rather significantly when looking from 2006 to 2010. Table 2 shows the size of 22 of the largest international banks in the world which were considered systemically important (SIFIs) by the Financial Times (developments in their total assets are depicted in Annex 1). At end-2010, the amount of total assets of 19 of these banks had increased when compared with 2006, in a majority of cases at double digit growth rates.<sup>5</sup> Only three experienced a decline in total assets from 2006, Morgan Stanley, UBS and Credit Suisse, all of them banking groups either specialised or predominantly diversified into investment banking activities.

<sup>5</sup> Data for Japanese banks are as of the end of the fiscal year, i.e. end of March. Data for Royal Bank of Canada are as of the end of October.

The longer-term trend of increasing total assets of the world's largest global banks from 2006 to 2010 has been buttressed by substantial consolidation processes in several national banking systems, sometimes with public support, which have resulted in higher degrees of concentration in national markets.<sup>6</sup> Some of these processes involved large government financial support or private-public sector partnerships, i.e. private solutions with public assistance (such as the takeover of Bear Stearns by JP Morgan Chase); other were private sector "only" solutions, for example the takeover of Washington Mutual by JP Morgan Chase. Some cross-border resolutions of failed banks changed the structure of the domestic banking industries substantially, such as the takeovers of Bradford & Bingley and Alliance & Leicester by Banco Santander, of Fortis by BNP Paribas and of certain parts of the investment banking and capital markets business of Lehman Brothers by Barclays.

At the same time, in the immediate aftermath of the financial crisis, the banks in our sample showed a downward adjustment of their size: Of the ten largest banks, seven had smaller balance sheets in 2010 than in 2008. For some banks, this deleveraging was very pronounced: Royal Bank of Scotland, UBS and Barclays reduced their total assets between 2008 and 2010 by 40%, 35% and 27% respectively (Table 2). In the case of UK banks, this restructuring occurred on the back of significant public support. The process of deleveraging also resulted in downward adjustments of the balance sheets of Goldman Sachs and Morgan Stanley, the two remaining US independent investment banks, which was corrected somewhat after 2008 (Annex 1, Chart 1.B).

Notwithstanding the deleveraging of banks' balance sheets since the peak of the turmoil, the financial crisis doesn't seem to have interrupted the longer-term trend of increasing size. Only three out of the 22 banks considered had lower total assets in 2010 than in 2009 (Table 2). Clearly bank resolutions processes have had an upward impact on the size of various globally operating banks. But there are other factors to explain the longer-term trend of increasing size in banking. One is the significant economies of scale identified in banking, where larger size generates efficiency benefits derived from technological advantages and allows for better diversification of risk [Wheelock and Wilson (2009), Feng and Serletis (2010) Hughes and Mester (2011)]. Additional factors of more strategic nature should not be discarded. For instance, very large banks can benefit from lower funding costs arising from an implicit government guarantees that they would not be allowed to fail<sup>7</sup>; Brewer III and Jagtiani (2011) show that banks may be willing to pay a premium for mergers that would increase their size to a level generally perceived as being "too big to fail".

### 3 Recent trends in global banks' performance

In addition to size, the 2007-2009 global financial crisis had a strong impact on the performance of the largest international banking groups as well. One of the most widely used indicators for bank performance is the return on average equity (ROE), measured by net income over the average of total equity at the end of the year. It shows how well a bank has performed on various profitability categories, during a particular year, and indicates how competitive the bank can be in raising equity in financial markets [Hempel and Simonson (1999)].

ROAEs for our peer group of the largest global banks are shown in Annex 2. Most banks experienced a sharp decline in profitability for the reporting year 2008. However, the banks that display more stable ROEs and have kept them high over the period 2006-10 are

<sup>6</sup> At the same time, this process does not seem to have resulted in a strong adjustment in the overall size of the industry.

<sup>7</sup> At the same time, it needs to be acknowledged that larger banks may hold funding advantages over smaller banks that may be due to a variety of factors and not necessarily only to "too big to fail" arguments [see Standard & Poor's (2011)].

commercial-banking oriented universal banks without exception, most notably BBVA, Banco Santander, Standard Chartered Bank and Royal Bank of Canada (Annex 2). Nomura, Royal Bank of Scotland and UBS, all of them investment-banking oriented universal banks, are on the opposite side. Moreover, the most profitable global banks in 2006, i.e. Goldman Sachs and Morgan Stanley, displayed a rather high variability of their return on average equity over the subsequent years.

Interestingly, the data show a marked recovery in profitability after the sharp decline in 2008, for most banks reaching levels of ROAE in 2010 not far from those prevailing in 2006, prior to the outbreak of the financial crisis. This is indicated by rather pronounced V-shape patterns in the evolution of return on average equity for many large internationally active banks (Annex 2). At the same time, there are notable differences in levels of ROAE among banks in different countries. In particular, Japanese banks display relatively low rates of profitability as demonstrated, reflecting well-known historical patterns and business practices such as emphasis on long-term banking relationships and relatively low income growth [Oyama and Shiratori (2001), Loukoianova (2008)]. Among euro area banks, the most profitable ones over 2006-2010 were the two leading Spanish banks.

The performance of internationally active and diversified banks has been the subject of considerable empirical research [see CGFS (2010b)]. The international expansion of banks may improve their risk profile and increase their risk-adjusted return or profitability through geographical diversification and efficiency gains [see for example García-Herrero and Vázquez (2007)].

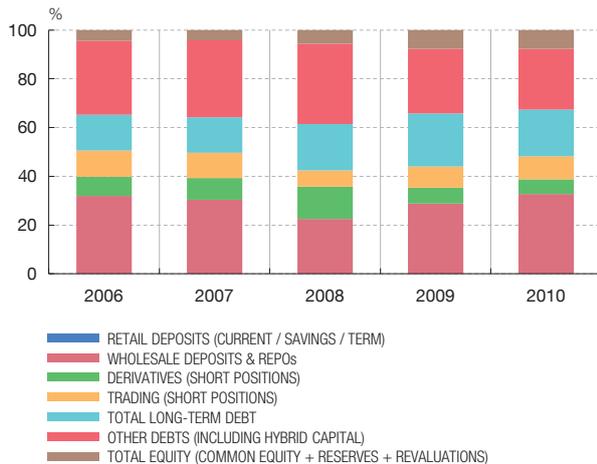
#### 4 Recent trends in global banks' funding and liquidity management

Banks may fund themselves through a wide range of sources of financing, including deposits, equity and debt. A standard classification of funding models differentiates between wholesale and retail funding. The former includes central bank liquidity, interbank loans, with a prominent role for international interbank short-term US dollar funding, other short-term debt, most notably repurchase agreements (repos) and commercial paper (CP), and longer-term debt. Sometimes, equity financing is included in wholesale funding as well. Retail funding is essentially funding through customer deposits, such as current, savings and term deposits.

