COMMENTS ON THE CONSULTATIVE DOCUMENT
"THE NEW BASEL CAPITAL ACCORD" (CP3)

Spanish Banking Association (AEB)
July 2003

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The Spanish Banking Association (*Asociación Española de Banca*, AEB) appreciates the opportunity to make comments on the consultative document "The New Basel Capital Accord", of April 2003 (CP3). Given the advanced stage of elaboration of the New Accord and the various former opportunities to express opinions on the document, the current reply is in no way meant to be comprehensive, but it does try to focus on a few aspects which merit our attention, either because we think they can yet be improved or because of their particular relevance for this Association or for both reasons. On the other hand, the European Banking Federation (FBE) has prepared a reply document with a larger scope in terms of contents. AEB, which is a member of the FBE and as such has co-operated in the preparation of the document, supports it in general terms, and endorses it but in those specific remarks mentioned below.

Considering the foregoing, besides a final miscellaneous section dealing with a number of issues of varying importance, our reply basically focuses on the following items:

- Treatment of equity.
- Capital requirements in emerging markets.
- Recognition of provisions.
- Operational risk.
- Stress Testing as an element in Pillar Two.

I. TREATMENT OF EQUITY

Although the FBE reply document already stresses the disproportionate treatment of equity exposures, and consequently proposes a few measures to mitigate this, the peculiarity of the Spanish banking system in this area (with important stakes in non-financial companies) makes it advisable to insist on this point. Aside from the technical arguments included in the said document, we wish to underscore the following:

- The criteria to be able to apply the **credit risk method (PD/LGD)** rather than the market risk method to a given equity position should be made as lax as possible, setting as the sole condition that the exposure be included in the banking book.

- It would be of the utmost importance that a sufficiently long and flexible **transition period** be established for the adoption of the new capital requirements in this section.

- It should be avoided, as a basic criterion in this matter and all others, that the **more developed models** lead to higher regulatory capital requirements than those resulting from simple or standard models.

II.- CAPITAL REQUIREMENTS IN EMERGING MARKETS

Our Association feels that the issue of capital requirements in emerging markets, though not specifically considered in the new Accord, is a very important one not only for the international banking groups with significant exposures in those markets, but also for the countries themselves and their financial systems.

The AEB is willing to underline the issue by including a technical document thereon (Annex I), along with the following executive summary.

Executive summary

In respect of the confidence level, it is stressed in the document that the proposal of applying a percentage of 99.9% for calculating capital requirements in connection with the credit risk, using internal models, is too high for financial institutions in emerging countries. In fact, this confidence level is equal to demanding of financial institutions that their S&P rating be around A-, a level which very few of those countries can attain.

On the other hand, for international financial institutions with interests in emerging countries, the current proposal neglects the positive effect, in terms of diversification, that these investments have on loan portfolios.

Thus the capital requirement calculations that use internal models naturally take stock of the greater risks assumed in these countries. However, there is an asymmetric treatment insofar as the risks are at least partially offset by greater diversification, which is not taken into consideration.

In our opinion, the combination of these two problems (excessive confidence level and partial recognition of diversification) clearly limits the benefits of implementing the new Accord in emerging countries, in such a way that it may even have undesired effects on these economies.

On the one hand, local banks will not have incentives for using internal models, missing out on a unique opportunity to foster a better understanding and management of risk in these countries, geared towards a more efficient asset allocation that will favour the development of these economies.

On the other hand, international financial institutions, forced into using internal models to calculate capital requirements, can be penalised because of the non-recognition of diversification. This has a dual consequence. First of all, there could be uneven competition between international banks and local banks, because the latter, as we have stated, may not use internal models to calculate capital requirements, so their requirements would be lower.

Secondly, but equally important, the appeal of investing in emerging economies might be reduced, having a negative impact on the financial systems of those countries and on emerging economies at large.

We think that now, in the final stage of the consultative period, we are still in time to solve this problem. In the working paper, three alternative solutions are proposed instead of the current treatment in CP-3. Among these, we think that the best option, for practical reasons and because of the possibility of incorporating it to the new capital Accord document, is to locally adjust the implicit confidence level in the capital requirements by credit risk formula used in the internal models. This adjustment would be made according to each country's credit rating, i.e., the worse the rating, the lower the confidence level.

The working paper shows how this adjustment, besides correcting excess confidence levels for emerging countries, also mitigates the problem of non-recognition of diversification. The confidence level could be established in the regulations either in objective terms (with a table relating external ratings and confidence levels) or leaving it to the discretion of the national supervisors.

The proposed solution can easily be incorporated in Pillar One, establishing the confidence level as one of the parameters for internal models. If, in spite of this, it is decided that Tier I is to be left unchanged, the lowering of capital requirements should at least be incorporated via Pillar Two. In other words, Pillar Two should be able to allow capital reductions, in this case arising from the lack of recognition of diversification in Pillar One.

Although the emerging countries have not been the main concern in the new Accord, it should be noted that the Basel Committee still has the opportunity to make adjustments in the regulations so as to allow them to be implemented in these economies in the medium term, benefiting both the financial system in the aggregate and the general development of these economies.

III. RECOGNITION OF PROVISIONS

Within the conceptual framework of the new Accord in terms of credit risk, the principle whereby provisions should be used to offset the expected loss (EL) component implicitly included in regulatory capital is commonly accepted. In fact, the 1988 Accord allowed general provisions to be computed as capital—up to 1.25% of the risk weighted assets (RWA). The QIS 3 Technical Guide also allowed the EL component to be offset with the excess general provisions over the said 1.25% ceiling. However, CP3 introduces a limitation whereby such offsetting may only be applied if the EL exceeds 1.25% of the RWA, and in practice this is a very restrictive requirement considering that because of the capital curve shape—the EL will normally be lower than 1.25% of the RWA.

The new demand will affect **Spanish banks to a greater extent in comparative terms**, because at all times it has been assumed that, for the purpose of the offsetting we are dealing with, the provisions set aside on the basis of the FOCEI would be considered as general ones. Therefore, in order to benefit from the advantages of this fully justified offsetting, we must insist on the request made by the FBE to have paragraph 348 of CP3 changed, **returning to the approach applied in paragraph 333 of the QIS3 Technical Guide.**

IV. OPERATIONAL RISK

In relation to operational risk, following we are detailing a few aspects that we think should be reviewed and/or reworded in order to achieve a higher sensitivity in the determination of the capital requirements of financial institutions in connection with the operational risk that they effectively assume.

A. Incentives.

1. The incentive provided for going on from the application of the **Basic Model to the Standard Model** is very limited and, in our opinion, many banks will not be encouraged to actively implement operational risk management set-ups in all of their business areas. There is even the possibility of a significant number of them being inclined to remaining within the Basic Model.

2. The current wording of the document allows capital requirements to be calculated using the **AMA method** only in those business lines where it is beneficial to do so, under the assumption that the calculation of capital requirements using this Advanced method in the rest of the business lines would yield higher results than by applying the standard or basic method. The same situation arises if we compare the incentives for applying the Basic Method and the Standard Method in some business lines. In short, maintaining "betas" that are above 15% is an incentive NOT to use the more advanced methods in certain business lines.

B. Use of the AMA Method.

1. Greater detail would be desirable in respect of the criteria that must be met in order to consider that the bank is **pricing in the expected losses**, in order to only use the unexpected losses in the calculation of capital requirements.

2. It would also be convenient that the specific criteria that will be used to consider that the **estimate of unexpected losses** is valid be stated, in order for this capital requirement calculation procedure to be accepted by the supervisor. There is a vague reference to a *"sufficiently fragmented system..."* in the identification of the risk factors affecting the "distribution queues."

3. On the other hand, it is highly probable that the **capital floor** established for the first two years, respectively 90% and 80%, may

make it impossible for some banks, according to their business structure, to be able to benefit from additional capital reductions via the implementation of more sophisticated methods, due to the fact that the 20% tranche may be used up with the improvements obtained via additional capital reductions arising from credit risk.

In particular, if these limits are reached through the application of the credit risk models (for instance, because of the effect of the weighting of mortgages and consumer loans), there might not be any incentives to introduce improvements in the management of operational risk.

4. Regarding the current definition of **"Gross revenues",** calculation procedures should be implemented and their scope would have to be clarified, because probably the consolidated "gross revenues" an international banking group will differ from the result of the sum of the "gross revenues" of each country's banks, owing to differences in the accounting criteria.

5. It would be convenient that a more precise definition be given of what the Committee considers **business environment indicators and internal control indicators**, and under what conditions may they be requested to modify (either improving or worsening) the bank's risk profile.

6. The possibility of using **correlations** in the estimate of non-recurring losses is announced. It would be convenient to state what **criteria and parameters** they may be used with.

7. The demand of measuring the operational risk in terms similar to those applied to credit risk, by means of the establishment of a 99.9% **confidence level,** given the depth of the operational risk databases that are available at present and bearing in mind the variety and the diversification with the rest of the risks, may be excessive in our opinion. We think that 99% should be enough.

8. Last of all, it seems advisable that the limitations in capital reduction owing to the hedging of risks by means of **insurance policies** should be more flexible in order to allow financial entities greater freedom to choose to use comprehensive insurance estrategies vs. the strategy of reinforcing their capitalisation levels. This objective could be reached by means of the deletion of the 20% limit established in the document, and instead greater discretion could be used, administered by the supervisor, via the application of additional cualitative criteria.

V. STRESS TESTING AS AN ELEMENT IN PILLAR TWO

Our Association fully endorses the remarks relating to Pillar Two included in the FBE document, particularly the general approach regarding its genuine nature and purpose within the new Accord. In this respect, we wish to underscore the idea that **Pillar Two** should not always necessarily entail **additional capital requirements** (the possibility that the specific adjustments that are entailed may occasionally be negative should be considered), and especially any other aspects which, because of the **discretional approach**, may represent a threat for the level playing field both in domestic and cross-border terms.

We are of the opinion that the principle that should prevail in any case is that the supervisor's responsibility should be to oversee the existence of a minimum capital that will permanently guarantee the solvency and soundness of the system and of the banks it comprises, but these banks will have to determine the concrete capital and reserves buffer which, on top of those minimum requirements, they decide to hold at any given time on the basis of their individual strategic objectives.

We also wish to specifically refer to the requirement that banks submit their models to stress testing. Annex II includes a document on this issue. Its major conclusions are the following:

· Stress testing should not become a **compulsory requirement** for the adoption of internal ratings based (IRB) models.

· It is a technique which, notwithstanding its virtual importance in terms of credit risk in the future, is still **being developed and refined** and therefore has a number of weaknesses, especially regarding its capacity to detect the effects of the concentration and/or diversification of portfolios.

· Some of the criteria incorporated by Pillar One already entail a **sufficiently conservative bias** (for instance, the 99.9% confidence level), therefore the additional application of stress scenarios could lead to systematic overestimates of capital requirements.

· It is arguable that the use of stress testing techniques will actually mitigate the possible **procyclicality** of Basel II, which is one of the main arguments stated for the inclusion of the same.

· In any case, **extreme scenarios** that might generate unrealistic and unattainable results should be avoided.

· The results of the stress testing exercises would **not** be **subject to public disclosure**.

VI. OTHER ISSUES

A. Credit Risk. Standard Model

1. Exposures with banks (paragraph 37)

Although we share the FBE's idea that there should be a single, compulsory treatment of these exposures, in the event the possibility of choosing persists we prefer option 2, which according to our knowledge is the option chosen by Banco de España.

B. Credit risk. Internal Ratings Based (IRB) models

1. Exposures with banks (paragraph 256)

The LGD parameter corresponding to non-subordinated positions should be reduced even more than what is contended by the FBE; specifically, to 20%.

2. Delinquency (paragraph 364)

In the said paragraph a number of inconsistencies are detected as a result of the Spanish translation of the term "delinquency," which gives rise to a number of doubts which could in turn result in an added and presumably unwanted complexity. Therefore the scope of application should be limited to the specific cases that it is meant to regulate, and in any event there should be a close assessment of the additional costs arising from the duplication of the evaluation processes and of the databases that are to be maintained and handled.

3. Guarantees in retail operations (paragraphs 303 and 444)

In retail operations it is normal to consider the existence of guarantees as part of the discriminating function, which therefore affects the scoring of the operation. It seems like CP3 accepts this widespread practice (paragraph 303), but there could be cases breaching the provisions in paragraph 444. It would be convenient to specify, under the terms and conditions that are considered appropriate, that in retail portfolios the strict application of paragraph 444 should not apply.

4. Minimum requirements in IRB models (paragraph 413)

The flexibility that is introduced by this paragraph should also apply to the validation of databases, provided that, though the terms and conditions required are not met by the whole portfolio, a significant percentage of the same complies with them.

On the other hand, our proposal is that the period required for probability of default (PD) data in the Advanced IRB model be 3 years.

C. Pillar Three

Although this issue has been dealt with once and again, it is essential, in light of the important repercussion of the transition to the IAS accounting standards in the year 2005, that an effort be made to keep the highest possible alignment between the new accounting regulations and the own funds regulations, not only in terms of market disclosure but also in terms of the basic concepts they are grounded on.

D. Implementation

Taking into account the foregoing comments on the difficulties for the application of the new Capital Accord to emerging countries, we are of the opinion that, in the implementation process, aside from dealing with the many complex issues that are still pending, we should play closer attention to such application. In this regard, we propose that a sufficiently large representation of emerging countries be incorporated to the *ad hoc* fora and particularly to the Accord Implementation Group (AIG).

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ANEXO 1

IMPACT OF BIS II ON CAPITAL REQUIREMENTS IN EMERGING MARKETS: DIVERSIFICATION EFFECTS AND IMPLICIT CONFIDENCE LEVEL

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1. INTRODUCTION

Sensitivity to risk of capital requirements is a key principle in risk management. Financial entities should aim to align accurately capital requirements with intrinsic risks to which they are exposed. The New Capital Accord proposal, known as Basel II, aims to go in this direction, as stated in the various consultative documents published by the Basel Committee. The proposed capital framework is based on three principles: risk-sensitivity of the minimum capital requirements, supervisory review of an institution's capital adequacy and internal assessment process, and market discipline through effective use of disclosure.

