Basel Committee
on
Banking Supervision

5 November 2001

Results of the Second Quantitative Impact Study

Introduction

In April 2001, the Basel Committee on Banking Supervision initiated a Quantitative Impact Study (QIS2)[1] involving a range of banks across the G10 and beyond. The objective of the study was to gather the data necessary to allow the Committee to gauge the impact of the proposals for capital requirements set out in the January 2001 second consultative paper (CP2). An earlier more limited study (QIS1) had been carried out in 2000 to inform the CP2 calibration. The results of the QIS2 exercise on the effect of the proposed credit risk charges are set out below.

The Committee appreciates that the exercise has represented a significant burden on banks and is grateful for the considerable commitment of time and resources from participating banks. Within a relatively short period, participants not only had to apply the new proposals in the context of their institutions but also to extract from their systems a wide array of data not previously required for supervisory purposes. Some of the systems difficulties were insurmountable in the time available. As a result, not all banks completed all parts of the questionnaire. In other cases, estimates were used or simplifying assumptions were made. There has been an intense dialogue between banks and national supervisors and then among national supervisors to address questions regarding the data and to try and ensure consistency in the results. However, inevitably it has not been possible in the time available to resolve all issues surrounding the data and some questions remain. These are detailed below.

Overall, 138 banks from twenty-five countries participated in the QIS. In addition to the countries represented on the Basel Committee on Banking Supervision[2], nine developed and three emerging markets took part. Not all participating banks managed to calculate the capital requirements under each of the three methods set out in the proposals – Standardised, IRB Foundation and IRB Advanced. However, 127 banks provided complete information on the standardised approach and fifty-five banks on the IRB Foundation. Only twenty-two banks were able to calculate the Advanced approach for all portfolios.

In analysing the results, banks from countries that are members of the Basel Committee (hereinafter referred to as "G10 banks") and banks situated in European Union (EU) countries have been split into two groups – Group 1, comprising diversified, internationally active banks with Tier 1 capital of at least Euro 3bn, and Group 2, consisting of smaller or more specialised banks. Regarding the G10 sample, the Committee believes that the Group 1 banks are broadly representative of the large internationally active banks across the G10, but may be

[1] Banks were asked to complete the questionnaire using data from a convenient date in 2000 or the first quarter of 2001.

[2] The Basel Committee is comprised of representatives of central banks and banking supervisory authorities from Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

less representative in each country of the total banking sector as this could be expected to have a larger share of retail exposures. The Group 2 institutions, however, may be much less representative of smaller and non-internationally active institutions, due to the much larger number of such banks and the broader range of their typically more specialised activities.

Separate results are also shown for banks in the EU (including EU countries that are Basel Committee members) as national supervisors in Europe will be engaged in additional efforts to revise capital directives; there are also separate results given for banks outside both the G10 and EU. Results for individual banks in the categories above have been considered together and are presented in this report on the basis of arithmetic averages for each population. Charts showing data for individual banks within each of these populations are attached in the Annex.

In calculating the results, banks were asked to comply with the approaches set out in the Committee's January 2001 second consultation paper. One adjustment, however, was made to the information banks provided. Under the IRB approaches set out in CP2, the proposed treatment of loans against which a specific provision had been made was to deduct the specific provision from the gross amount of the loan but apply a full capital charge on the remaining portion of the loan. The Committee recognised that this probably led to an excessive charge, since a specific provision may cover much or all of the potential loss, and devised a new approach.[3] QIS2 provided the necessary data in order to calculate the charges on that basis, and the results presented here use that new approach.

