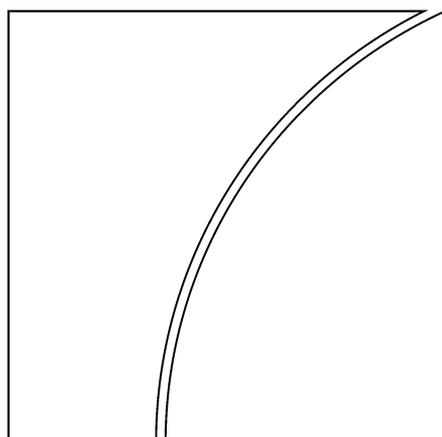


Basel Committee
on Banking Supervision

Working Paper No. 12



**Markets for Bank
Subordinated Debt and
Equity in Basel Committee
Member Countries**

August 2003



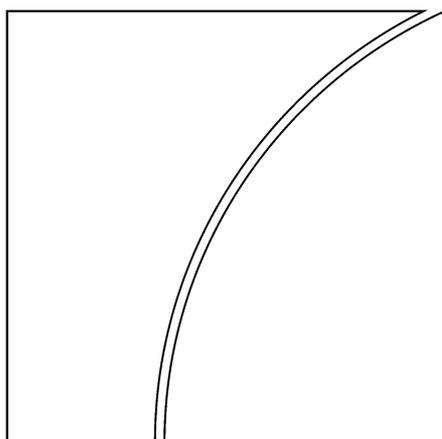
BANK FOR INTERNATIONAL SETTLEMENTS

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August 2003



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Markets for bank subordinated debt and equity in Basel Committee member countries¹

I. Executive summary

This paper is a study of the markets for banks' securities in ten countries (Belgium, France, Germany, Japan, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom, and the United States). It aims at contributing to the assessment of the potential effectiveness of direct and indirect market discipline.² This is achieved through collecting a rich set of data on the detailed characteristics of the instruments used by banks to tap capital markets, the frequency and size of their issuance activity, and the share of issuing banks in national banking systems. Further, information is collected on the amounts of debt and equity outstanding and about trading volumes and liquidity. We evaluate developments over the period from 1990–2001. We focus on subordinated bonds among banks' debt instruments, because they are the prime class of uninsured instruments suited to generate market discipline and have been proposed by some observers as a mandatory requirement for banks.

The **main conclusions** of the study are as follows:

First, subordinated debt issuance is widespread: over the 1990–2001 period and in the ten countries contributing to the study, 5,600 issues took place, and the banks that issued subordinated debt (SND) represent more than 50% of banking assets in all countries. The study also finds that in some countries very small institutions are among the active issuers (e.g. in Germany and Spain). While some caveats apply, this suggests some potential for direct market discipline also in the case of small banks. However given the small size of the issuances, the fact that they are generally privately placed and that many of the small banks are publicly owned (Germany), this potential may be severely limited.

Second, the size of SND markets and potential for market discipline from such markets is not in proportion to the research that has been conducted on such markets. For example, the US SND market is no larger than the one of some larger European countries (Germany, United Kingdom) or Japan. Taking the euro area as one market, the data suggest that given the comparable size of the economies, the euro area SND market is larger than the one in the US by a factor of more than two.³ This is a striking finding; given the almost exclusive attention that research has devoted to the US and the limited evidence available for other countries (Appendix B). However, the US has the largest market in *public* SND issuance in terms of value of the instruments over 1990–2001, which is relevant for the depth of the secondary markets providing for indirect market discipline. Still, public issues are also high in Germany and the United Kingdom, as well as the Netherlands, suggesting that the scope for indirect market discipline could also be substantial in those countries. While overall SND

¹ This report is based on submissions from members of the Basel Committee's Research Task Force. It is coordinated by R. Gropp and J. Vesala (both European Central Bank). The views expressed in this report are those of the authors and do not represent the official views of the Basel Committee, its member institutions or the BIS.

² Direct market discipline refers to the idea that anticipation of higher refinancing costs may constrain banks risk taking, while indirect market discipline is the notion that market signals may be useful to supervisors in detecting weak banks.

³ As the report covers only five of the twelve euro area countries, more precise comparisons are not possible.

markets in Japan are sizeable, Japanese conditions so far do not seem very conducive with market discipline mainly due to the dominance of private placements and non-listing of the existing public issues.

Third, the relatively low frequency of issuance and the long-term maturity of currently issued SND instruments are not in line with some proposals for mandatory SND requirements. The report finds that banks tend to issue SND generally less than twice a year, and average initial terms to maturity tend to be in excess of 10 years. Most proposals for SND requirements would have viewed at least four times a year and an initial term to maturity of two years as particularly conducive to direct market discipline. There is, however, a relatively large group of major banking institutions which issued SND frequently and in sufficient amounts suitable to encourage direct market discipline.

Fourth, given that banks issue SND at all, in many countries they tend to issue more than they are likely to be permitted to use for regulatory purposes.⁴ Hence, the report briefly discusses other motives for issuing SND and identifies taxes, limited deposit insurance, and the relative development of equity versus debt markets as complementary explanations.

Fifth, SND markets grew steadily over the period under study and the average size of issues increased considerably. Applying quite rigid liquidity and frequency of issue requirements, we identify a group of banks for which indirect market discipline almost certainly can be effective. More generally, we find that public placements greatly dominate private placements in value, which may support secondary market discipline also for a broader set of banks. Nevertheless, the quite small average size of the issues by smaller banks, weak liquidity and the concentration of the volumes of outstanding SND at major banking organisations all suggest that the availability of signals would ultimately be limited to the largest organisations.⁵

Sixth, secondary equity market signals could be useful monitoring devices due to ample liquidity in the case of major banking institutions. The markets for bank equity have also become increasingly deeper and more liquid over time, which is indicated by the growing average equity trading volume. In general, the potential strength of equity markets in disciplining banks would lie mainly in providing secondary market signals (i.e. indirect market discipline).

Seventh, the study concludes that for a number of reasons (the incentives of equity holders, frequency of issues) direct market discipline is not likely to arise from equity markets. Equity issuance is neither a common nor regular occurrence for major banking organisations. Since 1990, such issues have occurred rather sporadically. It seems likely that this is at least partially a consequence of the period under study. High levels of bank profitability in the late-1990s and 2000/2001 (the sample ends in 2001) have limited the need to resort to costly equity issuance, as banks have been able to accumulate retained earnings. Active equity issuance seems to have been related to maintaining adequate capital buffers and generating equity instruments to finance expansion and consolidation. Equity does not seem to be used as strongly as SND for funding purposes by banks and the two instruments seem to be complements rather than substitutes.

⁴ The Basel capital rules permit the use of SND as part of Tier 2 capital, but limits it to 50% of Tier 1 capital.

⁵ However, in the case of the largest banks too-big-to-fail may prevent effective market discipline. We do not examine this issue in this study.

Finally, the availability of the signals and thus potential market discipline is narrower from equity markets than from SND markets as equity market activity is more focused on the largest banks. Interestingly, the situation is the reverse in the US, as more banks have publicly traded equity than traded subordinated debt. Further, the trend toward financial conglomeration implies that the equity prices quoted for financial conglomerates or financial holding companies may increasingly reflect non-bank activities. The same would hold for SND as well when it is issued at the holding company level.

II. Introduction

The study is motivated by the considerable interest in the community of bank supervisors and central banks on the quality and availability of market signals on banks' current and prospective financial condition and risks. The basic reasons for this interest are twofold. One, increased cost of raising new debt or equity in the primary capital markets could exert *direct market discipline* on banks.⁶ Namely, the anticipation of higher re-financing cost may constrain banks' risk-taking. This could complement the activities by supervisory authorities in constraining banks' risk-taking. Second, the prices of banks' outstanding securities (bond yield-spreads and share prices) could provide a signal of the bank's financial condition and risk outlook (i.e. default risk). Therefore, spreads and share prices could provide inputs to the monitoring exercised by private investors, supervisors and central banks. The monitoring and potential corrective actions by market participants and authorities have been labelled *indirect market discipline*. In particular, supervisors can use the (secondary) market signals as screening devices or inputs into early warning models geared at identifying banks, which should be more closely scrutinised.⁷ In addition, central banks may be able to use such data as potential indicators of systemic fragility. While market prices may not contain information above and beyond that contained in other sources, they may efficiently summarise such information in a few convenient indicators. Moreover, market information is available at a very high frequency, in particular relative to balance sheet and income statement information. Finally, market information is inherently forward looking, compared with backward looking accounting data.

The potential benefits of market discipline are explicitly reflected in Pillar III of the proposed New Basel Capital Accord.⁸ In Pillar III, it is recognised that market discipline has the potential to reinforce capital regulation and other supervisory efforts to promote the safety and soundness of banks. The Committee aims to encourage market discipline by developing a set of disclosure requirements, which are intended to permit an assessment of default risk by market participants. These include information on capital, risk exposures, risk assessment by the bank and management processes.

⁶ The distinction between direct and indirect market discipline was first expressed in the Board of Governors of the Federal Reserve System "Using Subordinated Debt as an Instrument of Market Discipline" Staff Study 172, December 1999.

⁷ Supervisory early warning models combine a set of bank-level financial indicators (balance sheet, income statement and market indicators), and sometimes other variables (e.g. macroeconomic conditions), to make a prediction about the future state of a bank. A growing number of supervisory agencies have been experimenting with these kinds of models. See "Supervisory Risk Assessment and Early Warning Systems" by Sahajwala and van den Bergh, Working Paper 4 of the Basel Committee on Banking Supervision.

⁸ See Third Consultative Paper, April 2003, Basel Committee on Banking Supervision.

One major objective of this paper is to provide a first assessment of the potential for market discipline in member countries. Market discipline can arise from debt and equity market prices. The academic and policy discussion has largely focussed on discipline arising from subordinated debt (SND), since its junior status makes it more risk-sensitive than uninsured senior debt instruments. There is extensive evidence for the US and some evidence for Europe (see Appendix C) that the primary and secondary market prices for banks' SND instruments can indeed reflect risk-differences across banks and could thus constitute a source of direct and indirect market discipline. Market participants and also increasingly supervisors and central banks already monitor market price movements. However, there is some recent evidence that banks' SND issuance decisions are also affected by the perception of their risks so that banks would tend to avoid issuance when the required risk premium would be high.⁹ This would weaken the power of direct market discipline and possibly also that of indirect market discipline as the frequency of issuance and the liquidity of existing debt outstanding tend to be correlated.

While the focus has been on SND, it has been argued more recently that equity market signals can be as or even more attractive monitoring devices and leading indicators of bank fragility than SND prices (see Appendix C). For this reason, this study covers both SND and equity markets.

This study aims at contributing to the assessment of the potential effectiveness of direct and indirect market discipline. This is achieved though collecting a rich set of data on the detailed characteristics of the instruments used by banks to tap capital markets, the frequency and size of their issuance activity, and a range of characteristics of issuing financial institutions. Further, information is collected on the amounts of debt and equity outstanding and about trading volumes and liquidity. Consequently, the study looks at, in the first instance, whether suitable market instruments exist and their potential direct and indirect market discipline. We evaluate developments over the period from 1990–2001. We focus on subordinated bonds among banks' debt instruments, because they are the prime class of uninsured instruments suited to generate market discipline and have been proposed by some as a mandatory requirement for banks.

The study builds on two earlier contributions, namely a study summarising US subordinated debt markets¹⁰ and one doing the same for Europe.¹¹ However, this study is the first to attempt to collect comparable data across the largest European countries, Japan and the US. The study also takes a first step at examining the relevance of equity markets for market discipline. Further, as the data are often official information from supervisory authorities and central banks, they tend to be quite comprehensive. And finally, the study hopes to gain additional useful insights from extensive cross-country comparisons.

The paper is organised as follows. Section III discusses the existing regulatory requirements, tax and other factors affecting banks' issuance of subordinated debt and equity. It also recalls the existing SND proposals in the academic literature to foster market discipline to provide some background for assessing the character of SND markets and instruments.

⁹ See Covitz, Hancock and Kwast "Market Discipline Reconsidered: the Roles of Deposit Insurance Reform, Funding Manager Decisions and Bond Market Liquidity", Board of Governors of the Federal Reserve System, Washington, DC Working Paper No 2003-46, April 2003.

¹⁰ FRB, 1999 op. cit. See also Hancock and Kwast, 2001. "Using Subordinated Debt to Monitor Bank Holding Companies: Is it Feasible?" *Journal of Financial Services Research* 20, pp. 147-187.

¹¹ Sironi "An Analysis of European Banks SND Issues and its Implications for the Design of a Mandatory Subordinated Debt Requirement" Mimeo, Bocconi University, October 2000.

Section IV presents the evidence concerning SND markets (main features, time trends, scope of issuance, and bank-level evidence). Section V turns to discussing bank equity markets (main features, trading, and issuance activity). The report is accompanied by a number of appendices. Appendix A reviews the main country-specific definitions for instruments eligible for regulatory capital purposes, Appendix B summarises the mandatory subordinated debt proposals in the literature and Appendix C the existing relevant empirical literature.¹²

III. Why do banks issue subordinated debt and equity?

Like other firms, banks' decisions to issue securities are driven by the need for funding and the choice among instruments is by a myriad of considerations, including bankruptcy costs, agency costs and taxes. In addition, since banks' liability structure is regulated through capital adequacy standards, the issuance of SND and equity instruments may also be affected by the eligibility of these instruments as components of regulatory capital.

Basel regulatory requirements

The 1988 Basel Capital Accord (as amended subsequently) has been widely adopted as the framework for capital adequacy regulation at the national level. Under the Basel standards, eligible capital includes shareholders' equity (plus retained earnings and minority interests), general provisions and loss reserves, "hybrid" capital instruments (e.g. trust preferred stock), and term (fixed-maturity) subordinated debt. Bank capital is intended to absorb losses without the interests of the senior debt holders (especially insured depositors) being affected. The present revision of the Basel Accord will leave regulatory capital definitions unchanged.

The three tiers of eligible instruments decrease in the quality and loss-absorbing capacity of capital. To be eligible, the instruments have to adhere to supervisory rules concerning their detailed characteristics (such as deferral, subordination and maturity) and are subject to limits concerning the amount that can be counted as regulatory capital. There are also some national differences in the specific requirements (see Appendix A), which can affect banks' issuance decisions in cross-country comparison as discussed below (after considering the impact of the standard requirements).

In general, Tier 1 instruments must contain provisions for cancellation of dividend payments, deferred dividends should be non-cumulative, they should be subordinated to all debt, and they should not be of fixed maturity. There is no limit on the amount of Tier 1 capital a bank can hold, with the exception that if Tier 1 preferred stock were to be considered redeemable, this stock can be used only up to 15% of total Tier 1 capital.

Tier 2 capital consists of revaluation reserves and possibly undisclosed reserves, general provisions and loan loss reserves, up to 1.25% of RWA, hybrid capital instruments, and term SND. The hybrid instruments can include debt instruments, in particular perpetual SND, and also cumulative preference shares. We call these instruments here "upper Tier 2". The general conditions for eligible instruments are that payments should be deferrable, and that principal and interest can be written down, such that the instruments are effectively loss-

¹² Appendix C was prepared by Diana Hancock and Myron Kwast (Federal Reserve Board of Governors).

absorbing.¹³ “Upper Tier 2” instruments need to be subordinated to all debt. “Lower Tier 2” capital includes fixed-maturity SND with a minimum initial maturity of five years. There is no deferral of coupon payments and loss-absorption (i.e. write-down of principal or interest). In order to avoid a sudden diminution of the capital base, “lower Tier 2” is amortised in its final five years of maturity. Hence, banks frequently call the respective debt instruments at five years of remaining maturity if call options are included in the contracts.¹⁴ “Lower Tier 2” SND cannot exceed 50% of Tier 1 capital for inclusion in the capital base and total Tier 2 capital used to meet banking book requirements cannot exceed 100% of the Tier 1 capital used to meet those requirements.

Tier 3 capital consists of fixed maturity SND with a minimum maturity of two years. Tier 3 debt is not amortised and it ranks *pari passu* with “lower Tier 2” debt.¹⁵ Tier 2 and 3 capital must not exceed Tier 1 overall. Given its short maturity and limited role, as trading book capital requirements are typically small, Tier 3 is a relatively less important form of bank capital. Finally, Tier 1 capital must reach at least 4% of RWA, and the total capital base must reach 8%.

Equity and SND issuance in light of regulatory requirements

While a detailed discussion of banks’ liability structure is beyond the scope of this study it may be useful to discuss why banks issue equity and subordinated debt. The starting point for any discussion of this sort has to be the frictionless Modigliani-Miller world, in which banks would be completely indifferent between different sources of finance. In reality, three considerations importantly affect the decision of firms to decide on the capital structure and which particular instruments to use. These are agency considerations, tax considerations and, very important in the context of banks, regulatory and insolvency considerations. We ignore agency considerations in this report, as they would lead us far from the core of the report. As to the other determinants of capital structure, in general banks will select a structure which balances tax and bankruptcy considerations, given the constraints imposed by the regulatory regime.

As discussed in some detail above, bank capital regulation supports equity issuance by requiring a minimum amount of common Tier 1 equity, while it only allows the use of a limited amount of SND. Since banks need to meet the capital requirements on an ongoing basis and their ratings and funding costs are increasingly risk-sensitive under restricted deposit insurance,¹⁶ banks typically choose to hold a buffer above the minimum Tier 1 requirement. This is the case even though equity issuance is more costly than SND issuance because of the junior status, full loss-absorption and the tax disadvantages of equity.¹⁷ Also, the data

¹³ Note that “upper or lower Tier 2” are not official Basel concepts.

¹⁴ Morgan Stanley *op. cit.* suggest that having call options and exercising them at 5 years of remaining maturity is typical for bank SND. Data for the US suggest that call options were quite common (used in 50% or more of the SND issued by the top 50 US bank holding companies) from 1994 and 1999, while they became significantly less frequent after that. In Japan, 85% of SND instruments issued between 1991 and 2001 were callable.

¹⁵ What really distinguishes Tier 3 SND from “lower Tier 2” instruments is the required “lock-in” clause, which stipulates that principal and coupon can be deferred at the order of the supervisor if payment would cause capital to fall below requirements. For trading book capital requirements, Tier 2 and 3 SND cannot exceed 200% of the Tier 1 capital used to meet those requirements.

¹⁶ This effect can be diluted by the existence of an implicit safety net for banks that are considered too-big-to-fail. For a discussion of the impact of deposit insurance limitation, see Gropp and Vesala, 2002.

¹⁷ The Tier 1 ratios of major international banks are typically 6%-12%.

collected for this study indicate that the banks which issued equity over the study period of 1990-2001 went significantly over the Tier 1 requirement (see the summary table below).

Under some simplifying assumptions, we can evaluate the amount of SND on banks' books against the regulatory standards. Suppose all SND has fixed maturity and the SND issued to cover market risks is small.¹⁸ If banks issued SND for regulatory purposes only, subordinated debt should not exceed 50% of the Tier 1 capital. Aside from buffer capital, SND, hence, should not exceed 2% of RWA irrespective of the amount of the capital requirement filled by Tier 1 equity. However, the issue is complicated by the fact that most banks hold capital in excess of the regulatory minimum. The reasons for this buffer are a matter of debate. First, national regulators may have imposed a higher capital requirement on a discretionary basis. Second, banks for fear of violating the requirement want to retain manoeuvring room. Third, the market views 8% of risk-weighted assets as insufficient cushion against risks and demands a higher ratio and results in a higher rating and lower funding costs. If banks have Tier 1 capital above 4% of RWA, they can also use more SND to increase their overall capital ratio up to reaching the 50% limit against Tier 1.

Given these considerations, we discuss two benchmarks: Whether or not banks have more than 2% of risk weighted assets in SND outstanding, and (as a stricter benchmark) whether or not banks have more than 50% of Tier 1 capital outstanding. The summary table shows that on average banks in our sample hold 3.6% of risk weighted assets in SND. Hence, even on average banks tend to hold more SND than they can use for regulatory purposes on the basis of the first criterion. This is even more striking when considering only the 50 largest issuers of SND, as the average share of SND is 5.3% of RWA.¹⁹ This is clearly above what banks will use for regulatory purposes, especially since Tier 1 equity is typically well above its minimum level leaving less need for SND to meet the overall capital ratio. Even if one assumed that regulators required banks to hold more capital and, hence, Tier 1 capital was at the "minimum regulatory level" and that all SND was subject to the amortisation after five years of remaining maturity (i.e. no call options were exercised), the above amounts of SND are beyond what banks would be permitted to use for regulatory purposes.²⁰

Banks could issue perpetual upper Tier 2 SND corresponding to the amount of 4% of RWA for capital adequacy purposes. However, apart from the UK and Japan, the issuance of all perpetual SND is found quite rare in the set of countries included in this study (see summary table).

¹⁸ Our data confirm the view that the issuance of SND for Tier 3 purposes is limited as the average maturity of SND issues is quite long. Moreover, in many countries, banks have not issued short-term SND (2-5 years) at all, which is eligible only for Tier 3 capital (see Tables 4A and B).

¹⁹ Compare also Table 10 below.

²⁰ In the data set, the average maturity of SND is 11.4 years (excluding perpetuals), which would cause 26% of SND outstanding to be ineligible. Thus, all banks (the 50 largest SND issuers) in our sample would have 30% (110%) more SND than they can use for regulatory purposes.

Summary table: extent and maturity features of SND and equity issuance

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	UK 1990-2001	Switzerland 1991-2001	Japan 1991-2001	US 1990-2001	Total
Outstanding SND (percentage of equity, all banks)	73.1	89.2	55.2	83.9	24.6	43.7	n.a.	51.4	31.6	31.6	44.6
Outstanding SND (percentage of risk weighted assets, all banks)	9.0	n.a.	3.5	5.3	n.a.	5.7	n.a.	n.a.	1.5	3.4	3.6
Outstanding amount of equity (percentage of total assets, all banks)	4.4	n.a.	6.4	4.7	n.a.	n.a.	8.8	5.1	3.7	8.0	6.7
Average maturity of SND (years)	9.1	10.8	9.5	11.0	11.7	10.7	14.0	10.7	10.7	13.6	11.4
Share of SND of over 5 years maturity (percentage of total)	86.7	100.0	98.7	97.4	99.4	100.0	98.2	85.4	99.7	99.9	98.6
Share of perpetual SND (percentage of total)	16.2	4.9	-	7.7	3.9	15.0	40.9	-	39.4	-	5.2

-: zero value, n.a.: data not available

Sources: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank, Bank of Japan, Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

A further check of the relevance of regulatory considerations is the initial term to maturity of issues. This is because, for SND to count under Tier 2 capital, its initial maturity must be in excess of five years. It turns out that the vast majority of SND issues have in fact a longer initial term to maturity than five years, with 11.4 years as an average in the full sample. The relatively long maturities suggest that regulatory considerations do play a role. Nevertheless, given the large number of banks issuing SND far in excess of what they would be permitted to use as regulatory capital, it seems that regulatory reasons alone are unlikely to be able to provide the full explanation. This question is interesting against the background that banks in the presence of deposit insurance, unlike non-financial corporations, have access to a very cheap source of funding in the form of insured deposits. It would seem that if banks optimised their capital base and funding costs, they would not issue dated SND above 2% or RWA, and this is clearly not the case.

As regards the impact of the differences in national rules (see Appendix A), a first notable deviation is the ability of German banks to issue fixed maturity Tier 1 capital. In the US, banks can include up to 25% of Tier 1 capital in cumulative preferred instruments, so-called trust preferred stock.²¹ As discussed below, the use of trust preferred stock by US bank holding companies did expand after the decision to allow them as Tier 1 capital, largely driven by tax considerations.

Germany allows fixed maturity SND to be counted as ‘upper Tier 2’ capital, which can provide an additional incentive for banks to issue these instruments.²² Indeed, in Germany no perpetuals are issued (see summary table), as there is no specific regulatory benefit associated with them. In Germany, France and the Netherlands, “upper Tier 2” SND is also allowed to rank at the same level in seniority (“pari passu”) with “lower Tier 2” SND, which represents an incentive to invest in these instruments. Spain, instead, has a stricter rule as regards loss absorption for perpetuals included in “upper Tier 2” capital. In Spain, the share of perpetual SND is below average, which could be in part explained by the specific regulatory treatment. Overall, however, the differences in regulatory treatment seem to be too benign to explain the very substantial differences in the amount of SND banks have on their balance sheets.

A complementary reason for issuing SND may be the limited supply of insured deposits. In most deposit insurance schemes, there are limits to the insured amount and these limits tend to apply per depositor. Hence, insured deposits may be in limited supply and those banks that want to expand the balance sheet would need to issue other instruments. Given that, banks are left with a choice between issuing equity, issuing other non-SND debt or issuing SND. While equity obviously also is useful to satisfy capital requirements, it may be relatively expensive and thus not considered for funding purposes. It could be primarily used to provide for an adequate buffer above regulatory requirements, in particular if internal funding sources are limited because of weak profitability. Our analysis of equity issuance suggests that, perhaps apart from the issuance of trust preferred stock by US banks, banks issue equity primarily for beefing-up capital levels and to replace weakened internal funding sources (see Section IV).

²¹ Source: Morgan Stanley “Bank Capital A-Z”, January 2002. The Federal Reserve approved in October 1996 the inclusion of these instruments into Tier 1. Trust preferred stock is issued by special purpose vehicles set up by bank holding companies for this purpose. The proceeds are lent to the parent company in the form of a 30-year SND instrument.

²² Source Morgan Stanley op. cit.

In this context, it may be interesting to consider the different taxation regimes for debt and equity. In general, interest is taxed only at the investors' level, as it is deductible from corporate tax at the bank level. In contrast, dividends are not deductible from the corporate income tax in countries covered in this report. Even though most countries have partially integrated the corporate and personal taxation of dividends in order to reduce the tax advantage of debt, the integration tends to be incomplete, such that some tax advantage to debt financing may remain.²³ The US is an extreme case in this context, as dividend taxation is not integrated. This means that dividends are taxed twice, once at the bank level and a second time at the investors' level. Hence from a tax perspective, US banks should issue relatively more debt than banks in other countries. From the summary table, we can see that this is not the case, as the US is at the lower end of SND amounts outstanding (31.6% of equity as opposed to 44.6% for the sample as a whole). Hence, from this crude analysis, it appears that differences in taxation do not play a major role for the propensity of banks to issue SND.

We would conclude that equity is issued primarily to maintain adequate capitalisation, and not for funding purposes, apart from issuing equity to be used for restructuring (mergers and acquisitions) (see Section IV). We could imagine four determinants of the share of subordinated debt in banks' balance sheets. One, the fact that subordinated debt may help satisfy regulatory requirements. Second, the limits of deposit insurance per depositor, resulting in the need for expanding banks to find alternative sources of finance. Third, the tax treatment of debt versus equity would make debt preferred to equity for funding purposes, although this would not necessarily suggest the issuance of SND as senior debt exhibits the same benefit. One reason for the co-existence of the two classes of banks' uninsured debt seems to be related to the heterogeneity of investors with preferences for different kinds of debt instruments.²⁴ Other reasons can be due to the depth of particular debt markets, which affects the relative costs of the instruments.

Proposals of mandatory SND issuance

Mandatory issuance of SND has been proposed by some observers in order to support market discipline. These proposals are reviewed here in order to provide an idea of what features of SND have been considered useful for developing market discipline. The desirability and/or feasibility of the proposals are not assessed in this study. In addition, one should note that the existing proposals for mandatory SND issuance are based on the US experience and may not, therefore, necessarily be applicable to other countries.

Proposals to use SND requirements as disciplining devices for banks can roughly be divided into three groups: 1st, 2nd and 3rd generation proposals.²⁵ The main characteristics are summarised in Appendix B. In summary: 1st generation proposals relied largely on the disciplining through increases in the cost of funding. 2nd generation proposals rely on the inability to issue new funds by poorly performing banks through put options. And 3rd

²³ Generally the integration of dividend taxation works as follows: The firm pays the full corporate income tax on all profits, whether distributed as dividends or not. The investor receives the net of tax dividend plus some flat tax benefit, which is supposed to compensate for the corporate income tax the firm already paid. The investor then pays his or her personal income tax rate on the total (dividend plus tax benefit).

²⁴ See U. Birchler and D. Hancock "What Does the Yield on Subordinated Bank Debt Measure?", mimeo, February 2003.

²⁵ See FRB, 1999 op. cit.

generation rely on caps on the spread of SND issues over the comparable maturity risk free rate.

1st generation SND requirements would ask banks to issue SND at relatively short maturities, while the maturity should be long enough to prevent runs. The proposals are relatively heterogeneous with regard to the amount that banks should be required to issue, and range from 2% of total liabilities to 3%–5% of deposits and 1%–4% of risk weighted assets. Issuance should be frequent, although not necessarily at regular intervals. The main motivation behind the proposals was essentially to permit a discretionary increase in capital requirements, without asking banks to issue more costly equity and, hence to provide an additional cushion of junior claimants, in case the bank fails.

2nd generation SND requirements were motivated by the supervisory forbearance in the early 1980s during the S&L crisis in the US. The proposals complemented the idea of higher funding costs for riskier banks with the ability of banks to issue (or roll over) SND. The inability of a bank to issue SND was to be used as a trigger to force supervisory discipline. The proposals required banks to issue SND on a frequent basis (multiple issues per year) and/or proposed to attach a put option to the debt, which permitted the holder to require the bank to re-purchase its debt. Each bank's ability to issue SND would then be a market signal of its viability.

A weakness of these proposals was that they rely exclusively on banks' ability to issue debt (direct market discipline) and fail to use the information contained in primary or secondary market spreads (indirect market discipline). The proposals permitted issuance at the necessary rate to attract investors and, therefore, banks could be operating at high-risk levels without triggering supervisory action. Put options, on the other hand, give investors a powerful tool to discipline banks by enabling them to demand early repayment of the SND. However, as FRB, 1999, argues, there are also a number of arguments against put options. One, market liquidity and comparability of risk premia may be reduced. Second, the decision to close a bank may be taken out of the hands of supervisors and put into the hands of individual investors. Further, individual investors may act pro-cyclically, as many banks may have financial difficulties concurrently at the time of an economic downturn. In addition, there may be simultaneous "runs" on banks arising from put options, resulting in an increase in systemic risk. This would be inconsistent with the "non-runable" arguments for introducing SND requirements in the first place.