With regards to credit risk, the Basel proposal distinguishes between two approaches to compute capital requirements. The first is a standardised approach, which is basically similar to the method employed in the current accord, although there is a wider discrimination between the risk weights. The second, internal ratings based approach, for which both a foundation and an advanced model have been designed, aims to be much more risk-sensitive and to bring regulatory capital closer to the concept of economic capital.

The implication of higher risk sensitivity is that under internal models, capital requirements for some portfolios will be reduced, while for others, with higher risk, they will increase. Consequently, it makes sense that, for given emerging countries' portfolios, risk weights should rise.

In this document we analyse the impact on capital requirements of the New Basel Capital Accord for investments in emerging countries. Furthermore, we show that for these economies the proposal, in its current form, is inappropriate and generates excessively high capital charges. The reasons are basically twofold:

- On the one hand, the use of a sole confidence level in the Basel II curves is very penalising. Indeed, the implicit confidence level in all the Basel formulae used to compute capital requirements for credit risk purposes is 99.9%. The same confidence level is used for all banks, regardless of the country in which they operate and independently of their target rating. The use of such a high confidence level, required as a general rule, is rather penalising. According to Standard & Poor's, such a confidence level implies requiring that all financial entities have a minimum rating around A-, regardless of the country in which they operate.

  Thus it does not seem reasonable to require the same confidence level or, equivalently, rating, from all financial entities in emerging economies, where only very few countries reach an A- rating.

For instance, in the case of financial entities in Latin American countries, a paradoxical situation would arise. According to Standard & Poor's, Mexico's rating is BBB-, Colombia's is BB, Peru's is BB-, Brasil is B+, and Venezuela's is CCC+. The only country with an A- rating is Chile. Thus Chile would be the only country in line with the confidence level required by Basel II, i.e. apart from Chile the regulator would be requiring financial entities to have a better rating than that of the country in which they operate.

-   On the other hand, the one-factor model used in the Basel proposal is inadequate for international financial entities with investments in emerging economies. Indeed, in this model diversification benefits are only partially recognised. The supervisor uses one-factor models, mainly because of their simplicity and additivity. Nevertheless, there are circumstances under which this kind of models turn out to be very restrictive and lead to excessively high capital requirements.

    The model proposed by the Basel Committee is thus asymmetric, in the sense that it recognises the worse credit quality of the counterparties but does not, on the other hand, take into account the improvement in terms of portfolio diversification that this kind of investments can generate. In its current form, and in particular in the case of financial entities with investments in emerging economies, the Basel proposal disincentives diversification and is conservative.

Finally, although it may be true that the existence of a high solvency level for the entire financial system is desirable, and convenient - for which emerging countries must be required to have high levels of capital - one must not forget that there is a trade-off between solvency and development. It is important that regulators be aware that the good intentions of improving the solidity and stability of the financial system must not jeopardise the natural and beneficial international capital flows to emerging countries - the very countries in most need of such financing.

The remainder of this document is organised as follows. In Section 2 we present a review of various studies that analyse the likely impact of Basel II on emerging markets. In Section 3 we show the impact on capital requirements of the confidence level and we illustrate how requirements would change if we adjusted the confidence level in function of each country's rating (instead of using a unique confidence level). The effect of the non-recognition of diversification benefits is illustrated in Section 4, by means of comparison with a two-factor model, which incorporates diversification effects. In Section 5 we propose various alternatives to both tackle the problem of a unique confidence level and take into account diversification, as well as a practical solution to correct, at least partially, the distortions created by the non-recognition of diversification and the use of a sole confidence level. This solution is based on adjusting the implicit confidence level in the Basel formulae used to compute capital requirements for credit risk purposes, taking into account the financial entities' economic environment. For this, in this document we have used as adjustment mechanism the rating of the country in which the financial entity is located. Finally, Section 6 summarises the main conclusions.

2. REVIEW OF THE LITERATURE

Since the publication of the New Capital Accord proposal in January 2001, a number of academic studies have been published regarding the effect of Basel II on emerging countries. For instance, Griffith-Jones and Spratt (2001) were the first to voice concern that the implementation of IRB models in developing and transition economies could significantly decrease bank lending to them, and/or increase its cost, and accentuate pro-cyclicality. The implications of new risk weightings under the standardised approach are also likely to be negative for these countries, in particular for those with low ratings, but less so than under the IRB approaches, which are much more risk-sensitive. The implications of this, according to these authors, are that large parts of the developing world will no longer be able to access international bank lending on terms likely to be acceptable. The impact is likely to be felt most severely in the lowest rated countries - the very countries in most need of such access. Concerning the issue of pro-cyclicality, the authors comment that it is a source of serious concern that the IRB approach is likely to increase further pro-cyclicality of lending, especially to speculative-grade developing countries, and therefore their vulnerability to developmentally costly currency crises.

In this line, a paper produced by B. Rime (2000) of the Swiss National Bank, argues that the coexistence of the standardised and IRB approaches will encourage sophisticated banks to decrease risk taking (as the incentive towards holding poor quality loans will be removed), but provide incentives for less sophisticated banks (operating under the standardised approach) to increase risk-taking. The author expresses concern, from a prudential perspective, about the impact of banks with the lowest credit risk expertise being disproportionately involved in making loans to high-risk borrowers. These findings would imply that as the major international banks reduce exposure to the developing world (or at least the riskier parts), they may be replaced by less sophisticated banks who, still operating under the standardised approach, retain an incentive - albeit reduced - towards holding lower quality loans.

Some authors go a step further, such as Rojas-Suarez (2001), who argues that the adoption of Basel II can weaken, rather than strengthen, the stability of banks in emerging markets. The author concludes that emerging countries can be divided into two groups according to their capacity to enforce regulatory capital. For the first group, consisting of economies characterised by a high concentration of financial and real asset ownership, as well as inappropriate accounting standards and reporting systems, improper classification of non-performing loans and deficient legal and judicial frameworks, and thus unable to enforce supervisory actions, capital standards do not work. Thus, for these countries, the recommendation is to design a capital standard that appropriately reflects the risk of banks' assets, and that is not the case of Basel II. For the second group of countries, formed by those countries where, although domestic capital markets remain shallow, foreign banks have contributed to improve the usefulness of capital ratios by providing an outside source of capital, the author concludes that implementation of the proposed Basel II would introduce further distortions in the allocation of bank credit and exacerbate the volatility of capital flows to emerging countries.

Additionally, a number of independent studies have attempted to assess the likely impact on the cost of borrowing for low rated borrowers. Some, such as Reisen (2001), have suggested alarming increases in the costs of borrowing, to the extent that developing countries would be effectively excluded from international bank lending. The author argues that if

Basel II is implemented as it is, speculative-grade borrowers, the bulk of emerging and developing countries, will suffer from a dramatic rise in debt costs and heightened cyclicality of global bank credit, as well as from increased volatility of private capital flows, and hence increased vulnerability to currency crises. Other research, as in Powell (2001), predicts a sharp rise in the cost of lending to emerging countries with poorer credit ratings as well as to Mexico, Korea and Ecuador. The different approaches all point to a significant rise in the cost of lending to low rated borrowers.

A number of other submissions to the Basel Committee voice concern that the proposed changes to the Capital Accord could unintentionally increase the amplitude of business cycles, as for instance in Danielsson et al (2001). These concerns are generally expressed with reference to the wealthiest countries, but are even more relevant to emerging market economies.

A number of international banks argue, in their submissions to the Basel Committee, that the calibrations used are too conservative and therefore produce capital requirements, particularly for low rated borrowers, that are in excess of those produced by their own, internal models. For example, Citigroup argues that "…the calibration of capital causes regulatory minimum capital requirements to increase to inappropriately high levels when compared to existing rules of internal risk models". Similarly, Credit Suisse Group affirms that "…the calibration of high-risk grades in the IRB sanctions SMEs and emerging markets. Their access to capital from large institutions will be made significantly more difficult" [1].

In their discussion paper, Griffith-Jones and Spratt (2002) question the arguments presented by some that concerns over the impact of the new proposals on the cost of bank lending are misplaced. The suggestion is that banks price loans off their own internal models rather than on the basis of capital requirements, and that, consequently, all the New Accord will do is bring regulatory requirements into line with existing practice. The authors argue that, whilst this may be so when the regulatory capital required is below that which banks would choose to hold, if the regulatory requirements are above those indicated by the banks' own models, it would be liable to force them to increase the cost (and/or reduce the quantity) of lending to lower rated borrowers. In addition, they make the point that if SMEs are treated differently, due to their distinct risk profile and importance as an engine of economic growth, a similar argument can be made in the case of developing countries. From a global perspective, developing countries could be as much an "engine growth" as SMEs are at the national level. This, combined with the different risk profile of these countries, could justify the development of a separate curve, as that developed for SMEs.

Pursuing this point, Griffith-Jones, Segoviano and Spratt (2002a) state that, although the modifications made to the January 2001 Consultative Paper, in particular by flattening the IRB curve, have diminished significantly the problems for developing countries, the required capital for lower-rated borrowers proposed in November 2001 will still be higher than under the existing Accord. Thus, to the extent that the pricing and availability of bank loans is influenced by capital requirements, the current proposals will see an increase in cost (and/or reduction in quantity) for borrowers below investment grade. In this line, according to estimates made in Lowe and Segoviano (2001), had the IRB approach (in its January 2001 version) been in place in Mexico, between late 1994 till end 1996, capital requirements would have at least doubled for some banks, and on average would have increased by at least forty

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[1] See *Comments on the Second Consultative Package*, 2001, http://www.bis.org/bcbs/cacomments.htm.

percent. Under the proposals released in November 2001, the overall increase would still be substantial, but about one third less than under the previous proposals.

Moreover, with respect to the preferential treatment given to SMEs, Griffith-Jones, Segoviano and Spratt raise the following issue. If special treatment is being given to SMEs, mainly because of political pressure from those developed countries where SMEs generate important employment effects, should not at least some special treatment be given to lending to developing countries, who generate such a high proportion of world employment? More to the point, they discuss the underlying assumption of a single systematic risk factor, which is the same across all loans. This is a major problem, as diversification benefits are completely ignored despite the fact that, domestically and internationally, diversification benefits could play a major role for banks concentrating in below investment grade borrowers - either SMEs or developing countries. Indeed, if diversification benefits were to be sufficiently recognised, there might be incentives - in terms of lower capital requirements - for portfolio diversification: for example, between developed and developing countries internationally. Due to concerns expressed by politicians in certain developed countries and by a number of institutions (especially in Germany) about the high levels of capital requirements delivered by IRB risk functions for SMEs, the correlation parameter in the PD curve was modified. Thus the constant 0.2 correlation assumption was replaced by a function of asset correlation which is decreasing in PD (November 2001), further flattened by the introduction of a size-adjustment factor for SMEs (July 2002), based on the assumption that smaller companies present less systematic risk. The authors conclude that it may also be appropriate to make a similar adjustment to the IRB function for international diversification, to take account of lower correlation between developed and developing countries' risk.

Griffith-Jones, Segoviano and Spratt (2002b), in a later paper, continue discussing the reason why capital requirements under the new proposal could be inappropriately high for developing and emerging economies, i.e. that the benefits of international diversification are not taken into account. They argue that the Basel Committee should incorporate the benefits of international diversification into the New Accord. The argument is similar to that used to support the November 2001 modifications resulting in the flattening of the IRB curve. In essence, that argument is that a higher PD for a corporate reduces correlation, as bankruptcy/default may be the result of any number of non-systemic factors that would not necessarily have any impact on the prospects for other corporates. The empirical results they obtain show that the degree of correlation between the real and financial sectors of developed economies is greater than that which exists between developed and developing economies. Furthermore, they obtain that an international loan portfolio which is diversified across the developed, emerging and developing regions enjoys a more efficient risk/return trade-off - and therefore lower overall portfolio risk as measured by unexpected losses - than one focused exclusively on developed markets. Results from simulations carried out suggest that the level of an unexpected loss that a portfolio focused on purely developed country borrowers would face in an extreme event, would be about 25% higher than a portfolio diversified across developed and developing countries. The authors conclude that, because one of the major benefits of investing in developing and emerging economies is their relatively low correlation with mature markets, the Basel Committee should incorporate the benefits of international diversification into the New Accord. Unless the proposal is amended, capital requirements will not clearly reflect risk and will unfairly penalise lending to developing countries.

As Griffith-Jones (2003) concludes in an article published in the Financial Times, "…developing economies and transition countries are not represented at all in the Basel committee and so have limited leverage to make their case. However, given the committee's technical expertise and fair-mindedness, there is still a chance that it will amend the current proposal to take into account the benefits of international diversification. It would be technically wrong, economically unwise and politically insensitive not to do so".

The impact of not taking into account diversification effects can be significant, as shown in García and García (2002). In this paper, a two-factor model is implemented in order to detect the extent of undervaluation of diversification effects in the Basel II proposal, based on a one-factor model. Results obtained show that the level of overestimation obtained with the one-factor model can be very high. Depending on the factor correlation used, maximum excess capital requirements over the one-factor model can vary between 10% (when the correlation between factors is 75%) and 60% (when the correlation between factors is 0%). Moreover, in some circumstances the one-factor model can generate the wrong incentives, in the sense that it always provides incentives to decrease loans to higher PD counterparties. On the other hand, the two-factor model shows that, in some cases, because of the benefits of diversification, adding higher PD counterparties to a portfolio can reduce the risk.

Méndez (2003) also highlights, in a review of critical issues in the current version of the New Basel Capital Accord, the undervaluation of diversification benefits. The modifications to the risk weight curves introduced progressively, as a result of comments submitted by the financial industry, mitigate the deficiency of the one-factor model, but only partially. The author concludes that, in order to incorporate fully the advantages of diversification, the New Accord should evolve towards credit risk portfolio models. He also points out that the conclusions of the Third Quantitative Impact Study (QIS3), on which the latest calibration of the Capital Accord (Third Consultative Package or CP3) is based, should be interpreted with caution. This is the only manner of avoiding that the new proposal be biased and imply comparative disadvantages for those entities and markets barely represented in the analysis, as is the case of emerging countries.