Summary of Results

On average, the QIS2 results indicate that the CP2 proposals for credit risk would deliver an increase in capital requirements for all groups under both the Standardised and IRB Foundation approaches. Indeed, the Foundation approach would generate higher capital requirements than the Standardised, counter to the Committee's desired incentives. Across the G10, Group 1 banks' minimum capital requirements under the Standardised approach would be 6% higher on average. Under the IRB Foundation, minimum requirements would be 14% higher. Requirements seem likely to be lower under the IRB Advanced with an average change of –5%. For G10 Group 2 banks, which would be more likely to use the Standardised approach, the average increase in capital would be 1%. Results for Group 1 EU banks are similar with increases of 6% and 10% under the Standardised and IRB Foundation approaches, respectively, but with a smaller change of -1% under the IRB Advanced approach. For banks outside the G10 and EU the increase under the standardised approach was 5% on average.

The results discussed above do not include any charge for operational risk. As reported in a June 25, 2001 press release (available at www.bis.org/press/p010625.htm), the Committee has concluded that its original target proportion of regulatory capital related to operational risk (i.e. 20%) will be reduced in line with the view that this reflects too large an allocation of regulatory capital to this risk. For purposes of this exercise and to illustrate the potential impact of the operational risk capital charge, Table 1 reflects an operational risk charge of 12% of

[3] The Committee has since issued a paper proposing a revised treatment of specific provisions under the IRB approach whereby capital requirements would continue to be calibrated towards expected loss and unexpected loss but done so in recognition of specific provisions actually made. See www.bis.org/publ/bcbs_wp5.htm for further discussion.

current minimum regulatory capital for the standardised approach and 10% for the IRB approaches.[4]

Table 1 - Percentage Change in Capital Requirements under CP2 Proposals

	Standardised		IRB Foundation		IRB Advanced	
	Credit	Overall	Credit	Overall	Credit	Overall
G10 Group 1	6%	18%	14%	24%	-5%	5%
Group 2	1%	13%				
EU Group 1	6%	18%	10%	20%	-1%	9%
Group 2	-1%	11%				
Other (non-G10, non-EU)	5%	17%				

Commentary

The overall increase in credit risk capital requirements under the Standardised approach reflects the fact that the proportion of loan books in the higher quality rating bands, which benefit from the lower weights, is fairly modest. Any reduction in requirements for these exposures was outweighed by the increased capital requirements for exposure in the new higher risk-weight bucket (i.e. 150%) and, particularly, by the increased charges on commitments. A large portion of the book is unrated. The quality distribution for corporate portfolios in each group is set out below. The large proportion of lower rated or unrated exposures, particularly among nonG10–nonEU banks, is clear. Another factor is the proportion of sovereign exposures below investment grade. This may, in part, relate to the treatment of local currency exposures where it is proposed that there will be supervisory discretion to assign a preferential risk weighting when they are funded in local currency – this option may not have been exercised in all cases.[5] In the case of interbank exposures, the number of unrated counterparties is larger than expected. This may, in part, relate to the treatment of exposures to subsidiaries of larger rated banks where the subsidiary does not itself have a rating. When calculating the interbank capital requirements, 68% of G10 Group 1 banks used option 1 - which assigns risk weights based on the bank's sovereign, while the remainder used option 2 - which bases risk weights on the bank's external rating.[6]

[4] The Committee has assumed that for the Standardised approach on credit risk the standardised charge for operational risk will apply (i.e. 12%). For the IRB approaches, the figure of 10% has been used only as a working assumption for the purpose of this exercise. For further information, see also the Basel Committee's *Working Paper on the regulatory treatment of operational risk* at www.bis.org/publ/bcbs_wp8.htm.

[5] This was one of a number of supervisory guidelines formulated at the national level and communicated to participants, these being illustrative and solely for the purposes of the QIS2 exercise

[6] The selection of options is also a guideline specified by the relevant national supervisory authority for purposes of this exercise.