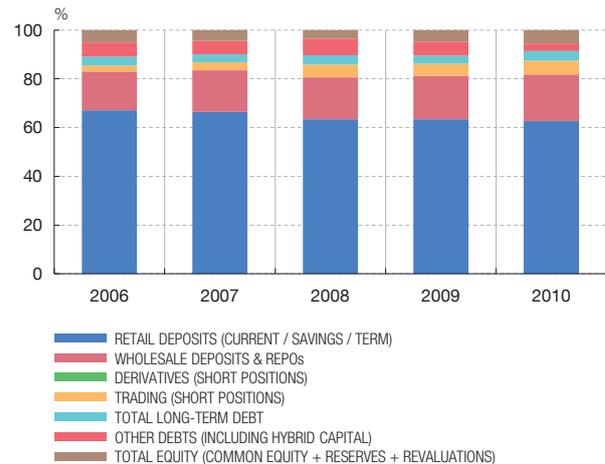
During the global financial crisis of 2007-2009, banks' funding models experienced rather unprecedented shocks, both in terms of access to funding and of cost. Large internationally operating banks had built up important maturity and currency mismatches between asset and funding structures [CGFS (2010a)]; in particular, specialised investment banks and investment-banking oriented universal banks had increased significantly their leverage [Kalemlı-Ozcan et al. (2011)]. In the summer of 2007, tensions emanating from US subprime mortgage markets spilled over to banks' short-term wholesale funding markets and liquidity conditions deteriorated rapidly, particularly for highly leveraged banks. Contagion through interconnectedness of major global banks and their funding models led to sharp and unprecedented increases in interbank money market interest rates; in this setting, European banks had difficulty in obtaining US dollar liquidity [Domanski and Turner (2011)]. Moreover, US investment banks, which had become highly dependent on short-term wholesale funding – particularly on repo and CP financing – in the years prior to the financial crisis as a way to leverage their balance sheets, experienced severe dislocations in their funding [Adrian and Shin (2010)]<sup>8</sup>. As a matter of fact, the collapses of both Bear

<sup>8</sup> US investment banks' use of repo borrowing increased by almost one trillion dollar from 2004 to 2007, of which an increasing part consisted of overnight repos, i.e. repurchase agreements with a maturity of just one day [Financial Crisis Inquiry Commission (2011), Adrian and Shin (2010)].

5.1 GOLDMAN SACHS. Specialised investment bank



5.2 MITSUBISHI UFJ (a) Specialised commercial bank



SOURCE: Bankscope.

a Mitsubishi UFJ reports according to the Japanese fiscal period. Thus, 2010 end-of-period data are reflected by the statements released on 31.3.2011.

Stearns and Lehman Brothers were highly related to their inability to access any longer these short-term funding markets, as investor confidence in their business models had eroded. These problems were not only circumscribed to US investment banks: the demise of Northern Rock in the UK was also caused by funding strains in short-term wholesale financing, on which its business model depended crucially [Shin (2009)].

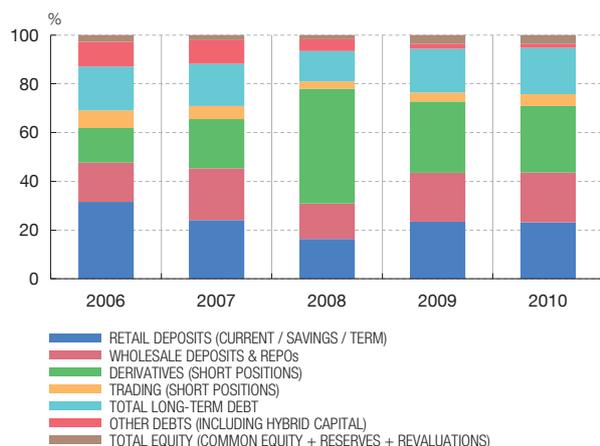
The disruptions in short-term funding markets prompted central banks worldwide to inject substantial amounts of liquidity into the system and the Federal Reserve granted US investment banks unprecedented access to its liquidity facilities. All in all, central bank liquidity became a major source of wholesale funding. Moreover, after the collapse of Lehman Brothers some governments supported the funding of their globally operating banks, to the detriment of a level playing field in global banking.

In order to analyse banks' funding models, we use detailed breakdowns of the funding of banks in our narrower sub-sample of ten banks. The breakdown includes retail deposits, short-term wholesale funding (interbank and repo financing), derivatives and trading positions, long-term debt, other debt and, for completeness sake, equity (Charts 5 to 7). Similar to our findings for asset structures, we find significant differences between the specific funding structures of these banks.

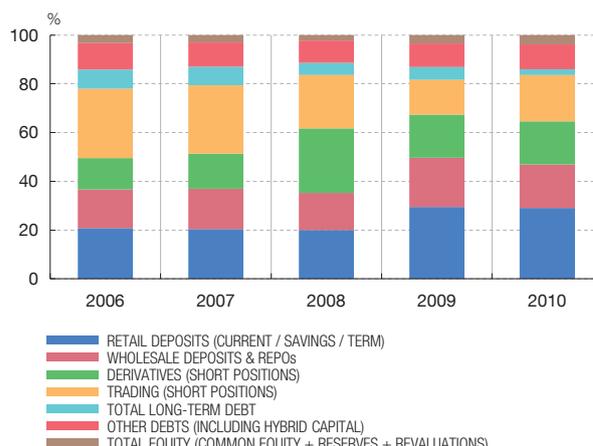
#### 4.1 FUNDING STRUCTURE OF THE SPECIALISED BUSINESS MODELS

Goldman Sachs represents the specialised investment bank model, with essentially no deposit funding and significant reliance on short-term wholesale funding and other debt financing (Chart 5.1). In 2008, when the crisis hit especially the funding of investment banks, its interbank and repo funding experienced a considerable reduction (in relative terms), but in 2010 the shares of these financing sources had returned to pre-crisis levels. Furthermore, in 2009 and 2010 Goldman Sachs exposures to derivatives, in relative terms, were significantly lower than in 2008. Turning to the other specialised model, around 60% of Mitsubishi UFJ funding in 2010 depended predominantly on customer deposits, the largest figure in our sample, which has remained rather stable throughout 2006-2010; use of other sources of financing, such as short-term wholesale funding instruments, was rather stable as well, with little diversification to liability items such as trading, derivatives and long-term debt (Chart 5.2).