The 3rd generation proposals attempted to alleviate these weaknesses by combining elements of 1st and 2nd generation SND requirements. These proposals would require banks to issue SND with a maturity of 2 years on a monthly basis and would impose a cap on the spread over the risk free rate of 50 basis points. Banks that are unable to issue SND at rates under the cap would consequently be forced to shrink their assets by 1/24 per month.²⁶

IV. Subordinated debt markets

In this section, we characterise the primary and secondary markets for SND instruments in order to analyse the potential effectiveness of direct and indirect market discipline on banks.

²⁶ 1/24 is obtained assuming that banks use 2% RWA of SND as part of their capital base.

Tables 1–13 and Charts 1–6 summarise the primary markets for subordinated debt. We have information on roughly 5,600 subordinated debt instruments issued by banking organisations headquartered in Belgium, France, Germany, the Netherlands, Spain, Sweden, the UK, Japan, Switzerland and the US. The total amount issued is some \$438 billion. This, in the case of the majority of countries, involves issues during the period of 1990 to 2001, though in some cases the coverage is shorter (Belgium: 1992–2001, France: 1997–2001 and Japan and Switzerland: 1991–2001). In the following we summarise the most important features of these issues and attempt to highlight patterns across countries, as well as examine the relationship of these features among each other.

Despite the efforts to harmonise data collection, it was inevitable that there were differences across countries in the scope and nature of the data provided, which must be kept in mind when interpreting the findings. The most important differences are twofold. First, the US data only include the top 50 bank holding companies, whereas other countries have provided more comprehensive data covering all or almost all of the banks in the respective country. Nevertheless, the US data do still cover around 75% of the total banking assets in the US. Second, the ownership structure of banks can differ, which might affect the extent of market discipline arising from SND issuance. For instance, the data may include a certain amount of issuance by government-owned institutions (e.g. in Germany), or by banks receiving capital support from the government (e.g. in Japan).

Over the 1990–2001 period, the most active issuers of subordinated debt were German banks, with 3,459 issues, followed by US banks (820 issues), Japanese banks (319 issues), UK banks (282 issues) and Spanish banks (253 issues) - see Table 1A. German, US and UK banks issued the largest amount of subordinated debt, US\$ 95 billion, US\$ 92 billion and US\$ 91 billion over the time period, respectively. Japan also has sizeable activity the total value reaching US\$ 49 billion over the period (Table 1B).

These overall findings stand somewhat in contrast to research activity on subordinated debt issues and market discipline on banks. As detailed in Appendix C, the overwhelming majority of studies consider US data. There are 38 studies examining market discipline for the US and four using European data, while we were able to find only one study using Japanese data. There seems to be considerable scope and need for examining market discipline outside the US.

Main features of the market

Next, let us consider some of the features of subordinated debt issues. With respect to currency (Tables 1A and 1B), the most important currencies of issuance are the US dollar (39%) and the euro and its predecessor currencies (38% of total value), followed by the GBP and the Japanese yen at 10% each. Table 1A summarises the currency distribution by number, and it is clear that those figures are dominated by the fact that more than 60% of all issues took place in Germany (see below).

Tables 1A and 1B suggest that banks with larger domestic markets mainly issue in their national currency. In fact, US banks exclusively issue in their national currency. The exception to this rule is the UK, where only about 40% of all issues in value and number are issued in GBP and euro (and predecessor currencies, largely LUF) and US\$ amount to 20% each.²⁷ There is an important aspect of the role of the euro in the European context, as it

²⁷ Among the euro predecessor currencies, the Luxembourg Franc plays a special role, as it not only accounts for a significant share of Belgian banks' issues (13%), but also of German (3%) and UK banks (5%).

considerably broadens the investor base (and hence liquidity) for larger banks operating with smaller home markets (Belgian banks for example). While we do not have detailed information, it is likely that banks have taken advantage of this aspect. If so, the euro may play an important catalytic role in enhancing market discipline in Europe, particularly for banks residing in smaller countries. Over time, it appears likely that banks residing in the euro area will behave more like their counterparts in Japan and the US, and issue predominantly in euro.

The vast majority of subordinated debt issues have been “plain vanilla” fixed rate notes (80%, Table 2). However, this overall figure hides considerable variation among countries. While issues have been mostly fixed in the US, UK, Switzerland, the Netherlands, and Germany, Japanese banks issue slightly more floating rate notes than fixed rate, Spanish banks predominantly issue floating rate instruments (67%) and Swedish banks exclusively issue floating rate instruments. While these differences in part may be attributable to differences in inflation history (e.g. Spain) and may be expected to disappear over time, other factors (such as the structure of assets and liabilities) also must play a role, as in the case of Sweden and Japan. It should be stressed that the figures tell us little about interest rate risk, as interest rate swaps (swapping a fixed coupon stream for a variable coupon stream or vice versa) may be common, at least in the US (FRB, 1999).

Two specific features of the SND issues are of particular interest in the context of market discipline. One, as discussed above, some of the 2nd generation subordinated debt proposals featured a relatively prominent role for put options, i.e. the right of debt holders to demand early repayment of the instrument. It is of interest that there is not a single “puttable” issue among those considered in this paper.²⁸ Hence, requiring banks to issue puttable debt would involve a major change, as such instruments have failed to spontaneously emerge in the market. Similarly, the roughly 5,600 SND issues considered here do not contain a single case of convertibility into common or preferred stock, as some recently have argued may be desirable from a market discipline perspective.²⁹

Second, Tables 3A and 3B summarise the SND issues from the perspective of market type. In numbers, 42% of the issues is publicly placed and 53% private placements (for the remainder the information is not available). The relations are more than reversed when looking at market value; here more than 69% are public placements and only 24% private. This suggests that, as one would expect, public placements tend to be significantly larger than private placements.

However, as in previous tables, the overall figures hide considerable cross-country variation. The figures for number of issues are largely driven by Germany, which during 1990 to 2001 reports no less than 2,500 private placements of subordinated debt. In addition, almost all of 319 Japanese SND issues are privately placed.³⁰ In contrast, the Netherlands, Sweden, Switzerland, and the UK report that the vast majority of SND issues (77% to 98%) are publicly placed.³¹ It should be noted that most Japanese issues in 1998 and 1999 were related to the injection of public funds in the banking sector. These issues are held by the

²⁸ One reason may be that puttable debt is often disallowed under capital rules (e.g. the US).

²⁹ See M. Flannery (2002) “No Pain, no Gain? Effecting Market Discipline via “Reverse Convertible Debentures” University of Florida Working Paper.

³⁰ There was no split into private and public issues in Japanese data concerning the most popular euro market issues, but they are deemed mostly private because of the relatively small amounts and complexity of transactions.

³¹ The US provided data only for public issues.

government (the Resolution and Collection Corporation) and amounted to \$15 billion, i.e. 31% of the total SND issuance by Japanese banks 1991–2001. These issues do not seem likely candidates to foster market discipline in Japanese banks.

The question of the proportion of SND issues that is publicly issued (and traded) is important, because it can provide an upper bound on the number of SND issues which may provide secondary market signals to supervisors. Only public issues can provide both direct and indirect market discipline. Direct market discipline is, in principle also available through private placements. In these cases, the negotiation with investors delivers the impact on the bank's funding cost, while in public issues it is the price at which the issue is taken to the market. The extent of direct market discipline through private placements is unclear and needs further research.

While far from a sufficient condition for indirect market discipline to arise from secondary markets, public issuance is clearly a necessary condition. Viewed in this light, it is interesting to note that there are more than 1,400 SND's publicly issued in the covered group of EU countries alone, amounting to 40% of the total value of SND issued. Note also that in the US and the Netherlands, it is not banks that issue publicly traded SND but rather the bank holding company or the financial holding company.

Analysing the data more deeply, we find that in the case of Germany, the public placements are overwhelmingly domestic, while in the Netherlands, Switzerland, and the UK, euro placements dominate. Only in the UK and Switzerland, are there a few (nine and three, respectively) global placements of SND issues. We would consider it likely that European placements are more liquid than domestic ones, even in the case of a "large" economy like Germany's, and we consider global placements to be more liquid still. Taking this line of argument to its logical conclusion, it appears that of the roughly 4,000 European SND issues for which we have the information, about 25% would be actively traded (1,000 issues) and, hence, can be expected to yield reliable secondary market prices. It also suggests, not surprisingly, that signals from secondary markets can very likely only be obtained for the largest banks, whose issues are large enough to warrant the high fixed cost of an international SND issue. The US country report suggests that the SND of the top 15 to at most 20 banking organisations is traded regularly. These 20 institutions issued SND publicly 742 times from 1990 to 2001. In Japan, banks initially issued SND via their foreign subsidiaries (sometimes in tax heavens), and were only allowed after 1997 to issue domestically.

In conclusion, looking at the public SND issuance volume, the availability of indirect market signals appears greatest for Germany in the number of banks. When examining the nature of the instruments, the scope seems most reduced for Japan due to the high share of private placements, and bank-support related issuance (Table 3A). In terms of SND value, the public issuance by the US, Swiss, Dutch, and UK banks, appropriately adjusted for the size of the respective economies, is larger than that of German banks (Table 3B).³²

The final SND characteristic that we consider is the initial term to maturity of the issues (Tables 4A and B). The vast majority of issues have an initial term to maturity of between 5 and 15 years (85%). This is true in all countries except the UK and Japan, where perpetual issues have a share of 40%. Leaving perpetuals aside, the mean initial term to maturity is around 9-11 years in all countries, again with the UK being the exception, as there non-

³² See the discussion of liquidity conditions below.

perpetual SND issues have an initial term to maturity of 14 years. US issues also tend to have a longer term to maturity of just under 14 years.

Recall that in order to facilitate direct market discipline, SND issues should be relatively short-term, as banks should be forced to access the market on a frequent basis. Most recent mandatory SND proposals argue in this context that an initial term to maturity of around two years would be optimal, as an even shorter maturity would contain the risk of SND “runs”. On the other hand, as was argued in FRB, 1999, a homogenous initial term to maturity may improve indirect market discipline by facilitating liquidity and comparability of secondary market signals. Viewed from this perspective, the current situation may not be optimal from either criterion: generally the initial term to maturity is too long to facilitate frequent market access and not homogenous enough to facilitate comparability. Taking homogeneity of initial term to maturity as a criterion, the US, France, Germany and the Netherlands stand out as relatively homogenous, while Belgium, the UK and Japan (a significant number of perpetuals), and Spain (a high share of SND with more than 20 year initial maturity), are considerably less so.³³

Trends over time

There are clearly many ways to look at the data (did maturity change over time, currency, etc.). We will focus on relatively broad-brush considerations, such as frequency and issue size, as well as total SND outstanding by banks. The main trends are summarised in Charts 1–6.

Chart 1A plots the number of issues per year from 1990 to 2001 in the countries covered by this study. There is a strongly increasing trend during the first half of the 1990s and some levelling off after 1994. However, this trend is somewhat exaggerated by the large increase in German SND issuance during the period, as becomes evident in Chart 1B, which excludes Germany. In most other countries, SND issuance, while fluctuating, exhibits no strong trend during the 1990s. Aside from Germany, we can detect distinct trends in two countries. For the UK, the chart shows a strong increase in the period 1998-2001. And in the US, where, after a steady increase in issues until 1997, issuance noticeably declined in 1999/2000, only to pick up again in 2001. The reasons for the decline in the US are not entirely clear. Possible explanations include the economic downturn that started in 2000. While this may have been a contributing factor, it is unlikely to provide a full explanation, given that growth also declined in other countries covered in this paper and that non-financial corporate issuances of debt were at a record high in 2001 in the US. In part, the substitution of senior debt and trust preferred stock for subordinated debt may be the explanation. Both instruments increased considerably during the period from 1996 to 1999.

In contrast to the number of issues, there is a clear increasing trend in all countries, apart from the US and Switzerland, in the total amount of SND issued (Chart 2). In this context, UK developments are particularly striking: The average total amount issued per year between 1990 and 1998 was US\$ 3.7 billion, between 1999 and 2001 this figure increased to US\$ 19.4 billion. Belgium also shows a strong increase in amounts issued (average 1992–1998: US\$ 1 billion, 1999–2001: US\$ 3 billion). A similar pattern can be detected in Spain where the 1990 to 1998 average was US\$ 1.6 billion, which increased to US\$ 4.2 billion in 1999 to 2001. The figures for the Netherlands are more variable over time, but issuances in 2001

³³ The time to maturity may matter for the information content of secondary market signals, as they reflect the probability of failure over the horizon of the remaining maturity. Hence, the spread of a 2 year bond reflects the probability of failure within 2 years, the spread of a 10 year bond the probability of failure within 10 years.

stood at a record high of more than US\$ 5 billion. These strong increases in the size of total issuance in European countries since 1999 are in line with evidence from corporate bond markets more generally, which have strongly increased in size in Europe since the introduction of the common currency. Whether these trends will be sustained over a longer time period remains to be seen; in the case of issues of non-financial institutions a marked levelling off could be observed in 2002. However, it seems likely that the increases observed in Belgium, the Netherlands and Spain suggest that SND issues have become cheaper due to the larger investor base in the euro area. The data for Germany are more ambiguous on this issue. At the same time, the common currency can at best only partly explain the increase in the UK, where instead take-over bids (or failed take-over bids) may have provided additional incentive to issue SND.

Combining the information of the two previous paragraphs, namely that in most countries the number of issues has remained flat over time with the information that, again in most countries, total amounts issued increased substantially, we can conclude that the average size of issues has increased (Chart 3). Focusing first on those countries with the largest issues most recently - i.e. Japan, the Netherlands, Sweden, Switzerland and the UK. In Japan, the large average size in 1998 is related to the injection of public funds in the banking sector. The average size of issues shows an interesting pattern in the Netherlands. Through 1995, average size declined (from US\$ 300 million to US\$ 70 million), only to steadily increase thereafter, reaching US\$ 1 billion in 2001. In Sweden, trends are similar, with mean issue size increasing from 1996 onwards, also reaching its peak in 2001 with US\$ 500 million. Finally, in the UK and Switzerland average size of issues has quite steadily increased during the entire period under consideration, reaching its peak in 2000 and 2001 with just over and just under US\$ 400 million, respectively.

A surprising finding is the absence of the US in the large average issue group (in addition to having relatively few issues, at least in 2000/2001). Average issue size in the US has remained essentially constant during the decade. This implies that at the beginning of the 1990s, US banks' issues were relatively large, while towards the end of the decade US issues at US\$ 100 million were quite small in comparison to those in other countries.³⁴ This average, in addition, hides considerable variation, as the smallest issues tended to be below US\$ 5 million and the largest at US\$ 3 billion. As a comparison, it is interesting to consider Belgian and Spanish figures. Average issue size in Belgium and Spain has increased steadily during the 1990s. In 1997–1999, average issue size was quite similar to the US in both countries, also just above US\$ 100 million, although with considerably less variation in size in the case of Belgium (minimum: US\$ 40 million, maximum: US\$ 400–900 million).

Finally, Germany stands out with a high number of relatively small SND issues, which are distributed among a very large number of issuing banks. This is reflected in the much smaller average issue size of around US\$ 30 million during the period under consideration.

Chart 4 shows that total amounts outstanding have substantially increased over the ten years analysed. The largest amounts of SND outstanding include Germany (US\$ 100 billion), the US (US\$ 80 billion for the top 50 BHCs) and the UK and Switzerland with around US\$ 50 billion, respectively. But even in smaller European countries, SND outstanding is sizeable, e.g. in Belgium and The Netherlands at around US\$ 25 billion. Related to this is the question of how many banks have subordinated debt outstanding and their share in total assets of the banking system. Charts 5 and 6 summarise the findings. In most countries, the

³⁴ Note that this finding becomes even more striking, when considering that the US data are limited to issuances by the top 50 BHCs.

number of banks with subordinated debt on their balance sheet is a small share of the total number of banks. In Sweden and the Netherlands the share is below 5%, in Germany and Spain it is slightly higher, at around 10% (Germany) and 20% (Spain). In the UK, the coverage in number of banks is, on the other hand, quite high with shares of generally above 50%. Further, as shown in Chart 6, in most countries the share has remained unchanged, with the exception of Spain, where the percentage of banks with subordinated debt outstanding increased from 18% in 1992 to 31% in 2001. The figures in Chart 6 reflect the fact that in most countries only the largest banks issue subordinated debt. From the perspective of market discipline it may be more instructive to consider the share of assets in the banking system of banks with subordinated debt outstanding. One can look at these figures as a measure of the share of assets potentially subject to market discipline. Chart 6 shows that the coverage in terms of assets is much higher than coverage in terms of numbers, which is a reflection that in most countries only large banks issue subordinated debt. In addition, during the 1990s, this coverage has steadily increased in all countries, for which we have data. The coverage is at or above 60% of total assets in all countries, above 70% in Germany and above 80% in Sweden and Spain.

A complementary way to look at the coverage of the banking system is to consider how concentrated SND issues are. The higher the concentration in issuance, the smaller the coverage of banks, although this effect should be qualified by differences in the concentration of the banking system. These figures are reported in Tables 5A and 5B and show that there are substantial differences in the share of SND issues of the largest three, five and ten banks. In three countries (Belgium, the Netherlands and the UK) the ten largest banks were responsible for issuing all subordinated debt. In Belgium and the Netherlands, this reflects the concentrated structure of the banking system, in the UK, it reflects the fact that smaller banks do not issue SND. Despite the fragmented US banking system, SND issuance is also quite concentrated in the US, as the 10 largest BHCs issue 82% of all subordinated debt. In contrast, Germany gives a completely different picture. In numbers, the 10 largest banks only issue less than 20% of all subordinated debt. This means that many smaller banks also issue SND. However, the issues of smaller banks tend to be smaller in size. This is reflected in Table 5B, where we see that 17% of German banks issue 70% of all SND in value. These figures reflect that even very small banks issue SND in Germany, although on a very small scale. Finally, Spain is an interesting case in the sense that the Spanish banking system is relatively concentrated (in comparison to Germany and the US), and nevertheless smaller banks also issue SND in significant numbers and value.

Bank level evidence

Tables 6–10 give information on frequency, average size, and total amount of issues for individual banks, as well as SND issued as a percentage of a number of basic individual bank characteristics. Note that the tables include data for France for the period 1997–2001 only. We largely focus on Table 8, which ranks banks by average issue size, and on Table 9, which ranks banks by the average number of issues per year. In addition, Table 6 gives some overall averages for the group of banks covered in this study as a whole, as well as country averages.

Starting with the overall averages, we find that on average the 210 banks issue SND 1.5 times a year. The average issue size is US\$ 134 million. This frequency is less than what most mandatory SND proposals advocate, as they propose issuances at a quarterly or even a monthly frequency. On the other hand, secondary market monitoring of the average bank

appears feasible in the sense that market participants typically view an issue size of US\$ 150 million as sufficiently large to ensure adequate liquidity and, hence, meaningful market signals.³⁵

Turning to individual country averages, annual frequency ranges from a low of 0.4 in Sweden to a high of 2.8 in the UK. Hence, UK banks, conditioning on that they issue SND at all, come quite close to a quarterly frequency. Three other countries report a frequency of above 2 issues per year (Belgium, Germany, and Japan). In addition to Sweden, banks in Spain on average have less than one issue per year. In these countries direct market discipline seems less effective. Looking at the average size, there are six countries, in which average issues are above the US\$ 150 million threshold (the Netherlands, Sweden, UK, Japan, Switzerland and the US). Combining the information on frequency and size, we can identify three countries in our sample, in which effective direct market discipline might thus be most effective: the UK and possibly The Netherlands and Switzerland. In these countries banks issue SND relatively frequently (around twice a year) and the issues are on average sufficiently large to provide meaningful signals. Japan may be excluded from this set of countries because of the factors affecting the quality of secondary market signals discussed above. The US market conditions are favourable for direct market discipline on the 15 to 20 top banking organisations.

Of course, country averages may hide considerable variation among banks and may be strongly influenced by individual banks, which issue very frequently and/or very large amounts. Tables 8 and 9 permit an identification of banks, which would at present satisfy some basic criteria for effective market discipline. As before, we somewhat arbitrarily define the thresholds as a frequency of around 2 issues or more per year combined with an average issue size of around US\$ 150 million or more. The result of this exercise would be that there are seven banks in the UK, three in Germany and France, four in Japan, and two in Spain, Switzerland and the US which satisfy both criteria. This is a total of 23 out of the 210 banks analysed.³⁶ However, it is important to bear in mind that these are generally the largest banks in a country and may still represent a substantial share of a country's assets, especially in concentrated banking systems, such as Switzerland.

More generally, Table 8 suggests that Japanese, UK and US banks issue the largest SND. In the top 10 banks, three are Japanese and three US (and one bank from Spain, France, and the Netherlands). However, all of the Japanese banks included in the top 10 issued only once a very large SND amount when the public capital injection took place. The banks that issued more frequently and for other purposes appear lower in this league table. Note also that there are no German banks in the top 20 largest average issuers. The largest German issuer (as measured by average issue size) is not one of the four large commercial banks (Deutsche Bank, BHVB, Commerzbank, Dresdner Bank), but rather a relatively small bank associated with a large carmaker (Volkswagen Bank). In contrast, looking at Table 6, which

³⁵ The frequency of issuance may also be important for market discipline arising from secondary market prices (indirect discipline), as frequent (public) issues tend to imply that more information is released about the bank, hence enabling the market to assess the condition of the bank more easily.

³⁶ The banks are marked in yellow in Table 9. Note that the research on the US summarised in Appendix C suggests that direct and indirect market discipline exists for at least 20 US BHCs. This underlines that the criteria applied here may be quite stringent and may constitute a lower bound for the extent of market discipline in a given country.

lists the banks with the largest number of issues during the 1990s, eight of the top 20 banks are German.³⁷

The figures in Table 9 also permit a closer investigation of the reasons for the surprisingly high number of SND issues in Germany. Among the 50 most frequently issuing banks, in addition to the large “Landesbanken”,³⁸ there are no less than eight German savings banks and one co-operative bank. These banks are by any standard small. On average, they have total assets of US\$ 8 billion and combined (i.e. all nine banks added together), they have total assets of US\$ 75 billion. As a comparison, the average size of all 210 banks issuing SND is 109 billion and the average size of the 50 banks issuing SND most often during the 1990s (Table 6) is US\$ 299 billion. Aside from Spain, where there are also some very small banks issuing SND (although quite infrequently), the extensive issuing activity of very small banks can only be observed in Germany. One possible explanation includes the public ownership of these savings banks. Savings banks in Germany enjoy a public guarantee and are wholly publicly owned, generally by the town they serve. These issues, hence, are unlikely to provide either direct or indirect market discipline; in fact, the frequency of issue may be driven by the perception of retail investors that any liability of a publicly owned savings bank in Germany is guaranteed by the local government. However, the German data also suggest that, at least in theory, frequent private placements of small banks are feasible. To the extent that they are to be sold to institutional investors, they also could provide direct market discipline to smaller banks.³⁹

To conclude this section, we present some simple correlation coefficients among different variables of interest in Table 11. First, note that these are conditional correlations, i.e. they are conditional on the bank being included in the sample, which generally is a function of whether it issues SND.⁴⁰ For the group of 210 banks under consideration, we find a high correlation between issuing SND frequently and bank size, as well as between frequency and RWA. As expected, the size of the bank is also positively correlated with the average size of issues. In contrast, we do not find that the share of SND in total or risk weighted assets varies with bank size. This suggests that, given banks issue SND at all, they do not issue disproportionately more SND if they are larger.

We observe significant differences across countries. Important may be the difference between some European countries (Germany, UK and Switzerland) on the one hand and Japan and the US on the other in terms of the correlation between frequency of issuance and the size of the bank. In the case of European countries this correlation is relatively low, while it is 0.95 in Japan and 0.78 in the US, respectively. These figures point to differences in the market structure of SND: In Japan and the US larger banks issue larger amounts more frequently, while in Europe, large banks issue larger amounts, but smaller banks may also access SND markets on a regular basis. We would take this as some evidence that there may be some scope for market discipline (at least arising from the primary market) for smaller European banks. Second, the correlation between average issue size and the size of

³⁷ Note that these figures are distorted for Japanese and French banks by the differences in time periods covered.

³⁸ The “Landesbanken” are public banking institutions, which perform a number of services to small Savings banks (“Sparkassen”), including liquidity provision and payment processing.

³⁹ Note, however, that in the wake of the recent ruling of the EU courts that the public guarantees for “Landesbanken” violate EU rules on subsidies, there may be an element of risk in the SND issues of these banks.

⁴⁰ For some countries the criterion is more stringent, including for the US, where only the 50 largest bank holding companies are included.

the bank is quite high in Europe, while it is negative in Japan and the US. We would argue that the reasons lie in specific features of the sample for the latter two countries. As noted previously, the US sample is limited to the largest BHCs and therefore conditions on being large. In case of Japan, the correlation is affected by a few very small banks issuing extremely large amounts in connection with the injection of public funds.

Liquidity

Indirect market discipline crucially depends on whether reliable indicators of bank risk can be obtained from SND secondary markets. This in turn is largely a function of the liquidity of these markets. Most standard measures of market liquidity (trade size, trade impact, spread between more and less liquid securities etc.) require detailed information on individual trades, which is beyond the scope of this study. As a consequence, we largely draw on simpler measures, such as bid-ask spreads and trading volume to assess liquidity of SND issues.

Before we discuss some of these indicators, it may be useful to recall that the empirical evidence on the question of whether SND spreads reflect banks' risk is overwhelmingly positive, at least for private sector banks that are not publicly guaranteed (Appendix B). Eighteen of 22 studies, looking at subordinated debt markets in Europe and the US, find that spreads tend to reflect bank risk and this finding appears to become more robust in studies using more recent data. This in itself is evidence that some SND markets are sufficiently liquid to provide meaningful signals. However, as the studies tend to select particularly large and liquid issues, rather than cover the entire market, these findings tend to tell us little about the liquidity of SND issues more generally. Further, it is important to bear in mind that even in markets with ample liquidity during normal times, in times of financial system stress, liquidity can dry up quite rapidly. Of course, those times may be precisely the times when differentiated and accurate market signals may be most useful to supervisors.

Recall that, based on the criteria that issues of more than US\$ 150 million and an issuing frequency of at least twice a year may be sufficient to ensure an adequate level of liquidity in the secondary market, we identified 23 banks for which these criteria are satisfied. These banks on average have total assets of US\$ 459 billion, represent the largest banks in their respective countries and can be considered "large and complex banking organisations" for which market monitoring is often deemed to be of most use. We feel that this group of banks represents a lower bound of banks for which market monitoring can play an especially useful role.

What can we say about liquidity in the market for SND more generally? Tables 12A and B show average and median bid-ask spreads for the four largest issuing banks (Table 12A) and for 30 SND issues in Belgium (Table 12B). As a benchmark we also report some bid-ask spreads for corporate bonds from the NYSE Automated Bond System (ABS) for 1995/96. The NYSE's ABS is a useful benchmark, because it is generally the largest centralised bond market in the US, has been widely used for research on bond pricing, and during the period listed more than 2100 different bonds, including a large number of foreign and US corporate bonds.⁴¹

⁴¹ The NYSE ABS, while commonly used in the academic literature, may suffer some shortcomings simply because the vast majority of US corporate bonds are traded in a dealers' market and, hence, it may reflect only a relatively small segment of the overall US corporate bond market.

Generally, bid-ask spreads for SND issues in Belgium are higher in most years than those of the benchmark. The median bid-ask spread for issues of the Belgian bank with the largest number of issues outstanding (“first most active issuer”), varies between 0.25% and 0.58%. Only in 1999, was the median bid-ask spread as low as 0.1%, which would be in line with the median spread of the benchmark (0.13%). Similarly, for the second, third and fourth most active issues there are years in which the median bid-ask spread was in line with the benchmark, but for most periods it appears to be significantly above. This conclusion can also be drawn from the median bid-ask spread of all Belgian SND issues (Table 12B).

An even less encouraging conclusion emerges from Tables 13A and 13B, which report trading volume in SND issues for Spain. Median trading volume for the four most active issuers of SND is zero for essentially all periods under consideration. This means that on more than 50% of all trading days, no transaction took place. At the same time, the standard deviation of trading volume is quite high, suggesting that there may be very large individual transactions. If one wanted to focus on the positive, this could suggest that there is interest from institutional investors in SND in Spain, which in turn could be indicative that pricing at least some of the time may be relatively informed.

The conclusions from looking at the trends over time in trading volume and bid-ask spreads are also mixed, at best. We argued above that there is some evidence that the introduction of the common currency resulted in deeper and more liquid bond markets. However, this is not reflected in the trend of bid-ask spreads of Belgian SND issues over time. While some narrowing of bid-ask spreads can be observed in 1999, in the later years there is a considerable widening. In contrast, the median trading volume of all SND issues in Spain (last column of table 13A), suggest that on the majority of trading days at least some SND is traded and this amount is increasing. However, it is interesting that this trading volume is not from trading in the four most active issuers of SND.

Table 13B shows the average monthly standard deviation of SND yields for German, Dutch and Swiss SND issues. It is clear that the higher the standard deviation of yields, the more likely it is that trading is relatively active, although the standard deviation may also be influenced by noise and fluctuations in liquidity. If it is assumed that SND issues tend to trade on average at par (100), yields vary on average by 90 basis points in a given month in Germany and by 36 basis points in the Netherlands. Clearly, the figures are conditional volatilities in the sense that they are conditioned on there being trading at all. Nevertheless, they can be taken as somewhat encouraging signs that yields can move quite substantially over the course of a month. However, how far these moves reflect bank risk, rather than, say, changing monetary conditions or other factors, is of course impossible to tell from the data available.

Conclusion

The first conclusion is that the relative size of SND markets does not correspond to the attention that has been devoted to these different markets. There is considerable need for research on market discipline outside the US. In addition, we find the following:

One, subordinated debt issuance is widespread: over the 1990–2001 period and in the ten countries contributing to the study, around 5,600 issues took place, and the banks that issued SND represent more than 50% of banking assets in all countries. The study also finds that in some countries very small institutions are among the active issuers. While there is considerable need for further research on this question, it does suggest some potential for direct market discipline also in the case of small banks (although given the small size of these issues, little potential for indirect market discipline).

However, the relatively low frequency of issuance and the long-term character of SND instruments are not in line with proposals for mandatory SND requirements. The study finds that banks tend to issue SND generally less than twice a year, and average initial terms to maturity tend to be in excess of 10 years. Most proposals for SND requirements would have viewed at least four times a year and an initial term to maturity of two years as particularly conducive to direct market discipline. However, there is a relatively large group of major banking institutions which issued SND frequently and in sufficient amounts to generate conditions for direct market discipline.