Table 2a: Quality Distribution of Corporate Exposures under the Standardised Approach

		AAA-AA	A	BBB-BB	Below BB	Higher risk category	Unrated
Corporate	G10 – Group 1	6%	9%	11%	1%	1%	72%
	G10 – Group 2	11%	9%	6%	2%	2%	70%
	EU – Group 1	6%	8%	8%	1%	1%	75%
	EU – Group 2	8%	10%	5%	2%	2%	73%
	Other	7%	3%	4%	2%	3%	81%

Table 2b: Quality Distribution of Sovereign and Interbank Exposures under the Standardised Approach

		AAA-AA	A	BBB	BB-B	C and Below	Higher risk category	Unrated
Interbank	G10 – Group 1	54%	14%	4%	2%	0%	0%	27%
	G10 – Group 2	61%	27%	1%	1%	0%	0%	9%
Sovereign	G10 – Group 1	73%	5%	4%	11%	0%	0%	10%
	G10 – Group 2	91%	5%	0%	0%	0%	0%	3%

Under the IRB Foundation, most of the increase in capital requirements (for G10 Group 1 banks) comes from the corporate portfolio where requirements increase by 22%. This was attributed by many of the participating banks to the steepness of the IRB risk-weight curve and the IRB function's "scaling factor" of 1.56.

Table 3: Contribution by portfolio to overall increase in IRB Foundation capital requirements (G10 Group 1 banks)

Portfolio	**Percentage of current capital requirements**	**Percentage increase in capital requirements**	**Relative contribution * (Increase/reduction relative to total current requirements)**
Corporate	61%	22%	14%
Sovereign	1%	238%	3%
Interbank	8%	49%	4%
Retail	24%	-28%	-7%
Securitisation	1%	108%	1%
Equity	3%	-17%	0%
Project Finance	2%	22%	0%
Overall increase			**14%**

* subject to roundings

Of the increase in requirements for the corporate portfolio, over half comes from the treatment of corporate commitments, although there is some question regarding these data as banks may have included some commitments that are unconditionally cancellable.

Increased capital requirements on the sovereign, interbank and securitised assets portfolios also contribute to the overall increase, the first two showing particularly large increases of 238% and 49% respectively. Securitisation adds another 1% to the overall effect because of sizeable third party guarantees and liquidity facilities for some banks (which under existing rules are currently risk-weighted rather than deducted from capital). The reduction in capital requirements for the retail portfolio partly offsets these increases, the average decline of 28% in the capital requirement in this portfolio across the banks reducing the overall change in requirements by approximately 7%.

Table 4: Quality Distribution of Drawn Exposures under the IRB Foundation Approach[7]

		AAA, AA, A	BBB	Below BBB
Corporate	G10 Group 1	36%	30%	34%
Interbank	G10 Group 1	81%	11%	8%
Sovereign	G10 Group 1	82%	7%	11%

Table 5: Quality Distribution of Undrawn Exposures under the IRB Foundation Approach[8]

		AAA, AA, A	BBB	Below BBB
Corporate	G10 Group 1	54%	27%	18%
Interbank	G10 Group 1	71%	16%	13%
Sovereign	G10 Group 1	76%	9%	15%

Twenty-two banks provided some information on the effect of the IRB Advanced approach. Most of these banks reported a decrease in capital requirements; a small number of banks found capital requirements would increase. All of these results used the benchmark assumption of a three-year average maturity. Furthermore, a small sample of banks was able to calculate capital requirements using the mark-to-market or default mode maturity adjustments. In general, capital requirements decreased when banks applied either of these maturity adjustments.

7 Results shown are averages for G10 Group 1 banks. Unrated exposures have been pro-rated into rated buckets.

8 Results shown are averages for G10 Group 1 banks. Unrated exposures have been pro-rated into rated buckets.

Variation Across Banks

Within these results there was significant variation between banks. The charts attached show the variation in the change in capital requirements under each approach within each grouping – G10, EU and Other. While one of the main factors behind the variation in the results is the relative quality of the corporate exposures, another important element in the IRB calculations is the importance of retail activity. Banks with large retail exposures have significantly lower capital requirements reflecting the generally lower risk.