Finally, in a recent discussion paper, Repullo and Suárez (2003) develop a model, based on a perfectly competitive market for business loans and a single risk factor, to analyse the implications for the pricing of bank loans of Basel II. The authors comment on the advantageous (disadvantageous) treatment that low risk (high risk) lending receives in the IRB approach. Their loan pricing equation implies that low-risk firms will achieve reductions in their loan rates by borrowing from banks adopting the IRB approach, while high-risk firms will avoid increase in their loan rates by borrowing from banks that adopt the less risk-sensitive standardised approach of Basel II. They compute the level of the social cost of bank failure that could justify the IRB capital requirements of Basel II and conclude that the current design implies excessive charges for high PD loans. This result is related to the fact that Basel II does not take into account the net interest income from performing loans, which provides a buffer, in addition to capital, against credit losses, and propose a margin income correction for IRB capital requirements.

3. IMPACT OF A SOLE CONFIDENCE LEVEL ON EMERGING COUNTRIES

In the New Basel Capital Accord proposal, the implicit confidence level in all the formulae used to compute capital requirements for credit risk purposes is 99.9%. The same confidence level is used for all banks, independently of the country in which they operate and independently of their target rating. The use of such a high confidence level, required as a general norm, is rather penalising. Such a confidence level implies requiring that all financial entities have a minimum rating around A-, regardless of the country in which they operate. Below we present a table with Standard & Poor's ratings for a selection of developed and developing countries:

Table 1: Standard & Poor's Ratings (July 2003)

DEVELOPED COUNTRIES

Country	Rating
Austria	AAA
Belgium	AA+
Finland	AAA
France	AAA
Germany	AAA
Greece	A+
Ireland	AAA
Italy	AA
Luxembourg	AAA
Netherlands	AAA
Portugal	AA
Spain	AA+

Country	Rating
Australia	AAA
Canada	AAA
Japan	AA-
Switzerland	AAA
UK	AAA
USA	AAA

DEVELOPING COUNTRIES

Country	Rating	Country	Rating
Argentina	SD	Bulgaria	BB+
Bolivia	B	Croatia	BBB-
Brazil	B+	Czech Republic	A-
Chile	A-	Estonia	A-
Colombia	BB	Hungary	A-
Ecuador	CCC+	Latvia	BBB+
Mexico	BBB-	Lithuania	BBB+
Panama	BB	Poland	BBB+
Paraguay	SD	Romania	BB-
Peru	BB-	Russia	BB
Uruguay	B-	Slovak Republic	BBB
Venezuela	CCC+	Slovenia	A+
		Ukraine	B

Country	Rating
China	BBB
India	BB
Indonesia	B-
Korea	A-
Malaysia	BBB+
Philippines	BB
Thailand	BBB-

It can be observed that, in general, developing countries have substantially lower ratings than those of the developed countries. In the case of Latin American countries, with the exception of Chile, all countries have ratings well below A-.

One may ask the question whether the use of the same confidence level or, equivalently, rating, from all financial entities, is adequate, in particular in the case of emerging countries, where country ratings are substantially lower than A-.

On the other hand, it is obvious that a high solvency level for the entire financial system is desirable, and convenient. This objective should be accomplished without jeopardising normal capital flows towards emerging economies. We believe the Basel Committee should include this type of considerations in the New Accord.

The objective in this section is to illustrate how penalising IRB models, based on a sole 99.9% confidence level, are, compared with BIS I and with the standardised approach of BIS II, when applied to low-rated countries. We go one step further and show what capital requirements would result if a different confidence level were used for each country, in function of its external rating.

Example:

We consider an example of a loan portfolio to SME Corporates[2] of a financial entity that operates in a country with a given rating, and analyse the impact of modifying the country's rating from A- to CCC+[3].

Loan Portfolio Assumptions:

Exposure = 100
LGD = 45%
Maturity = 1 year[4]
Loans to SME Corporates, sales = 25 million[5]
The investments made do not have an external rating, but we consider that they have an internal rating, equal to the country rating less 3 notches.

We calculate capital requirements using four different models:

− BIS I.

− BIS II standardised approach[6].

− BIS II IRB advanced model.

− BIS II IRB advanced model with adjustment for confidence level (BIS II IRB Advanced Approach formula, replacing the 99.9% confidence level by a variable parameter).

We present detailed results of the calculation of capital requirements according to the four models in Appendix I, Section A. In this appendix, we also present results of a second scenario, in which the counterparties' internal rating is, on average, equal to the country rating less two notches (instead of the three notches difference).

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[2] We have chosen a portfolio of loans to SME Corporates purely as an illustrative example. Nevertheless, it is essential to understand that the choice of a different curve (whether retail or corporate) would merely move the risk weight curves upwards or downwards and would not change the conclusions.

[3] In Appendix II we present the empirical default frequencies associated to the different ratings of Standard & Poor's and Moody's based on the most recent historical data, as well as the default frequency for each rating used in this study.

[4] We assume the loans have an average maturity of one year so as to simplify calculations. The consideration of a different maturity would not change the conclusions.

[5] We assume average sales are 25 million euros, which is half-way between 5 and 50 million. The choice of a different level of average sales would only move the risk weight curves upwards or downwards and would not change the conclusions.

[6] Capital requirements calculated according to the BIS II standardised approach are larger than those calculated according to BIS I because of the operational risk charge included in the former. Indeed, the three BIS II formulae include an operational risk charge computed using the Alternative Standardised Approach. This operational risk charge is related only to the exposure considered. In reality the total operational risk charge includes, in addition to this, the operational risk charge not related to credit risk, and will therefore be larger than that considered in this analysis.
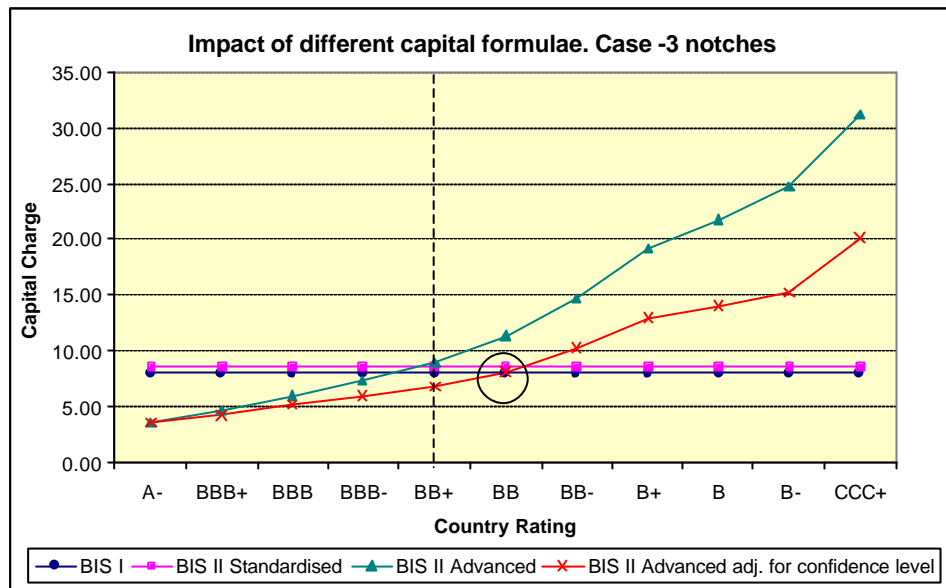
Figure 1

Analysis of results

The two horizontal lines in Figure 1 represent capital charges obtained under BIS I and the BIS II standardised approach. The steepest curve (green line with triangles) corresponds to capital charges calculated under the BIS II advanced model. Finally, the fourth curve (red line with crosses) represents capital charges computed using the BIS II advanced approach formula, in which we have replaced the 99.9% confidence level by the confidence level corresponding to the different country ratings.

For country ratings equal to A-, the confidence level used is 99.9%[7], which explains why in this case capital charges under the BIS II advanced model adjusted for the confidence level coincide with capital charges under the BIS II advanced model.

It can be seen that, for countries with ratings below BB+, the BIS II IRB advanced model produces capital charges above BIS I and the BIS II standardised approach.

For these lower ratings, the BIS II IRB advanced approach, adjusted using the confidence level corresponding to the country's rating, produces capital charges similar to those of the standardised approach for ratings around BB. For the very worst ratings (ratings below BB), capital charges are higher with the BIS II advanced approach adjusted for the confidence level than with the standardised approach, but are well below those obtained with the BIS II advanced 99.9% confidence level approach.

It makes economic sense, and is wise, that capital requirements should increase with risk. Nevertheless, we believe that the slope of the BIS II advanced model is excessively steep, and can be penalising for low-rated countries. The BIS II advanced model adjusted for the country's confidence level is an increasing function in risk, yet it is not so steep as the advanced model curve.

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[7] See Appendix II.

In Figure 2 we show the capital requirements for the different country ratings, using the BIS II IRB advanced approach and the BIS II advanced approach adjusted for the confidence level, using as the base = 100 capital requirements under the BIS II advanced model for a developed country (rating A-).
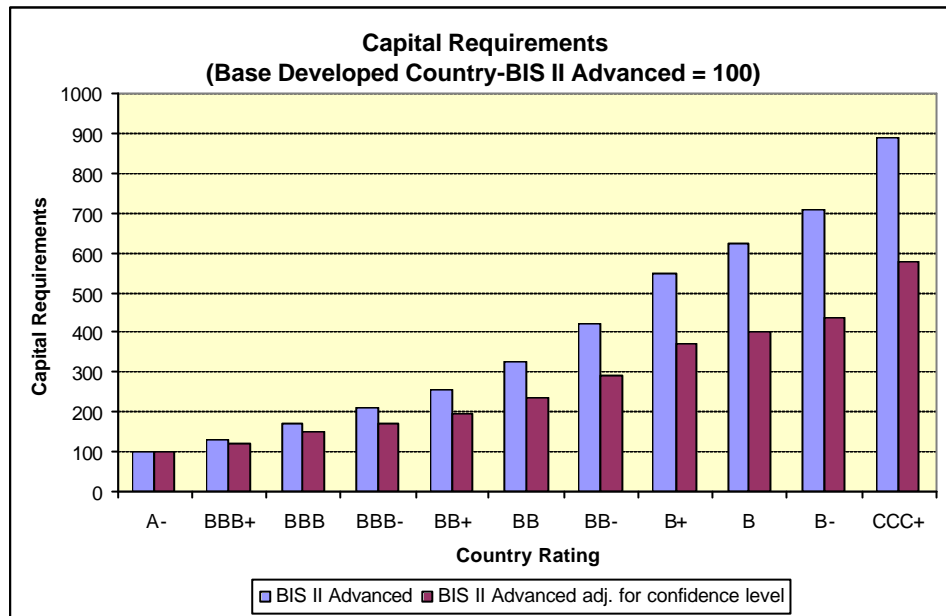

Figure 2

We observe that, as country ratings deteriorate, capital requirements under the two methods increase. Obviously, as risk increases, capital requirements should also rise. Nevertheless, while capital charges under the BIS II advanced model rise sharply, under the BIS II advanced model adjusted for the confidence level, these increase in a more progressive manner.

For example, in the case of a country with a BB rating, capital requirements under the BIS II advanced model are around three times those of a developed country, while under the BIS II advanced model adjusted for the confidence level, they are of the order of twice those of a developed country. For a country with a B rating, capital requirements under the BIS II advanced model are around six times those of a developed country, while under the BIS II advanced model adjusted for the confidence level, they are of the order of four times those of a developed country.

4. NON-RECOGNITION OF DIVERSIFICATION AND IMPLICIT CONFIDENCE LEVEL

For internationally active banks with subsidiaries in emerging countries, the problem is not only the unique confidence level, but also the non-recognition of the benefits of diversification.

Indeed, diversification benefits in Basel II are only partially recognised. The supervisor uses one-factor models, mainly because of their simplicity and additivity. Nevertheless, there are circumstances under which this kind of models turn out to be very restrictive and lead to extremely high capital requirements. For instance, in the case of investments in emerging markets, the model proposed by the Basel Committee recognises the worse credit quality of the counterparties but does not, on the other hand, take into account the improvement in terms of portfolio diversification that this kind of investments can generate.

In this line, Griffith-Jones, Segoviano and Spratt (2002b) obtain empirical results that show that the degree of correlation between the real and financial sectors of developed economies is greater than that which exists between developed and developing economies. Thus, an international loan portfolio diversified across developed and emerging countries enjoys a more efficient risk/return trade-off, and lower overall portfolio risk as measured by unexpected losses, than one focused exclusively on developed markets.

Focusing on the case of Spain and Latin America, we obtain results that go in the same direction. In Appendix III we show that, between Spain and Latin American countries, GDP correlations, as well as correlations between aggregate default rates, are not significant or are negative.

In this section we illustrate how the BIS II formulae fail to incorporate the benefits of international diversification, by means of the comparison of the BIS II standardised and IRB advanced models with a two-factor model implemented by García and García (2002), which takes better into account some of the diversification effects. We also show that a simple and practical way of taking into account diversification can be to use the BIS II IRB advanced model, adjusted by a different confidence level depending on each country's external rating.

Example:

We consider an example of a financial entity that operates in a developed country, with a loan portfolio to SME Corporates[8]. This entity is envisaging the acquisition of a bank in a standardised model in an emerging country with a lower rating. We assume that this bank also has a loan portfolio to SME Corporates.

We estimate the capital charge before the acquisition, assuming the bank in the developed country is using the BIS II advanced model, while the bank in the emerging country is using the BIS II standardised model. We also compute the capital charge after the acquisition has been completed, assuming that the bank in the emerging country moves to the

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[8] As previously, we have chosen portfolios of loans to SME Corporates purely as an illustrative example. The choice of a different curve (whether retail or corporate) would merely move the risk weight curves upwards or downwards and would not change the conclusions.

advanced model. Additionally, we consider the utilisation of alternative models, such as the two-factor model with various factor correlations, and the BIS II advanced model, adjusted with a different confidence level depending on the emerging country's external rating.

In the case of BIS II models (all models except for the two-factor model), total capital charges are obtained as the sum of capital charges for the developed country and capital charges for the emerging country[9]. Capital charges in the two-factor model are obtained incorporating diversification effects.

Furthermore, we consider the impact of different country ratings and thus vary the emerging country's rating from A- to CCC+[10].