Second, the data in this report suggest that SND markets appear to be – surprisingly – no greater in the US than in the larger European economies individually. In part this is a reflection of the reduction of new SND issues in 1999–2001 in the US, but even in the early 1990s the US SND market was smaller than the one of large European countries (or Japan). However, the US, together with the UK, has the largest market in *public* SND issuance, which is relevant for the depth of the secondary markets providing for indirect market discipline. Still, the *number* of public issues was highest in Germany in 1990–2001. Further, the introduction of the euro may facilitate a greater potential for market discipline in some smaller European countries, at least for the largest banks in those countries (Belgium, the Netherlands). Finally, Japanese conditions so far do not seem very conducive to market discipline mainly due to the dominance of private placements.

Third, given that banks issue SND at all, they tend to issue more than they are permitted to use for regulatory purposes. Hence we briefly discussed other motives for issuing SND in Section II and identify taxes, limited deposit insurance, and the relative development of equity versus debt markets as complementary explanations.

Fourth, SND markets grew steadily over the period under study in most countries and the average size of issues increased considerably. Applying quite rigid liquidity and frequency of issue requirements, we identify a group of banks for which market discipline almost certainly can be effective. More generally, we find that public placements greatly dominate private placements in value, which may support secondary market discipline also for a broader set of banks. Nevertheless, the quite small average size of the issues by smaller banks and the concentration of the volumes of outstanding SND at major banking organisations suggest that the availability of signals would ultimately be limited to the largest organisations.

Although the above conclusions are justified, there are at least two main gaps in our understanding of the issues. One involves the effect of disclosure on market discipline. Pillar III of the proposed Basel Accord is largely concerned with designing a framework for banks to disclose important information about their risk, operations and capital. The effect of these rules in terms of market discipline can only be judged in light of current rules on disclosure in member countries. In addition, individual banks may release more information about their operations than is required. Hence, the question “Are differences in disclosure across countries and banks related to frequency and characteristics of issues, as well as secondary and primary market pricing?” may be an important future avenue for research.

Second, while initially part of this study, it turns out members have no or little information about the investors in SNDs. The issue of who holds the SNDs is important in the context of market discipline for a number of reasons. One, retail investors may not be able to obtain the necessary information and may suffer from co-ordination failure when monitoring.⁴² Second,

⁴² As monitoring is a public good benefiting not only the monitoring investor but all investors, it is likely to be underprovided.

there may be conflicts of interest if parent bank holding companies hold the SND issues of their subsidiary banks. This problem has been recognised in the SND proposals in the literature, which tend to require holders of SND to be “outsiders”. In general, the role of private placements in generating direct market discipline would merit further research.

We have evidence from interviews of market participants in the US (FRB, 1999) that SND in the US is largely purchased by institutional investors. There appear to be very few retail investors. Given the relatively high number of small banks issuing SND in Europe, retail investors may play a much larger role.

V. Equity markets

In the market discipline literature, the focus has been on banks’ SND instruments, in part because mandatory subordinated debt issuance requirements have been widely discussed. In contrast, equity markets have received much less attention. In particular, signals based on equity prices are often considered ill suited for monitoring purposes. The main problem is that the relationship between equity prices and bank default risk is not clear-cut.⁴³ The reason is that equity-holders can have incentives to influence the bank management to increase risk-taking due to the option-like character of their claim and because equity prices increase when high net present value projects are undertaken. Equity-holders have unlimited potential upside gains from risk-taking, while their downside losses are bounded. These incentives are of relatively greater importance when the (charter) value of the bank is small.

The relationship between banks’ risks and their charter values is found empirically to hold for US and European banks.⁴⁴ Hence, while equity prices depend positively on expected future profits, they may not necessarily reflect a change in the probability of bank insolvency when the bank is already relatively close to the default point. This implies that equity prices might rise rather than fall when the riskiness of banks’ assets increases and when the constant monitoring of the condition of banks would be most relevant.

However, studies of US equity prices have revealed that changes in simple share price indicators reflect changes in the risk profiles of large banking organisations, which supports the notion that when banks are “going concerns”, even straight equity prices can deliver an appropriate signal of changes in the risk profile. Moreover, both market participants and bank supervisors have monitored such price movements for many years in the US and increasingly also elsewhere, suggesting that indirect market discipline is exerted through equity markets. The main appeal for using equity-market signals as a monitoring device is that data are readily available and markets tend to be deeper and more liquid than the secondary markets for banks’ SND-instruments. Moreover, the possible incorrectness of the simple equity price signals is not an argument to dismiss the monitoring of equity market data. Option pricing models suggest (at least) two equity price-based indicators, which would not in theory encounter the problem of producing an incorrect signal vis-à-vis changes in the

⁴³ Whether or not the signals derived from SNDs are “clear cut” has recently become a matter of debate. If the value of assets of a bank declines below a certain threshold (essentially the value of senior debt and equity), SND holders’ incentives are identical to those of equity holders.

⁴⁴ See e.g. Keeley “Deposit Insurance, Risk and Market Monitoring” American Economic Review, December 1990 and Gropp and Vesala “Deposit Insurance, Moral Hazard and Market Monitoring” ECB Working Paper, 2002.

bank's risk-taking behaviour. The first is the distance-to-default⁴⁵ (or the implied probability of default derived from it) and the second the implied volatility⁴⁶ obtained from the equity option prices of the share in question. The latter is less complex, but also a less direct indicator of default risk than distance-to-default, and can be more constrained by data availability as option quotations on bank stocks are required. The former is theoretically more attractive, but can be sensitive to specific computational assumptions.

Appendix C shows that there is some evidence for US and European banks that supports the use of the distance-to-default as a leading indicator of banks' financial difficulties. Moreover, the evidence suggests that the distance-to-default does react more strongly earlier to increased default risk than the SND spread, which moves in a detectable way only relatively close to the default point. This finding is also confirmed empirically. Recently others provide positive evidence for the use of the implied volatility and conclude that equity-based indicators contain information over and above other indicators of bank risk.⁴⁷

The above suggests that secondary market signals based on banks' share prices could be attractive monitoring devices. Therefore, investigating the participation of banks in the stock market is relevant. However, equity could be an interesting instrument for market discipline also because equity-holders have a direct say in banks' management decisions. They explicitly have the right to intervene in strategic management decisions and can replace management, which is not the case with debt-holders. While this disciplining could occur at any time, it could be particularly associated with new equity issuance as the management has to convince either old or new shareholders to invest more in the firm. Hence there is a case for investigating also primary equity markets.

Main features of the market

We examine how many banks are listed on stock exchanges in order to assess the availability of the secondary market signals in relation to the number and assets of banks in national banking systems. Given the available data, the number of banks with equity listed on a stock exchange seems to be typically somewhat smaller than the number of banks with publicly traded listed SND outstanding, except for the US and the Netherlands (Charts 7 and 8).⁴⁸ The percentage of listed banks ranges from less than 1% in Germany to around 13% in Japan, while the number of banks with SND outstanding is somewhat higher. In terms of assets, the difference is even smaller such that the share of listed banks ranges from around

⁴⁵ The distance-to-default represents the number of asset value standard deviations away from the default point and is thus a complete measure of default risk. It is calculated using option-pricing theory to solve for the unobservable market value of assets and its volatility from observable equity market capitalisation and volatility figures. The default point is defined as the point at which the value of the bank is precisely equal to the value of its liabilities (i.e. equity value is zero).

⁴⁶ Implied volatility is a standard way of quoting the price of an option contract and represents a proxy of asset volatility and thereby also default risk. Given the market price of the option and the Black & Scholes formula the implied volatility that is consistent with that actual option price can be derived. Since this is an estimate of the volatility of the stock to maturity it is a forward-looking measure of equity volatility, which is a proxy for asset risk. Furthermore, since equity volatility is positively related to asset volatility, movements in implied volatilities proxy changes in the default probability.

⁴⁷ Hoggarth, G. (2002), "Market Indicators of Bank Risk", mimeo, Bank of England. Swidler, S. and J.A. Wilcox (2001), "Information about Bank Risk in Options Prices", unpublished paper, Office of the Comptroller of the Currency.

⁴⁸ Note that 98% of the top US 50 BHCs are listed. Figures for the US banking system as a whole were not available.

45% (Germany and Spain) to around 85% (Sweden and Japan), which is typically slightly below the asset share of the banks with listed SND outstanding. Hence, the scope of market discipline and secondary market signals through equity markets seems to be somewhat narrower than through SND markets. The equity market activity is more clearly focused on the largest banking organisations than the SND activity.

Publicly traded equity is typically issued at the bank holding company level or, where relevant, at the level of the financial conglomerate (financial holding company in the US).⁴⁹ This implies that equity price movements are observed at the level which captures the nexus of all complex activities of a bank holding company or the conglomerate. This complexity makes the fact that equity markets are able to efficiently process and summarise information very valuable. However, equity price movements will not only reflect banking, but also insurance and other activities of the entire financial group. Recently, the drift towards conglomeration has been quite strong in Europe, as especially links between banking and insurance have developed. The impact of insurance businesses on conglomerates' share price development is particularly pronounced in Belgium.⁵⁰

Banks' publicly traded equity is traded on the major organised exchanges. Banks are typically quoted on the national major exchange, but some major international banks are also quoted on the NYSE in addition to their home country exchange. Major US banks are typically quoted on the NYSE, and a few are listed on Nasdaq.

Liquidity

The discussion above suggested that the biases in equity returns may be filtered out by using more advanced indicators. However, as for SND markets, indirect market discipline also crucially depends on whether such indicators can be reliably constructed, which again mainly depends on the availability of market liquidity. Indeed, all country reports highlight that equity markets are typically deeper and more liquid than SND markets, making them more attractive for monitoring and secondary market discipline. In pricing, liquidity premia tend to play a much smaller role in equity markets as compared with SND markets.

Typical liquidity measures (trade size, trade impact, bid-ask spreads) have not been collected for bank equity markets. Instead, we rely on data on average trading volumes and total amount of equity instruments outstanding. The former is a particularly useful liquidity measure as it indicates the turnover in a bank's equity on a daily basis, thus depicting the existence of active trading which is a necessary condition for sufficient liquidity. These data are presented in Charts 9 for each country and for the four most active issuers of equity (three most active banks for Belgium).

⁴⁹ Financial conglomerates can be defined as groups conducting within one financial institution or group at least two of the three traditionally distinct activities of banking, securities and insurance. This general definition, however, could lead to different legal definitions. For instance, the planned EU Directive on financial conglomerates requires the presence of insurance to qualify a conglomerate, since the capital regulation for banks and securities firms is already laid down under a single framework by the Capital Adequacy Directive (securities activities are considered part of "universal banking"). In the United States, on the other hand, the notion of financial conglomerate adopted by the Gramm-Leach-Bliley Act of 1999 is that of a financial holding company, which can (but is not bound to) offer the full range of financial services.

⁵⁰ In the UK, some smaller banks are owned by large firms whose primary activity is not banking (for example, a few are owned by retailers). A judgement therefore has to be made as to the extent the firm's equity price is likely to reflect its banking arm relative to the firm's other activities.

The average daily trading volumes for the equity of the most actively traded banks in the countries ranged in 2001 between around US\$ 5 million in Sweden and close to US\$ 250 million in Switzerland.⁵¹ The daily trading volumes of the major banking organisations typically breach US\$ 10 million a day.

The daily volumes of equity of the second most active bank can be significantly smaller and, according to country reports, moving further down trading volumes can drop rather abruptly once one moves to smaller institutions. However, the high levels of trading volumes observed daily for all the countries suggest that ample liquidity is present for major banking organisations that are listed on stock exchanges. The country reports suggest that there is confidence in sufficient liquidity even in the case of less traded banks. For instance, the tenth most active bank in the US has a trading volume which is only 13% of the volume of the most actively traded bank, but the Federal Reserve continues to monitor the equity price movements of these ten and many more banking organisations.

Over time, trading volumes have also tended to increase everywhere and for all banks. All country reports note that average daily equity trading volume has grown significantly since early 1990. This growth can be attributed to the general increase in market turnover following from regulatory changes (lowering commissions) and technological changes (such as the start of electronic trading). As for banking-specific reasons, the turnover growth is in part explained by the bank consolidation and conglomeration wave, which heightened in the late 1990s. However, in 2001 the volume growth stagnated, and even declined in France, Germany, Spain and Japan (already since 1999). This reflected the turndown of banks' equity prices (together with the overall stock market), since trading volume is measured as share price times the number of traded shares. To some extent the earlier increase in share prices until 2000 may also have inflated the trading volume figures. For example in Germany, the share price-adjusted trading volume of the three most active banks declined after its peak in 1996.

The total amount of equity outstanding (i.e. the market capitalisation of the banks in question) grew quite substantially over the study period, but mainly reflected the share price changes, as new equity issuance was quite irregular (see Charts 9). Consequently, the figures started typically falling in 2001 together with the stock market. In Japan this occurred in the mid-1990s.

There are some notable differences across markets. The trading volumes appear relatively low for German banks. Note that on the German market, even the second most active bank had a daily average trading volume of less than one million dollars, which is very low compared to its market capitalisation (US\$ 10 billion). In the very concentrated Dutch and Belgian banking sectors, some doubts could exist regarding the liquidity of other than the three biggest banks' shares, and beyond four banks in Sweden.

Japanese banks have relatively high daily trading volumes. The view expressed in the country report is that after the banking failures of 1997 share prices of Japanese banks have increasingly reflected the differences in the credit risk across banks, while this was not necessarily the case prior to these failures.

⁵¹ One should note that the relation between the number of shares outstanding and trading volume is not necessarily linear.

Bank level evidence

Again, examining primary market issuance activity is relevant for assessing the extent of possible direct market discipline on banks. Tables 14–16 report our data on this aspect. We have data on 228 issues by the 58 most actively issuing banking organisations.

It is immediately clear that equity issuance is much more infrequent than SND issuance. The number of equity issues is much smaller and the average number of issues per year is less than half of that of SND issues. The average issue size is conversely much higher for equities, around four times the average size of SND issues.

By looking at the number of equity issues that occurred over the period 1990–2001, it is difficult to infer a clear trend for the countries that have provided data. Issuance activity has been very low in the UK, US and Sweden. Only 16 transactions occurred in the US over the period 1997–2000 (excluding the issuance of trust preferred stock discussed above), and no single issue occurred in 2001. Issuance by UK banks was also quite limited, only ten transactions occurring from 1990 to 2001. During the period 1990 to 2001 there were no major new issues of equity by Swedish banking organisations. It should be recalled that in particular the 1997–2001 period was one of very high, even record profits for many banks. Thus, many banks could increase capital through retained earnings, and had no need to issue new shares which represents a more expensive source of capital funds.

German (in terms of both number and value of issues), Belgian (number of issues) and Dutch banks (value of issues) have been relatively active issuers. This can possibly be explained by relatively strong expansion of these organisations into international banking and securities markets and other sectors of financial services (often by forming large financial conglomerates). However, an even more important reason for banks' large-scale acquisition of new equity capital seems to be related to the maintenance of regulatory capital adequacy. Japan represents a special case in this regard. Most of the preferred stock issues between 1998 and 2000, especially in 1999, were public capital injections into the banking sector. These operations make Japanese banks dominate the top of equity issuance in terms of total issue value or average size of issue (see Tables 15 and 16).⁵² As only a small amount of this stock was issued to private investors, the scope for direct market discipline was limited.

Major banks have carried out most of the new issuance. In the UK, the US, and the Netherlands, the number of equity issues for the total banking sector and for the major banks is in fact the same. Common stock has been the dominating instrument, while in the US and especially in the UK, preferred stock is also important. The capital injections in Japan referred to above were carried out in terms of preferred stock. It is also clear that the issuance of equity can depend on a number of individual circumstances, for example expansion plans, consolidation and restructuring and regulatory capital shortages.

Simple correlation coefficients (conditional on equity issuance having taken place) among variables measuring equity issuance activity and bank characteristics can shed further light on the types of banks that entered the equity markets during the time period studied (Table 18). First, the finding of a negative correlation in all countries between the average size of total equity issuance volume and the equity-to-RWA ratio suggests that, a major reason for entering the equity markets is to maintain sufficient capital buffers. In all countries except the US, the correlation coefficient is negative also with respect to the equity-to-total assets ratio. In countries other than the US, less capitalised banks also tend to issue equity

⁵² Few cases of new banks issuing equity for the first time are reported, such as the issuance by former mutual institutions which transformed into a PLC.

more frequently. The reduced need to issue equity when profitability is high is also demonstrated in Table 18, as the correlation coefficients between issuance activity and profitability (return on assets) are typically negative. Unsurprisingly, the average equity issue size and total issuance are positively correlated with bank size (total assets).

The discussion in Section II showed that the decisions to issue equity and SND may not be independent, since, for instance, ample equity capital would reduce the need to issue SND for capital adequacy purposes. The discussion also suggested that SND would be preferred as a funding instrument to the more expensive equity instruments, and thus SND would not be issued for regulatory purposes only. These views gain some further support in Table 18, where those banks that issued both equity and SND are analysed together. For the full sample, total equity issuance and average issue size are negatively correlated with the SND-to-RWA ratio, suggesting that a high amount of equity issuance reduced the regulation-induced incentive to issue SND. This finding is not robust across countries, however. In addition, we find that the relative amount of SND on banks' balance sheets (relative to RWA or total assets) is not smaller when banks have a high relative amount of equity. This points to the direction that SND is largely issued for funding purposes and that equity and SND issuance are complements rather than substitutes. However, we should stress that these results are only suggestive and deserve further research.

Conclusion

The evidence presented in this section suggests that secondary equity market signals can be useful monitoring devices due to ample liquidity in the case of major banking institutions. The problem for the signal quality due to equity-holders possibly desiring increased risk-taking can be reduced by monitoring specific indicators derived from equity market data (e.g. the distance-to-default and implied volatility).

Banks that issue equity do not necessarily also issue SND and vice versa. Overall, the scope of the signals and thus potential market discipline is narrower from equity markets than from SND markets, as equity market activity is more focused on the largest banks (except for the US and the Netherlands). Conglomeration can blur the signal in the sense that the equity prices quoted for financial conglomerates or financial holding companies may increasingly reflect non-bank activities (e.g. insurance in the case of some major European conglomerates). This is also true for the issuance of SND in the US.

The market for bank equity has become increasingly deeper and more liquid over time, which is indicated by the growing average equity trading volume. This supports the use of equity prices in monitoring banks (i.e., indirect market discipline). Overall liquidity has gained strength over recent years, although this could be related to some extent to the favourable and dynamic growth experience by stock markets over the period 1997–2000, and to the acceleration of banking consolidation at that time.

Equity issuance is not a common or regular occurrence for major banking organisations. Since 1990, such issues have occurred rather sporadically. High levels of bank profitability in the late-1990s and early 2000s have limited the need to resort to costly equity issuance, as banks have been able to accumulate retained earnings. Active equity issuance seems to have been related to maintaining adequate capital buffers and generating equity instruments to finance expansion and consolidation. Equity does not seem to be used as strongly as SND for funding purposes by banks and the two instruments may be complements rather than substitutes. Thus, equity markets are not well suited for generating direct market discipline on banks.

Appendix A

Features of regulatory capital eligible instruments

	Belgium	France	Germany	Netherlands	Spain	Sweden	UK	Japan	USA
<i>Tier 1 preferred stock</i>									
Subordination in default	Subordinated to Tier 2, senior to equity	Subordinated to Tier 2, senior to equity	Subordinated to Tier 2, senior to equity	Subordinated to Tier 2, senior to equity	Subordinated to Tier 2, senior to equity	Subordinated to Tier 2, senior only to common equity	Subordinated to Tier 2, senior to equity	Subordinated to Tier 2, senior to equity	Subordinated to all other debt
Loss absorption (to avoid insolvency)	Yes	No	Yes (as Tier 1 and upper Tier 2)	No	No	No	No	Yes	Yes
Minimum maturity	Perpetual	Perpetual	Perpetual	Perpetual	Perpetual	Perpetual	Perpetual	Perpetual	Longest possible (30 years)
Cumulative dividend	No	No	Yes	No	No	No	No	No	Approved
<i>"Upper Tier 2"</i>									
Subordination in default	Senior to equity but junior to lower Tier 2	Pari passu with all other sub. debt	Pari passu with all other sub. debt	Pari passu with all other subordinated debt	Junior to lower Tier 2, senior to Tier 1	Subordinated to lower Tier 2	Junior to all debt (including lower Tier 2), senior to equity	Subordinated to lower Tier 2	n.a.
Loss absorption (to avoid insolvency)	No	Yes	Yes, as Tier 1	Yes, against capital shortfall	Yes, but no write-up in liquidation	Yes	Yes	Yes	n.a.
Minimum maturity	Perpetual	Perpetual	5 years	Perpetual	Perpetual	Perpetual	Perpetual	Perpetual	n.a.
Cumulative coupons	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	n.a.

Features of regulatory capital eligible instruments (cont)

	Belgium	France	Germany	Netherlands	Spain	Sweden	UK	Japan	USA
<i>"Lower Tier 2"</i>									
Loss absorption	No	No	No	No	No	No	No	No	n.a.
Subordination in default	Subordinated to senior debt	Subordinated to senior debt	Subordinated to senior debt	Subordinated to senior debt	Subordinated to senior debt	Subordinated to senior debt	Subordinated to senior debt	Subordinated to senior debt	Subordinated to senior debt
Minimum maturity	5 years	5 years	5 years	5 years	5 years	5 years	5 years + one day	5 years	5 years
Amortisation of capital for regulatory purposes	20% annual over last 5 years	20% annual over last 5 years	Only counts as 40% over last 2 years	20% annual over last 5 years	20% annual over last 5 years	20% annual over last 5 years	20% annual over last 4 years	20% annual over last 5 years	20% annual over last 5 years
Cumulative coupons	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
<i>Tier 3</i>									
Loss absorption		No	No	No, but principal deferral	No, but principal deferral	No, but principal deferral	No	n.a.	n.a.
Subordination in default		Pari passu with other sub.debt	Subordinated to senior debt	Pari passu with lower Tier 2	Pari passu with lower Tier 2	Pari passu with lower Tier 2	Subordinated to senior debt	n.a.	n.a.
Minimum maturity		2 years	2 years	2 years	2 years	2 years	2 years	n.a.	n.a.
Cumulative coupons		Yes	Yes	Yes	Yes	Yes	Yes	n.a.	n.a.

Main source: Morgan Stanley "Bank Capital A-Z", January 2002.

Appendix B

Summary of subordinated debt proposals

Generation	Citations	Objective	Amount	Maturity	Issuance	Covenants	Rate cap	Puttable debt
1 st	FDIC, 1983; Benston et al., 1986; Horvitz, 1986; Litan and Rauch, 1997; The Bankers Roundtable, 1998;	Discipline through increasing costs of funds	Differs: 2% of liabilities; 3-5% of deposits; 1-4% of RWA	Relatively short, but long enough to prevent runs	Frequent	Generally not	No	Generally not
2 nd	Cooper and Fraser, 1988; Keehn, 1988; Wall, 1989; Evanoff, 1993;	Discipline through ability to issue and put options	3% of deposits; 4% of RWA	Long term (at least 5 years)	Frequent (semi-annually)	Yes; as a function of bank performance; Convertible to equity; limits on insider ownership.	Generally not.	Yes, SND may be puttable at 95% of par value
3 rd	Calomiris, 1997, 1999;	Discipline through cap in spread over risk free rate	2% of RWA	2 years	Frequent (monthly)	Limits on insider ownership	Yield capped at 50bp above riskless rate	No

Source: FRB, 1999.

Appendix C

Summary of empirical studies on the effectiveness of market discipline exerted by uninsured liabilities and equity on banking organisations

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
Aharony, J. and I. Swary, 1996, "Additional Evidence on the Information-based Contagion Effects of Bank Failures," <i>Journal of Banking and Finance</i> , 20, January, pp. 57-69.	US	1986-89	33 traded BHCs headquartered in the Southwest region	Common stock	Abnormal stock returns reflect the distance of the solvent banks' headquarters from the headquarters of each failed bank and the capital adequacy of the solvent bank. Investors appear to make rational inferences about the value of surviving banks.	Yes.
Avery, R.B., T.M. Belton, and M.A. Goldberg, 1988, "Market Discipline in Regulating Bank Risk: New Evidence from the Capital Markets," <i>Journal of Money, Credit and Banking</i> , November, pp. 547-610.	US	1983-84	71 BHCs 137 bonds	Subordinated debt	Risk premiums on bank-related long-term debt are virtually unrelated to traditional accounting measures of bank performance and the index proposed by the FDIC for assessing risk-related insurance premiums.	No.
Baer, H. and E. Brewer, 1986, "Uninsured Deposits as a Source of Market Discipline: Some New Evidence," Federal Reserve Bank of Chicago <i>Economic Perspectives</i> , September/October, pp. 23-31.	US	1979:Q4 1982:Q3	37 BHCs	Certificates of deposit	Large CD rates reflect measured bank risks (i.e., measures of the level and variability of stock prices) in a plausible fashion.	Yes.

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
Berger, A. N., S.M. Davies, and M. J. Flannery, 2000, "Comparing Market and Supervisory Assessments of Bank Performance: Who know What When?," <i>Journal of Money, Credit, and Banking</i> , 32, August (part 2), pp. 641-667.	US	1989:Q4-1992:Q2	184 large BHCs	Subordinated debt and common stock	Supervisory assessments and bond rating agency assessments complement each other, in that each of these types of assessment helps predict the other. In contrast, supervisory assessments and equity market indicators are not related to each other, perhaps because equity market participants focus more on non-default outcomes while supervisors focus on bankruptcy risks. Abnormal stock returns and insider holdings predict bank performance several quarters in advance.	Yes. Bond rating agencies tend to predict BHC's future problem loans. Equity market participants, however, tend to forecast future earnings and are less concerned with changes in loan quality.
Billett, M., J. A. Garfinkel, and E.S. O'Neal, 1998, "The Cost of Market versus Regulatory Discipline in Banking," <i>Journal of Financial Economics</i> , 48, pp.333-358.	US	1990-95	109 downgraded BHCs	Uninsured deposits and commercial paper	During the quarter of a downgrade, both assets and liabilities of the BHCs declined. While insured deposits increased by 1.42% during downgrade periods, uninsured deposits and commercial paper use decline by 6.56% and 27.9%, respectively.	Yes, but the effectiveness of market discipline is undermined because riskier banks use more insured deposits.
Bliss, R. R. and M.J. Flannery, 2000, "Market Discipline in the Governance of US Bank Holding Companies," Federal Reserve Bank of Chicago Working Paper.	US	1986:Q1 1997:Q4	107 BHCs 761 bonds	Subordinated debt	Managerial actions after bond values change are equally likely to increase or decrease the value of a BHC's debt.	No.

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
Cargill, T. G., 1989, "CAMEL Ratings and the CD Market," <i>Journal of Financial Services Research</i> , 3, pp. 347-358.	US	1984-1986	58 banks	Certificates of deposit	Large CD rates reflect measured bank risks (i.e., CAMEL ratings) in a plausible fashion.	Yes.
Covitz, D.M., D. Hancock, and M.L. Kwast, 2000, "Mandatory Subordinated Debt: Would Banks Face More Market Discipline?," working paper, Board of Governors of the Federal Reserve System, June.	US	1986:Q2-1997:Q4	Top 50 BHCs in each Quarter.	Subordinated debt	Issuance decisions depend on the risk profile of BHCs. And, issuance spreads over comparable maturity Treasury securities are positively correlated with accounting-based and market-based risk measures.	Yes.
Crabbe, L. and M. Post, 1994, "The Effect of a Rating Downgrade on Outstanding Commercial Paper," <i>Journal of Finance</i> , March, pp. 39-56	US	1986-91	28 BHCs with 41 Moody's Downgrades	Commercial paper and large certificates of deposit	The quantity of CP falls dramatically in the weeks after a CP rating downgrade, but the quantity of CDs holds steady.	No, quantity of CDs did not change in response to CP rating downgrade.
Davies, S. M., 1993, "The Importance of Market Information in Predicting Bank Performance," Working Paper, Board of Governors of the Federal Reserve System, Washington, DC, April.	US	1986-91	344 BHCs, 24 independent banks and subsidiary banks of the BHC sample	Common stock	The ratio of market equity to book equity (and non-linear expressions derived therefrom) can help predict future BHC and bank insolvency, where solvency is measured by whether an institution's equity capital is above a pre-specified low level (e.g., 2 or 3%), even in the presence of accounting risk measures and examination data.	Yes.

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
DeYoung, R., M.J. Flannery, W.W. Lang, and S.M. Sorescu, 2001, "The Information Content of Bank Exam Ratings and Subordinated Debt Prices," <i>Journal of Money, Credit, and Banking</i> , 33, November, pp. 900_925	US	1989:Q2 - 1995:Q1 for BHCs and 1986:Q2-1995:Q1 for banks	67 different bank holding companies and 1,079 different national banks	Subordinated debt	Subordinated debenture spreads are correlated with accounting-based and market-based risk measures and recent examination ratings, particularly unexpected downgrades. But, bank examiners routinely uncover value-relevant information about the safety and soundness of banks several months before this information is impounded in debenture prices.	Yes.
Ellis, D.M. and M.J. Flannery, 1992, "Does the Debt Market Assess Large Banks' Risk?," <i>Journal of Monetary Economics</i> , December, pp. 481-502.	US	1982-88	Six, Large, Money Center Banks	Certificates of deposit	Bank CD rates immediately reflect the information impounded in bank stock prices. Even for "too-big-to-fail" banks, a reduction in the asset portfolio's value significantly raises CD risk premia.	Yes.
Ely, D. P., A.L. Houston, and C.O. Houston, 1995, "Can Financial Markets Discipline Banks? Evidence from the Markets for Preferred Stock," <i>Journal of Applied Business Research</i> , January, pp. 59-66	US	1984-90	115 BHCs/banks 152 Issues of Preferred Stock	Money-market preferred stock (MMPS) and capital market preferred stock (CMPS)	A depository institution's asset credit risk and profitability are associated with the choice between issuing MMPS and CMPS. Banking organizations offering MMPS tend to have lower profitability and higher credit risk than organizations that issue CMPS. This finding is consistent with the view that the auction process for MMPS allows investors to adjust for shifts in risk profiles by repricing the issue each 49 days. This finding that institution-specific risk influences funding behaviour is consistent with market discipline.	Yes.