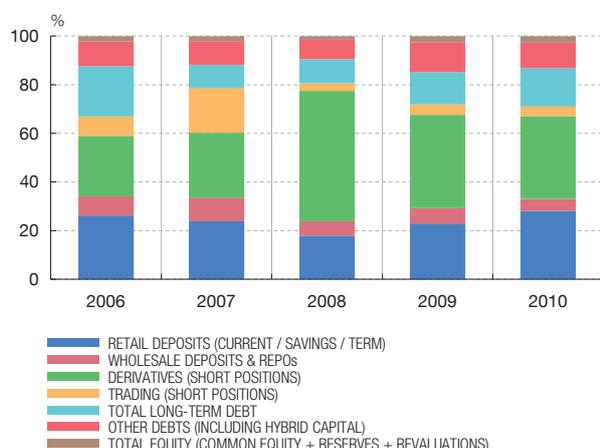
6.1 BARCLAYS BANK. Diversified investment bank



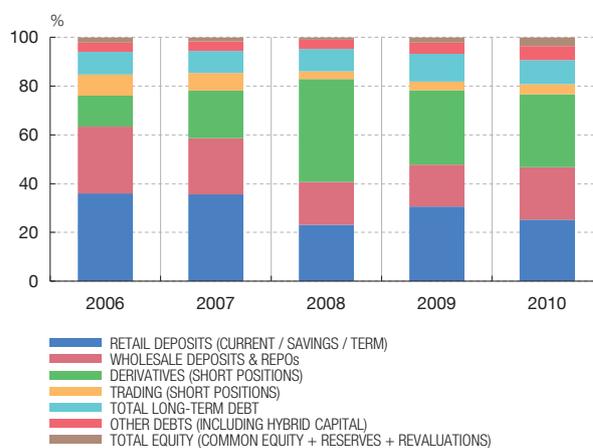
6.2 BNP PARIBAS. Diversified investment bank



6.3 DEUTSCHE BANK. Diversified investment bank



6.4 UBS. Diversified investment bank



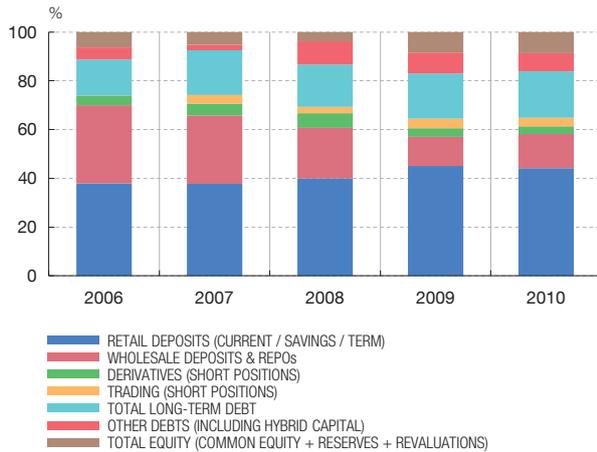
SOURCE: Bankscope.

4.2 FUNDING STRUCTURE OF THE DIVERSIFIED OR UNIVERSAL BUSINESS MODELS

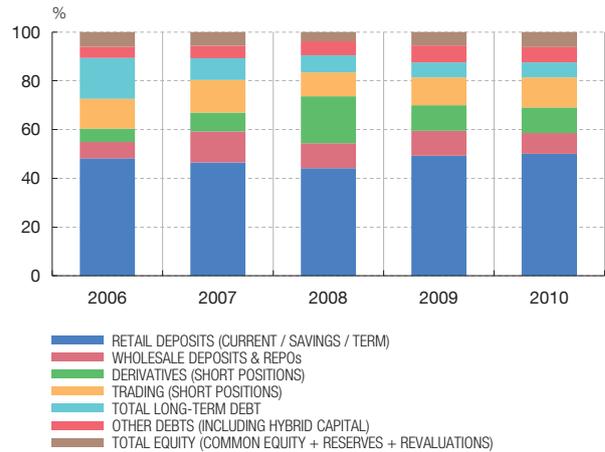
The funding structure of investment banking oriented universal banks displays a relatively modest share of customer deposits, at just 20%-30% of total funding in 2010, but maintained substantial liability positions in derivatives and trading, an important characteristic of this business model (Chart 6). These banks experienced major shifts in their funding structure after 2008. The most significant change was a rapid and substantial decline in derivatives in 2009 and 2010, which had increased very strongly in 2008, mostly due to market valuation adjustments of financial derivatives' trading positions resulting from the financial crisis. Regarding other important changes in these banks' funding structures, they all increased their use of customer deposit financing after 2008, and hence moved more towards the commercial banking oriented business model.

By contrast, the funding of the diversified commercial banks was characterised by a much larger share of customer deposits – of between 40% and 50% at end-2010 – (Chart 7). After 2008 they showed an ever greater recourse to deposit financing (in relative terms), at the expense of short-term wholesale funding. This latter development was a trend clearly visible among commercial banking oriented universal banks, including BBVA and HSBC, especially when comparing the figures for 2010 with those for 2006 or 2007.

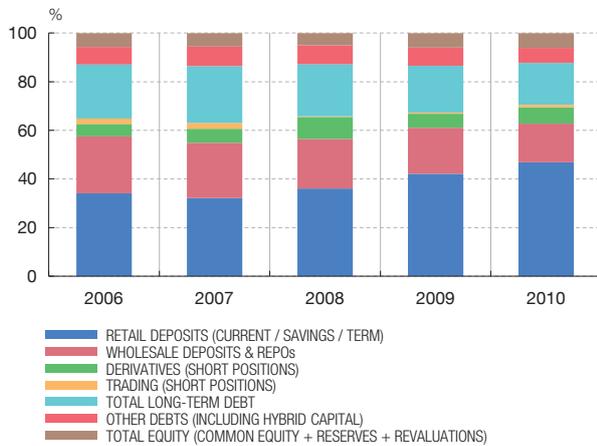
7.1 CITIGROUP. Diversified commercial bank



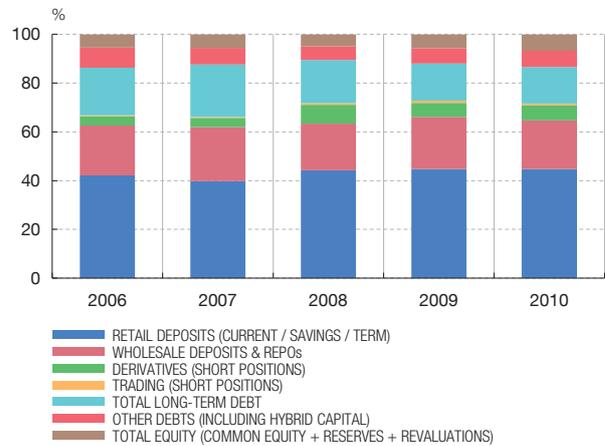
7.2 HSBC. Diversified commercial bank



7.3 BANCO SANTANDER. Diversified commercial bank



7.4 BBVA. Diversified commercial bank



SOURCE: Bankscope.

The trend towards greater recourse to customer deposit funding by both investment and commercially oriented universal banks is clearly visible in the evolution of loans to deposits ratios, shown in Annex 3. If this ratio is higher than one, a bank needs other funding sources to finance its loans. For a majority of banks, the loan to deposit ratio declined rather significantly during 2006-2010, and especially after 2008.