Loan Portfolio Assumptions:

Total Exposure = 100 : 80 in developed country and 20 in emerging country
LGD = 45%
Maturity = 1 year[11]
Loans to SME Corporates, sales = 25 million[12]
The investments made do not have an external rating, but we consider that they have an internal rating, equal to the country rating less 3 notches.

The four different models considered are as follows:

−   BIS II standardised approach for the emerging country and BIS II advanced model for the developed country.

−   BIS II IRB advanced model for both countries.

−   BIS II IRB advanced model for the developed country and BIS II IRB advanced model with adjustment for confidence level (BIS II IRB Advanced Approach formula, replacing the 99.9% confidence level by a variable parameter) for the emerging country.

−   Two-factor model, implemented by García and García (2002), which takes better into account the effect of diversification. The model is an extension to the one-factor model of Schönbucher (2000). In this framework, it is assumed there are two economies or countries, each one driven by its own factor, common to all obligors of that country. The two economies are related through the correlation between their underlying factors.
    We vary the factor correlation between 0% and 100%.

All models include an operational risk charge computed using the Alternative Standardised Approach[13].

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[9] This can be done due to the additivity of capital charges in a one-factor model.

[10] In Appendix II we present the empirical default frequencies associated to the different ratings of Standard & Poor's and Moody's based on the most recent historical data, as well as the default frequency for each rating used in this study.

[11] We assume the loans have an average maturity of one year so as to simplify calculations. The consideration of a different maturity would not change the conclusions.

[12] We assume average sales are 25 million euros, which is half-way between 5 and 50 million. The choice of a different level of average sales would only move the risk weight curves upwards or downwards and would not change the conclusions.

[13] This operational risk charge is related only to the exposure considered. In reality the total operational risk charge includes, in addition to this, the operational risk charge not related to credit risk, and will therefore be larger than that considered in this analysis.

We present detailed results of the calculation of capital requirements according to the four models in Appendix I, Section B. In this appendix we also present results of a second scenario, in which the counterparties' internal rating is, on average, equal to the country rating less two notches (instead of the three notches difference).
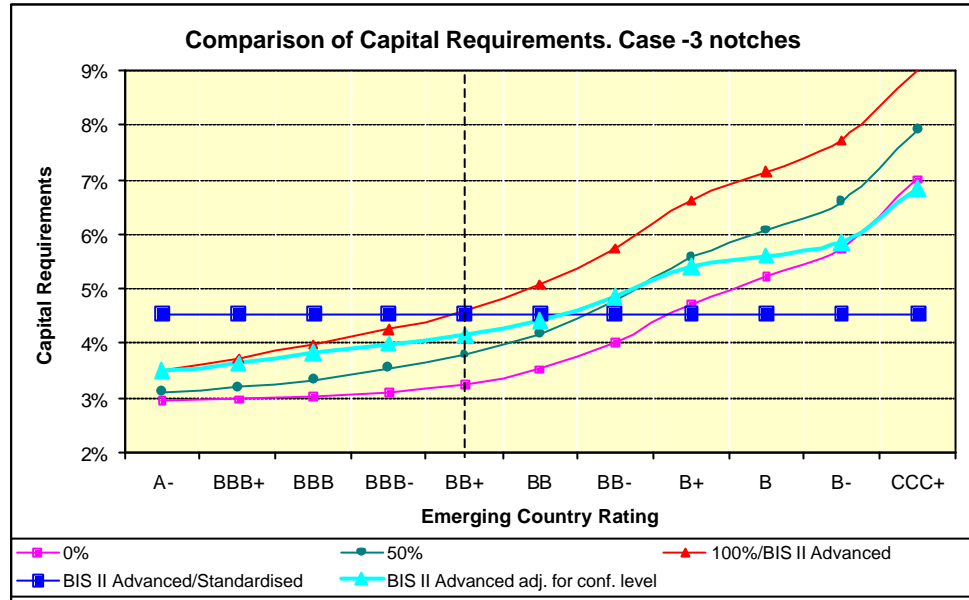

Figure 3

In Figure 3, 0%, 50%, and 100% are the factor correlations between the two economies/countries employed in the two-factor model.

Analysis of results

The horizontal line in Figure 3 represents the average capital requirements computed using the BIS II IRB advanced model for the developed market and the BIS II standardised approach for the emerging market. These represent capital requirements in the initial situation, before the acquisition. They are obviously constant, since in the standardised approach, capital charges for the emerging country loan portfolio are independent of the rating (and capital charges for the developed country loan portfolio are also independent of the emerging country's rating).

Moreover, capital requirements computed using the BIS II advanced model for the developed market and the BIS II standardised approach for the emerging market are higher (lower) than those obtained with the BIS II IRB advanced model for the two countries for good (worse) country ratings. Consequently, for ratings worse than BB+, a higher level of capitalisation might create disincentives, with respect to the current situation, to acquire the bank in the emerging country.

It can also be seen that, in the two-factor model, as the correlation between factors increases (0%, 50%, and 100% lines), capital requirements for a given country rating increase, until the correlation is 100%, which coincides with the one-factor BIS II advanced model.

By definition, the BIS II advanced model which takes into account the rating of the emerging country via the confidence level produces, for the best rating (A-)[14], capital requirements identical to those of the two-factor model with correlation 100% (or, equivalently, with the BIS II advanced model). Furthermore, it is very interesting to observe that capital requirements computed using this adjustment are very similar to those of the two-factor model with correlation 0% for the worst rating considered (CCC+). Between the two extreme ratings, capital charges can be obtained with the two-factor model using an intermediate correlation (somewhere between 0% and 100%).

One important aspect we wish to point out, with regards to the two-factor model, is the reduction in capital requirements caused by diversification. In Figure 4 we illustrate the impact, in terms of capital requirements, for a bank with investments only in a developed country, of acquiring a bank in an emerging country with e.g. a BBB rating. This result was already observed in García and García (2002), that in some cases, due to the benefits of diversification, adding higher PD counterparties to a portfolio can actually reduce the risk.
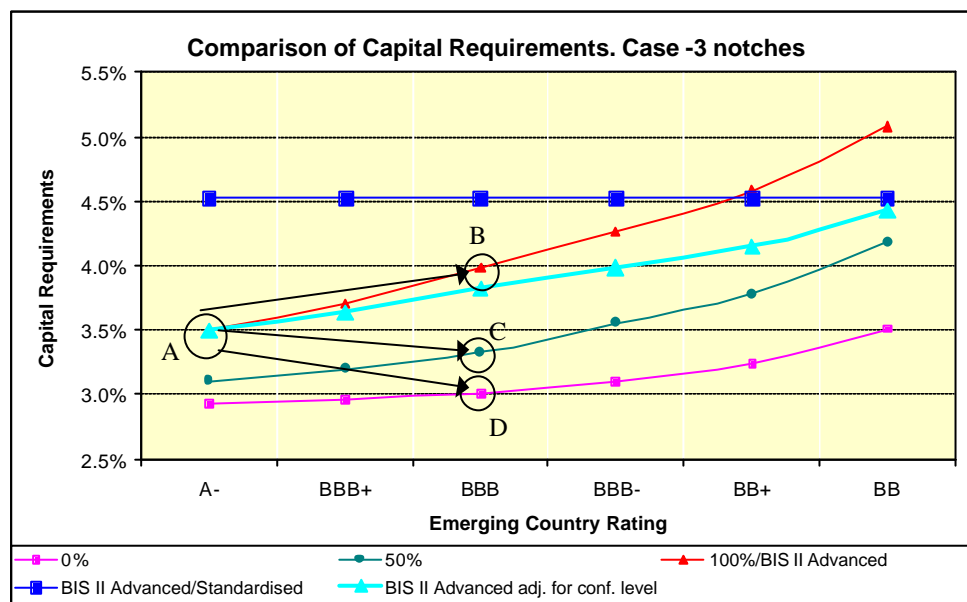

Figure 4

In Figure 4, Point A represents initial capital requirements of the bank with investments only in the developed country, while points B, C and D correspond to capital requirements once the bank in question has acquired the bank in the emerging country (with rating BBB). Capital requirements in the final situation can increase (point B, factor correlation = 100%) or decrease (points C and D, factor correlation = 50% and 0%, respectively) with respect to the initial situation, depending on the factor correlation used in the two-factor model.

In Figure 5 we show the capital requirements for the different country ratings, for the different models, using as the base = 100 capital requirements under the BIS II advanced model for a developed country (rating A-).

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[14] As explained previously, for country ratings equal to A-, the confidence level used is 99.9% (see Appendix II). This explains why in this case capital charges under the BIS II advanced model adjusted for the confidence level coincide with capital charges under the BIS II advanced model.
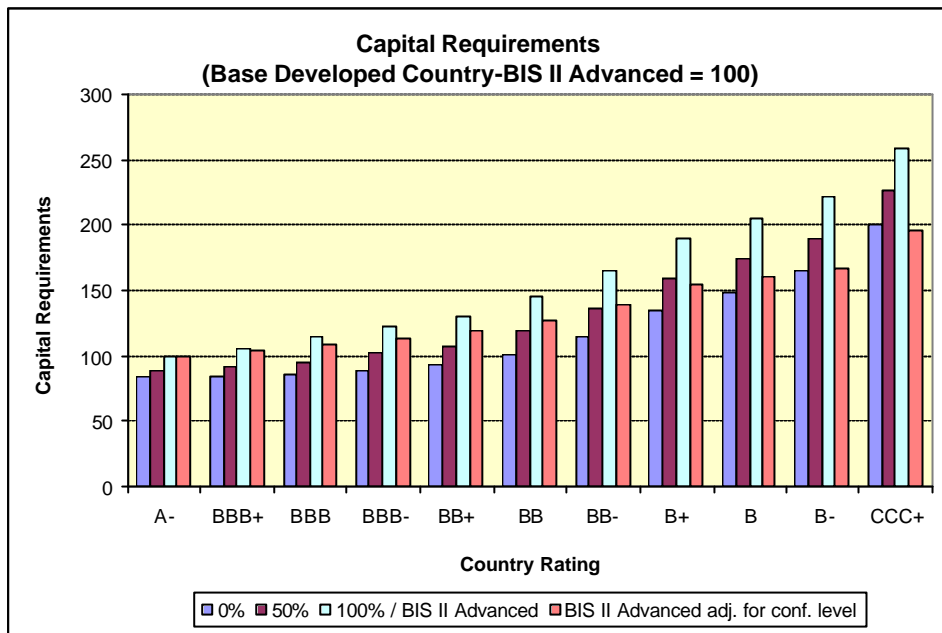
Capital Requirements
(Base Developed Country-BIS II Advanced = 100)

Figure 5

We observe that, as country ratings deteriorate, capital requirements under all methods increase. Nevertheless, as previously, while capital charges under the BIS II advanced model rise sharply, under the BIS II advanced model adjusted for the confidence level, these increase in a more progressive manner.

Consequently, if internationally active banks with investments in emerging markets use IRB models for all their portfolios, there can be disincentives to invest in such countries. On the other hand, neither financial entities nor local regulators in low-rated emerging countries will have incentives to apply IRB models, and will probably remain under BIS I or will apply, at the very most, the BIS II standardised approach. The combination of disincentives to invest in emerging countries and the unfair competitive situation caused by local entities staying under the standardised approach could reduce the flow of international investments in these countries.

Additionally, there is another disadvantage with local entities staying under standardised models. In our opinion, they will lose the benefit of the use of internal models as a valuable mechanism to understand, and thus control better, their risks. Internal models lead to a better allocation of resources and, consequently, are good for these countries' financial and economic development.

5. ALTERNATIVE TREATMENTS FOR INVESTMENTS IN EMERGING MARKETS

In this section we propose alternative treatments for investments in emerging markets in order to solve at least partially the problems of non-recognition of the effects of international diversification and of the unique implicit confidence level.

ALTERNATIVE I: Maintain the current treatment proposed in CP3

Advantage:

- Simplicity, nothing to do.

Disadvantages:

- No incentives for local entities nor for local regulators to move to IRB models (thus, these would most probably remain under BIS I or BIS II Standardised Approach).

- Competitive disadvantage for international entities using IRB models at a consolidated level.

- Impact on international capital flows and emerging economies' development (increase in the cost and/or reduction in the quantity of international bank lending to emerging economies).

ALTERNATIVE II: Admission of portfolio/multi-factorial models

Advantage:

- Full recognition of the real benefits of diversification.

Disadvantages:

- Computational complexity.

- Difficulty of validation (more parameters to be validated).

- In practice not feasible in the short run.

- Would only solve the problem of diversification, since local entities would still suffer pressure from the implicit confidence level problem.

ALTERNATIVE III: Modification of the correlation function (use of different correlation functions depending on whether the country is a developing or a developed country)

Advantage:

- In a certain way recognises the benefits of diversification. The justification is similar to that underlying the November 2001 (constant 0.2 correlation assumption replaced by a function of asset correlation, decreasing in the probability of default) and July 2002 (correlation function further flattened by the introduction of a size-adjustment factor) modifications for SMEs, i.e. that smaller companies present less systematic risk.

Disadvantages:

- Difficulty of calibration (choice of the new correlation functions).

- Increased model complexity (many new curves).

- Potential "booking arbitrage".

ALTERNATIVE IV: Confidence level adjustment in function of the country's external rating or provided by the regulator

Advantages:

- Local entities avoid pressure from the implicit unique confidence level.

- Additional incentives to use IRB models in emerging countries.

- Compensation for international entities for the non-recognition of diversification.

- New parameter (confidence level) is objective and observable (country's rating), no need for any additional calibrations.

Disadvantage:

- Slightly increased model complexity.

- Potential "booking arbitrage".

Based on the different advantages and disadvantages, ***our recommendation is to employ Alternative IV***. We believe there are two possible ways of implementation:

a) Via Pillar I: In the risk weight formulae, use of different confidence levels according to each country's rating.

b) Via Pillar II: Pillar I not modified but allow for Pillar II reductions derived from the benefits of diversification, for which a way of proceeding could be established (e.g. recalculate all capital requirements using different confidence levels).