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
Evanoff, D.D. and L.D. Wall, 2001, "Sub-debt Yield Spreads as Bank Risk Measures," <i>Journal of Financial Services Research</i> , 20, October/December, pp. 121-146.	US	1985-99	100 largest banking organisations (banks and BHCs)	Subordinated debt (largest bond issue outstanding for each firm).	Subordinated debenture yields do as well or better at predicting supervisory ratings (i.e., BOPECS and CAMELS) than any regulatory capital ratios.	Yes.
Evanoff, D.D. and L.D. Wall, 2002, "Measures of the Riskiness of Banking Organizations: Subordinated Debt Yields, Risk-based Capital, and Examination Ratings," <i>Journal of Banking and Finance</i> , May, pp. 989-1009.	US	1985-99	100 largest banking organisations (banks and BHCs)	Subordinated debt (largest bond issue outstanding for each firm).	Subordinated debenture spreads are better at predicting supervisory ratings (i.e., BOPECS and CAMELS) than regulatory capital ratios used in prompt corrective actions standards, except the tier 1 leverage ratio.	Yes.
Flannery, M.J. and S.M. Sorescu, 1996, Evidence of Bank Market Discipline in Subordinated Debenture Yields: 1983-1991," <i>Journal of Finance</i> , September, pp.1347-1377.	US	1983-1991	80 BHCs 3 Banks 422 bonds	Subordinated debt	Bank-specific risk measures are correlated with debenture rates over the entire sample period (1983-1991) and, most prominently, in the last 3 years of the sample.	Yes.
Gorton, G. and A.M. Santomero, 1990, "Market Discipline and Bank Subordinated Debt," <i>Journal of Money, Credit and Banking</i> , February, pp. 119-128.	US	1983-1984	71 BHCs 137 bonds	Subordinated debt	Applied a (non-linear) contingent claims pricing methodology to the Avery, Belton, and Goldberg (1988) data and found "little support for the presence of market discipline in the subordinated debt market."	No.

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
Goyal, V. K., 2001, "Market Discipline of Bank Risk: Evidence from Subordinated Debt Contracts," Working Paper, Department of Finance, Hong Kong University of Science and Technology, October.	US	1974-95	150 largest BHCs, of which 72 issued subordinated debt.	Fixed-rate, US dollar, subordinated bonds; 415 bonds.	Bank holding companies with a higher Tobin's q ratio (estimated as the ratio of the market value of assets over the book value of assets) are less likely to issue debt instruments that include restrictive covenants (i.e., restrictions on investment, restrictions on payment of dividends, and restrictions on financing) than firms with a lower q ratio.	Yes, but the likelihood of including restrictive covenants in bank debt contracts is systematically related to risk-taking incentives (proxied by Tobin's q) only during 1981-1988.
Gunther, J.W., M.E. Levonian, and R.R. Moore, 2001, "Can the Stock Market Tell Bank Supervisors Anything They Don't Already Know?" <i>Economic and Financial Review</i> , Federal Reserve Bank of Dallas, Second Quarter, pp. 2-9.	US	June 1996-March 2000	914 BHCs	Common stock	A measure of expected default probability distilled from equity prices (i.e., KMV EDFs) helps predict the future financial condition of individual banking organisations, as reflected in their supervisory ratings.	Yes. Findings suggest that financial markets may provide useful information to supervisors, particularly between inspections.
Hancock, D. and M.L. Kwast, 2001, "Using Subordinated Debt to Monitor Bank Holding Companies: Is it Feasible?," <i>Journal of Financial Services Research</i> , 20, October/December, pp. 147-187.	US	January 1997-October 1999	40 BHCs	Subordinated debt; 265 bonds	The time-series effects of banking organization-specific risks and systematic factors on bank subordinated debt spreads are significantly different across vendor data sources. Nevertheless, there is a high degree of concordance in rankings of banking organizations, by their minimum spread across issues, and this concordance rises with greater liquidity in the overall bond market.	Yes.

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
Hannon, T. and G.A. Hanweck, 1988, "Bank Insolvency Risk and the Market for Large Certificates of Deposit," <i>Journal of Money, Credit and Banking</i> , May, pp. 575-593.	US	1985:Q1	300 banks	Certificates of deposit	Large CD rates reflect measured bank risks (i.e., the likelihood of bank insolvency, the variability of assets, and bank capitalization) in a plausible fashion.	Yes.
Hassan, M. K., 1993, "Capital Market Tests of Risk Exposure of Loan Sales Activities of Large US Commercial Banks," <i>Quarterly Journal of Business and Economics</i> , Winter, pp. 27-49.	US	1984-88	'84: 50 banks 171 bonds '85: 49 banks 137 bonds '86: 48 banks 160 bonds '87: 43 banks 174 bonds '88: 49 banks 223 bonds	Subordinated debt that is non-callable	Bank-specific accounting risk measures are correlated with implied variances that are calculated by incorporating default risk-premium into the subordinated debt pricing model of Gorton and Santomero. Subordinated debt holders appear to price loan sales as risk-reducing bank activities.	Yes.
Hassan, M. K., G.V. Karels, M.O. Peterson, 1993, "Off-Balance Sheet Activities and Bank Default-Risk Premia: A Comparison of Risk Measures," <i>Journal of Economics and Finance</i> , Fall, pp. 69-83.	US	1984-1988	'84: 50 banks 171 bonds '85: 49 banks 137 bonds '86: 48 banks 160 bonds '87: 43 banks 174 bonds '88: 49 banks 223 bonds	Subordinated debt that is non-callable	Bank-specific accounting risk measures are correlated with implied variances that are calculated by incorporating default risk-premium into the subordinated debt pricing model. None of the off-balance sheet measures considered were found to be correlated with these implied variances.	Yes.

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
Jagtiani, J., G. Kaufman, and C. Lemieux, 1999, "Is the Safety Net Extended to Bank and Bank Holding Company Debt?: Evidence from Debt Pricing," Federal Reserve Bank of Chicago Working Paper, 1998, December.	US	1992-97	19 banks with 39 non-callable subordinated bonds 41 BHCs with 39 non-callable subordinated bonds and 41 senior note issues	Senior notes and subordinated debt	BHC bonds and bank bonds are priced by the market in relation to their underlying credit risks. This relationship appears to be stronger for BHC bonds.	Yes.
Jagtiani, J. G. Kaufman, and C. Lemieux, 2000, "Do Markets Discipline Banks and Bank Holding Companies? Evidence from Debt Pricing," Federal Reserve Bank of Chicago Working Paper, June.	US	1992-97	19 banks with 19 non-callable subordinated bonds 39 BHCs with 39 non-callable subordinated bonds	Subordinated debt	BHC-issued and bank-issued subordinated debt instruments trade at a yield spread that is not statistically different from each other. Spreads are sensitive to risk measures and they rise as credit risk increases, particularly at less-capitalized firms.	Yes.
Jagtiani, J. and C. Lemieux, 2000, "Stumbling Blocks to Increasing Market Discipline: A Note on Bond Pricing and Funding Strategy Prior to Failure, Federal Reserve Bank of Chicago Emerging Issues Series, S&R-98-8R, April.	US	1980-95	Five banks that failed whose parent BHC had publicly traded bonds outstanding during recent quarters prior to failure.	Certificates of deposit, senior notes, and subordinated debt	The market penalises failing banks by charging dramatically higher subordinated debt spreads (correlated with accounting-based risk measures) starting approximately five quarters prior to failure. Banks also shifted their funding sources towards insured deposits as their credit ratings deteriorated. Their insured deposits start rising approximately five quarters or more prior to failure. Curiously, however, uninsured CD rates did not appear to rise as the failure date was approached.	Yes, particularly for subordinated debt market. Uninsured CDs were run off before failure, though rates did not incorporate a risk premium.

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
James, C.M., 1988, "The Use of Loan Sales and Standby Letters of Credit by Commercial Banks," <i>Journal of Monetary Economics</i> , 22, pp. 395-422.	US	1985:Q1	300 banks	Certificates of deposit	Large CD rates reflect measured bank risks (i.e., leverage, loan loss provisions, and variance of stock returns) in a plausible fashion.	Yes.
James, C.M., 1990, "Heterogeneous Creditors and the Market Value of Bank LDC Loan Portfolios," <i>Journal of Monetary Economics</i> , 25, pp. 325-346	US	1986:Q1- 1987:Q2	23 banks	Certificates of deposit	Large CD rates reflect measured bank risks (i.e., bank asset risk, domestic loans-to-total capital) in a plausible fashion. A negative relationship between large CD rates and the ratio of foreign loans to capital was interpreted as evidence of an implicit government guarantee on foreign loans.	Yes.
Jordan, J.J., 2000, "Depositor Discipline at Failing Banks," <i>New England Economic Review</i> , March/April, pp.15-28.	US	1989-95	65 FDIC-insured banks which operated for at least 7 quarters before failing.	Certificates of deposit	Just before failure, New England banks offset declines in uninsured deposits with increases in insured deposits. Spreads on CDs rose as bank's condition deteriorated.	Yes, particularly after the passage of FDICIA.
Keeley, M.C., 1990, "Deposit Insurance, Risk, and Market Power in Banking," <i>American Economic Review</i> , 80, pp. 1183-1200.	US	1984-86	77 largest BHCs	Certificates of deposit	Large CD rates reflect measured bank risks (e.g., market-value-of capital-to-assets ratio) in a plausible fashion.	Yes.
Krainer, J. and J. Lopez, 2003 "Forecasting Bank Supervisory Ratings using Securities Market Information" Federal Reserve Bank of San Francisco Working Paper.	US	1990-98	Largest BHC	Equity and subordinated debt	In sample: market prices can forecast BOPEC ratings, but not out of sample forecasting ability	Yes

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
Morgan, D. and K. Stiroh, 1999, "Bond Market Discipline of Banks: Is the Market Tough Enough?," Staff Report #95, Federal Reserve Bank of New York, December.	US	1993-98	Banks and BHCs 600 bonds	Subordinated debt	A comparison of the statistical relationship between bond spreads and ratings for banking organizations and for other US firms during 1993-1998 suggests that they are similar, at least for investment grade issues, but fairly weak for the largest.	Yes.
Morgan, D. P. and K. J. Stiroh, 2001, "Market Discipline of Banks: The Asset Test," <i>Journal of Financial Services Research</i> , 20, October/December, pp. 195-2008.	US	1993-98	81 entities, consisting of BHCs and banks affiliated with BHCs.	Fixed-rate, investment grade bonds.	Bond spreads reflect the overall mix of banks' loans and other assets at the time of issuance, even after controlling for accounting- and market-based risk proxies used in earlier studies. Bondholders, for example, require higher spreads for banks with more substantial trading activities or with a larger proportion of assets devoted to commercial loans.	Yes.
Pettway, R. H., 1976, "The Effects of Large Bank Failures Upon Investors' Risk Cognizance in the Commercial Banking Industry," <i>The Journal of Financial and Quantitative Analysis</i> , 11, September, pp. 465-477.	US	January 1971 – June 1975	19 large commercial banks	Common stock	The failure of Franklin National significantly increased bank stock investors' perceived level of unsystematic risk, but this effect subsided within 20 weeks of its closure. This finding suggests that share prices could be used to identify firms that would subsequently fail.	Yes.
Pettway, R. H., 1980, "Potential Insolvency, Market Efficiency, and Bank Regulation of Large Commercial Banks," <i>The Journal of Financial and Quantitative Analysis</i> , 15, March, pp. 219-236.	US	January 1972 - December 1976	7 (24) large commercial banks that failed (did not fail) during the sample period	Common stock	Share prices and returns reflect an increasing potential for bankruptcy of large commercial banks. Cumulative average returns (CARs) calculated before failure dates illustrated that there were adverse changes in the market returns on failed banks as much as two years prior to their actual failure.	Yes.

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
Pettway, R.H. and J.F. Sinkey, Jr., "Establishing On-site Bank Examination Priorities: An Early Warning System Using Accounting and Market Information," <i>Journal of Finance</i> , 35, March, pp. 137-150.	US	January 1972-December 1976.	66 banks, 33 of which failed.	Common stock	Investors' perceptions, as reflected in bank equity prices, contain useful information for early warning purposes. Indeed, use of equity data is likely to give bank regulators significant lead time to prevent bank failure.	Yes.
Simons, K. and S. Cross, 1991, "Do Capital Markets Predict Problems in Large Commercial Banks?," <i>New England Economic Review</i> , May/June, pp. 51-56.	US		22 national banks that were downgraded from CAMEL 4 to CAMEL 5 between 1981 and 1987	Common stock	In the aggregate, shareholder returns fail to anticipate downgrades by bank examiners. Moreover, examination of individual problem banks fails to reveal convincing instances of specific information that had been known to investors prior to such a downgrade.	No.
Gropp, R. and A. Richards, 2001 "Rating Agency Actions and the Pricing of Debt and Equity of European Banks: What can we Infer about Private Sector Monitoring of Bank Soundness?" <i>Economics Notes</i> 30 (3) pp. 373-398.	EU	1989-2000	32 large commercial banks	Common stock, Subordinated debt	Use event study methodology. Find little effect of ratings changes on SND prices but significant effects on stock abnormal returns.	No on SND Yes on equity.
Gropp, R. and J. Vesala, 2002 "Deposit Insurance, Moral Hazard and Market Monitoring" <i>Federal Reserve Bank of Chicago Bank Structure Conference Proceedings</i> , May	EU	1991-98	128 large commercial banks	Subordinated debt	Suggests that explicit deposit insurance may serve as a commitment device to limit the safety net and permit monitoring by uninsured subordinated debt holders. Further find that credible limits to the safety net reduce risk taking of smaller banks with low charter values and sizeable subordinated debt shares only.	Yes.

**Summary of empirical studies on the effectiveness of market discipline
exerted by uninsured liabilities and equity on banking organisations (cont)**

Bibliographic citation	Country	Period	Sample	Uninsured liability	Findings	Evidence of market discipline?
Gropp, R., J. Vesala and G. Vulpes, 2002 "Equity and Debt Market Signals as Leading Indicators of Bank Fragility" ECB Working Papers No. 150.	EU	1990-2000	84 banks of which 23 failed	Common stock, subordinated debt	Find that distances to default and SND spreads have predictive power for bank failures. Spreads are affected by the safety net and predict relatively late.	Yes.
Sironi, A., 2003 "Testing for Market Discipline in the European Banking Industry: Evidence from Subordinated Debt Issues" forthcoming: <i>Journal of Money, Credit and Banking</i> .	EU	1991-2000	31 large commercial banks	Subordinated debt	SND spreads sensitive to bank risk with the exception of debt issued by public banks. Risk sensitivity has improved during the 90s.	Yes
Oda, N., 1999 "Estimating Fair Premium Rates for Deposit Insurance: Using Option Pricing Theory: An Empirical Study of Japanese Banks" Bank of Japan IMES Monetary and Economic Studies Vol. 17 No. 1, pp. 133-171.	Japan	1989-1997	87 banks	Common stock	Finds that basing deposit insurance premia on stock prices would more accurately reflect banks' risk compared to other methods.	Yes

Table 1.A: Subordinated debt issues by currency (number of issues)

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	The Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	United Kingdom 1990-2001	EU 2/	Switzerland 1991-2001	Japan 1991-2001	USA 1990-2001	Total	Percent of total
CHF	-	-	25	-	-	-	2	27	59	-	-	86	1.5%
EUR 1/	112	123	3,293	28	203	5	62	3,826	33	1	-	3,860	68.9%
<i>of which pre 1999:</i>													0.0%
BEF	19	-	-	-	-	-	-	19	-	-	-	19	0.3%
DEM	4	-	2,420	1	14	-	5	2,444	11	1	-	2,456	43.9%
ESP	-	-	-	-	106	-	-	106	-	-	-	106	1.9%
FRF	2	50	2	-	3	-	3	60	3	-	-	63	1.1%
GRD	-	-	-	-	-	-	-	0	-	-	-	0	0.0%
IEP	-	-	-	-	-	-	-	0	-	-	-	0	0.0%
ITL	-	-	-	-	-	-	1	1	2	-	-	3	0.1%
LUF	23	-	49	1	1	-	14	88	7	-	-	95	1.7%
NLG	16	-	13	1	1	-	1	32	-	-	-	32	0.6%
ATS	-	-	2	-	-	-	-	2	-	-	-	2	0.0%
PTE	-	-	6	-	-	-	-	6	-	-	-	6	0.1%
FIM	-	-	-	-	-	-	-	0	-	-	-	0	0.0%
GBP	1	-	9	-	-	-	133	143	11	-	-	154	2.8%
JPY	11	-	66	-	3	-	5	85	-	275	-	360	6.4%
SEK	1	-	-	-	-	5	-	6	-	-	-	6	0.1%
USD	13	-	58	9	45	10	75	210	27	42	820	1,099	19.6%
Other	16	-	8	2	2	-	5	33	1	1	-	35	0.6%
Total	154	123	3459	39	253	20	282	4,330	131	319	820	5,600	100.0%

1/ National currencies until 1999, EUR thereafter.

2/ 1990-2001: DE, NL, ES, SE, UK; 1992-2001: BE; 1997-2001: FR.

-: zero value, n.a.: data not available

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank, Bank of Japan Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

Table 1.B: Subordinated debt issues by currency (amounts issued, US\$ millions)

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	The Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	United Kingdom 1990-2001	EU 2/	Switzerland 1991-2001	Japan 1991-2001	USA 1990-2001	Total	Percent of total
CHF	-	-	2,697	-	-	-	206	2,903	8,270	-	-	11,173	2.6%
EUR 1/	13,934	17,419	75,406	11,558	18,080	2,233	21,000	159,630	5,686	7	-	165,323	37.8%
<i>of which pre 1999:</i>													
BEF	1,884	-	-	-	-	-	-	1,884	-	-	-	1,884	0.4%
DM	651	-	30,919	155	322	-	1,275	33,322	1,948	7	-	35,277	8.1%
ESP	-	-	-	-	6,207	-	-	6,207	-	-	-	6,207	1.4%
FRF	383	6,624	294	-	473	-	493	8,267	540	-	-	8,807	2.0%
GRD	-	-	-	-	-	-	-	0	-	-	-	0	0.0%
IEP	-	-	-	-	-	-	-	0	-	-	-	0	0.0%
ITL	-	-	-	-	-	-	140	140	81	-	-	221	0.1%
LUF	1,320	-	2,447	30	24	-	385	4,206	406	-	-	4,612	1.1%
NLG	892	-	1,416	459	18	-	113	2,898	-	-	-	2,898	0.7%
ATS	-	-	32	-	-	-	-	32	-	-	-	32	0.0%
PTE	-	-	174	-	-	-	-	174	-	-	-	174	0.0%
FIM	-	-	-	-	-	-	-	0	-	-	-	0	0.0%
GBP	127	-	2,110	-	-	-	37,120	39,357	3,124	-	-	42,481	9.7%
JPY	963	-	2,833	-	2	-	979	4,777	-	38,223	-	43,000	9.8%
SEK	53	-	-	-	-	884	-	936	-	-	-	936	0.2%
USD	1,224	-	11,761	4,250	8,531	2,100	31,474	59,340	8,900	10,876	92,469	171,585	39.2%
Other	897	-	637	682	374	-	563	3,153	33	12	-	3,198	0.7%
Total	17,198	17,419	95,444	16,490	26,987	5,216	91,342	270,096	26,013	49,118	92,469	437,696	100.0%

1/ National currencies until 1999, EUR thereafter.

2/ 1990-2001: DE, NL, ES, SE, UK; 1992-2001: BE; 1997-2001: FR.

-: zero value, n.a.: data not available

Table 2: Subordinated debt issues by instrument (number of issues)

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	The Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	United Kingdom 1990-2001	EU 1/	Switzerland 1991-2001	Japan 1991-2001	USA 1990-2001	Total	Percent of total
Fixed Rate	69	103	3,001	32	87	-	226	3,518	116	174	810	4,618	82.5%
<i>of which:</i>													
Zero Coupon	7	-	18	-	6	-	n.a.	31	-	1	18	50	0.9%
Warrant for Equity	-	-	-	-	-	-	n.a.	-	10	-	-	10	0.2%
Convertible into Floating	8	3	-	-	-	-	n.a.	11	-	78	-	89	1.6%
Warrant for Debt	-	-	-	-	-	-	n.a.	0	-	-	-	0	0.0%
Convertible to common stock	-	-	-	-	-	-	n.a.	0	4	-	-	4	0.1%
Convertible to preferred stock	-	-	-	-	-	-	n.a.	0	-	-	-	0	0.0%
Floating Rate	12	20	458	7	166	20	55	738	15	145	10	908	16.2%
<i>of which:</i>													
Extendable	-	-	-	-	-	-	n.a.	0	-	139	-	139	2.5%
Convertible into Fixed	-	-	-	-	-	-	n.a.	0	-	3	-	3	0.1%
Convertible to common stock	-	-	-	-	-	-	n.a.	0	-	-	-	0	0.0%
Convertible to preferred stock	-	-	-	-	-	-	n.a.	0	-	3	-	3	0.1%
Other/unknown	73	-	-	-	-	-	1	74	-	-	-	74	1.3%
Total	154	123	3,459	39	253	20	282	4,330	131	319	820	5,600	100.0%

-: zero value, n.a.: data not available

1/ 1990-2001: DE, NL, ES, SE, UK; 1992-2001: BE; 1997-2001: FR.

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank, Bank of Japan, Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

Table 3.A: Subordinated debt issues by market type (number of issues)

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	The Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	United Kingdom 1990-2001	EU	Switzerland 1991-2001	Japan 1991-2001	USA 1990-2001	Total	Percent of total
Public issue	51	123	911	39	n.a.	17	259	1,400	123	10	820	2,353	42.0%
<i>of which:</i>													
Domestic	2	n.a.	902	1	n.a.	1	11	917	54	8	n.a.	979	17.5%
Euro	49	n.a.	9	25	n.a.	16	211	310	54	-	n.a.	364	6.5%
Foreign	-	n.a.	-	13	n.a.	-	28	41	12	-	n.a.	53	0.9%
Global	-	n.a.	-	-	n.a.	-	9	9	3	2	n.a.	14	0.3%
Private placement	103	n.a.	2,548	-	n.a.	3	23	2,677	8	300	-	2,985	53.3%
<i>of which:</i>													
Domestic	n.a.	n.a.	2,463	-	n.a.	-	1	2,464	1	22	-	2,487	44.4%
Euro	n.a.	n.a.	79	-	n.a.	3	12	94	7	278	-	379	6.8%
Foreign	n.a.	n.a.	6	-	n.a.	-	10	16	-	-	-	16	0.3%
Total	154	123	3,459	39	253	20	282	4,330	131	319	820	5,600	100.0%

-: zero value, n.a.: data not available. Japan: no breakdown of euro issues into private/public, but estimated mostly private.

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank, Bank of Japan Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

Table 3.B: Subordinated debt issues by market type (amounts issued, USD millions)

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	The Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	United Kingdom 1990-2001	EU	Switzerland 1991-2001	Japan 1991-2001	USA 1990-2001	Total 1/	Percent of total 1/
Public issue	n.a.	17,419	45,473	16,490	n.a.	n.a.	88,967	168,349	25,585	7,235	92,469	268,054	69.0%
<i>of which:</i>													
Domestic	n.a.	n.a.	42,707	459	n.a.	n.a.	1,354	44,520	7,459	3,235	n.a.	47,755	16.1%
Euro	n.a.	n.a.	2,766	11,099	n.a.	n.a.	69,521	83,386	13,055	n.a.	n.a.	83,386	28.2%
Foreign	n.a.	n.a.	-	4,932	n.a.	n.a.	11,780	16,712	2,771	-	n.a.	16,712	5.6%
Global	n.a.	n.a.	-	-	n.a.	n.a.	6,312	6,312	2,300	4,000	n.a.	10,312	3.5%
Private placement	n.a.	n.a.	49,971	-	n.a.	n.a.	2,375	52,346	428	41,106	-	93,452	24.1%
<i>of which:</i>													
Domestic	n.a.	n.a.	41,583	-	n.a.	n.a.	81	41,664	22	17,683	-	59,347	20.1%
Euro	n.a.	n.a.	6,200	-	n.a.	n.a.	640	6,840	406	23,423	-	30,263	10.2%
Foreign	n.a.	n.a.	2,188	-	n.a.	n.a.	1,654	3,842	n.a.	-	-	3,842	1.3%
Total	17,198	17,419	95,444	16,490	26,987	5,216	91,342	270,096	26,013	49,118	92,469	437,697	100.0%

-: zero value, n.a.: data not available. Japan: no breakdown of euro issues into private/public, but estimated mostly private.

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank, Bank of Japan Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

1/ Note that breakdown n.a. for some countries. Total will not correspond to components

Table 4.A: Subordinated debt issues by initial term to maturity (number of issues)

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	The Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	United Kingdom 1990-2001	EU	Switzerland 1991-2001	Japan 1991-2001	USA 1990-2001	Total	Percent of total
Initial term to maturity													
Up to 5 years	21	-	46	1	2	-	5	75	6	1	1	83	1.5%
More than 5 up to 10	95	53	1,854	5	66	-	17	2,090	80	137	150	2,457	43.9%
More than 10 up to 15 years	8	63	1,322	26	122	14	90	1,645	19	50	319	2,033	36.3%
More than 15 up to 20 years	2	1	87	3	15	3	19	130	4	2	229	365	6.5%
More than 20 years	3	-	150	1	38	-	34	226	3	1	97	327	5.8%
Unknown	-	-	-	-	-	-	3	3	19	4	24	50	0.9%
Perpetuals	25	6	-	3	10	3	114	161	-	124	-	285	5.1%
Total	154	123	3,459	39	253	20	282	4,330	131	319	820	5,600	100.0%
<i>Memorandum items:</i>													
Range [min;max]	[3;40]	[6;15]	[1;40.1]	[5;29]	[1;30.6]	[10;15]	[1;40]	[1;40.1]	[3;30]	[5;15]	[5.5;100]	[1;100]	n.a.
Mean (excludes perpetuals)	9.1	10.8	9.5	11.0	11.7	10.7	14.0	11.0	10.7	10.7	13.6	11.8	n.a.

-: zero value, n.a.: data not available

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank, Bank of Japan, Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

Table 4.B: Subordinated debt issues by initial term to maturity (percent of total)

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	The Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	United Kingdom 1990-2001	EU	Switzerland 1991-2001	Japan 1991-2001	USA 1990-2001	Total
Initial term to maturity												
Up to 5 years	13.6%	-	1.3%	2.6%	0.8%	-	1.8%	1.7%	4.6%	0.3%	0.1%	1.5%
More than 5 up to 10	61.7%	43.1%	53.6%	12.8%	26.1%	-	6.0%	48.3%	61.1%	42.9%	18.3%	43.9%
More than 10 up to 15 years	5.2%	51.2%	38.2%	66.7%	48.2%	70.0%	31.9%	38.0%	14.5%	15.7%	38.9%	36.3%
More than 15 up to 20 years	1.3%	0.8%	2.5%	7.7%	5.9%	15.0%	6.7%	3.0%	3.1%	0.6%	27.9%	6.5%
More than 20 years	1.9%	-	4.3%	2.6%	15.0%	-	12.1%	5.2%	2.3%	0.3%	11.8%	5.8%
Unknown	-	-	-	-	-	-	-	-	14.5%	-	2.9%	0.9%
Perpetuals	16.2%	4.9%	-	7.7%	4.0%	15.0%	40.4%	3.7%	-	38.9%	-	5.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

-: zero value, n.a.: data not available

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank, Bank of Japan, Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

Table 5.A: Concentration of subordinated debt issues (in numbers of issues)

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	The Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	United Kingdom 1990-2001	EU 1990-2001	Switzerland 1991-2001	Japan 1991-2001	USA 1997-2001
3 most issuing banks	85%	37%	8%	100%	43%	85%	51%	17%	83%	69%	60%
5 most issuing banks	97%	60%	11%	100%	48%	n.a.	79%	22%	90%	89%	70%
10 most issuing banks	100%	80%	17%	100%	69%	n.a.	100%	31%	n.a.	98%	82%

-: zero value, n.a.: data not available

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank, Bank of Japan, Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

Table 5.B: Concentration of subordinated debt issues (in amounts of issues)

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	The Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	United Kingdom 1990-2001	EU 1990-2001	Switzerland 1991-2001	Japan 1991-2001	USA 1997-2001
3 most issuing banks	90%	50%	36%	100%	77%	84%	51%	48%	92%	68%	49%
5 most issuing banks	98%	69%	51%	100%	85%	n.a.	78%	63%	95%	88%	58%
10 most issuing banks	100%	78%	70%	100%	90%	n.a.	100%	82%	n.a.	97%	76%

-: zero value, n.a.: data not available

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank, Bank of Japan, Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