Overall, in the aftermath of the 2007-2009 global financial crisis large international banks' funding models have shifted towards more stable funding sources, with increasing reliance on customer deposits. At the same time, many banks – especially commercial banking oriented universal banks – reduced their recourse to short-term wholesale funding markets.<sup>9</sup> The crisis revealed important shortcomings in funding models mainly concentrated on short-term wholesale debt instruments.

The crisis also revealed the importance of intra group capital transfers which turned out to be an effective tool to support foreign affiliates in distress during the turmoil [Navaretti

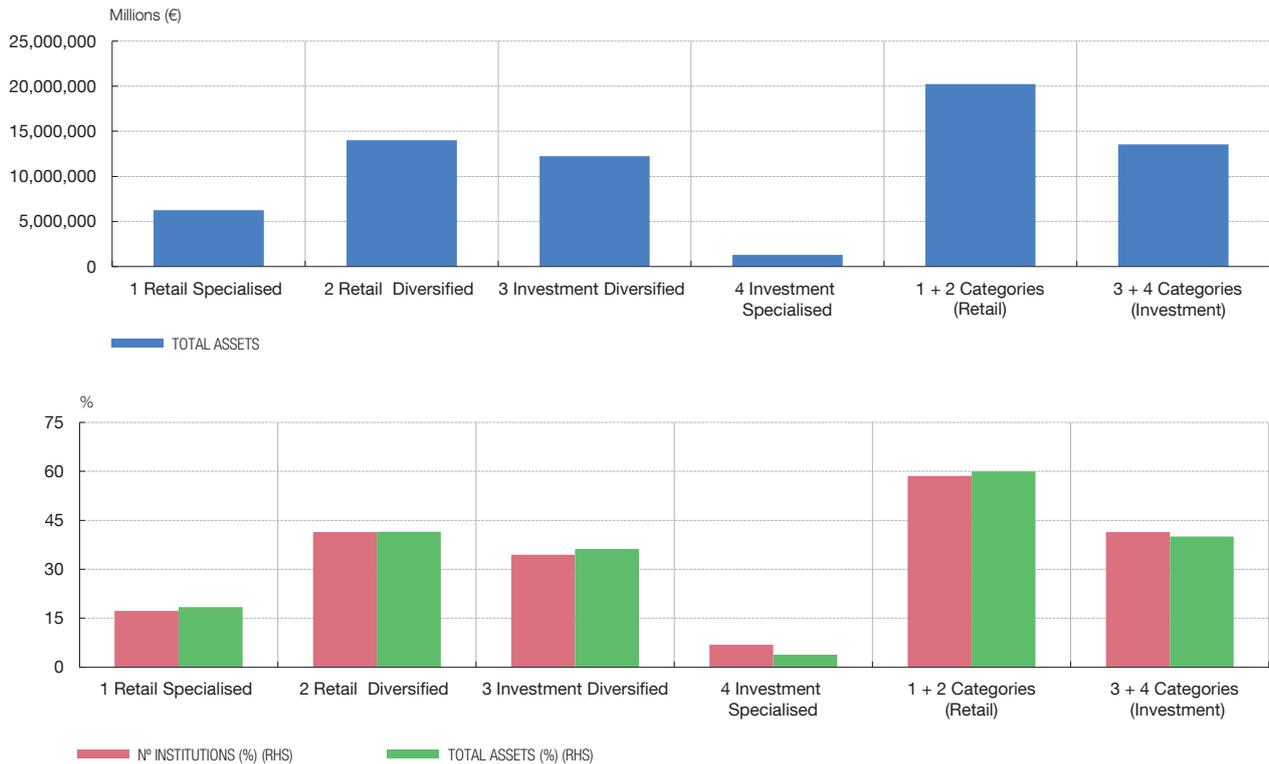
<sup>9</sup> The rating agencies generally view retail deposit funding as the most reliable and stable source of bank funding [see for example Fitch (2011)]. Deposit funding may be more beneficial also due to the existence of deposit insurance schemes, which mitigate the likelihood of bank runs and lower the attractiveness of market-based funding modes, regardless the quality of borrowers [Greenbaum and Thakor (1987)].

et al. (2010), Cetorelli and Goldberg (2011b)]. Large international operating banks seem to have considerable flexibility in moving around sizeable amounts of funding inside their global organisation, which contributes to their financial resilience and versatility [De Haas and Van Lelyveld (2010)]. Of course, this aspect is closely related to their funding and liquidity management practices. In the case of centralised banks, the funding of foreign subsidiaries relies on intra group loans from the parent bank which is the institution raising funds in financial markets. By contrast, the non-centralised liquidity management model is characterised by a high degree of financial autonomy, in which every subsidiary raises financing in financial markets under its own name and according to its own credit rating. The centralised model has certain advantages for banks in terms of economies of scale and cost efficiencies, but it also entails risks in terms of lighter monitoring by markets of banks' global funding operations, while being more prone to mispricing of risk as well. It is worth mentioning that, on the contrary, in the decentralized model funding is carried out by the final user of these funds, i.e. the subsidiary in need of funds which is the institution that taps markets under its own name and its own risk profile. As a consequence in the decentralized model it is easier for markets to accurately assign and price the risk involved in the funding than in the centralized one as in the latter case it is the matrix the institution that gets financing. In the wake of the 2007-2009 financial crisis, international banks have gradually increased funding through local sources of financing in the foreign markets where they operate [CGFS (2010b)]. At the same time, evidence suggests that global banks have increased centralisation of liquidity management, through tighter monitoring of liquidity buffers and short-term liabilities at their headquarters.

## 5 Conclusions, challenges and perspectives

The analysis presented in this article showed that overall the commercial banking oriented business models proved more resilient during the global 2007-2009 financial crisis when compared with the investment banking oriented models, due to their relatively modest exposures to trading and derivatives activities, their greater reliance on stable sources of funding through customer deposits and larger diversity of business lines which allows to compensate losses in some business segments with revenues from alternative sources [see also: Boston Consulting Group (2009), ECB (2010), Standard and Poor's (2011)]. When comparing the balance sheet structures of both specialised commercial banks and commercial banking oriented universal banks in 2006 and 2010, they show relatively similar composition. In contrast, the balance sheets of banks which adopted investment banking related business models, especially investment banking oriented universal banks, experienced rather significant changes in balance sheet structures during this period. More specifically, in 2008, at the height of the financial crisis, these banks showed strong increases in derivatives exposures on their liabilities side, which were significantly reduced in 2009 and 2010. In general, the weight of securities markets activities on the assets side and of trading exposures on the liabilities side fell and, at the same time, retail and wholesale lending activities, especially the use of customer deposit financing, increased. All in all, most investment banking oriented universal banks in our sample moved towards the business model of the commercial banking oriented universal bank after 2008.