Data quality

As noted above, although supervisors have worked hard to try to verify the results, there remain significant questions over the quality of the data. Banks have found it difficult, if not impossible in some cases, to overcome data limitations. An area where this has particular relevance is in the impact of credit risk mitigation. Whereas the recognition of wider forms of collateral results in a reduction of capital requirements for some banks of as much as 20%, others have made no allowance at all for new forms of credit risk mitigation in their results.

A number of banks also had difficulty in identifying those loans to small and medium-sized enterprises (SMEs) that could be included under the retail treatment. Until banks have made any necessary system changes to allow the identification of SME exposures that meet the definition that might be finally adopted for inclusion of these exposures in retail, it is hard to judge exactly the proportion of loans to SMEs that would be reclassified from the corporate to the retail portfolio.

Another systems issue is identifying commitments that are unconditionally cancellable. Under IRB Foundation, commitments that are unconditionally cancellable should have been excluded. Some banks do not have the system capabilities enabling them to identify such commitments and have consequently overstated commitments by simply including limits set for counterparties.

Some banks have tended to build in conservative assumptions when calculating the new requirements. For example, some banks set penal PDs for the unrated portion of the book. Other banks made what appear to be extreme assumptions regarding LGD for retail.

There are also factors leading to instances where the capital requirements may have been underestimated. There seems to be a wide variation in banks' definition of default with some banks applying a definition close to that proposed by the Committee and others applying a more limited definition. When banks move to applying a definition of default along the lines of that in CP2, this could increase the requirements for individual exposures because it could increase PD estimates.

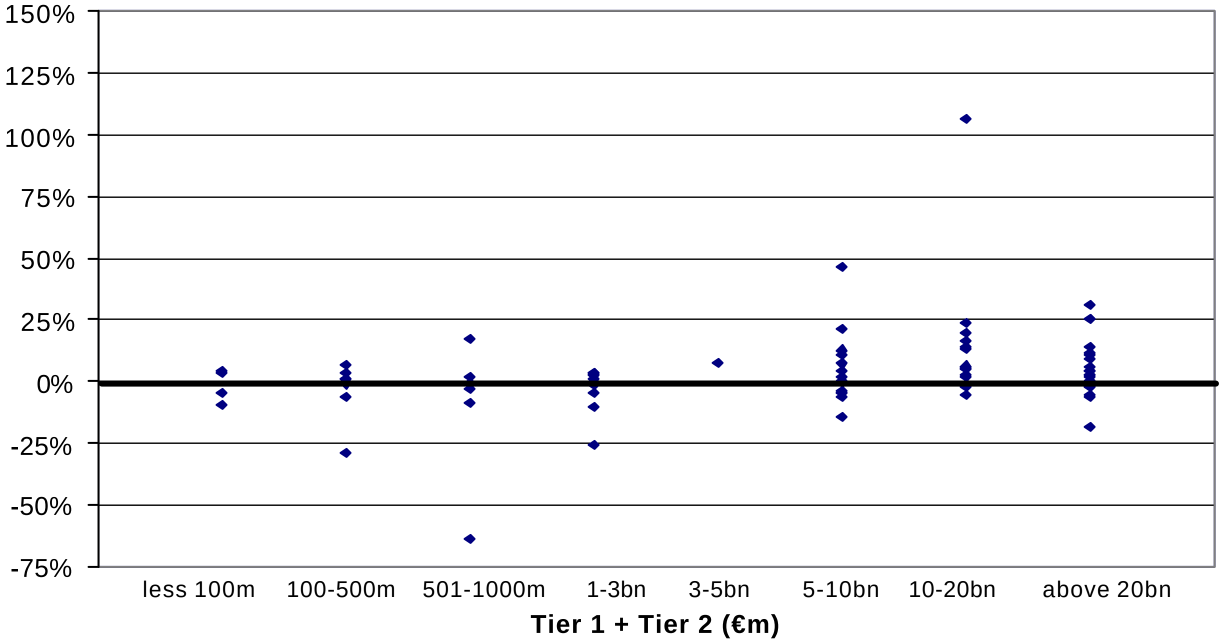
In the same direction, project finance and equity were treated as corporate exposures whereas the Committee has now developed and issued papers proposing revised treatments for both.