Table 6. Subordinated debt issues, 50 banks with the highest number of issues

Issuer		Number of issues		Amount (US\$ million)		Bank information (end-2001)				
		Total	Avg. Year	Total	Avg. issue	Total assets	Total equity	Total RWA	Total SND1/	
1	Bank of America	US	197	16.4	20,966	106.42	621,764	48,521	505,988	21,125
2	Citigroup	US	182	15.2	6,060	33.29	646,944	63,453	506,502	16,622
3	BAYER.HYPO- UND VEREINSBANK AG	DE	145	12.1	12,236	84	328,969	17,352	180,932	9,677
4	J.P. Morgan Chase & Co.	US	113	9.4	16,385	145.00	693,575	41,099	455,123	15,661
5	Mizuho FG(*2)	JP	97	8.8	14210	146	1140174	35652	710489	12570
6	UFJ Holdings	JP	75	6.8	10885	145	601108	19597	386204	9756
7	NASSAUISCHE SPARKASSE	DE	74	6.2	646	9	12,913	469	8,194	379
8	DZ BANK AG	DE	74	6.2	6,717	91	147,960	2,643	53,253	2,488
9	DRESDNER BANK AG	DE	74	6.2	12,850	174	306,129	10,365	129,729	7,367
10	CSG	SU	67	5.6	13,196	197	240,585	25,828	n.a.	8,632
11	SPARKASSE ZU LUEBECK	DE	62	5.2	239	4	2,129	91	1,562	85
12	Bank of New York	US	59	4.9	4,106	70	81,028	6,317	69,280	3,476
13	COMMERZBANK AG	DE	59	4.9	9,698	164	257,707	9,745	136,701	6,510
14	B.S.C.H.	ES	58	5.8	11,344	196	313,431	15,688	n.a.	11,453
15	Fortis	BE	56	5.6	7,293	130	401,316	20,133	153,450	11,205
16	WESTDEUTSCHE LANDESBANK	DE	55	4.6	4,667	85	299,553	5,622	97,852	5,387
17	Mitsubishi-Tokyo FG	JP	53	4.8	7731	146	749731	25050	454644	5313
18	HSBC	UK	52	4.7	13,096	252	686,165	109,236	391,185	n.a.
19	Sumitomo Mitsui FG	JP	51	4.6	8392	165	813842	21947	508990	7394
20	BAYER.LANDESBANK	DE	51	4.3	6,573	129	272,524	6,779	125,727	4,711
21	KREISSPARKASSE IN SIEGBURG	DE	50	4.2	353	7	4,754	157	2,921	150
22	Royal Bank of Scotland	UK	47	4.3	19,276	410	519,991	69,141	305,956	n.a.
23	KREISSPARK/HERZOGTUM LAUENBURG	DE	47	3.9	170	4	2,485	103	1,601	57
24	LANDESBANK BADEN-WUERTEMBERG	DE	46	3.8	3,627	79	255,702	5,144	97,048	3,712
25	HBOS	UK	44	4.0	13,597	309	398,367	41,398	227,441	n.a.
26	Barclays	UK	43	3.9	13,760	320	505,408	55,109	230,880	n.a.
27	STADT- U.KREISSPARK.PFORZHEIM	DE	42	3.5	539	13	6,196	235	3,951	155
28	KBC	BE	42	4.2	3,859	92	233,248	14,321	98,830	7,598
29	BBVA	ES	38	3.8	6,413	169	271,568	14,506	n.a.	6,708
30	NORDDEUTSCHE LANDESBANK	DE	37	3.1	2,220	60	134,605	3,464	54,350	1,834
31	Abbey National	UK	36	3.3	11,625	323	267,307	20,572	122,307	n.a.
32	Dexia	BE	33	3.3	4,266	129	234,749	8,889	76,680	6,110
33	Lloyds TSB	UK	32	2.9	11,781	368	275,746	60,286	158,259	n.a.
34	STADTSPARKASSE KOELN	DE	32	2.7	460	14	20,151	695	12,509	514
35	FleetBoston	US	30	2.5	3,345	111	203,638	17,608	201,588	6,207
36	DIE SPARKASSE IN BREMEN	DE	30	2.5	247	8	10,318	334	7,011	182
37	LANDWIRTSCHAFTLICHE RENTENBANK	DE	29	2.4	879	30	50,329	598	9,820	931
38	Bankers Trust NY	US	28	2.3	3,211	115	60,133	4,623	39,104	2,602
39	MITTELBR.SPARKASSE	DE	28	2.3	214	8	5,450	219	2,054	112
40	HAMBURGISCHE LANDESBANK	DE	27	2.3	1,636	61	78,623	2,599	41,021	1,435
41	DEUTSCHE BANK AG	DE	27	2.3	6,738	250	586,936	19,107	194,637	7,139
42	Chase Manhattan Bank	US	26	2.2	3,681	142	715,348	42,338	444,328	15,519
43	UBS	SU	26	2.2	7,200	277	612,158	14,068	n.a.	9,759
44	BANQUE FEDERALE DES BANQUES POPULAIRES	FR	26	5.2	1,927	74	13,576	2,158	n.a.	2,237
45	LANDESBANK RHEINL.-PFALZ	DE	22	1.8	1,370	62	53,129	847	20,565	862
46	LANDESBANK SCHLESW/-HOLSTEIN	DE	22	1.8	1,282	58	80,186	2,579	39,927	1,044
47	First Union/Wachovia	US	21	1.8	4,179	199	330,452	28,455	269,726	10,307
48	IKB DEUTSCHE INDUSTRIEBANK AG	DE	21	1.8	1,439	69	31,320	1,039	20,134	618
49	SG	FR	21	4.2	3,295	157	371,864	10,588	n.a.	9,474
50	ING Bank	NL	20	1.7	9,228	461	390,731	14,378	214,309	9,807
Total 50 banks			2,627	n.a.	329,108	n.a.	14,956,962	928,411	7,772,759	253,183
Average of 50 banks			53	4.6	6,582	137	299,139	18,568	176,654	5,754
Average of 210 reporting banks			27	1.5	2,084	134	109,736	6,403	52,940	1,987
Country averages per bank:										
Belgium (6 banks)			26	2.2	2,866	110	173,073	8,169	64,779	3,065
Germany (50 banks)			27	2.2	1,787	66	84,868	980	32,798	1,323
France (23 banks)			11	1.0	639	118	78,139	2,697	n.a.	2,232
The Netherlands (2 banks)			10	1.6	8,245	422	458,594	14,390	227,622	12,078
Spain (50 banks)			5	0.5	540	65	20,979	1,243	n.a.	526
Sweden (4 banks)			5	0.4	1,304	265	146,366	6,329	32,310	2,313
United Kingdom (10 banks)			28	2.8	9,134	297	286,571	37,888	156,116	n.a.
Switzerland (6 banks)			22	1.7	4,335	162	221,083	10,285	n.a.	9,196
Japan (10 banks)			32	2.6	4,912	319	379,745	12,055	254,518	4,075
USA (48 banks)			17	1.4	1,926	186	122,216	9,582	91,626	3,170

-.: zero value, n.a.: data not available

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank Bank of Japan, Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

210 reporting banks. France: 1997-2001, Belgium: 1992-2001, Japan, Switzerland: 1991-2001, others: 1990-2001. 1/ Total SND outstanding for US banks may include small amounts of limited-life preferred stock

Table 7. Subordinated debt issues, 50 banks with the highest total amount of issues

Issuer		Number of issues		Amount (US\$ million)		Bank information (end-2001)			Total SD	
		Total	Avg. Year	Total	Avg. issue	Total assets	Total equity	Total RWA		
1	Bank of America	US	197	16.4	20,966	106	621,764	48,521	505,988	21,125
2	Royal Bank of Scotland	UK	47	4.3	19,276	410	519,991	69,141	305,956	n.a.
3	J.P. Morgan Chase & Co.	US	113	9.4	16,385	145	693,575	41,099	455,123	15,661
4	Mizuho FG(*2)	JP	97	8.8	14,210	146	1140174	35652	710489	12570
5	Barclays	UK	43	3.9	13,760	320	505,408	55,109	230,880	n.a.
6	HBOS	UK	44	4.0	13,597	309	398,367	41,398	227,441	n.a.
7	CSG	SU	67	5.6	13,196	197	240,585	25,828	n.a.	8,632
8	HSBC	UK	52	4.7	13,096	252	686,165	109,236	391,185	n.a.
9	DRESDNER BANK AG	DE	74	6.2	12,850	174	306,129	10,365	129,729	7,367
10	BAYER.HYPO- UND VEREINSBANK AG	DE	145	12.1	12,236	84	328,969	17,352	180,932	9,677
11	Lloyds TSB	UK	32	2.9	11,781	368	275,746	60,286	158,259	n.a.
12	Abbey National	UK	36	3.3	11,625	323	267,307	20,572	122,307	n.a.
13	B.S.C.H.	ES	58	5.8	11,344	196	313,431	15,688	n.a.	11,453
14	UFJ Holdings	JP	75	6.8	10,885	145	601108	19597	386204	9756
15	COMMERZBANK AG	DE	59	4.9	9,698	164	257,707	9,745	136,701	6,510
17	ING Bank	NL	20	1.7	9,228	461	390,731	14,378	214,309	9,807
18	Sumitomo Mitsui FG	JP	51	4.6	8,392	165	813842	21947	508990	7394
19	Mitsubishi-Tokyo FG	JP	53	4.8	7,731	146	749731	25050	454644	5313
20	Fortis	BE	56	5.6	7,293	130	401,316	9,580	153,450	11,205
21	ABN AMRO Bank	NL	19	1.6	7,261	382	526,456	14,403	240,934	14,350
22	UBS	SU	26	2.2	7,200	277	612,158	14,068	n.a.	9,759
23	DEUTSCHE BANK AG	DE	27	2.3	6,738	250	586,936	19,107	194,637	7,139
24	DZ BANK AG	DE	74	6.2	6,717	91	147,960	2,643	53,253	2,488
25	BAYER.LANDESBANK	DE	51	4.3	6,573	129	272,524	6,779	125,727	4,711
16	BBVA	ES	38	3.8	6,413	169	271,568	14,506	n.a.	6,708
26	Citigroup	US	182	15.2	6,060	33	646,944	63,453	506,502	16,622
27	Standard Chartered	UK	13	1.2	5,304	408	107,379	13,416	69,169	n.a.
28	Bank One	US	15	1.3	4,804	320	268,954	20,226	253,330	8,799
29	WESTDEUTSCHE LANDESBANK	DE	55	4.6	4,667	85	299,553	5,622	97,852	5,387
30	Dexia	BE	33	3.3	4,266	129	234,749	4,630	76,680	6,110
31	First Union/Wachovia	US	21	1.8	4,179	199	330,452	28,455	269,726	10,307
32	Bank of New York	US	59	4.9	4,106	70	81,028	6,317	69,280	3,476
33	KBC	BE	42	4.2	3,859	92	233,248	7,523	98,830	7,598
34	Chase Manhattan Bank	US	26	2.2	3,681	142	715,348	42,338	444,328	15,519
35	LANDESBANK BADEN-WUERTTEMBERG	DE	46	3.8	3,627	79	255,702	5,144	97,048	3,712
36	Swiss Bank Corp	SU	16	1.3	3,601	225	n.a.	n.a.	n.a.	n.a.
37	CREDIT AGRICOLE S.A.	FR	11	2.2	3,542	322	226,613	11,028	n.a.	4,978
38	FleetBoston	US	30	2.5	3,345	111	203,638	17,608	201,588	6,207
39	SG	FR	21	4.2	3,295	157	371,864	10,588	n.a.	9,474
40	Bankers Trust NY	US	28	2.3	3,211	115	60,133	4,623	39,104	2,602
41	LA CAIXA	ES	3	0.3	2,894	965	75,928	6,512	n.a.	2,677
42	Wachovia (Old)	US	8	0.7	2,446	306	74,828	6,455	83,020	2,894
43	Republic New York	US	16	1.3	2,299	144	53,052	3,278	28,248	2,625
44	NORDDEUTSCHE LANDESBANK	DE	37	3.1	2,220	60	134,605	3,464	54,350	1,834
45	Sumitomo Trust & Banking	JP	8	0.7	2,150	269	125869	4971	89730	1993
46	Northern Rock	UK	10	2.5	2,049	205	38,302	3,854	21,560	n.a.
47	BNPP	FR	14	2.8	2,031	145	598,594	16,821	n.a.	12,058
48	Svenska Handelsbanken	SE	5	0.4	1,948	390	124,320	5,093	56,511	2,642
49	BANQUE FEDERALE DES BANQUES POPULAIRES	FR	26	5.2	1,927	74	13,576	2,158	n.a.	2,237
50	Wells Fargo & Co.	US	9	0.8	1,796	200	92,815	13,200	80,313	2,346

-: zero value, n.a.: data not available

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank, Bank of Japan, Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

210 reporting banks. France: 1997-2001, Belgium: 1992-2001, Japan, Switzerland: 1991-2001, others: 1990-2001. Total SND outstanding for US banks may include small amounts of limited-life preferred stock

Table 8. Subordinated debt issues, 50 banks with the largest average issue size

Issuer		Number of issues		Amount (US\$ million)		Bank information (end-2001)				
		Total	Avg. Year	Total	Avg. issue	Total assets	Total equity	Total RWA	Total SND	
1	Mizuho Trust & Banking	JP	1	0.1	1146	1146	46536	2006	36711	1130
2	LA CAIXA	ES	3	0.3	2894	965	75,928	6,512	n.a.	2,677
3	Mitui Trust Holdings	JP	1	0.1	764	764	100767	3739	76567	754
4	Natwest Holdings	US	1	0.1	750	750	29,226	3,421	20,914	498
5	CAISSE NALE CAISSES D'EPARGNE PREVOYANCE	FR	2	0.4	1254	627	46,665	3,212	n.a.	0.750
6	Regions Financial Corp	US	1	0.1	500	500	45,545	4,036	33,471	725
7	Union Planters Corporation	US	1	0.1	500	500	33,198	3,224	24,992	974
8	ING Bank	NL	20	1.7	9228	461	390,731	14,378	214,309	9,807
9	Hokkaido Bank	JP	1	0.1	418	418	27191	1183	15412	0
10	Royal Bank of Scotland	UK	47	4.3	19276	410	519,991	69,141	305,956	n.a.
11	Standard Chartered	UK	13	1.2	5304	408	107,379	13,416	69,169	n.a.
12	Svenska Handelsbanken	SE	5	0.4	1948	390	124,320	5,093	56,511	2,642
13	ABN AMRO Bank	NL	19	1.6	7261	382	526,456	14,403	240,934	14,350
14	BB&T	US	4	0.3	1500	375	70,870	6,150	50,967	1,501
15	National City Corp	US	4	0.3	1497	374	106,894	7,381	89,654	3,624
16	Lloyds TSB	UK	32	2.9	11781	368	275,746	60,286	158,259	n.a.
17	Abbey National	UK	36	3.3	11625	323	267,307	20,572	122,307	n.a.
18	CREDIT AGRICOLE S.A.	FR	11	2.2	3542	322	226,613	11,028	n.a.	4,978
19	Bank One	US	15	1.3	4804	320	268,954	20,226	253,330	8,799
20	Barclays	UK	43	3.9	13760	320	505,408	55,109	230,880	n.a.
21	HBOS	UK	44	4.0	13597	309	398,367	41,398	227,441	n.a.
22	NATEXIS BANQUES POPULAIRES	FR	1	0.2	308	308	76,325	2,627	n.a.	1,805
23	Wachovia (Old)	US	8	0.7	2446	306	74,828	6,455	83,020	2,894
24	Marine Midland Bank	US	1	0.1	300	300	87,114	7,049	55,620	2,712
25	VOLKSWAGEN BANK GMBH	DE	2	0.2	558	279	11,652	639	10,347	457
26	UBS	SU	26	2.2	7200	277	612,158	14,068	n.a.	9,759
27	Sumitomo Trust & Banking	JP	8	0.7	2150	269	125869	4971	89730	1993
28	CDC IXIS CAPITAL MARKETS	FR	1	0.2	257	257	100,377	0,509	n.a.	0.633
29	Alliance & Leicester	UK	2	0.5	514	257	56,920	5,870	28,044	n.a.
30	CAJA DE AHORROS DE MADRID	ES	6	0.6	1531	255	58,652	3,560	n.a.	1,383
31	EUROCLEAR BANK	BE	2	0.2	507	253	11,002	1,425	2,577	533
32	HSBC	UK	52	4.7	13096	252	686,165	109,236	391,185	n.a.
33	Bank of Boston	US	3	0.3	750	250	76,914	5,488	74,108	2,679
34	SunTrust Banks	US	5	0.4	1249	250	104,741	8,360	99,701	2,737
35	DEUTSCHE BANK AG	DE	27	2.3	6738	250	586,936	19,107	194,637	7,139
36	Föreningsparbanken	SE	3	0.3	704	235	101,580	3,967	n.a.	2,062
37	Swiss Bank Corp	SU	16	1.3	3601	225	n.a.	n.a.	n.a.	n.a.
38	Nordea	SE	8	0.6	1572	225	236,428	11,568	33,188	2,066
39	Skandinaviska enskildabanken	SE	4	0.3	842	211	123,134	4,688	39,540	2,483
40	Northern Rock	UK	10	2.5	2049	205	38,302	3,854	21,560	n.a.
41	First Security Corp	US	1	0.1	200	200	21,225	1,681	--	599
42	Mercantile Bancorporation	US	1	0.1	200	200	35,655	3,053	26,653	425
43	Associated Banc-Corp	US	1	0.1	200	200	13,640	1,070	9,528	182
44	Wells Fargo & Co.	US	9	0.8	1796	200	92,815	13,200	80,313	2,346
45	First Union/Wachovia	US	21	1.8	4179	199	330,452	28,455	269,726	10,307
46	CSG	SU	67	5.6	13196	197	240,585	25,828	n.a.	8,632
47	B.S.C.H.	ES	58	5.8	11344	196	313,431	15,688	n.a.	11,453
48	MBNA Corp	US	3	0.3	530	177	45,451	7,799	48,893	464
49	First American Bank Corp	US	2	0.2	350	175	21,080	1,877	16,119	360
50	United Jersey Banks	US	1	0.1	175	175	39,668	3,247	30,288	225

--: zero value, n.a.: data not available

Source: National Bank of Belgium, Deutsche Bundesbank, Commission Bancaire de France, Netherlands Bank, Bank of Spain, Sveriges Riksbank, Bank of England, Swiss National Bank Bank of Japan, Federal Reserve Board, Dealogic and Bureau van Dijk Bankscope.

210 reporting banks. France: 1997-2001, Belgium: 1992-2001, Japan, Switzerland: 1991-2001, others: 1990-2001. Total SND outstanding for US banks may include small amounts of limited-life preferred stock

Table 9. Subordinated debt issues, 50 banks with the highest average number of issues per year

Issuer		Number of issues		Amount (US\$ million)		Bank information (end-2001)				
		Total	Avg. Year	Total	Avg. issue	Total assets	Total equity	Total RWA	Total SND	
1	Bank of America	US	197	16.4	20,966	106	621,764	48,521	505,988	21,125
2	Citigroup	US	182	15.2	6,060	33	646,944	63,453	506,502	16,622
3	BAYER.HYPO- UND VEREINSBANK AG	DE	145	12.1	12,236	84	328,969	17,352	180,932	9,677
4	J.P. Morgan Chase & Co.	US	113	9.4	16,385	145	693,575	41,099	455,123	15,661
5	Mizuho FG(*2)	JP	97	8.8	14,210	146	1140174	35652	710489	12570
6	UFJ Holdings	JP	75	6.8	10,885	145	601108	19597	386204	9756
7	DRESDNER BANK AG	DE	74	6.2	12,850	174	306,129	10,365	129,729	7,367
8	DZ BANK AG	DE	74	6.2	6,717	91	147,960	2,643	53,253	2,488
9	NASSAUISCHE SPARKASSE	DE	74	6.2	646	9	12,913	469	8,194	379
10	B.S.C.H.	ES	58	5.8	11,344	196	313,431	15,688	n.a.	11,453
11	Fortis	BE	56	5.6	7,293	130	401,316	9,580	153,450	11,205
12	CSG	SU	67	5.6	13,196	197	240,585	25,828	n.a.	8,632
13	BANQUE FEDERALE DES BANQUES POPULAIRES	FR	26	5.2	1,927	74	13,576	2,158	n.a.	2,237
14	SPARKASSE ZU LUEBECK	DE	62	5.2	239	4	2,129	91	1,562	85
15	COMMERZBANK AG	DE	59	4.9	9,698	164	257,707	9,745	136,701	6,510
16	Bank of New York	US	59	4.9	4,106	70	81,028	6,317	69,280	3,476
17	Mitsubishi-Tokyo FG	JP	53	4.8	7,731	146	749731	25050	454644	5313
18	HSBC	UK	52	4.7	13,096	252	686,165	109,236	391,185	n.a.
19	Sumitomo Mitsui FG	JP	51	4.6	8,392	165	813842	21947	508990	7394
20	WESTDEUTSCHE LANDESBANK	DE	55	4.6	4,667	85	299,553	5,622	97,852	5,387
21	Royal Bank of Scotland	UK	47	4.3	19,276	410	519,991	69,141	305,956	n.a.
22	BAYER.LANDESBANK	DE	51	4.3	6,573	129	272,524	6,779	125,727	4,711
23	SG	FR	21	4.2	3,295	157	371,864	10,588	n.a.	9,474
24	KBC	BE	42	4.2	3,859	92	233,248	7,523	98,830	7,598
25	KREISSPARKASSE IN SIEGBURG	DE	50	4.2	353	7	4,754	157	2,921	150
26	HBOS	UK	44	4.0	13,597	309	398,367	41,398	227,441	n.a.
27	KREISSPARK/HERZOGTUM LAUENBURG	DE	47	3.9	170	4	2,485	103	1,601	57
28	Barclays	UK	43	3.9	13,760	320	505,408	55,109	230,880	n.a.
29	LANDESBANK BADEN-WUERTTEMBERG	DE	46	3.8	3,627	79	255,702	5,144	97,048	3,712
30	BBVA	ES	38	3.8	6,413	169	271,568	14,506	n.a.	6,708
31	STADT- U.KREISSPARK.PFORZHEIM	DE	42	3.5	539	13	6,196	235	3,951	155
32	Abbey National	UK	36	3.3	11,625	323	267,307	20,572	122,307	n.a.
33	Dexia	BE	33	3.3	4,266	129	234,749	4,630	76,680	6,110
34	NORDDEUTSCHE LANDESBANK	DE	37	3.1	2,220	60	134,605	3,464	54,350	1,834
35	Lloyds TSB	UK	32	2.9	11,781	368	275,746	60,286	158,259	n.a.
36	BNPP	FR	14	2.8	2,031	145	598,594	16,821	n.a.	12,058
37	STADTSPARKASSE KOELN	DE	32	2.7	460	14	20,151	695	12,509	514
38	Northern Rock	UK	10	2.5	2,049	205	38,302	3,854	21,560	n.a.
39	FleetBoston	US	30	2.5	3,345	111	203,638	17,608	201,588	6,207
40	DIE SPARKASSE IN BREMEN	DE	30	2.5	247	8	10,318	334	7,011	182
41	LANDWIRTSCHAFTLICHE RENTENBANK	DE	29	2.4	879	30	50,329	598	9,820	931
42	Bankers Trust NY	US	28	2.3	3,211	115	60,133	4,623	39,104	2,602
43	MITTELBR.SPARKASSE	DE	28	2.3	214	8	5,450	219	2,054	112
44	DEUTSCHE BANK AG	DE	27	2.3	6,738	250	586,936	19,107	194,637	7,139
45	HAMBURGISCHE LANDESBANK	DE	27	2.3	1,636	61	78,623	2,599	41,021	1,435
46	CREDIT AGRICOLE S.A.	FR	11	2.2	3,542	322	226,613	11,028	n.a.	4,978
47	UBS	SU	26	2.2	7,200	277	612,158	14,068	n.a.	9,759
48	Chase Manhattan Bank	US	26	2.2	3,681	142	715,348	42,338	444,328	15,519
49	CREDIT INDUSTRIEL ET COMMERCIAL - CIC	FR	10	2.0	514	51	50,398	1,911	n.a.	2,002
50	LANDESBANK RHEINL.-PFALZ	DE	22	1.8	1,370	62	53,129	847	20,565	862

210 reporting banks. France: 1997-2001, Belgium: 1992-2001, Japan, Switzerland: 1991-2001, others: 1990-2001. Total SND outstanding for US banks may include small amounts of limited-life preferred stock.

Table 10. Outstanding amount of subordinated debt, 50 banks ranked by the share of SND in total assets

Issuer		Total amount of SND (end-2001)			
		% of total assets	% of total equity	% of risk weighted assets	
1	CREDIT COMMERCIAL DE FRANCE	FR	21.5	451.9	n.a.
2	BANQUE FEDERALE DES BANQUES POPULAIRES	FR	16.5	103.7	n.a.
3	CPR	FR	5.6	26.2	n.a.
4	Republic New York	US	4.9	80.1	9.3
5	EUROCLEAR BANK	BE	4.8	37.4	20.7
6	BANQUE MARTIN MAUREL	FR	4.7	187.0	n.a.
7	Bankers Trust NY	US	4.3	56.3	6.7
8	Bank of New York	US	4.3	55.0	5.0
9	SPARKASSE ZU LUEBECK	DE	4.0	93.1	5.4
10	CREDIT INDUSTRIEL ET COMMERCIAL - CIC	FR	4.0	104.7	n.a.
11	VOLKSWAGEN BANK GMBH	DE	3.9	71.5	4.4
12	Society Corp (Keycorp)	US	3.9	50.9	3.7
13	Wachovia (Old)	US	3.9	44.8	3.5
14	SOFINCO	FR	3.8	75.1	-
15	B.S.C.H.	ES	3.7	73.0	-
16	CSG	SU	3.6	33.4	-
17	LYONNAISE DE BANQUE L.B	FR	3.5	118.8	-
18	LA CAIXA	ES	3.5	41.1	-
19	Comerica	US	3.5	37.0	3.0
20	Bank of Boston	US	3.5	48.8	3.6
21	Bank of America	US	3.4	43.5	4.2
22	National City Corp	US	3.4	49.1	4.0
23	Allfirst Financial	US	3.3	37.6	3.9
24	Bank One	US	3.3	43.5	3.5
25	KBC	BE	3.3	101.0	7.7
26	KREISSPARKASSE IN SIEGBURG	DE	3.1	95.1	5.1
27	First Union/Wachovia	US	3.1	36.2	3.8
28	Marine Midland Bank	US	3.1	38.5	4.9
29	BANKGESELLSCHAFT BERLIN AG	DE	3.1	93.7	7.2
30	FleetBoston	US	3.0	35.3	3.1
31	BAYER.HYPO- UND VEREINSBANK AG	DE	2.9	55.8	5.3
32	Union Planters Corporation	US	2.9	30.2	3.9
33	NASSAUISCHE SPARKASSE	DE	2.9	80.8	4.6
34	First Security Corp	US	2.8	35.6	-
35	Fortis	BE	2.8	117.0	7.3
36	C L	FR	2.8	81.0	-
37	ABN AMRO Bank	NL	2.7	99.6	6.0
38	NBD Corp	US	2.6	36.1	2.7
39	EUROPESE BANK VOOR LATIJNS-AMERIKA	BE	2.6	52.9	6.3
40	SunTrust Banks	US	2.6	32.7	2.7
41	Dexia	BE	2.6	132.0	8.0
42	BANQUE COVEFI	FR	2.6	26.8	-
43	Citigroup	US	2.6	26.2	3.3
44	STADTSPARKASSE KOELN	DE	2.5	73.9	4.1
45	SG	FR	2.5	89.5	-
46	FINAREF	FR	2.5	20.0	-
47	COFIDIS	FR	2.5	23.9	-
48	Wells Fargo & Co.	US	2.5	17.8	2.9
49	COMMERZBANK AG	DE	2.5	66.8	4.8
50	FACTOFRANCE HELLER	FR	2.5	26.4	-
Average of 50 banks			3.9	69.8	5.3
Average 210 banks			2.1	44.6	3.6
Country averages (full sample):					
Belgium			2.9	73.1	9.0
Germany			1.6	55.2	3.5
France			4.0	89.2	n.a
The Netherlands			2.6	83.9	5.3
Spain			1.5	24.6	n.a
Sweden			1.8	43.7	5.7
United Kingdom			n.a.	n.a.	n.a
Switzerland			2.6	51.4	n.a
Japan			1.1	31.6	1.5
USA			2.3	29.5	3.0

210 reporting banks. France: 1997-2001, Belgium: 1992-2001, Japan, Switzerland: 1991-2001, others: 1990-2001.

Table 11. Relationship between SND issue size, frequency of issue and bank characteristics
(Correlation coefficients)

	Belgium 1992-2001	France 1997-2001	Germany 1990-2001	The Netherlands 1990-2001	Spain 1990-2001	Sweden 1990-2001	United Kingdom 1990-2001	EU	Switzerland 1991-2001	Japan 1991-2001	USA 1997-2001	Total
Frequency of issue												
Average issue size	0.03	0.46	0.01	n.a.	0.17	0.10	0.41	0.17	0.56	-0.51	-0.24	-0.04
Bank size (total assets)	0.98	0.68	0.47	n.a.	0.94	0.93	0.41	0.60	0.39	0.95	0.78	0.66
RWA	0.99	n.a.	0.60	n.a.	n.a.	-0.10	0.89	0.49	n.a.	0.95	0.81	0.66
SND/RWA	-0.34	n.a.	0.46	n.a.	n.a.	0.13	n.a.	0.15	n.a.	0.27	0.23	0.13
SND/Total assets	-0.13	0.00	0.51	n.a.	0.51	-0.84	n.a.	0.11	n.a.	0.08	0.24	0.15
SND/Equity	0.34	-0.11	0.39	n.a.	0.58	-0.87	n.a.	0.23	n.a.	0.26	0.23	0.17
Average issue size												
Bank size (total assets)	0.04	0.24	0.62	n.a.	0.37	-0.24	0.39	0.49	0.98	-0.45	-0.15	0.21
SND/RWA	0.91	n.a.	0.05	n.a.	n.a.	-1.00	n.a.	0.30	n.a.	0.38	0.00	-0.02
SND/Total assets	0.89	-0.08	0.06	n.a.	0.47	0.39	n.a.	0.12	n.a.	0.42	0.04	0.07
SND/Equity	-0.38	-0.04	-0.03	n.a.	0.29	0.30	n.a.	0.10	n.a.	0.18	-0.04	-0.01
Bank size (total assets)												
SND/RWA	-0.35	n.a.	0.20	n.a.	n.a.	0.47	n.a.	0.16	n.a.	0.21	0.17	0.00
SND/Total assets	-0.19	-0.14	0.00	n.a.	0.50	-0.98	n.a.	0.03	n.a.	-0.02	0.17	-0.02
SND/Equity	0.31	-0.02	0.07	n.a.	0.54	-0.98	n.a.	0.20	n.a.	0.14	0.21	0.04
Number of banks	7	23	50	2	50	4	10	146	6	10	48	210

Table 12.A: Belgium: Bid/ask spreads for the most active issuers
(Percent)

Year		First	Second	Third	Fourth
1993	Annual Average	n.a.	n.a.	0.40	n.a.
	Annual median	n.a.	n.a.	0.40	n.a.
	Annual Standard deviation	n.a.	n.a.	0.00	n.a.
1994	Annual Average	n.a.	n.a.	0.40	n.a.
	Annual median	n.a.	n.a.	0.40	n.a.
	Annual Standard deviation	n.a.	n.a.	0.00	n.a.
1995	Annual Average	0.25	0.15	0.40	n.a.
	Annual median	0.25	0.15	0.40	n.a.
	Annual Standard deviation	0.00	0.00	0.00	n.a.
1996	Annual Average	0.34	0.17	0.40	n.a.
	Annual median	0.25	0.15	0.40	n.a.
	Annual Standard deviation	0.12	0.05	0.00	n.a.
1997	Annual Average	0.46	0.29	0.29	0.29
	Annual median	0.50	0.28	0.30	0.35
	Annual Standard deviation	0.09	0.03	0.12	0.07
1998	Annual Average	0.30	0.40	0.37	0.35
	Annual median	0.30	0.39	0.34	0.37
	Annual Standard deviation	0.01	0.08	0.36	0.04
1999	Annual Average	0.12	0.56	0.37	0.23
	Annual median	0.10	0.56	0.36	0.26
	Annual Standard deviation	0.12	0.00	1.02	0.09
2000	Annual Average	0.48	0.36	0.43	0.37
	Annual median	0.48	0.31	0.45	0.37
	Annual Standard deviation	0.05	0.11	0.47	0.19
2001	Annual Average	0.59	0.33	0.46	0.36
	Annual median	0.58	0.34	0.46	0.35
	Annual Standard deviation	0.07	0.02	0.66	0.16

Memorandum items:

US ABS exchange market (1995-1996)^{1/}

Investment grade corporate bonds

Mean 0.21

Median 0.13

Standard deviation 0.33

Non-investment grade corporate bonds

Average 0.19

Median 0.13

Standard deviation 0.31

Source: Bloomberg

Other countries: n.a., Source: National Bank of Belgium.