The crisis and the related increase in the number of bank resolutions worked as important catalysts behind the longer-term trend of increasing the size of global banks. More structurally, economic strategies such as achieving significant economies of scope and scale may have been important drivers as well, both for the diversification of business activities, as evidenced by the dominant business model in our sample of the diversified or universal bank, and for increasing size of large global banks. At the same time, "too big



SOURCE: BIS and Bankscope.  
NOTE: Exchange rate adjusted.

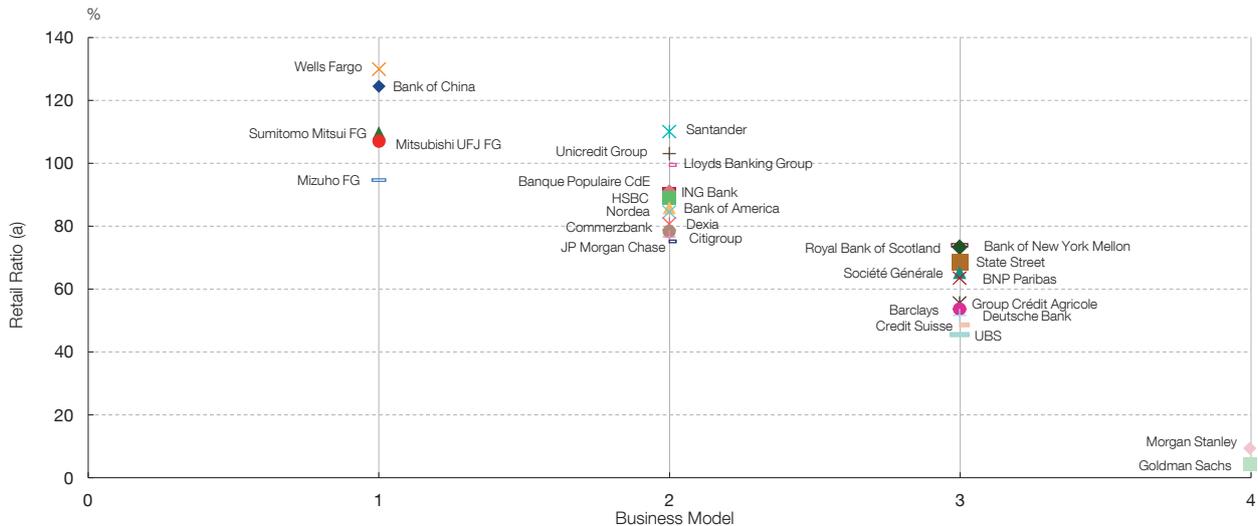
to fail” advantages such as lower funding costs for banks that are perceived systemically important cannot be excluded as an important reason behind the trend of larger international banking groups.<sup>10</sup>

Regarding challenges and perspectives for the future, it is clear that the regulatory environment is the key challenge for banks’ business models in the years ahead of us. The evidence shown through the previous sections strongly suggests that regulation aimed at reducing the likelihood and the impact of failure of any large internationally active financial institution should take into account the business model it conducts. In this regard, it might be opportune to look at several recent important regulatory initiatives such as those that address the systemic and moral hazard risks associated with large financial institutions and those aimed at isolating or ring fencing retail banking vis-à-vis investment banking.

The Basel Committee on Banking Supervision (BCBS) and the Financial Stability Board (FSB) have developed a framework to deal with the “too-big-to-fail” issue based on the two objectives.<sup>11</sup> First, the objective is to reduce the probability of failure by improving the loss

<sup>10</sup> Demirgüç-Kunt and Huizinga (2011) show that systemically large banks display lower profitability and higher risk, suggesting that it is neither in the interest of their shareholders nor regulators for them to become too large relative to the size of their national economies. On the basis of these findings the authors suggest that regulatory intervention may be warranted were such an outcome to materialise, such as additional capital charges or in the extreme case downsizing or splitting up of business activities. However, size restrictions may have unwelcome effects as well as demonstrated in Dermine and Schoemaker (2010), such as a lack of credit risk diversification in case size reduction would imply less internationally diversified banks.

<sup>11</sup> See Basel Committee on Banking Supervision, “Global systemically important banks: assessment methodology and the additional loss absorbency requirement”, November 2011.



SOURCE: Own elaboration with Bankscope data.

a Retail Ratio = (Net Customer Loans + Customer Deposits) / Total Assets.

absorbency of the financial institutions subjected to the regulations. Second, an additional goal is to reduce the impact of failure by improving global recovery and resolution frameworks.

To attain the first goal, the proposals entail new requirements for the banks that have been identified as systemically important at the global level. In particular, an additional loss absorption capacity is tailored to the impact of their default within a range from 1% to 2.5% of risk-weighted assets that should be met with common equity. In addition, the FSB and BCBS propose changes in national resolution regimes, additional requirements for resolvability assessment and for recovery and resolution planning and, last but not least, for more effective supervision. All these measures have been approved by the G20. Thus, institutions identified as Global Systemically Important Financial Institutions (G-SIFIs) will have to adapt to this regulation from 2012 onwards and its full implementation is targeted for 2019. Chart 9 represents our initial assessment of how the G-SIFIs identified by the BCBS fit in the categorization of business models described in this article. Chart 8 shows the size of balance sheets of institutions by category at end-2010.

The assessment methodology developed to identify the systemic importance of G-SIFIs follows a multiple indicator-based measurement approach that encompasses many dimensions of systemic importance and includes parameters such as cross-jurisdictional activity, size, interconnectedness, substitutability/financial institution infrastructure and complexity. On top of it, some qualitative information incorporated in the supervisory judgement completes the assessment.

Indeed the business model of institutions influences some of the categories aforementioned, especially those of interconnectedness and complexity. However, as shown in the chart, the list of institutions identified as G-SIFIs contains, according to our assessment, banks in all categories without a clear bias to any. In fact, at first glance it seems that the number of specialized investment banks is relatively low, though admittedly it might be explained by the failure of very noticeable ones in the crisis. As the data show, the relatively low prominence of investment banks is further exemplified by the (much) larger size of total assets of the more retail oriented banks.

Following the well-documented high resilience and stability of the retail banking model, which also find support in this article, some could argue that the G-SIFIs identification criteria do not take into account sufficiently the benefits of this model. However, in this regard, advocates of the BCBS approach may counter that the concept of “systemically important” is much richer than just focusing on different business models. In fact, the additional requirements imposed on any G-SIFI depend on its scoring insofar institutions are allocated into one out of five possible buckets (eg. riskier banks should be allocated to higher ranked buckets and thus be asked to fulfill stricter additional capital requirements). In any case, what it is clear is that regulation should and in fact has taken into account (sufficiently or not) idiosyncrasies associated with the different business models of banks.