We have mentioned in Alternatives III and IV that there might arise a possibility of "booking arbitrage" via the country originator of the operations. For example, an international bank with a subsidiary in an emerging country might find it more beneficial to lend to borrowers based in the developed country from its subsidiary than from the developed country (use of lower correlations or of a lower confidence level).

In fact the problem is that the diversification problem is related, strictly speaking, to the counterparty's country (and not to the lending bank's country), whilst the confidence level problem is associated with the lending bank's country (and not with the borrower's country). Nevertheless, although the two problems are based on two different axes, the solution we propose is based on the use of the rating of the lending bank's country, used as a proxy.

We believe that "booking arbitrage" is more a theoretical than a practical problem, because of the difficulties existing to finance determined operations from a subsidiary in an emerging country. Even so, in case of this arising, Pillar II would be the obvious solution.

6. CONCLUSIONS

In this document we have argued, basing ourselves on an illustrative example, that the internal models capital curves of the New Basel Capital Accord are penalising for emerging economies. This is due to the unique confidence level implicit in the Basel II curves as well as to the non-recognition of diversification benefits in the Basel proposal.

It must remain clear that we are not questioning the risk-sensitivity of capital requirements, which is essential for optimal risk management. Indeed, financial entities should aim to align accurately capital requirements with intrinsic risks to which they are exposed. The New Capital Accord proposal, in particular through the use of internal models, aims to go in this direction.

The problem made evident in this study is that the underlying assumptions in the model are inadequate for emerging countries and are thus penalising for them. The Basel proposal, in its current form, disincentives the use of internal models, and hence the opportunity to improve risk management models and practices could be lost.

Firstly we have questioned the use of a unique implicit confidence level of 99.9% in the New Basel Capital Accord formulae used to compute capital requirements for credit risk purposes. The use of the same confidence level for all banks, regardless of the country in which they operate and independently of their target rating, can be extremely penalising, in particular for emerging countries. Indeed, most emerging countries have ratings well below A-, which is the rating in line with the 99.9% confidence level in the Basel proposal.

Another essential point we have discussed is that diversification benefits in Basel II are only partially recognised. The supervisor uses one-factor models, mainly because of their simplicity and additivity. Nevertheless, in the case of investments in emerging markets, where the model proposed by the Basel Committee recognises the worse credit quality of the counterparties but does not take into account the improvement in terms of portfolio diversification, this turns out to be very restrictive and leads to excessively high capital requirements.

Finally we have proposed a simple and practical solution manner of correcting, at least partially, the distortions created by the non-recognition of diversification and the use of a sole confidence level. This solution is based on the adjustment of the implicit confidence level in the capital formulae so that it reflect emerging countries' ratings.

This adjustment should be incorporated in Pillar I, establishing the confidence level as an additional parameter in internal models. This is crucial in order to create a level playing field for international banks with investments in emerging markets, and so as not to jeopardise the financial system development in these countries, which is itself critical for a sustainable economic development.

APPENDIX I: CALCULATION OF CAPITAL REQUIREMENTS

A. IMPACT OF A SOLE CONFIDENCE LEVEL ON EMERGING COUNTRIES

Example:

We consider an example of a loan portfolio to SME Corporates[15] of a financial entity that operates in a country with a given rating, and analyse the impact of modifying the country's rating from A- to CCC+[16].

Loan Portfolio Assumptions:

Exposure = 100
LGD = 45%
Maturity = 1 year[17]
Loans to SME Corporates, sales = 25 million[18]
The investments made do not have an external rating, but we consider that they do have an internal rating. We consider two scenarios:
- Counterparties' average internal rating = Country rating – 2 notches
- Counterparties' average internal rating = Country rating – 3 notches

We calculate capital requirements using four different models, which we describe in more detail below:

− BIS I.

− BIS II standardised approach.

− BIS II IRB advanced model.

− BIS II IRB advanced model with adjustment for confidence level (BIS II IRB Advanced Approach formula, replacing the 99.9% confidence level by a variable parameter).

Comparison of different capital formulae

Notation:
RW   Risk Weight
RWA   Risk Weighted Assets
PD   Probability of Default
LGD   Loss Given Default
M   Maturity

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[15] We have chosen a portfolio of loans to SME Corporates purely as an illustrative example. Nevertheless, it is essential to understand that the choice of a different curve (whether retail or corporate) would merely move the risk weight curves upwards or downwards and would not change the conclusions.
[16] In Appendix II we present the empirical default frequencies associated to the different ratings of Standard & Poor's and Moody's based on the most recent historical data, as well as the default frequency for each rating used in this study.
[17] We assume the loans have an average maturity of one year so as to simplify calculations. The consideration of a different maturity would not change the conclusions.
[18] We assume average sales are 25 million euros, which is half-way between 5 and 50 million. The choice of a different level of average sales would only move the risk weight curves upwards or downwards and would not change the conclusions.

S   Sales
α   Confidence Level

❖ **BIS I**

RW = 100%
RWA = Exposure
Capital = 8% of RWA

❖ **BIS II Standardised Approach**

RW = 100% (assume no external rating)
RWA = Exposure
Operational risk charge = 18% x 0.035 x Exposure   (Alternative Standardised Approach)[19]
Capital = 8% of RWA + Operational risk charge

❖ **BIS II IRB Advanced Approach**

The Basel II IRB models are based on a one-factor model. In this model, the basic assumption is that default occurs when the asset value of the company falls below a certain level, known as the bankruptcy level, usually identified with the debt level of the company (Merton model). In this model, it is assumed that all assets in the economy are driven by a unique factor. The advantage of this model is the existence of a simple analytical solution to the credit loss distribution function. In addition, capital requirements under such a model are additive.

It can be shown, as in Schönbucher (2000), that, given a one-factor model, the cumulative distribution function of defaults is given by

$$F(x) = P(X \le x) = F\left(\frac{1}{\sqrt{r}} \cdot \left(\sqrt{1-r} \cdot F^{-1}(x) - F^{-1}(PD)\right)\right)$$

Thus we can easily obtain the risk weight function as in the BIS II consultative papers[20]:

$$RW(LGD, PD, M, S) = \frac{1}{8\%} \cdot LGD \cdot F\left(\frac{F^{-1}(PD) + \sqrt{r(PD)} \cdot F^{-1}(0.999)}{\sqrt{1 - r(PD)}}\right) \cdot \left(\frac{1 + (M - 2.5) \cdot b(PD)}{1 - 1.5 \cdot b(PD)}\right)$$

$$b(PD) = (0.08451 - .05898 \cdot log(PD))^2$$

$$r(PD) = 0.12 \cdot \frac{1 - e^{-50PD}}{1 - e^{-50}} + 0.24 \cdot \left(1 - \frac{1 - e^{-50PD}}{1 - e^{-50}}\right) - 0.04 \cdot \left(1 - \frac{S - 5}{45}\right)$$

M = 1 ⇒ this term
is equal to 1

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[19] In reality the total operational risk charge includes, in addition to the charge mentioned here of *18% x 0.035 x Exposure*, the operational risk charge not related to credit risk, and will therefore be larger than that considered in this analysis.

[20] Assuming LGD is constant.

RWA = RW · Exposure

Operational risk charge = 18% x 0.035 x Exposure   (Alternative Standardised Approach)

Capital = 8% of RWA + Operational risk charge

❖ *BIS II IRB Advanced Approach with adjustment for confidence level*

We use the BIS II IRB model, replacing the 99.9% confidence level by a confidence level, **a**, which will be different for each country, depending on its rating.

$$RW(LGD, PD, M, S) = \frac{1}{8\%} \cdot LGD \cdot F\left(\frac{F^{-1}(PD) + \sqrt{r(PD)} \cdot F^{-1}(a)}{\sqrt{1 - r(PD)}}\right)\left(\frac{1 + (M - 2.5) \cdot b(PD)}{1 - 1.5 \cdot b(PD)}\right)$$

$$b(PD) = (0.08451 - .05898 \cdot log(PD))^2$$

$$r(PD) = 0.12 \cdot \frac{1 - e^{-50PD}}{1 - e^{-50}} + 0.24 \cdot \left(1 - \frac{1 - e^{-50PD}}{1 - e^{-50}}\right) - 0.04 \cdot \left(1 - \frac{S - 5}{45}\right)$$

$M = 1 \Rightarrow$ this term is equal to 1

RWA = RW · Exposure

Operational risk charge = 18% x 0.035 x Exposure   (Alternative Standardised Approach)

Capital = 8% of RWA + Operational risk charge

Below we present a figure of IRB risk weights as a function of the confidence level **a** used. We use the same assumptions of LGD = 45%, Maturity = 1 year, and loans to SME Corporates with sales = 25 million.
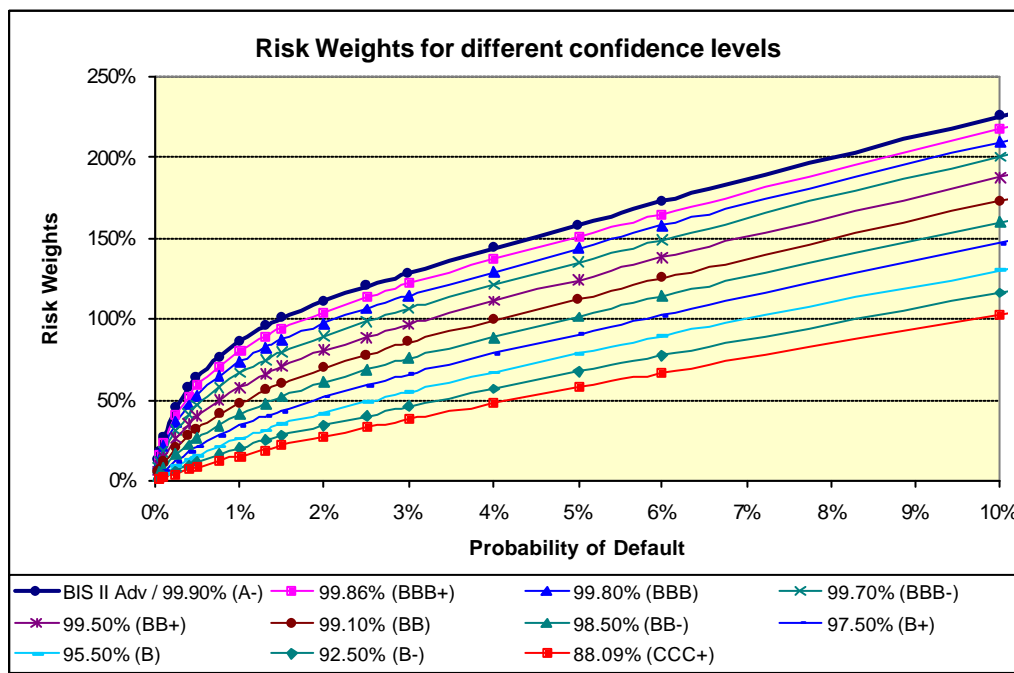

Figure 6

BBVA

a) Capital charges for the four models, with country ratings between A and CCC+ and SME's internal rating = country rating - 2 notches

Table 2: Capital charges for the four models, Case -2 notches

Country Rating	Conf. Level	SME's Rating	SME's PD	BIS I					BIS II Standardised					BIS II Advanced					BIS II Advanced adjusted for confidence level			
				RWA	Credit Risk	Op Risk	Total		RWA	Credit Risk	Op Risk	Total		RWA	Credit Risk	Op Risk	Total		RWA	Credit Risk	Op Risk	Total
Developed	**99.90%**	**BBB**	**0.20%**	**100**	**8.00**	**0.00**	**8.00**		**100**	**8.00**	**0.63**	**8.63**		**27.543**	**2.20**	**0.63**	**2.83**		**27.543**	**2.20**	**0.63**	**2.83**
A-	99.90%	BBB	0.20%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		27.54	2.20	0.63	**2.83**		27.54	2.20	0.63	**2.83**
BBB+	99.86%	BBB-	0.30%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		35.87	2.87	0.63	**3.50**		32.43	2.59	0.63	**3.22**
BBB	99.80%	BB+	0.50%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		48.75	3.90	0.63	**4.53**		40.22	3.22	0.63	**3.85**
BBB-	99.70%	BB	0.90%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		66.54	5.32	0.63	**5.95**		50.61	4.05	0.63	**4.68**
BB+	99.50%	BB-	1.50%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		84.01	6.72	0.63	**7.35**		58.50	4.68	0.63	**5.31**
BB	99.10%	B+	2.50%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		103.84	8.31	0.63	**8.94**		66.85	5.35	0.63	**5.98**
BB-	98.50%	B	4.50%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		134.57	10.77	0.63	**11.40**		84.83	6.79	0.63	**7.42**
B+	97.50%	B-	7.50%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		176.66	14.13	0.63	**14.76**		109.26	8.74	0.63	**9.37**
B	95.50%	CCC+	11.91%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		231.65	18.53	0.63	**19.16**		139.13	11.13	0.63	**11.76**
B-	92.50%	CCC	15.00%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		264.77	21.18	0.63	**21.81**		151.08	12.09	0.63	**12.72**
CCC+	88.09%	CCC-	18.90%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		301.25	24.10	0.63	**24.73**		165.75	13.26	0.63	**13.89**