^{1/} Source: Hong and Warga, 1998

Table 12.B: Belgium: Bid/ask spreads for all issues

Year		
1993	Annual Average	0.40
	Annual median	0.40
	Annual Standard deviation	0.00
1994	Annual Average	0.04
	Annual median	0.04
	Annual Standard deviation	0.00
1995	Annual Average	0.27
	Annual median	0.27
	Annual Standard deviation	0.00
1996	Annual Average	0.30
	Annual median	0.27
	Annual Standard deviation	0.00
1997	Annual Average	0.31
	Annual median	0.32
	Annual Standard deviation	0.09
1998	Annual Average	0.37
	Annual median	0.35
	Annual Standard deviation	0.20
1999	Annual Average	0.36
	Annual median	0.36
	Annual Standard deviation	0.54
2000	Annual Average	0.41
	Annual median	0.41
	Annual Standard deviation	0.27
2001	Annual Average	0.41
	Annual median	0.41
	Annual Standard deviation	0.29

Source: Bloomberg

Other countries: n.a., Source: National Bank of Belgium

Table 13A: Trading volumes of subordinated debt for the most active issuers, Spain

Year		First most active issuer	Second most active issuer	Third most active issuer	Forth most active issuer	Trading volumes of total subordinated debt
1996	Daily Average	508	33	0	0	565
	Daily median	0	0	0	0	9
	Daily Standard deviation	1,926	258	-	0	1943
1997	Daily Average	1,468	1,478	0	0	3450
	Daily median	0	0	0	0	10
	Daily Standard deviation	9,000	6,971	-	0	12699
1998	Daily Average	1,094	1,389	0	76	3814
	Daily median	0	0	0	0	60
	Daily Standard deviation	4,847	5,502	-	176	9400
1999	Daily Average	625	694	0	157	1676
	Daily median	0	0	0	90	216
	Daily Standard deviation	3,853	2,784	-	214	5164
2000	Daily Average	69	45	0	585	1081
	Daily median	0	0	0	127	429
	Daily Standard deviation	409	411	-	5738	5777
2001	Daily Average	74	26	0	335	1013
	Daily median	0	0	0	133	676
	Daily Standard deviation	492	179	-	1241	1413

Other countries n.a.

Source: Bank of Spain

Table 13B: Standard deviation of bank bond yields

	Germany monthly	The Netherlands monthly	Switzerland daily
1990	n.a.	0.225	0.037
1991	0.857	0.166	0.060
1992	1.311	0.460	0.079
1993	0.862	0.483	0.054
1994	0.821	0.805	0.074
1995	1.026	0.558	0.058
1996	1.082	0.208	0.055
1997	0.897	0.136	0.062
1998	0.734	0.315	0.063
1999	0.942	0.644	0.083
2000	0.807	0.130	0.084
2001	0.898	0.222	0.095

Other countries n.a.

Source: Deutsche Bundesbank, Netherlands Bank and Swiss National Bank.

Table 14. Major issuers of equity, sorted by average number of issues per year

	Issuer	Number of issues		Amount (US\$ million)		Bank information (end-2001)		
		Total	Avg. Year	Total	Avg. issue	Total assets	Total equity	Total RWA
1	DE Commerzbank Aktiengesellschaft	16	1.33	17,900	1,119	353,369	9,863	128,786
2	JP Resona Holdings	14	1.17	13,016	930	338,727	9,713	217,243
3	UK Standard Chartered	3	1.00	1,032	344	107,379	13,416	69,169
4	DE Bayerische Hypo- und Vereinsbank Aktiengesellschaft	12	1.00	9,140	762	316,844	17,013	170,456
5	JP Mizuho Holdings	11	0.92	29,254	2,659	1,140,174	35,652	710,489
6	BE Fortis	9	0.82	995	90	401,316	20,133	153,450
7	JP UFJ Holdings	9	0.75	20,483	2,276	601,108	19,597	386,204
8	DE Oldenburgische Landesbank Aktiengesellschaft	8	0.67	483	60	8,126	369	5,128
9	DE Württembergische Hypothekenbank Aktiengesellschaft	8	0.67	205	26	28,940	330	6,892
10	US SOUTHTRUST CORPORATION	3	0.60	438	146	48,755	3,962	40,124
11	BE KBC	6	0.55	123	11	233,247	14,321	98,830
12	JP Chiba Kogyo Bank	6	0.50	1,158	193	14,981	726	9,304
13	JP Sumitomo Mitsui Banking	6	0.50	18,108	3,018	813,842	21,947	508,990
14	JP Mitui Trust Holdings	6	0.50	5,343	891	100,767	3,739	76,567
15	BE BBL	5	0.45	146	13	140,937	3,846	51,541
16	SU Basler Kantonalbank	4	0.44	70	17	7,932	356	n.a.
17	SU Luzerner Kantonalbank	4	0.44	69	17	10,401	491	n.a.
18	SU Zuger Kantonalbank	4	0.44	40	10	5,402	201	n.a.
19	JP MTFG	5	0.42	7,262	1,452	749,731	25,050	454,644
20	JP Kumamoto Family Bank	5	0.42	478	96	10,037	560	6,921
21	DE Deutsche Bank Aktiengesellschaft	5	0.42	7,479	1,496	656,932	19,415	183,368
22	DE Dresdner Bank Aktiengesellschaft	5	0.42	6,695	1,339	334,926	10,423	122,218
23	US MBNA	2	0.40	2,800	1,400	45,451	7,799	48,893
24	US BANK ONE CORPORATION	2	0.40	1,270	635	268,954	20,226	253,330
25	US FIFTH THIRD	2	0.40	383	191	71,026	7,630	n.a.
26	BE Dexia Bank Belgique	4	0.36	3,412	310	234,749	8,889	76,680
27	UK HSBC	1	0.33	1,148	1,148	686,165	109,236	391,185
28	UK Royal Bank of Scotland	1	0.33	926	926	519,991	69,141	305,956
29	UK Lloyds/Lloyds TSB	1	0.33	336	336	275,746	60,286	158,259
30	UK Egg	1	0.33	156	156	n.a.	1,853	n.a.
31	UK Close Brothers	1	0.33	28	28	n.a.	1,602	n.a.
32	UK Bank of Scotland	1	0.33	134	134	n.a.	n.a.	n.a.
33	SU Basellandsch. Kantonalbank	3	0.33	105	35	8,149	410	n.a.
34	SU Bank Linth	3	0.33	44	15	1,998	139	n.a.
35	DE Bayerische Hypotheken- und Wechselbank Aktiengesellschaft	4	0.33	2,590	647	113,463	4,253	n.a.
36	DE Bankgesellschaft Berlin Aktiengesellschaft	4	0.33	1,843	461	80,545	1,682	33,998
37	DE Vereins- und Westbank Aktiengesellschaft	4	0.33	642	160	18,081	789	12,480
38	DE DePfa Deutsche Pfandbriefbank AG	4	0.33	343	86	99,890	1,174	16,891
39	DE ConSors Discount-Broker Aktiengesellschaft	4	0.33	177	44	1,779	437	1,115
40	DE IKB Deutsche Industriebank Aktiengesellschaft	3	0.25	697	232	30,462	1,071	18,968
41	DE BHF-Bank Aktiengesellschaft	3	0.25	665	222	23,455	1,651	12,207
42	DE BADEN-WÜRTTEMBERGISCHE BANK Aktiengesellschaft	3	0.25	300	100	20,558	591	10,361
43	DE Deutsche VerkehrsBank Aktiengesellschaft	3	0.25	198	66	8,580	314	5,185
44	DE DAB Bank AG	3	0.25	132	44	1,970	171	754
45	DE Bankverein Werther Aktiengesellschaft	3	0.25	3	1	68	5	35
46	SU Banque Cantonale Vaudoise	2	0.22	196	98	21,388	858	n.a.
47	US FIRST UNION / WACHOVIA	1	0.20	2,526	2,526	330,452	28,455	269,726
48	US WELLS FARGO	1	0.20	759	759	92,815	13,200	80,313
49	US FLEET FINANCIAL GROUP	1	0.20	757	757	203,638	17,608	201,588
50	US BANK BOSTON	1	0.20	247	247	76,914	5,488	74,108
51	US J.P. MORGAN CHASE & CO.	1	0.20	200	200	693,575	41,099	455,123
52	US REPUBLIC NEW YORK CORPORATION	1	0.20	150	150	53,052	3,278	28,248
53	US ZIONS	1	0.20	136	136	24,304	2,281	19,097
54	SU Banque Cantonale de Genève	1	0.11	81	81	10,201	388	n.a.
55	SU BSI SA	1	0.11	59	59	4,176	296	n.a.
56	SU Walliser Kantonalbank	1	0.11	40	40	4,310	209	n.a.
57	SU Coop Bank	1	0.11	35	35	5,749	387	n.a.
58	DE comdirect bank Aktiengesellschaft	1	0.08	132	132	2,716	724	1,074
Total 58 banks		228	24	163,569	29,564	10,458,239	644,744	5,875,894
Average 58 banks		3.93	0.41	2820.15	509.73	190149.81	11311.29	136648.71

N.a. for France, Sweden, and Spain. The U.S.:1997-2001, Japan: 1991-2001, others 1990-2001.

Table 15. Major issuers of equity, sorted by total issue volume (end-2001)

	Issuer	Number of issues		Amount (US\$ million)		Bank information		
		Total	Avg. Year	Total	Avg. issue	Total assets	Total equity	Total RWA
1	JP Mizuho Holdins	11	0.92	29,254	2,659	1,140,174	35,652	710,489
2	JP UFJ Holdings	9	0.75	20,483	2,276	601,108	19,597	386,204
3	JP Sumitomo Mitsui Banking	6	0.50	18,108	3,018	813,842	21,947	508,990
4	DE Commerzbank Aktiengesellschaft	16	1.33	17,900	1,119	353,369	9,863	128,786
5	JP Resona Holdings	14	1.17	13,016	930	338,727	9,713	217,243
6	DE Bayerische Hypo- und Vereinsbank Aktiengesellschaft	12	1.00	9,140	762	316,844	17,013	170,456
7	DE Deutsche Bank Aktiengesellschaft	5	0.42	7,479	1,496	656,932	19,415	183,368
8	JP MTFG	5	0.42	7,262	1,452	749,731	25,050	454,644
9	DE Dresdner Bank Aktiengesellschaft	5	0.42	6,695	1,339	334,926	10,423	122,218
10	JP Mitusi Trust Holdings	6	0.50	5,343	891	100,767	3,739	76,567
11	BE Dexia Bank Belgie	4	0.36	3,412	310	234,749	8,889	76,680
12	US MBNA	2	0.40	2,800	1,400	45,451	7,799	48,893
13	DE Bayerische Hypotheken- und Wechselbank Aktiengesellschaft	4	0.33	2,590	647	113,463	4,253	n.a.
14	US FIRST UNION / WACHOVIA	1	0.20	2,526	2,526	330,452	28,455	269,726
15	DE Bankgesellschaft Berlin Aktiengesellschaft	4	0.33	1,843	461	80,545	1,682	33,998
16	US BANK ONE CORPORATION	2	0.40	1,270	635	268,954	20,226	253,330
17	JP Chiba Kogyo Bank	6	0.50	1,158	193	14,981	726	9,304
18	UK HSBC	1	0.33	1,148	1,148	686,165	109,236	391,185
19	UK Standard Chartered	3	1.00	1,032	344	107,379	13,416	69,169
20	BE Fortis Bank NV	9	0.82	995	90	401,316	20,133	153,450
21	UK Royal Bank of Scotland	1	0.33	926	926	519,991	69,141	305,956
22	US WELLS FARGO	1	0.20	759	759	307,569	27,214	246,900
23	US FLEET FINANCIAL GROUP	1	0.20	757	757	203,638	17,608	201,588
24	DE IKB Deutsche Industriebank Aktiengesellschaft	3	0.25	697	232	30,462	1,071	18,968
25	DE BHF-Bank Aktiengesellschaft	3	0.25	665	222	23,455	1,651	12,207
26	DE Vereins- und Westbank Aktiengesellschaft	4	0.33	642	160	18,081	789	12,480
27	DE Oldenburgische Landesbank Aktiengesellschaft	8	0.67	483	60	8,126	369	5,128
28	JP Kumamoto Family Bank	5	0.42	478	96	10,037	560	6,921
29	US SOUTHTRUST CORPORATION	3	0.60	438	146	48,755	3,962	40,124
30	US FIFTH THIRD	2	0.40	383	191	71,026	7,630	59,491
31	DE DePfa Deutsche Pfandbriefbank AG	4	0.33	343	86	99,890	1,174	16,891
32	UK Lloyds/Lloyds TSB	1	0.33	336	336	275,746	60,286	158,259
33	DE BADEN-WÜRTTEMBERGISCHE BANK Aktiengesellschaft	3	0.25	300	100	20,558	591	10,361
34	US BANK BOSTON	1	0.20	247	247	76,914	5,488	74,108
35	DE Württembergische Hypothekenbank Aktiengesellschaft	8	0.67	205	26	28,940	330	6,892
36	US J.P. MORGAN CHASE & CO.	1	0.20	200	200	693,575	41,099	455,123
37	DE Deutsche VerkehrsBank Aktiengesellschaft	3	0.25	198	66	8,580	314	5,185
38	SU Banque Cantonale Vaudoise	2	0.22	196	98	21,388	858	n.a.
39	DE ConSors Discount-Broker Aktiengesellschaft	4	0.33	177	44	1,779	437	1,115
40	UK Egg	1	0.33	156	156	n.a.	1,853	n.a.
41	US REPUBLIC NEW YORK CORPORATION	1	0.20	150	150	53,052	3,278	28,248
42	BE BBL	5	0.45	146	13	140,937	3,846	51,541
43	US ZIONS	1	0.20	136	136	24,304	2,281	19,097
44	UK Bank of Scotland	1	0.33	134	134	n.a.	n.a.	n.a.
45	DE comdirect bank Aktiengesellschaft	1	0.08	132	132	2,716	724	1,074
46	DE DAB Bank AG	3	0.25	132	44	1,970	171	754
47	BE KBC	6	0.55	123	11	233,247	14,321	98,830
48	SU Basellandsch. Kantonalbank	3	0.33	105	35	8,149	410	n.a.
49	SU Banque Cantonale de Genève	1	0.11	81	81	10,201	388	n.a.
50	SU Basler Kantonalbank	4	0.44	70	17	7,932	356	n.a.
51	SU Luzerner Kantonalbank	4	0.44	69	17	10,401	491	n.a.
52	SU BSI SA	1	0.11	59	59	4,176	296	n.a.
53	SU Bank Linth	3	0.33	44	15	1,998	139	n.a.
54	SU Walliser Kantonalbank	1	0.11	40	40	4,310	209	n.a.
55	SU Zuger Kantonalbank	4	0.44	40	10	5,402	201	n.a.
56	SU Coop Bank	1	0.11	35	35	5,749	387	n.a.
57	UK Close Brothers	1	0.33	28	28	n.a.	1,602	n.a.
58	DE Bankverein Werther Aktiengesellschaft	3	0.25	3	1	68	5	35

N.a. for France, Sweden, and Spain. The U.S.:1997-2001, Japan: 1991-2001, others 1990-2001.

Table 16. Major issuers of equity, sorted by average size of issues

	Issuer	Number of issues		Amount (US\$ million)		Bank information (end-2001)			
		Total	Avg. Year	Total	Avg. issue	Total assets	Total equity	Total RWA	
1	JP	Sumitomo Mitsui Banking	6	0.50	18,108	3,018	813,842	21,947	508,990
2	JP	Mizuho Holdins	11	0.92	29,254	2,659	1,140,174	35,652	710,489
3	US	FIRST UNION / WACHOVIA	1	0.20	2,526	2,526	330,452	28,455	269,726
4	JP	UFJ Holdings	9	0.75	20,483	2,276	601,108	19,597	386,204
5	DE	Deutsche Bank Aktiengesellschaft	5	0.42	7,479	1,496	656,932	19,415	183,368
6	JP	MTFG	5	0.42	7,262	1,452	749,731	25,050	454,644
7	US	MBNA	2	0.40	2,800	1,400	45,451	7,799	48,893
8	DE	Dresdner Bank Aktiengesellschaft	5	0.42	6,695	1,339	334,926	10,423	122,218
9	UK	HSBC	1	0.33	1,148	1,148	686,165	109,236	391,185
10	DE	Commerzbank Aktiengesellschaft	16	1.33	17,900	1,119	353,369	9,863	128,786
11	JP	Resona Holdings	14	1.17	13,016	930	338,727	9,713	217,243
12	UK	Royal Bank of Scotland	1	0.33	926	926	519,991	69,141	305,956
13	JP	Mitusi Trust Holdings	6	0.50	5,343	891	100,767	3,739	76,567
14	DE	Bayerische Hypo- und Vereinsbank Aktiengesellschaft	12	1.00	9,140	762	316,844	17,013	170,456
15	US	WELLS FARGO	1	0.20	759	759	307,569	27,214	246,900
16	US	FLEET FINANCIAL GROUP	1	0.20	757	757	203,638	17,608	201,588
17	DE	Bayerische Hypotheken- und Wechselbank Aktiengesellschaft	4	0.33	2,590	647	113,463	4,253	n.a.
18	US	BANK ONE CORPORATION	2	0.40	1,270	635	268,954	20,226	253,330
19	DE	Bankgesellschaft Berlin Aktiengesellschaft	4	0.33	1,843	461	80,545	1,682	33,998
20	UK	Standard Chartered	3	1.00	1,032	344	107,379	13,416	69,169
21	UK	Lloyds/Lloyds TSB	1	0.33	336	336	275,746	60,286	158,259
22	BE	Dexia Bank Belgie	4	0.36	3,412	310	234,749	8,889	76,680
23	US	BANK BOSTON	1	0.20	247	247	76,914	5,488	74,108
24	DE	IKB Deutsche Industriebank Aktiengesellschaft	3	0.25	697	232	30,462	1,071	18,968
25	DE	BHF-Bank Aktiengesellschaft	3	0.25	665	222	23,455	1,651	12,207
26	US	J.P. MORGAN CHASE & CO.	1	0.20	200	200	693,575	41,099	455,123
27	JP	Chiba Kogyo Bank	6	0.50	1,158	193	14,981	726	9,304
28	US	FIFTH THIRD	2	0.40	383	191	71,026	7,630	59,491
29	DE	Vereins- und Westbank Aktiengesellschaft	4	0.33	642	160	18,081	789	12,480
30	UK	Egg	1	0.33	156	156	n.a.	1,853	n.a.
31	US	REPUBLIC NEW YORK CORPORATION	1	0.20	150	150	53,052	3,278	28,248
32	US	SOUTHTRUST CORPORATION	3	0.60	438	146	48,755	3,962	40,124
33	US	ZIONS	1	0.20	136	136	24,304	2,281	19,097
34	UK	Bank of Scotland	1	0.33	134	134	n.a.	n.a.	n.a.
35	DE	comdirect bank Aktiengesellschaft	1	0.08	132	132	2,716	724	1,074
36	DE	BADEN-WÜRTTEMBERGISCHE BANK Aktiengesellschaft	3	0.25	300	100	20,558	591	10,361
37	SU	Banque Cantonale Vaudoise	2	0.22	196	98	21,388	858	n.a.
38	JP	Kumamoto Family Bank	5	0.42	478	96	10,037	560	6,921
39	BE	Fortis	9	0.82	995	90	401,316	20,133	153,450
40	DE	DePfa Deutsche Pfandbriefbank AG	4	0.33	343	86	99,890	1,174	16,891
41	SU	Banque Cantonale de Genève	1	0.11	81	81	10,201	388	n.a.
42	DE	Deutsche VerkehrsBank Aktiengesellschaft	3	0.25	198	66	8,580	314	5,185
43	DE	Oldenburgische Landesbank Aktiengesellschaft	8	0.67	483	60	8,126	369	5,128
44	SU	BSI SA	1	0.11	59	59	4,176	296	n.a.
45	DE	ConSors Discount-Broker Aktiengesellschaft	4	0.33	177	44	1,779	437	1,115
46	DE	DAB Bank AG	3	0.25	132	44	1,970	171	754
47	SU	Walliser Kantonalbank	1	0.11	40	40	4,310	209	n.a.
48	SU	Basellandsch. Kantonalbank	3	0.33	105	35	8,149	410	n.a.
49	SU	Coop Bank	1	0.11	35	35	5,749	387	n.a.
50	UK	Close Brothers	1	0.33	28	28	n.a.	1,602	n.a.
51	DE	Württembergische Hypothekenbank Aktiengesellschaft	8	0.67	205	26	28,940	330	6,892
52	SU	Basler Kantonalbank	4	0.44	70	17	7,932	356	n.a.
53	SU	Luzerner Kantonalbank	4	0.44	69	17	10,401	491	n.a.
54	SU	Bank Linth	3	0.33	44	15	1,998	139	n.a.
55	BE	BBL	5	0.45	146	13	140,937	3,846	51,541
56	BE	KBC	6	0.55	123	11	233,247	14,321	98,830
57	SU	Zuger Kantonalbank	4	0.44	40	10	5,402	201	n.a.
58	DE	Bankverein Werther Aktiengesellschaft	3	0.25	3	1	68	5	35

N.a. for France, Sweden, and Spain. The U.S.:1997-2001, Japan: 1991-2001, others 1990-2001.

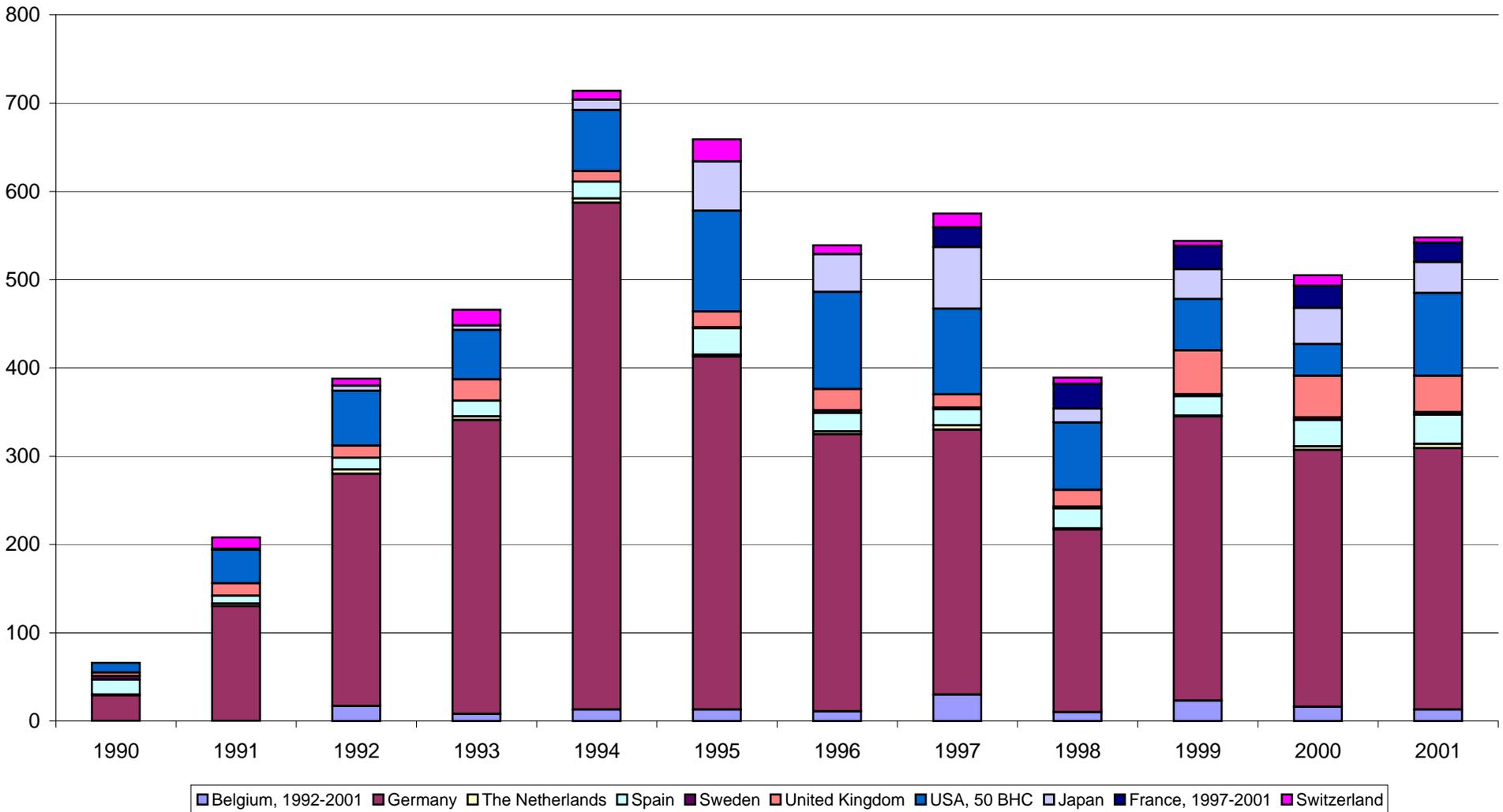
Table 17. Outstanding amount of equity, banks ranked by the share of equity in total assets

Issuer		Total amount of equity (end-2001)	
		% of total assets	% of RWA
1	DE Comdirect bank Aktiengesellschaft	26.6%	67.3%
2	DE ConSors Discount-Broker Aktiengesellschaft	24.6%	39.2%
3	UK Lloyds/Lloyds TSB	21.9%	38.1%
4	US MBNA	17.2%	16.0%
5	UK HSBC	15.9%	27.9%
6	US WELLS FARGO	14.2%	16.4%
7	UK Royal Bank of Scotland	13.3%	22.6%
8	UK Standard Chartered	12.5%	19.4%
9	US FIFTH THIRD	10.7%	n.a.
10	US ZIONS	9.4%	11.9%
11	DE DAB Bank AG	8.7%	22.6%
12	US FLEET FINANCIAL GROUP	8.6%	8.7%
13	US FIRST UNION / WACHOVIA	8.6%	10.5%
14	US SOUTHTRUST CORPORATION	8.1%	9.9%
15	US BANK ONE CORPORATION	7.5%	8.0%
16	US BANK BOSTON	7.1%	7.4%
17	SU BSI SA	7.1%	n.a.
18	DE BHF-Bank Aktiengesellschaft	7.0%	13.5%
19	SU Bank Linth	6.9%	n.a.
20	SU Coop Bank	6.7%	n.a.
21	DE Bankverein Werther Aktiengesellschaft	6.7%	13.1%
22	NL HOOP EFFECTEN BK.	6.4%	14.3%
23	US REPUBLIC NEW YORK CORPORATION	6.2%	11.6%
24	BE KBC	6.1%	14.5%
25	US J.P. MORGAN CHASE & CO.	5.9%	9.0%
26	JP Kumamoto Family Bank	5.6%	8.1%
27	NL KAS-BANK	5.5%	18.2%
28	DE Bayerische Hypo- und Vereinsbank Aktiengesellschaft	5.4%	10.0%
29	NL VAN LANSCHOT	5.2%	8.1%
30	SU Basellandsch. Kantonalbank	5.0%	n.a.
31	BE Fortis	5.0%	13.1%
32	SU Walliser Kantonalbank	4.9%	n.a.
33	JP Chiba Kogyo Bank	4.8%	7.8%
34	SU Luzerner Kantonalbank	4.7%	n.a.
35	DE Oldenburgische Landesbank Aktiengesellschaft	4.5%	7.2%
36	NL FORTIS (AMS)	4.5%	8.5%
37	SU Basler Kantonalbank	4.5%	n.a.
38	DE Vereins- und Westbank Aktiengesellschaft	4.4%	6.3%
39	SU Banque Cantonale Vaudoise	4.0%	n.a.
40	SU Banque Cantonale de Genève	3.8%	n.a.
41	BE Dexia Bank Belgie	3.8%	11.6%
42	DE Bayerische Hypotheken- und Wechselbank Aktiengesellschaft	3.7%	n.a.
43	SU Zuger Kantonalbank	3.7%	n.a.
44	JP Mitusi Trust Holdings	3.7%	4.9%
45	NL ING GROEP CERTS.	3.7%	6.7%
46	DE Deutsche VerkehrsBank Aktiengesellschaft	3.7%	6.1%
47	DE IKB Deutsche Industriebank Aktiengesellschaft	3.5%	5.6%
48	JP MTFG	3.3%	5.5%
49	JP UFJ Holdings	3.3%	5.1%
50	JP Mizuho Holdins	3.1%	5.0%
51	DE Dresdner Bank Aktiengesellschaft	3.1%	8.5%
52	DE Deutsche Bank Aktiengesellschaft	3.0%	10.6%
53	DE BADEN-WÜRTTEMBERGISCHE BANK Aktiengesellschaft	2.9%	5.7%
54	JP Resona Holdings	2.9%	4.5%
55	DE Commerzbank Aktiengesellschaft	2.8%	7.7%
56	NL ABN AMRO HOLDING	2.7%	6.0%
57	BE BBL	2.7%	7.5%
58	JP Sumitomo Mitsui Banking	2.7%	4.3%
59	DE Bankgesellschaft Berlin Aktiengesellschaft	2.1%	4.9%
60	DE DePfa Deutsche Pfandbriefbank AG	1.2%	7.0%
61	DE Württembergische Hypothekenbank Aktiengesellschaft	1.1%	4.8%
Average		6.7%	12.5%
Country averages:			
Belgium		4.4%	11.7%
Germany		6.4%	14.1%
France		n.a.	n.a.
The Netherlands		4.7%	10.3%
Spain		n.a.	n.a.
Sweden		n.a.	n.a.
United Kingdom		8.8%	16.4%
Switzerland		5.1%	n.a.
Japan		3.7%	5.6%
USA		7.7%	12.6%