In the regulatory arena, two national initiatives that may impinge on the business model of banks are also worthwhile to be commented. The first one relates to the recommendations of the Independent Commission on Banking for UK banking (ICB report), especially those ones directed at institutions that combine retail services with global wholesale and investment banking operations. The second one has to do with certain regulations proposed in the US to implement the Volcker rule and in particular to its unintended consequences and extraterritorial effects.

The ICB report proposes ring-fencing retail banking activities that would make it easier and less costly to effectuate the resolution of any banking institution, would allow for targeted policies towards banks in difficulties and would minimize the need for public support. Besides, according to the report, structural separation of activities should help insulate retail banking from external shocks. Interestingly, the report is very favorable to business models that provide a great degree of financial autonomy to subsidiaries versus centralized models. It is important to note that the ICB report does not ask for complete separation of activities and institutions could maintain the advantages derived from economies of scale. Moreover, according to the ICB, the recommendations proposed are neutral with regard to the various business models of UK banks.

Having said all that, the report advocates additional loss absorbency requirements for large UK retail banks (equity capital of at least 10% of risk weighted assets, which exceeds the Basel III level for G-SIFIs) and acknowledges that the proposed reforms affect only a relatively small proportion of wholesale and investment banking activity in the City. The argument for the latter is to avoid any adverse effect on the competitiveness of UK banks versus foreign banks. The ICB view on the need for additional burdens imposed on large retail oriented banking groups is defended as a compensation for the possible “too big to fail” implicit subsidy these institutions benefit from. This reasoning might implicitly endorse the belief that these large and key retail banks will be rescued by the public sector in case it would be needed, whereas small retail banks and wholesale and investment oriented-banks would be allowed to fail. The merits of the proposals in the ICB report are indeed considerable. However, challenges remain with regard to their implementation and it might be argued whether the “no bail out” assumption for large investment banks versus large retail ones will be followed in case of a financial crisis with systemic effects.

The US approach to isolate retail banking from other activities that is embedded in the Volcker rule is quite different, though in essence its objectives are close to those of the ICB proposals. In a nutshell the Volcker rule prohibits any link between retail business (which benefits from FDIC deposit insurance) and other activities, particularly proprietary trading, prime brokerage business for hedge funds or risk capital activities, except for exceptions

to be detailed. As a consequence, it either interdicts any relation or it imposes the compliance with severe information requirements to qualify for the exception. The proposed US regulation clearly differentiates among business models and it interferes with the relations between retail and investment business. This is an issue particularly relevant for large institutions and among other things it regulates the links between the subsidiaries of non-US banks active in the US with their parent banks. This issue may have severe potential consequences for the activities carried out by those foreign institutions and in fact is under review by US authorities. Some private institutions (among those the Institute for International Finance, IIF) have called for a sufficient degree of coordination regarding those regulatory initiatives with extraterritorial consequences.

In addition, regulatory developments may induce the movement of specific business lines out of banks – both commercial and investment banks – and into the non-bank financial sector, such as hedge funds, private equity and asset managers. This may provide further impetus to the development of the so-called Shadow Banking System. Moreover, regulatory changes may lead to a further consolidation of large globally active banks, as scale and scope economies, infrastructure and distribution channels will become more important to maintain competitive positions [Morgan Stanley and Oliver Wyman (2011)]. This could buttress the longer-term trend towards bigger size of large international banking groups and higher industry concentration that we observe in our analysis. With respect to perspectives for funding structures, the prevailing view is that the greater recourse to deposit financing observed in the aftermath of the financial crisis in 2008 may continue for the foreseeable future, implying greater competition for deposits between banks (ECB, 2009 and 2010). This trend may entail new challenges as well, as enhanced competition in deposit markets may lead, according to certain academic research, to an increase in risk, if banks compete for market power offering higher deposit rates [Craig et al. (2010)].

All in all, and despite the recent financial crises, international banking has not lost its dynamism and continues to provide important amounts of financing, especially to the fastest growing economies in the world. These international activities of globally active banks are of considerable strategic importance in their well-diversified business portfolios and form a traditional source of revenues on their balance sheet. Indeed, the diversity of business models for banks active internationally is welcome. However, as shown in the article, the so-called universal commercial banking oriented business model has shown a particularly high degree of stability and resilience to the international financial crisis, an issue that may have to be taken into account in pending regulation.

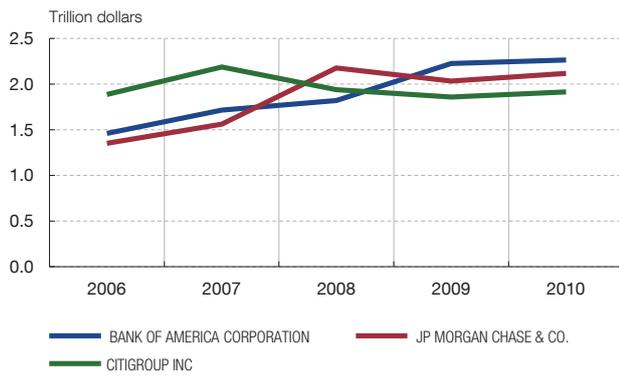
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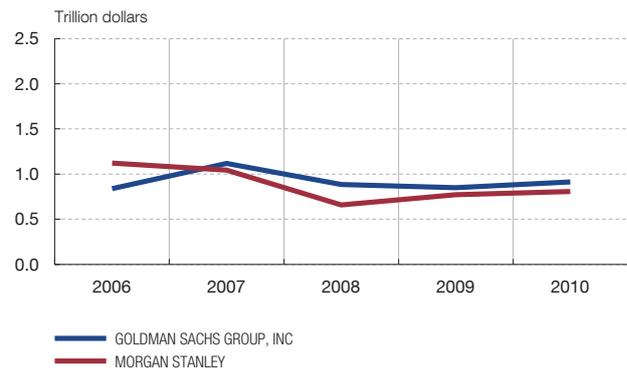
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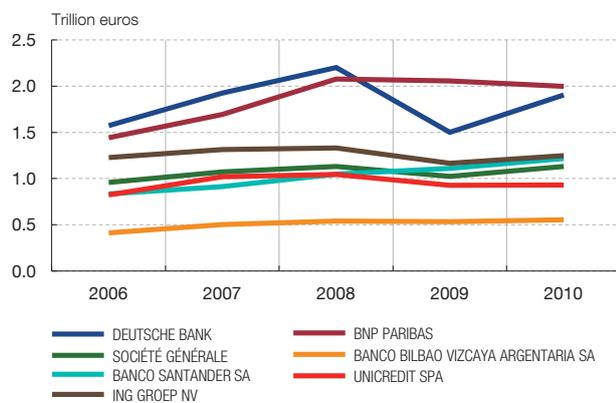
1.A US COMMERCIAL BANKS