a) Risk weights and capital charges for the four models, with country ratings between A and CCC+ and SME's internal rating = country rating - 2 notches
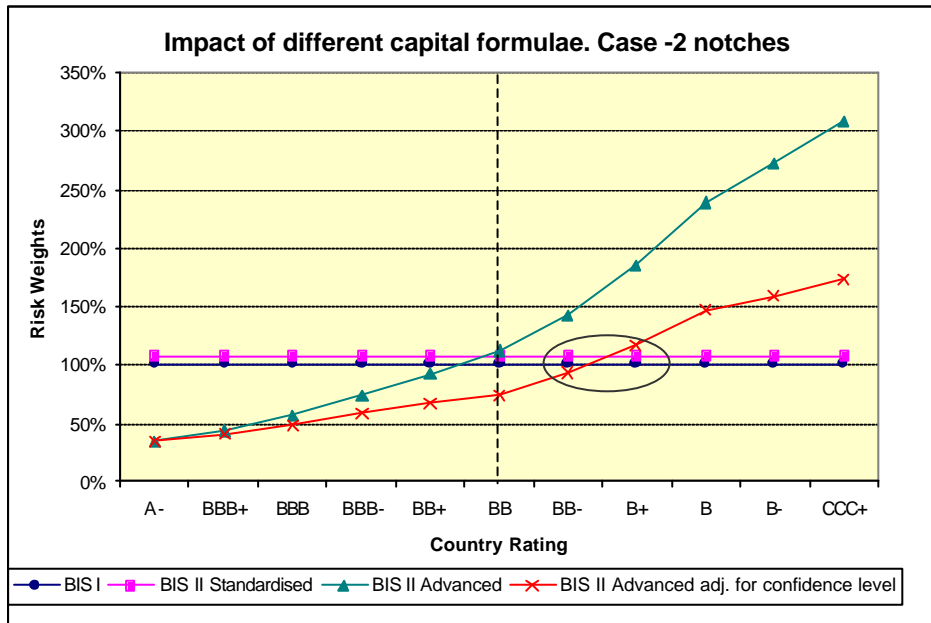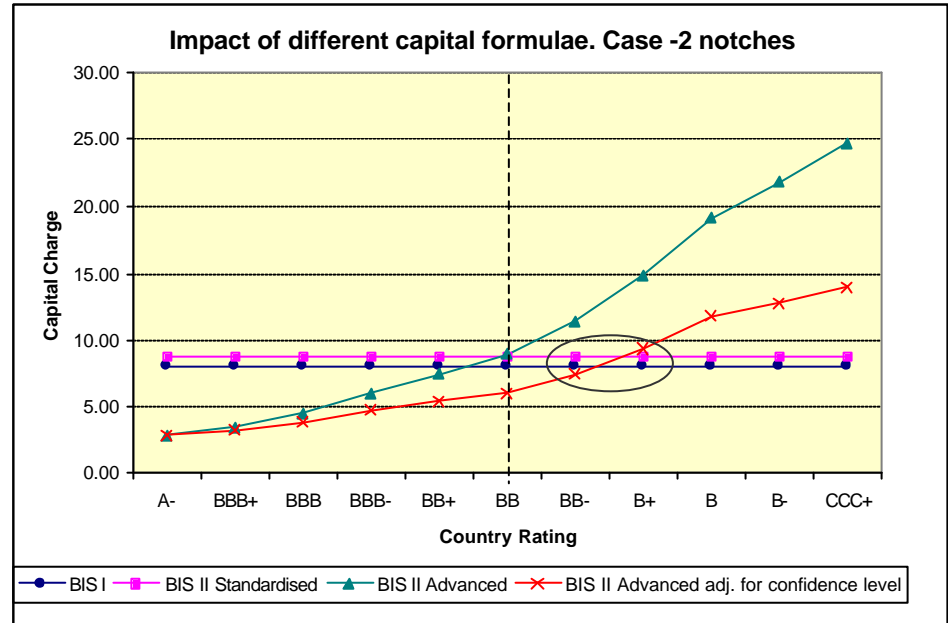

Figure 7

Figure 8

b) Capital charges for the four models, with country ratings between A and CCC+ and SME's internal rating = country rating - 3 notches

Table 3: Capital charges for the four models, Case -3 notches

Country Rating	Conf. Level	SME's Rating	SME's PD	BIS I					BIS II Standardised					BIS II Advanced					BIS II Advanced adjusted for confidence level				
				RWA	Credit Risk	Op Risk	Total		RWA	Credit Risk	Op Risk	Total		RWA	Credit Risk	Op Risk	Total		RWA	Credit Risk	Op Risk	Total	
Developed	**99.90%**	**BBB**	**0.20%**	**100**	**8.00**	**0.00**	**8.00**		**100**	**8.00**	**0.63**	**8.63**		**35.87**	**2.87**	**0.63**	**3.50**		**35.87**	**2.87**	**0.63**	**3.50**
A-	99.90%	BBB-	0.30%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		35.87	2.87	0.63	**3.50**		35.87	2.87	0.63	**3.50**
BBB+	99.86%	BB+	0.50%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		48.75	3.90	0.63	**4.53**		44.52	3.56	0.63	**4.19**
BBB	99.80%	BB	0.90%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		66.54	5.32	0.63	**5.95**		56.30	4.50	0.63	**5.13**
BBB-	99.70%	BB-	1.50%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		84.01	6.72	0.63	**7.35**		66.32	5.31	0.63	**5.94**
BB+	99.50%	B+	2.50%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		103.84	8.31	0.63	**8.94**		76.47	6.12	0.63	**6.75**
BB	99.10%	B	4.50%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		134.57	10.77	0.63	**11.40**		94.22	7.54	0.63	**8.17**
BB-	98.50%	B-	7.50%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		176.66	14.13	0.63	**14.76**		120.45	9.64	0.63	**10.27**
B+	97.50%	CCC+	11.91%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		231.65	18.53	0.63	**19.16**		155.09	12.41	0.63	**13.04**
B	95.50%	CCC	15.00%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		264.77	21.18	0.63	**21.81**		167.10	13.37	0.63	**14.00**
B-	92.50%	CCC-	18.90%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		301.25	24.10	0.63	**24.73**		182.72	14.62	0.63	**15.25**
CCC+	88.09%	CC	30.00%	100	8.00	0.00	**8.00**		100	8.00	0.63	**8.63**		382.00	30.56	0.63	**31.19**		244.66	19.57	0.63	**20.20**

b) Risk weights and capital charges for the four models, with country ratings between A and CCC+ and SME's internal rating = country rating - 3 notches
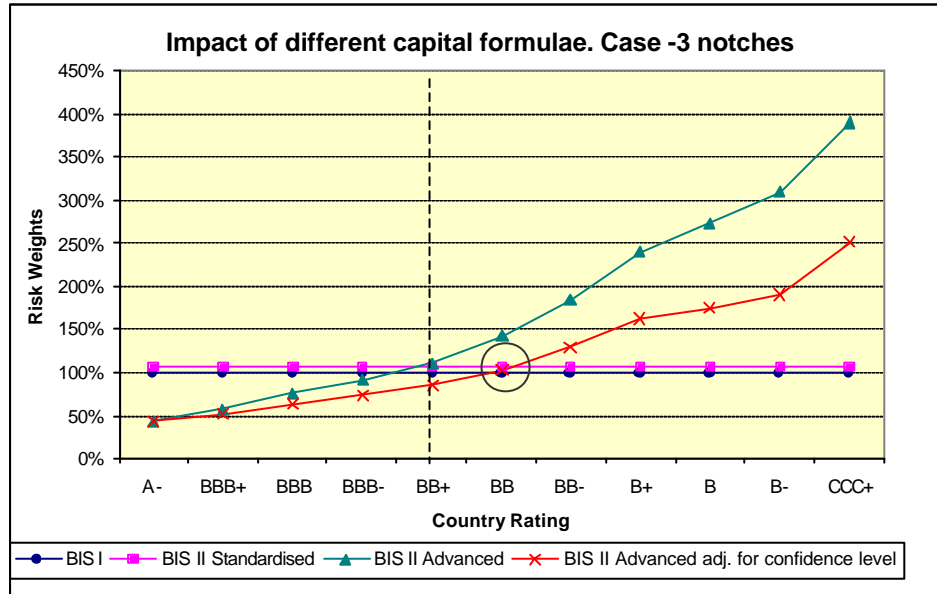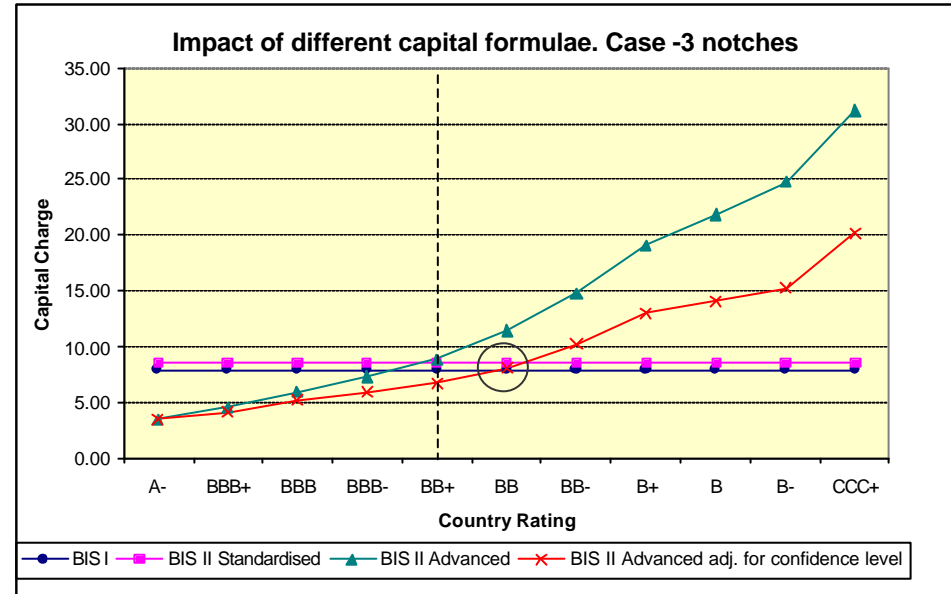

Figure 9

Figure 10

c) Analysis of results

In Figures 7, 8, 9 and 10, the two horizontal lines represent capital charges obtained under BIS I and the BIS II standardised approach. The steepest curve (green line with triangles) corresponds to capital charges calculated under the BIS II advanced model. Finally, the fourth curve (red line with crosses) represents capital charges computed using the BIS II advanced approach formula, in which we have replaced the 99.9% confidence level by the confidence level corresponding to the different country ratings.

For country ratings equal to A-, the confidence level used is 99.9% [21], which explains why in this case capital charges under the BIS II advanced model adjusted for the confidence level coincide with capital charges under the BIS II advanced model.

In the case of the counterparties' internal rating being two notches below the country's rating, it can be seen that, paradoxically, for ratings below BB, the BIS II IRB advanced model produces risk weights and capital charges above BIS I and the BIS II standardised approach. Similar results are obtained when the counterparties' internal rating is three notches below the country's rating. In this case, for ratings below BB+, the BIS II IRB advanced model produces risk weights and capital charges above BIS I and the BIS II standardised approach.

For these lower ratings, the BIS II IRB advanced approach, adjusted using the confidence level corresponding to the country's rating, produces risk weights and capital charges similar to those of the standardised approach for ratings around BB- and B+ in the case of -2 notches (BB for -3 notches). For the very worst ratings (ratings below B+ in the case of -2 notches and below BB for -3 notches), risk weights and capital charges are higher with the BIS II advanced approach adjusted for the confidence level than with the standardised approach, but are well below those obtained with the BIS II advanced 99.9% confidence level approach.

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[21] See Appendix II.

B. NON-RECOGNITION OF DIVERSIFICATION AND IMPLICIT CONFIDENCE LEVEL

Example:

We consider an example of a financial entity that operates in a developed country, with a loan portfolio to SME Corporates[22]. This entity is envisaging the acquisition of a bank in a standardised model in an emerging country with a lower rating. We assume that this bank also has a loan portfolio to SME Corporates.

We estimate the capital charge before the acquisition, assuming the bank in the developed country is using the BIS II advanced model, while the bank in the emerging country is using the BIS II standardised model. We also compute the capital charge after the acquisition has been completed, assuming that the bank in the emerging country moves to the advanced model. Additionally, we consider the utilisation of alternative models, such as the two-factor model with various factor correlations, and the BIS II advanced model, adjusted with a different confidence level depending on the emerging country's external rating.

In the case of BIS II models (all models except for the two-factor model), total capital charges are obtained as the sum of capital charges for the developed country and capital charges for the emerging country[23]. Capital charges in the two-factor model are obtained incorporating diversification effects.

Furthermore, we consider the impact of different country ratings and thus vary the emerging country's rating from A- to CCC+[24].

Loan Portfolio Assumptions:

Total Exposure = 100 : 80 in developed country and 20 in emerging country
LGD = 45%
Maturity = 1 year[25]
Loans to SME Corporates, sales = 25 million[26]
The investments made do not have an external rating, but we consider that they do have an internal rating. We consider two scenarios:
-   Counterparties' average internal rating = Country rating – 2 notches
-   Counterparties' average internal rating = Country rating – 3 notches

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[22] As previously, we have chosen portfolios of loans to SME Corporates purely as an illustrative example. The choice of a different curve (whether retail or corporate) would merely move the risk weight curves upwards or downwards and would not change the conclusions.

[23] This can be done due to the additivity of capital charges in a one-factor model.

[24] In Appendix II we present the empirical default frequencies associated to the different ratings of Standard & Poor's and Moody's based on the most recent historical data, as well as the default frequency for each rating used in this study.

[25] We assume the loans have an average maturity of one year so as to simplify calculations. The consideration of a different maturity would not change the conclusions.

[26] We assume average sales are 25 million euros, which is half-way between 5 and 50 million. The choice of a different level of average sales would only move the risk weight curves upwards or downwards and would not change the conclusions.

The four different models considered are as follows (we describe these in more detail below):

- BIS II standardised approach for the emerging country and BIS II advanced model for the developed country.

- BIS II IRB advanced model for both countries.

- BIS II IRB advanced model for the developed country and BIS II IRB advanced model with adjustment for confidence level (BIS II IRB Advanced Approach formula, replacing the 99.9% confidence level by a variable parameter) for the emerging country.

- Two-factor model, implemented by García and García (2002), which takes better into account the effect of diversification. The model is an extension to the one-factor model of Schönbucher (2000). In this framework, it is assumed there are two economies or countries, each one driven by its own factor, common to all obligors of that country. The two economies are related through the correlation between their underlying factors.
  We vary the factor correlation between 0% and 100%.

All models include an operational risk charge computed using the Alternative Standardised Approach)[27].

Comparison of different capital formulae

Notation:

RW	Risk Weight
RWA	Risk Weighted Assets
PD	Probability of Default
LGD	Loss Given Default
M	Maturity
S	Sales
α	Confidence Level

❖ *BIS II Standardised Approach*

RW = 100% (assume no external rating)
RWA = Exposure
Operational risk charge = 18% x 0.035 x Exposure   (Alternative Standardised Approach)[28]
Capital = 8% of RWA + Operational risk charge

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[27] This operational risk charge is related only to the exposure considered. The total operational risk charge includes, in addition to this, the operational risk charge not related to credit risk, and will therefore be larger than that considered in this analysis.