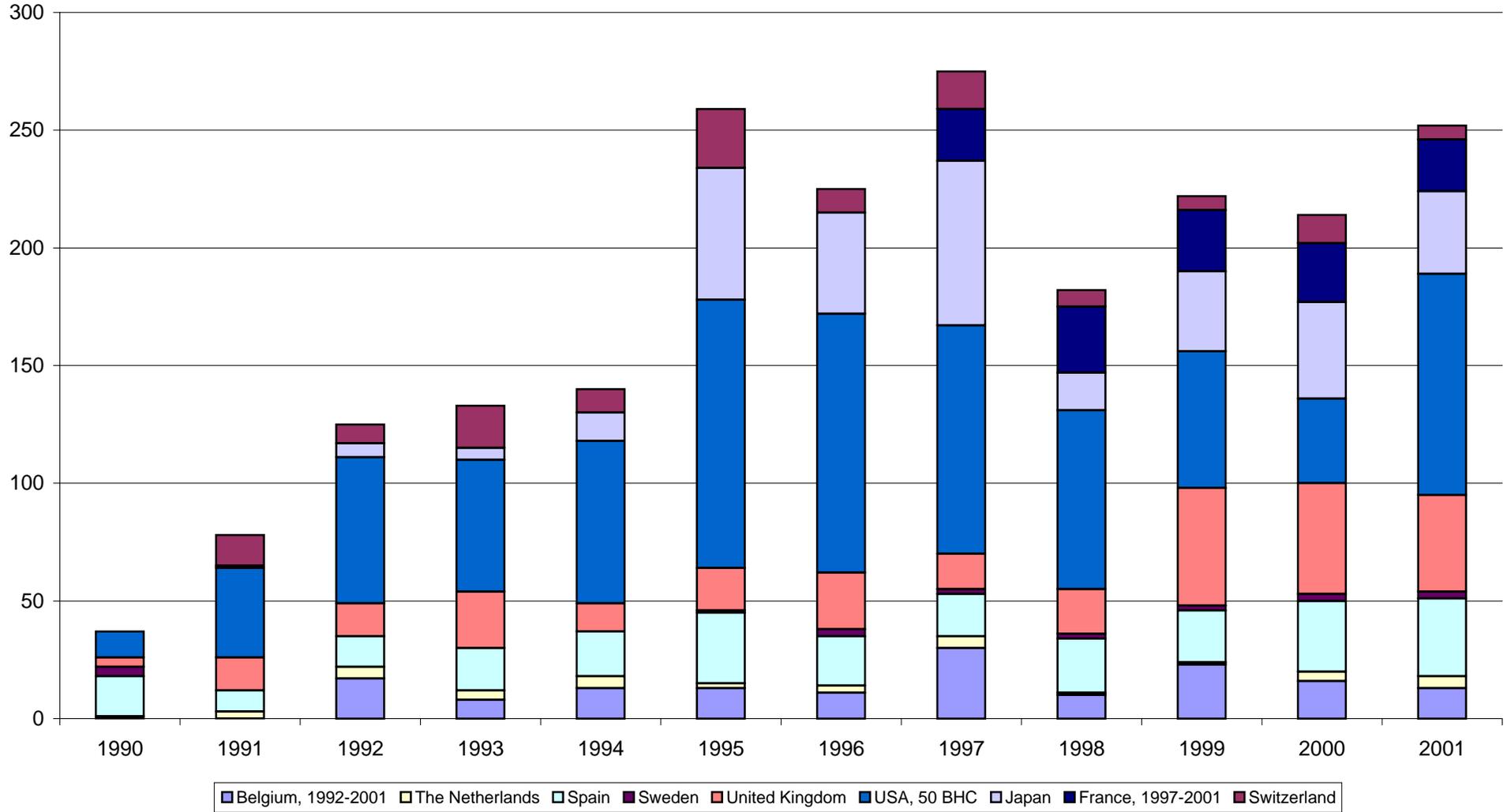
Table 18. Relationship between equity issue size, frequency of issue and bank characteristics
(Correlation coefficients)

	Belgium 1992-2001	Germany 1990-2001	United Kingdom 1990-2001	EU	Switzerland 1991-2001	Japan 1990-2001	USA 1997-2001	Total
Frequency of issuance								
Average issue size	n.a.	0.44	-0.10	0.08	-0.66	0.23	-0.14	0.19
Bank size (Total assets)	n.a.	0.47	-0.75	0.23	0.02	0.30	-0.34	0.34
Total equity/Total assets	n.a.	-0.31	-0.53	-0.24	-0.33	-0.52	0.34	-0.23
Total equity/RWA	n.a.	-0.33	-0.62	-0.30	n.a.	-0.49	0.31	-0.25
SND/RWA	n.a.	0.45	n.a.	0.56	n.a.	-0.06	0.50	0.24
SND/TA	n.a.	0.42	n.a.	0.56	n.a.	0.69	-0.38	0.41
SND/EQUITY	n.a.	0.24	n.a.	0.40	n.a.	0.78	-0.42	0.48
ROA	n.a.	-0.04	n.a.	-0.04	n.a.	-0.59	0.44	-0.45
Average issue size								
Bank size (Total assets)	n.a.	0.94	0.96	0.90	0.67	0.90	0.18	0.81
Total equity/Total assets	n.a.	-0.28	-0.29	-0.11	-0.20	-0.79	0.37	-0.10
Total equity/RWA	n.a.	-0.20	-0.19	-0.09	n.a.	-0.73	-0.22	-0.19
SND/RWA	n.a.	0.63	n.a.	0.06	n.a.	0.67	-0.97	-0.43
SND/TA	n.a.	0.30	n.a.	0.06	n.a.	0.17	0.92	-0.17
SND/EQUITY	n.a.	0.09	n.a.	-0.21	n.a.	0.18	0.74	-0.35
ROA	n.a.	-0.14	n.a.	-0.14	n.a.	-0.13	0.17	-0.37
Total equity issuance								
Bank size (Total assets)	0.68	0.77	0.38	0.37	0.92	0.87	0.02	0.52
Total equity/Total assets	-0.73	-0.24	-0.84	-0.25	-0.41	-0.73	0.66	-0.26
Total equity/RWA	-0.67	-0.19	-0.81	-0.26	n.a.	-0.68	-0.20	-0.25
SND/RWA	n.a.	0.63	n.a.	0.11	n.a.	0.64	-0.84	-0.13
SND/TA	n.a.	0.49	n.a.	0.28	n.a.	0.52	0.83	0.10
SND/EQUITY	n.a.	0.22	n.a.	0.06	n.a.	0.52	0.63	0.07
ROA	-0.61	-0.09	n.a.	0.30	n.a.	-0.27	0.54	-0.13
Total equity/RWA								
SND/RWA	n.a.	-0.14	n.a.	-0.24	n.a.	0.27	-0.57	0.37
Total equity/Total assets								
SND/Total assets	n.a.	0.05	n.a.	-0.02	n.a.	-0.30	0.34	0.05
Number of banks	6	18	7	35	10	8	11	64

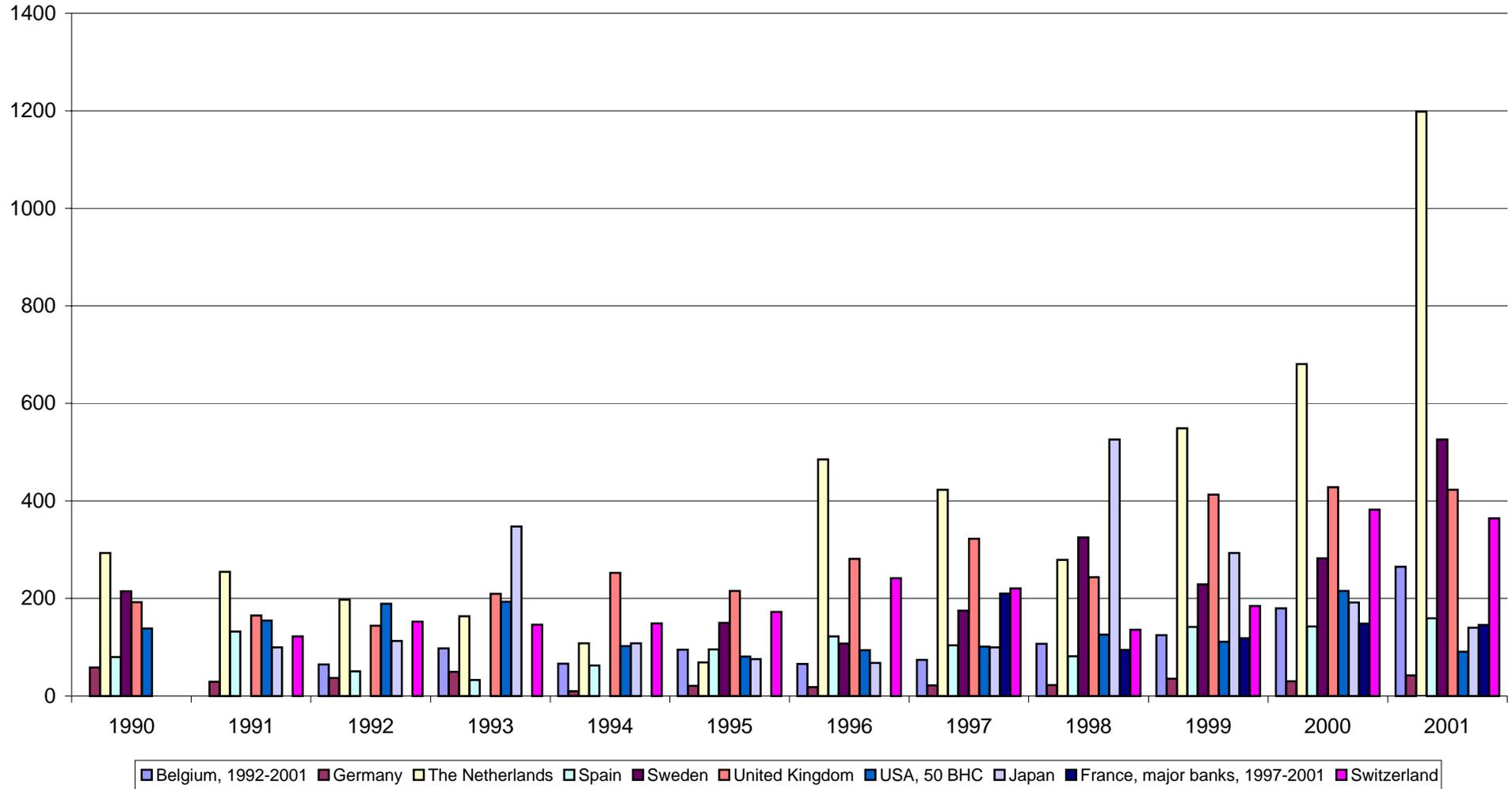
**Chart 1.A:
Subordinated debt, number of issues**



**Chart 1.B:
Subordinated debt, number of issues, excluding Germany**



**Chart 3:
Mean size of SND issues, US\$ millions**



**Chart 4:
Subordinated debt, total amounts outstanding, US\$ billions**

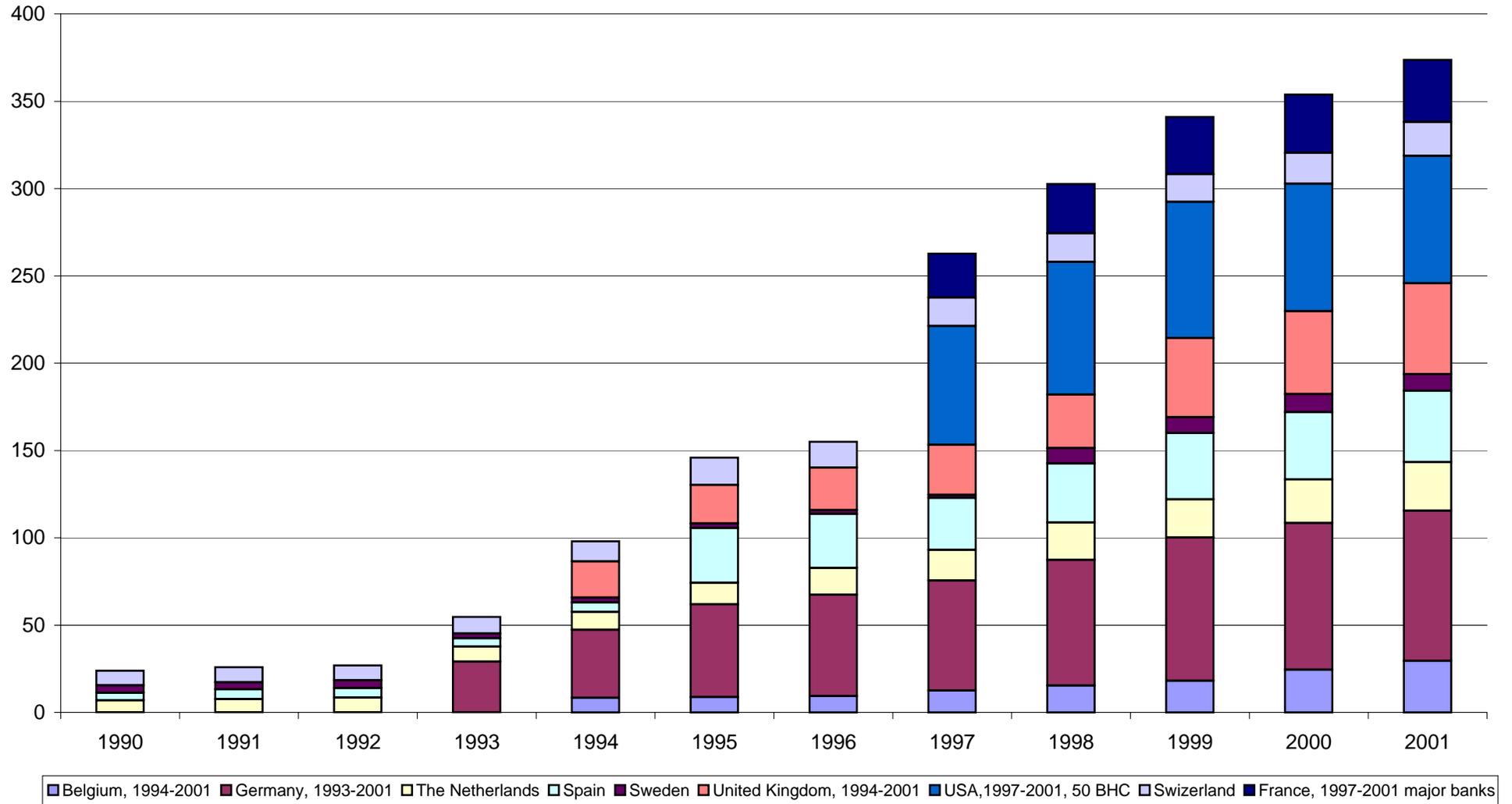


Chart 5:
Percentage of banks with subordinated debt outstanding (in numbers of banks), 1990-2001

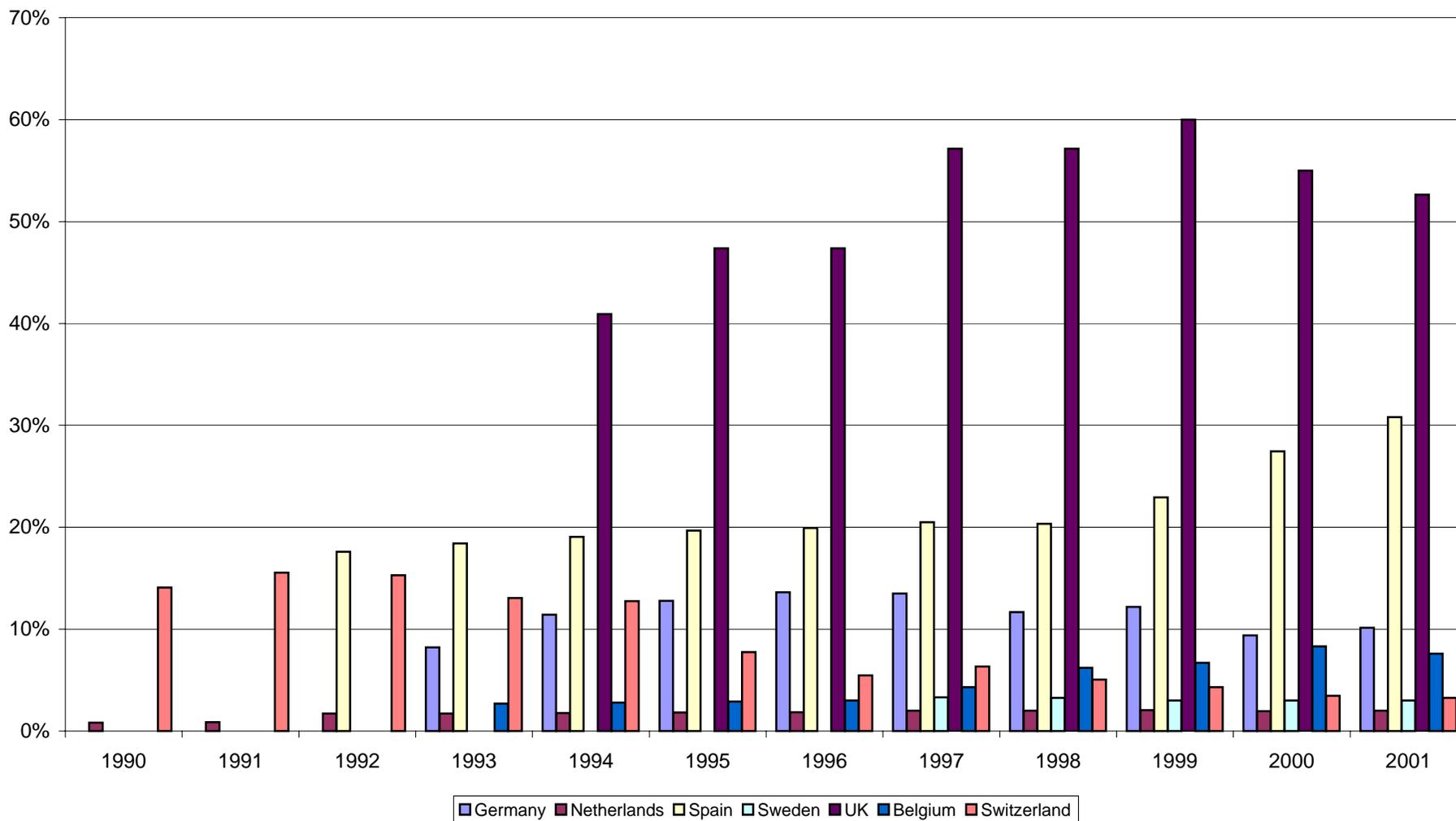
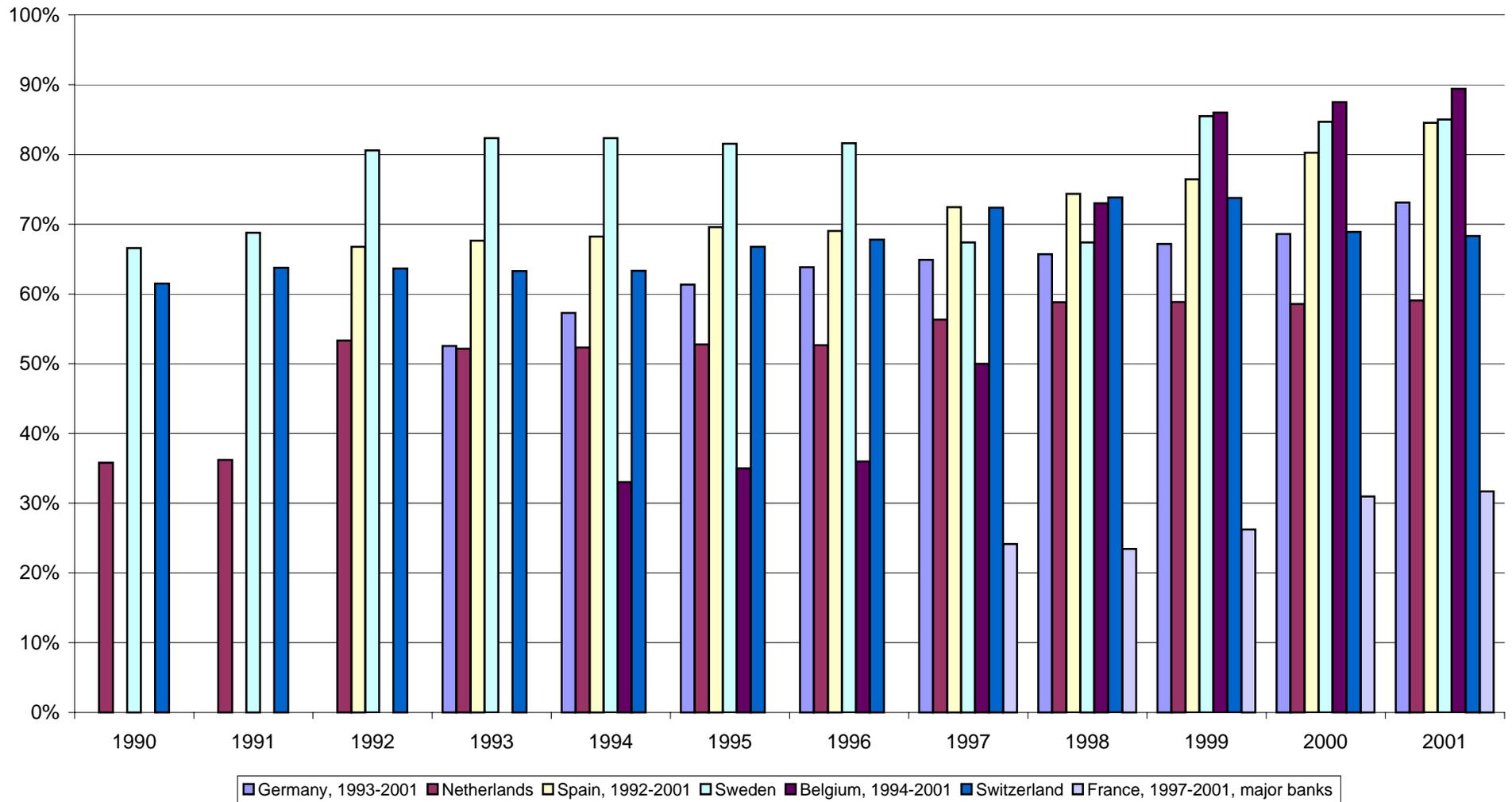
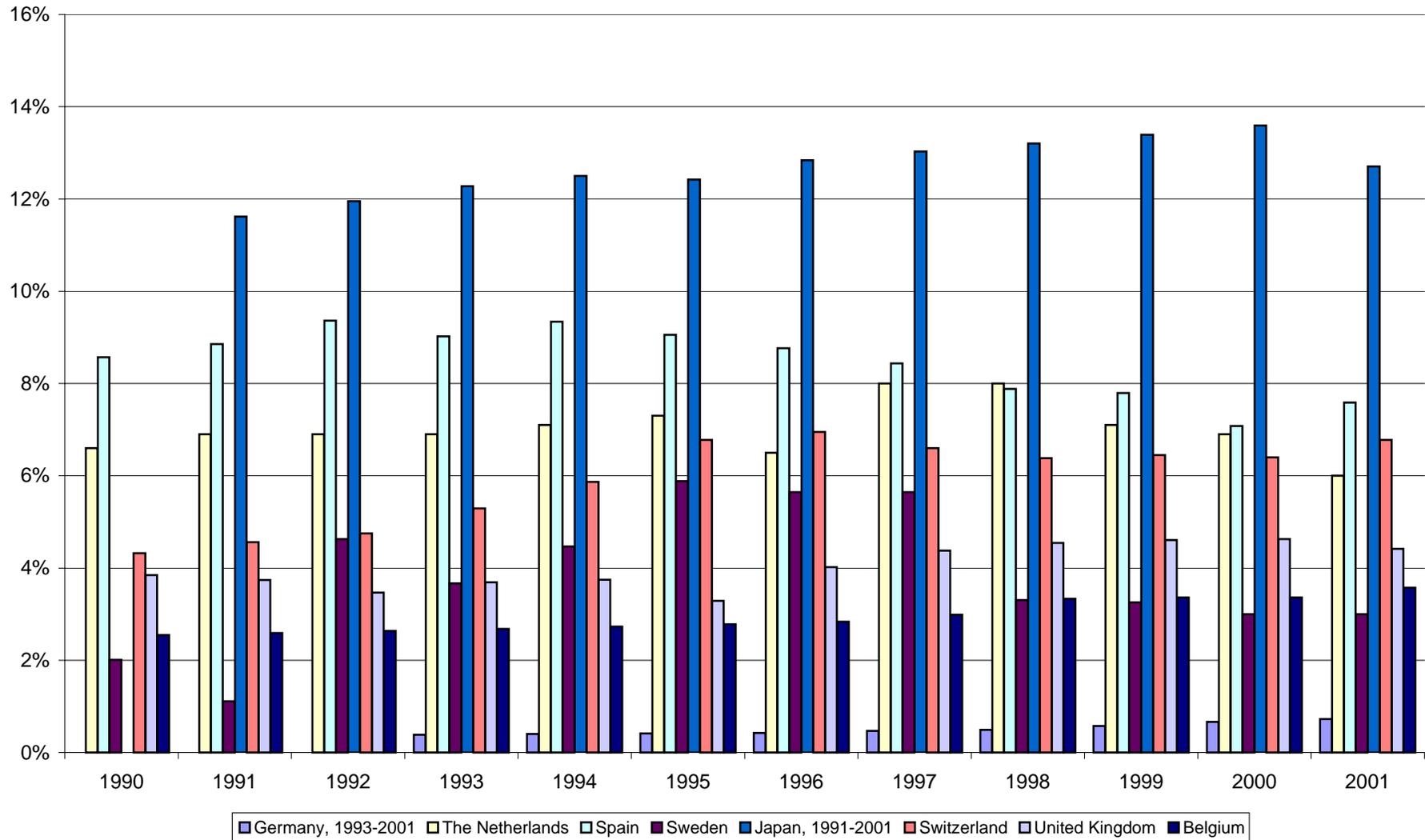


Chart 6:
Percentage of banks with subordinated debt outstanding (in total assets), 1990-2001



**Chart 7:
Percentage of listed banks (in numbers of banks), 1990-2001**



**Chart 8:
Percentage of listed banks (in total assets), 1990-2001**

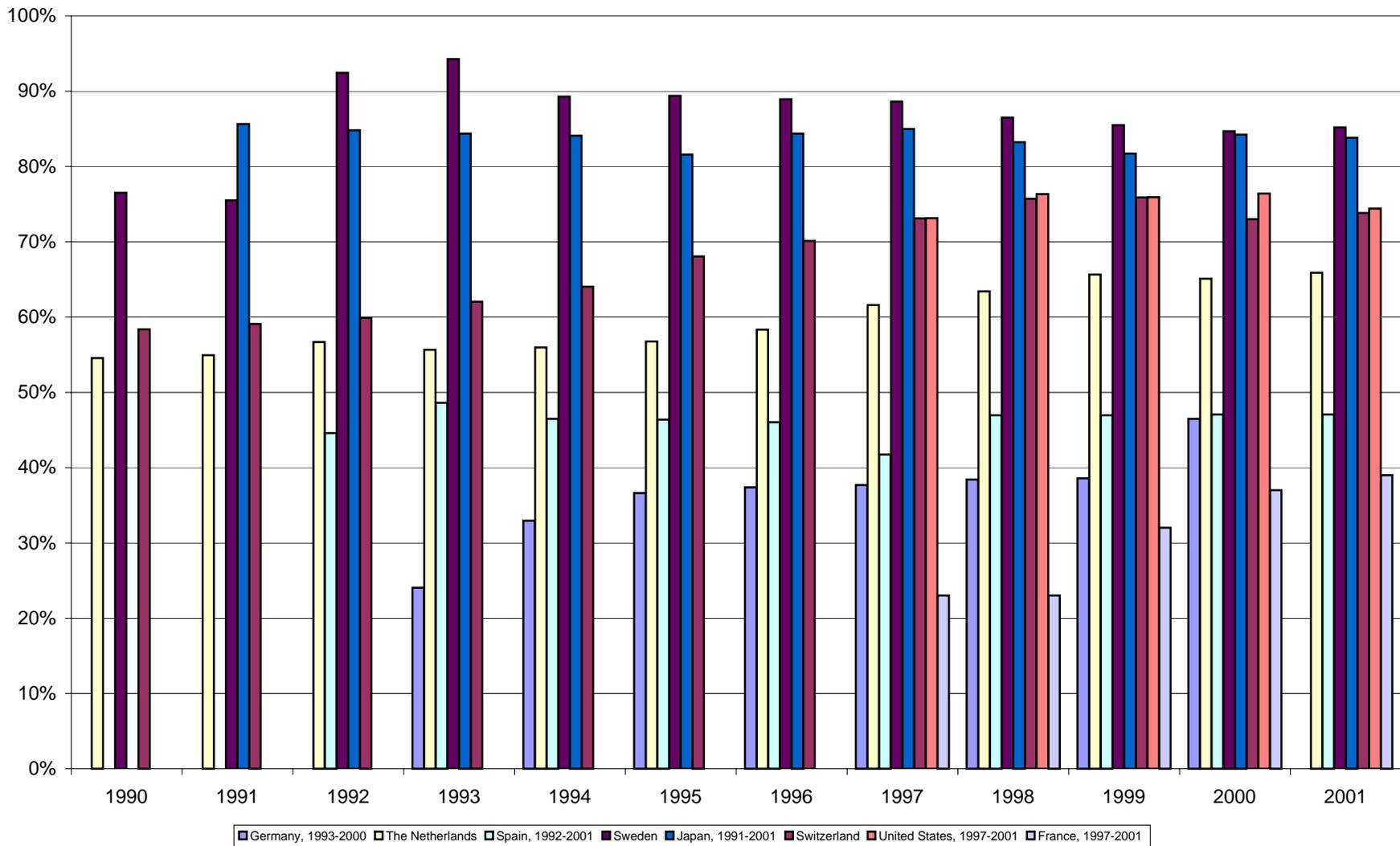


Chart 9. Germany:
Average equity trading volumes (bars - left axis) and total equity outstanding (lines - right axis),
US\$ millions, end of year