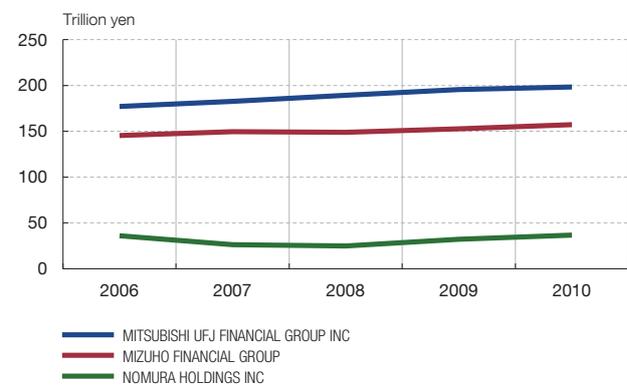
1.B US INVESTMENT BANKS



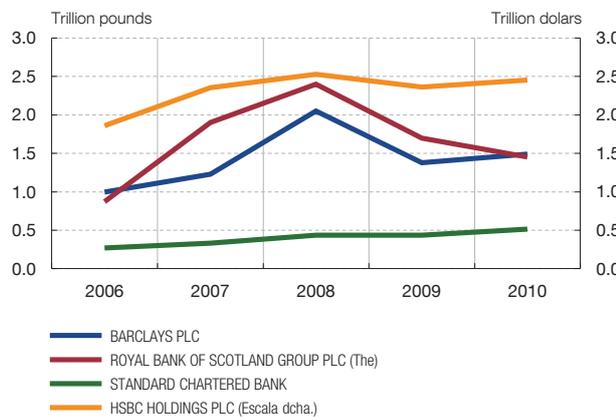
1.C EUROZONE BANKS



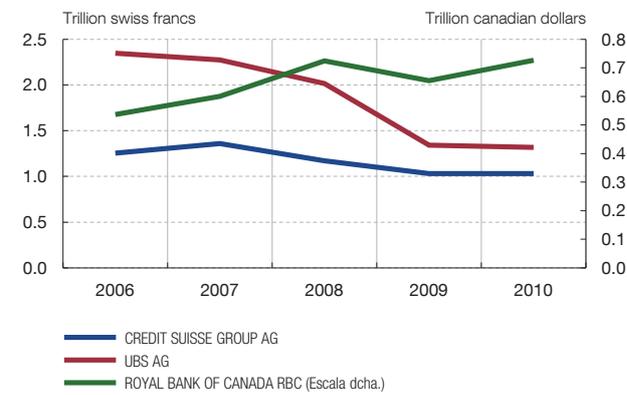
1.D JAPANESE BANKS (a)



1.E UK BANKS (b)



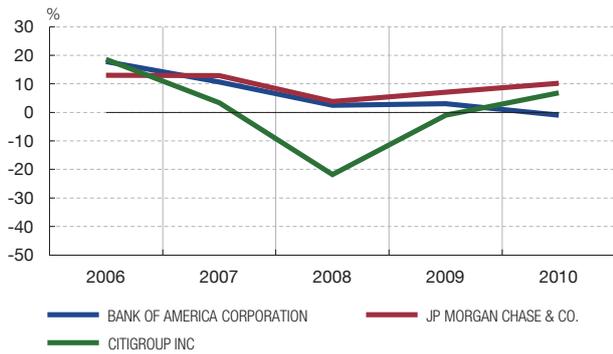
1.F OTHER INDUSTRIALISED COUNTRIES. Banks



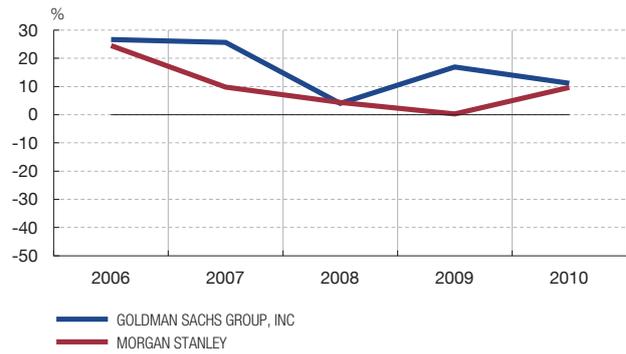
SOURCE: Bankscope.

- a Japanese institutions (Chart 1.d) report in accordance with the Japanese fiscal year. Thus, 2010 closing data are reflected by the statements released on 31.3.2011.
- b Barclays Plc and The Royal Bank of Scotland Group Plc report in local currency (GBP), whereas HSBC Holdings Plc and Standard Chartered publish their consolidated statements in American dollars (USD).