[28] In reality the total operational risk charge includes, in addition to the charge mentioned here of *18% x 0.035 x Exposure*, the operational risk charge not related to credit risk, and will therefore be larger than that considered in this analysis.

❖ **BIS II IRB Advanced Approach**

$$RW(LGD, PD, M, S) = \frac{1}{8\%} \cdot LGD \cdot F\left(\frac{F^{-1}(PD) + \sqrt{r(PD)} \cdot F^{-1}(0.999)}{\sqrt{1 - r(PD)}}\right) \cdot \left(\frac{1 + (M - 2.5) \cdot b(PD)}{1 - 1.5 \cdot b(PD)}\right)$$

$$b(PD) = (0.08451 - .05898 \cdot log(PD))^2$$

$$r(PD) = 0.12 \cdot \frac{1 - e^{-50PD}}{1 - e^{-50}} + 0.24 \cdot \left(1 - \frac{1 - e^{-50PD}}{1 - e^{-50}}\right) - 0.04 \cdot \left(1 - \frac{S - 5}{45}\right)$$

$M = 1 \Rightarrow$ this term is equal to 1

$RWA = RW \cdot Exposure$
Operational risk charge = 18% x 0.035 x Exposure   (Alternative Standardised Approach)
Capital = 8% of RWA + Operational risk charge

❖ **BIS II IRB Advanced Approach with adjustment for confidence level**

$$RW(LGD, PD, M, S) = \frac{1}{8\%} \cdot LGD \cdot F\left(\frac{F^{-1}(PD) + \sqrt{r(PD)} \cdot F^{-1}(a)}{\sqrt{1 - r(PD)}}\right) \cdot \left(\frac{1 + (M - 2.5) \cdot b(PD)}{1 - 1.5 \cdot b(PD)}\right)$$

$$b(PD) = (0.08451 - .05898 \cdot log(PD))^2$$

$$r(PD) = 0.12 \cdot \frac{1 - e^{-50PD}}{1 - e^{-50}} + 0.24 \cdot \left(1 - \frac{1 - e^{-50PD}}{1 - e^{-50}}\right) - 0.04 \cdot \left(1 - \frac{S - 5}{45}\right)$$

$M = 1 \Rightarrow$ this term is equal to 1

$RWA = RW \cdot Exposure$
Operational risk charge = 18% x 0.035 x Exposure   (Alternative Standardised Approach)
Capital = 8% of RWA + Operational risk charge

❖ *Two-factor model*

The two-factor model implemented in García and García (2002) takes better into account the effect of diversification. The model is an extension to the one-factor model of Schönbucher (2000). In this framework, it is assumed there are two economies or countries, each one driven by its own factor, common to all obligors of that country. The two economies are related through the correlation between their underlying factors.

In this two-factor model framework, the cumulative distribution function of defaults is given by

$$F(x) = P(X \le x) = \iint\limits_{n_1 \cdot PD_1 + n_2 \cdot PD_2 \le x} f(y_1, y_2) \cdot dy_1 \cdot dy_2$$

where y_1 and y_2 are the realisations of the factors in the developed and emerging country, and
n_1 and n_2 are the proportions invested in the developed and emerging country.

García and García (2002) show that it is possible to obtain a quasi-analytical expression for the default probability using the two-factor model[29].

In order to maintain coherence with the case of the one-factor model, we calculate capital requirements with the two-factor model using a confidence level of 99.9%. Furthermore, we use the same assumption for the correlations within each of the two economies:

$$r(PD_1) = 0.12 \cdot \frac{1 - e^{-50PD_1}}{1 - e^{-50}} + 0.24 \cdot \left(1 - \frac{1 - e^{-50PD_1}}{1 - e^{-50}}\right) - 0.04 \cdot \left(1 - \frac{S_1 - 5}{45}\right)$$

$$r(PD_2) = 0.12 \cdot \frac{1 - e^{-50PD_2}}{1 - e^{-50}} + 0.24 \cdot \left(1 - \frac{1 - e^{-50PD_2}}{1 - e^{-50}}\right) - 0.04 \cdot \left(1 - \frac{S_2 - 5}{45}\right)$$

r_F is the correlatio n between factors and varies between 0% and 100%

The proportions used are $n_1 = 80\%$ and $n_2 = 20\%$.

As in the one-factor models, the maturity adjustment term is equal to 1.

Operational risk charge = 18% x 0.035 x Exposure   (Alternative Standardised Approach)

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[29] The practical implementation of the model was developed in Matlab 5.3 and is available under request to the authors.

a) Results from varying the country ratings between A and CCC+, with counterparties'
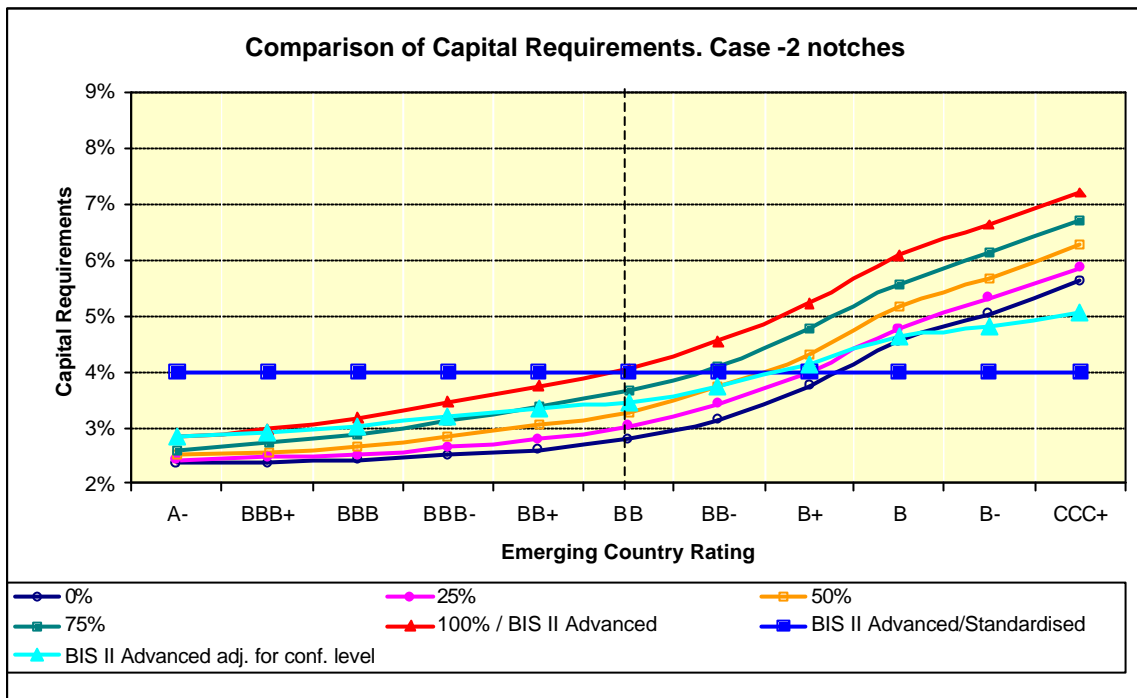*internal rating = country rating – 2 notches*[30]

Figure 11

b) Results from varying the country ratings between A and CCC+, with counterparties'
internal rating = country rating – 3 notches[30]

Figure 12

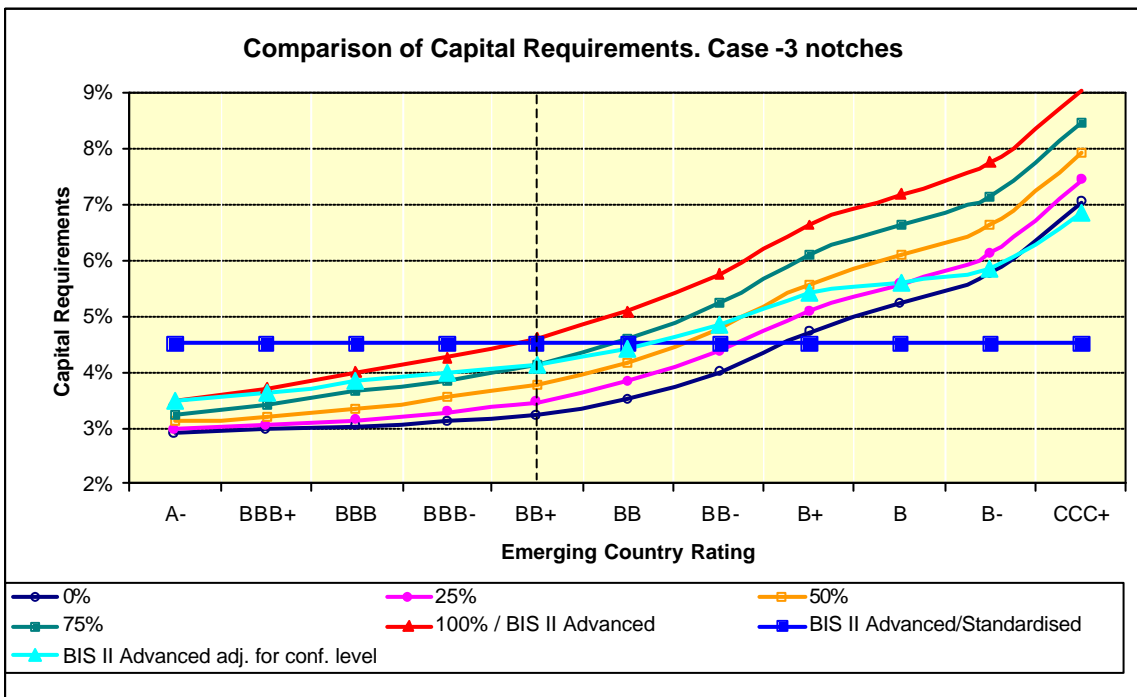[30] 0%, 25%, 50%, 75% and 100% are the factor correlations employed in the two-factor model.

c) Analysis of results

The horizontal line represents the average capital requirements computed using the BIS II IRB advanced model for the developed market and the BIS II standardised approach for the emerging market. These represent capital requirements in the initial situation, before the acquisition. They are obviously constant, since in the standardised approach, capital charges for the emerging country loan portfolio are independent of the country's rating (and capital charges for the developed country loan portfolio are also independent of the emerging country's rating).

Moreover, capital requirements computed using the BIS II advanced model for the developed market and the BIS II standardised approach for the emerging market are higher (lower) than those obtained with the BIS II IRB advanced model for the two countries for good (worse) country ratings. Consequently, for ratings worse than BB for the case of –2 notches (BB+ for –3 notches), there are no incentives to acquire the bank in the emerging country.

It can also be seen that, in the two-factor model, as the correlation between factors increases (0%, 25%, 50%, 75% and 100% lines), capital requirements for a given rating increase, until the correlation is 100%, which coincides with the one-factor BIS II advanced model.

By definition, the BIS II advanced model which takes into account the rating of the emerging country via the confidence level produces, for the best rating (A-)[31], capital requirements identical to those of the two-factor model with correlation 100% (or, equivalently, with the BIS II advanced model). Furthermore, it is very interesting to observe that, for the worst rating considered (CCC+), capital requirements computed using this adjustment are very similar (slightly below in the case of -2 notches) to those of the two-factor model with correlation 0%. Between the two extreme ratings, capital charges can be obtained with the two-factor model using an intermediate correlation (somewhere between 0% and 100%).

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[31] As explained previously, for country ratings equal to A-, the confidence level used is 99.9% (see Appendix II). This explains why in this case capital charges under the BIS II advanced model adjusted for the confidence level coincide with capital charges under the BIS II advanced model.

APPENDIX II: RATINGS AND EDF'S

In this Appendix we present the empirical default frequencies associated to the different ratings of Standard & Poor's and Moody's based on the most recent historical data, as well as the default frequency for each rating used in our analysis.