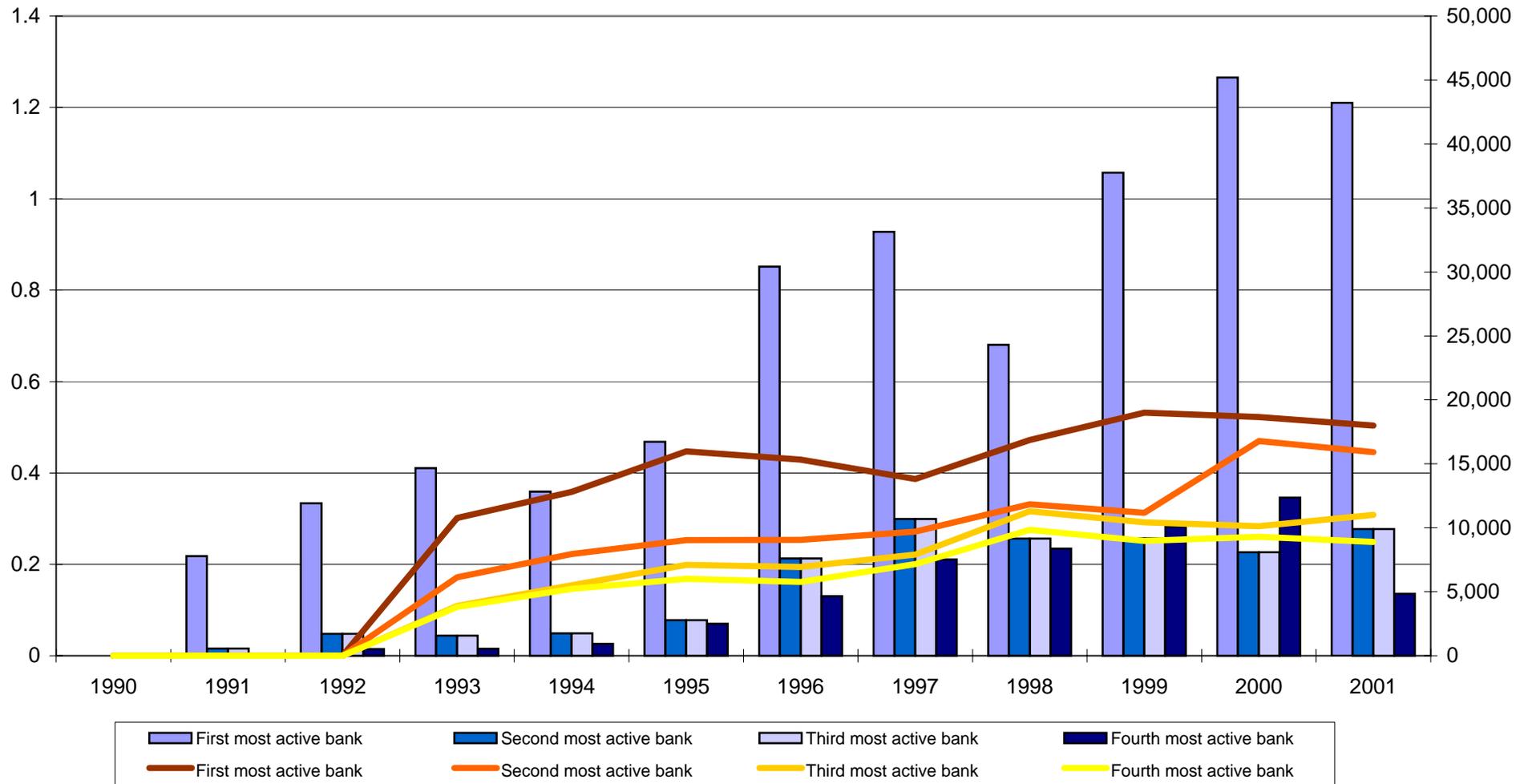


Chart 9. Spain:
Average equity trading volumes (bars - left axis) and total equity outstanding (lines - right axis),
US\$ millions, end of year

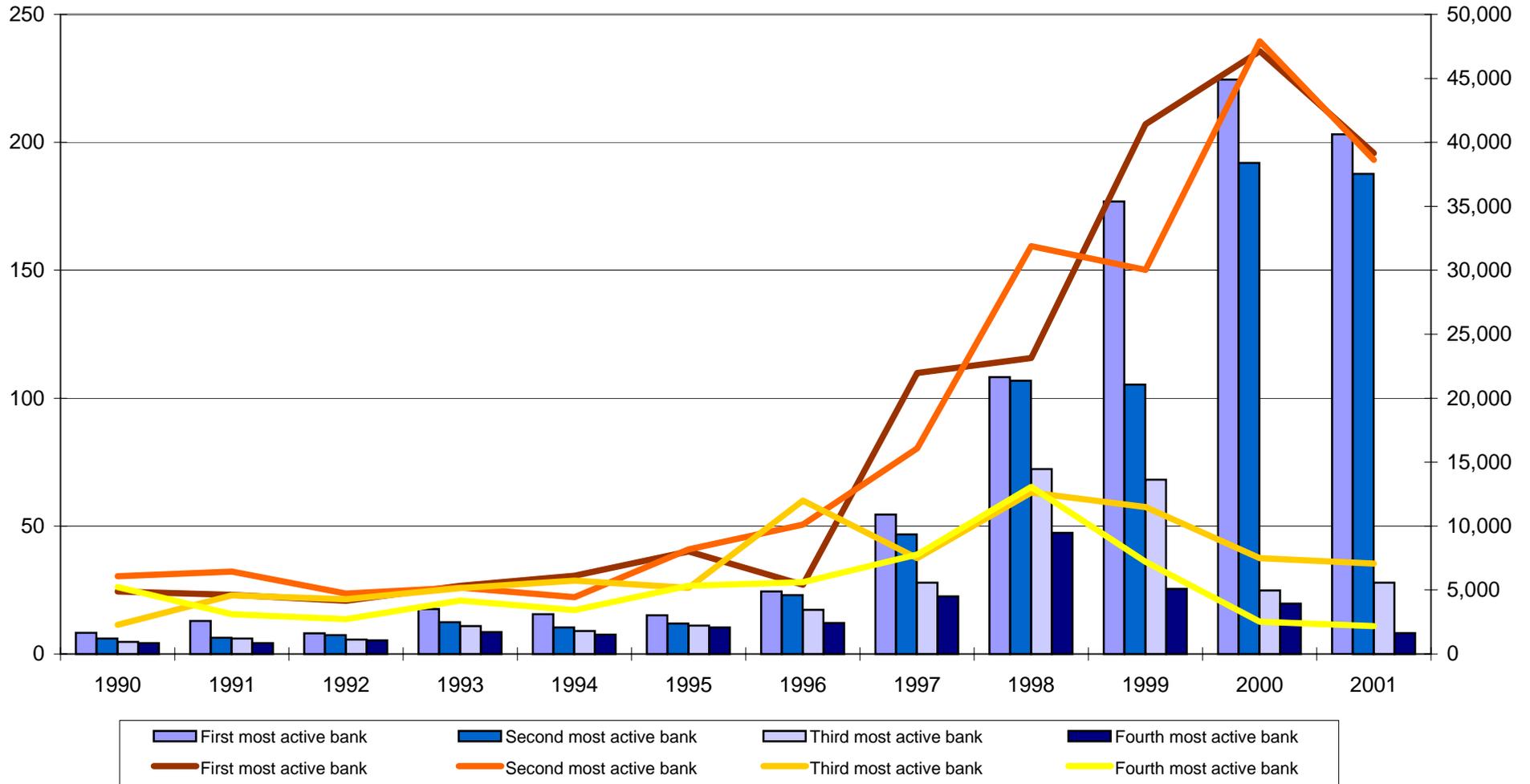


Chart 9. France:
Average equity trading volumes (bars - left axis) and total equity outstanding (lines - right axis),
US\$ millions, end of year

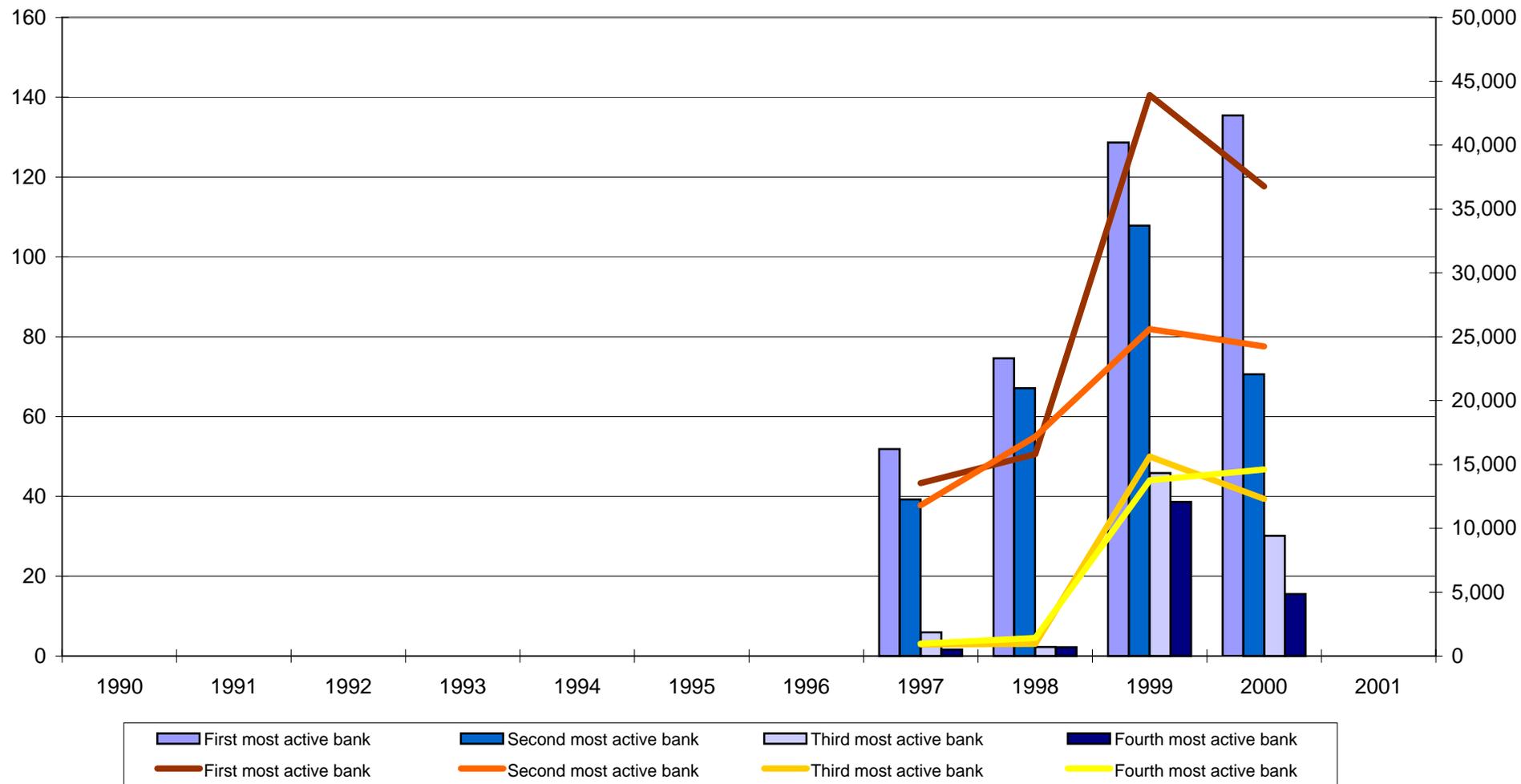
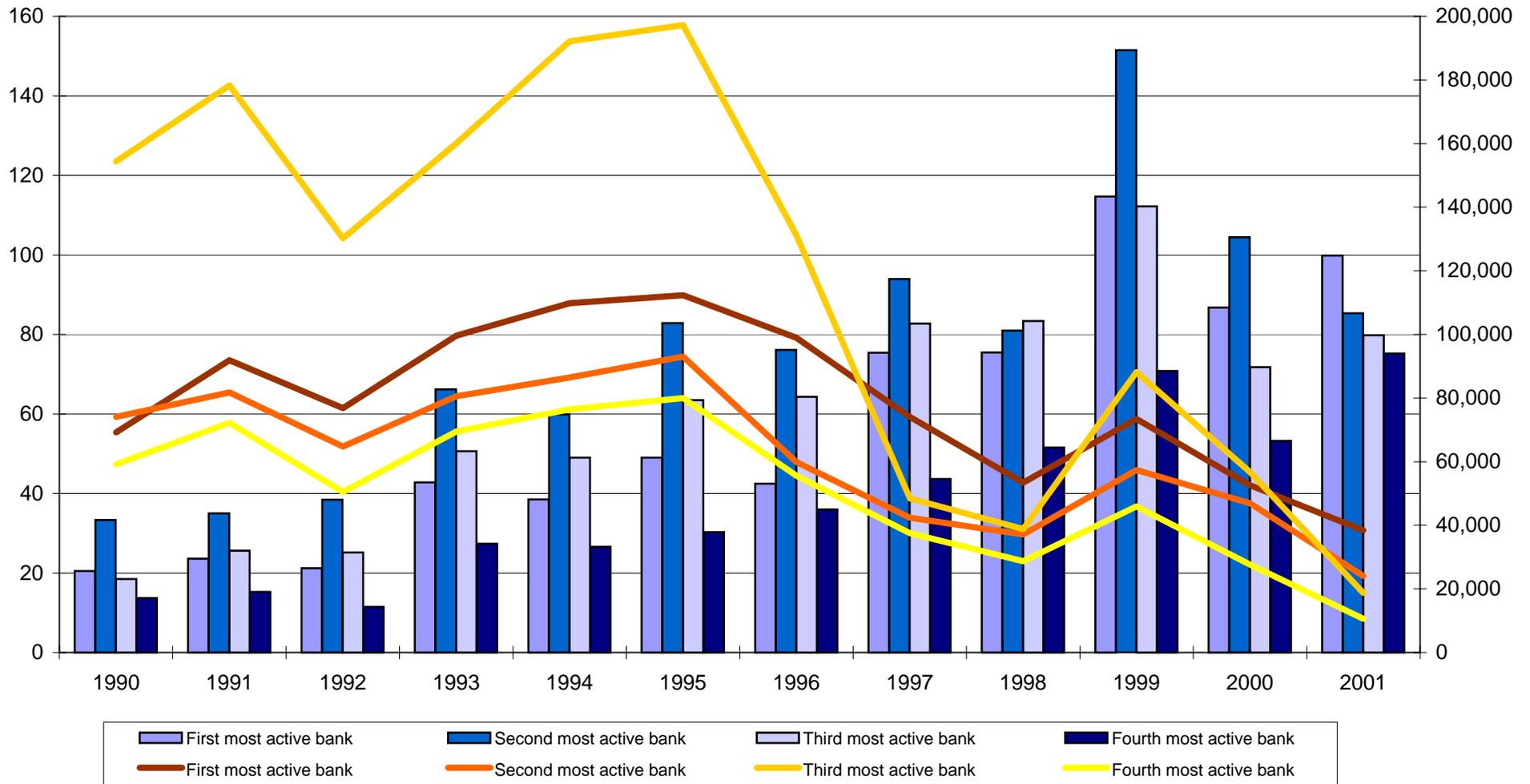


Chart 9. Japan:
Average equity trading volumes (bars - left axis) and total equity outstanding (lines - right axis),
US\$ millions, end of year



**Chart 9. The Netherlands:
Average equity trading volumes (bars - left axis) and total equity outstanding (lines - right axis),
US\$ millions, end of year**

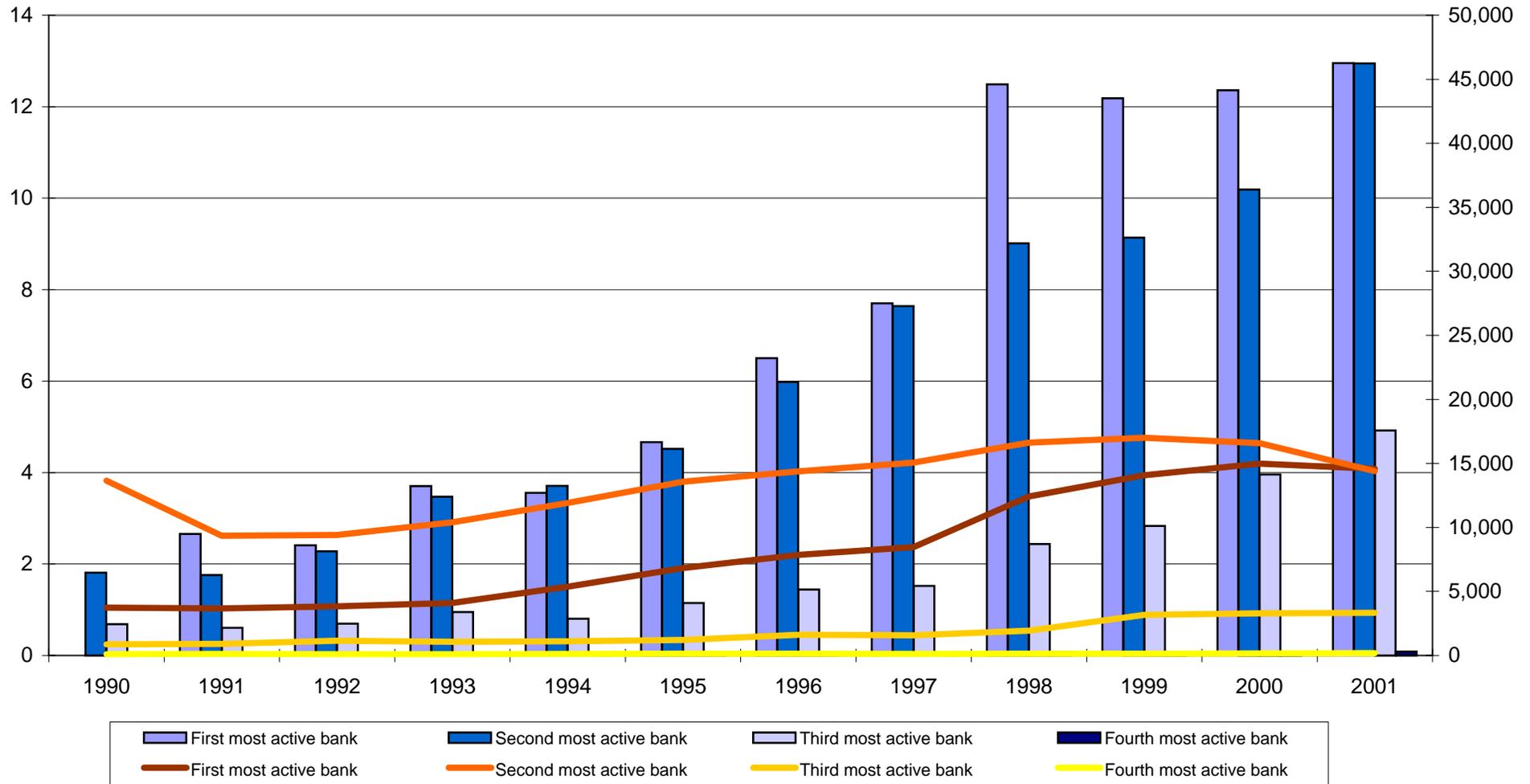


Chart 9. Sweden:
Average equity trading volumes (bars - left axis) and total equity outstanding (lines - right axis),
US\$ millions, end of year

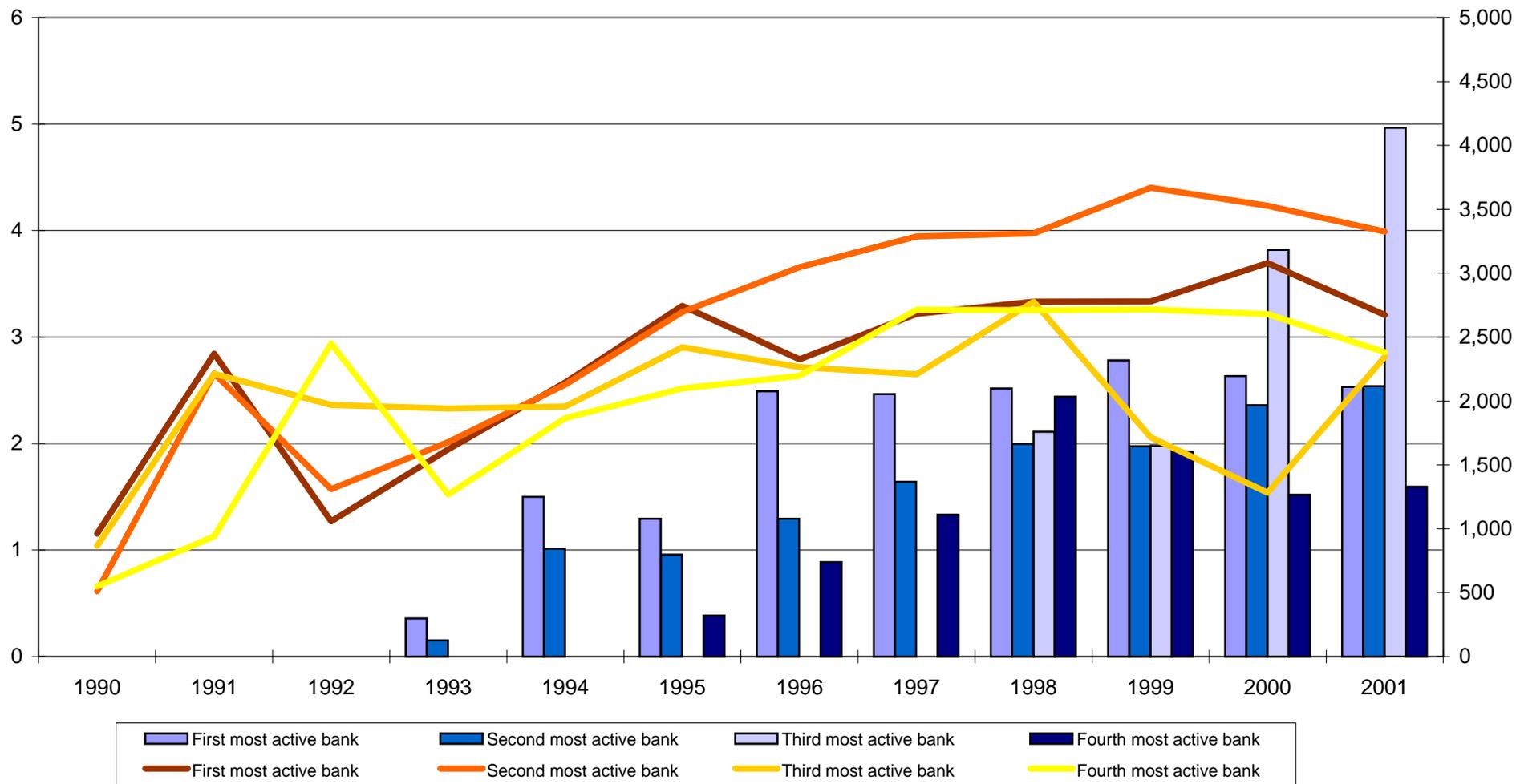
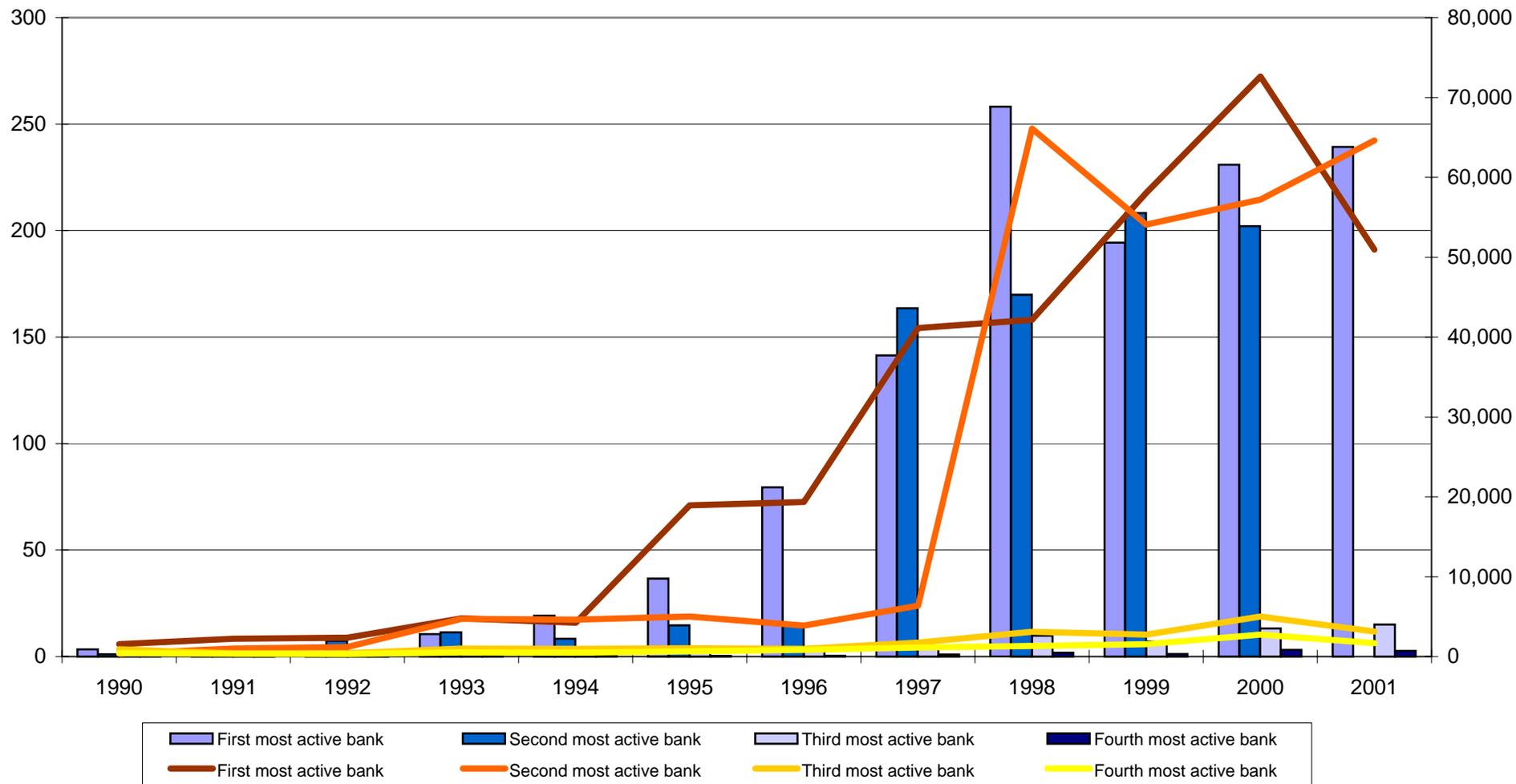
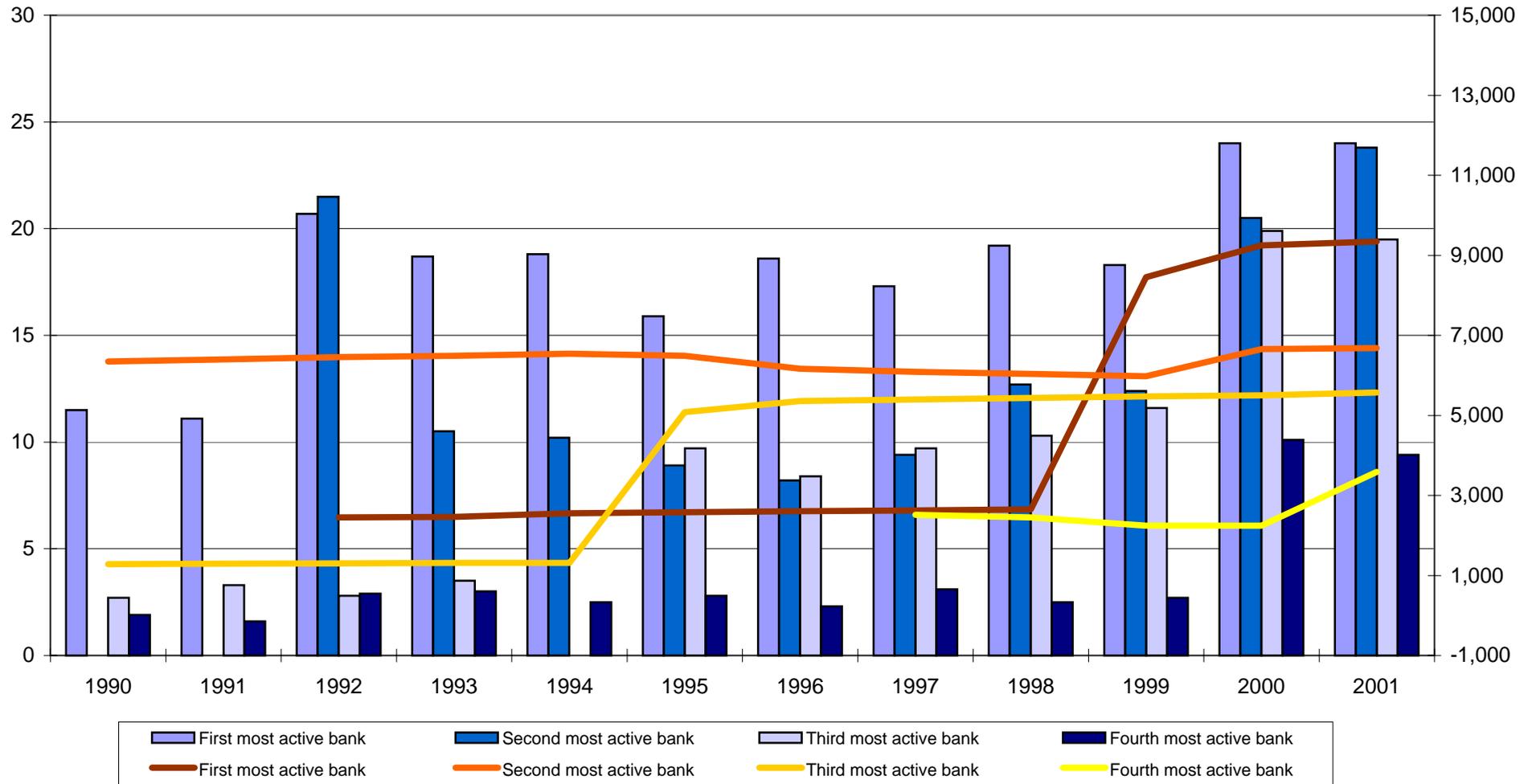


Chart 9. Switzerland:
Average equity trading volumes (bars - left axis) and total equity outstanding (lines - right axis),
US\$ millions, end of year



**Chart 9. The United Kingdom:
Average equity trading volumes (bars - left axis) and total equity outstanding (lines - right axis),
US\$ millions, end of year**



**Chart 9. The United States:
Average equity trading volumes (bars - left axis) and total equity outstanding (lines - right axis),
US\$ millions, end of year**