The effect of the proposed granularity adjustment has not been included in these summary results due to unresolved questions on its structure. Nevertheless, most Group 1 banks found that the granularity charge would modestly reduce capital requirements, although some banks reported significant declines and others a large increase. (Large effects in either direction would be surprising, given the expected diversification in the exposures of Group 1 banks.)

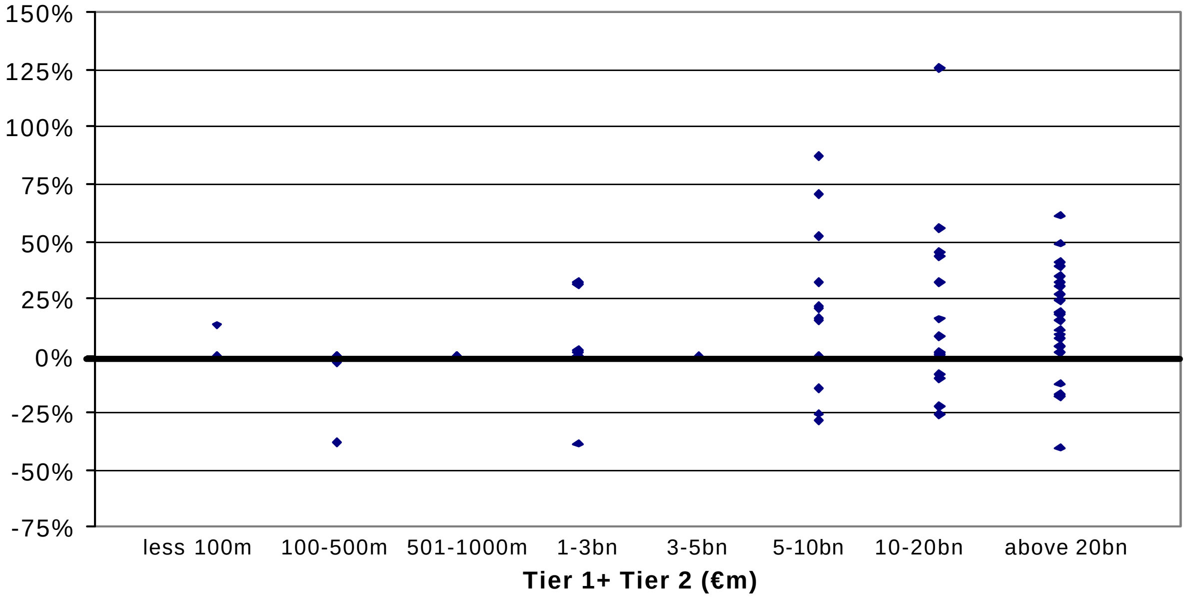
ANNEX

Percentage Changes in Capital Requirements for G10 Banks

(a) Standardised Approach

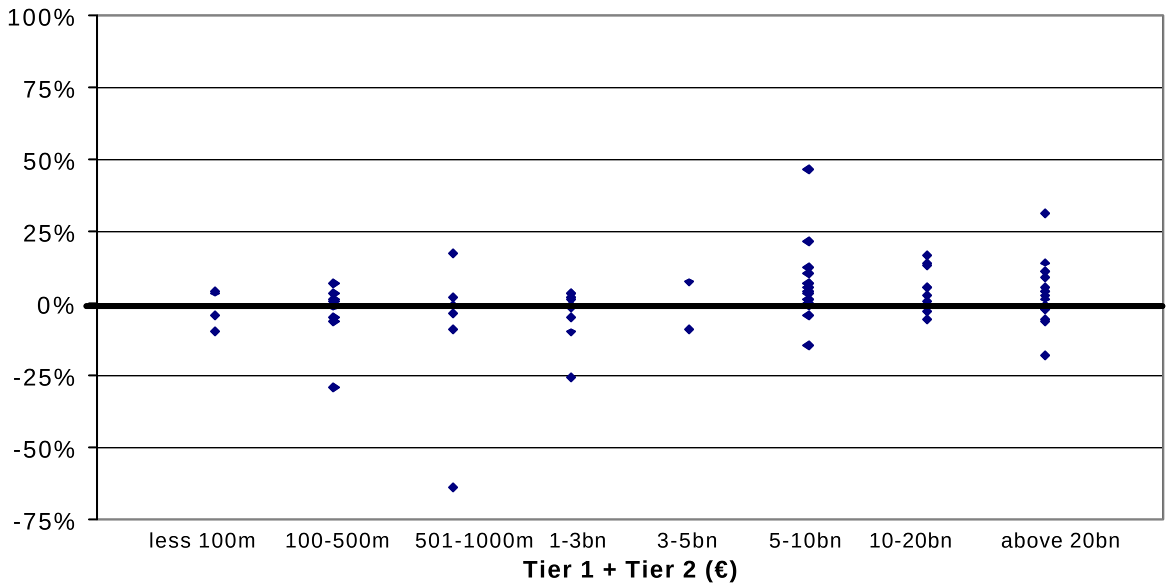


(b) IRB Foundation Approach

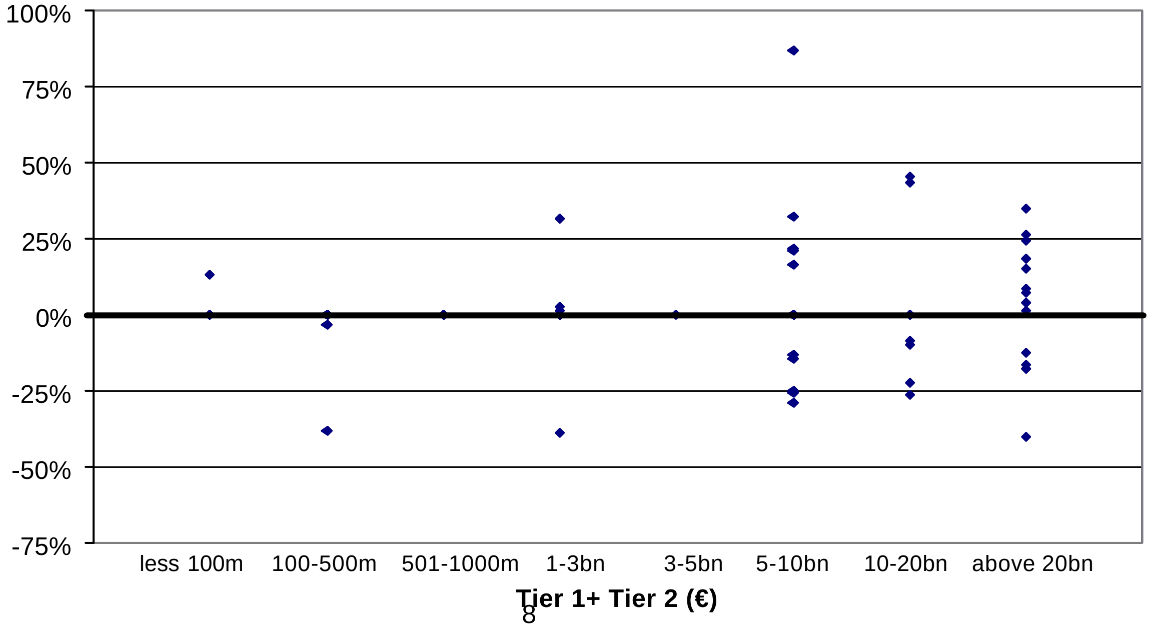


Percentage Changes in Capital Requirements for EU Banks

(a) Standardised Approach



(b) IRB Foundation Approach



Percentage Changes in Capital Requirements for non-G10, non-EU Banks

(a) Standardised Approach