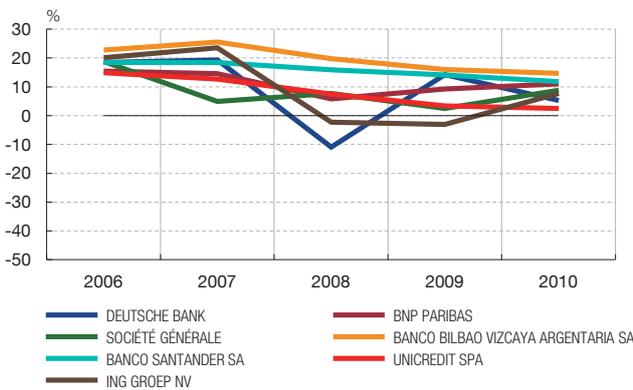
2.A US COMMERCIAL BANKS



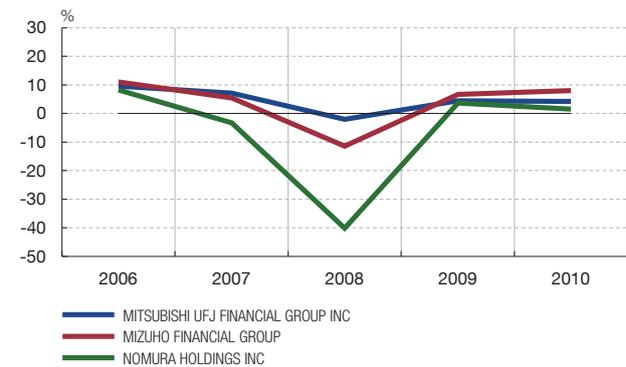
2.B US INVESTMENT BANKS



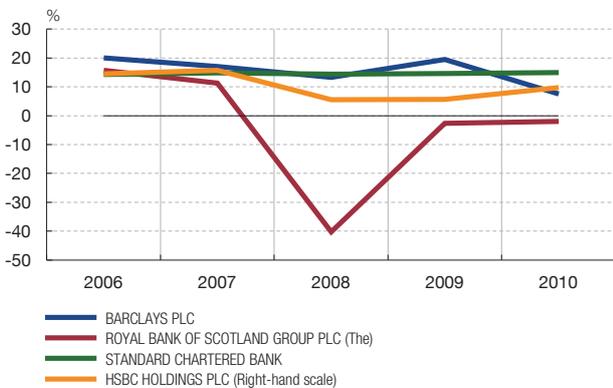
2.C EUROZONE BANKS



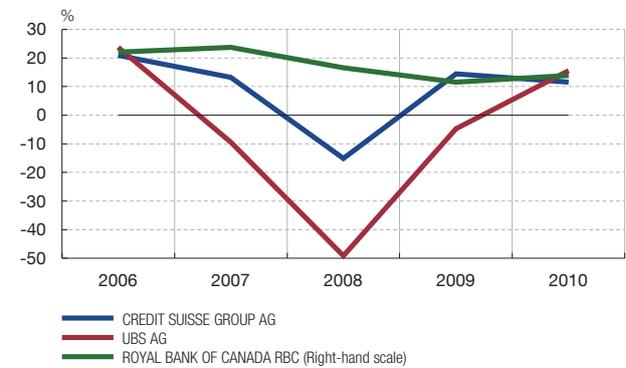
2.D JAPANESE BANKS (a)



2.E UK BANKS



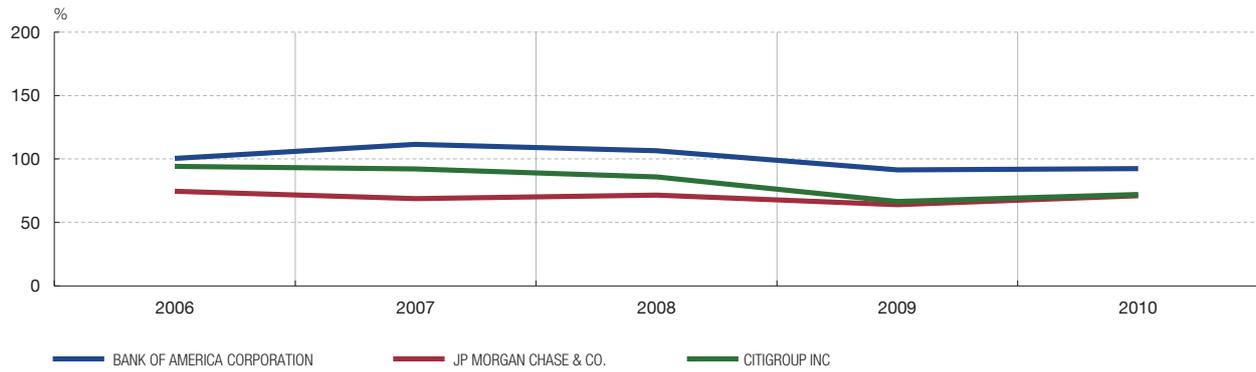
2.F OTHER INDUSTRIALISED COUNTRIES. Banks



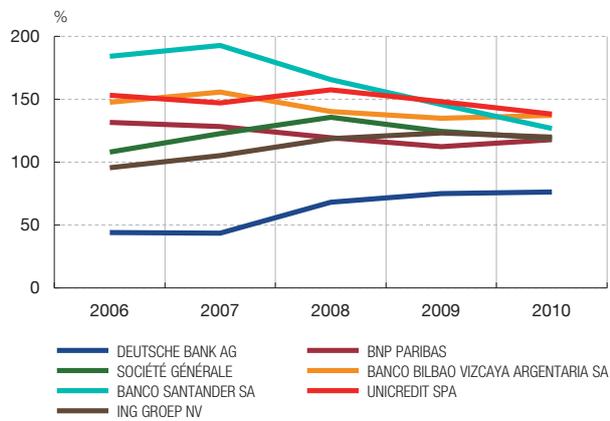
SOURCE: Bankscope.

a Japanese institutions (Chart 2.d) report in accordance with the Japanese fiscal year. Thus, 2010 end-of-period data are reflected by the statements released on 31.3.2011.

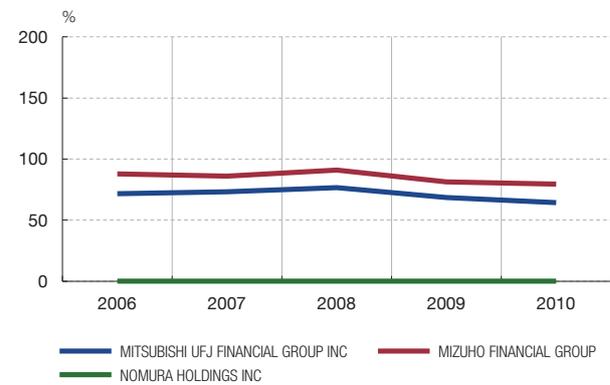
3.A US COMMERCIAL BANKS



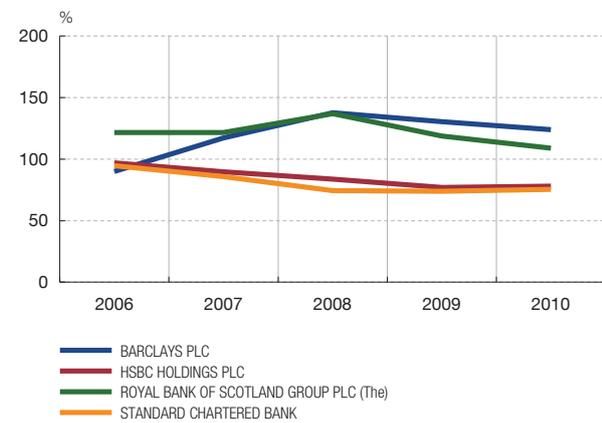
3.B EUROZONE BANKS



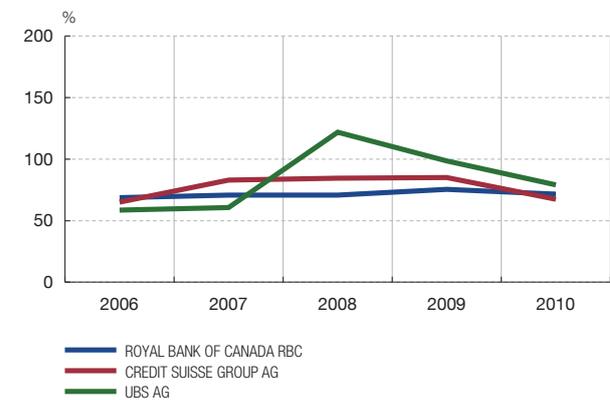
3.C JAPANESE BANKS (a)



3.D UK BANKS



3.E OTHER INDUSTRIALISED COUNTRIES (BANKS)



SOURCE: Bankscope.

a Japanese institutions (Chart 3.c) report in accordance with the Japanese fiscal year. Thus, 2010 end-of-period data are reflected by the statements released on 31.3.2011.