Table 4: Ratings and Empirical Default Frequencies

| January 2003 S&P Rating	EDF	April 2003 Moody's Rating	EDF	Analysis BBVA Rating	EDF
AAA	0.00%	Aaa	0.00%	AAA	0.01%
AA+	0.00%	Aa1	0.00%	AA+	0.02%
AA	0.00%	Aa2	0.00%	AA	0.03%
AA-	0.02%	Aa3	0.00%	AA-	0.04%
A+	0.06%	A1	0.00%	A+	0.05%
A	0.05%	A2	0.00%	A	0.07%
A-	0.04%	A3	0.00%	A-	0.10%
BBB+	0.35%	Baa1	0.20%	BBB+	0.14%
BBB	0.34%	Baa2	1.00%	BBB	0.20%
BBB-	0.43%	Baa3	0.70%	BBB-	0.30%
BB+	0.52%	Ba1	1.40%	BB+	0.50%
BB	1.16%	Ba2	0.70%	BB	0.90%
BB-	2.07%	Ba3	1.60%	BB-	1.50%
B+	3.29%	B1	1.50%	B+	2.50%
B	9.31%	B2	4.80%	B	4.50%
B-	13.15%	B3	5.30%	B-	7.50%
CCC	27.87%	Caa-C	23.80%	CCC+	11.91%
				CCC	15.00%
				CCC-	18.90%
				CC	30.00%
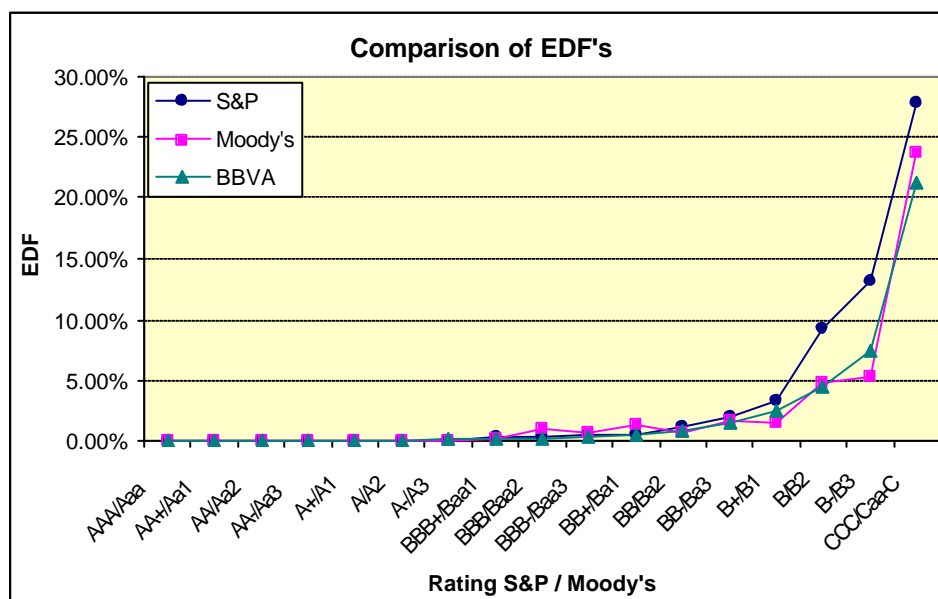
Figure 13
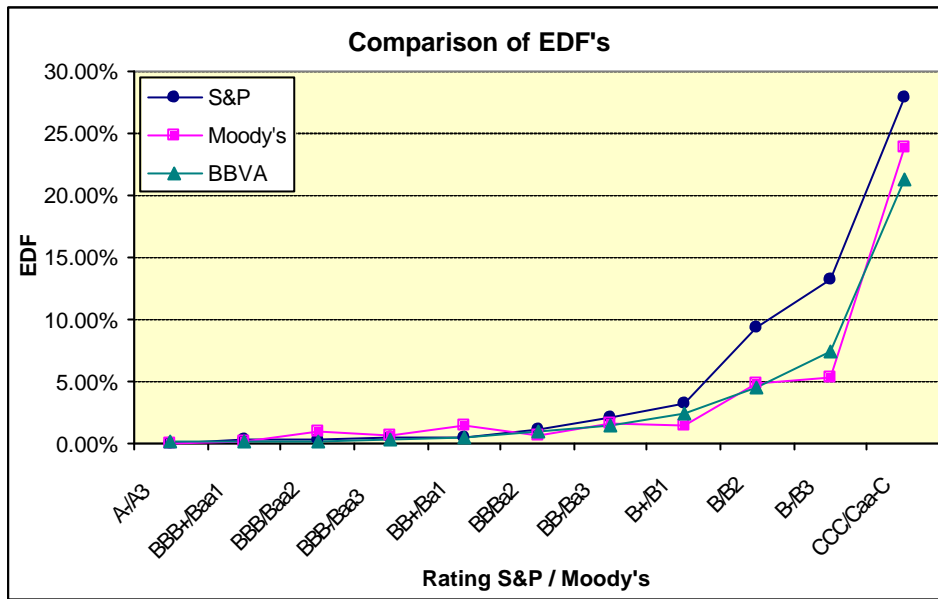
Figure 14
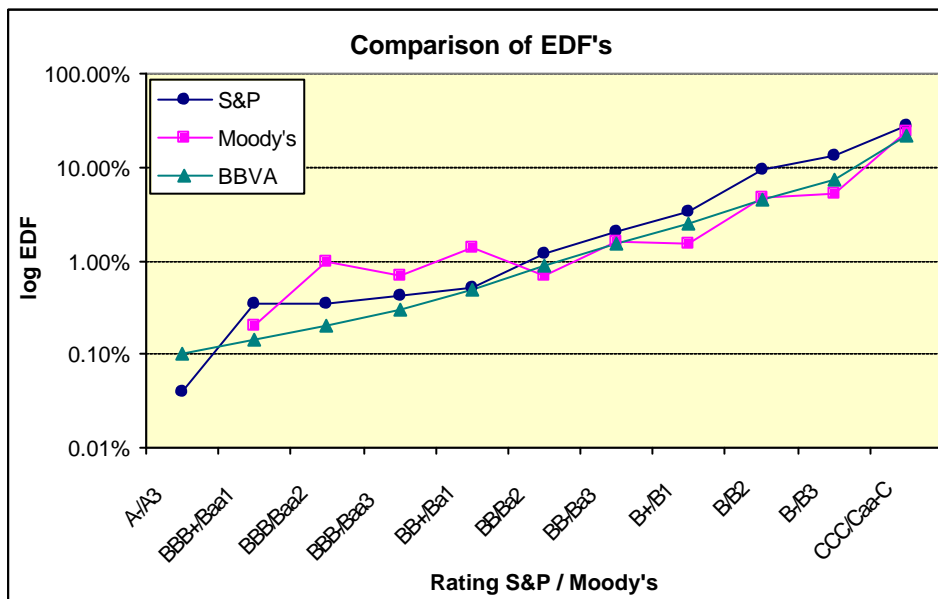
Figure 15

We observe that the default frequencies used throughout the study are reasonably in line with the empirical default frequencies of S&P and Moody's. In any case, the utilisation of different empirical default frequencies would not affect, in essence, the conclusions obtained in this study.

Throughout the document, the confidence level associated with each country is obtained as 1-EDF.

APPENDIX III: EMERGING MARKETS DIVERSIFICATION

The following graphs and tables illustrate the important diversification effect that investments in emerging markets can introduce in banks' portfolios. In particular we analyse:

- GDP correlations (between Spain and Latin American countries and within Latin America).

- Correlations between default rates (between the Spanish financial system and Latin American financial systems).

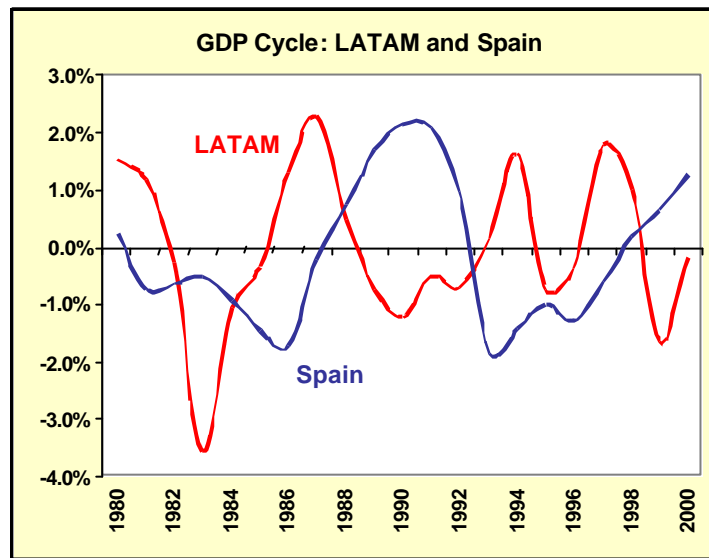### GDP Cycle: Spain versus LATAM

Figure 16

Data: annual GDP data for the period 1980 to 2000 for the 7 largest Latin American economies. The cycle has been estimated as the difference of log GDP and the trend.

Table 5: Correlation between Spanish GDP and some Latin American GDP's

		ARG	BRA	CHI	COL	MEX	PER	VEN	LATAM
	T+1	-0.32	0.13	0.02	0.18	-0.15	0.15	-0.16	0.03
SPAIN	T	-0.42	-0.03	-0.11	-0.29	-0.02	-0.31	-0.12	-0.25
	T-1	-0.43	-0.23	-0.05	-0.37	0.29	-0.63	0.03	-0.39

95% significance level = 0.44

In general Spanish GDP is not correlated with the LATAM economies. In the cases where the correlation is significant at the 95% significance level (shaded areas), it is negative. Clearly, LATAM investments are good for diversification.

Table 6: Correlations between LATAM GDP's (intra)

CONTEMPORANEOUS CORRELATION

	ARG	BRA	CHI	COL	MEX	PER	VEN
ARG		0.07	0.25	0.32	-0.06	0.31	0.38
BRA			0.23	0.21	-0.20	0.50	0.17
CHI				0.60	0.15	0.30	0.14
COL					0.00	0.59	0.31
MEX						-0.17	0.11
PER							0.35
VEN							

95% significance level = 0.44

Correlations between LATAM GDP's are also mostly non-significant (the shaded areas correspond to the ones that are significant). The reason for this could be that most Latin American countries are basically closed economies.

Table 7: Correlations between default rates[32]

Correlations in logs eliminating the trend

	ARG(*)	BRA(*)	CHI	COL(*)	MEX(*)	PER(*)	VEN(*)
Spain t-1	0.062	-0.149	-0.665	0.193	0.075	-0.887	0.487
Spain t	0.134	-0.154	-0.681	0.135	-0.089	-0.906	0.438
Spain t+1	0.214	-0.346	-0.674	0.120	-0.233	-0.917	0.361
Periodicity	M	M	M	M	Q	Q	M
From	jan-94	apr-00	feb-98	dec-97	1Q97	1Q94	aug-99
Nº obs.	81	12	36	40	28	17	21

(*) Cyclical component

The correlations between the default rates of the Spanish financial system and of the LATAM countries' financial systems are not significant or are negative (the shaded areas correspond to the ones that are significant).

Given the previous tables, it is clear that the international banking groups with interests in emerging economies are penalised in relation to their competitors by the one-factor model implicit in Basel II. This is because the hypothesis used to construct the BIS II formulae penalises the greater risk incurred, while the benefit of greater diversification is not acknowledged at all.

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[32] These are defined as the aggregate default rates of the financial system of each one of the countries. In some cases, monthly data was used, while in others, quarterly data was used. The period used was different for the various countries considered (maximum of seven years, minimum of two years).

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Santander Central Hispano

STRESS TEST REQUIREMENT FOR IRB METHODS

- We are convinced that stress-testing techniques, although still in a developing stage in the area of credit risk, can play an important role in the future for assisting banks, and to some extent regulators, in the process of capital adequacy assessment.

- We doubt, however, that given its non-mature present stage, it should be included as a requirement to qualify for applying IRB methods.

- We also doubt that, for the same reason, could be an adequate instrument to mitigate the possible procyclical skew of the new regulatory framework. From our view the present proposals already contain enough mechanisms to mitigate such effects.

- Other credit risk management tools closely linked to stress-testing, like portfolio models (such as Riskmetrics' CreditManager or KMV's Portfolio Manager), have been excluded from BIS II. The Basel Committee considered, perhaps rightly, that the present state-of-the-art was not mature enough for using these methodologies to determine regulatory capital. The main difficulty seems the quantification of correlation factors between different portfolios and markets to capture adequately portfolio diversification and concentration effects.

- In our opinion, stress-testing methodologies for credit risk portfolios are still far from consolidated. Besides, the usual data problems on rating migration patterns, correlations or volatility of LGD are even more acute in some portfolios, like those in emerging markets, with severe data limitations and short economic cycles.

- Availability of sound stress-test processes for credit portfolios could be also an excessive requirement for medium/small banking institutions that, otherwise, could expect to qualify for the foundation IRB method.

- But our main concern is that this new requirement could be a hidden way of increasing the level of confidence behind the capital curve of Pillar I.

- The qualitative BIS II requirements for internal rating assignation processes (see par. 361-362-363) already prescribe the use of stress economic scenarios to assign internal ratings.

- When using stress-test scenarios, migration tables of internal ratings (skewed for a downturn cycle) would have to be used. To the extent that those migration patterns were built on point-in-time internal ratings or, due to data problems, external sources of rating migration were used, an overestimation of rating downgrades and therefore new capital requirements could be the

División de Riesgos. Area de Gestión Integral del Riesgo
Paseo de la Castellana, 24 – 1ª planta – Madrid 28046
Teléfono: 34-91-342-69-56; Fax: 34-91-342-69-82; e-mail: desviat@gruposantander.com

result. That would mean applying effectively a greater level of confidence than the 99,9% now supposedly behind Pillar I.

- The maturity adjustment applied in the advanced IRB method can already be considered as a conservative "looking forward" approach, taking into account future deterioration of present PD's, since time horizon for PD estimation is supposedly one year.

- Besides the proposed treatment for internal rating assignation, there are in the BIS II proposals other risk factors, like LGD's quantification or the use of conservative haircuts for collaterals, that already incorporate a skew conservative enough for calculating regulatory capital. The additional application of stress scenarios over these risk factors (PD's, LGD's), which already have been conservatively calculated, could result in an overestimation of capital requirements.

- If we consider the usefulness of stress-test exercises for assess the impact of assymetric or specific shocks, such as specific industry downturn or a country recession, which finally penalises risk concentrations, we have to consider also that BIS II has excluded geographical or industry diversification effects from capital requirements quantification. In this sense excessive credit risk concentrations would have to be addressed in Pillar II, with or without stress-testing.

- In relation to the pro-cyclicality effects of the New Accord, we believe that the stress-testing requirement does not guarantee solving that issue. On the contrary it could contribute to increase capital requirements at the bottom of the cycle.

- To some extent, it is unavoidable that a more risk sensitive framework like the one proposed in Basel II will have a certain pro-cyclical effect. In any case there are already different factors that mitigate that effect and that do not make necessary the use of stress-testing practices:

  - Most banks operate with capital levels well above regulatory minimums.
  - Assignment of internal ratings should be based on a "through the cycle" basis.
  - The new regulatory framework already incorporates many assumptions of conservative nature.
  - Treatment of insolvency provisions, as is the case in Spain with the so called "statistical provision", could be a good tool to reduce cycle impact (provisioning expected losses, independently of real losses being well bellow in periods of high cycle).

- Through Pillar II supervisory review process, regulators will always have the possibility of asking for additional capital buffers over regulatory minimum if a bank risk profile, due to factors not considered in Pillar I – such as excessive risk concentrations or flaws in its internal rating system – merits so.

- Finally, we believe that the requirement of "having in place sound stress-testing processes" is premature and should not be included as a requirement for applying IRB methods. Stress Testing could be a useful reference in the process of assessing capital adequacy under Pillar II, but its present state-of-the-art does not advice to prescribe its general application for regulatory purposes. On the other hand the proposed BIS II framework already disposes of enough mechanisms to reduce its possible pro-cyclical effects.

- In the case of Basel Committee not removing this obligation, we should seek to see confirmed last announced conditions on stress-testing and, as suggested in the last meeting of our working group, public disclosure of the results of these exercises should be avoided (given difficulty of comparing bank specific own-design methodologies).